S. Wale inv.t

E. Rooker sculp.

*What NATURE sparing gives, or half denies, –*
*See! healthfull INDUSTRY at large supplies. –*
*See! in BRITANNIA'S Lap profusely pours, –*
*While heaven-born SCIENCE swells th'increasing Stores.*

Ecce! ferunt Pueri Calathis Tibi Lilia plenis. VIRG.

J. A. Anthony 1854

THE

# GARDENERS DICTIONARY:

4/2 CONTAINING

The BEST and NEWEST METHODS

OF

CULTIVATING and IMPROVING

THE

Kitchen, Fruit, Flower Garden, and Nursery;

As also for Performing the

Practical Parts of AGRICULTURE:

INCLUDING

The MANAGEMENT of VINEYARDS,

WITH THE

Methods of MAKING and PRESERVING WINE,

According to the present Practice of

The most skilful Vignerons in the several Wine Countries in *Europe*.

TOGETHER WITH

DIRECTIONS for PROPAGATING and IMPROVING,

From REAL PRACTICE and EXPERIENCE,

ALL SORTS OF TIMBER TREES.

---

THE EIGHTH EDITION,

Revised and Altered according to the latest SYSTEM of BOTANY; and Embellished with several COPPER-PLATES, which were not in some former Editions.

---

BY PHILIP MILLER, F. R. S.

Gardener to the Worshipful Company of APOTHECARIES, at their Botanic Garden in *Chelsea*, and Member of the Botanic Academy at *Florence*.

---

. . . . *Digna manet divini gloria ruris.* VIRG. Georg.

---

LONDON,

Printed for the AUTHOR;

And Sold by JOHN and FRANCIS RIVINGTON, at No. 62, *St. Paul's Church-yard*; A. MILLAR, J. WHISTON, W. STRAHAN, J. HINTON, R. BALDWIN, B. WHITE, L. HAWES and W. CLARKE and R. COLLINS, W. JOHNSTON, T. CASLON, S. CROWDER, T. LONGMAN, B. LAW, C. RIVINGTON, J. DODSLEY, W. GRIFFIN, T. CADELL, T. LOWNDES, S. BLADON, G. ROBINSON and J. ROBERTS, and T. PAYNE.

M. DCC. LXVIII.

Mo. Bot. Garden
1908

To the Most Noble

# HUGH,

## Duke and Earl of NORTHUMBERLAND,

## EARL PERCY,

Baron WARKWORTH of Warkworth Castle,

Lord Lieutenant and Custos Rotulorum of the Counties of MIDDLESEX and NORTHUMBERLAND,

Of the City and Liberty of WESTMINSTER,

And of the Town and County of NEWCASTLE upon TYNE,

VICE ADMIRAL of all AMERICA,

And of the County of NORTHUMBERLAND,

One of his MAJESTY's Most Honourable Privy Council,

Knight of the Most Noble Order of the GARTER,

And Fellow of the ROYAL SOCIETY.

MAY IT PLEASE YOUR GRACE,

YOUR Grace's kind Acceptance of two former Editions of this Work, has emboldened me to lay this at Your Grace's Feet, as a public Acknowledgment of the many uſeful Obſervations and Inſtructions, which Your Grace has at ſeveral Times communicated to me for its Improvement. If I have been ſo happy as to employ them in ſuch manner, as to merit Your Grace's Approbation, I ſhall have leſs Reaſon to doubt that of the Public; ſince the moſt ſkilful Perſons in this uſeful Branch of Science, pay the higheſt Regard to Your Grace's Judgment.

The many Improvements which Your Grace is annually making ſo happily upon Your various Eſtates, ſufficiently demonſtrate Your Grace's ſuperior Judgment; but more particularly in a Country almoſt deſtitute of Timber: Where, if Your Grace continues planting, ſo ardently as for ſeveral Years paſt, the whole Face of the Country will be much altered for the better, and Your Grace's Eſtate thereby greatly improved.

That Your Grace may long live to continue theſe Improvements, and to be an Example to others, is the ſincere Wiſh of

Your GRACE'S

Moſt obedient humble Servant,

CHELSEA,
*March* 1, 1768.

Philip Miller.

# P R E F A C E.

THE GARDENERS DICTIONARY having already gone through ſeveral editions, it may reaſonably be ſuppoſed, the public are well acquainted with the nature of it, which renders it leſs neceſſary to enlarge on that ſubject. The author therefore thinks himſelf obliged to return his thanks for the kind reception his work has met with.

But as there may be ſome, who may think that the republiſhing it is doing them an injury, eſpecially thoſe who have purchaſed a former edition, it may not be amiſs to make ſome apology for this.

When the firſt edition was publiſhed, gardening was then much leſs known than at preſent; and therefore, as the knowledge of the art increaſed, it became more neceſſary to enlarge on the ſubject, by adding the new improvements to the former, without which it would have been deemed imperfect: for as the author's ſituation in life rendered him capable of being well informed of the progreſs made in the art, by his great correſpondence both at home and abroad, he thought it would not be unpleaſing to communicate thoſe improvements to the public: in doing which, he has been careful not to publiſh any thing imparted to him, until he was fully ſatisfied of the facts by experiments.

Others have ſuggeſted, that printing the improvements ſeparately would give ample ſatisfaction in this point; but the author had made trial of former purchaſers ſome years paſt, by publiſhing ſeveral ſheets of new articles, by way of Supplement, for which there was ſcarce any demand; ſo that the few which were ſold, would not defray the expence of paper and printing.

As the number of plants now cultivated in England, are more than double thoſe which were here when the firſt edition of this book was publiſhed, the mentioning of them, together with their culture, could not well be avoided in a work of this nature, therefore the author hopes his care in inſerting them will not be cenſured.

From the title of this book it may ſeem to be only a Dictionary on the art of gardening, but all the branches of agriculture are included in it, in a more complete manner than can be found in any other book extant, though written wholly on the ſame ſubject. Nor are the inſtructions here given for performing the work in every part taken up haſtily, or upon ſlight experiment; but moſt of them are the reſult of more than twenty years practice in different parts of England, where the author has been permitted to ſuperintend and direct the whole: therefore he can aſſure the public he has been very cautious in recommending any thing, which he is not thoroughly convinced to be true.

It is amazing to ſee, in moſt of the books which have been publiſhed concerning huſbandry, that ſcarce any of the compilers have taken the leaſt notice of the common practice of ſowing eight times the quantity of Corn upon land that is neceſſary, to the great expence and detriment of the farmers, who are ſo wedded to their old cuſtoms, as not to be convinced of the error: for ſo obſtinate are they in this matter, that unleſs the whole ground be covered with the blades of Corn by the ſpring, they judge it not worth ſtanding, and in conſequence thereof frequently plough up their Wheat and winter Corn, to ſow the land with Barley, or other Lent Corn; whereas, if the former had been left ſtanding, it would have produced a better crop than any land can do where the blades are very thick, as the author has frequently obſerved. I have mentioned this to ſeveral farmers, but the anſwer has conſtantly been, that on rich ground a thin crop of roots will often produce a large crop of Corn, but on poor land it will not pay coſt, which is a very great abſurdity; for how is it poſſible, that bad land can ſupply proper nouriſhment to a greater number of roots than better ground? and where this practice is obſerved, ſeldom more than three or four buſhels are reaped from one ſown; whereas, where the ſame quantity is ſown upon the ſame, or a like ſoil, and has room to grow, the produce will be at leaſt ſix or ſeven buſhels. Yet I have ſeen growing upon land not very good, and uncultivated, for more than twenty years, which and was ſown with

 Wheat

Wheat in drills, where three gallons of ſeed were allowed to an acre, a produce of nine quarters per acre; now this is no more than an eighth part of the ſeed uſually ſown by farmers, who ſeldom reap more than one-third of this produce; by which it appears plainly, that in the common method of huſbandry, there is at leaſt eight times the quantity of ſeed ſown upon the land that is neceſſary. How great a ſaving this would be in a whole country, I leave every one to judge, eſpecially in ſcarce years, when Corn is dear; and what an expence is occaſioned by the contrary practice to the farmers, who notwithſtanding ſeem unwilling to alter their ancient cuſtoms. Theſe matters are treated of under the articles AVENA, HORDEUM, SECALE, and TRITICUM.

Nor are the common farmers better managers of their paſture lands; for on them they ſeldom are at the trouble of rooting up bad weeds, which frequently over-run them; theſe are often permitted to ſcatter their ſeeds, by which the land is ſtocked with a ſupply of weeds for ſeven years or more, tho' the utmoſt care be taken afterward to deſtroy them: but tho' there are ſome farmers who may be ſuppoſed more careful in this reſpect, yet theſe leave in their head lands, and on their banks, hedge-rows, and the ſides of ditches, a ſufficient number of weeds to ſtock their fields when the ſeeds are permitted to ſcatter: beſide, theſe paſtures have rarely a ſufficient quantity of manure allowed them, eſpecially where there is much arable land; nor is the dreſſing laid on at a proper ſeaſon; the general rule with moſt of the farmers being to carry and ſpread the dung upon their paſtures, ſoon after the crop of hay is taken off the ground; and as this is done in ſummer, the heat of the ſun draws all the moiſture from it, whereby the greater part of its goodneſs is evaporated and loſt. But as theſe points are more fully treated of in the body of this work, the author deſires the reader to refer to them.

On the article of TIMBER perhaps many may ſuppoſe, the author has been too diffuſe in his inſtructions; but if thoſe who are of that opinion will only conſider, how material an article this is to the welfare of this country, he flatters himſelf they will change their ſentiments, eſpecially when they reflect upon the great waſte that has been made of it for many years paſt; as alſo that the perſons now employed by the government to cultivate and improve it, deriving their own profits from the waſte of timber, ſeem to think, that as their predeceſſors have long practiſed it, they have a right to do the ſame; this is now carried to ſo great an extravagance, that unleſs a ſpeedy ſtop be put to it, the government will be greatly diſtreſſed for their marine. For although this practice began in the Royal Foreſts, &c. yet ſeveral of the nobility and gentry, who had very great quantities of timber growing upon their eſtates, have deſtroyed a conſiderable part of theirs alſo; therefore, from a due regard for the public, the author has treated of the beſt methods for propagating and preſerving timber, which he hopes may not be diſpleaſing to the generality of his readers.

The ſeveral plants here propoſed for trial in the Britiſh dominions in America, are ſuch as there is reaſon to believe will ſucceed in thoſe parts where the experiments are deſired to be made, and confined to ſuch only, as may be of utility to the public, and real advantage to the inhabitants of thoſe countries: furthermore, theſe experiments are propoſed to be tried upon plants which will not ſucceed well in England, ſo as to render their culture practicable, and therefore will not interfere with the growth or trade of this country, and the conſumption of which is very great here, many of them being of very conſiderable uſe in our manufactures, which cannot be carried on without them; as namely the Safflower, Indigo, and ſeveral other ſorts uſed in dyeing, none of which will thrive in this country to advantage, with many medicinal drugs, which, if introduced into the iſlands of America, will certainly thrive there as well as in their native ſoils. Coffee and Chocolate grow equally well there; but the former being gathered before it is ripe, ill dried, and brought over to England in ſhips freighted with rum and ſugars, the effluvia of theſe commodities are imbibed by the Coffee, whereby it is rendered leſs valuable: as to the latter, it was formerly cultivated by the Spaniards in the iſland of Jamaica, when they were in poſſeſſion of it, ſo as to furniſh the inhabitants with a quantity ſufficient for their own conſumption; whereas the Engliſh inhabitants now reſident there, purchaſe it of the Spaniards: theſe articles therefore require the public attention, for if the above commodities may be eaſily produced in the Britiſh colonies in America, they will not only ſupply us with ſuch as are genuine, but alſo turn the balance of trade, greatly to the advantage both of Great-Britain and her colonies.

It is alſo a great neglect of the inhabitants of the ſugar iſlands in America, to commit the care of their plantations to overſeers, who at beſt go on in their uſual courſe, planting eight or ten ſugar canes in each hill, ſo that if five or ſix of them grow, they will be ſo cloſe as to ſpoil each other; for whenever theſe plants are ſtinted in their growth, they are ſoon attacked by vermin, which ſpread and multiply ſo greatly, as frequently to deſtroy the whole crop, or at leaſt very much to damage it; and this they lay upon inclement ſeaſons, calling it a blight, whereas it proceeds from their own covetous cuſtom. A gentleman of learning, who had a conſiderable eſtate in Jamaica, which was bequeathed to him upon his arrival there, was determined to make trial of the horſe-hoeing huſbandry

among

among his canes. Accordingly he ſet out one acre of land in the middle of a large piece, which he cauſed to be planted with canes at five feet diſtance, putting but one to each hill; theſe grew to a very large ſize, and when ripe were cut, as alſo an acre from the beſt part of the piece in which the others were planted: each of them then were boiled ſeparately to examine their produce, which was nearly equal in the weight of ſugar; but where the plants grew ſingle, the juice was boiled with a ninth part of the fuel which the other required, and he ſold the ſugar for ſix ſhillings per hundred weight more than he could get for the former. This ſhews what advantages may be expected, if the poſſeſſors of lands were careful to make trials.

The alterations made in the catalogues of trees and plants which are added at the end of the book, have been done to prevent ſwelling the work to too great a ſize, therefore their ſpecific differences are not inſerted at full length; but as their generical titles are mentioned, and the figures to each ſpecies denote them according to their reſpective ſpecies referred to in the body of the book, the reader is deſired to turn to the ſeveral genera, where under each article, their ſpecies with their reſpective titles are inſerted at length, as alſo their culture and natural places of growth. The uſe of theſe catalogues, eſpecially to ſuch as are not acquainted with the art of gardening, but particularly to thoſe who ſet up for deſigners of gardens, may be of great ſervice; for if this part of planting were duly attended to, there would not be ſo many abſurdities committed, as are now to be found in moſt of theſe deſigns, where we often ſee ſome of the ſmalleſt growing ſhrubs placed, where the largeſt trees ſhould have been planted.

In the whole of this performance, the author has principally aimed at rendering the inſtructions given, as clear and intelligible as poſſible to the practitioners, as well as to thoſe who are leſs acquainted with the art; in every particular he has obſerved all poſſible regard to truth, not having advanced any thing as ſuch, but what he has been fully convinced of by his own experience: he hopes therefore for indulgence from the public, for any imperfections or omiſſions which may appear in the book, ſince in a work of ſo great extent, it cannot be expected to be abſolutely perfect, though it is humbly hoped there will not be found in it many faults.

Some errors of the preſs have accidentally crept in, occaſioned by the author's other neceſſary avocations, which frequently called him into the country during the time it was printing; but as moſt of theſe are corrected, and are not beſides of themſelves of great importance, he hopes the candid reader will pardon them.

The Gardeners Kalendar, inſerted in moſt of the former editions, is in this omitted, many editions of that piece having been printed in octavo; it is preſumed therefore that few perſons who have any inclination for the innocent diverſion of gardening, are without it; and as the adding any thing to this work would have ſwelled it greatly, which the author wiſhes he could have ſtill further ſhortened; and moreover it having been obſerved to him, by many of his friends, that few perſons would chuſe to turn over ſo large a volume, to find in it the articles they may have in a portable one, the omiſſion of the Kalendar was thought more adviſeable.

In the laſt edition of this work, the author adopted in a great meaſure the ſyſtem of Linnæus, which was the prevailing method of ranging plants then in uſe among botaniſts; but as many of the plants which were treated of in the Gardeners Dictionary, were not to be found in any of Linnæus's works then publiſhed, Tournefort's ſyſtem was alſo applied to take in ſuch as were not fully known to Dr. Linnæus; but ſince that time the learned profeſſor having made great additions to his works, and thoſe additions being generally conſulted for the names of plants, the author has now applied Linnæus's method entirely, except in ſuch particulars, where the Doctor not having had an opportunity of ſeeing the plants growing, they are ranged by him in wrong claſſes; as for inſtance, the Ilex or Agrifolium is ranged in his fourth claſs, with thoſe plants whoſe flowers have four ſtamina or male organs, and four ſtigmas or female parts of generation; whereas thoſe plants have male flowers upon ſome, and female upon other plants. The Laurus Linnæus has placed in his ninth claſs, with thoſe plants whoſe flowers have nine ſtamina or male organs of generation, and one female part; but theſe plants ſhould alſo be ranged in his twenty-ſecond claſs, for all the ſpecies of this genus have male and female flowers on different plants. Theſe, with ſome other alterations from Linnæus's ſyſtem, have been made in this edition, where the author has given his reaſons for ſo doing, which he hopes will be approved by the public.

Many plants are likewiſe omitted in this edition, ſeveral of them natives of England, but rarely cultivated in our gardens; as alſo many varieties accidentally ariſing from ſeeds, as are moſt of thoſe with double flowers, which, if enumerated, would have ſwelled the book to an immoderate ſize; however, moſt of theſe varieties are caſually mentioned, to inform the reader of their reſpective difference, which the author hopes will be deemed ſufficient But as the variety of fruits, as well as of eſculent

lent

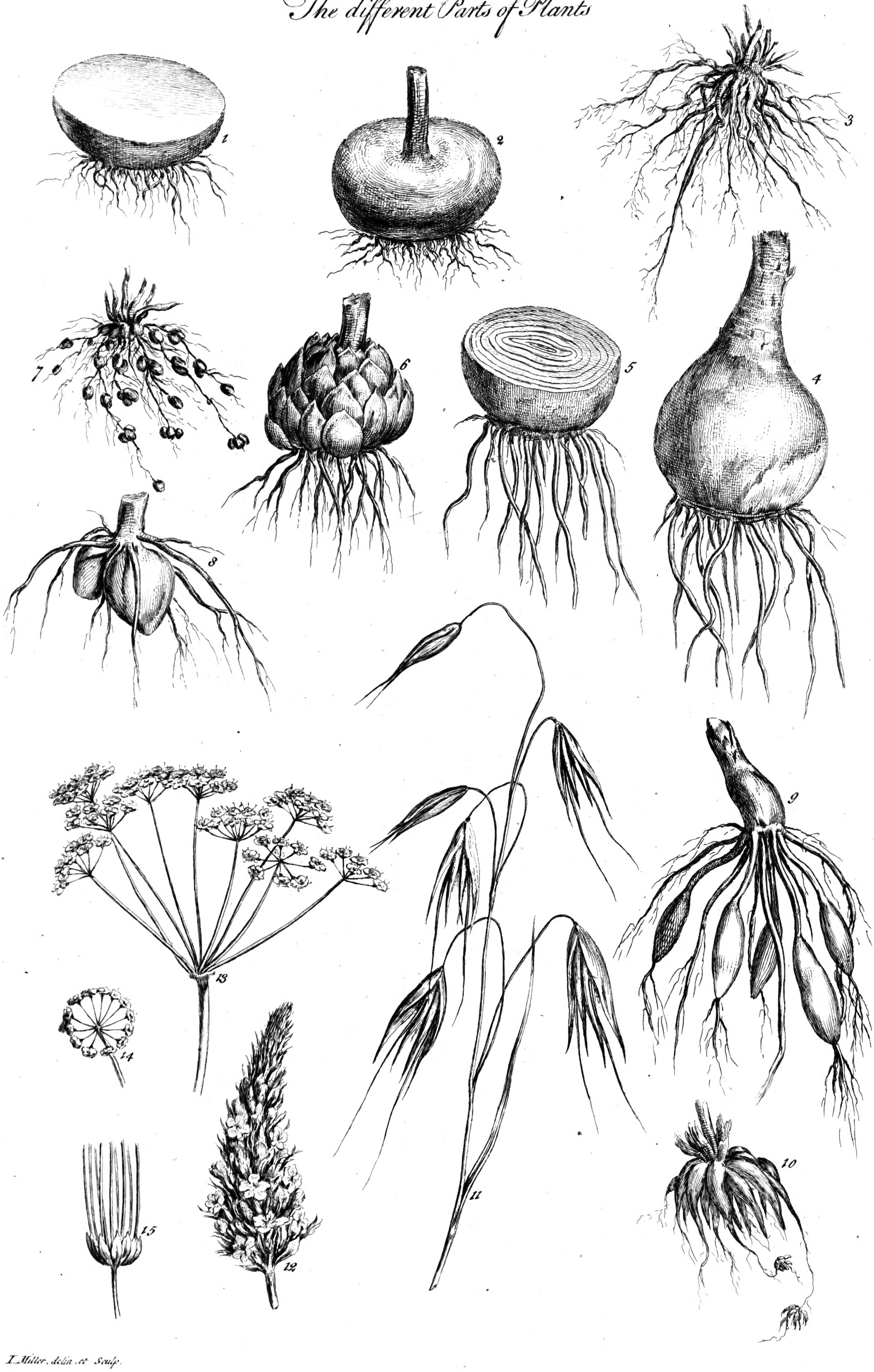
lent plants, have been most of them, at least the fine sorts, greatly improved by culture, they are fully treated of under their proper genera.

On this article a long series of observations has been made by the author, who for near fifty years has applied himself closely to this subject; for as many former botanists have enumerated a great number of varieties as so many species, the study of botany was thereby rendered greatly perplexed; some of the modern writers on this subject, by going into the contrary extreme, have abridged the species almost as much. Indeed it must be allowed, that ascertaining the real specific difference of plants, would be of great service to the science of botany; but this cannot be done otherwise, than from many years experience in their culture, especially by observing the varieties which arise from the same seeds, as also the difference produced by different soils and situations, which is frequently so great as to perplex very good judges in this matter. There are likewise many other varieties which have arisen from seeds, saved from plants, and grown near others of a different species, by which means they have partaken of both; but these hybridine plants rarely producing any seeds afterward, the alteration goes no farther.

AN

Plate. 1.

# The different Parts of Plants




I. Miller. delin. et Sculp.

A N

# E X P L A N A T I O N

## O F T H E

## T E C H N I C A L T E R M S of B O T A N Y

Mentioned in this

# W O R K.

A ROOT, *Radix*, is that part of a plant, by which it naturally receives its nouriſhment. There are ſeveral ſorts of theſe, as

A fibrous Root, *Radix fibroſa*, is that which conſiſts only of fibres. See plate 1. fig. 3.

A tuberous Root, *Radix tuberoſa*, is that which conſiſts of an uniform fleſhy ſubſtance, and is of a roundiſh figure. See plate 1. fig. 1, 2. where it is cut horizontally through the middle.

A bulbous Root, *Radix bulboſa*, is that which conſiſts of ſeveral coats involving one another, as is ſhewn plate 1. fig. 4, 5. or of ſeveral ſcales lying over one another, as in plate 1. fig. 6. The firſt of theſe is called a tunicated Root, the laſt a ſquamous Root.

A granulous Root, *Radix granuloſa*, is a kind of grumous root, with ſmall knobs reſembling ſo many grains of Corn. See plate 1. fig. 7.

A teſticulated Root, *Radix teſticulata*, is a double tuberous root, conſiſting of two fleſhy knobs reſembling a pair of teſticles. See plate 1. fig. 8.

An aſphodel Root, *Radix aſphodeli*, is a kind of grumous root, whoſe fleſhy fibres ſwell into large knobs toward the bottom, reſembling the dugs of animals. See plate 1. fig. 9.

A grumous root, *Radix grumoſa*, is one which is compoſed of ſeveral fleſhy knobs ending in fibres. See plate 1. fig. 10.

A Stalk, *Caulis*, is a part of a plant, receiving the nouriſhment from the root, and diſtributing it into the other parts with which it is cloathed, not having one ſide diſtinguiſhable from the other. The ſtalk of a tree is called the trunk or ſtem, i. e. *Caudex*.

A Branch, *Ramus*, is the diviſion of a ſtalk. In trees it is generally called a bough.

A Pedicle, *Pediculus*, is that part of a ſtalk, which immediately ſuſtains a leaf, a flower, or a fruit. Dr. Linnæus has diſtinguiſhed theſe. Thoſe which ſuſtain the leaves he calls *Petiolus*, and thoſe which ſuſtain the fruit, *Pedunculus*.

A Spike, *Spica*, is a part of a ſtalk thick ſet with flowers or fruits, in ſuch a manner as to form an acute cone. See plate 1. fig. 12.

A Thyrſe, ſee *Thyrſus*, differs from a ſpike in that the flowers or fruits are ſet more looſely on it, ſo that there are ſpaces viſible between them.

A Panicle, *Panicula*, is a ſtalk diffuſed into ſeveral pedicles ſuſtaining the flowers or fruits. See Plate 1. fig. 11.

An Umbel, *Umbella*, is the extremity of a ſtalk or branch, divided into ſeveral pedicles or rays, beginning from the ſame point, and opening in ſuch a manner as to form an inverted cone. See plate 1. fig. 13. When the pedicles (*a*), into which the ſtalk is divided, are ſubdivided into others of the ſame form, upon which the flowers or fruits are diſpoſed (*b*). The firſt order (*a*) is called rays, the ſecond (*b*) Pedicles. That umbel which conſiſts of one pedicle only is called a ſimple umbel. See fig. 15. plate 1. That which is compoſed both of rays and pedicles, is called a compound umbel, as fig. 13.

A Corymbus differs from an umbel, in that the rays or pedicles are diſpoſed in ſuch a manner, as to form a ſphere. See plate 1. fig. 14.

A twining ſtalk, *caulis volubilis*, is one which twiſts about any prop or tree without the help of tendrils.

A climbing Stalk, *Caulis ſcandens*, is that which faſtens itſelf to any prop or neighbouring ſupport by the help of tendrils.

A creeping Stalk, *Caulis repens*, is that which lies on the ground, and propagates itſelf by emitting roots at the joints.

A trailing, or procumbent ſtalk, *Caulis procumbens*, is that which lies on the ground unleſs it is ſupported, but does not emit roots.

A Tendril, *Capreolus* or *Clavicula*, is a part of a ſtalk, or rather a branch from the ſide of a ſtalk, placed oppoſite to the leaf, which curls and lays hold on any adjacent body, and thereby ſupports the ſtalk, as in the Vine, &c.

A Fruit, *Fructus*, is that part of a plant which contains the ſeed with its covering. Of this there are many different forms.

A Cone, *Conus*, is a dry ſeed-veſſel, conſiſting of ſeveral ligneous parts, adhering cloſely together, and ſeparating when ripe. Of this there are ſeveral ſorts which differ in their form and texture, as in plate 2. fig. 1. is a cone of the Pineaſter, whoſe ligneous ſcales end in ſharp protuberances, which open by the warmth of the ſun in the ſpring, and eaſily emit the ſeeds. Fig. 2. plate 2. ſhews the cone of the Cedar of Libanus, whoſe ſcales are ſmooth, lying cloſe over each other, and drop off, leaving the middle column on the branches. Fig. 3. plate 2. exhibits a cone of the Firtree, whoſe ſcales are ſmooth, and the form oblong. Fig. 4, 5. plate 2. ſhews the cone of the Cypreſs, which is of an irregular ſpherical form, and the ſcales ſeparate, emitting the ſeeds from between them. Fig. 6. plate 2. repreſents the cone of the Pine-tree, whoſe ſcales terminate in blunt protuberances.

Dry Seed-veſſels, according to the number of cells into which they are divided, are called Unicapſular, Bicapſular, Quinquecapſular, &c. See plate 2. fig. 8, 9.

An Apple, *Pomum*, is generally underſtood to be a fleſhy fruit incloſing ſeveral hard ſeeds in the center; but it is very difficult to know what the ancients meant by the title Pomum, for this title is frequently uſed in their writings to expreſs things of different forms, therefore this epithet ſhould be only applied to thoſe fruits which are umbilicated, and contain many ſeeds. See fig. 11, 12. plate 2.

# An Explanation of the Technical Terms of Botany.

Acini is by ſome ſuppoſed to be the berries of Grapes and Currants, but is uſed in a more extenſive ſenſe by moſt of the writers on botany, who ſtile the ſmall protuberances of Mulberries, Strawberries, &c. fig. 7. plate 2. Acini.

A Cluſter, *Racemus*, is a ſtalk divided or branched into ſeveral pedicles, ſuſtaining the flowers or fruits thick ſet together in an oblong form. See fig. 12. plate 2. The firſt of theſe conditions diſtinguiſhes it from a ſpike, the laſt from a panicle.

A Pod, *Siliqua*, is a long membranaceous ſeed-veſſel, either flat or round, containing one or two rows of ſeeds. See fig. 13, 14. plate 2. Some of theſe are jointed, each of the ſwellings containing one ſeed, as is ſhewn, fig. 15. plate 2.

The Seeds of Corn and Graſs are called Grains, *Grana*. The leaf which covers the grain is called Chaff, *Gluma*, fig. 16. plate 2. *a* The Beard, *Ariſta*. *b* is a ſmall needle proceeding from the chaff. The chaff which has no beard is called naked.

A Plum, *Prunum*, is a fleſhy veſſel incloſing a hard brittle ſhell, in which is one or two ſeeds.

A Nut, *Nux*, is a ſeed covered with a hard, dry, brittle ſhell.

A Flower, *Flos*, is the organs of generation of both ſexes, adhering to a common placenta, together with their common coverings, or of either ſex ſeparately, with its proper coverings, if it have any.

Flowers are either male, female, or hermaphrodite. The male flowers have ſtamina and ſummits, but have no ovary or ſtyle. Female flowers have an ovary and ſtyle, but have no ſtamina or ſummits. Hermaphrodite flowers have both organs of generation.

The Ovary, *Ovarium*, or *Germen*, according to Linnæus, is the rudiment of the fruit. See *a*, fig. 13. plate 3. and ſo is properly the female organ of generation.

The Style, *Stylus*, is a body accompanying the ovary, either ariſing from the top of it. See *b* fig. 13. plate 3. or ſtanding as an axis in the middle with the embryos of the ſeeds round it, fig. 12. plate 3. and *c* is the ſtigma.

The Empalement, *Calyx*, is generally underſtood to mean, thoſe leſs tender leaves, which cover the other parts of the flower. See fig. 11. *a*, plate 3. Theſe, according to Mr. Ray, are of an herbaceous colour.

The Petals, *Petala*, are thoſe tender fine-coloured leaves, which are the moſt conſpicuous parts of a flower. See fig. 11. *b*, plate 3.

The Stamina or Filaments, according to Linnæus, which ſome call Chives, are thoſe ſlender threads which generally ſurround the ſtyle. See *c*, fig. 11. plate 3.

The Summits, or Apices, which Linnæus calls *Anthera*, are thoſe bodies which contain the farina fœcundans, or prolific powder, analagous to the male ſperm in animals; theſe generally terminate the ſummits. See *d*, fig. 11. plate 3.

Flowers, according to the number of their petals, are called monopetalous, dipetalous, tripetalous, tetrapetalous, &c.

A regular monopetalous flower is that in which the petal is not at all divided. See fig. 1. plate 3. or if divided, the ſegments are equal, as in fig. 2. plate 3.

An irregular monopetalous flower, is that in which the parts of the petal are unequal, as in fig. 3. plate 3. theſe Dr. Linnæus calls ringent flowers. Mr. Ray, Tournefort, and others, call all thoſe monopetalous flowers, whoſe petals are connected at their baſe, and fall off without ſeparating; but Dr. Linnæus calls them tetrapetalous or pentapetalous, when the petal is divided into ſo many parts near the bottom.

A regular polypetalous flower, is when the petals are equal in ſize, and agree in poſition, as in fig. 3. plate 3.

An irregular polypetalous flower is when the petals do not agree together in figure and poſition. See fig. 9, 10. plate 3.

A labiated, or Lip-flower, *Flos labiatus*, is an irregular monopetalous flower, divided uſually into two lips, as in fig. 6. plate 3. The upper lip *a*, is called the Creſt, *Galea*, and the under one *b*, the Beard, *Barba*. Sometimes the creſt is wanting, as in fig. 4. plate 3. and then the ſtyle and ſtamina ſupply its place. This is by ſome called an unilabiated flower.

A papilionaceous Flower, *Flos papilionaceus*, in ſome meaſure reſembles a butterfly with its wings extended. See fig. 5, 7. plate 3. It always conſiſts of theſe four parts: the ſtandard, *Vexillum*, *a*, which is a large ſegment or petal; the two Wings, *Alæ*, *b*, which compoſe the ſides; and the Keel, *Carina*, *c*, which is a concave petal or ſegment, reſembling the lower part of a boat; the keel is ſometimes of one petal or ſegment and entire; ſometimes it conſiſts of two petals or ſegments adhering pretty cloſely together.

A Floret, *Floſculos*, is a little tube expanded at the top, uſually into five ſegments. See fig. 17, 20. plate 3. and ſitting upon the embryo of a ſingle ſeed *a*; from the inner part of the floret ariſe five ſtamina *b*, which uniting together form a ſheath *c*; from the embryo of the ſeed *a*, ariſes a ſtyle *d*, which paſſes through the ſheath *c*, to which it is connected, and is terminated by a bifid ſtigma which is generally reflexed, *e*. Theſe are hermaphrodite.

A Semifloret, *Semifloſculus*, is tubulous at the baſe, and afterwards expanded in form of a tongue. See fig. 18. plate 3. Theſe generally form the rays of compound flowers, and are female.

A compound Flower, *Flos compoſitus*, is that which is compoſed either of florets, fig. 19. plate 3. or ſemiflorets, fig. 15. plate 3. or both together, fig. 16. and fig. 20.

A Diſk, *Diſcus*, is an aggregate of florets forming, as it were, a plain ſurface, as in fig. 19. plate 3. Such flowers are called diſcous flowers.

A Ray, *Radius*, is ſeveral ſemiflorets ſet round a diſk. See fig. 16. *a*, plate 3. in form of a radiant ſtar. Such flowers are called radiated diſcous flowers; thoſe which have no ſuch ray, are called naked diſcous, as fig. 19. plate 3.

A headed flower, *Flos capitatus*, is that which is compoſed of florets and ſemiflorets collected into a roundiſh head, and are all incloſed in one common ſcaly empalement, as in fig. 14. plate 3.

A whorled Flower, *Flos verticillatus*, is when the flowers are collected in whorls round the ſtalks at the baſe of the leaves, as in fig. 20. plate 3.

A Moſs Flower, which riſes on a ſlender foot-ſtalk from the plant, fig. 27. plate 3. with the head (or *Capitulum*), fig. 28. and the cover (or *Calyptra*) which opens and falls off when the ſeeds are ripe.

A Cone cut through the middle longitudinally to repreſent how the ſeeds are lodged between the ſcales. See fig. 22. plate 3.

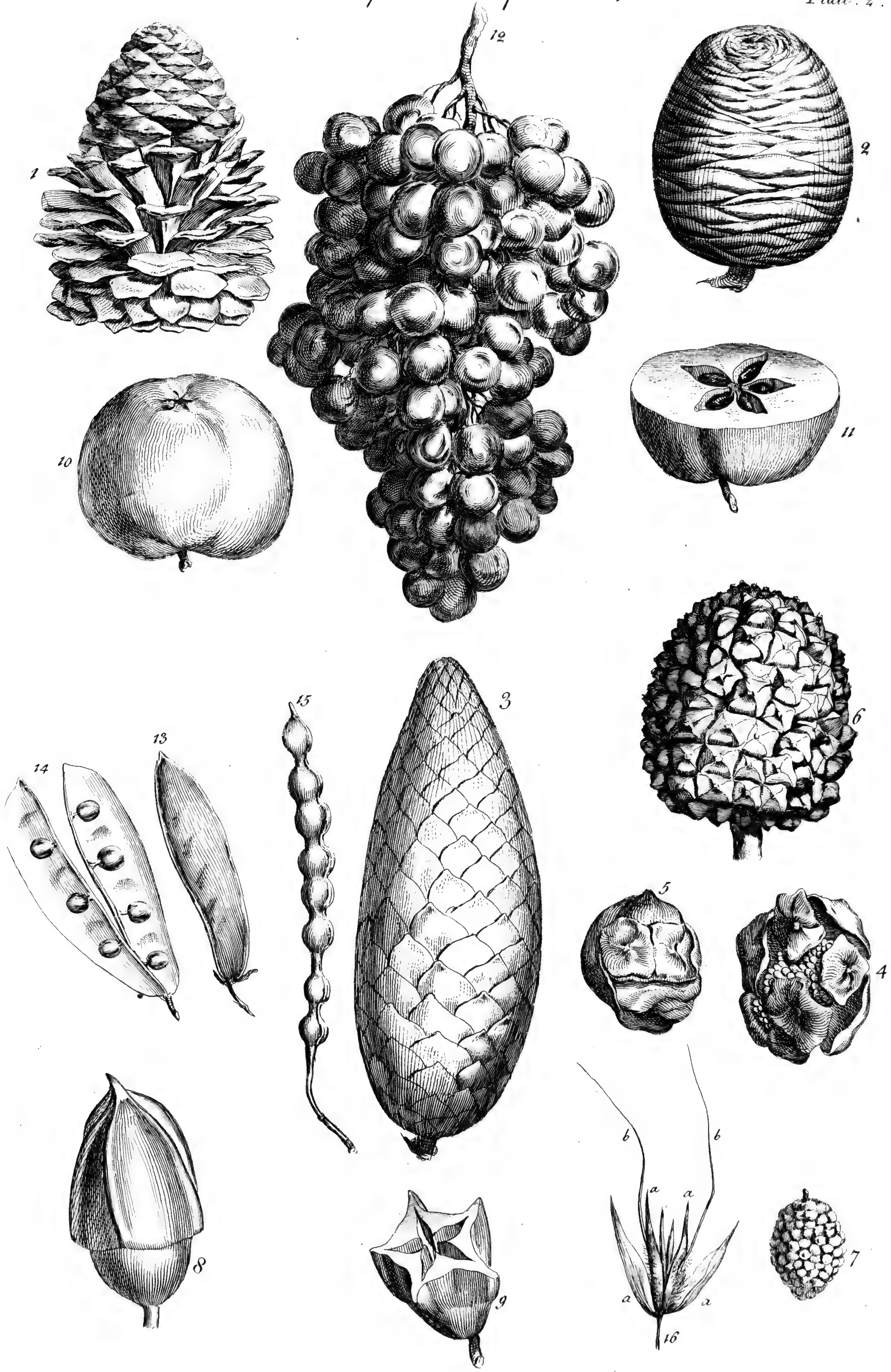
Fig. 24. plate 3. ſhews the parts of a flower, *a* is the empalement, *b* the germen, *c* the ſtyle, *d* the ſtigma, *e* the ſtamina, *f* the ſummit, and *g* the ſame entire.

Fig. 21. plate 3. ſhews a flower with ſeveral nectariums which ſit cloſe to the germen *a*.

Fig. 25. *a* ſhews a germen, *b* a ſtyle, and *c* a ſtigma.

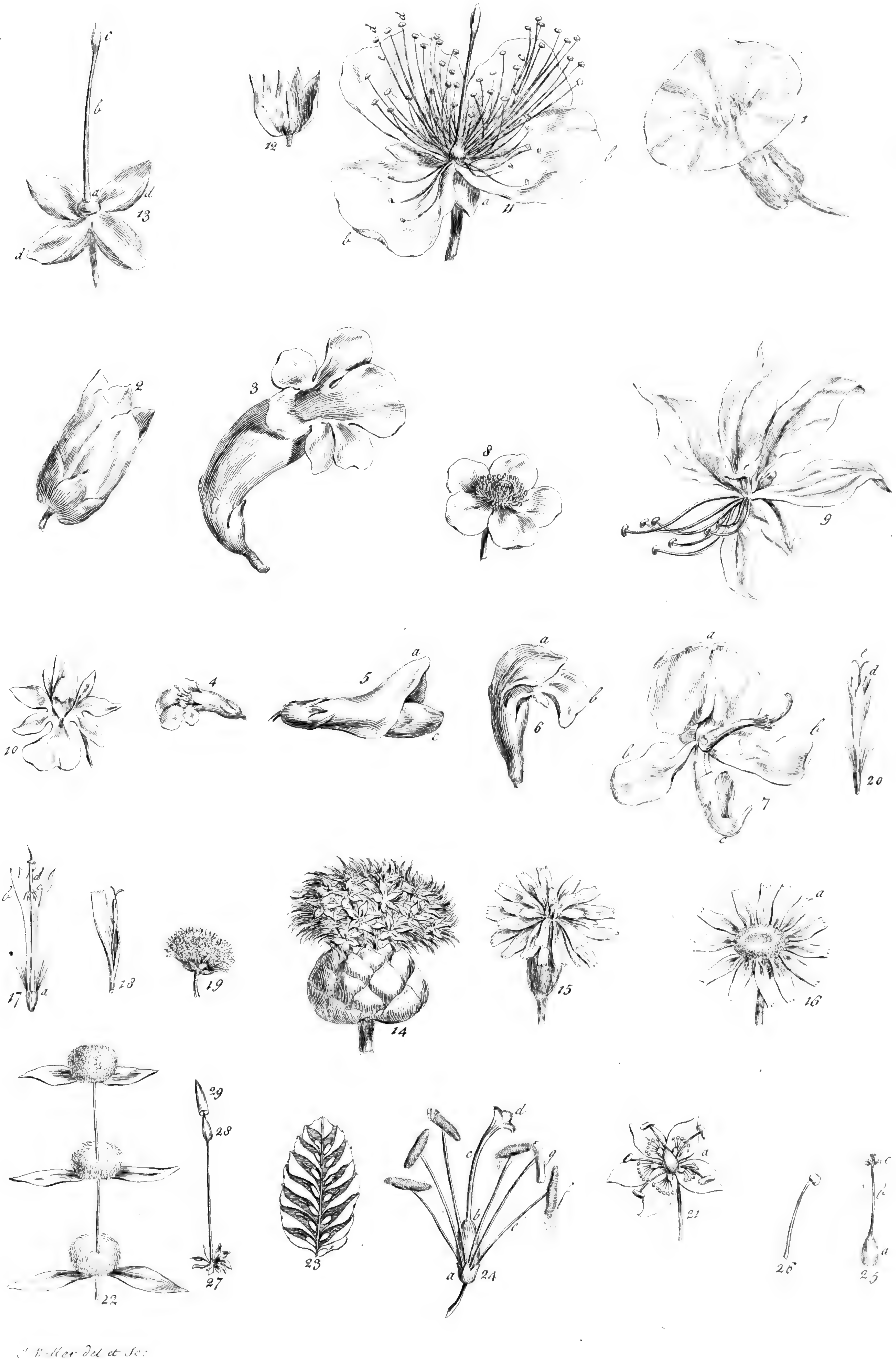
Fig. 26. ſhews a grain of farina fœcundans magnified.

PLATE




J. Miller del. et Sc.

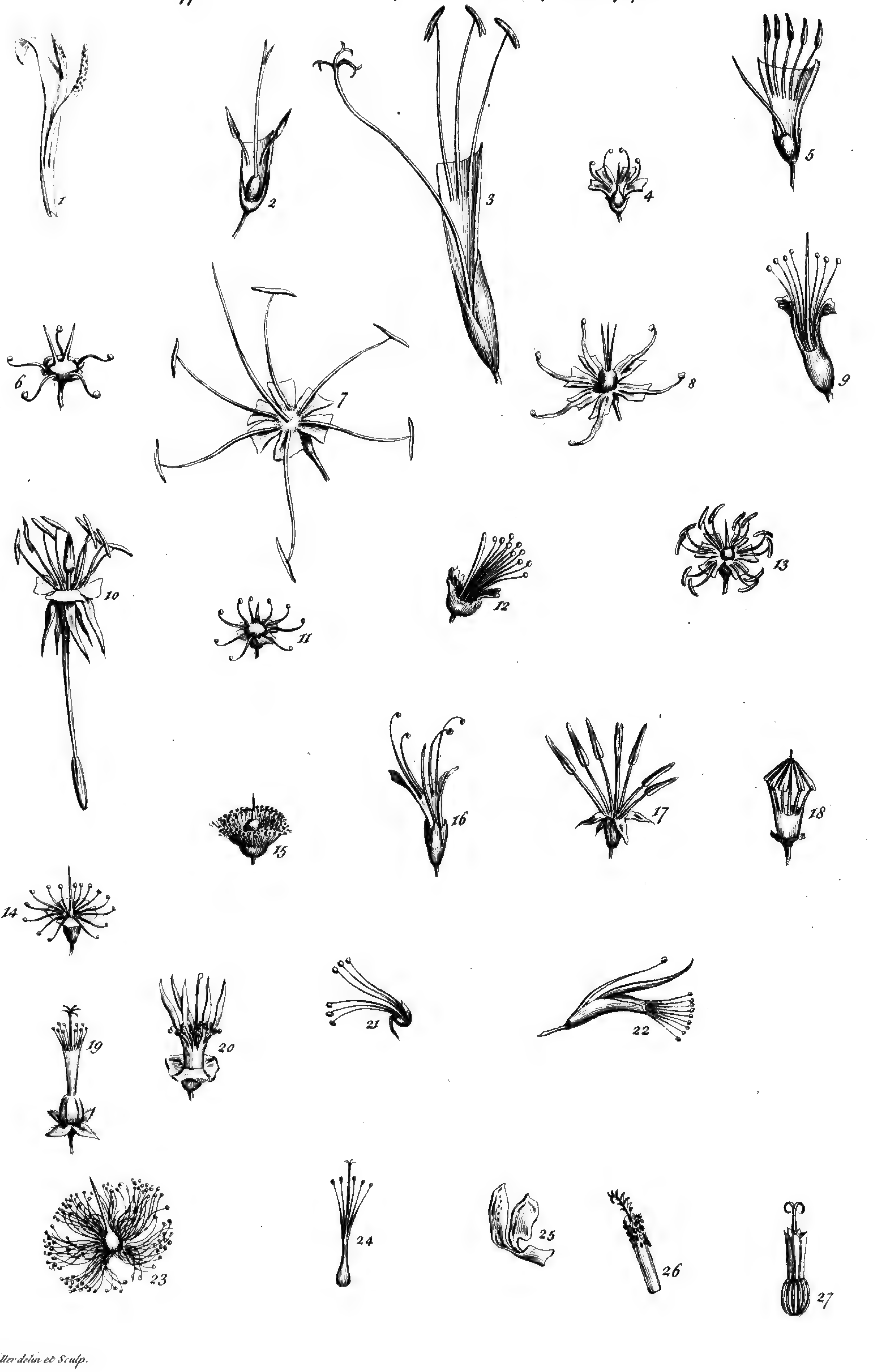
# Different Structures of flowers.



J. Miller del et Sc.

Different Structures of the Sexual parts of plants.






I. Miller delin et Sculp.

# PLATE IV.

## *Contains the figures which explain the Syſtem of Dr. Linnæus, who claſſes the plants by the number of ſtamina in their flowers.*

FIG. 1. ſhews a flower with one ſtamina and one ſtyle, which he titles *Monandria Monogynia.*

Fig 2. ſhews a flower with two ſtamina and one ſtyle, which he titles *Diandria Monogynia.*

Fig. 3. ſhews a flower with three ſtamina and one ſtyle, which he titles *Triandria Monogynia.*

Fig. 4. ſhews a flower with four ſtamina and one ſtyle, which he titles *Tetrandia Monogynia.*

Fig. 5. ſhews a flower with five ſtamina and one ſtyle, whice he titles *Pentandria Monogynia.*

Fig. 6. ſhews a flower with five ſtamina and two ſtyles, which he titles *Pentandria Digynia.*

Fig. 7. ſhews a flower with ſix ſtamina and one ſtyle, which he titles *Hexandria Monogynia.*

Fig. 8. ſhews a flower with ſix ſtamina and three ſtyles, which he titles *Hexandria Trigynia.*

Fig. 9. ſhews a flower with ſeven ſtamina and one ſtyle, which he titles *Heptandria Digynia.*

Fig. 10. ſhews a flower with eight ſtamina and one ſtyle, which he titles *Octandria Digynia.*

Fig. 11. ſhews a flower with nine ſtamina and one ſtyle, which he titles *Enneandria Monogynia.*

Fig. 12. ſhews a flower with ten ſtamina and one ſtyle, which he titles *Decandria Monogynia.*

Fig. 13. ſhews a flower with twelve ſtamina and one ſtyle, which he titles *Dodecandria Monogynia.*

Fig. 14. ſhews a flower with more than twelve ſtamina, but leſs than twenty, and theſe ariſe either from the petals or the empalement, and with one ſtyle, which he titles *Icoſandria Monogynia.*

Fig. 15. ſhews a flower with a great number of ſtamina and one ſtyle, which he titles *Polyandria Monogynia.*

Fig. 16. ſhews a flower with two long, and two ſhorter ſtamina, and one ſtyle, which he titles *Didynamia.*

Fig. 17. ſhews a flower with four long and two ſhorter ſtamina, and one ſtyle, which he titles *Tetradynamia.*

Fig. 18. ſhews a flower with five ſtamina, which are connected with the ſtyle in one body, which he titles *Monadelphia Pentandria.*

Fig. 19. ſhews a flower with ten ſtamina and one ſtyle, which are joined at the baſe into one body, which he titles *Monodelphia Decandria.*

Fig. 20. ſhews a flower with many ſtamina joined in one body, with a many-pointed ſtyle, which he titles *Monadelphia Polyandria.*

Fig. 21. ſhews a flower with ſix ſtamina joined in two bodies, which he titles *Diadelphia Hexandria.*

Fig. 22. ſhews a flower with ten ſtamina, nine of which are joined together at their baſe, and the other is ſeparated, with one ſtyle. This he titles *Diadelphia Decandria.*

Fig. 23. ſhews a flower with many ſtamina, which are connected at their baſe into ſeveral cluſters or bunches, which he titles *Polyadelphia Polyandria.*

Fig. 24. ſhews a ſingle floret of a compound flower, Theſe which are hermaphrodite have five ſtamina and one ſtyle, which are connected at their baſe. This claſs he titles *Syngeneſia.*

Fig. 25. ſhews a flower whoſe ſtamina are connected with, and ſeem to proceed from, the ſtyle, which is divided into two parts. This he titles *Gynandria.*

Fig. 26. ſhews a flower of the ſixteenth claſs, which is of a different figure from thoſe before repreſented. The ſtamina of this ſtand round the column formed by the ſtyle.

Fig. 27. ſhews a floret of the compound flowers ſitting upon the germen or embryo of the ſeed, with the two reflexed ſtigmas on the top of the ſtyle,

A N

# E X P L A N A T I O N

OF THE

# AUTHORS NAMES and WORKS

Referred to by the

# ABBREVIATIONS in this WORK.

ACT. Phil. The Philosophical Transactions of the Royal Society.

Act. Reg. Sc. The Memoirs of the Royal Academy of Sciences at Paris.

Aldin. A Description of some Rare Plants which were cultivated in the Farnesian Gardens at Rome, by Tobias Aldinus. Printed at Rome 1625, fol.

Alpin. Ægypt. Prosper. Alpinus's Natural History of Egypt, in two Parts. Reprinted in 4to at Leyden, 1735.

Alpin. Exot. Prosper Alpinus of Exotic Plants in two Books. Printed in 4to at Venice, 1656.

Amman. Char. Paul Amman's Characters of Plants. Printed in 12mo.

Amman. Hort. Paul Amman's Description of the Plants in the Garden of Bosius. Printed in 4to.

Amman Joh. John Amman's History of Russian Plants. Printed in 4to at Petersburgh, 1739.

Banister. A Catalogue of Plants observed in Virginia, by John Banister. Printed in Ray's History of Plants.

Barrel. Icon. Jacob Barrelier's History and Figures of the Plants which he observed in France, Spain, and Italy. Printed at Paris in fol. 1714.

Bocc. Rar. Figures and Descriptions of Rare Plants, observed by Paul Boccone in Sicily, &c. Printed at Oxford 1674, in 4to.

Bocc. Mus. Paul Boccone's Museum of Rare Plants. Printed in Italian, in two Parts, at Venice, 1697, 4to.

Boerh. Ind. An Index of the Plants growing in the Physic-Garden at Leyden, by Dr. Herman Boerhaave. Printed at Leyden 1719, in 4to.

Breyn. Cent. I. The first Century of Exotic Plants, by Dr. James Breynius. Printed at Dantzick, 1678, folio.

Breyn. Prod. I. & II. The first and second Prodromus to the Collection of Rare Plants, by Dr. James Breynius. The first printed in 1680, the second in 1689, at Dantzick, in 4to. Both reprinted at Dantzick in 4to, by his Son John Philip Breynius.

Burman. Dec. John Burman's Decades of Rare African Plants. Printed in 4to at Amsterdam, 1738.

Burman. Thes. John Burman's Treasury of Ceylon Plants. Printed in 4to at Amsterdam, 1737.

Buxbaum. Cent. I. & II. John Christian Buxbaum's Century the First. Printed at Petersburgh 1728, the Second 1729, both in 4to.

Cæsalp. Andrew Cæsalpinus of Plants. Printed at Florence 1583, in 4to.

Camer. Hort. Joacim Camerarius's Garden of Plants. Printed in 4to at Frankfort, 1588.

Catesb. Hist. Mark Catesby's Natural History of Carolina, Florida, and the Bahama Islands. In two large volumes, fol. with cuts. Printed at London in several years.

C. B. P. Caspar Bauhinus's Pinax to his Theatre of Plants. Printed at Basil 1671, 4to.

C. B. Prod. Caspar Bauhinus's Prodromus to his Theatre of Plants. Printed at Basil 1671, 4to.

Clus. Hist. Charles Clusius's History of Rare Plants. Printed at Antwerp 1605, fol.

Clus. Exot. Charles Clusius's Exotics, in ten Books. Printed at Antwerp 1601, fol.

Column. Ecphr. Fabius Columna's Ecphrasis, in two Parts. Reprinted in 4to at Rome, 1616.

Commel. Rar. Descriptions and Figures of Rare Exotic Plants, which were in the Physic-Garden at Amsterdam, by Caspar Commelin. Printed at Leyden 1706, 4to.

Commel. Præl. Caspar Commelin's Prelude to Botany. Printed at Leyden 1703, 4to.

Corn. James Cornutus's History of Canada Plants. Printed at Paris 1635, 4to.

Dale. Samuel Dale's Pharmacologiæ, in two volumes 8vo. Printed at London 1710, and reprinted in one volume in 4to at London, 1735.

Dale. Thom. Thomas Dale's Observations on many new Plants which he discovered in America. MS.

Dalech. Hist. Jacob Dalechamp's General History of Plants. Printed at Lyons 1587, in two vols. fol.

Dillen. Cat. John Jacob Dillenius's Catalogue of the Plants which grow naturally about Gissam in Germany. Printed at Frankfort 1719, 8vo.

Dod. Pempt. Dodonæus's Six Pemptedes. Printed at Antwerp 1616, fol.

Dodart. Dodart's Commentaries to the History of Plants. Printed at Paris 1676, fol.

Elchr. Elchrodt's Index to the Plants in the Garden at Carolsruhan. In three parts, 8vo.

Ferrar. Hesp. John Baptist Ferrarius's Hesperides. Printed at Rome 1646, fol.

Ferrar. Fl. Cult. The Culture of Flowers, by J. Baptist Ferrarius. Printed at Rome 1633, 4to.

Feuille. Ludovick Feuille's Physical, Mathematical, and Botanical Observations, made in South America. Printed in three vols. 4to, at Paris. The first and second in 1714, and the third 1725.

Flor. Virg. Flor. Virginica, or an Account of the Plants which have been observed to grow in Virginia, by John Clayton, Esq; Published by Frederic Gronovius at Leyden, in two parts, 8vo, 1739.

Flor. Lugd. Flora Lugduno Batava, or a Catalogue of the Rare Plants which were growing in the Garden at Leyden. Printed in 8vo at Leyden, 1695.

Flor. Zeyl. Flora Zeylanica, or a Catalogue of the Plants which were collected by Paul Herman in the Island of Ceylon, from 1670 to 1677. Printed at Amsterdam in 8vo, 1748, by Dr. Linnæus.

Garidel. Peter Garidel's History of the Plants growing about Aix in Provence. Printed at Paris 1719, fol.

Ger.

Ger. Emac. Gerard's Hiſtory of Plants, improved by Thomas Johnſon. Printed at London 1633, folio.

Grew. Nehemiah Grew's Anatomy of Plants. Printed at London 1652, fol.

Hort. Chelſ. A Catalogue of the Plants in the Chelſea-Garden, by Mr. Iſaac Rand, F. R. S. Printed at London 1739, 8vo.

Hort. Amſt. The Hiſtory of Rare Plants which were in the Phyſic-Garden at Amſterdam, by Caſpar and John Commelin, in two volumes, folio. Printed at Amſterdam 1697, and 1701.

H. Beaum. A Catalogue of the Exotic Plants which were in the Gardens of Mynheer Van Beaumont in Holland. Printed at the Hague 1690, 8vo.

Hort. Elth. Hortus Elthamenſis, or a Deſcription of the Rare Plants which were growing in the Garden at Eltham, by John James Dillenius, in two volumes, fol. with figures. Printed at London 1732.

Hort. Mal. The Plants which grow naturally at Malabar, figured and deſcribed by Henry Rheede Van Draakenſtain, in twelve volumes folio. Printed at Amſterdam from 1679 to 1703.

Hort. Maur. A Catalogue of the Plants in the Garden of Signior Mauroceni, by Anthony Tita, 8vo. Printed at Padua 1713.

Hort. Cliff. Hortus Cliffortianus, or a Catalogue of the Garden of Plants at Hartechamp, belonging to Mr. George Clifford of Amſterdam, ranged according to the new Method of the ſexes of Plants, by Dr. Charles Linnæus. Printed at Amſterdam in folio 1736, with elegant figures.

H. C. Hortus Catholicus, i. e. the Univerſal Garden, by Franſciſcus Cupani. Printed at Naples 1696, 4to.

H. Edin. A Catalogue of the Plants growing in the Phyſic-Garden at Edinburgh, by James Sutherland. Printed at Edinburgh 1683, 8vo.

H. Eyſt. Hortus Eyſtettenſis, by Baſilius Beſler. Printed at Neurenberg 1613, fol.

H. L. A Catalogue of the Plants growing in the Phyſic-Garden at Leyden, by Paul Herman, M. D. Printed at Leyden 1687, 8vo.

H. R. Monſp. A Catalogue of the Plants growing in the Royal Garden at Montpelier, by Peter Magnol. Printed at Montpelier 1697, 8vo.

H. R. Par. A Catalogue of the Plants growing in the Royal Garden at Paris. Printed at Paris 1665, fol.

Hort. Upſal. Hortus Upſalienſis, or a Catalogue of the Exotic Plants growing in the Garden at Upſal in Sweden, by Charles Linnæus. Printed at Amſterdam in 8vo, 1748.

Houſt. Houſtoun, Dr. William, a Manuſcript Catalogue of the Plants which he had obſerved growing in the Iſlands of Jamaica and Cuba; as alſo at Campeachy and La Vera Cruz, in the years 1728, 1729, and 1732.

J. B. An Univerſal Hiſtory of Plants, by John Bauhin, in three volumes. Printed at Embrun 1650, fol.

Juſſ. Juſſieu. Anthony Juſſieu, Profeſſor of Botany in the Royal Garden at Paris, who has publiſhed ſome Memoirs of Plants, in the Acts of the Academy of Sciences at Paris.

Juſſ. Bern. Dr. Bernard de Juſſieu, Demonſtrator of the Plants in the Royal Garden at Paris, who has delivered to the Royal Academy of Sciences many curious Obſervations on Plants which are printed in their Memoirs.

Kemp. Ex. Dr. Englebert Kœmpfer's Deſcription of the curious Plants which he obſerved in Japan. Printed at Limoguen in 1712, 4to.

Lin. Gen. Plant. Charles Linnæus, F. R. S. Doctor of Phyſic, and Profeſſor of Botany at Upſal in Sweden, who has publiſhed ſeveral Editions of his Method of ranging Plants according to their Parts of Generation. The firſt at Leyden in 1737, and the ſecond in 1754, at Stockholm, 8vo.

Lin. Sp. Plant. The Species of Plants by the ſame Author in two volumes, 8vo. Printed at Stockholm in 1753, and the ſecond Edition in 1765.

Lin. Mat. Med. Linnæus's Materia Medica, 8vo. Printed at Stockholm 1749.

Lob. Adv. Matthias Lobel's Adverſaria Stirpium. Printed at Antwerp 1676, folio.

Lob. Ic. Icons of Plants by Matthias Lobel. Printed at Antwerp 1576, fol.

Lugd. A general Hiſtory of Plants by Dalechamp. Printed at Lyons 1586, two volumes in fol.

Magn. Peter Magnol, his Catalogue of the Plants growing about Montpelier. Printed in 8vo at Montpelier, in 1686.

Magn. Hort. Peter Magnol, his Catalogue of the Plants in the Garden at Montpelier. Printed at Montpelier in 1697, 8vo.

Malp. The Anatomy of Plants, by Marcellus Malpighius. Printed at London in fol. 1679.

Marcg. George Marcgrave, his Natural Hiſtory of Braſil. Printed at Leyden 1648, fol.

Martyn. Cent. John Martyn, Profeſſor of Botany at Cambridge, his five Decades of Rare Plants. Printed at London 1728, 1729, &c. in large folio, with figures of the Plants in their proper Colours.

Matth. Peter Andrea Matthiolus, his Commentaries on Dioſcorides. Printed at Venice 1558, fol.

Mentz. Chriſtian Mentzelius's Indexes of Plants in ſeveral Languages. Printed at Berlin in fol. 1682.

Michel. Peter Anthony Micheli, his New Genera of Plants. Publiſhed at Florence 1729, fol.

Moriſ. H. R. Robert Morriſon, his Catalogue of the Royal Garden at Blois, to which is joined his Prelude to Botany. Printed at London 1699, 8vo.

Mor. Hiſt. An univerſal Hiſtory of Plants, by Robert Morriſſon. Printed at Oxford 1679, 1680, and 1699, three volumes in folio.

Munt. Aloid. An Hiſtory of Aloes, by Abraham Muntingius. Printed at Amſterdam 1668, 4to.

Munt. Phyt. Muntingius's Phytographia. Printed at Leyden 1702, fol.

Munt. Herb. Brit. Muntingius's true Herba Britannica, 4to, to which is frequently added his Aloidærum. Printed at Amſterdam in 4to, 1698.

Niſſol. Niſſole, his Memoirs of Plants. Printed in the Acts of the Academy of Sciences at Paris.

Par. Bat. Prod. The Prodromus to the Paradiſus Batavus. Printed at Leyden 1998, 4to.

Park. Parad. The Garden of pleaſant Flowers, by John Parkinſon. Printed at London 1629, fol.

Park. Theat. The Theatre of Plants, by John Parkinſon. Printed at London 1649, fol.

Pet. James Petiver, his Hiſtory of the Engliſh Plants. Printed at London in fol. with cuts, 1713.

Piſ. Braſ. William Piſo, his Natural Hiſtory of Braſil. Printed at Leyden 1648, fol.

Pluk. Alm. Almageſtum Botanicum, by Leonard Pluknet. Printed at London 1696, fol.

Pluk Amal. Amaltheum Botanicum, by Leonard Pluknet. Printed at London 1703, fol.

Pluk. Mantiſſ. Mantiſſa Almageſti Botanici, by Leonard Pluknet. Printed at London 1700, fol.

Pluk. Phyt. Pluknet's Phytographia, i. e. a Delineation of Plants. Printed at London 1691, and 1692, fol.

Plum. Cat. Father Charles Plumier, his Catalogue of American Plants. Printed at Paris 1703, 4to.

Plum. Nov. Gen. New Genera of American Plants, by Father Plumier. Printed at Paris 1713, 4to.

Plum. Pl. Am. A Deſcription of American Plants, by Father Plumier. Printed at Paris 1693, fol.

Pon. Bald. John Ponæ, his Deſcription of the Plants growing upon Mount Baldus and Verona. Printed at Antwerp 1601, fol.

Ponted. Pontedera, his Anthologia, or Diſcourſe on the Flowers of Plants. Printed at Padua 1720, 4to.

Raii Hiſt. Ray's Hiſtory of Plants. Printed at London 1686, and 1704, in three volumes, folio.

Raii Meth. John Ray, his Method of claſſing Plants improved and augmented. Printed at Lond. 1703, 8vo.

Raii Syn. A Synopſis of the Britiſh Plants, by John Ray, augmented by Dr. Dillenius. Printed at London 1724, 8vo.

Rauw. Leonard Rauwolf's Travels in the Eaſt. Printed at London.

## An EXPLANATION of the AUTHORS NAMES.

Rea. Flora, Ceres, and Pomona, by John Rea. Printed at London 1676, fol.

Rivin. Auguſtus Quirinus Rivini, his Order of ranging Plants by the Figures of their Flowers. Printed in five Claſſes at Leipſic in 1690, 1691, and 1699, in fol. with figures.

Roy. Flor. Leyd. Adrian Van Royen, Profeſſor of Botany at Leyden, his Prodromus, or Catalogue of the Plants growing in the Phyſic-Garden at Leyden. Printed at Leyden 1741, 8vo.

Sauv. Flora Monſpelienſis, by Fr. Sauvage. Hague, 8vo, 1755.

Scheuch. John Jacob Scheuchzer, his Obſervations of the Plants he diſcovered growing on the Alps, in three Journies. Printed at Leyden, in two volumes 4to, 1723.

Sloan. Cat. A Catalogue of the Plants growing in the Iſland of Jamaica, by Sir Hans Sloane, M. D. Printed at London 1696, 8vo.

Sloan. Hiſt. A natural Hiſtory of Jamaica, by Sir Hans Sloane, M. D. Printed at London 1707, and 1725, in two volumes, fol.

Swert. A Florilegium, or a Collection of Flowers, by Swertius. Printed at Franckfort 1612, fol.

Tab. Ic. Icons of Plants, by Tabernæmontanus. Printed at Franckfort 1590, fol.

Tourn. Inſt. Inſtitutions of Botany, by Joſeph Pitton Tournefort. Printed at Paris 1716, 4to.

Tourn. Cor. A Corollary to the Inſtitutions of Botany, by J. Pitton Tournefort. Printed at Paris 1703, 4to.

Trew. Chriſt. Jacob Trew, Doctor of Phyſic, F. R. S. and of the Academy of Natural Curioſities, who has publiſhed ſeven Decades of Rare Plants, finely illuminated, in folio, at Neurenberg.

Triumf. John Baptiſt Triumfetta, his Obſervations on the Vegetation of Plants, with the Hiſtory of the Plants growing about Rome. Printed at Rome 1685, 4to.

Triumf. Syl. John Baptiſt Triumfetta, his Syllabus of the Plants in the Phyſic-Garden at Rome.

Vaill. Sebaſtian Vaillant, his New Genera of Plants. Printed in the Memoirs of the Academy of Sciences.

Vaill. Diſ. Sebaſtian Vaillant's Diſcourſe on the Structure of Flowers. Printed at Leyden 1718, 4to.

Volk. Flora Neurenbergenſis. An Account of Plants in the Garden of Neurenberg, of Dr. Volkamer. Printed at Neurenberg 1700, 4to.

Zan. A Hiſtory of Plants, by Jacob Zanoni. Printed at Bologna 1675, fol.

THE

THE

# GARDENERS DICTIONARY.



A B E L E-tree. See Populus.

ABIES; the Fir-tree.

The name is derived from *abeo*, to extend or advance. Others ſay, it is derived from *abeo*, to go away, becauſe the bark ſplits, and, as it were, falls away, or is broke off eaſily.

The Characters are,

*The male flowers are diſpoſed in a looſe bunch, having no corolla, but many ſtamina, joined in form of a column at their baſe, but ſeparate above, having erect ſummits. The female flowers are collected in an oblong cone, each ſcale including two, which have no corolla, a ſmall germen with a ſingle ſtigma. Theſe are ſucceeded by membranaceous winged ſeeds.*

Dr. Linnæus, profeſſor of botany at Upſal, whoſe ſyſtem is generally followed at preſent, ranges this genus in the ninth ſection of his twenty-firſt claſs of plants, which includes ſuch as have male and female flowers, placed at diſtances on the ſame tree, whoſe ſtamina are joined together in form of a column.

To this genus he joins the Pine, Cedar, and Larch-tree, ſuppoſing them only different ſpecies of one genus; however, as there is great difference in the culture of theſe trees, we ſhall chooſe to continue the former method of arranging them under their different genera. It may not be amiſs however to obſerve, that in the former editions of Linnæus's Genera Plantarum, theſe plants were ranged under the article Abies, but in the laſt edition he has thought proper to place them under Pinus.

The Species, which are at preſent to be found in the Engliſh gardens, are,

1. Abies (*Alba*) foliis ſubtus argenteis apice emarginatis, conis erectis. *Fir-tree whoſe leaves are white on their under-ſide, and indented at their points, commonly called Silver Fir.* Abies taxi folio, fructu ſurſum ſpectante. Tourn. Inſt. R. H.
2. Abies (*Picea*) foliis ſubulatis mucronatis lævibus bifariam verſis. *The Norway Fir, or Pitch-tree.* Abies tenuiore folio, fructu deorſum inflexo. Tourn. Inſt. R. H.
3. Abies (*Balſamea*) foliis ſubtus argenteis apice ſubemarginatis bifariam verſis. *The Balm of Gilead Fir.* Abies taxi foliis, odore balſami Gileadenſis. Raii Hiſt. App.
4. Abies (*Canadenſis*) foliis linearibus obtuſiuſculis ſubmembranaceis. *The Newfoundland White Spruce Fir.* Abies foliis piceæ brevioribus, conis parvis biuncialibus laxis. Rand.
5. Abies (*Mariana*) foliis linearibus acutis, conis minimis. *The Black Spruce Fir of North America with very ſmall cones.*
6. Abies (*Americana*) foliis linearibus obtuſiuſculis bifariam verſis conis ſubrotundis. *The Hemlock Spruce Fir.*

There is alſo another ſort of Fir, which has been of late years introduced from North America, by the title of Red Spruce Fir of Newfoundland; but ſo far as we can judge by the young trees now growing in the Engliſh gardens, it appears to be only a variety of the Black Newfoundland Spruce Fir. There was alſo many years paſt a tree of the China Fir, growing in the garden of Mr. Morgan of Weſtminſter, which is mentioned by Dr. Pluknet, but being in a bad ſituation it made little progreſs, the ſmoke of London being very hurtful to all ſorts of evergreen trees; but whether it was killed in that garden, or removed to any other, I do not know, for the ground has been built upon many years.

The firſt and ſecond ſorts of Firs are very common in gardens and plantations of evergreen trees.

The firſt grows in great plenty about Straſburgh, and other parts of Germany; from whence the turpentine is brought to England. But it is ſuppoſed, that moſt, if not all of theſe were originally planted; however, the moſt beautiful of theſe trees are now growing upon mount Olympus, from whence I have received cones, which were upwards of a foot in length. Theſe are certainly natives of the place. Dr. Tournefort, in his travels, mentions the Firs of mount Olympus as the moſt beautiful trees in the Levant.

The ſecond ſort, which is very common in the woods of Norway, is the tree that affords the white deals, and grows in the vallies where the ſoil is very deep.

There are two varieties of this ſpecies, greatly differing in the length and colour of their leaves, as alſo the ſize of their cones; one of which has been diſtinguiſhed by nurſery-gardeners, under the title of

Long Coned Cornish Fir. The leaves of this are whiter, and much longer than the others; the cones are also of a greater length than those of the common sort, so that by the appearance of the trees, any person might suppose them to be a distinct species. But from the seeds which were carefully taken from this sort, both varieties of plants have risen, therefore they must be only deemed varieties.

From this tree the pitch is drawn, and hence it had the title of Picea, or Pitch-tree.

The third sort was formerly growing in the Bishop of London's garden at Fulham; and of late years there has been a great number of the trees raised from the seeds which have been brought from America. This sort makes very little progress after eight or ten years growth; the only place in which the trees have made any figure, is at his Grace the Duke of Bedford's at Woburn-abbey in Bedfordshire.

The fourth sort is a native of North America, from whence the seeds have been brought to England, and great numbers of the plants raised. This is called by the inhabitants in America, the White Spruce Fir. It grows naturally on the mountains and higher lands, and arrives to a much greater size than most of the other sorts. Those in the gardens of the late Duke of Argyle, at Whitton near Hounslow, are by much the finest I have seen: but there must be some trees of a greater age in Devonshire, unless they have been destroyed; for in the year 1724, I received some branches of this tree full of cones, from a gentleman of that county, who had several of the trees then growing, which were of a considerable size.

The fifth sort grows naturally on moist land, in many parts of North America, but rarely arrives to the size of the fourth: however, the inhabitants of America use the branches of both indifferently in making of Spruce-beer, from whence the trees obtained the title of Spruce-trees.

From both these species of Fir, exsudes a fine clear turpentine of a strong scent, which the native Indians use to cure green wounds, and also for some internal disorders; and of late years the English physicians in North America, have likewise adopted it into their practice.

The sixth sort is also a native of America, from whence the seeds have been brought into Europe. This tree does not thrive well in any part of England, nor in many places of America; though in some particular spots I have been informed there are very large high trees now growing. It is a native of many parts of North America.

These trees are all raised from seeds taken out of their polyspermous cones. The way to get out the seeds is, by exposing the cones to a gentle fire, which will cause their squamous cells to open, and readily emit the seeds: but they should not be exposed to too great a heat, for the cones of all the Firs open much easier than those of Pines, especially those of the Silver and Balm of Gilead Firs, which, if permitted to hang late in the autumn, fall to pieces and scatter their seeds. This ought not to be done until the time of sowing them, which is best performed the latter end of March.

These plants should be all raised in a nursery, where they may be protected from the birds, otherwise they will be in danger of being destroyed when they first come up. For as they bring up the husk of the seed on the top of the plant, the birds, in picking off the husk, will break off the tops of the plants, whereby a whole bed may be lost in a few hours, if not carefully guarded from them.

The best time for sowing these seeds is about the latter end of March, or the beginning of April, according as the season is more or less forward, on a bed of light earth, covering the seeds about half an inch deep with the same mould. If this bed be netted over to keep off the birds, it will be a sure method of preventing them from destroying the young plants at their first coming out of the ground; at which time they should likewise be screened from the sun in the middle of the day, by covering the beds with mats, because too much sun frequently destroys the plants when they are young. In this bed the plants should remain until the following spring, when there should be a number of beds prepared in the nursery to receive the seedlings. In the beginning of April they should be transplanted into the beds, at the distance of six inches row from row, and in the rows at three inches asunder, setting them in a quincunx order. In removing these plants, they should be very carefully raised up with a trowel, so as not to break off the fibres of their roots; nor should they be kept long out of the ground. During the time they are out, their roots should be covered, to prevent the wind from drying their fibres; and in planting, the earth should be pressed close to their roots, to prevent the air from penetrating to them. If the season proves dry, it will be proper to water the plants every week once or twice, according to the warmth of the weather; the beds should also be covered with mats, to screen the plants from the sun, and drying winds, until they have taken good root; after which time they will require little farther care, than to keep them clean from weeds. In these beds the plants may remain two years, at the end of which they should be transplanted into an open spot of ground, for their roots will in that time meet quite over the beds. This ground, to which they are to be removed, should be well trenched and cleared from all noxious weeds, and made level. The beginning of April, just before the plants begin to shoot, will be a good time to remove them. In takeing up the plants, great care should be taken not to tear off or injure their roots; nor should too many of the plants be taken up at one time, but rather plant them as fast as they are taken up, that they may be as little time out of the ground as possible. For the drying winds, which usually happen at this season, will greatly injure the roots of these plants, if much exposed thereto.

The distance at which they should be placed in the nursery, should be four feet row from row, and in the rows two feet asunder. This distance may by some be thought too great; but if it be considered how much their roots spread in the ground, as also that when they are planted nearer together, it will be very difficult to take up the plants again without cutting and tearing off their roots, especially if they are not all taken up clean at the same time: these considerations must have greater weight than that of the loss of a little ground, with all who have any regard to the future welfare of the plants. In planting them, it will be adviseable to draw a line cross the ground, and to dig out a trench of a foot wide, into which the plants may be placed at the distance of two feet asunder. Then fill the earth into the trench, covering the roots of the plants with the finest part of it, scattering it carefully between the roots; and when the whole trench is filled in, press the earth gently down with your feet; but by no means tread it too hard, especially if the ground be strong, or apt to bind too close.

When the plants are thus planted, if the season should prove dry, they ought to be watered, in order to settle the earth to their roots; and if this be repeated three or four times, (if the season should continue dry) it will greatly promote their taking new root, and secure them from the injuries of the drying winds. In this nursery the plants may remain two or three years, according to the progress they shall have made; and during this time, the ground between the plants should be constantly kept clean from weeds, and dug between the rows every spring; in doing of which, care must be taken not to cut or injure the roots of the plants: this is all the culture they will require during their continuance in the nursery. When they are transplanted into the places where they are to remain, the necessary care to be taken is, in taking them up, not to injure or cut off their roots, and to let them be as little time out of the ground as possible;



and

and while they are out, to guard their roots from the drying winds. The ſureſt time for removing theſe trees is about the beginning of April; for though they may be, and often are, removed with ſucceſs at Michaelmas, yet the ſpring is the more ſure ſeaſon, eſpecially in moiſt land.

Moſt of the kinds of Firs may be removed at the height of ſix or ſeven feet; but thoſe of two feet high are much better to tranſplant, and will in a few years gain the aſcendant of taller trees: I would not, therefore, adviſe the tranſplanting of theſe trees when they are much above two feet high, eſpecially if they have ſtood in the nurſery unremoved. For then their roots will have extended themſelves to a diſtance, which muſt be cut in taking them out of the ground; and where great amputation is uſed either to the roots or branches of theſe trees, the quantity of turpentine which commonly iſſues from theſe wounds, will greatly weaken the trees. There is another advantage alſo in planting them when ſmall, which is that of not requiring ſtaking to ſecure them from being blown down by ſtrong winds, which in tall trees is a great trouble or expence. And whoever will give themſelves the trouble to obſerve, how much trees of two feet high exceed in growth thoſe which are removed at a much greater height, will, I am ſure, be convinced of the truth of what is here ſaid.

The common Spruce Fir is what affords the white deals. The trees grow in the deep ſtrong ſoils of Norway and Denmark; but will grow likewiſe in almoſt any ſoil or ſituation in England, provided it be not within the reach of the ſmoke of great cities, which is very injurious to all theſe ſorts of trees; nor do they thrive near ſo well in dunged land, as in freſh uncultivated ſoils. The diſrepute theſe trees have been under for ſome years paſt, has been occaſioned by their being planted too cloſe together, or too near other trees, whereby the air has been excluded from their branches, which has occaſioned moſt of their under branches to decay; ſo that when viewed from the ground under their branches, they have a greater appearance of dead than living trees. But where they have been allowed a good diſtance, and planted in a ſtrong freſh ſoil, they have had their branches quite feathered within ſix or eight feet of the ground, and that too in trees upward of ſixty feet high; therefore ſhould not be planted nearer than twelve feet apart, nor ſhould they be ſo near, where the plantation is more than three rows deep. In this caſe, eighteen or twenty feet aſunder will be full near enough, eſpecially where the trees are deſigned to have their branches feathered near the ground, in which one of the beauties of theſe trees conſiſts.

The Silver Fir requires a ſtronger land than the Spruce, for in dry ground they ſeldom make any great progreſs; and many times, even after they have arrived to a conſiderable ſize, are deſtroyed by very dry ſeaſons, where the ſoil is ſhallow, or too dry. But when they are planted in a proper ſoil, they grow to a very large ſize, and are extremely beautiful, having the under ſide of their leaves white, and the upper ſide of a dark green colour.

This ſort of Fir, however, is frequently injured by froſts, when they happen late in the ſpring, eſpecially while the plants are young. For when theſe are planted in a warm ſituation, they are apt to ſhoot pretty early, and if any ſharp froſts happen after they have puſhed, the young ſhoots are killed; ſo that they loſe a year's growth, and are rendered ſo very unſightly, that many times they have been pulled up and thrown away. In cold ſituations, however, where they do not begin to ſhoot ſo early, they are not ſubject to this diſaſter; and, in many ſuch places, theſe trees grow to a large ſize, and have their beauty. I have ſometimes ſeen ſome fine trees of this ſort of Fir, which grew upon natural bogs, where, by extending their roots, they had drained the ground to a conſiderable diſtance round them. There were ſome trees of this kind lately growing in England, upwards of ninety feet high.

*The method of raiſing the other ſorts of Firs.*

About the latter end of March, or the beginning of April (according to the forwardneſs of the ſeaſon, by which every perſon muſt be guided) prepare a very moderate bed, in length proportional to the quantity of ſeeds to be ſown, and where there are frames which can be ſpared for this purpoſe, theſe may be placed upon the bed; but where theſe are wanting, the bed ſhould be cradled over with hoops, that they may be covered with mats or canvaſs; then plunge the bed full of ſmall pots, ſuch as are commonly ſold about London for four ſhillings and two pence per hundred. Theſe pots ſhould be filled with light undunged earth, and the interſtices between the pots may be filled up with any other earth which is neareſt to the place; then ſow the ſeeds in theſe pots, covering them about half an inch with the ſame light earth. In drying winds the bed ſhould be covered, to prevent the earth from drying too faſt, which would prove hurtful to the ſeeds; nor ſhould the ſeeds have too much wet, which would be equally injurious to them: therefore the earth ſhould be but ſeldom watered, and it muſt never be given in great quantities. When there is any appearance of froſt at night, the bed ſhould alſo be covered. With this management the plants will appear in five or ſix weeks time, when they muſt be carefully guarded from birds, as was before directed for the common ſorts, and alſo ſcreened from the ſun in the middle of the day; but they muſt now have freſh air admitted to them at all times when the weather will permit. They may alſo be allowed to receive any gentle ſhowers of rain, but they ſhould not have too great plenty of moiſture, which will frequently rot the young plants, and cauſe them to drop. Upon the judicious care of this, depends the whole ſucceſs; for I have frequently ſeen great numbers of theſe plants deſtroyed in one day, by being either too much expoſed to the ſun, or from having too much wet.

It may, perhaps, ſeem ſtrange to many, that I ſhould direct the ſowing the ſeeds of theſe trees which are ſo very hardy upon a hot-bed; but from many trials I have always found they have ſucceeded much better this way than any other, for the gentle warmth of the bed will not only cauſe the ſeeds to vegetate much ſooner than they would naturally do in the cold ground, but the plants will alſo riſe much ſtronger, and, conſequently, be in leſs danger of rotting in their ſhanks. And as the warmth of the bed is only to bring up the plants, ſo there ſhould be but little dung employed in making it; for after the plants are up, they muſt be inured to the open air, and treated as hardily as the common ſorts.

There may be others, perhaps, who will object to the directions given for ſowing the ſeeds in ſuch ſmall pots, becauſe, where there is any quantity of the ſeeds, it is uſual to ſow them in boxes, or large pots: but I can from many years experience aver, that moſt ſorts of ſeeds ſucceed better when ſown in ſmall pots, than in boxes, or larger ones, and therefore recommend this practice.

As the ſeeds of the Hemlock Fir will frequently remain in the ground four or five months, the pots, in which they are ſown, ſhould not be diſturbed, if the plants come not up ſo ſoon as may be expected; for unleſs upon ſtirring the ground, the ſeeds are found to be decayed, there may be hopes of their growing the ſecond ſpring, for I have ſometimes had the ſeeds remain a whole year in the ground, and afterwards come up very well: this caution, therefore, is given to prevent the pots from being too haſtily turned out.

The plants of theſe ſorts of Fir muſt be afterwards treated in the ſame way as the common ſorts, with this difference only, that they ought to be tranſplanted into a more ſhady ſituation and moiſter ſoil. For while the plants are young, they will not thrive if they are much expoſed to the ſun, or in a dry ſoil; but

when they have obtained ſtrength, they will bear the open ſun very well, and in a moiſt ſoil will make great progreſs; whereas in dry ground they frequently ſtint, and produce plenty of male flowers and cones, by the time they get to the height of four or five feet. When the branches of theſe rees are cut off to trim them up to have ſtems, it ſhould be done gradually, never cutting more than one tier of branches in one year; for if too many wounds are made at the ſame time on theſe reſinous trees, the turpentine will iſſue out in ſuch quantities as to weaken and check their growth. The beſt time for pruning theſe trees is in September, at which time they abound not ſo much in turpentine as in the ſpring, and, conſequently, do not bleed much. What flows out at that ſeaſon, is ſeldom more than is neceſſary for covering the wounds, to prevent the wet and cold of the ſucceeding winter from penetrating the wounded parts. Theſe branches ſhould be cut cloſe to the trunk.

ABROTANUM, or Southernwood. See Artemisia.

ABROTANUM FŒMINA. See Santolina.

ABRUS. See Glycine.

ABSINTHIUM, Wormwood. See Artemisia.

ABUTILON. See Sida.

ACACIA, Egyptian Thorn, or Binding Bean Tree. See Mimosa.

ACALYPHA, three ſeeded Mercury. This genus of plants is by Dr. Linnæus ranged in the ninth ſection of his twenty-firſt claſs, which comprehends ſuch plants as have their male flowers furniſhed with one ſet of united ſtamina.

The Characters are,

*The male flowers are in cluſters ſituated above the female in the ſame plant. Theſe have no corolla: they have a four leaved empalement with ſeveral ſhort ſtamina, which are joined at their baſe, having roundiſh ſummits. The female flowers have a large empalement, a three leaved cup which is permanent: they have no corolla. A roundiſh germen with three branching ſtyles, and a long ſtigma. The cup afterwards turns to a capſule with three cells, each containing one roundiſh ſeed.*

The Species are,

1. Acalypha (*Virginica*) involucris fœmineis cordatis inciſis, foliis ovato-lanceolatis petiolo longioribus. Hort. Upſal. 290. i. e. *Three ſeeded Mercury, whoſe female flowers have a heart-ſhaped empalement, and oval ſpear-ſhaped leaves, with long foot-ſtalks.* Mercurialis tricoccos hermaphroditica.
2. Acalypha (*Virgata*) ſpicis fœmineis involucris cordatis ſerratis; maſculis aphyllis diſtinctis foliis lanceolato-ovatis. Amœn. Acad. 5. p. 410. *Three ſeeded Mercury, whoſe female flowers have an indented heart-ſhaped empalement, diſtinct from the male.*
3. Acalypha (*Indica*) involucris fœmineis cordatis ſubcrenatis, foliis ovatis petiolo brevioribus. Flor. Zeyl. 341. *Mercury, whoſe female flowers have heart-ſhaped crenated empalements and oval leaves.*

The firſt ſort grows naturally in Virginia, and ſeveral other parts of North America, from whence I received the ſeeds. It is an annual plant, which ſeldom grows more than a foot high, ſending out ſeveral ſide branches towards the bottom. The leaves are very like thoſe of the broad leaved Pellitory of the wall, and are placed alternately, having long footſtalks, from the alæ, or wings of the leaf. The flowers are produced in ſmall cluſters, the male always being above the female. Theſe make but a poor appearance, and reſemble thoſe of the Pellitory ſo much, that at a ſmall diſtance, any perſon might ſuppoſe them to be the ſame, till convinced by a nearer inſpection.

If the ſeeds of this ſort are permitted to ſcatter, the plants will come up in the ſpring, better than if ſown by hand; for if they are not put into the ground in Autumn, they rarely grow the firſt year. All the culture this plant requires, is to keep it clear from weeds, and let it remain where it was ſown, for it doth not bear removing well. It flowers in Auguſt, and the ſeeds ripen in October.

The ſecond ſort is a native of the warmeſt countries. I received the ſeeds of this from Jamaica, where it grows in great plenty. This is alſo an annual plant, which in England ſeldom exceeds the former ſort in its ſtature. The leaves of this greatly reſemble thoſe of the annual Nettle, and ſting full as much when touched. It is too tender to thrive in the open air in England, therefore the ſeeds ſhould be ſown in pots, plunged into a hot-bed; and if the plants do not come up the firſt year, (which often happens) the pots ſhould be put in ſhelter in winter, and the following ſpring plunged again into a hot-bed, which will bring up the plants. Theſe muſt be tranſplanted into pots, and brought forward in hot-beds, otherwiſe they will not produce ſeeds ripe in England.

Theſe plants have no beauty to recommend them, but as they are preſerved in ſeveral gardens for the ſake of variety, I thought it neceſſary to inſert them here.

ACANACEOUS plants [ſo called from ἄκανθα, *Gr.* a thorn or prickle] are ſuch as have prickly heads.

ACANTHUS [ἄκανθος, ſo called, as ſome ſay, from ἄκανθα, a thorn.] It is alſo called Branca Urſina, or Bear's-breech.

The Characters of this plant are,

*The empalement is compoſed of three pair of unequal leaves. The flower is unequal, of one leaf, with a ſhort tube, the beard, or lower lip, being large, plain, and erect. It has no upper lip. The ſtamina and ſtyle occupy the place of it. Theſe are arched and ſtretched out beyond the empalement. There are two long and two ſhorter ſtamina, which cloſely coaleſce to the ſtyle, which is ſituated upon a roundiſh germen, and afterwards become an oval capſule, having two cells, each containing one fleſhy ſmooth oblong ſeed.*

This genus of plants is by Dr. Linnæus ranged in the ſecond ſection of his fourteenth claſs, intitled Didynamia Angioſpermia, from the flowers having two long, and two ſhorter ſtamina, and the ſeeds growing in a cover.

The Species are,

1. Acanthus (*Mollis*) foliis ſinuatis inermibus. Hort. Cliff. *The common, or ſmooth garden Bear's-breech.* Acanthus Sativus vel Mollis Virgilii. C. B.
2. Acanthus (*Nigra*) foliis ſinuatis inermibus glabris lucidè virens; *Portugal Bear's-breech, with ſmooth ſinuated leaves of a lucid green colour.* Acanthus Luſitanicus ampliſſimo folio lucido. Juſſ.
3. Acanthus (*Diſcoridis*) foliis lanceolatis integerrimis margine ſpinoſis. Gron. Ov. *Middle Bear's-breech, with intire leaves, having ſpines on their borders.*
4. Acanthus (*Spinoſus*) foliis pinnatifidis ſpinoſis. Hort. Cliff. 326. *Prickly Bear's-breech.* Acanthus aculeatus. C. B. P. 383.
5. Acanthus (*Ilicifolius*) foliis repandis dentato-ſpinoſis, caule fruticoſo aculeato. Oſb. it. 92. *Shrubby Bear's-breech, with prickly leaves like Holly.* Acanthus malabarius, agrifolii folio. Pet. ſic. 10.

The firſt ſort is what is uſed in medicine, and is ſuppoſed to be the Mollis Acanthus of Virgil. The leaves of this plant are cut upon the capitals of Corinthian pillars.

Various have been the diſputes among the learned about the plant, which is mentioned under this title by Virgil, who have given ſo many different characters to it, that no plant yet known will agree with them all. Many, therefore, have been of opinion, that there were two ſorts of the Acanthus, one of them a tree, and the other an herb. The tree is ſuppoſed to be the Egyptian Acacia, and the plant the firſt ſort here mentioned; but there yet remains a difficulty with regard to ſome of the epithets applied to that plant, as firſt, where it is mentioned to be an evergreen berry-bearing plant. *Baccas ſemper frondentis Acanthi.* As to its being evergreen, that may be eaſily conceived of our Acanthus, in the warm climate of Italy; for in England, where the plants grow in a warm ſituation, they are ſeldom deſtitute of leaves more than ſix weeks, unleſs the winter proves very ſevere. We may alſo ſuppoſe, that the fleſhy oval ſeed-veſſels of this plant might be taken for berries. But then with regard to its being a twining plant, *flexi*

*tacuiſſem*

*tacuissem vimen acanthi*, it will by no means agree with this, or the Egyptian Acacia. However, as the botanists in general have agreed that the plant here mentioned is the Acanthus of Virgil, and there being several entire columns of the Corinthian order yet remaining at Rome, upon whose capitals the leaves of this plant are so well expressed, as not to admit of any doubt of their being designed from our Acanthus, and these columns being as antient as the time of Vitruvius, there can be no doubt that this is the plant from whose leaves Callimachus, a famous architect, composed the capitals of the Corinthian pillars.

The second sort was discovered in Portugal by Dr. Bernard de Jussieu, demonstrator of plants in the royal garden at Paris, from whom I received the seeds in 1725, which succeeded in the Chelsea garden, and frequently perfects seeds there; which being sown, constantly produce the same plants as the parent, and therefore must be a distinct species.

The third sort is at present very rare in England; it grows naturally in the east, and is by Dr. Linnæus supposed to be the Acanthus of Dioscorides, but with what certainty I cannot determine. This sort is not so hardy as either of the two former, so requires shelter in the winter; therefore the plants while young, should be kept in pots, and placed under a common frame during the winter season; where they may enjoy the open air in mild weather, but screened from hard frosts. When the plants have acquired strength, some of them may be turned out of the pots, and planted in a border near a south wall, and in hard frosts if they are covered with mats or hand-glasses, they may be secured, and these plants will more certainly flower than those in the pots.

The leaves of the fourth sort are deeply jagged, in very regular order, and each segment is terminated with a sharp spine, as are also the foot-stalks of the leaves, and the empalement of the flower, which renders it troublesome to handle either of them.

The fifth sort grows naturally in both Indies; I received it from the Spanish West-Indies. There is a good figure of this plant in Pluknet's Phytographia, tab. 261, fig. 4. under the following title, Frutex Indicus spinosus, foliis Agrifolii siliqua geminata brevi. This is a shrub which rises about four feet high, is divided into many branches, garnished with leaves, very like those of the common Holly, both in size and shape, and are armed with spines in the same manner; the flowers come out singly, which are white, and shaped like those of the common Acanthus, but smaller. After the flower is past, the germen becomes an oval bicapsular vessel, having one oblong seed in each cell. This shrub is evergreen, but is too tender to thrive out of a stove in England, and can only be propagated by seeds, which do not ripen in Europe.

The other sorts are lasting plants, which may be propagated either by seeds, or parting of their roots; if by the former method, the seeds should be sown in a light dry soil, towards the end of March: if the season proves favourable, the plants will appear in May, and all the culture they require, is to keep them clean from weeds, and where the plants are too close, to thin them, so as to leave them about six inches asunder, which will be room enough for them to grow till autumn, when they should be transplanted where they are designed to remain. The first, second, and third sorts, being tenderer than the others, ought to be planted in a warm border near a wall; and as these do not multiply so fast by their roots, so they do not require more room than three feet; but the fourth sort spreads its roots to a great distance, therefore must have more than twice that room. This being hardy in respect to cold, may be planted between shrubs, to fill up vacant spaces, where it will thrive fast enough, provided the ground be light, and not over wet, and when the plants are in flower, will make an agreeable variety. If this sort is propagated by its root, it may be performed either in spring or autumn; but the three first must only be removed in the spring, for if they are transplanted in the autumn, and the following winter prove cold, they will be in danger of being destroyed.

These plants take root very deep in the ground, so that when they are planted in wet ground, their roots will rot in winter: I have frequently traced them more than four feet, therefore they should not be removed after they have been growing long in a place, but the side shoots may be annually taken off, especially from the creeping kinds, otherwise they will spread so far, as to over-bear any of their neighbouring plants or shrubs. When the sorts with creeping roots are once established in a garden, they are with difficulty eradicated, for every root which may happen to be left, will shoot again, so as to become troublesome.

ACARNA. See Cnicus.

ACAULIS, or ACAULOS [of *α neg.* and *caulis* a stalk or stem; i. e. without stalk;] a plant is said to be *acaulis*, or without stalk, whose flower rests on the ground, having no visible stalk.

ACER [so called according to Vossius, from *acris*, L. because of the very great hardness of its wood.] The Maple-tree.

The Characters of this tree are,

*The empalement of the flower is monopetalus, coloured, and cut into five sharp segments at the brim, and is permanent. The corolla is composed of five oval petals which spread open, and are larger than the empalement. It hath eight short awl-shaped stamina crowned by simple summits. The germen is compressed, and immersed in the large perforated receptacle. The style is slender. It hath two acuminated stigma which are reflexed. The capsules are two, joined at their base; they are roundish, each being terminated by a large wing, inclosing one roundish seed in each.*

This is ranged by Dr. Linnæus, in his twenty-third class of plants, entitled Polygamia Monœcia.

The Species are,

1. Acer (*Pseudo Platanus*) foliis quinquelobis inæqualiter serratis floribus racemosis. Lin. Sp. Plant. 1054. *The greater Maple, falsely called Platanus.* Acer majus multis falso platanus. J. B. The Sycamore-tree.
2. Acer (*Campestre*) foliis lobatis obtusis emarginatis. Lin. Sp. Plant. 1055. *The small, or common Maple.* Acer campestre & minus. C. B. P. 431. By the French, *Petit erable des bois.*
3. Acer (*Negundo*) foliis compositis floribus racemosis. Hort 144. *The Virginia Ash-leaved Maple.* Acer maximum foliis trifidis vel quinquefidis Virginianum. Pluk. Phyt.
4. Acer (*Platanoides*) foliis quinquelobis acuminatis acutè dentatis glabris floribus corymbosis. Lin. Flor. Suec. 303. *The Norway Maple with Plane-tree leaves.* Acer platanoides. Munt. Phyt.
5. Acer (*Rubrum*) foliis quinquelobis subdentatis subtus glaucis pedunculis simplicissimis aggregatis. Lin. Sp. Plant. 1055. *The scarlet flowering Maple of Virginia.* Acer Virginianum folio majore subtus argenteo supra viridi splendente. Pluk. Alm. 7.
6. Acer (*Saccharinum*) foliis quinquepartito-palmatis acuminato dentatis. Lin. Sp. Plant 1055. *The American Sugar Maple.*
7. Acer (*Pensylvanicum*) foliis trilobis acuminatis serrulatis floribus racemosis. Lin. Sp. Plant. 1055. *The Mountain Maple of America.*
8. Acer (*Opalus*) foliis lobatis, minimè incisis fructu racemoso. *The Italian Maple, commonly called Opalus.* Acer major folio rotundiore minùs laciniato & opalus Italorum. Raii Hist.
9. Acer (*Monspesulanum*) foliis trilobis integerrimis. Prod. Leyd. 459. *The Montpelier Maple.* Acer trifolium. C. B. P. 431.
10. Acer (*Cretica*) foliis trilobis integerrimis subtus pubescentibus. *Cretan Maple with three entire lobes to the leaves, which are somewhat hairy on their under-side.*

These trees are easily propagated by sowing their seeds, which should be done soon after they are ripe, in a bed of common earth, covering them about half an inch thick with light mould. The spring following they will appear above ground, and, if kept clear from weeds, some of the sorts will grow above a foot high

the first summer. The autumn following (if they are close in the seed-bed) it will be proper to transplant them into a nursery, in rows at three feet distance, and two feet asunder in the rows; in which place they may remain three or four years, by which time they will be large enough to plant out for good.

If the seeds of any of the sorts of Maple are kept out of the ground till spring, they rarely come up the same year, and many times do not grow; so that the surest method of raising them is, to sow the seeds as soon as possible when they are ripe; and, if the seeds are to be transported to any distance, it will be proper to put them up in sand, or earth, whereby their growing quality will be preserved.

The first and fourth sorts are very proper to make plantations near the sea, or to shelter such plantations of trees as are too nearly situated thereto. For both these sorts thrive, and resists the spray, which is usually blown from the sea, better than most other trees do.

The variegated sort is also raised from seeds of the same kind; and most of the plants so raised, will be as finely striped as the old plant from whence the seeds were taken, which is not common to many other variegated plants.

The common Maple is too well known to need any particular account, it growing, very frequently, in hedge-rows in most parts of England. It is raised in the same manner with the former.

The Virginian flowering Maple was raised from seeds, which were brought from Virginia many years since by Mr. John Tradescant, in his garden at South Lambeth, near Vauxhall, and since, in the gardens of the Bishop of London, at Fulham, where the trees have flowered for several years, and produced ripe seeds, from which several trees have been raised. It may be also propagated by laying down the young branches early in the spring, giving them a little slit at a joint, by which means they will have taken sufficient root in two years, to be transplanted elsewhere. They require a situation a little defended from the north-east winds, especially while young; and delight in a moist light soil, in which they thrive much better than in a dry ground, and will produce more flowers, and better seeds. This tree commonly flowers in the beginning of April, and the seeds are ripe in five or six weeks after, at which time they should be sowed; for they are very apt to perish, if kept long out of the ground.

There is another variety of the flowering Maple, which was sent from America to Sir Charles Wager, and flourished several years in his garden at Parsons-green, near Fulham. This is by the gardeners titled Sir Charles Wager's flowering Maple. The flowers of this kind come out in large clusters, and surround the younger branches, so as to appear at a small distance covered with them. It is now become pretty common in some of the nurseries near London, so that the former sort is not so much esteemed, being less beautiful; but it is doubtful if they are distinct species.

The Ash-leaved Maple is a very strong shooting tree, and is, in Virginia, one of the largest trees of this kind. It must be planted in places not too much exposed to violent winds, being subject to split thereby. This tree ripens seeds very well in England, by which means it is easily propagated, or by cuttings planted in autumn.

The Norway Maple has a milky sharp juice, so that few insects care to prey thereon, by which means the leaves are seldom eaten or defaced; and being smooth, and of a shining green, they have a much better appearance than those of the Sycamore; and in the spring, when the flowers are out, have great beauty. This tree is also raised by seeds, of which it affords great quantities, which rise and grow from the scattered seeds as well as the common sort; it will also grow from cuttings, if they are planted in the autumn.

The variegated kind may also be propagated by inoculating a bud of the striped kind into one of the plain sort, though I am not at present sure whether it will take upon any other sort of Maple, not having made the experiment; but I believe it can scarce fail. Most, if not all the other sorts of Maples, take very well upon each other.

The American Sugar Maple has some resemblance to the Norway, when the plants are young; but as they grow up the leaves are more deeply divided, and their surfaces less smooth, so that they are then easily distinguished. From this tree the inhabitants of North America make a very good sort of sugar, in large quantities, by tapping the trees early in the spring, and boiling the juice, which drawn out till the fæces subside, is the sugar; but I am of opinion, that the people make sugar from more than one sort of Maple in America, for I have found that the Ash-leaved Maple abounds with a saccharine juice, in full as great plenty as any other sort. Mr. Ray and Dr. Lister, prepared a tolerable good sort of sugar from our greater Maple, by tapping some of the trees in their bleeding season; and I have observed, upon cutting off branches from the scarlet Maple in February, a great quantity of a very sweet juice hath flowed out for several days together.

The eighth sort of Maple is very common in most parts of Italy, but particularly about Rome, where it is one of the largest trees of that country, and is esteemed for the size of the leaves, which are large, affording a great shade; so that these trees are frequently planted by the sides of roads, and near habitations. In England this tree is very rarely to be met with, though it is hardy enough to bear the open air; but as the seeds have not been brought over to England till lately, there are no large plants in the English gardens at present.

The ninth sort is common in the south of France and Italy; the leaves of this resemble those of the common Maple, but are of a much thicker substance, and not so large, but are of a shining green colour. They continue in verdure very late in the autumn, which renders the trees more valuable. At present, this sort is not common in England. I raised several plants from seeds, some of which have for several years produced good seeds in the Chelsea garden, where from the scattered seeds the plants come up annually in plenty.

The tenth sort hath some resemblance to the ninth. The leaves of this sort are of a much thinner texture, and their foot-stalks are covered with a soft hairy down, whereas those of the other are smooth and stiff. This sort grows naturally in the Levant.

Most of the sorts of Maple which come from America, are very impatient of heat while young; their seeds therefore should be sown in a sheltered situation, for if the plants are exposed to the full sun but one day, when they first appear, few of them will survive it; but especially the Sugar Maple, of which sort I constantly lost most of the plants, till I had the precaution to place the pots, in which the seeds were sown, entirely in the shade; for no sooner are they exposed to the sun, but they are immediately attacked by insects, which in one day will devour their seed leaves, after which the plants suddenly drop to the ground. This precaution therefore is necessary to be observed, in raising most of the sorts of Maple from seeds.

The timber of the common Maple is far superior to the Beech for all uses of the turner, particularly dishes, cups, trenchers, and bowls; and when it abounds with knots (as it very often doth), it is highly esteemed by the joiners for inlayings, &c. and also for the lightness of the wood, is often employed by those that make musical instruments; and for the whiteness of its wood, it was formerly in great request for tables, &c.

ACETOSA [of *acetosus*, L. eager, sour.] The Sorrels are by Dr. Linnæus joined to the genus of Dock, under the title of RUMEX; but as all the known species of Sorrel, have male flowers growing upon distinct roots from the female, therefore by his method should be ranged in his twenty-second class titled Diœceia; therefore I have taken the liberty to separate these from the Docks, rather to preserve their old title, as

as the plants have been long used both in the kitchen and shops.

The Characters are,

*It hath male and female flowers in different plants; the male flowers have a three leaved empalement, in which are included six stamina, crowned with flat oblong summits, but have no corolla: the female flowers have also a three leaved empalement, in the center of which is situated a three cornered germen, supporting a trifid stylus. The germen afterward turns to a triangular seed.*

The Species are,

1. Acetosa (*Pratensis*) foliis sagittatis inferioribus pediculatis caulinis sessilibus. *Common or Meadow Sorrel.* Acetosa pratensis. C. B. P. 114.
2. Acetosa (*Acetosella*) foliis lanceolato-hastatis radice repente. *Common Sheep's Sorrel.* Acetosa arvensis lanceolata. C. B. P. 114.
3. Acetosa (*Scutatus*) foliis cordato hastatis radice repente. *Round leaved or French Sorrel.* Acetosa rotundifolia hortensis. C. B. P. 114.
4. Acetosa (*Digynus*) humilis repens folio rotundo emarginato. *Low creeping Sorrel with a round indented leaf.* Acetosa rotundifolia repens Eborascensis folio in medio deliquium patiente. Mor. Hist.
5. Acetosa (*Alpina*) foliis cordatis acuminatis amplexicaulibus. *Alpine Sorrel, with heart-shaped pointed leaves embracing the stalks.* Acetosa montana lato ari rotundo folio. Bocc. Mus.
6. Acetosa (*Lunaria*) foliis subcordatis, caule arboreo. *Sorrel-tree with roundish heart-shaped leaves.* Acetosa arborescens, subrotundo folio. Pluk. Alm. 8.
7. Acetosa (*Rosea*) foliis erosis, valvulæ alterius ala maxima membranacea declinata. *Sorrel from Egypt with bitten leaves, and large membranaceous valves declining.* Acetosa Ægyptia rosea seminis involucro. Shaw. Pl. Afr.
8. Acetosa (*Sterilis*) foliis oblongis pedunculis brevissimus raró florens. *Northern barren Sorrel.* This is the Acetosa Muscovitica sterilis. Mor. Hist.

The first of these sorts, though but small in the fields, yet, when sown in gardens, will produce fair large leaves; this is commonly cultivated in gardens. It must be sown early in the spring, in a shady moist border; and if the plants are afterward removed into another shady border, at the distance of four or six inches square, they will produce larger leaves, and continue longer. This is the common Sorrel used in medicine; but the Northern barren Sorrel is preferred to it in the kitchen-garden, because it rarely runs to seed, but is increased by parting the roots either in spring or autumn, and is fit for use all the year.

The round leaved (or French) Sorrel, is a more grateful acid, so by many persons is preferred to the other two sorts for kitchen use; this is also a medicinal plant, and should not be wanting in any good garden: it is a great runner at the root, by which means it is easily propagated, and the roots planted at the distance of two feet square at least: it will agree better with an open situation than the other two sorts. And if the flower-stems and rambling branches are cut off in in the beginning of July, the roots will soon put out new leaves, which will be tender and much better for kitchen uses, than the older leaves; so that by cutting down the shoots of some plants at different times, there will always be a supply of young leaves, which is the only part of the plant used in the kitchen. And this sort is much preferable to the common Sorrel for soups, so many persons have of late years cultivated it in their gardens, since the use of Sorrel has been greatly increased in England, by the introduction of French cookery, it being an ingredient in many of their sauces and soups. Insomuch that about Paris, Sorrel is cultivated in as great quantity as almost any other esculent plant.

The Sheep's Sorrel is a common weed in most parts of England, growing upon dry banks and in gravelly soils in great plenty; for as it propagates very fast by its creeping roots, so wherever it once gets possession in the ground, it soon multiplies. This is rarely admitted to have a place in gardens, but as it has long been continued in the Dispensaries as a medicinal plant, so it is here inserted.

The low creeping Northern Sorrel, is preserved in many gardens for the sake of variety, but has not been used in the kitchen. This sort grows wild in most of the northern counties, as also in Wales. I have seen it growing in great plenty in Yorkshire and Westmoreland. The leaves of this sort have very short footstalks, and are indented at both ends. These grow near to the ground, and the flower-stems rarely rise above six inches high. The roots creep in the ground, whereby it multiplies exceedingly in a proper situation. As this sort grows naturally in shady moist places, so whoever is desirous to have it thrive in a garden, must plant it in a north border and in a moist soil, where it may be propagated in plenty, and be used for the same purposes as the others.

The Alpine Sorrel is full as hardy as the common, and as the leaves are much larger, so they are better for the uses of the kitchen, having as pleasant an acid taste, and being much more succulent. This may be propagated either by seeds, or parting of their roots, in the same manner as the common sort; but the plants require more room, for which reason they ought not to be nearer than a foot from each other, especially in good ground.

ACETOSELLA. See Oxalis.

ACHILLEA, Milfoil Yarrow, or Nosebleed.

The Characters are,

*It hath a compound radiated flower, consisting of many tubulous florets, which are hermaphrodite, and compose the disk of the flower; the female flowers are ranged round the border; these have their corolla stretched out on one side like a tongue, which compose the rays, all included in one common scaly empalement. The hermaphrodite flowers have each five short slender stamina, accompanying a small germen, which is situated in the bottom, and rests upon a downy bed; the germen afterwards becomes a single oval seed, having a down adhering to it.*

The Species are,

1. Achillea (*Millefolium*) foliis bipinnatis nudis, laciniis linearibus dentatis. Hort. Cliff. 413. *Common Yarrow, called also Milfoil, Stratiotes, and Nosebleed.* Of this there is a variety with purple flowers, which is often found growing naturally in England.
2. Achillea (*Santolina*) foliis setaceis dentatis, denticulis subintegris subulatis reflexis. Hort. Cliff. 412. *Eastern Sneezwort with a Lavender-cotton leaf, an dalarge flower.*
3. Achillea (*Tomentosa*) foliis pinnatis hirsutis pinnis linearibus dentatis. Lin. Sp. Plant. 897. *Woolly Yarrow with yellow flowers.*
4. Achillea (*Pubescens*) foliis pinnatis, foliolis lanceolatis incisis serratis subtus lanigeris. Hort. Cliff. 413. *Eastern Sneezwort with hoary Tansey leaves, and the rays of the flower of a pale yellow colour.*
5. Achillea (*Abrotanifolia*) foliis pinnatis supra decompositis, laciniis linearibus distantibus. Flor. Leyd. Prod. 175. *Tallest Eastern Yarrow, with a Wormwood leaf and yellow flowers.*
6. Achillea (*Clavennæ*) foliis pinnatifidis planis obtusis tomentosis. Lin. Sp. Plant. 898. *Broad-leaved Alpine umbelliferous Wormwood.*
7. Achillea (*Tanacetifolia*) foliis pinnatis foliolis lineari lanceolatis basi sursum auctis. Flor. Leyd. Prod. 176. *Eastern Sneezwort with hoary Tansey leaves, and a golden flower.*
8. Achillea (*Ageratum*) foliis lanceolatis obtusis acutè serratis. Hort. Cliff. 413. *Commonly called Sweet Maudlin.*
9. Achillea (*Ægyptiaca*) foliis pinnatis foliolis obtuse lanceolatis serrato dentatis. Hort. Cliff. 413. *Hoary Sneezwort with crested pinnulæ.*
10. Achillea (*Ptarmica*) foliis lanceolatis acuminatis argutè serratis. Lin. Sp. Plant. 898. *Common Ptarmica or Sneezwort.* Of this sort there is a variety with double flowers which is preserved in gardens.
11. Achillea (*Macrophylla*) foliis pinnatis planis inciso serratis extimis majoribus coadunatis. Lin. Sp. Plant. 1265. *Alpine Sneezwort with Feverfew leaves.*

12. ACHILLEA (*Nana*) foliis pinnatis dentatis hirsutissimis floribus glomerato umbellatis. Lin. Sp. Plant. 2671. *Hoary Alpine Milfoil, with a specious flower.*

13. ACHILLEA (*Nobilis*) foliis bipinnatis, inferioribus nudis planis, superioribus obtusis tomentosis corymbis convexis confertissimis. Lin. Sp. 1268. *Noble or Sweet Milfoil.*

14. ACHILLEA (*Alpina*) foliis lanceolatis dentato-serratis denticulatis tenuissimè serratis. Hort. Cliff. 413. *Alpine Sneezwort with leaves deeply serrated, commonly called White Maudlin.*

The first sort here enumerated, is the common Yarrow or Milfoil, which grows naturally on banks and by the sides of foot-paths in most parts of England, so is rarely allowed a place in gardens; but being an officinal plant, it is here mentioned to introduce the others. Of this there is a variety with purple flowers, which is frequently found wild in England; but the plants seldom continue to produce purple flowers long, when they are transplanted into gardens. The Yarrow creeps greatly by its roots, and also multiplies by seeds, so that it becomes a troublesome weed, where it is permitted to grow.

The third sort is often planted in gardens for the sake of variety. This is of humble growth, seldom rising more than eight or nine inches high. The leaves are finely cut, and are very hoary; the flowers are of a bright yellow colour, and continue long in beauty. It grows naturally in the south of France, Spain, and Italy, but will live in the open air in England. It is increased by parting of the roots, the best time for which is in October.

The fourth, fifth, seventh, and ninth sorts, are natives in the islands of the Archipelago. These were introduced into France by Dr. Tournefort. The ninth sort hath very hoary leaves, which remain all the year; and the plants growing close and low, make a pretty appearance at all seasons. The flowers are produced in umbels on the top of the stalks, which are yellow; these appear in June, July, August, and September, and are of long duration, so that frequently some of them continue the greater part of the winter. This sort must have a dry soil and a warm situation, where it will endure the cold of our ordinary winters in the open air, but in very severe frost they are often destroyed; a few plants therefore ought to be sheltered under a frame in winter, to preserve the kind. It is propagated by slips, which may be taken off and planted in a shady border, any time in summer, when they will take root in about six weeks, and then may be transplanted either into pots, or the borders where they are to remain. This sort rarely perfects its seeds in England.

The fourth, fifth, and seventh sorts, are of taller growth, propagating by their roots, and ripening seeds in England, so that they may be obtained in plenty; and as they require little care to cultivate them, being hardy enough to live in the open air, they may be allowed a place in gardens, where, by their hoary leaves, they will make a pretty diversity; and their flowers continuing long, though not the most beautiful, yet make a pretty contrast when intermixed with others.

The sixth sort is a very humble plant; the foot-stalks which support the umbels of its flowers, rarely rise above six inches high. As for the flowers themselves, they are near as large as those of the common Sneezwort, white, and growing in flat umbels; these appear in June and July. The leaves of the plant have some likeness to those of the common Wormwood, and are very hoary, growing close to the ground, decaying in autumn, so that in winter they make little appearance. This species of Yarrow is propagated by parting of the roots, either in spring or autumn, and should have a dry soil, for much wet in winter will rot them. It never perfects its seeds here, and therefore can only be multiplied the other way. This sort is a native of the Alps.

The eighth sort is commonly known by the title of Sweet Maudlin in the markets; it was formerly more used in medicine than at present, so that there is scarce any of it cultivated in the gardens for sale; and when it is asked for, the people in the markets commonly give the fourteenth sort for it, which being a very hardy plant, and easily propagated, is now generally sold for the other. For though the true Maudlin is hardy in respect to cold, yet in wet winters the roots are often killed by moisture, especially those which are in good ground; but when the plants grow out of the joints of walls, or in rubbish, they will live many years without care. There are two other varieties of this plant which are found growing naturally in Spain, one of them having longer and more compact umbels of flowers, and the other hath broader leaves and smaller flowers; but these approaching so near to the common sort in every other particular, I thought it would be needless to enumerate them as distinct species. The common Maudlin is propagated by parting of the roots, either in spring or autumn; and as it ripens seeds very well, so it may be propagated by sowing the seeds in April. It flowers in June and July, and the seeds are ripe in September.

The tenth sort is the common Sneezwort; this grows wild in the woods and other shady places, in many parts of England, so is not admitted into gardens; this creeps greatly by its roots, so as to cover a large spot of ground soon. It is sometimes used in medicine, and in the spring the young tender shoots are put into sallads, to correct the coldness of other herbs; and the roots are used for the tooth-ach, whence some have given the title of Field Pellitory to this plant. There is a variety of this with double flowers, which is preserved in gardens, and is commonly known by the title of double Maudlin. When this is planted in pots, so as to confine the roots from creeping, the stalks will grow closer together, and then they make a tolerable appearance when in flower; but where the roots have full liberty to run, the stalks grow farther distant from one another, in which case they make but an indifferent appearance. It flowers in July and August.

The fourteenth sort has some resemblance to the tenth, but the leaves are longer, deeper cut on their edges, and are of a darker green colour. This propagates fast enough by its creeping root, and is very hardy.

The eleventh and twelfth sorts are natives of the Alps, and consequently very hardy; they multiply by seeds, and also by parting of their roots, and will thrive in almost any soil, but love an open exposure. The eleventh produces many stalks which rise near three feet high, having loose branching umbels of white flowers on their top, resembling those of the common Sneezwort, but larger. The twelfth sort hath hoary leaves, and the umbels of its flowers are more compact; the stalks of this do not rise more than a foot high. Both these deserve a place in gardens.

The thirteenth sort approaches near the first, but the leaves are of a pale green, and not so long, or so much cut as those of the first; these have a strong sweet scent when bruised. It is equally hardy with the first, and therefore requires little culture.

ACHRAS. See SAPOTA.

ACHYRANTHES.

The CHARACTERS are,

*The empalement consists of five pointed rigid leaves which are permanent; the flower hath no petals; but in the center of the empalement is situated the pointal, having a bifid stigma, attended by five stamina, supporting small summits. The pointal afterward becomes a single roundish seed, inclosed in the empalement.*

The SPECIES are,

1. ACHYRANTHES (*Aspera*) caule erecto, calycibus reflexis spicæ adpressis. Fl. Zeyl. 105. *Achyranthes with an upright stalk, and a reflexed flower-cup.* Amaranthus siculus spicatus radice perenni. Bocc. Rar. Plant. 16. tab. 9.

2. ACHYRANTHES (*Indica*) caule erecto, foliis obversè ovatis undulatis floribus reflexis. *Achyranthes with an erect stalk, obverse oval waved leaves and reflexed flowers.*

3. ACHYRANTHES (*Lappacea*) caule erecto, spicâ interruptâ, floribus externè lanatis. Lin. Sp. Plant. 204. *Achyranthes with an upright stalk, a loose spike, and the outside of the flower woolly.*

4. ACHYRANTHES (*Lanata*) caule erecto, spicis ovatis lateralibus calycibus lanatis. Lin. Sp. Plant. 204. *Achyranthes with an erect stalk, and oval spikes of flowers produced from the wings of the leaves, which are covered with a soft down.*

The first sort hath been long in the English gardens, where it hath been preserved more for the sake of variety, than for its beauty or use. It grows near three feet high, with oblong pointed leaves; the flowers come out in long spikes from the extremity of the branches, which are composed of an empalement, with a style and five stamina, but hath no petals, so may be ranged under the class of blink flowers. The plants of this sort must be raised on a hot-bed, and when they have acquired strength, they may be transplanted into the full ground, where they will flower in July, and their seeds ripen in September. If these are kept in pots, and put into a warm green-house in winter, they will live two or three years, where persons are inclined to keep them so long. This sort grows naturally in the islands of America, and also in India and Sicily.

The seeds of the second sort I received from Malabar, which have for some years flourished at Chelsea, and annually produced ripe seeds, which have never varied from the parent plant.

The third and fourth sorts grow naturally at the Cape of Good Hope, from whence I received their seeds. These are all preserved in botanic gardens for the sake of variety, but have no great beauty to recommend them, to those who do not cultivate plants for the improvement of that science.

They may all be propagated in the same manner as the first, and will perfect their seeds the same year; but the plants of the three last sorts may be preserved through the winter if placed in a stove, for they are too tender to be kept in a green-house where there is not artificial heat.

ACINOS. See THYMUS.

ACINUS, or ACINI, by good authors is not used for the grape stone, but the grape itself, as appears from the following passage in Columella, *Cum expresseris vinacea, quæ acinis celantur.* It is commonly used for those small grains growing in bunches, after the manner of grapes, as Ligustrum, &c.

ACNIDA, Virginia Hemp.

This plant grows naturally in Virginia, and in some other parts of North America, but is rarely cultivated in Europe, except in some few botanic gardens, for the sake of variety. It hath male and female flowers growing upon different roots, so is near of kin to the Hemp, under which title it has been ranged by some former botanists. But as it is a plant of little beauty, and at present no use has been made of it, it is to little purpose to say more of it here.

ACONITUM, Wolfsbane, or Monkshood, [of ἄκων, or ἀκὴ, a dart, because the Barbarians used to daub their darts therewith; others of ἀκονάω, to accelerate, because it hastens death].

The CHARACTERS are,

*The flower hath no empalement, but consists of five unequal petals, which vary in different species; the galea (or hood) is tubulous, and covers the other parts of the flower like a friar's cowl; the two lateral petals, which inclose the stamina and style are equal: these are concave and slightly indented in the middle. The two lower petals are narrow and oblong: in the bottom of the flower are placed two nectarii, upon which are situated the styles; in some there are two, in others three, and some have five: these are forked, and stretch out far beyond the stamina, which are numerous and irregular: after the flower is past, the germen become oblong seed-vessels terminated in a point, and coalescing at their base; these have but one cell, which is filled with angular rough seeds.*

This genus of plants is by Dr. Linnæus ranged in the third section of his thirteenth class, entitled Polyandria trigynia, from the flowers having many stamina, and three styles.

The SPECIES are,

1. ACONITUM (*Lycoctonum*) foliis palmatis multifidis villosis. Lin. Sp. Plant. 532. *Yellow Wolfsbane or Monkshood, with palmated hairy leaves finely divided.* Aconitum lycoctonum luteum. C. B. P. 183.
2. ACONITUM (*Altissimum*) foliis palmatis, nervosis glabris. *Greatest yellow Wolfsbane, with nervous, smooth, palmated leaves.* Aconitum luteum majus ampliore caule amplioribusque foliis. Dod. p. 441.
3. ACONITUM (*Variegatum*) foliis multifidis laciniis semipartitis supernè latis. Hort. Cliff. 214. *Lesser Wolfsbane with blue flowers, whose under leaves are cut into many parts, and whose upper have broader segments.* Aconitum cæruleum minus, sive napellus minor. C. B. P. 183.
4. ACONITUM (*Anthora*) floribus pentagynis foliorum laciniis linearibus. Lin. Sp. Plant. 532. *Wholesome Wolfsbane with yellow flowers.* Aconitum salutiferum sive anthora. C. B. P. 184.
5. ACONITUM (*Napellus*) foliorum laciniis linearibus supernè latioribus linea exaratis. Hort. Cliff. 214. *Wolfsbane, or Monkshood, with large blue flowers.* Aconitum cæruleum, sive napellus. 1 C. B. Pin. 183.
6. ACONITUM (*Pyramidale*) foliis multipartitis, spicis florum longissimis sessilibus. *The common blue Monkshood, with a long spike of flowers.* Aconitum pyramidale multiflorum. H. R. Par.
7. ACONITUM (*Alpinum*) foliorum laciniis pinnatifidis flore maximo. *Large flowered Monkshood, or Wolfsbane, of a blue purple colour.* Aconitum cæruleo purpureum flore maximo, sive napellus. 4 C. B. P. 183.
8. ACONITUM (*Pyrenaicum*) foliis multipartitis laciniis linearibus incumbentibus squamosis. Hort. Upsal. 152. *Yellow Pyrenean Monkshood, or Wolfsbane, with fine cut leaves.* Aconitum Pyrenaicum luteum foliorum segmentis sibi invicem incumbentibus. Raii Syll. 367.
9. ACONITUM (*Cammarum*) floribus subpentagynis, foliorum laciniis cuneiformibus incisis acutis. Lin. Sp. Plant. 751. *Monkshood with flowers, having commonly five styles, and the segments of the leaves awl-shaped.*
10. ACONITUM (*Orientale*) elatius, foliis palmatis flore magno albo. *Eastern Monkshood, with a tall stalk and a large white flower.* Aconitum lycoctonum orientale flore magno albo. Tourn. Cor.

The sixth sort is the most common in the English gardens; this is cultivated for the beauty of its long spike of blue flowers, which are brought to the markets in London, towards the end of May, when it commonly flowers; so that these being intermixed with the Guelder Roses and other flowers of the same season, make an agreeable variety, when properly blended, to adorn halls and other apartments. But as most of the species of Monkshood are a deadly poison, not only to men but to brutes also, they ought not therefore to be admitted into places where children or ignorant persons frequent, lest by smelling to these flowers, they should draw some of the farina into their nostrils, which may prove very hurtful to them, as I can from experience assert for fact. We have an account of a man who was poisoned in the year 1732, by eating some of this plant, which by an unskilful person was put into a sallad instead of Celery. This is particularly mentioned in the Transactions of the Royal Society, N° 432. Dodonæus also relates a story of the bad effects of one species of Monkshood, which was recent in his time. Some unskilful persons had gathered the young shoots of the blue Monkshood to eat in a sallad, and all that eat of them were seized with terrible symptoms, and soon died. Dr. Turner also mentions, that some Frenchmen at Antwerp eat the shoots of this plant for those of Masterwort, and all of them died in two days, except two players who threw them up by vomit. I have known persons who by smelling to the flowers, have been seized with swooning fits, and have lost their sight for two or three days.

The fourth sort is that which is made use of in medicine, and is esteemed an antidote to those which are poisonous.

poisonous. This is by some writers titled Anthora, and by others Antithora, as the poisonous kinds have been called Thora. Whenever therefore any of the species of this genus is ordered in medicine, this is the sort intended.

Most, if not all the other sorts are esteemed poisonous; but those with blue flowers are supposed to be of a much stronger quality, than the yellow or white flowered kinds. It is confidently affirmed, that the huntsmen on the Alps, who hunt the wolves and other wild animals, dip their arrows into the juice of these plants, which renders the wounds made by them deadly.

The sixth sort is the first which flowers; this grows near four feet high, and the spikes of flowers are upward of two feet long, so that when it is in flower, it makes a pretty appearance; and being very hardy, growing in any soil or situation, and multiplying greatly by the root, has induced many persons to allow it a place in their gardens, for the sake of its flowers, who being ignorant of its dangerous qualities, have permitted it to spread and propagate greatly. It flowers in May and June. The seeds are ripe in September; but as this sort multiplies so greatly by the root, it is rarely propagated the other way.

The first and second sorts are the next which flower; these come about the middle of June, and if the season is not warm, will continue in flower till August. The first grows upwards of three feet high, and the second above four, the spikes of flowers too in this being much longer than the former.

The third sort flowers a little later than either of those, but seldom grows more than two feet high, and the spikes of flowers are much shorter than either of the two last.

The wholesome Wolfsbane flowers in the middle of August, and often continues in beauty till the middle of September; the flowers are not so large as those of some other sorts, but being of a sulphur colour, make a pretty appearance in the borders of the flower-garden. This sort will not thrive so well under the shade of trees as many of the other sorts, and therefore must have an open exposure.

The ninth and tenth sorts flower the beginning of July. The ninth usually grows about four feet high, but the tenth I have seen upwards of six. This sort is at present very rare in Europe. It was found by Dr. Tournefort in the Levant, who sent the seeds to the royal garden at Paris, where it was first cultivated in Europe, and from that garden, others have been furnished with the seeds.

The eighth sort flowers in July. This grows about four feet high, having a long spike of yellow flowers of a middling size, wherefore they may be allowed a place among shrubs, or in such parts of the garden as are not frequented by children.

The fifth, sixth, and seventh sorts flower in August, when they make a pretty appearance; and were it not for their noxious quality, would deserve a place in every garden. There are two or three varieties of the fifth sort, one with white, another with Rose coloured, and a third with variegated flowers; but these are only varieties which often change. The Napellus minor is also apt to change in the colour of its flower; of this sort I have had some plants with variegated flowers, but they changed in two years and became plain, nor did their seeds produce any plants with variegated flowers. The seventh sort will grow to the height of five feet in good ground; the flowers are very large, but not many upon each spike. These are of a deep blue colour.

All the sorts of Monkshood may be propagated by seeds, which should be sown in the autumn, in a shady situation: the plants often come up the first year, if the seeds are sown in autumn, otherwise it is the second spring before they appear; therefore the ground should be kept clean from weeds all the following summer, and when the plants come up, they should be watered in dry weather until they are fit to transplant; when they are to be carefully taken up, and planted in shady borders, at the distance of four inches each way, observing to water them until they have taken good root in the ground; after which time they will require no other care but to keep them clean from weeds, till the following autumn, when they may be transplanted to the places where they are to remain.

The common Monkshood will grow under the shade of trees, in wildernesses or woods, and will increase fast enough by means of its creeping roots; but tho' most of the other sorts delight in shade, yet few of them will thrive under trees, for which reason they should be planted in shady borders which are not overhung by trees, where they will continue much longer in flower, and thrive better than in an open exposure.

ACONITUM HYEMALE. See Helleborus.

ACORUS, the Sweet Rush.

The Characters are,

*It hath a simple cylindrical stalk, which is closely covered with small flowers, so as to form a sort of katkin (or iulus). These flowers have no empalement, but are composed of six concave obtuse petals. In the center of the flower is situated a swelling germen, attended by six stamina, which are extended beyond the petals, and are crowned with thick double summits; the germen afterward turns to a short triangular capsule, having three cells, in which are lodged oval oblong seeds.*

Dr. Linnæus ranges this genus in his sixth class of plants, entitled Hexandria monogynia, the flowers having six stamina and one style.

We have but one Species of this plant,

Acorus (*Calamus*) Roy. Leyd. 6. *The sweet smelling Flag or Calamus.* Acorus verus, sive calamus aromaticus. C. B. P. 34.

This plant grows naturally in standing waters which are shallow, and is found wild in some parts of England; particularly in Norfolk, and also near Uxbridge in Middlesex, and in several parts of the north. In Holland this plant abounds in most of their ditches and standing waters. The leaves of this plant, when broken, send forth a strong aromatic scent; the roots are much stronger, and have been long used in medicine. This may be transplanted into a garden, where if the ground is moist, it will grow very well; but never produces its spike, unless it grows in the water. It loves an open situation, and will not thrive well under the shade of trees. The spikes of flowers (which are by many writers termed (Juli) appear toward the latter end of June, and continue till August. When this plant is fixed in a proper situation, it will multiply by its creeping roots fast enough.

ACRIVIOLA. See Tropæolum.

ACTÆA, Herb Christopher.

The Characters are,

*The empalement of the flower is composed of four concave obtuse leaves, which fall off; the flower hath four petals which are much larger than the empalement. In the center is placed the oval germen, crowned with an oblique depressed stigma, attended by numerous slender stamina, crowned with erect double roundish summits. After the flower is past, the germen becomes an oval or globular berry, having one cell, in which are lodged four seeds, which are roundish on their outside, but angular where they are joined.*

Dr. Linnæus ranges this genus under his thirteenth class of plants, entitled Polyandria monogynia, the flowers having many stamina and one germen.

The Species are,

1. Actæa (*Spicata*) racemo ovato fructibusque baccatis. Lin. Sp. Plant. 504. *Common Herb Christopher, or Bane Berries.* Christophoriana vulgaris nostras racemosa & ramosa. Mor. Hist. p. 2, 8.
2. Actæa (*Alba*) racemo ovato baccis niveis, radice tuberosa. *American Herb Christopher, with white berries.* Christophoriana Americana baccis niveis. Mor. Hist. p. 28.
3. Actæa (*Racemosa*) racemis longissimis fructibus unicapsularibus. Lin. Sp. Pl. 504. *American black or wild Snakeroot.* Christophoriana Americana procerior & longius spicata. Hort. Elth. 79.

The first sort grows naturally in several places in the northern counties of England: I found it in pretty great

great plenty in a wood near Kirby Lonſdale, as alſo near Ingleborough Hill in Yorkſhire. It grows two feet and a half high, the foot-ſtalks of the leaves ariſe from the root; theſe divide into three ſmaller foot-ſtalks, each of which divide again into three, and theſe have each three lobes, ſo that each leaf is compoſed of twenty-ſeven lobes (or ſmall leaves). The flower-ſtem which ariſes from the root, is garniſhed with leaves of the ſame form, but are ſmaller. On the top of the ſtalk appears the flowers, which grow in ramoſe ſpikes, and are of a pure white; theſe come out in May, and are ſucceeded by black ſhining berries about the ſize of Peaſe, which ripen in the autumn.

This is propagated by ſeeds, which ſhould be ſown ſoon after they are ripe; for if they are kept out of the ground till ſpring, the plants will not come up till the year after, ſo that a whole year will be loſt. They ſhould be ſown on a ſhady border, and kept clean from weeds. As the ſeeds ſeldom come up all at the ſame time, the border in which they are ſown ſhould not be diſturbed till the following autumn, to ſee what plants may appear; when the plants ſhould be tranſplanted into a ſhady border, where they may remain to flower. This plant hath a perennial root, which laſts many years, but the ſtalk is annual, and periſhes in autumn, ſoon after which is the beſt time to tranſplant them.

The ſecond ſort grows naturally in North America, from whence I have received the ſeeds; the leaves of this are ſomewhat like thoſe of the firſt ſort, but are not ſo deeply indented on their edges. The flowers grow in a more compact ſpike, and the berries are very white and tranſparent when ripe; the roots of this is compoſed of thick tubers, or knobs. This is an abiding plant, and delights in a light moiſt ſoil, and a ſhady ſituation; it may be propagated in the ſame manner as the former.

The third ſort is a native of North America, where it is called Black Snakeroot, to diſtinguiſh it from the common Snakeroot. This plant hath large compound leaves, which riſe immediately from the root, and are branched after the ſame manner as the firſt ſort, which grow more than two feet high. The flower-ſtems frequently riſe to the height of four or five feet, being terminated by a long ſpike of white flowers, which is reflexed at the top. This flowers in June, or beginning of July, but does not perfect ſeeds in England. During the time of its flowering, the plant makes a good appearance in a garden, and therefore deſerves a place in the ſhady borders, or among ſhrubs; where, if it be not over-hung by them, it thrives very well, and being hardy, will require no other care than the ſhrubs themſelves. It is generally propagated by ſeeds, which are annually ſent from North America; it loves a moiſt light ſoil, and a ſhady ſituation.

The root of this plant is greatly uſed by apothecaries and phyſicians in America, in many diſorders, and is ſuppoſed to be an antidote againſt poiſon, or the biting of the rattle-ſnake.

ADANSONIA, Ethiopian four Gourd, or Monkies Bread.

This plant is ſo named from one Mr. Adanſon, a French ſurgeon, who reſided ſome years at Senegal, in Africa, and during that time made ſeveral diſcoveries in natural hiſtory, and brought home a curious collection of ſeeds and plants.

The Characters are,

*It hath a cup-ſhaped empalement, divided into five ſegments at the brim; which turn backward, and the empalement falls off: the flower has five roundiſh petals, whoſe brims are reflexed; at the tail of theſe are ſituated many ſtamina joined in a tube, which ſpread horizontally above, and are crowned by kidney-ſhaped ſummits. The germen is oval, the ſtyles are long, variouſly intorted, having many hairy ſtigma. It hath a large oval ligenous capſule of ten cells, filled with a farinaceous ſour pulp, incloſing many kidney ſhaped ſeeds.*

This genus of plants is ranged in the fifth ſection of Linnæus's ſixteenth claſs, intitled Monodelphia polyandria, the flowers having many ſtyles which coaleſce with the ſtamina in one houſe.

There is known but one Species at preſent,

Adansonia. This is the Baobab. Alp. Egypt. c. 27. f. 28.

The young plants, and alſo moſt of the new branches, have ſingle ſpear-ſhaped leaves towards their lower part, but at their extremities the leaves have ſome three, and others five lobes, of the ſame ſize and form as the lower, which are diſpoſed like a hand; theſe are entire, ending in a point, and fall off in winter. The ſtems are large and woody, but of a ſoft texture, and have generally a large ſwelling near the root.

It is propagated by ſeeds, which muſt be procured from the country where it grows naturally (for it doth not produce any in Europe); theſe muſt be ſown in pots, and plunged into a hot-bed, where, in about ſix weeks, the plants will come up, and in a ſhort time after be fit to tranſplant; when they ſhould be each planted into a ſeparate pot, filled with light ſandy earth, and plunged into a freſh hot-bed, obſerving to ſhade them until they have taken new root; after which time they ſhould have free air admitted to them every day in warm weather, but muſt be ſparingly watered; for as their ſtems are ſoft (eſpecially when young) too much wet will cauſe them to rot. As the plants advance in their growth, they are to be ſhifted into larger pots, but muſt conſtantly be plunged into the bark-bed, being too tender to thrive in this country without this artificial heat, therefore they muſt conſtantly remain in the ſtove with other tender exotic plants: the plants when young make great progreſs in their growth, where they are properly treated; for in three years many of them have been more than ſix feet high, and have put out ſeveral lateral branches, their ſtems were alſo proportionable; but after four or five years growth, they are almoſt at a ſtand, their annual ſhoots rarely exceeding two or three inches.

The account which Monſieur Adanſon gives of the trees he ſaw at Senegal and other parts of Africa, in regard to the ſize of them is amazing, ſeveral of which he meaſured round their ſtems from ſixty-five to ſeventy feet in circumference, but their height was not extraordinary. The trunks of theſe trees were from eight to twelve feet high, dividing into many horizontal branches which touched the ground at their extremities; theſe were from forty-five to fifty-five feet long, and were ſo large in circumference, that each branch was equal to a monſtrous tree in Europe; and where the water of a neighbouring river had waſhed away the earth, ſo as to leave the roots of one of theſe trees bare and open to ſight, they meaſured one hundred and ten feet long, without including thoſe parts of the roots which remained covered with earth or ſand: for he deſcribes the plains where the trees grow to be a barren moveable ſand, ſo that from its being continually ſhifted by the winds, there are no tracts diſcoverable, whereby perſons can be guided in travelling over them.

Proſper Alpinus in his hiſtory of Egyptian plants, deſcribes this tree, to which he gives the title of Baobab, ſo that it alſo grows in that country; but he does not mention any of them to be near the ſize of thoſe deſcribed by Monſieur Adanſon.

There were ſome plants of this ſort in ſeveral gardens, which were raiſed from ſeeds obtained from Grand Cairo in the year 1724, by the late Dr. William Sherard, ſome of which were grown to the height of eighteen feet; but in the ſevere winter 1740, they were all loſt, and ſince that time there has not been any of the ſeeds brought to England, till the return of Mr. Adanſon to Paris in 1754, who ſent ſome of the ſeeds over here, which have ſucceeded, and many of the plants are now upwards of eight feet high.

ADELIA, we have no Engliſh title for this genus of plants.

The Characters are,

*It hath male and female flowers upon different roots: the male flowers have an empalement of one leaf cut into five concave ſegments, but no corolla; it hath many ſlender ſtamina the length of the empalement, crowned by roundiſh ſummits. The female flowers have a five leaved concave empalement which is permanent; they have no corolla, but*

*a roundish germen with three short divaricated styles, and torn stigma. The capsule hath three cells, each containing one roundish seed.*

This genus of plants, is ranged by Dr. Linnæus, in the twelfth section of his twenty-second class, which includes those which have male flowers on distinct plants from the female, whose stamina join at their base.

The Species are,

1. Adelia (*Bernardia*) foliis oblongis tomentosis serratis. Lin. Sp. Plant. 1473. *Adelia with oblong, woolly, sawed leaves.*
2. Adelia (*Ricinella*) foliis obovatis integerrimis. Lin. Sp. Plant. 1473. *Adelia, with oval entire leaves.*
3. Adelia (*Acidoton*) ramis flexuosis, spinis gemmaceis. Amœn. Acad. 5. 411. *Adelia with flexible branches and prickly gems.*

These plants grow naturally in the island of Jamaica, and are near a-kin to the Ricinus, or Croton, but the male flowers growing upon different plants from the female, has occasioned their being ranged in a different class. Dr. Houstoun constituted a genus of them by the title of Bernardia, in honour to Dr. Bernard de Jussieu, demonstrator of plants in the royal garden at Paris; but Dr. Linnæus has fixed the title of Adelia to them. The plants are propagated by seeds, when these can be procured from the countries where they grow, for they do not produce good seeds in England. The seeds must be sown upon a hot-bed in the spring, and when the plants are fit to remove, they should be each transplanted into a separate small pot, filled with light earth, and plunged into a hot-bed of tan, treating them in the same manner as is hereafter directed for Croton. In the autumn, the pots should be plunged into the tan-bed in the stove, where, if they are kept in a temperate heat in winter, and not over-watered during that season, the plants may be preserved, and the summer following will produce flowers; but as these have little beauty, the plants are seldom propagated except in botanic gardens.

ADENANTHERA. Prod. Leyd. 462. Bastard Flower-fence.

The Characters are,

*The empalement of the flower is of one leaf, slightly cut into five at the top; the flower is of the bell-shaped kind, and is composed of five petals, which are reflexed and concave on their under side. In the center is situated an oblong germen, supporting a style crowned with a single stigma; this is attended by ten erect stamina of the same length, which are crowned with roundish summits; after the flower is past, the germen becomes a long compressed pod, containing many convex smooth seeds, placed at a distance from each other.*

Dr. Linnæus ranges this genus of plants in the first section of his tenth class, entitled Decandria monogynia, the flowers having ten stamina and one germen; but he separates it from the Poinciana, because the petals of the flower are equal, and the empalement is of one leaf, whereas the Poinciana hath a five leaved empalement, and the petals are unequal.

Adenanthera foliis decompositis. Prod. Leyd. 462. *Bastard Flower-fence with decompounded leaves.*

There is another species, or at least a variety of this kind, with scarlet seeds, which is at present rare in this country. I received the seeds of it from India, from which many plants have been raised, but they are of very slow growth in England.

The sort here mentioned grows to a very large tree in its native country, but it is so tender as to require a stove to preserve it through the winter in England, so that there are no large plants in the English gardens at present; the young plants which are not more than two feet high, have large branching leaves, composed of many equal divisions, garnished with small oval leaves, which are placed alternately on the midrib, and are of a bright green colour. The stems of the plants are woody, the bark of a brown colour, and the leaves continue all the year; but I have not seen any flowers produced in England as yet, but by some dried samples which were brought from India, they seem to be small, and of little beauty; the fine branching leaves of the plant, however, make a very handsome appearance in the stove. The seeds are of a shining black colour, and are somewhat larger than those of the great Lentil, and nearly of the same shape. This plant must be raised on a hot-bed, and afterwards placed in the bark-stove with other tender exotics.

ADHATODA. See Justicia.

ADIANTHUM, i. e. Maidenhair.

The Characters are,

*This genus is distinguished from the other capillary plants by the fructification, being confusedly joined in oval spots, and the points of the leaves reflexed.*

The Species are,

1. Adianthum (*Capillus Veneris*) frondibus decompositis foliis alternis pinnis cuneiformibus lobatis pedicellatis. Lin. Sp. Plant. 1096. *The true Maidenhair.* Adianthum foliis Coriandri. C. B. P. 356.
2. Adianthum (*Pedatum*) frondibus pedatâ foliolis pinnatis pinnis antice gibbis incisis fructificantibus. Lin. Sp. Plant. 1095. *American Maidenhair.* Adianthum Americanum. Corn. Canad. 7. tab. 6.
3. Adianthum (*Trapeziforme*) frondibus supradecompositis foliolis alternis, pinnis rhombeis incisis utrinque fructificationibus. Lin. Sp. Plant. 1097. *The largest black American Maidenhair with branching stalks, and leaves shaped like the figure of a rhombus.*

There are many species of this genus, which are natives of the East and West-Indies, greatly differing in size and form from each other. I have upwards of thirty distinct species in my collection of dried plants, which to enumerate in this place, would be superfluous, as they have not been introduced into the English gardens. The three sorts here mentioned, are all that I have seen growing in England.

The first sort is the true Maidenhair, which is directed to be used in medicine; but as it does not grow naturally in England, so the Trichomanes is usually substituted for it, which grows in great plenty in several parts of England. The other is a native of the south of France, Italy, and the Levant, from whence I have received the plants. It usually grows out of the joints of walls, and the fissures of rocks, so that whoever is inclinable to keep this plant in their gardens, should plant it in pots filled with gravel and lime rubbish, in which it will thrive much better than in good earth; but the pots must be sheltered under a frame in winter, otherwise the plants are often killed by the frost.

The second sort is often preserved in gardens for the sake of variety; this may be preserved in pots, and treated in the same manner as the former; for altho' it will live through the winter in the open air in moderate seasons, yet in severe frost it is sometimes destroyed. This grows naturally in Canada in such quantities, that the French send it from thence in package for other goods, and the apothecaries at Paris use it for the Maidenhair, in all their compositions in which that is ordered.

The third sort grows naturally in very warm countries; I received it from Jamaica in a tub of earth among other plants. This sort will not thrive in England, unless it be preserved in a stove, where its shining black stalks and odd shaped leaves will afford an agreeable variety among other exotic plants.

ADNATA, ADNESCENTIA, are those offsets, or small bulbs, which are produced from the roots of bulbous plants, and are closely connected to the parent root; of this sort is the Narcissus, Amaryllis, Pancratium, &c.

ADONIDIS HORTI, i. e. the gardens of Adonis, are plants, flowers, &c. in pots or cases, set on the outside of windows, in balconies, &c.

ADONIS, or FLOS ADONIS, Bird's-eye, or Pheasant's-eye.

The Characters are,

*The empalement of the flower is composed of five concave, obtuse, coloured leaves which fall off; the flower is composed in some species of five petals, and in others of twelve or*

*or fourteen. In the center there are many germina collected in a head, which are attended by a great number of short stamina, crowned by oblong inflexed summits; after the flower is past, the germina become so many naked seeds, closely adhering to the pedicle, and forming an obtuse spike.*

This genus is by Dr. Linnæus ranged in the seventh section of his thirteenth class, entitled Polyandria Polyginia, the flowers having many stamina and many germina.

The Species are,

1. Adonis (*Annua*) floribus octopetalis fructibus subcylindricis. Hort. Upsal. 156. *The common Adonis, or Flos Adonis, with small red flowers.*
2. Adonis (*Æstivalis*) floribus pentapetalis fructibus ovatis. *Annual Adonis with pale yellow flowers.* Adonis Sylvestris flore luteo foliis longioribus. C. B. P. 178.
3. Adonis (*Vernalis*) flore dodecapetalo, fructu ovato. Lin. Sp. Plant. 771. *Perennial Adonis with yellow flowers, by some titled fennel-leaved black Hellebore.* Adonis Hellebori radice Buphthalmi flore. H. L.

There is a variety of the first sort, which hath been long cultivated in the gardens; the flowers of this are larger, and the leaves shorter, than those of the wild sort; but, from many repeated trials of sowing their seeds separately, they appear to be only accidental variations arising from culture, and therefore may be properly esteemed as such.

The second sort is undoubtedly a distinct species. I have cultivated both these sorts above thirty years, and have never observed the second to vary either in the shape of its leaves, colour, make of the flower, or growth of the plants, which are much taller than the first, the leaves thinner, sparingly set on the stalks, and of a lighter colour.

Both these sorts are annual, and if the seeds are sown in autumn, the plants will come up the following spring; but when the seeds are not sown till spring, they rarely come up the same year: so that when the seeds are permitted to fall on the ground, they generally succeed better than when sown by art. The first sort grows naturally in Kent, particularly by the side of the river Medway, between Rochester and Maidstone, where it is found in great plenty in the fields which are sown with wheat; but in the intermediate years when the fields are sown with spring corn, there is rarely a plant of it to be found, which shews the necessity of sowing the seeds in autumn, for those fields of spring corn, if suffered to remain undisturbed after the harvest, will abound with this plant the following year. For some years past, great quantities of the flowers of this plant have been brought to London, and sold in the streets by the name of Red Morocco. Both these annual sorts flower in the beginning of June, and the seeds ripen in August and September; this must be understood of those plants which arise from seeds sown in autumn, or such as have fallen to the ground; for when any plants come up from the seeds sown in the spring (which sometimes happen) they do not flower till July or August, and their seeds seldom ripen before October.

These plants will thrive best in a light soil, but may be sown in any situation, so that by sowing some in a warm situation, and others in the shade, they may be continued longer in flower. The seeds ought to be sown where the plants are to remain to flower, for they do not bear transplanting, especially if they are not removed while the plants are very young: therefore they should be sown in small patches in the borders of the flower garden, and when the plants come up, they should be thinned, leaving three or four in each patch, which will make a better appearance than where they grow single.

The third sort hath a perennial root, and an annual stalk. This grows naturally on the mountains of Bohemia, Prussia, and other parts of Germany, where the root is often used as the true Black Hellebore, though from the descriptions given by the antients of that plant, this by no means will agree with them: this has been long cultivated in gardens. It produces its flowers the latter end of March, or the beginning of April, according to the forwardness of the season: the stalks rise about a foot and a half high, and when the roots are large, and have stood unremoved for some years, they will put out a great number of stalks from each: these are garnished with fine slender leaves, which are placed in clusters at intervals. At the top of each stalk, is produced one large yellow flower, composed of an unequal number of petals, the center of which is occupied by a great number of germen, surrounded by many stamina; after the flowers drop, the germen become naked seeds, closely adhering to the foot-stalk, forming an obtuse spike. These ripen in August, and should be sown soon after, otherwise they seldom succeed.

When the plants come up, they must be carefully kept clean from weeds, and, in very dry weather, if they are now and then refreshed with water, it will promote their growth. They should remain in the place where they are sown until the second year, for they make but slow progress while young. The best time to transplant them is in autumn, when they ought to be planted where they are to remain, for if often removed, they will not produce many flowers, nor those flowers be so strong as on the plants which are unremoved.

ADOXA. Lin. Gen. 450. Moschatellina. Tourn. Inst. Tuberous Moschatel, or Hollow Root. This is ranged in Linnæus's eighth class, entitled Octandria Tetragynia, the flower having eight stamina and four styles.

The Characters are,

*The empalement of the flower is bifid and permanent, upon which rests the germen; the flower is of one leaf, which is cut into four acute segments. The germen is situated in the center, supporting four erect styles, these are attended by eight stamina, crowned by roundish summits; after the flower is past, the germen becomes a round berry, resting on the empalement, which hath four cells, each containing a single compressed seed.*

There is but one Species of this genus.

Adoxa. Hort. Cliff. 152. *Bulbous Fumitory Hollow Root, or tuberous Moschatel.* Radix cava minima viridi flore of Gerard.

This plant grows naturally in shady woods in divers parts of England: I have frequently gathered it on the top of Hampstead among the bushes, near the wood; it is a very low plant, seldom rising more than four or five inches high, the leaves resemble those of the bulbous Fumitory, the flower-stalk arises immediately from the root, upon the top of which is placed four or five small flowers of an herbaceous white colour; these appear the beginning of April, and the berries ripen in May, soon after which the leaves decay. There is little beauty in this plant, but as some persons are fond of collecting the several kinds of plants in their gardens, which are not commonly found, it is mentioned here. The roots may be transplanted any time after the leaves are decayed, till winter; these are tuberous, and shaped somewhat like a tooth. They must be planted in the shade, under shrubs; for if they are exposed to the open sun, they will not thrive. The leaves and flowers smell like Musk, from whence it has been by some called Musk-Crowfoot.

ÆGILOPS, Wild Festuc, a sort of grass which grows naturally in many parts of Europe, so is rarely cultivated except in botanic gardens.

ÆGOPODIUM, Small Wild Angelica, or Goutwort; this plant grows naturally in several places near London, but the roots run so fast in a garden, as to render it a troublesome weed.

ÆSCHYNOMENE. Lin. Gen. Plant. 769. Bastard Sensitive plant.

This genus of plants is ranged in the third section of Linnæus's seventeenth class, entitled Diadelphia decandria; the flowers of this class have ten stamina, nine of which are united, and the other is separate.

The Characters are,

*The empalement of the flower consists of one leaf, cut into two equal segments, the upper being bifid, and the*

*lower trifid; the flower is of the butterfly kind, the standard being large and heart-shaped; the two wings are oval, and shorter than the standard; the keel is moon-shaped, and as long as the standard. In the bottom of the flower is situated an oblong hairy germen, supporting an arched style, attended by ten stamina, nine of which coalesce, and the other is separated from them; after the flower is past, the germen becomes a long, plain, jointed pod, which separates at the joints, in each of which is lodged one kidney-shaped seed.*

The Species are,

1. Æschynomene (*Aspera*) caule scabro leguminum articulis medio scabris. Lin. Sp. Plant. 713. *Bastard Sensitive plant with a rough stalk, and a jointed pod.* Mimosa non spinosa major Zelanica. Breyn. Cent. 51.
2. Æschynomene (*Americana*) caule herbaceo hispido, foliolis acuminatis, leguminum articulis semicordatis, bracteis ciliatis. Lin. Sp. Plant. 1061. *Bastard Sensitive plant with a stinging herbaceous stalk, pointed leaves, and the joints of the pods heart-shaped.* Hedysarum caule hirsuto mimosæ foliis alatis, pinnis acutis minimis gramineis. Sloan. Cat. Jam.
3. Æschynomene (*Arborea*) caule lævi arboreo leguminum articulis semicordatis glabris. Prod. Leyd. 384. *Bastard Sensitive plant with a smooth tree-like stalk, and smooth jointed pods.* Sesban caule simplici glabro, foliis pinnatis glabris. Monier.
4. Æschynomene (*Sesban*) caule herbaceo lævi, foliolis obtusis, leguminibus cylindricis æqualibus. Lin. Sp. Plant. 1061. *Bastard Sensitive plant with a smooth stalk, obtuse leaves, and equal cylindrical pods.* Galega Egyptiaca siliquis articulatis. C. B. P. 352.
5. Æschynomene (*Pumila*) caule herbaceo lævi, foliolis acuminatis, leguminibus hinc serratis medio scabris. Lin. Sp. Plant. 1061. *Bastard Sensitive plant, with a smooth herbaceous stalk, pointed leaves, and serrated rough pods.* Hedysarum annuum minus Zeylanicum mimosæ foliis. Inst. R. H. 402.
6. Æschynomene (*Grandiflora*) caule arboreo, floribus maximis, leguminibus filiformibus. Lin. Sp. Plant. 1060. *Bastard Sensitive plant with a tree-like stalk, large flowers, and slender pods.* Galegæ affinis malabarica arborescens, siliquis majoribus umbellatis. Raii Hist. 1734.

The first sort rises to the height of four or five feet, having a single herbaceous stalk, which is in some parts rough. The leaves come out on every side toward the top, forming a sort of head; these are composed of a great number of small leaves (or pinnæ) which are smooth, and of a glaucous colour. The flowers come out from between the leaves, two or three together upon long foot-stalks; they are yellow, and shaped like those of Pease. After the flower is past, the germen becomes a flat jointed pod, about four inches long, which, when ripe, parts at the joints, and in each division is lodged a single kidney-shaped seed.

The second sort seldom rises more than two feet high, but sends out three or four lateral branches; these are clothed with narrow winged leaves, whose pinnæ are placed alternate on the midrib. The flowers come out from the leaves upon branching foot-stalks, five or six together; these are much less than those of the first sort, and of a paler yellow colour. After the flowers are past, the germen becomes a jointed pod, having three or four swelling divisions, in each of which is lodged a single kidney-shaped seed.

The third sort grows to the height of six or seven feet, with a single stem; the leaves are smooth, and come out towards the top of the stalk, as in the first sort they are composed of many pinnæ, placed alternate on the midrib. The flowers come out from the wings of the leaves, two or three together, being of a copper colour, and as large as those of the first sort. After the flowers are past, the germen becomes a smooth jointed pod, each division being half heart-shaped, and inclosing a single kidney-shaped seed.

The fourth sort grows naturally in Egypt, and also on the coast of Guinea, from whence I received the seeds. This hath woody stems and branches, which are garnished with smooth leaves, composed of many blunt pinnæ, set by opposite pairs; the flowers, which are small, and of a deep yellow colour, come out from the wings of the leaves in long spikes, which hang downward. After the flower is past, the germen becomes a taper-pointed smooth pod, not jointed.

The fifth sort rises about three feet high, with a single herbaceous stalk, seldom putting out any side branches. The flowers come out from the wings of the leaves, sometimes single, and other times two or three upon each foot-stalk; these are small, and of a pale yellow colour. After the flower is past, the germen becomes a long falcated pod, divided into eleven, or thirteen partitions, each containing a single kidney-shaped seed.

The sixth sort rises six or eight feet high, with a woody stem, sending out branches towards the top, garnished with obtuse leaves; the flowers are large, yellow, and succeeded by large pods, including kidney-shaped seeds.

The first, third, and fourth sorts, will live through the winter in England, if placed in a warm stove; but as their stalks are succulent, they must be kept dry in winter, otherwise they are very subject to rot. They should be plunged into the tan-bed, for when put into a dry stove, the fibres of their roots soon grow dry, and their leaves hang and fade, which shews their want of moisture; but when they have water given them, it causes the tender fibres of their roots to perish, and the plants soon after decay.

The fifth sort is annual, therefore the seeds should be sown early in March on a hot-bed, and the plants should be brought forward in the spring, and afterwards placed in an airy glass-case, or a stove in summer, for if they are exposed to the open air, the seeds rarely ripen in England.

The sixth sort grows to a large shrub in hot countries, but is with difficulty preserved through the winter in this country. The plants are propagated by seeds, which must be sown on a hot-bed in the spring, and the plants, when fit to remove, should be planted in pots, and brought forward on a hot-bed, then should be plunged into the bark-bed in the stove, where, if they are tenderly treated, they will live through the winter, and flower the summer following.

These are all propagated by seeds, which should be sown on a hot-bed early in the spring, and when the plants have strength enough to be removed, they should be put each into a separate small pot, filled with light earth, and plunged into a fresh hot-bed, to bring them forward; and as they advance in their growth, they should be shifted into large pots, but great care should be taken not to over-pot them, for if the pots are too large, the plants will not thrive. The first, second, and fifth sorts are annual, therefore must be brought forward early in the year, otherwise they will not perfect their seeds; but the third, fourth, and sixth sorts may be preserved through the winter, and will flower early the following summer, and their seeds will ripen in the autumn. The other sorts usually flower in July, and their seeds ripen in October.

ÆSCULUS. Lin. Gen. 420. The Horse Chestnut.

The Characters are,

*The empalement of the flower consists of one leaf, slightly cut into five segments. The flower is composed of five roundish petals, folded at their border, and waved; these are narrow at their base, and are inserted in the empalement. In the center is placed a roundish germen, having a single style, crowned with a pointed stigma, attended by seven stamina, which extend to the length of the petals, and are declining, crowned with upright summits. When the flower is past, the empalement becomes a thick, roundish, echinated capsule, opening into three cells, in one or two of which are lodged globular seeds.*

This genus of plants, is, by Dr. Linnæus, ranged in his seventh class, entitled Heptandria Monogynia, the flower having seven stamina and one style.

The Species are,

1. Æsculus (*Hippocastanum*) floribus heptandriis. Hort. Upsal. 92. *The common Horse Chestnut.* Hippocastanum

num vulgare. Tourn. Inst. Castanea equini. Clus. Hist. 1. p. 7.

2. Æsculus (*Pavia*) floribus octandris. Lin. Sp. 488. *Scarlet Horse Chestnut.* Pavia. Boerh. Ind. Alt. 2. p. 260.

The Horse Chestnut was brought from the northern parts of Asia about the year 1550, and was sent to Vienna about the year 1588. It was called Castanea from the shape of its fruit, and the title of Equini was added to it from its being a good food for horses when ground.

This tree was in much greater esteem formerly than at present, for since it is become so very common, few persons regard it. What has occasioned its being so seldom planted, is the decay of the leaves early in summer; so that where they are growing in gardens, their leaves frequently begin to fall in July, and occasion a litter from that time, until all the leaves are fallen; but notwithstanding this inconvenience, the tree has great merit, for it affords a noble shade in summer; and during the time of its flowering, there is no tree has greater beauty, for the extremity of the branches are terminated by fine spikes of flowers, so that every part of the tree seems covered with them; which are finely spotted with a rose colour, and these being intermixed with the green leaves make a noble appearance.

The former method of planting these trees in avenues and strait lines, has also been in some measure the occasion of their present disrepute, because in such plantations great part of their beauty is lost; for when their branches are so far extended as to nearly meet, most of the flowers which are produced are hid from sight, and as the trees grow larger, their branches will interfere with each other, and produce few flowers; the leaves will also decay much sooner in close plantations, than on single trees: therefore the great beauty of them is, to stand singly at a distance from all other trees, upon lawns of grass in parks, where their fruit will be of great service to deer, who are very fond of them. In such situations, when the trees are grown to a good size, there is not a finer object than they will afford during their season of flowering, which is in May, and when the weather is moderate, they will continue in beauty near a month.

As this tree is quick in its growth, so in a few years they will arrive to a size large enough to afford a good shade in summer, as also to produce plenty of flowers. I have known trees which were raised from nuts, in twelve or fourteen years, large enough to shade two or three chairs under the spread of their branches, and have been covered with flowers in the season, so that few trees make greater progress than these. But as their wood is of little value, the trees should not be propagated in too great plenty: a few therefore of them placed at proper distances in parks for ornament is as many as should be preserved, the wood not being fit even for burning, nor any other use that I know of.

These trees are propagated by sowing the nuts; the best time for doing this is early in the spring; but the nuts should be preserved in sand during the winter, otherwise they are apt to grow mouldy and rot. They may indeed be planted in autumn, but then they will be in danger of rotting if the winter should prove very wet, as also of being removed or eaten by vermin.

When the nuts succeed, and have a proper soil, the plants will shoot near a foot the first summer; so that where they grow pretty close together, it will be proper to transplant them the following autumn, when they ought to be planted in rows at three feet distance, and one foot asunder in the rows: in this nursery they may remain two years, by which time they will be fit to plant where they are designed to be continued; for the younger these trees are planted out, the larger they will grow. But there are many who will object to their being planted out young in parks, because they will require a fence to secure them against the cattle; which will also be necessary, whatever size they are when planted; and if large, they must be well staked to prevent their being displaced by strong winds: which is another expence, and when we consider how much faster a young tree will grow, than those which are removed at a greater age, there can be no excuse for planting large trees.

This tree is not very nice in its culture, for it requires little care in the management, and will thrive in most soils and situations, but in a sandy loam they make the greatest progress; and if the soil be inclining to moisture, the leaves will continue in verdure much longer, than in very dry ground.

When these trees are transplanted, their roots should be preserved as entire as possible, for they do not succeed well, when torn or cut; nor should any of the branches be shortened, for there is scarce any tree, which will not bear amputation better than this; so that when any branches are by accident broken, they should be cut off close to the stem, that the wound may heal over.

There is something very singular in the growth of these trees, which is the whole shoot being performed in less than three weeks, after the buds are opened; in which time I have measured shoots a foot and a half long, with their leaves fully expanded: and no sooner are the flowers fallen, than the buds for the succeeding year are formed, which continue swelling till autumn; at which time the folding covers are spread over with a thick tenacious juice, which serves as a pigment to defend the tender buds from the frost and rain in winter; but upon the first return of warmth in the spring, this melts and runs off, whereby the bud is at full liberty to extend. And what is remarkable in this pigment, it is never so far hardened as to injure the tender buds, which are always formed at the extremity of the former year's shoot; a plain direction not to shorten them, for by so doing, the future shoots are entirely cut off.

In Turkey the nuts of this tree are ground, and mixed with the provender for their horses, especially those which are troubled with coughs, or are broken winded; in both which disorders, they are accounted very good. Deer are very fond of the fruit, and at the time of their ripening will keep much about the trees, but especially in strong winds, when the nuts are blown down, which they carefully watch, and greedily devour as they fall.

There are some old trees now standing, which were planted single, at a great distance from any other; these are grown to a very large size, and their heads form a natural parabola, and when their flowers are in full beauty, there is not any tree yet known in Europe, which makes so fine an appearance. I have measured some of these trees, whose branches have extended more than thirty feet in diameter, and their heads have been so close, as to afford a perfect shade in the hottest seasons. These were planted in 1679, as appears by some writings which are in the possession of the persons, who have now the property of the land where they grow: so that although they are of quick growth, yet they are not of short duration.

The Scarlet Horse Chestnut grows naturally in North America, where it rises to the height of twenty feet, but does not spread its branches to any great extent, the flowers are wholly red, which are much smaller than those of the common sort, they are tubulous, but want brims to expand, so make but an indifferent appearance, when compared to the other: however for variety this should have a place in gardens.

It may be propagated by the nuts, if they are procured from the country where the trees naturally grow; for the seasons are seldom favourable enough to ripen them in England. The nuts should be sown in pots early in the spring, and the pots plunged into a moderate hot-bed to forward their growth; toward the end of May, the pot should be plunged into the ground in a south-east border, and in dry weather the plants should be duly watered, whereby they will acquire strength by the autumn; when it will be very proper to screen the plants from early frosts which often pinch the top buds, and occasion their decay in the winter, for while the plants are young they are impatient of frosts, but when they have obtained

strength

ſtrength it ſeldom hurts them: the ſpring following the plants ſhould be carefully ſeparated and planted a foot diſtance from each other in a ſheltered ſituation; and the following winter, if it proves cold, it will be proper to cover the plants with ſome light covering to protect them; after the ſecond winter they will require no farther ſheltering.

The common method now practiſed by the nurſerymen, who propagate theſe trees for ſale, is by grafting or budding them upon ſtocks of the Horſe Cheſtnut, but as the ſtocks greatly out-grow the buds or grafts, they have a bad appearance; nor do the trees laſt long.

ÆTHER [of αἴθειν, *Gr.* to burn or flame; ſome of the antients having ſuppoſed it to be of the nature of fire.] It is uſually underſtood to be a thin ſubtile matter or medium, much finer and rarer than air itſelf, which commences from the limits of the atmoſphere, and poſſeſſes the whole heavenly ſpace. See Atmosphere and Air.

AGAVE, Lin. Gen. 390. American Aloe.

The Characters are,

*The flower has no empalement, is funnel-ſhaped, and of one leaf, which is cut at the brim into ſix equal ſegments; the oblong germen is ſituated below the flower, upon which reſts the ſlender ſtyle, which is extended a conſiderable length beyond the petals, and is crowned by a three cornered ſtigma. This is attended by ſix erect ſtamina, of the ſame length, crowned by narrow ſummits; after the flower is paſt, the germen becomes an oblong three cornered ſeed veſſel, having three cells, which are filled with flat ſeeds.*

Dr. Linnæus has ſeparated the plants of this genus from the Aloe, to which they had been joined by former botaniſts, becauſe the ſtamina and ſtyle in theſe flowers are extended much longer than the corolla, and the corolla reſt upon the germen, which in the Aloe are not ſo. We may alſo mention another difference in the growth of the plants, by which they may be diſtinguiſhed before they flower; which is, all the plants of this genus have their center leaves cloſely folding over each other, and embracing the flower ſtem which is formed in the center; ſo that theſe never flower until all the leaves are expanded, to give the ſtem its liberty to advance, and when the flower is paſt, the plants die. Whereas the flower-ſtem of the Aloe, is produced on one ſide of the heart or center of the plant, ſo they flower annually, and the leaves are always more expanded, than thoſe of this genus.

The Species are,

1. Agave (*Americana*) foliis dentato-ſpinoſis ſcapo ramoſo. Gen. Nov. 1102. *The Great American Aloe, with a branching ſtalk.* Aloe Americano muricata. J. B.
2. Agave (*Virginia*) foliis dentato-ſpinoſis ſcapo ſimpliciſſimo. Lin. Sp. Plant. 323. *American Aloe with a ſimple ſtalk.*
3. Agave (*Fœtida*) foliis integerrimis. Gen. Nov. Sp. Pl. 323. *American Aloe with ſtiff whole leaves.* Aloe Americana viridi rigidiſſimo & fœtido folio piet dicta indigenis. Hort. Amſt. 2. p. 35.
4. Agave (*Tuberoſa*) radice tuberoſâ foliis longiſſimis marginibus ſpinoſis. *American Aloe, with a tuberous root and very long leaves, with ſpines on their edges.* Aloe Americana radice tuberoſâ minor. Pluk. Alm. 19.
5. Agave (*Vivipara*) foliis reflexis, marginibus dentatis. *American Aloe with reflexed leaves, whoſe edges are indented.* This is by ſome called the Childing Aloe, from its producing young plants after the flowers. Aloe Americana ſobolifera. Herm. H. Ludg. 16.
6. Agave (*Karatto*) foliis erectis læte virentibus, marginibus fuſcis minimè ſerratis. *American Aloe with long deep green leaves, edged with brown, and very ſlightly ſawed.* This is called in America Karattò.
7. Agave (*Vera Cruz*) foliis oblongis marginibus ſpinoſiſſimis nigricantibus. *American Aloe with oblong leaves, whoſe edges are cloſely beſet with black ſpines, commonly called Broad-leaved Aloe from Vera Cruz.* Aloe Americana ex Verâ Cruce foliis latioribus & glaucis. H. L.
8. Agave (*Rigida*) foliis lineari-lanceolatis integerrimis rigidis aculeo terminatis. *Narrow-leaved Aloe from Vera Cruz.* Aloe Americana ex Verâ Cruce foliis anguſtioribus minùs glaucis. Hort. Beam.

The firſt ſort here mentioned, has been long preſerved in the Engliſh gardens, where of late years there have been ſeveral of the plants in flower. The ſtems of this when the plants are vigorous, generally riſe upward of twenty feet high, and branch out on every ſide, ſo as to form a kind of pyramid, the ſlender ſhoots being garniſhed with greeniſh yellow flowers, which ſtand erect, and come out in thick cluſters at every joint. Theſe have ſix long ſtamina, crowned with yellow ſummits, placed round the ſtyle, which is alſo extended to the ſame length as the ſtamina. After the flowers fall away, the germen, which is ſituated beneath the flower, becomes an oblong triangular veſſel, divided into three cells, filled with compreſſed ſeeds; but theſe do not come to maturity in England.

When theſe plants flower, they make a fine appearance, and continue a long time in beauty, if they are protected from the cold in autumn, as there will be a ſucceſſion of new flowers produced, for near three months, in favourable ſeaſons. It has been generally believed, that this plant doth not flower until it is a hundred years old; but this is a great miſtake, for the time of its flowering depends on the growth of the plants; ſo that in hot countries where they grow faſt, and expand many leaves every ſeaſon, they will flower in a few years, but in colder climates, where their growth is ſlow, it will be much longer before they ſhoot up their ſtem. There is a variety of this ſort with ſtriped leaves, which is now pretty common in the Engliſh gardens.

The plants of the ſecond ſort are ſo like thoſe of the firſt, as not to be diſtinguiſhed from them, but by good judges. The principal difference is, the leaves of this are narrower toward their extremity, and of a paler colour: the ſtems of this ſort do not riſe ſo high as the firſt, nor do they branch in the ſame manner, but the flowers are collected into a cloſe head at the top, they are however of the ſame ſhape and colour. There has been three or four plants of this ſort, which have lately flowered in England, one of which was in the Chelſea garden a few years paſt. This ſort ſeldom puts out ſo many offſets as the common Aloe.

The ſeventh ſort greatly reſembles theſe, ſo that many perſons have ſuppoſed it to be the ſame; but the leaves of this are much thinner, the indentures on their edges abundantly cloſer, and not ſo deep, as in either of the former; the ſpines too are blacker. How this differs from the others in flower I know not, having ſeen none of their flowers produced in England.

Theſe three ſorts are hardy. I have known plants of the firſt ſort live in the open air for ſome years in mild ſeaſons, but in ſevere winters they are always killed, if not ſheltered. They are propagated by offſets, which the firſt ſort ſends out in plenty, but the third ſeldom puts out any; ſo theſe may be increaſed by taking off ſome of the larger roots, at the time when the plants are ſhifted, planting them in pots filled with light ſandy earth, which will ſhoot out and become good plants, as I have experienced. The ſecond ſort generally puts out ſuckers enough for propagation, though not in ſo great plenty as the firſt. All theſe ſhould be planted in pots filled with light ſandy earth, and houſed in winter with oranges, myrtles, &c. and during that ſeaſon, ſhould have but little wet. In the ſummer they muſt be placed abroad in the open air, where they may remain till toward the end of October, when they ſhould be houſed again. The ſeventh ſort being a little tenderer than the other two, ſhould be put into the green-houſe before them, and may ſtay there a little longer in the ſpring.

The third ſort hath long narrow ſtiff leaves, of a pale green colour, not indented on their edges, but frequently a little waved: the ſide leaves ſpread open, but thoſe in the center fold cloſely over each other, and ſtrictly ſurround the bud. The plants of this ſort rarely grow more than three feet high, but the flower-ſtem riſes near twenty, and branches out much like that

that of the firſt, but more horizontally; the flowers are of the ſame ſhape, but ſmaller, and of a greener colour. After the flowers are paſt, inſtead of ſeed-veſſels, young plants ſucceed to every flower, ſo that all the branches are cloſely beſet with them. There was a plant of this kind which flowered in the Chelſea garden 1755, the ſtem of which begun to ſhoot the beginning of October, and by the end of that month was upwards of ten feet high, by the end of November it was near twenty, and the lower lateral branches were upward of four feet long, the others decreaſing gradually, ſo as to form a regular pyramid. In December the ſtalks were cloſely garniſhed with flowers, and in the ſpring, when the flowers dropped off, they were ſucceeded by young plants, which as they fell off and dropped into the pots which ſtood near, put out roots and become good plants. This ſort never produces offsets from the root, ſo that it cannot be increaſed but when it flowers, at which time there will be plenty enough. The old plant preſently after dies.

The fourth ſort hath leaves ſomewhat like the third in ſhape and colour, but they are indented on their edges, and each indenture terminates in a ſpine; the root of this ſort is thick, and ſwells juſt above the ſurface of the ground, in other reſpects it agrees with the former. This ſort hath not flowered in England, therefore I cannot tell how it differs in its flowers from the other. I have raiſed this from ſeeds which were ſent me from America, but the plants never put out ſuckers from the roots, ſo that it can only be propagated by ſeeds. Dr. Linnæus ſuppoſes it to be the ſame with the third ſpecies, but whoever ſees the plants will not doubt of their being different.

The fifth ſort never grows to a large ſize; the leaves of it are ſeldom more than a foot and a half long, and about two inches and a half broad at their baſe; theſe end in a ſlender ſpine, being ſlightly indented on their edges; they are alſo reflexed backward toward their extremity, and are of a dark green colour. The flower-ſtem riſes about twelve feet high, and branches out toward the top in the ſame manner as the third ſort; the flowers are nearly of the ſame ſize and colour as thoſe of the third, and after they fall off, are ſucceeded by young plants in the ſame manner. A plant of this kind flowered in the garden at Chelſea, in December 1754. This never produces any ſuckers from the root, ſo cannot be increaſed until it flowers.

The leaves of the ſixth ſort are from two feet and a half to three feet long, and about three inches broad, being of a dark green colour, ending in a black ſpine; the borders of the leaves are of a browniſh red colour, and ſlightly ſerrated. Theſe ſtand more erect than in the other ſpecies; but as this ſort hath not flowered in England, ſo I cannot ſay how it differs from the other. The plants of it were ſent me from St. Chriſtopher's, by the title of Koratto, which I ſuppoſe is given indifferently to other ſpecies of this genus; for I have frequently heard the inhabitants of America call the common great Aloe by the ſame name.

The eighth ſort hath long, narrow, ſtiff leaves, which are entire, and are terminated by a ſtiff black ſpine. Theſe leaves are ſeldom more than two feet long, and little more than an inch broad, being of a glaucous colour. The ſide leaves ſtand almoſt horizontally, but the center leaves are folded over each other, and incloſe the flower-bud. This ſort never puts out ſuckers from the root, nor have I ſeen any plants of this kind in flower, although there are many of them in the Engliſh gardens, ſome of which are of a conſiderable age.

The third, fourth, fifth, ſixth, and eighth ſorts, are much tenderer than the others, ſo cannot be preſerved through the winter in England, unleſs they are placed in a warm ſtove; nor will they thrive if ſet abroad in ſummer, therefore they ſhould conſtantly remain in the ſtove, obſerving to let them enjoy a great ſhare of free air in warm weather. They require a light ſandy earth, and ſhould have little wet in winter; but in warm weather, may be gently watered twice a week, which is as often as is neceſſary; for if they have much water given them, it rots their roots, and then their leaves will decay and inſects infeſt them. They ſhould be ſhifted every ſummer into freſh earth, but muſt not be put into large pots, for unleſs their roots are confined, the plants will not thrive.

AGERATUM. Lin. Gen. Plant. 842. Baſtard Hemp Agrimony.

The Characters are,

*The flowers are included in one common oblong empalement, which is compoſed of many ſcales. Theſe are uniform, tubulous, and hermaphrodite, and little longer than the empalement, each being cut at their margin into five ſegments, which ſpread open. Theſe have five ſlender ſtamina, crowned with cylindrical ſummits: in the center of the flower is ſituated an oblong germen, ſupporting a ſlender ſtyle, crowned by two fine ſtigmas. The germen afterward becomes an oblong angular ſeed, crowned with its proper little cup, cut into five narrow ſegments, which ſpread open. The receptacle of the ſeed is ſmall, naked, and convex.*

This genus of plants is by Dr. Linnæus ranged in his ſeventeenth claſs, entitled Syngeneſia polygamia æqualis, the flowers having their ſtamina joined together in a cylinder, and there being male, female, and hermaphrodite florets included in the ſame common empalement.

The Species are,

1. Ageratum (*Conyzoides*) foliis ovatis caule piloſo. Lin. Sp. Plant. 839. *Baſtard Hemp Agrimony, with oval leaves and a hairy ſtalk.* Eupatorium humile Africanum ſenecionis facie folio lamii. Herm. Pars 161.
2. Ageratum. (*Houſtonianum*) foliis oppoſitis petiolatis crenatis, caule hirſuto. *Baſtard Hemp Agrimony, with leaves having long ſoot-ſtalks placed oppoſite, whoſe edges are bluntly indented, and a hairy ſtalk.* Eupatorium herbaceum meliſſæ folio villoſum flore cœruleo. Houſt. MSS.
3. Ageratum (*Altiſſimum*) foliis ovato cordatis rugoſis floralibus alternis, caule glabro. Lin. Sp. Plant. 839. *Baſtard Hemp Agrimony, with rough, oval, heart-ſhaped leaves, flower branches growing alternate, and a ſmooth ſtalk.* Eupatorium urticæ foliis Canadenſe flore albo. H. L.

The two firſt are annual plants. The ſeeds of theſe muſt be ſown on a hot-bed in the ſpring, and when the plants are come up and are ſtrong enough to remove, they ſhould be tranſplanted into another moderate hot-bed, obſerving to water and ſhade them until they have taken root, after which time they muſt have a good ſhare of air in warm weather. In June they ſhould be inured to bear the open air, toward the middle of which month, they may be tranſplanted into the full ground, where they will begin to flower in July, and continue flowering till the froſts in autumn deſtroy them. The ſeeds ripen in September and October, and when any of them ſcatter upon the ground, and the ſame earth happens to be put on a hot-bed the following ſpring, the plants will come up in great plenty, as they frequently do in the open air; but theſe plants will be too late to produce good ſeeds, unleſs the ſummer proves warm. The firſt ſort grows naturally in Africa, and alſo in the iſlands of America; for in tubs of earth which I received with plants from Jamaica, Barbadoes, and Antigua, I have had plenty of the plants ariſe, from ſeeds which were ſcattered on the ground. The ſecond ſort was found growing naturally at La Vera Cruz, by the late Dr. William Houſtoun, who ſent the ſeeds to Europe, which have ſo well ſucceeded in many gardens, as to become a weed in the hot-beds. There is a variety of this with white flowers, which ariſes from the ſame ſeeds.

The third ſort grows naturally in North America, but has been many years an inhabitant of the Engliſh gardens. This hath a perennial root and an annual ſtalk; the ſtalks will grow five or ſix feet high, and toward their tops put out ſide branches: the leaves are ſhaped like a heart. At the ends of the ſhoots the flowers are produced in large tufts, which are of a pure white; and

these appearing in October, at a feafon when there is a fcarcity of other flowers, renders it more valuable.

This fort is propagated by feeds, as alfo by parting of the roots; the latter method is commonly practifed in England, becaufe there are few autumns fo favourable as to ripen the feeds: but the feeds are frequently brought from North America, where this plant is very common; for being light, they are eafily wafted about to a great diftance, where they come to maturity; fo that where there are any plants growing, all the adjoining land is filled with the feeds of them.

The beft time for planting and tranfplanting the roots of this plant, is in autumn, foon after their ftalks decay, that they may have good root before the drying winds come on, otherwife they will not flower ftrong, or make a good increafe. The roots fhould be allowed three feet room every way, for as they fpread and increafe very much, fo when they are cramped for room, the plants ftarve, and in dry feafons their leaves will hang. They delight in a rich moift foil and open fituation, where they will produce many ftalks from each root, which will grow fo large as to form a confiderable brufh. This plant will bear the fevereft cold in winter.

AGERATUM, or MAUDLIN. See Achillea.

AGERATUM PURPUREUM. See Erinus.

AGNUS CASTUS. See Vitex.

AGRIFOLIUM. See Ilex.

AGRIMONIA. Lin. Gen. Plant. 534. Agrimony.

The Characters are,

*The empalement of the flower is of one leaf, which is cut into five acute fegments, and refts on the germen. The flower has five petals, which are plain and indented at their extremity, but are narrow at their bafe, where they are inferted in the empalement. In the center arifes a double ftyle, refting on the germen, which is attended by twelve flender ftamina, which are crowned with double compreffed fummits. After the flower is paft, the germen becomes two roundifh feeds faftened to the empalement.*

This genus of plants is ranged by Dr. Linnæus in the fecond fection of his eleventh clafs, entitled Dodecandria digynia, the flowers having twelve ftamina and two ftyles.

The Species are,

1. Agrimonia (*Eupatoria*) foliis caulinis pinnatis impari petiolato, fructibus hifpidis. Hort. Cliff. *The common Agrimony.* Agrimonia officinarum. Tourn.
2. Agrimonia (*Minor*) foliis caulinis pinnatis, foliolis obtufis dentatis. *The white Agrimony.* Agrimonia minor flore albo. Hort. Cath.
3. Agrimonia (*Odorata*) altiffima, foliis caulinis pinnatis foliolis oblongis acutis ferratis. *The fweet-fcented Agrimony.* Agrimonia odorata. Camer.
4. Agrimonia (*Repens*) foliis caulinis pinnatis, impari feffili, fructibus hifpidis. Lin. Sp. 643. *Eaftern Agrimony with pinnated leaves and a thick creeping root.* Agrimonia orientalis humilis radice craffiffimâ repente fructu in fpicam brevem & denfam congefto. Tourn. Cor.
5. Agrimonia (*Agrimonoides*) foliis caulinis ternatis fructibus glabris. Hort. Cliff. 179. *Three leaved Agrimony with fmooth fruit.* Agrimonoïdes Col. Echpr.

The firft fort grows naturally in feveral parts of England, by the fides of hedges, and in woods. This is the fort which is commonly ufed in medicine, and is brought to the markets by thofe who gather herbs in the fields.

The fecond fort is the fmalleft of all the fpecies; the leaves of this have not fo many pinnæ as the common fort, and the pinnæ are rounder, and the indentures on their edges blunter. The fpike of flowers is flender, and the flowers fmaller, and of a dirty white colour. This fort grows naturally in Italy, from whence I received the feeds, and have conftantly found that the feeds of this when fown never vary.

The third fort grows near four feet high; the leaves of this have more pinnæ than either of the former, which are longer and narrower, ending in acute points; the ferratures of the leaves are fharper than any of the other, and when handled emit an agreeable odour. The leaves of this fort make an agreeable cooling tea, which is a very good beverage for perfons in a fever, in which diforder I have known it often prefcribed by good phyficians.

The fourth fort is of humble growth, feldom rifing above two feet high; the pinnæ of its leaves are longer and narrower than either of the former, and the fpikes of flowers very fhort and thick. The roots of this are very thick, and fpread widely under ground, by which it multiplies fafter than either of the other; the feeds are alfo much larger and rougher than thofe of the common fort. This was fent by Dr. Tournefort to the royal garden at Paris, and from thence the other botanic gardens have been fupplied with them.

The fifth fort greatly refembles the other in the fhape of its pinnæ (or fmaller leaves) but there are but three upon each foot-ftalk; the flower of this hath a double empalement, the outer one being fringed. There are but feven or eight ftamina in each flower, and the feeds are fmooth, for which reafon Fabius Columna, and other writers on botany, have feparated it from the Agrimony, making it a diftinct genus.

All thefe forts are hardy perennial plants, which will thrive in almoft any foil or fituation, and require no other care but to keep them clear from weeds. They may be propagated by parting of their roots, which fhould be done in autumn, when their leaves begin to decay, that the plants may be well eftablifhed before the fpring. They fhould not be planted nearer than two feet, that their roots may have room to fpread. They may alfo be propagated by feeds, which fhould be fown in autumn, for if they are kept out of the ground till fpring, they feldom come up the fame feafon.

AGROSTEMMA. Lin. Gen. Plant. 516. Wild Lychnis or Campion.

The Characters are,

*The empalement of the flower is permanent, of one leaf, which is tubulous, thick, and cut into five narrow fegments at the edge; the flower is compofed of five petals, which are the length of the tube, but fpread open at the top. In the center is fituated an oval germen fupporting five ftyles, which are flender, erect, and crowned with fimple ftigma. Thefe are attended by ten ftamina, five of which are inferted in the bafe of the petals, and the others ftand alternately between: after the flower is paft, the germen becomes an oval oblong capfule, having one cell opening into five divifions, which is filled with angular feeds.*

This genus of plants is by Dr. Linnæus ranged in the fifth fection of his tenth clafs, entitled Decandria pentagynia, the flowers of this divifion having ten ftamina and five ftyles.

The Species are,

1. Agrostemma (*Githago*) hirfuta calycibus corollam æquantibus petalis integris nudis. Lin. Sp. Plant. 435. *Hairy wild Lychnis, whofe empalement is equal with the corolla, and the petals entire and naked, commonly called Corn Campion.* Lychnis fegetum major. C. B. P.
2. Agrostemma (*Celirofa*) glabra foliis lineari-lanceolatis petalis emarginatis coronatis. Hort. Upfal. 115. *Smooth wild Campion with narrow fpear-fhaped leaves, and the petals of the flowers indented at their brim.* Lychnis foliis glabris calyce duriore. Bocc. Sic. 27.
3. Agrostemma (*Coronaria*) tomentofa foliis ovato-lanceolatis, petalis integris coronatis. Hort. Upfal. 115. *The fingle Rofe Campion.* Lychnis coronaria Diofcoridis fativa. C. B. P. 203.
4. Agrostemma (*Flos Jovis*) tomentofa petalis emarginatis. Lin. Sp. Plant. 436. *Umbelliferous Mountain Campion.* Lychnis umbellifera montana Helvetica. Zan. Hift. 128.

The firft fort grows naturally in the corn fields in moft parts of England, fo is feldom admitted into gardens.

The fecond fort grows naturally in Sicily, and being a plant of little beauty, is only preferved in botanic gardens for the fake of variety.

The fingle Rofe Campion has been long an inhabitant of the Englifh gardens, where, by its feed having fcattered, it is become a kind of weed. There are three varieties of this plant, one with deep red, another with flefh-coloured, and a third with white flowers, but

but these are of small esteem; for the double Rose Campion being a fine flower, has turned the others out of most fine gardens. The single sorts propagate fast enough by the seeds, where they are permitted to scatter, for the plants come up better from self-sown seeds, than when they are sown by hand, especially if they are not sown in autumn.

The sort with double flowers, which is a variety of the former, never produces any seeds, so is only propagated by parting of the roots; the best time for this is in autumn, after their flowers are past; in doing of this, every head which can be slipped off with roots should be parted. These should be planted in a border of fresh undunged earth, at the distance of six inches one from the other, observing to water them gently until they have taken root; after which they will require no more, for much wet is very injurious to them, as is also dung. In this border they may remain till spring, when they should to be planted into the borders of the flower-garden, where they will be very ornamental during the time of their flowering, which is July and August.

The fifth sort grows naturally upon the Helvetian mountains; this is a low plant, with woolly leaves; the flower-stem rises near a foot high; the flowers grow in umbels on the top of the stalk, which are of a bright red colour. It flowers in July, and the seeds ripen in September. It must have a shady situation, and will thrive best in a moist soil.

AIR [*Aër*, *Lat.* Ἀὴρ, of τȣ̃ ἀεὶ ῥεῖν, because it always flows; or as others, of ἄημι, to breathe.] By air is meant all that fluid expanded mass of matter which surrounds our earth, in which we live and walk, and which we are continually receiving and casting out again by respiration.

The substance whereof air consists, may be reduced to two kinds, viz.

1. The matter of light or fire, which is continually flowing into it from the heavenly bodies.

2. Those numberless particles, which is in form either of vapours, or dry exhalations, are raised from the earth, water, minerals, vegetables, animals, &c. either by the solar, subterraneous, or culinary fire.

Elementary air, or air properly so called, is a certain subtile, homogeneous, elastic matter, the basis or fundamental ingredient of the atmospherical air, and that which gives it the denomination.

Air therefore may be considered in two respects; either as it is an universal assemblage, or chaos, of all kinds of bodies; or as it is a body endued with its own proper qualities.

1. That there is fire contained in all air is demonstrable, in that it is evident, that there is fire existing in all bodies, and to this fire it is that air seems to owe all its fluidity; and were the air totally divested of that fire, it is more than probable that it would coalesce into a solid body; for it is found by many experiments, that the air condenses and contracts itself so much the more, the less degree of warmth it has; and, on the contrary, expands itself the more, according as the heat is greater.

2. In respect of exhalations, air may be said to be a general collection of all kinds of bodies; for there are no bodies but what fire will render volatile, and disperse into air; even salts, sulphurs, and stones, nay and gold itself, though the heaviest and most fixed of all bodies, are convertible into vapours by a large burning-glass, and are carried on high.

Those floating particles, thus raised from terrestrial bodies, are moved and agitated by the fiery particles divers ways, and are diffused through the whole atmosphere.

Of the matters thus raised in the atmosphere, those which come from fluid bodies, are properly called vapours, and those from solid or dry ones, exhalations.

The cause of this volatility and ascent is the fire, without which all things would fall immediately down towards the center of the earth, and remain in eternal rest.

Thus, if the air be full of vapours, and the cold succeeds, these vapours before dispersed are congregated and condensed into clouds, and thus fall back again into the form of water, rain, snow, or hail.

From the time of the entrance of the spring till autumn, the evaporation is constant; but then it begins to fail, and in the winter ceases, to lay up fresh matter for the coming season.

And thus it is that frosty winters, by congealing the waters, and by covering the earth with a crust, and thus imprisoning the exhalations, make a fruitful summer.

And this seems to be the reason why in some countries, where the winter is severer than ordinary, the spring is more than ordinary fruitful; for in such places the exhalations being pent up a long time, are discharged in the greater quantity, when the sun makes them a passage; whereas, under a feebler cold, the flux would have been continual, and consequently no great stock reserved for the next occasion.

This vaporous matter then being at length received into the atmosphere, is returned again in the form of rain, a forerunner of a chearful crop.

As the sun retires, the cold succeeds, and thus the diversity of the seasons of the year depends on a change in the face of the crust of the earth, the presence of the air, and the course of the sun.

And hence we conceive the nature of meteors, which are all either collections of such vapours and exhalations, or dispersions thereof.

The subtiler oils are always rising into the air. Now two clouds, partly formed of such oils, happening to meet and mix, by the attrition, the oil frequently takes fire, and hence proceed thunder, lightnings, and other phænomena, which may be farther promoted by the disposition of the clouds to favour the excitation.

And hence arise great and sudden alterations in the air, insomuch that it shall be now intensely hot, and raise the spirits perhaps to eighty-eight degrees in a thermometer; and yet, after a clap of thunder with a shower, it shall fall again in a few minutes no less than twenty or thirty degrees.

It is therefore impossible to pronounce what the degree of heat will be in any given place at any time, even though we know ever so well the places and position of the sun and planets with respect to us, since it depends so much upon other variable things, no ways capable of being ascertained.

The lower the place, the closer, denser, and heavier is the air, till at length you arrive at a depth where the fire goes out; so that miners, who go deep, to remedy this inconvenience, are forced to have recourse to an artificial wind, raised by the fall of waters, to do the office of the other air.

Now, considering the air as such a chaos, or assemblage of all kinds of bodies, and a chaos so extremely liable to change, it must needs have a great influence on vegetable bodies.

3. Air considered in itself, or that properly called air.

Besides the fire and exhalations contained in the circumambient atmosphere, there is a third matter, which is what we properly mean by air.

To define the nature of it would be extremely difficult, inasmuch as its intimate affections are unknown to us; all we know is,

1. That air is naturally an homogeneous similar body.
2. That it is fluid.
3. That it is heavy.
4. That it is elastic.
5. That it rarefies by fire, and contracts by cold.
6. That it is compressible by a weight laid thereon, and rises, and restores itself upon a removal of the same: all which circumstances should incline it to coalesce into a solid, if fire were wanting.

1. Air is divided into real and permanent, and apparent or transient.

Real air is not reducible by any compression or condensation, or the like, into any substance besides air.

Transient air is the contrary of the former, and by cold,

cold, &c. may be condensed into original water; the difference between permanent and transient air, amounts to the same as that between vapour and exhalation; the one, e. g. being dry, and the other moist.

Hence, as Sir Isaac Newton says, it is, that as the particles of permanent air are grosser, and arise from denser bodies, than those of transient air or vapour, true air is more ponderous than vapour, and a moist atmosphere lighter than a dry one.

But this real air no where consists in its purity, but that air which concerns us, and the properties and effects of which are chiefly to be considered, is that which has been before treated on and described, which Mr. Boyle acknowledges to be the most heterogeneous body in the universe; and Dr. Boerhaave shews it to be an universal chaos and colluvies of all the kinds of created bodies in the universe, and in which may be found whatever fire can volatize.

2. That the air is fluid, appears from the easy passage it affords to bodies through it; as in the propagation of sounds, smells, and other effluvia; for these things shew it a body that gives way to any force impressed, and in yielding are easily moved among themselves, which are the properties of a fluid; so that scarce any body will call in question, whether air be a fluid, and thence being always in motion, and always moving other bodies, for no surface of any liquor that is contiguous to the air, can be at rest.

3. As to the gravity or heaviness of the air, that is likewise easily proved; for that the air is heavy, follows from its being a body, weight being an essential property of matter.

Sense and experiment sufficiently prove this: for, if a person lay his hand upon an open vessel placed on an air-pump, and the air be exhausted, he will sensibly feel the load of the incumbent atmosphere to increase, and press upon the upper part of his hand, as the air is exhausting.

In like manner, a hollow sphere of five or six inches diameter, divided into two segments exactly fitting each other, after the air is exhausted out of them, are pressed together with a force equal to a hundred pounds weight, and require the strength of two strong persons to pull them asunder; which, as soon as ever the air is let into them again, will fall asunder by the mere weight of the under hemisphere.

Mr. Boyle found that a lamb's bladder, containing about two thirds of a pint, and blown up, and well dried, lost about a grain and one eighth, when it was pricked, and the air let out.

Mr. Gravesande found, that the air in a glass ball of about two hundred and eighty-three inches capacity, weighed a hundred grains; and according to Burcher de Volder, a cubic foot of air is in weight one ounce, and twenty-seven grains.

Mr. Boyle has computed, that the weight of any quantity of air, near the surface of the earth, is to water as 1 to 1000; and Dr. Halley, as 1 to 800; and Mr. Hawksbee, as 1 to 885; and the gravity of the same quantity of air to the same quantity of mercury, as 1 to 10800.

Air therefore may be considered as an universal operculum, or cover, which by its weight keeps all terrestrial bodies down, and hinders them from flying off.

4. The air is elastic. Elasticity is a quality whereby a body yields to any external impressions by contracting itself into less compass; and upon removing or diminishing the impressive power, returns to its former space or figure. And by this quality, the air is distinguished from all other bodies in the atmosphere; neither fire nor exhalations appearing to be elastic, at least in any notable degree.

That there is such a quality in the air, is evident from innumerable experiments; and this property is inseparable from it. A bladder full blown being squeezed in the hand, the included air may be sensibly perceived to resist the touch; so that upon ceasing to compress it, the cavities or impressions, which were made in its surface, are immediately expanded again, and filled up.

Also thin glass bubbles, or bladders full of air, and exactly closed, and put into the receiver of an air-pump, the air being exhausted out of the receiver, the glass bubbles fly in pieces by the force of the air included in them.

From these experiments, and many others, it appears, that the air we breathe near the surface of the earth is compressed by its own weight into at least 1679 parts of the space it would possess in vacuo; and if the same air be condensed by art, the space it will occupy, when most dilated, will be as 505000 to 1, to that which it possesses when condensed; and Dr. Wallis suggests, that we are far from knowing the utmost it is capable of.

Nor does this power appear capable by any means to be destroyed or diminished; for Mr. Boyle made several experiments to discover how long air, brought to the greatest degree of expansion he could reduce it to in his air-pump, would retain its spring, and could never observe any sensible diminution; although the air was clogged some months with a weight that one would admire how it should support one moment.

It is, indeed, a wonderful property in air, that it should be capable of being contracted and extended infinitely; but, as hath been said, it does not appear, by all the experiments yet tried, that there are any limits of its compression or expansion; but still by the addition of a new weight, it will contract farther; and by taking the weight away, will expand farther.

5. Air rarefies by fire, and contracts by cold.

The colder the air is, the less space it takes up; and, on the contrary, the warmer the air is, it possesses the larger space; and so cooling and compression have the same effects upon air; and so cold and compression keep pace with one another.

The same holds of warming and diminishing of weight, or heat and expansion, which go hand in hand.

And to the same elastic power before-mentioned, and its being expanded by heat, it is owing, that air inclosed in glass vessels, at a time when it is much condensed, when it afterwards comes to expand by a farther degree of heat, frequently bursts the bottles.

6. Air is compressible by a weight laid thereon, and rises and restores itself upon a removal of the same. This property has been sufficiently shewn by what has been said before, and especially under the head of elasticity; wherefore, having considered the properties of air, I shall take notice of some of its operations and effects as to the business of vegetation.

Air, by being heavy and fluid, invests the whole earth, and presses all the bodies thereon with a great force, equal to what they would sustain from the pressure of a column of 29 inches depth of mercury, or 32 feet of water; and constringes and binds them down with a force amounting, according to the computation of Mr. Paschal, to 2232 pounds weight upon every square foot, or upwards of 15 pounds upon every square inch. Hence it prevents, e. g. the arterial vessels of plants and animals from being too much distended by the impetus of the circulating juices, or by the elastic force of the air so plentifully lodged in the blood of one, and the sap of the other. For,

The air presses equally every way, as is confirmed in what we observe of soft bodies sustaining this pressure without any change of figure, and brittle bodies without their breaking.

Air is a principal cause of the vegetation of plants, an instance of which we have from Mr. Ray, in the Philosophical Transactions of Lettuce-seed, that was sown in the glass-receiver of the air-pump, which was exhausted and cleared from all air, which grew not at all in eight days time; whereas some of the same seed that was sown at the same time in the open air, was risen to the height of an inch and a half in that time; but the air being let into the empty receiver, the seed grew up to the height of two or three inches in the space of one week.

That a certain portion of air is necessary to preserve the growing quality of seeds is manifest, from many repeated

repeated experiments; by putting up ſeeds into glaſs bottles, and ſealing the bottles hermetically, and in ſix months thoſe ſeeds have loſt their growing quality; whereas part of the ſame ſeeds which were kept in bags, grew at the age of two years; therefore it ſhould caution perſons not to exclude the air from their ſeeds, if they intend they ſhould grow.

Another inſtance of the uſefulneſs of the air in vegetation, is the Sedum, which will puſh out roots without earth and water, and live for ſeveral months: and ſome ſorts of Aloes, if hung up in a room entirely ſecured from froſts, will remain freſh for ſome years, though they will ſenſibly loſe in their weight.

Air is capable of penetrating the porous and ſpongy parts of plants, and being there contracted, and dilating itſelf again.

The air operates alſo within the bowels of the earth, and by its ſubtilty perſpiring through the pores, aſſiſts in the rarefaction of the crudities of the earth, and in the diſpelling all ſuperfluous moiſture, entering into the very pores and veins of the trees, plants, herbs, &c. carrying along with it thoſe ſalts contained either in itſelf, or lodged in the earth; which ſalts or juices, are altered according to the ſeveral figures or dimenſions of the different ſtrainers or veſſels of thoſe ſeveral plants, which grow upon the ſame ſpot of earth, which is ſo impregnated with theſe ſalts: and thence thoſe varieties in taſte and ſmell proceed, notwithſtanding they all receive their nouriſhment from the ſame ſtock that is lodged in the earth.

The air alſo affects the branches, leaves, and flowers of trees, plants, and herbs, entering and perſpiring through them, and even through the bark and body of the tree; and by the ſame kind of ſubtilty it does, by its refreſhing breezes, moderate the intenſeneſs of the ſun-beams, cooling, chearing, blowing, opening and extending all the offspring of nature.

The air fixes and inſinuates its aërial ſubſtance into the liquid ſap of vegetables: and as all the agitations in nature proceed from the contrariety of parts inhabiting together, in this, aërial and liquid ſubſtances being mixed, cauſe this agitation and motion in vegetables, or, more properly, ſet it all into a ferment (whether it be in the roots, or in the ſtem); and it riſes by co-operation of the ſun (which is the third agent in vegetation) up to the top of a tree, &c. as liquids riſe by fire to the top of the containing veſſel.

This air, we find, produces a vibratory motion in ſeveral bodies; and particularly in plants, the air veſſels thereof do the office of lungs: for the air contained in them, ſometimes contracting, and ſometimes expanding, according as the heat is increaſed or diminiſhed, preſſes the veſſels, and eaſe them again by turns; and thus promotes a circulation of their juices, which could ſcarce be otherwiſe effected.

Air, ſays the learned Dr. Hales, is a fine elaſtic fluid, with particles of very different natures floating in it, whereby it is admirably fitted by the great Author of nature to be the breath or life of vegetables as well as animals, without which they can no more live nor thrive than animals can.

As a proof of the great quantities of air in vegetables, he refers to the third chapter of his excellent treatiſe of Vegetable Statics, where he ſays, in the experiments on Vines, the great quantity of air was viſible, which was continually aſcending through the ſap in the tubes; which manifeſtly ſhews what plenty of it is taken in by vegetables, and is perſpired off with the ſap through the leaves.

He adds ſeveral experiments, as to an Apple branch, Apricot branch, Birch, and other plants, to prove the ſame thing.

And Dr. Grew has obſerved, that the pores are ſo large in the trunks of ſome plants, as in the better ſort of thick walking-canes, that they are viſible to a good eye without a glaſs; but with a glaſs, the cane ſeems as if ſtuck at top full of holes with great pins, ſo large as very well to reſemble the pores of the ſkin in the ends of the fingers and ball of the hand.

In the leaves of Pines, they are likewiſe through a glaſs a very elegant ſhew, ſtanding almoſt exactly in rank and file through the length of the leaves.

Whence it may be thought probable, that the air freely enters plants, not only with the principal fund of nouriſhment by the roots, but alſo through the ſurface of their trunks and leaves, eſpecially at night, when they are changed from a perſpiring, to a ſtrongly imbibing ſtate.

Dr. Hales likewiſe tells us, that in all thoſe experiments that he tried to this purpoſe, he found that the air entered very ſlowly at the bark of young ſhoots and branches, but much more freely through old bark; and that in different kinds of trees it had different degrees of more or leſs free entrance.

And likewiſe, that there is ſome air both in an elaſtic and unelaſtic ſtate, mixed with the earth (which may well enter the roots with the nouriſhment), he found by ſeveral experiments, which he gives in the beforementioned treatiſe.

The excellent Mr. Boyle, in making many experiments on the air, among other diſcoveries found, that a good quantity of air was producible from vegetables, by putting Grapes, Plums, Gooſberries, Peaſe, and ſeveral other ſorts of fruits and grains into exhauſted and unexhauſted receivers, where they continued for ſeveral days emitting great quantities of air.

This put the curious Dr. Hales upon farther reſearches to find out what proportion of air he could obtain out of the different vegetables, in which it was lodged and incorporated, which he performed by divers chymio-ſtatical experiments, which he gives in many inſtances in his treatiſe of the analyſis of the air, plainly ſhewing in what manner he performed them, and the events of them.

That from half a cubic inch, or 135 grains of heart of Oak, freſh cut from a growing tree, there were 108 cubic inches of air generated, which is a quantity equal to 216 times the bulk of the piece of Oak; that the weight of it was above 30 grains, one quarter part of the weight of 135 grains.

And he adds, that he took the like quantity of thin ſhavings from the ſame piece of Oak, and dried them at ſome diſtance from a gentle fire for 24 hours; in which time they evaporated 44 grains of moiſture; which 44 grains deducted from 135 grains, there remains 91 grains for the ſolid part of the Oak: then 30 grains will be one third of the weight of the ſolid part of the Oak.

He gives another experiment of Indian Wheat, which grew in his own garden, that he took 388 grains of it when it was not come to its full maturity, and that there were generated from it 270 cubic inches of air; the weight of which air was 77 grains, viz. one fourth of the weight of the Wheat.

And again, that a cubic inch, or 318 grains of Peaſe generated 396 cubic inches of air, or 113 grains, i. e. ſomething more than one third of the weight of the Peaſe.

And again, that from one ounce, or 437 grains of Muſtard ſeed, 270 cubic inches of air were generated, or 77 grains, which is more than one ſixth part of the ounce weight.

He likewiſe adds, that there is a great plenty of air incorporated into the ſubſtance of vegetables, which, by the action of fermentation, is rouſed into an elaſtic ſtate, as is evident from theſe experiments following.

On the 2d day of March, he poured 42 cubic inches of ale from the tun, which had been there ſet to ferment 34 hours before into a bolt head; and from that time to the 9th of June, it generated 639 cubic inches of air, with a very unequal progreſſion, more or leſs, as the weather was warm, cool, or cold; and ſometimes, upon a change from warm to cool, it reſorbed air, in all 32 cubic inches.

From the 2d of March to the 16th of April, 12 cubic inches of Malaga Raiſins, with 18 cubic inches of water, generated 411 cubic inches of air; and then again, it reſorbed 35 cubic inches in two or three cold days. From the 21ſt of April to the 16th of May, it generated 78 cubic inches; after which, the 9th of

June, it continued in a reforbing ftate, fo as to reforb 13 cubic inches: that there were at that feafon many hot days, with much thunder and lightning, which deftroys the elafticity of the air: there were generated in all 489 cubic inches, of which 48 were abforbed. The liquor was at laft vapid.

On the 10th of Auguft, 26 cubic inches of Apples being mafhed, they generated 986 cubic inches of air in 13 days time, which is a quantity equal to 48 times their bulk; after which they reforbed a quantity equal to their bulk, in three or four days, notwithftanding the weather was then very hot; after which time they were ftationary for many days, neither generating nor abforbing.

From which before-mentioned experiments on Raifins and ale, the ingenious author concludes, that wine and ale do not turn vapid in warm weather by imbibing the air, but by fermenting and generating too much; by which means they are deprived of their enlivening principle the air: for which reafon, thefe liquors are beft preferved in cool cellars, whereby this active invigorating principle is kept within due bounds; which when they exceed, wines are upon the fret, and are in danger of being fpoiled.

Upon thefe, and many other experiments, which the learned author has given in his aforefaid treatife, he obferves, that this air which arifes in fo great quantities from fermenting and diffolving vegetables, is true permanent air; which is certain, by its continuing in the fame expanded and elaftic ftate for many weeks and months; which expanded watery vapours will not do, but foon condenfe when cold.

Upon the whole, he concludes, that air abounds in vegetable fubftances, and bears a confiderable part in them: and if all the parts of matter were only endowed with a ftrongly attracting power, all nature would then immediately become one unactive cohering lump.

Wherefore it was abfolutely neceffary, in order to the actuating this vaft mafs of attracting matter, that there fhould be every where mixed with it a due proportion of ftrongly-repelling elaftic particles, which might enliven the whole mafs by the inceffant action between them and the attracting particles.

And fince thefe elaftic particles are continually in great abundance reduced by the power of the ftrong attracters, from an elaftic to a fixed ftate, it was therefore neceffary that thefe particles fhould be endued with a property of refuming their elaftic ftate, whenever they were difengaged from that mafs in which they were fixed, that thereby this beautiful frame of things might be maintained in a continual round of the production and diffolution of vegetables as well as animal bodies.

The air is very inftrumental in the production and growth of vegetables, both by invigorating their feveral juices, while in an elaftic active ftate, and alfo by greatly contributing in a fixed ftate, to the union and firm connexion of the feveral conftituent parts of thofe bodies, viz. their water, fire, falt, and earth.

To conclude, by reafon of thofe properties of the air before-mentioned, it is very ferviceable to vegetables, in that it blows up and breaks open the clouds, thofe treafures of rain, which fertilize the vegetable kind.

The air alfo helps to waft or difperfe thofe foggy humid vapours which arife from the earth, and would otherwife ftagnate, and poifon the whole face of the earth.

The air, by the affiftance of the fun, affumes and fublimates thofe vapours into the upper regions; and thefe foggy humid vapours are, by this fublimation, and the coercive power of the air and fun, rarefied and made of fecond ufe in vegetation.

And on the contrary, to the benign quality of the air, which is fo many ways fubfervient to vegetables, it is alfo fometimes, and upon fome accounts, injurious and pernicious to them; not only to the ligneous, herbaceous, and flowery parts above, but alfo to the roots and fibres below: for in that the air penetrates into the earth, it is eafy to be concluded, that a dry, hufky, fcorching air, may be very prejudicial to the tender fibres of new planted trees.

It may be likewife fuppofed, that all bodies of earth are more or lefs capable of imbibing the fluid air, and of attracting fuch falts as either the air can give, or the earth is capable of receiving.

AIZOON. Sempervive.

This name Dr. Linnæus has given to a plant near of kin to the Ficoides, which has been called Ficoidea, by fome modern botanifts.

The CHARACTERS are,

*It hath a permanent empalement of one leaf, which is cut into five acute fegments at the top: there are no petals in the flower, but the five-cornered germen refts on the empalement, fupporting five ftyles, which are crowned with fimple ftigma; thefe are attended by many hairy ftamina, which are inferted into the empalement, and are crowned with fimple fummits. The germen afterward becomes a fwelling five-cornered capfule, having five cells, in which are lodged many roundifh feeds.*

This genus of plants is by Dr. Linnæus ranged in the fifth divifion of his twelfth clafs, entitled Icofandria Pentagynia, the flowers of this clafs having more than nineteen ftamina, and in this divifion they have five ftyles.

The SPECIES are,

1. AIZOON (*Canarienfe*) foliis cuneiformi-ovatis floribus feffilibus. Hort. Upfal. 127. *Sempervive with oval wedge-fhaped leaves, and flowers without foot-ftalks.* Ficoidea procumbens portulacæ folio. Niffol. Act. Par. 1711.
2. AIZOON (*Hifpanicum*) foliis lanceolatis floribus feffilibus. Lin. Sp. Plant. 488. *Sempervive with fpear-fhaped leaves and flowers, having no foot-ftalks.* Ficoidea Hifpanica annua folio longiore. Hort. Elth. 143.
3. AIZOON (*Paniculatum*) foliis lanceolatis floribus paniculatis. Lin. Sp. Pl. 448. *Sempervive with fpear-fhaped leaves and flowers growing in panicles.* Aizoon foliis lanceolatis fubtus hirfutis. Prod. Leyd. 221.

As we have no Englifh names for thefe plants, fo I have adopted this of Sempervive, which hath been applied to the Aloe and Sedum, both which have been alfo titled Aizoon and Sempervivum.

The firft fort is a native of the Canary Iflands: this is an annual plant, which muft be raifed on a moderate hot-bed in the fpring; and when the plants are fit to tranfplant, they fhould be carefully taken up, and planted each into a fmall pot filled with frefh light earth, and plunged into another moderate hot-bed, obferving to fhade them from the fun until they have taken frefh root; after which they muft be hardened by degrees to bear the open air, into which they fhould be removed in June, placing them in a fheltered fituation, where they will flower, and ripen their feeds in September, foon after which the plants will perifh.

The fecond fort grows naturally in Spain; this is alfo an annual plant, whofe branches trail on the ground; the flowers have no beauty, fo thefe plants are only preferved by thofe who are curious in collecting rare plants for the fake of variety.

The third fort grows naturally at the Cape of Good Hope, from whence the feeds were brought to Europe. This is alfo of humble growth, and perifhes foon after the feeds are ripe.

Thefe may be propagated in the fame manner as the firft, and when the plants have acquired ftrength, they may be planted in the full ground; but they require a poor fandy foil, for in rich ground they will grow very luxuriant in branches, but will not flower till late in the feafon, fo rarely perfect their feeds; but when they are planted in dry fand, or lime rubbifh, they will be more productive of flowers, and lefs vigorous in their branches.

ALA is the hollow of a ftalk, which either the leaf, or the pedicle of the leaf, makes with the ftalk or branches; or it is that hollow finus placed between the ftalk or branch and leaf, from whence a new offfpring is wont to put forth, which the French call,

*Aiſſelles des Plantes.* Sometimes it is uſed for leaves which conſiſt of many lobes or wings.

Alæ is alſo uſed to ſignify thoſe petala of papilionaceous flowers placed between the Vexillum and the Carina, which the French call, *Les Ailes des Fleurs legumineuſes.*

Alæ is alſo uſed for thoſe extreme ſlender membranaceous parts of certain ſeeds; as is the Bignonia Plumeria, the fruit of the Maple, &c. which the French call *Semences ailées.* Again,

Alæ is uſed for thoſe foliaceous membranes which run the whole length of the ſtem; whence it is called, *Caulis alatus,* a winged ſtalk; in French, *Tige ailée:* but modern writers have ſtyled theſe *foliis decurrentibus,* or running leaves, becauſe theſe alæ or wings are connected with the leaves.

ALABASTRA, are thoſe green herbaceous leaves that encompaſs flowers. Jungius explains Alabaſtrum to be the globe, or roundiſh bud, that is but juſt peeping out.

ALATERNOIDES. See Phylica, Clutia, and Ceanothus.

ALATERNUS [called 'Ελαιόπρινος, as though of ἐλαία, an Olive, and πρῖνος, an Ilex], or evergreen Privet.

The Characters are,

*It hath male and female flowers in different plants in ſome ſpecies, and in others both ſorts of flowers on the ſame. The male flowers are compoſed of an empalement of one leaf, which is funnel-ſhaped, and cut into five ſegments at their brim; to the ſides of the empalement are fixed five ſmall petals; at the baſe of theſe petals are faſtened ſo many ſtamina, which are crowned with round ſummits. The female flowers have a great reſemblance to the male, but have no ſtamina. In the center is placed the germen, ſupporting a trifid ſtyle crowned by a round ſtigma, the germen afterward becomes a ſoft round berry, containing three ſeeds.*

Dr. Linnæus has joined this genus to the Rhamnus, to which he has alſo added the Frangula, Paliurus, and Zizyphus, and ranges them in his fifth claſs of plants, entitled Pentandria Monogynia.

The Species are,

1. Alaternus (*Phylica*) foliis ovatis marginibus crenatis glabris. *Common Alaternus, with ſmooth leaves indented on their edges.* Alaternus, 1 Cluſ. Hiſp. 56.
2. Alaternus (*Glabra*) foliis ſubcordatis ſerratis glabris. *Alaternus with heart-ſhaped ſmooth leaves, which are ſawed on their edges.* Alaternus minore folio. Tourn. Inſt. 595.
3. Alaternus (*Anguſtifolia*) foliis lanceolatis profundè ſerratis glabris. *Alaternus with ſmooth ſpear-ſhaped leaves, which are deeply ſawed.* Alaternus monſpeliaca foliis profundiùs inciſis. H. R. Par.
4. Alaternus (*Latifolia*) foliis ovato-lanceolatis integerrimis glabris. *Alaternus with ſmooth oval ſpear-ſhaped leaves, which are entire.* Alaternus Hiſpanica latifolia. Tourn. Inſt. 596.

The varieties of theſe plants are, the firſt ſort with variegated leaves, which is commonly called Bloatched Phillyrea by the nurſery gardeners. And the third ſort with leaves ſtriped with white, and another with yellow; theſe are known by the Silver and Gold ſtriped Alaternus: but as theſe are accidental varieties, I have omitted placing them among the number of ſpecies.

The common diſtinction of this genus from the Phillyrea, is in the poſition of their leaves, which in the plants of this are placed alternately on the branches, whereas thoſe of Phillyrea are placed by pairs oppoſite; this is obvious at all ſeaſons, but there are more eſſential differences in their characters, as will be explained under the article Phillyrea.

The firſt ſort has been long cultivated in the Engliſh gardens, but the plain ſort is now uncommon here; for the bloatched-leaved ſort has been generally cultivated in the nurſeries, and the other has been almoſt totally neglected.

Theſe plants were much more in requeſt formerly than they are at preſent, when they were planted againſt walls in court-yards to cover them, as alſo to form evergreen hedges in gardens, for which purpoſe theſe were improper; for their branches ſhoot very vigorouſly, and being very pliant, they are frequently diſplaced by the wind; and in winter, when much ſnow falls in ſtill weather, the weight of that which lodges on the hedges, frequently breaks them down: add to this the trouble of keeping them in order, which cannot be effected with leſs than three times clipping in a ſeaſon, which is not only expenſive, but alſo occaſions a great litter in a garden: theſe inconveniencies have juſtly brought theſe hedges into diſeſteem.

The third ſort with ſilver-ſtriped leaves, was alſo in great requeſt ſome years ago, for planting againſt out-houſes, and other buildings, to hide the brick-work; but as theſe required to be often clipped, and their branches frequently wanting to be faſtened up to the wall, which was troubleſome and expenſive, and this ſort of wall hedges being great harbour for vermin, there has been of late but little demand for theſe plants. The ſort with gold-ſtriped leaves is pretty rare in the Engliſh gardens, and is not ſo hardy as that with ſilver ſtripes, ſo that in ſevere winters they are often killed. But the taſte for theſe variegated plants is almoſt loſt in England, there being few perſons now, who do not prefer the plain green leaves to thoſe which are ſtriped.

The ſecond ſort was formerly in the Engliſh gardens, in much greater plenty than at preſent. This was generally called Celaſtrus, or Staff-tree. The leaves of this ſort are placed at greater diſtances than thoſe of the firſt, ſo that their branches appear thinly covered with them, which may have occaſioned their being diſeſteemed. The leaves of this are ſhorter than thoſe of the firſt ſort, and are rounded at their foot-ſtalks ſomewhat like a heart-ſhaped leaf, the edges are alſo ſawed.

The thrid ſort has been an old inhabitant in ſome gardens, but was not much propagated till of late years; the leaves of this are much longer and narrower than thoſe of either of the other ſorts, and the ſerratures on their edges are much deeper; this ſhoots its branches more erect, and forms an handſomer buſh than any of the other, and is equally hardy, ſo may be allowed to have a place in all plantations of Evergreens. This grows naturally in the ſouth of France, where the berries are gathered, and ſold by the name of Avignon berries, for the uſe of painters, &c. for making a yellow pigment.

Theſe ſorts are by ſome ſuppoſed to be only varieties and not diſtinct ſpecies; but from many repeated trials, in raiſing them from ſeeds, I can affirm they do not vary, the ſeeds conſtantly producing the ſame ſpecies as they were taken from.

The ſecond ſort grows naturally about Turin, from whence I have been ſupplied with the ſeeds.

All theſe ſorts are eaſily propagated by laying their branches down, as is practiſed for many other trees. The beſt time for this is in the autumn, and if properly performed, the layers will have made good roots by the autumn following, when they may be cut off from the old ſtock, and planted either into the nurſery, or in the places where they are deſigned to remain. When they are planted in a nurſery, they ſhould not remain there longer than a year or two; for as they ſhoot their roots to a great diſtance on every ſide, ſo they cannot be removed after two or three years growth, without cutting off great part of them, which is very hurtful to the plants, and will greatly retard their growth, if they ſurvive their removal; but they are frequently killed by tranſplanting, when they have ſtood long in a place. They may be tranſplanted either in the autumn or the ſpring, but in dry land the autumn planting is beſt, whereas in moiſt ground the ſpring is to be preferred.

The plain ſorts may alſo be propagated by ſowing their berries, which they produce in great plenty, but the birds are greedy devourers of them; ſo that unleſs the berries are guarded from them, they will ſoon

be

be devoured when they begin to ripen. The plants which arise from seeds, always grow more erect than those which are propagated by layers, so are fitter for large plantations, as they may be trained up to stems, and formed more like trees; whereas the layers are apt to extend their lower branches, which retards their upright growth, and renders them more like shrubs. They will grow to the height of eighteen or twenty feet, if their upright shoots are encouraged; but to keep their heads from being broken by wind or snow, those branches which shoot irregular should be shortened, which will cause their heads to be closer, and not in so much danger.

All the sorts thrive best in a dry, gravelly, or sandy soil, for in rich ground they are often injured by frost, when the winters are severe, but in rocky dry land they are seldom injured: and if in very hard frost their leaves are killed, yet the branches will remain unhurt, and will put out new leaves in the spring.

ALBUCA, Bastard Star of Bethlehem.

The Characters are,

*The flower has no empalement; it has six oblong oval petals, which are permanent; the three outer spread open, and the three inner are connected: it hath six three-cornered stamina the length of the corolla, three of which are fertile, crowned with moveable summits, the other three, which are barren, have no summits. The nectarium is situated near the base of the three fertile stamina; it has an oblong three-cornered germen, with a broad triangular style, crowned by a pyramidal three-cornered stigma; the capsule is three-cornered, having three cells filled with small plain seeds.*

This genus is ranged in the first section of Linnæus's sixth class of plants, the flower having six stamina and one style.

The Species are,

1. Albuca (*Major*) foliis lanceolatis. Lin. Sp. 438. *Star flower with spear-shaped leaves.* Ornithogalum luteo-virens. Indicum. Corn. Canad.
2. Albuca (*Minor*) foliis subulatis. Lin. Sp. 438. *Star-flower with awl-shaped leaves.* Ornithogalum Africanum, flore viridi altero alteri innato. Herm. Parad. 209. *African Star-flower with a greenish yellow flower.*

These plants have been generally ranged under the genus of Ornithogalum, but as their flowers differ in their form from the other species of that genus, Dr. Linnæus has constituted this genus for them.

The first sort grows naturally in Canada, and in some other parts of North America; the root is bulbous, from which shoot up eight or ten long narrow spear-shaped leaves. In the center of these arise a flower-stem a foot or more in height, garnished with a loose spike (or thyrse) of greenish yellow flowers, each have a long pedunculus, which turns downward, having pretty large stipulæ at their base, which are erect, and end in sharp points. After the flower is past, the germen swells to a three-cornered capsule, having three cells filled with flat seeds.

The second sort grows naturally at the Cape of Good Hope; this hath also a pretty large bulbous root, from which arise four or five narrow awl-shaped leaves, of a deep green colour: the flower-stem which comes from the center of the root, is naked, and rarely rises more than eight or nine inches high, having five or six greenish yellow flowers growing almost in form of an umbel at the top: these are rarely succeeded by seeds in England.

The Canada Albuca is hardy, so the roots may be planted about four inches deep in a border of light earth, where they will thrive, and produce their flowers late in the summer; but as the seeds rarely ripen in England, and the bulbs do not put out many offsets, the plants are not common in this country.

The African sort I raised from seeds a few years past; this generally flowers twice a year, the first time in March or April, and again in July or August, but has not produced any seeds. If the roots of this sort are kept in pots, filled with light earth, and are sheltered under a hot-bed frame in winter, they will thrive and produce flowers; but the best method is to have a border in the front of a green-house, or stove, where the roots of most of the bulbous flowers may be planted in the full ground, and screened in winter from frost; in such situations they thrive much better, and flower stronger, than when kept in pots.

ALCEA. Lin. Gen. 750. The Hollyhock.

The Characters are,

*The flower hath a double empalement, of which one is permanent. The outer one is spread open, and cut at the top into six segments; the inner is larger, and slightly cut into five. The flower is composed of five petals, which coalesce at their base, and spread open at the top in form of a rose. In the center is placed the round germen, supporting a short cylindrical style, crowned with numerous stigma, which is attended by many stamina joined below to the pentagonal column, and spread open at top; these are crowned with kidney-shaped summits: after the flower is past, the germen becomes a round, depressed, articulated capsule, having many cells, in each of which is lodged one compressed kidney-shaped seed.*

This genus is ranged by Dr. Linnæus in his sixteenth class of plants, entitled Monadelphia Polyandria: in this class the stamina and style coalesce and form a sort of column in the center of the flower, from whence Dr. Van Royen has given to this class the title of Columnifera, and in this division there are a great number of stamina.

The Species are,

1. Alcea (*Rosea*) foliis sinuatis angulosis. Hort. Cliff. 348. *Hollyhock with angular sinuated leaves.* Malva rosea folio subrotundo. C. B. P. 315.
2. Alcea (*Ficifolia*) foliis palmatis. Hort. Cliff. 348. *Hollyhock with handed leaves.* Malva rosea folio ficus. C. B. P. 315.

These are distinct species, whose difference in the form of their leaves always continues. The leaves of the first sort are roundish, and cut at their extremity into angles; whereas those of the second are deeply cut into six or seven segments, so as to resemble a hand.

The various colours of their flowers being accidental, as also the double flowers being only varieties which have risen from culture, are not by botanists deemed distinct species. I have not enumerated them here, therefore shall only mention the various colours which are commonly observed in their flowers; which are white, pale, red, deep red, blackish red, purple, yellow, and flesh colour. Besides these, I many years ago saw some plants with variegated flowers, in the garden of the late Lord Burlington, in London, raised from seeds which came from China.

Although these varieties of double Hollyhocks are not constant, yet where the seeds are carefully saved from the most double flowers, the greatest number of the plants will arise nearly the same, as the plants from which they were taken, both as to their colour and the fulness of their flowers, provided no plants with single or bad coloured flowers are permitted to grow near them. Therefore so soon as any such appear, they should be removed from the good ones, that their farina may not spread into the other flowers, which would cause them to degenerate.

The first species grows naturally in China, from whence I have often received the seeds. The second sort I have received from Istria, where it was gathered in the fields, but these seeds produced single red flowers only; whereas from some seeds of this sort, which were given me by the late Charles Du Bois, Esq; of Mitcham, in 1726, which he procured from Madras, I raised many double flowers of several colours.

These plants, although natives of warm countries, yet are hardy enough to thrive in the open air in England, and have for many years been some of the greatest ornaments in the garden, toward the latter part of summer; but since they have become very common, have not been so much regarded as they deserve, partly from their growing too large for small gardens, and their requiring tall stakes to secure them from being broken by strong winds. But in large gardens,

gardens, where they are properly diſpoſed, they make a fine appearance; for as their ſpikes of flowers grow very tall, there will be a ſucceſſion of them on the ſame ſtems, more than two months; the flowers on the lower part of the ſpike appearing in July, and as their ſtalks advance, new flowers are produced till near the end of September. When the plants are planted in good ground, their ſtalks often riſe to the height of eight or nine feet, ſo that near ſix feet of each will be garniſhed with flowers; which when double, and of good colours, will make a fine appearance, eſpecially if the various colours are properly intermixed.

They are propagated by ſeeds, which, as hath been already obſerved, ſhould be carefully ſaved from thoſe plants whoſe flowers are the moſt double, and of the beſt colours. If theſe are preſerved in their capſules until ſpring, the ſeeds will be better, provided they are gathered very dry, and care be taken that no damp comes to them in winter, which will cauſe their covers to be mouldy, and thereby ſpoil the ſeeds.

The ſeeds ſhould be ſown on a bed of light earth, about the middle of April, which muſt be covered about half an inch deep, with the ſame light earth; ſome perſons ſow them in ſhallow drills, and others ſcatter the ſeeds thinly over the whole bed. When they are ſown in the former method, the plants generally come up thick, ſo will require to be tranſplanted ſooner than thoſe which are ſown in the latter. By the firſt, the ſeeds may be more equally covered, and kept clean with leſs trouble, becauſe the ground between the drills may be hoed. When the plants have put out ſix or eight leaves, they ſhould be tranſplanted into nurſery-beds, at a foot diſtance from each other, obſerving to water them until they have taken good root; after which they will require no farther care, but to keep them clean from weeds till October, when they ſhould be tranſplanted where they are to remain.

Some perſons let their plants remain a year longer in the nurſery-beds to ſee their flowers, before they remove them to the flower-garden; but when this is intended, the plants ſhould be planted at a greater diſtance in the nurſery-beds, otherwiſe they will not have room to grow. However, I have always choſen to remove my plants the firſt autumn, for young plants more ſurely grow, than thoſe which are older; and if the ſeeds are carefully ſaved, there will not be one in ten of the plants come ſingle or of bad colours.

ALCHEMILLA, Ladies Mantle.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, which is ſpread open at the brim, and cut into eight ſegments. There are no petals to the flower, but the center of the empalement is occupied by the oval germen, into which is inſerted a long ſtyle, crowned with a globular ſtigma: this is attended by four erect ſtamina reſting on the brim of the empalement, and crowned with roundiſh ſummits; the germen afterwards turns to a ſingle compreſſed ſeed.*

Dr. Linnæus ranges this genus in the firſt ſection of his fourth claſs of plants, entitled Tetrandria monogynia, the flowers having four ſtamina and one ſtyle.

The SPECIES are,

1. ALCHEMILLA (*Vulgaris*) foliis lobatis ſerratis, ſegmentis involucro acuto. *The common Ladies Mantle.* C. B. P. 319.
2. ALCHEMILLA foliis lobatis ſericeis acutè ſerratis, ſegmentis involucro ſubrotundis. *Small ſilvery Ladies Mantle with lobated leaves ſharply ſerrated, and the ſegments of the involucrum cut into roundiſh ſegments.* Alchemilla Alpina pubeſcens minor. Tourn. Inſt. R. H. 508.
3. ALCHEMILLA (*Alpina*) foliis digitatis ſerratis. Flor. Lapp. 61. *Silvery Alpine Ladies Mantle with handed leaves.* Alchemilla perennis incana argentea ſive ſericea ſatinum provocans. Mor. Hiſt. 2. p. 195.
4. ALCHEMILLA (*Pentaphylla*) foliis quinatis multifidis glabris. Lin. Sp. Plant. 123. *Smooth five-leaved Ladies Mantle, cut into many ſegments.* Alchemilla Alpina pentaphyllea minima lobis fimbriatis. Bocc. Muſc. 1. p. 18.

The firſt ſort grows naturally in moiſt meadows in ſeveral parts of England, but is not very common near London: the roots are compoſed of many thick fibres, which ſpread greatly when they are in a proper ſoil; the leaves riſe immediately from the root, ſuſtained by long foot-ſtalks; they are roundiſh, and ſcalloped round the borders into ſeven or eight lobes, ſhaped ſomewhat like the Ladies ſcalloped Mantles, from whence it had its name. The flower-ſtems ariſe between the leaves about a foot high, which divide into many branches, and are at each joint garniſhed with one ſmall leaf, ſhaped like thoſe below; the flowers are compoſed of an herbaceous empalement, in the center of which is the ſtyle attended by four ſtamina, crowned with yellow ſummits; ſo that the only beauty of this plant is in the leaves, which are uſed in medicine, and are eſteemed to be vulnerary, drying and binding, and of great force to ſtop inward bleeding.

The ſecond ſort is much ſmaller than the firſt, the leaves are much whiter and appear ſilky; the flower-ſtems do not branch out ſo much, nor are the flowers produced in ſo large cluſters: their empalement is broader, and the ſegments more obtuſe than thoſe of the firſt ſort.

The third ſort grows naturally on the mountains in Yorkſhire, Weſtmoreland, and Cumberland, generally upon moiſt boggy places. It is alſo a native of Sweden and Denmark, the Alps, and other cold parts of Europe, and is admitted into gardens for the ſake of variety. The leaves of this ſort are very white, and deeply cut into five parts like a hand; the flower-ſtems ſeldom riſe more than ſix inches high, nor do the flowers make a better appearance than the other ſorts.

The fourth ſort grows naturally in Sweden, Lapland, and other cold countries, ſo is only to be found in ſome few curious botanic gardens in this country. Theſe are all abiding plants, which have perennial roots and annual ſtalks, which periſh in autumn. They may be propagated by parting their roots; the beſt time for doing this is in the autumn, that their roots may be eſtabliſhed before the drying winds of the ſpring come on. They ſhould have a moiſt ſoil and a ſhady ſituation, otherwiſe they will not thrive in the ſouthern parts of England. When they are propagated by ſeeds, they ſhould be ſown in the autumn; for when they are ſown in the ſpring, they ſeldom grow the firſt year. They ſhould be ſown on a ſhady moiſt border, and when the plants come up, they will require no other care but to be kept clean from weeds.

ALDER-TREE. See ALNUS.

ALETRIS.

The CHARACTERS are,

*The flower has no empalement, but hath one oblong oval petal, cut into ſix ſegments at the brim, and are permanent; it hath ſix awl-ſhaped ſtamina the length of the corolla, whoſe baſe are inſerted in the ſegments; theſe are crowned by oblong erect ſummits, and an oval germen ſupporting an awl-ſhaped ſtyle the length of the ſtamina, crowned by a trifid ſtigma. The germen afterward becomes an oval three-cornered capſule with three cells, filled with angular ſeeds.*

This genus of plants is ranged in Linnæus's firſt ſection of his ſixth claſs, the flowers having ſix ſtamina and one ſtyle.

The SPECIES are,

1. ALETRIS (*Farinoſa*) acaulis, foliis lanceolatis membranaceis, floribus alternis. Lin. Sp. 456. *Aletris without ſtalks, ſpear-ſhaped membranaceous leaves, and flowers placed alternate.* Hyacinthus caule nodo, foliis linguiformibus acuminatis dentatis. Flor. Virg. 38.
2. ALETRIS (*Capenſis*) acaulis, foliis lanceolatis undulatis, ſpica ovata, floribus nutantibus. Lin. Sp. 456. *Aletris without ſtalks, waved ſpear-ſhaped leaves, and an oval ſpike of alternate flowers.*

3. Aletris (*Hyacinthoides*) acaulis, foliis lanceolatis carnosis, floribus geminatis. Lin. Sp. 456. *Aletris without stalks, fleshy spear-shaped leaves, and flowers set by pairs.*

4. Aletris (*Zeylanica*) acaulis, foliis lanceolatis planis erectis radicalibus. *Aletris without stalks, and plain, spear-shaped, erect leaves rising from the root.*

5. Aletris (*Fragrans*) caulescens, foliis lanceolatis amplexicaulibus. *Stalky Aletris, with spear-shaped leaves embracing it.* Aloe Africana arborescens, floribus albis fragrantissimis. Hort. Amst. 2. tab. 4.

The first sort grows naturally in North America; it hath a tuberose root, from which arise several spear-shaped leaves, and a naked stalk supporting a spike of flowers placed alternate, of a greenish white colour; these appear in June, but are rarely succeeded by seeds in England.

This plant is tolerably hardy, so may be preserved thro' the winter, if sheltered under a hot-bed frame; but as the seeds do not ripen here, and the roots increase but slowly, the plants are at present rare in England.

The second sort grows naturally at the Cape of Good Hope. This is a low plant, seldom rising more than a foot high; the leaves are spear-shaped and undulated; the foot-stalks of the flower arise from the root, which sustain several white nodding flowers, in shape somewhat like those of the Hyacinth.

The roots of this sort must be planted in pots filled with light earth, that they may be sheltered in a dry airy glass-case in winter, being too tender to thrive in the open air in England; therefore the pots should be removed into shelter in October, and during the winter season, they should be sparingly watered. In May they should be placed abroad in a sheltered situation, and in warm weather must be frequently refreshed with water; with this management the plants will flower; but as they do not perfect their seeds here, nor do they increase fast by roots, the plants are scarce in England.

The third sort has been long preserved in the English gardens, and has been known by the title of Guinea Aloe; this hath thick fleshy roots like those of the Flag Iris, which creep far where they have room. The leaves arise singly from the root, and are near one foot and a half long, stiff, waved, and have no foot-stalks, arising immediately from the root, as do also the foot-stalks of the flowers, which when the roots are strong, are often a foot and a half high, garnished great part of their height with clear white flowers, shaped like those of the Hyacinth, whose brims are cut into six segments, which are reflexed; these seldom continue in beauty more than two or three days, and are never succeeded by seeds here.

The fourth sort is also pretty common, in gardens where there are conveniencies for preserving exotic plants. This hath fleshy creeping roots, which multiply greatly. The whole plant seldom rises more than six inches high: the leaves are plain and upright, arising without foot-stalks; but as I have never seen any flowers produced on the plants, I can give no description of them, but have followed Dr. Linnæus in ranging it, though I have great reason to believe he has not seen the flower; for he supposes this to be a variety of the third sort, which no person who is acquainted with the two plants can ever admit. This has been always known by the title of Ceylon Aloe.

The fifth sort rises with an herbaceous stalk to the height of eight or ten feet high, having many joints, and is adorned toward the top with a head of spear-shaped thin leaves, which are of a deep green colour and reflexed at their ends, embracing the stalks with their base. The foot-stalks of the flower arise from the center of the heads, which are generally two feet high, branching out on each side, and fully garnished with white flowers, in shape somewhat like those of the third sort; but these open only in the evening, when they emit a most fragrant odour, but close again in the morning, and are not of long duration; but these are sometimes succeeded by seeds, which, although fair to appearance, yet I could never raise any plants from them; but they are easily propagated from the side heads, which they put out after flowering.

The last three sorts are too tender to live through the winter in England, unless they are placed in a warm stove; nor will the third and fifth sorts produce their flowers, if the plants are not plunged into a tan-bed; for although the plants may be preserved in a dry stove, yet those make but little progress there; whereas when they are in a tan-bed, they will advance as much in one year as the other will in three or four; the leaves will also be much larger, and the whole plant much stronger. The third sort will sometimes flower in a dry stove, but the flower-stems will be weak, and do not produce half so many flowers as when in tan; but the fifth has not yet flowered here when kept in the dry stove.

The third and fourth sorts propagate very fast by their creeping roots, which send up many heads; these may be cut off in June, and laid in the stove for a fortnight, that the part wounded may be healed over; then they should be planted in small pots, filled with light sandy earth, and plunged into a moderate hot-bed of tanners bark, giving them but little water till they have put out good roots; then they must be treated like other tender succulent plants, never setting them abroad in summer.

The heads of the fifth sort when taken from the stems should be laid in the stove a week, for their wounds to heal, then should be planted in pots and treated as the other.

ALESANDER, or ALEXANDER. See Smyrnium.

ALKEKENGI. See Physalis.

ALLELUJAH. See Oxalis.

ALLIARIA. See Hesperis.

ALLIUM [of Ἀλέω, *Gr.* to avoid or shun, because many shun the smell of it], Garlick.

The Characters are,

*The flowers are included in one common spatha, which becomes dry; the flower is composed of six oblong, erect, concave petals, and six awl-shaped stamina, which extend the length of the petals, and are crowned with oblong summits. In the center is situated a short three-cornered germen, supporting a single style, crowned by an acute stigma. The germen afterward becomes an obtuse three-cornered capsule, opening into three parts, having three cells, filled with roundish seeds.*

The Species are,

1. Allium (*Sativum*) caule planifolio bulbifero, bulbo composito, staminibus tricuspidatis. Hort. Upsal. 76. *Common manured Garlick.* Allium sativum. C. B. P.

2. Allium (*Scorodoprasum*) caule planifolio bulbifero, foliis crenulatis vaginis ancipitibus staminibus tricuspidatis. Hort. Upsal. 77. *The Rocambole.* Allium sativum alterum sive allioprasum caulis summo circumlocuto. C. B. P. 73.

3. Allium (*Ursinum*) scapo nudo semicylindrico foliis lanceolatis petiolatis umbellâ fastigiatâ. Lin. Sp. Plant. 300. *Broad-leaved wild Garlick, or Ramsons.* Allium sylvestre latifolium. C. B. P.

4. Allium (*Lineare*) caule planifolio umbellifero umbellâ globosâ staminibus tricuspidatis corolla duplo longioribus. Lin. Sp. Plant. 294. *Great round-headed Garlick of the Holm Islands.* Allium Holmense sphærico capite. Raii Syn. 370.

5. Allium (*Moly*) scapo nudo subcylindrico foliis lanceolatis sessilibus umbellâ fastigiatâ. Hort. Upsal. 76. *The yellow Moly.* Allium latifolium luteum. Tourn. Inst. 384.

6. Allium (*Magicum*) caule planifolio umbellifero ramulo bulbifero staminibus simplicibus. Lin. Sp. Plant. 296. *Great broad-leaved Moly with Lily flowers.* Allium latifolium liliflorum. Tourn. Inst. 384.

7. Allium (*Obliquum*) caule planifolio umbellifero staminibus filiformibus flore triplo longioribus foliis obliquis. Lin. Sp. Plant. 296. *Umbelliferous Garlick with plain leaves, slender stamina, which are three times the*

*length of the flower, and oblique leaves.* Allium radice tunicatâ foliis planis linearibus caulinis capitulo umbellato. Flor. Siber. 1. p. 49.

8. Allium (*Ramosum*) caule subplanifolio umbellifero staminibus subulatis longioribus umbellâ globosâ foliis linearibus subconvexis. Lin. Sp. Pl. 296. *Umbelliferous Garlick with half plain leaves, long awl-shaped stamina, globular umbels, and narrow convex leaves.*

9. Allium (*Roseum*) scapo nudo umbellifero, pedicellis brevibus, petalis ovalibus, staminibus brevissimis, foliis linearibus. Lin. Sp. 432. *Garlick with a naked umbelliferous stalk, short foot-stalks, oval petals to the flower, very short stamina, and linear leaves.* Allium sylvestre sive moly minus, roseo amplo flore. Magnol. 11.

10. Allium (*Arenarium*) caule planifolio bulbifero vaginis teretibus spathâ muticâ staminibus tricuspidatis. H. Scan. 227. *Bulb-bearing Garlick, with plain leaves, a taper vagina, and three pointed stamina.*

11. Allium (*Carinatum*) caule planifolio bulbifero staminibus subulatis. Lin. Sp. Plant. 297. *Bulb-bearing garlick with plain leaves, and awl-shaped stamina.* Allium montanum bicorne angustifolium flore dilutè purpurascente. C. B. P. 74.

12. Allium (*Sphærocephalon*) caule terteifolio umbellifero, foliis semiteretibus, staminibus tricuspidatis corolla longioribus. Lin. Sp. 426. *Umbelliferous Garlick, with taper leaves which are longer than the petals.* Allium sive moly montanum purpureo flore. Clus. Hist. 1. p. 195.

13. Allium (*Flavum*) caule teretifolio umbellifero, floribus pendulis, petalis ovatis, flaminibus corolla longioribus. Lin. Sp. 428. *Umbelliferous Garlick, with taper leaves and pendulous flowers, having oval petals, and stamina longer than the corolla.* Allium montanum bicorne flore pallido odore. C. B. P. 75.

14. Allium (*Senescens*) scapo nudo ancipiti foliis linearibus subtus convexis lævibus umbellâ subrotundâ staminibus subulatis. Hort. Upsal. 79. *Greater Mountain Garlick with leaves like Narcissus.* Allium montanum foliis Narcissi majus. C. B. P. 75.

15. Allium (*Angulosum*) scapo nudo ancipiti foliis linearibus canaliculatis subtus subangulatis umbellâ fastigiatâ. Hort. Upsal. 79. *Garlick with a naked stalk, narrow hollow leaves, which are angular on their lower side, and a compact umbel.* Allium montanum foliis Narcissi minus. C. B. P. 75.

16. Allium (*Subhirsutum*) caule planifolio umbellifero foliis inferioribus hirsutis staminibus subulatis. Lin. Sp. Plant. 295. *Umbelliferous Garlick with hairy under leaves, and awl-shaped stamina, commonly called Dioscoridis Moly.* Moly angustifolium umbellatum. C. B. P. 75.

17. Allium (*Victorialis*) umbella rotundata, staminibus lanceolatis corolla longioribus, foliis ellipticis. Lin. Mat. Med. 163. *Umbelliferous Garlick with round umbels, spear-shaped stamina longer than the corolla, and elliptical leaves.* Allium montanum latifolium maculatum. C. B. P. 74.

18. Allium (*Descendens*) caule subteretifolio umbellifero, pedunculis exterioribus brevioribus, staminibus tricuspidatis. Lin. Sp. 427. *Umbelliferous Garlick with a half taper leaf, and three pointed stamina.* Allium moly latifolium, capite sphærico, flore purpureo. Rudb.

19. Allium (*Canadense*) scapo nudo tereti, foliis linearibus capitulo bulbifero. Kalm. It. *Canada Garlick with a naked taper stalk, linear leaves, and heads bearing bulbs.* Allium bulbiferum Virginianum. Boerh. Ind. Alt. 2. 146.

20. Allium (*Triquetrum*) scapo nudo foliis triquetris, staminibus simplicibus. Lin. Sp. 431. *Garlick with a naked stalk, triangular leaves, and simple stamina.* Moly parvum caule triangulo. C. B. P. 75.

We shall not bring under this genus the Cepa and Porrum, as is done by Dr. Linnæus, lest by too closely adopting his system, we may render this work less intelligible to the practical gardener, and such other persons who may delight themselves in the culture of a kitchen-garden; but not having studied the science of botany, may not so readily turn to those articles, therefore we shall insert their culture under their former titles.

The two first species are easily propagated by planting the cloves, or small bulbs, in the spring, in beds about four or five inches distance from each other, keeping them clean from weeds. About the beginning of June, the leaves of the first sort should be tied in knots, to prevent their spindling, or running to seed, which will greatly enlarge the bulb. In the middle of July, the leaves will begin to wither and decay, at which time they should be taken out of the ground, and hanged up in a dry room, to prevent their rotting, and may be thus preserved for winter use.

The roots of the second sort may remain in the ground till the leaves are decayed, when their bulbs may be taken up and dried, to be preserved for use during the winter season; but some of the roots may be at the same time planted again for the succeeding year; for this sort requires to be planted in autumn, especially on dry ground, otherwise their bulbs will not be large.

The third sort was formerly in greater esteem than at present, it being rarely cultivated in gardens, but is found wild in moist shady places in many parts of England; and may be cultivated by planting the roots in a moist shady border, at almost any time of the year; but the best season is in July, just as the green leaves are decaying.

The fourth sort grows naturally in the Holm Islands, from whence it has been transplanted into several gardens, where it is preserved more for the sake of variety than use.

The eleventh and thirteenth sorts grow wild in the northern parts of England, but are by the curious in botany preserved in their gardens. These are very hardy, and may be removed in July or August, when their leaves begin to decay, and will thrive in almost any soil or situation.

The fifth sort was formerly preserved in gardens for the sake of its yellow flowers, but having a very strong Garlick scent, most people have rooted it out of their gardens.

The sixth sort is also preserved by many persons in their gardens for the sake of variety, but as this hath a very strong scent, so it is not often admitted to the flower-garden.

The ninth and twelfth sorts are sometimes permitted to have a place in gardens for the sake of variety.

The seventh, eighth, and tenth sorts grow naturally in Tartary and Siberia, from whence their seeds were sent to Petersburgh, and from thence some of the botanic gardens have been supplied with seeds; these are only preserved for the sake of variety.

The fourteenth, fifteenth, and sixteenth sorts, have been planted in gardens for the variety of their flowers, but of late years most people have turned them out, to make room for better sorts. But the sixteenth multiplies so fast by offsets, as to render it difficult to extirpate them, when they have remained any time in a garden.

This produces large umbels of white flowers, growing on stalks about ten inches high; the time of flowering is in April and May.

The nineteenth sort was brought from Virginia, and is preserved in botanic gardens for variety's sake, but has no great beauty; it is very hardy, and will thrive in the open air very well; and is propagated by its bulbs, which are produced in plenty on the top of the stalks.

They are all of them very hardy, and will thrive in almost any soil or situation, and are easily propagated either by their roots, or from seeds: if from the roots, the best time is in autumn, that they may take good root in the ground before the spring, which is necessary, in order to have them flower strong the following summer. If they are propagated by seeds, they may be sown on a border of common earth, either in autumn, soon after the seeds are ripe, or in the spring following, and will require no farther care, but to

keep them clear from weeds; in the following autumn, the plants may be transplanted into the borders where they are to remain for good.

The greatest part of these plants produce their flowers in May, June, and July.

The yellow Moly will grow about a foot high; and having some beauty in the flowers, is worthy of a place in such borders of the flower-garden, where few better things will thrive. These increase plentifully both by roots and seeds.

The sixth and seventeenth sorts grow upwards of two feet high, and when they are in flower, make a pretty appearance; and as they are not troublesome to keep, may be allowed a place in the borders of the flower-garden.

All the other sorts are equally hardy, and will grow in any soil or situation; but as they have little beauty, they are rarely preserved, except in botanic gardens for the sake of variety.

ALMOND-TREE. See Amygdalus.

ALMOND-DWARF. See Persica.

ALNUS. See Betula.

ALNUS NIGRA BACCIFERA. See Frangula.

ALOE [*Gr.* Ἀλόη].

The Characters are,

*The flower is naked, having no empalement; it is of one leaf, having a long smooth tube, which is divided at the top into six parts, spreading open; it hath six awl-shaped stamina, which are inserted at their base to the germen, and are extended the length of the tube; these are crowned with oblong summits; in the center is situated the oval germen, supporting a single style, which is of the same length with the stamina, crowned with a trifid stigma. The germen afterward becomes an oblong capsule, having three furrows, which is divided into three cells opening in three parts, and filled with angular seeds.*

This genus of plants is by Dr. Linnæus ranged in the first section of his sixth class, titled Hexandria monogynia, from the flowers having six stamina and one style.

The Species are,

1. Aloe (*Mitriformis*) floribus pedunculatis cernuis corymbosis sub-cylindricis. Lin. Sp. Plant. 319. i. e. *Aloe with dependent flowers, having foot-stalks which are ranged in a cylindrical corymbus.* Aloe Africana mitriformis spinosa. Hort. Elth. 1. p. 21. Mitre-shaped Aloe.

2. Aloe (*Barbadensis*) foliis dentatis erectis succulentibus subulatis, floribus luteis in thyrso dependentibus. *Aloe with erect, succulent, awl-shaped leaves, and yellow flowers growing in a loose spike, hanging downward.* Aloe vulgaris. C. B. P. 386.

3. Aloe (*Arborescens*) foliis amplexicaulibus reflexis, margine dentatis, floribus cylindricis caule fruticosa. *Aloe with leaves embracing the stalks, which are reflexed and indented on their edges, flowers growing cylindrical, and a shrubby stalk.* Aloe Africana caulescens foliis glaucis caulem amplectantibus. H. Amst. Commonly called Sword Aloe.

4. Aloe (*Africana*) foliis latioribus amplexicaulibus, margine & dorso spinosis, floribus spicatis, caule fruticoso. *Aloe with broader leaves embracing the stalks, whose edges and back are set with spines, flowers growing in spikes, and a shrubby stalk.* Aloe Africana caulescens foliis minùs glaucis dorsi parte supremâ spinosa. Com. Præl. 68.

5. Aloe (*Disticha*) foliis latissimis amplexicaulibus maculatis, margine spinosis floribus umbellatis. *Aloe with very broad spotted leaves embracing the stalk, whose edges are set with spines and flowers, growing in an umbel.* Aloe Africana caulescens foliis spinosis maculis ab utrâque parte albicantibus notatis. Hort. Amstel. 2. p. 9. by some called the Sope Aloe, and by others Carolina Aloe.

6. Aloe (*Obscura*) foliis latioribus amplexicaulibus maculatis margine spinosis floribus spicatis. *Aloe with broad spotted leaves embracing the stalks, whose edges have spines, and flowers growing in a spike.* Aloe Africana caulescens foliis spinosis maculis ab utrâque parte albicantibus obscurioribus magis glaucis quàm præcedens. Boerh. Ind.

7. Aloe (*Plicatilis*) foliis ensiformibus inermis ancipitibus floribus laxè spicatis caule fruticoso. *Aloe with sword-shaped smooth leaves, standing two ways, the flowers growing in loose spikes, and a shrubby stalk.* Aloe Africana arborescens montana non spinosa folio longissimo plicatili flore rubro. Com. Hort. Amst. 2. p. 5.

8. Aloe (*Brevioribus*) foliis amplexicaulibus utrâque spinosis, floribus spicatis. *Aloe with leaves embracing the stalks, which are prickly on every side, and flowers growing in spikes.* Aloe Africana caulescens foliis glaucis brevissimis foliorum parte internâ & externâ nonnihil spinosa. Com. Præl. 71.

9. Aloe (*Variegata*) floribus pedunculatis cernuis racemosis prismaticis ore patulo æquali. Lin. Sp. Plant. 321. *Aloe with hanging flowers, having foot-stalks, and spreading equally at the brim.* Aloe Africana humilis foliis ex albo & viridi variegatis. Com. Præl. 79. *commonly called Partridge-breast Aloe.*

10. Aloe foliis erectis subulatis radicatis undique inerme spinosis. Hort. Cliff. 131. *Aloe with erect awl-shaped leaves, set with soft spines on every part.* Aloe Africana humilis spinis inermibus & verrucosis obsita. Com. Præl. 77. *commonly called Hedge-hog Aloe.*

11. Aloe (*Viscosa*) floribus sessilibus infundibuli formibus bilabiatis laciniis quinque revolutis summa erecta. Lin. Sp. Plant. 322. *Aloe with funnel-shaped flowers, without foot-stalks, opening in two lips, and cut into five segments, which turn backward, and are erect at the top.* Aloe Africana erecta triangularis & triangulari folio viscoso. Com. Præl. 82.

12. Aloe (*Spiralis*) floribus sessilibus ovatis crenatis segmentis interioribus conniventibus. Lin. Sp. Plant. 322. *Aloe with oval crenated flowers, without foot-stalks, and the interior segments closing together.* Aloe Africana erecta rotunda folio parvo & in acumen acutissimum exeunte. Com. Præl. 83.

13. Aloe (*Linguiforme*) sessilis foliis lingui formibus maculatis floribus pedunculatis cernuis. *Aloe with dwarf, tongue-shaped, spotted leaves, and hanging flowers, which have foot-stalks.* Aloe Africana flore rubro folio maculis albicantibus ab utrâque parte notato. H. Amst. 2. p. 15. *commonly called Tongue Aloe.*

14. Aloe (*Margaritifera*) floribus sessilibus bilabiatis labio superiore erecto inferiore patente. Lin. Sp. Plant. 322. *Aloe with sessile flowers, gaping with two lips, the upper being erect, and the under spreading.* Aloe Africana folio in summitate triangulari margaritiferâ flore subviridi. Com. Hort. Amst. 2. p. 19. *commonly called large Pearl Aloe.*

15. Aloe (*Vera*) foliis longissimis & angustissimis marginibus spinosis, floribus spicatis. *Aloe with very long narrow leaves, having spines on their hedges, and flowers growing in spikes.* Aloe Indiæ Orientalis, serrata succotrina vera flore Phœnicio. Hort. Beaumont. *The Succotrine Aloe.*

16. Aloe (*Glauca*) caule brevi, foliis amplexicaulibus bifariam versis spinis marginibus erectis floribus capitatis. *Aloe with a short stalk, leaves standing two ways, which embrace the stalk; the spines on the edges erect, and flowers growing in a head.* Aloe Africana caulescens foliis glaucis brevioribus foliorum parte internâ & externâ nonnihil spinosa. Com. Præl. 71.

17. Aloe (*Arachnoidea*) sessilis foliis brevioribus planis carnosis apice triquetris marginibus inerme spinosis. *Low Aloe with short, plain, fleshy leaves, triangular at their ends, and borders set with soft spines.* Aloe Africana humilis arachnoidea. Com. Præl. 72. *commonly called Cobweb Aloe.*

18. Aloe (*Herbacea*) foliis ovato-lanceolatis carnosis apice triquetris angulis inerme dentatis. Hort. Cliff. 131. *Aloe with oval, spear-shaped, fleshly leaves, having three angles at their extremities, which are indented and set with soft spines.* Aloe Africana minima atro-viridis spinis herbaceis numerosis ornata. Boerh. Ind. Alt. 2. p. 131.

19. Aloe (*Retusa*) floribus sessilibus triquetris bilabiatis labio inferiore revoluto. Lin. Sp. Plant. 322. *Aloe with flowers divided into three parts, the under lip being turned*

*turned back.* Aloe Africana breviſſimo craſſiſſimoque folio flore ſubviridi. Hort. Amſt. 2. p. 11. commonly called Cuſhion Aloe.

20. Aloe (*Verrucoſa*) ſeſſilis foliis carinatis utrâque verrucoſis bifariam verſis. *Low Aloe with keel-ſhaped leaves, warted on every part, and ſtanding two ways.* Aloe Africana foliis longis conjugatis ſupra cavis margaritiferis flore rubro elegantiſſimo. Boerh. Ind. Alt. p. 2, 131. commonly called Pearl-tongue Aloe.

21. Aloe (*Carinata*) ſeſſilis foliis carinatis verrucoſis apice triquetris carnoſis. *Low Aloe with fleſhy, keel-ſhaped, ſpotted leaves, which are triangular at their extremities.* This is the Aloe Africana flore rubro folio triangulari verrucis & ab utrâque parte albicantibus notato. Hort. Amſt. 2. p. 17.

22. Aloe (*Ferox*) foliis amplexicaulibus nigricantibus undique ſpinoſis. *Aloe with dark green leaves embracing the ſtalks, which are beſet with ſpines on every ſide.* Aloe vera coſta ſpinoſa. Munt. Phyt. commonly called Aloe ferox.

23. Aloe (*Uvaria*) floribus ſeſſilibus reflexis imbricatis priſmaticis. Lin. Sp. Plant. 323. *Aloe with reflexed flowers growing cloſe to the ſtalk, in form of a priſm, lying over each other like tiles on a houſe.* Aloe Africana folio triangulari longiſſimo & anguſtiſſimo floribus luteis fœtidis. Hort. Amſt. 2. p. 29. commonly called Iris Uvaria.

The firſt ſort of Aloe grows with an upright ſtalk, to the height of five or ſix feet, the leaves cloſely embrace the ſtalks; they are thick, ſucculent, broad at their baſe, growing narrower, and ending in a point, of a dark green colour, and have ſpines on the edges, as alſo a few on their upper ſurface; the leaves ſtand erect, and draw together towards the top, where they form the reſemblance of a mitre, from whence it is called the Mitre Aloe. The flower-ſtem riſes about three feet high, on the top of which the flowers come out in a ſort of globular ſpike, but afterwards is formed into a cylindrical ſpike: theſe have long footſtalks, which come out horizontally, and the flowers hang downward; they are tubulous, and cut into ſix unequal ſegments to the bottom, three being alternately broader than the others. There are ſix ſtamina, three of which are as long as the tube of the flower, the other three are ſhorter. Theſe are crowned with flat oblong ſummits of a gold colour. The three-cornered germen is ſituated in the bottom of the flower, ſupporting a ſingle ſtyle, which is ſhorter than the ſtamina, having no ſtigma on the top. The tube of the flower is of a fine red colour, and the brim is of a pale green, ſo that it makes a pretty appearance when the ſpikes of flowers are large.

This ſort will live in a warm dry green-houſe in winter, and may be placed in the open air in ſummer, in a ſheltered ſituation; but the plants ſhould not have much wet, leſt it ſhould rot their ſtems. With this management the plants will not grow ſo faſt, as when they are placed in a ſtove, but they will be ſtronger, and their ſtems will ſupport their heads much better.

The ſecond ſort is very common in the iſlands of America, where the plants are propagated upon the pooreſt land, to obtain the Hepatic Aloes, which are brought to England, and uſed chiefly for horſes, being too coarſe for medicine.

The leaves of this ſort are about four inches broad at their baſe, where they are near two inches thick, and diminiſh gradually to a point, having a few indentures on their edges; the leaves are of a ſea-green colour, and when young are ſpotted with white. The flower-ſtem riſes near three feet high, and the flowers ſtand in a ſlender looſe ſpike, with very ſhort footſtalks, hanging downwards. They are tubulous, and cut into ſix parts, of a bright yellow colour, and the ſtamina ſtand out beyond the tube. This never produces ſeed in England, and is too tender to live through the winter in our climate, in a common green-houſe, therefore it ſhould be placed in a moderate degree of warmth in that ſeaſon. I have known plants of this kind, which have had an oiled cloth tied about their roots, and hung up in a warm room more than two years, and afterwards planted in pots, which have grown very well, from whence the plant has been called Sempervivum by the inhabitants of America.

The third ſort will grow to the height of ten or twelve feet, with a ſtrong naked ſtem, the leaves growing at the top, which cloſely embrace the ſtalk; they are about two inches broad at their baſe, growing narrower to a point, and are reflexed, and indented on their edges, each being armed with a ſtrong crooked ſpine. The leaves are of a ſea-green colour, and very ſucculent. The flowers grow in a pyramidal ſpike, are tubulous, and of a bright red colour. Theſe are in beauty in November and December.

This ſort will live through the winter in a good green-houſe, but they will not flower unleſs they have a moderate ſhare of warmth, therefore the pots ſhould be removed into a ſtove in October, which ſhould not be kept above temperate heat, in which ſituation they ſeldom fail to flower.

The fourth ſort is ſomewhat like the third, but the leaves are broader, and have ſeveral ſpines on their backſide toward their extremities. The flowers of this grow in a looſer ſpike, and the plants never put out any ſuckers, ſo that it is very difficult to increaſe.

The fifth ſort ſeldom riſes much above two feet high, the leaves are very broad at their baſe, where they cloſely embrace the ſtalk, and gradually decreaſe to a point. The edges are ſet with ſharp ſpines, and the under leaves ſpread open horizontally every way; theſe are of a dark green colour ſpotted with white, ſomewhat reſembling the colour of ſoft ſope, from whence ſome have given it the title of Sope Aloe. The flowers grow in umbels on the tops of the ſtalks, which are of a beautiful red colour, and appear in Auguſt and September. This ſort is hardy, ſo may be kept in a common green-houſe in winter, and in the ſummer placed in the open air.

The ſixth ſort is ſomewhat like the fifth in its manner of growth, but the leaves are broader, of a lighter green colour; the edges and alſo the ſpines are of a copper colour, and the flowers grow in looſe ſpikes. This is as hardy as the former, ſo may be treated in the ſame manner. It flowers in September.

The ſeventh ſort grows to the height of ſix or ſeven feet, with a ſtrong ſtem, toward the upper part of which are produced two, three, or four heads, compoſed of long, compreſſed, pliable leaves, of a ſea-green colour, entire, and ending in obtuſe points; theſe are placed two ways, lying over each other with their edges the ſame way. The flowers are produced in ſhort looſe ſpikes, which are of a red colour, and appear at different times of the year.

The eighth ſort is an humble plant, ſeldom riſing more than a foot high; the leaves grow near the ground, which are broad at their baſe, where they embrace the ſtalk, and gradually diminiſh to a point; they are of a ſea-green colour, with ſome white ſpots; their edges, and alſo their upper parts below and above, are beſet with pretty ſharp ſpines; the flowers grow in looſe ſpikes, the tubulous part being red, and the brim of a light green colour.

The ninth ſort is a low plant, ſeldom riſing above eight inches high. The leaves of this are triangular, and turn back at their extremity; they are fleſhy and entire, their edges being very ſlightly ſawed. Theſe are curiouſly veined and ſpotted, ſomewhat like the feathers on a partridge's breaſt, from whence it had the name. The flowers grow in very looſe ſpikes, upon ſtalks about one foot high; they are of a fine red colour tipped with green. This will live in a good green-houſe through the winter.

I have raiſed a variety of this from ſeeds which I received from the Cape of Good Hope, with broader triangular leaves, which ſpread much more than thoſe of the former, and are not ſo beautifully ſpotted; the flower-ſtalks alſo grow much taller.

The tenth ſort is alſo a very low plant, never riſing to have ſtalks; the leaves are broad at their baſe, but are tapering to a point where they are triangular;

they are beſet on their edges, and both ſurfaces, with ſoft ſpines, very cloſely, from whence this plant had the name of Hedgehog Aloe. The flowers grow in a looſe head, on the top of the ſtalk, which is very thick, but ſeldom a foot high: they are of a fine red colour below, but of a pale green above. This ſort may be preſerved through the winter in a good green-houſe, and placed in the open air in ſummer.

The eleventh ſort grows near a foot high, and is furniſhed with triangular leaves, from the ground upward; theſe are of a dark green colour, and are placed in form of a triangle; the flowers grow thinly upon very ſlender foot-ſtalks, and are of an herbaceous colour, and their upper part turns backward. This ſort requires a moderate warmth in winter, ſo ſhould be placed in a cool part of the ſtove.

The twelfth ſort grows ſomewhat like the former, being beſet with leaves from the bottom, but theſe are rounder, and end in ſharp points; the flowers grow upon taller ſtalks, which branch out and grow in long cloſe ſpikes. There is a variety of this ſort which has been raiſed from ſeeds, which is much larger, the leaves thicker, and the flowers grow upon taller ſtalks, but this is only a ſeminal variety.

This ſort may be preſerved through the winter in a good green-houſe, but muſt have very little water given it during the cold weather.

The thirteenth ſort grows with its leaves near the ground, which are about ſix inches in length, and ſhaped like a tongue, from whence it had the title of Tongue Aloe. The flowers grow in ſlender looſe ſpikes, each hanging downward, of a red colour below, and green at the top. This is pretty hardy, ſo may be kept in a common green-houſe in winter, and ſet abroad in ſummer. There is a variety of this ſort, with leaves much more ſpotted.

The fourteenth ſort is of humble growth; the leaves come out on every ſide without order near the ground, they are thick, triangular at their ends, and cloſely ſtudded with white protuberances, from whence it was called Pearl Aloe. There is a ſmaller ſort of this which hath been long preſerved in the Engliſh gardens, but the manner of its flowering being the ſame, I ſuſpect it to be only a variety. This may be preſerved through the winter in a common green-houſe. It flowers at different ſeaſons of the year.

The fifteenth ſort is the true Succotrine Aloe, from whence the beſt ſort of Aloe for uſe in medicine is produced. This hath long, narrow, ſucculent leaves, which come out without any order, and form large heads. The ſtalks grow three or four feet high, and have two, three, and ſometimes four of theſe heads, branching out from it: the lower leaves ſpread out on every ſide, but the upper leaves turn inward toward the center; the flowers grow in long ſpikes, upon ſtalks about two feet high, each ſtanding on a pretty long foot-ſtalk; they are of a bright red colour tipped with green: theſe generally appear in the winter ſeaſon. This ſort may be preſerved through the winter in a warm green-houſe, but the plants ſo managed will not flower ſo frequently, as thoſe which have a moderate degree of warmth in winter.

The ſixteenth ſort reſembles the eighth in ſome particulars, but the leaves are much broader, and ſpread wide on every ſide; whereas thoſe of the eighth are ranged only two ways, and are narrow. This flowers but ſeldom, whereas the ſixteenth flowers annually in the ſpring, and may be kept through the winter in a common green-houſe.

The ſeventeenth ſort never riſes from the ground, but the leaves ſpread flat on the ſurface; theſe are plain, ſucculent, and triangular toward their end. The borders of the leaves, and alſo the ridge of the angle on their under ſide, are cloſely beſet with ſoft white ſpines. The flower-ſtalk riſes about a foot high, is very ſlender, and hath three or four ſmall herbaceous flowers ſtanding at a diſtance from each other. Theſe are tubulous, and cut into ſix parts at the brim, which turn backward. This ſort is tender, ſo ſhould be placed in winter in a moderate degree of heat, and muſt have little water. It ſeldom puts out offſets, ſo is generally increaſed by planting the leaves.

The eighteenth ſort is alſo a ſmall plant growing near the ground; the leaves of this ſort are almoſt cylindrical toward their baſe, but angular near their ends, and are ſet with ſhort ſoft ſpines at the angles: theſe leaves are ſhorter and of a darker green colour than thoſe of the former ſort, and the plants produce many ſuckers on every ſide. I have raiſed a variety of this from ſeeds, which hath ſhorter, whiter, and ſmoother leaves, but this hath not yet flowered. This will live in a common green-houſe in winter.

The nineteenth ſort hath very ſhort, thick, ſucculent leaves, which are compreſſed on their upper ſide like a cuſhion, from whence it had the name. This grows very cloſe to the ground, and puts out ſuckers on every ſide: the flowers grow on ſlender ſtalks, and are of an herbaceous colour. This may be preſerved through the winter in a good green-houſe, but ſhould have very little water during that ſeaſon, eſpecially when it hath no artificial heat.

The twentieth ſort hath long narrow tongue-ſhaped leaves, which are hollowed on their upper ſide, but keel-ſhaped below: theſe are cloſely ſtudded on every ſide, with ſmall white protuberances, from whence the plant hath had the title of Pearl Tongue Aloe. The flowers of this kind grow on pretty tall ſtalks, and form looſe ſpikes, each hanging downward: they are of a beautiful red colour, tipped with green. This ſort produces offſets in plenty, and is ſo hardy as to live in a common green-houſe through the winter. It flowers at different ſeaſons of the year.

The twenty-firſt ſort hath ſome reſemblance to the laſt, but the leaves are much broader and thicker; theſe ſpread out every way, and are not ſo concave on their upper ſurface, nor are the protuberances ſo large as thoſe of the former; the flowers are of a paler colour, and the ſpikes are ſhorter. I have raiſed plants from the ſeeds of this ſort, which have varied from the original, but none of them approached near the twentieth ſort. This is as hardy as the former ſort.

The twenty-ſecond ſort riſes to the height of eight or ten feet, with a ſtrong ſtem; the leaves grow on the top, which cloſely embrace the ſtalk; theſe come out irregularly, and ſpread every way; they are near four inches broad at their baſe, and diminiſh gradually to the top, where they end in a ſpine. They are of a dark green colour, and cloſely beſet with ſhort thick ſpines on every ſide. This ſort hath not as yet flowered in England, nor does it put out ſuckers, ſo that it is difficult to increaſe. It muſt have a warm green-houſe in winter, and very little water.

The twenty-third ſort hath very long, narrow, triangular leaves, ſhaped like thoſe of the Bull-ruſh; the flowers are produced in cloſe thick ſpikes, upon ſtalks near three feet high. They are of an Orange colour, having ſix yellow ſtamina, which come out beyond the tube of the flower; ſo that when the plants are ſtrong, and produce large ſpikes, they make a fine appearance. It flowers in Auguſt and September. There is a variety of this with narrower leaves, and longer ſpikes of flowers.

The ſoil in which theſe plants thrive beſt, is one half freſh light earth from a common (and if the turf is taken with it and rotted, it is much better); the reſt ſhould be white ſea ſand and ſifted lime rubbiſh, of each of theſe two, a fourth part; mix theſe together ſix or eight months at leaſt before it is uſed, obſerving to turn it over often in the time.

The middle of July is a very proper ſeaſon to ſhift theſe plants; at which time you may take them out of the pots, and with your fingers open the roots, and ſhake out as much of the earth as poſſible, taking off all dead or mouldy roots, but do not wound or break the young freſh ones: then fill the pot about three parts full of the above-mentioned earth, putting a few ſtones in the bottom of the pot, to drain off the moiſture; and after placing the roots of the plant in ſuch a manner as to prevent their interfering too much with each other, put in as much of the ſame earth, as to

to fill the pot almoſt to the rim, and obſerve to ſhake the plant, ſo as to let the earth in between the roots; and then with your hand ſettle it cloſe to the roots of the plant, to keep it ſteady in the pot; then water them gently, and ſet them abroad in a ſhady place, where they may remain for three weeks, giving them gentle waterings, if the weather ſhould prove hot and dry.

Toward the latter end of September, in a dry day, remove them into the houſe again, obſerving to give them as much free open air as poſſible, while the weather is warm; but, if the nights are cool, you muſt ſhut up the glaſſes, and give them air only in the day; and, as the cold increaſes, you muſt not open the glaſſes, but obſerve to give them gentle waterings often, till the middle of October, when you muſt abate watering according to the heat of the houſe in which they are kept. For thoſe plants which are placed in a ſtove, will require to be watered at leaſt once a week, moſt part of the winter; whereas thoſe which are kept in a green-houſe without artificial heat, ſhould not be watered oftener in winter than once a month.

When theſe hardier ſorts of Aloes are placed abroad in ſummer, they ſhould have but little water given them; and if much rain ſhould fall during the time they are abroad, they ſhould be ſcreened from it: for when they imbibe much wet in ſummer, they frequently rot the following winter, eſpecially if they are not kept in a moderate warm air. Therefore, thoſe who chooſe to treat theſe plants hardily, ſhould be cautious of their receiving too much moiſture.

The tender ſorts ſhould conſtantly remain in the ſtove, or be removed in ſummer to an airy glaſs-caſe, where they may have free air in warm weather, but be protected from rain and cold. With this management the plants will thrive and increaſe, and ſuch of them as uſually flower, may be expected to produce them in beauty at their ſeaſons.

The hardier ſorts thrive much better when they are expoſed in ſummer, and ſecured from the cold and rain in winter, than if they are treated more tenderly. For when they are placed in a ſtove, they are kept growing all the winter, whereby they are drawn up weak; and although they will flower oftener when they have a moderate ſhare of heat, yet in two or three years, the plants will not appear ſo ſightly as thoſe which are more hardily treated.

The twenty-third ſort is hardy enough to live abroad in mild winters, if they are planted in a warm border and a dry ſoil; but as they are often deſtroyed in ſevere winters, it is proper to keep ſome plants in pots, which may be ſheltered in winter under a frame, to preſerve the ſort. This is propagated by ſeeds, which the plants generally produce in plenty: the ſeeds muſt be ſown in pots ſoon after they are ripe, and in winter ſhould be ſheltered under a common hot-bed frame: in the ſpring the plants will come up, when they ſhould be inured to bear the open air by degrees; and when they are large enough to remove, ſome of them ſhould be planted in pots, and the other in a warm border, where they will require to be ſheltered the following winter, as they will not have obtained ſufficient ſtrength to reſiſt the cold.

Moſt of theſe Aloes are increaſed by offſets, which ſhould be taken from the mother plant, at the time when they are ſhifted, and muſt be planted in very ſmall pots, filled with the ſame earth as was directed for the old plants; but if, in taking the ſuckers off, you obſerve that part which joined to the mother root to be moiſt, you muſt let them lie out of the ground in a ſhady dry place ſix or eight days to dry before they are planted, otherwiſe they are very ſubject to rot. After planting, let them remain in a ſhady place (as was before directed in ſhifting the old plants) for a fortnight, when you ſhould remove the tender kinds to a very moderate hot-bed, plunging the pots therein, which will greatly facilitate their taking new root; but obſerve to ſhade the glaſſes in the middle of the day, and to give them a great ſhare of air.

Toward the middle of Auguſt, begin to harden theſe young plants, by taking off the glaſſes in good weather, and by raiſing them at other times with props, that the air may freely enter the bed, which is abſolutely neceſſary for their growth, and to prepare them to be removed into the houſe, which muſt be done toward the end of September, and managed as before directed for the old plants.

The African Aloes, for the moſt part, afford plenty of ſuckers, by which they are increaſed; but thoſe few that do not, may be moſt of them propagated, by taking off ſome of the under leaves, laying them to dry for ten days or a fortnight, as was directed for the offsets; then plant them in the ſame ſoil as was directed for them, putting that part of the leaf which adhered to the old plant, about an inch, or an inch and a half (according to the ſize of the leaf) into the earth, giving them a little water to ſettle the earth about them; then plunge the pots into a moderate hot-bed, obſerving to ſcreen them from the violence of the ſun, and give them gentle refreſhings with water once a week: the beſt ſeaſon for this is in June, that they may puſh out heads before winter.

The ſecond ſort produces the Aloes commonly ſold in the ſhops for horſes, and is called Aloe Hepatica. But it is from the fifteenth ſort, the Succotrine, or beſt ſort of Aloes, is produced; which is done by cutting their leaves tranſverſly, and placing earthen veſſels under them to receive the juice which drops from theſe cut leaves; which juice, when inſpiſſated, becomes the Aloe which is uſed in medicine. But I believe in making the coarſer ſort of Aloes, they preſs the leaves, whereby a greater quantity of juice is obtained: but this is not near ſo fine as the other.

**ALOE AMERICANA MURICATA.** See Agave.

**ALOIDES.** See Stratiotes.

**ALOPECUROS** [*Gr.* Ἀλωπέκουρος], Fox-tail, a kind of graſs.

**ALPINIA.**

This plant is ſo called after Proſper Alpinus, who was a famous botaniſt in his time, and travelled into Greece and Egypt, and has written two books in quarto of the plants of thoſe countries.

The Characters are,

*It hath a trifid empalement, upon which reſts the germen. The flower is of one leaf, which is unequally divided at the top into four parts, and reſembles a perſonated flower; the upper ſegment which reſembles the helmet, and alſo the two ſide ſegments, are indented in the middle, and the lower one is divided into three parts at the brim; in the center is placed the round germen, ſupporting a ſingle ſtyle crowned with a three cornered ſtigma: this is attended by a ſingle ſtamina fixed to the tube of the flower, which is crowned with a very narrow ſummit. After the flower is paſt, the germen becomes an oval fleſhy fruit, divided into three parts, incloſing ſeveral oval ſeeds, which have tails.*

This genus of plants, is by Dr. Linnæus ranged in his firſt claſs, which is entitled Monandria Monogynia, the flowers of which have but one ſtamina and one ſtyle.

We know but one Species of this genus, viz.

Alpinia. Royen. Prod. 12. This is by father Plumier titled, Alpina racemoſa alba Cannacori foliis. Nov. Gen. 26. i. e. *White branching Alpina, with leaves like the flowering Reed.*

This plant is a native of the Weſt-Indies, from whence it has been brought into ſome of the curious gardens of Europe, where it muſt be preſerved in a good green-houſe, and the pots plunged into a tub of water, otherwiſe it will not thrive in this country. The leaves decay every winter, and are puſhed out from the roots every ſpring, like the Maranta; ſo may be propagated by parting of the roots when the leaves decay.

**ALSINE** [*Gr.* Ἀλσίνη], Chick-weed.

Theſe plants are ſo well known to moſt perſons, it will be needleſs to mention them in this place, unleſs it be to caution perſons from permitting them to grow either in their gardens, or on dunghills, where they will ſoon ſhed their ſeeds, and become troubleſome

weeds;

weeds; but as they are annual, they may with little trouble be destroyed, if they do not stand to produce seed.

ALTHÆA [Ἀλθαία, so called from ἀλθαίνω, *Gr.* to heal], Marshmallow.

The CHARACTERS are,

*The flower hath a double empalement; the outer is of one leaf, and is unequally divided into nine narrow segments at the brim; the inner one is also of one leaf, cut into five broad acute segments at the top; these are both permanent. The flower hath five petals which coalesce at their base, but spread open above and are shaped like a heart. There are many stamina joined below, and form a kind of cylinder, but are loose above, and inserted in the column. In the center is placed the orbicular germen, supporting a short cylindrical style, crowned with numerous stigma, which are of equal length with the stamina. The empalement afterward becomes an orbicular depressed capsule, divided into several cells, each containing one compressed kidney-shaped seed.*

This genus of plants is ranged by Dr. Linnæus in the third section of his sixteenth class, which is titled Monodelphia Polyandria, the stamina being joined together to form a sort of column.

The SPECIES are,

1. ALTHÆA foliis simplicibus acuminatis acutè dentatis tomentosis. *Marshmallow with single woolly leaves, which are indented in sharp segments.* Althæa Dioscoridis & Plinii. C. B. P. 315. *Common Marshmallow.*
2. ALTHÆA (*Officinalis*) foliis simplicibus angulato-rotundioribus tomentosis. *Marshmallow with angular, woolly, round-pointed leaves.* Althæa folio rotundiori aut minùs acuminato. Sutherl. Edinb.
3. ALTHÆA (*Hirsuta*) foliis trifidis piloso-hispidis supra glabris. Hort. Cliff. 349. *Marshmallow with trifid, hairy, pungent leaves.* Alcea villosa. Dalechamp. Hist. 594.
4. ALTHÆA (*Cannabina*) foliis inferioribus palmatis superioribus digitatis. Hort. Cliff. 205. *Marshmallow with the under leaves shaped like a hand, and the upper leaves more divided.* Alcea fruticoso cannabino folio. Clus. Hist. p. 2. pag. 25.

The first sort is the common Marshmallow, which grows naturally in moist places in divers parts of England, and is frequently used in medicine. It hath a perennial root and an annual stalk. The plant grows erect, to the height of four or five feet, and puts out a few lateral branches on the side of the stalks, garnished with leaves which are hoary and soft to the touch; they are angular, and placed alternately on the branches; the flowers come out from the wings of the leaves, which are shaped like those of the Mallow, but are smaller and of a pale colour. These appear in June or July, and the seeds ripen in September. It may be propagated fast enough, either by seeds or parting their roots. When it is propagated by seeds they should be sown in the spring, but if by parting their roots, the best time is in autumn, when the stalks decay. It will thrive in any soil or situation, but in moist places will grow larger than in dry land. The plants should not be nearer together than two feet, for their roots spread wide on every side.

The second sort is somewhat like the first, but the leaves are not so long, nor do they end in a sharp point, but are angular, and rounder than those of the first. I have cultivated this in the Chelsea garden many years, and find it retains its difference.

The third sort grows naturally in Spain and Portugal; from both these countries I have received the seeds. This is a low plant, whose branches trail on the ground, unless they are supported by stakes. The leaves and stalks are beset with strong hairs; the flowers come out at the wings of the stalks, and are smaller than those of the common sort, having purplish bottoms. The leaves are deeply cut into three parts, and have long foot-stalks; the stalks are woody, but seldom last more than two years.

If the seeds of this sort are sown in April, the plants will flower in July, and the seeds ripen in September. They should be sown in the places where they are to remain, for as the roots shoot deep into the ground, unless the plants are removed very young, they seldom survive transplanting.

The fourth sort has a woody stem, which rises to the height of four or five feet, and puts out many side branches. These are garnished with leaves of different shapes; those which are on the lower part of the stalks are like a hand, very slightly cut toward their outside, but those which are placed on the upper part of the branches, are deeply cut into several parts; these are hairy, and grow alternately on the branches; the flowers come out from the wings of the stalks in the same manner as the other sorts, but are not so large as those of the common Marshmallow; they are of a deeper red colour, and the empalement is much larger. This sort seldom flowers the first year, unless the summer proves warm; but when the plants live through the winter, they will flower early the following summer, and produce good seeds. This grows naturally in Hungary and Istria, from both which places I have received the seeds.

It is propagated by seeds, which should be sown in the spring in the place where the plants are to remain; or if otherwise, the plants must be transplanted young, else they will not succeed. They should have a sheltered situation and a dry soil, otherwise they will not live through the winter in England. When these plants grow in a stony soil, or in lime rubbish, they will be stinted in their growth, but they will have less sap in their branches, so will better endure the cold of this climate. This sort seldom continues longer than two years in England, but as the seeds ripen here, the plants may be had in plenty.

ALTHÆA FRUTEX. See HIBISCUS and LAVATERA.

ALYSSOIDES. See ALYSSUM and LUNARIA.

ALYSSON ALPINUM LUTEUM. See DRABA.

ALYSSON SEGETUM. See MYAGRUM.

ALYSSON SERPILLI FOLIO. See CLYPEOLA.

ALYSSON VERONICÆ FOLIO. See DRABA.

ALYSSON VULGARE. See DRABA.

ALYSSUM, [Ἄλυσσον, of ἀλύσσω, *Gr.* to be mad; so called, because it was believed to have the virtue of curing madness.] Madwort.

The CHARACTERS are,

*The flower hath an oblong four-leaved empalement, which falls away. It hath four petals in form of a cross, which spread open above the empalement. It hath six stamina, two of which are shorter than the other four, crowned with broad summits; in the center of the flower is situated the oval germen, supporting a single style, crowned with an obtuse stigma. After the flower is past, the germen becomes a globular or compressed seed-vessel, in which are lodged several compressed seeds.*

This genus is ranged in the fifteenth class of Linnæus, entitled Tetradynamia Siliculosa; the flowers of this class have six stamina, four of which are longer than the other two, and the seed-vessels are short, in some globular, and in others they are compressed.

The SPECIES are,

1. ALYSSUM (*Saxatile*) caulibus frutescentibus paniculatis foliis lanceolatis mollissimis undulatis integris. Prod. Leyd. 331. *Madwort with shrubby stalks, flowers growing in panicles, and whole, soft, spear-shaped waved leaves.* Alysson Creticum saxatile foliis undulatis incanis. Tourn. Cor. 15.
2. ALYSSUM (*Halimifolium*) foliis lanceolato-linearibus acutis integerrimis caulibus procumbentibus perennantibus. Hort. Cliff. 333. *Madwort with whole, spear-shaped, pointed leaves, and trailing perennial stalks.* Alysson halimi folio sempervirens. Tourn. Inst.
3. ALYSSUM (*Spinosum*) ramis floreis senilibus spiniformibus nudis. Hort. Cliff. 332. *Madwort, whose older branches have naked spines.* Thlaspi fruticosum spinosum. C. B. P. 108.
4. ALYSSUM (*Montanum*) ramulis suffruticosis diffusis foliis punctato-echinatis. Hort. Upsal. 185. *Madwort with shrubby diffused branches and leaves, having prickly punctures.* Thlaspi montanum luteum. J. B. 2. p. 928.

5. Alyssum (*Incanum*) caule erecto foliis lanceolatis incanis integerrimis floribus corymbosis. Hort. Cliff. 332. *Madwort with an erect stalk, hoary spear-shaped leaves which are entire, and flowers collected into round heads.* Alysson fruticosum incanum. Tourn. Inst. R. H.

6. Alyssum (*Clypeatum*) caule erecto herbaceo siliculis sessilibus ovalibus compresso-planis petalis acuminatis. Lin. Sp. Plant. 651. *Madwort with an erect herbaceous stalk, pods growing close to the stalks, which are oval and compressed, and the flower leaves pointed.* Lunaria leucoii folio siliquâ oblongâ majori. Tourn. Inst. 218.

7. Alyssum (*Sinuatum*) caule herbaceo foliis lanceolatis dentatis siliculis inflatis. Lin. Sp. Plant. 651. *Madwort with an herbaceous stalk, spear-shaped indented leaves, and swollen seed-vessels.* Alyssoides incanum foliis sinuatis. Tourn. Inst. 213.

8. Alyssum (*Creticum*) caule herbaceo erecto foliis incanis lanceolatis integerrimis siliculis inflatis. Lin. Sp. Plant. 651. *Madwort with an erect herbaceous stalk, hoary, spear-shaped, entire leaves, and a swelling seed-vessel.* Alyssoides fruticosum Creticum leucoii folio incano. Tourn. Cor. 15.

9. Alyssum (*Vesicaria*) foliis linearibus dentatis, siliculis inflatis angulatis acutis. Lin. Sp. 910. *Madwort with linear indented leaves and swollen pods, which are angular and acute pointed.* Vesicaria Orientalis, foliis dentatis. Tourn. Cor. 49.

10. Alyssum (*Deltoideum*) caulibus suffrutescentibus prostratis, foliis lanceolato-deltoidibus, siliculis hirtis. Lin. Sp. 908. *Madwort with trailing shrubby stalks, deltoide spear-shaped leaves, and hairy pods.* Alysson Creticum foliis angulatis, flore violaceo. Tourn. Cor. 15.

11. Alyssum (*Calycinum*) caulibus herbaceus, staminibus omnibus dentatis, calycibus persistentibus. Jacq. Vind. 114. *Madwort with herbaceous stalks, all the stamina indented, and a permanent flower-cup.* Thlaspi Alysson dictum campestre majus. C. B. P. 107.

12. Alyssum (*Campestre*) caule herbaceo, staminibus stipatis pari setarum, calycibus deciduis. Lin. Sp. 909. *Madwort with an herbaceous stalk, and the flower-cup deciduous.* Alysson incanum, serpylli folio, fructu nudo. Tourn. Inst. 217.

The first sort is a low perennial plant, with a fleshy stalk, which seldom rises more than one foot high, but divides into many less branches which grow near the ground, so that a single plant will spread to a considerable distance. The branches are garnished with long spear-shaped leaves, which are hoary and waved on their edges, placed on without any order. The flowers are produced in loose panicles, at the extremity of every branch, and are of a bright yellow colour, consisting of four petals, placed in form of a cross: these being numerous, make a fine appearance during their continuance. They appear the latter end of April, or the beginning of May, and if the season is moderate, will continue three weeks in beauty. The seeds ripen in July, but it is only from young plants that seeds can be expected; for the old plants, or those which are raised from slips or cuttings, rarely produce seeds in England.

This plant is hardy, and although brought from a more southerly climate, yet, if planted in a dry, lean, or rubbishy soil, will endure our severest winters abroad. It is increased by sowing the seeds in March in a light sandy soil, or by planting cuttings in April or May; which are very apt to take root, if kept shaded in the heat of the day, and gently refreshed with water.

The second sort seldom continues above two or three years with us, and must therefore be often sown to preserve it; or if the seeds are suffered to fall, and remain upon the ground, the plants will rise without any trouble. This plant spreads itself upon the ground, and never rises to any height. It produces, at the extremity of its branches, very pretty tufts of small white flowers; of which the plant is seldom destitute for six or seven months successively, for which reason it deserves a place in the gardens of the curious. This will grow from seeds, and also from cuttings, if planted and managed as the former.

The third sort hath ligneous branches which rise about two feet high; these are armed with small spines; the leaves are hoary, spear-shaped, and thinly placed on the stalks without any order. The flowers are white, cross-shaped, and grow in small clusters at the extremity of the branches. After the flowers are past, the germen turns to an oblong seed-vessel, containing several round seeds.

This may be propagated in the same manner as the first sort, either by seeds or slips; and when the plants grow in rubbish, or on old walls, they will last much longer, and endure the cold of our winters better than those which are in a good soil. It grows naturally in Spain, Italy, and the south of France.

The fourth sort hath trailing branches, which lie on the ground; these are garnished with oblong hoary leaves, which are rough to the touch, and are placed alternately on every side of the branches; the flowers are produced in small clusters at the extremity of the branches, which are of a dark yellow colour, and are succeeded by seed-vessels shaped like those of the third sort. This grows naturally upon rocks and ruins, in Burgundy, and some other parts of France, as also about Basil. It may be propagated in the same manner as the former sorts, and when it grows in rubbish, the plants will continue some years; but in rich ground, they seldom live through the winter in England.

The fifth sort grows to the height of two feet, having ligneous stalks, which divide into several branches toward the top. These are garnished with hoary spear-shaped leaves, which are placed alternately on the branches; at the extremity of every shoot, the flowers are produced in round bunches, which are small, white, and cross-shaped; these are succeeded by oval seed-vessels, which are full of brown seeds. It grows naturally in the south of France, Spain, and Italy, chiefly on rocky or gravelly soils. When this is sown in a rich soil, it seldom survives the winter; but in lime rubbish, or upon old walls, it will continue several years. It flowers in June, July, August, and September, and the seeds ripen soon after; which if permitted to scatter, the plants will come up, and require little care.

The sixth sort is a biennial plant with an herbaceous stalk, which is garnished with oblong hoary leaves, placed alternately; the flowers come out from the wings of the stalks single, and are succeeded by oval compressed seed-vessels, shaped like those of the Lunaria, which contain many flat seeds. It grows naturally in Spain and Portugal, from whence I have received the seeds. It is propagated by seeds, which must be sown upon dry ground, or lime rubbish; for in rich land the plants will grow too vigorous in summer, so that in autumn they generally rot off and decay.

The seventh sort is a low spreading plant, which divides into small branches; these spread near the ground, and are garnished with oblong hoary leaves which continue through the year: the flowers are produced in small clusters at the extremity of the branches; they are of a bright yellow colour, consisting of four petals placed in form of a cross. After the flower is past, the germen becomes an oval swelling seed-vessel, which is filled with roundish seeds. This grows naturally in the islands of the Archipelago, but is hardy enough to live in the open air in England, in a dry soil and a warm situation. It is propagated by seeds, and seldom lasts longer than two or three years.

The eighth sort grows more erect, having an herbaceous stalk, which sends out a few lateral branches toward the top, garnished with oblong hoary leaves. The flowers grow in small clusters at the extremity of the branches, which are succeeded by oval swelling seed-vessels like the former. This seldom continues longer than two years in England; it must have a warm dry situation, otherwise it will not live in the open air, and is propagated by seeds, which should be

be sown in August, soon after they are ripe; and if a few of them are potted in October, and sheltered under a frame in winter, they will flower the following June, so good seeds may be obtained the same year; for those plants which arise early in the year, grow luxuriantly in summer, so do not often live through the winter, or ripen seeds.

The ninth and tenth sorts have trailing stalks, which spread on the surface of the ground; the plants produce their flowers toward the extremity of the stalks in loose spikes, which are formed like those of the other sorts, having four petals in each in form of a cross; those of the ninth sort are succeeded by swollen seed-vessels, but the tenth, which flowers early in the spring, are rarely succeeded by seed-vessels in this country. This is an abiding plant, which may be propagated from its trailing branches, which, if planted in April, will take root and become good plants by the following autumn, when two or three plants may be placed in a common frame for shelter in winter, to preserve the species; for in hard winters, those which are exposed are sometimes destroyed.

The eleventh and twelfth are both annual plants, so are propagated by seeds, which should be sown in a border of light earth in April, in such places where the plants are to remain; if these are thinned and kept clean from weeds, they will flower in July, and perfect their seeds in autumn.

AMARANTHOIDES. See GOMPHRENA.

AMARANTHUS ['Αμάραντος; of α privative, and μαραίνω, *Gr.* to wither; so called, because the flower of this plant being cropped, does not soon wither; but being dried, keeps the beauty of its colour a great while,] Flower-gentle.

The CHARACTERS are,

*It hath male and female flowers in the same plant. The flower hath no petals, but the empalement consists of three or five pointed spear-shaped leaves which are coloured and permanent; this is common to both sexes. The male flowers have in some species three, and in others five slender stamina, which are of the same length with the empalement, crowned with oblong summits. The female flowers have an oval germen, supporting three short awl-shaped styles, which are crowned with simple stigma. The empalement afterward becomes an oval coloured seed-vessel having one cell, in which is lodged a single globular seed.*

This genus of plants is by Dr. Linnæus ranged in the fifth division of his twenty-first class, entitled Monœcia Pentandria, from their having male and female flowers on the same plant, and the male flowers having five stamina.

The SPECIES are,

1. AMARANTHUS (*Tricolor*) glomerulis triandris axillaribus subrotundis amplexicaulibus foliis lanceolato-ovatis. Lin. Sp. Plant. 1403. *Flower-gentle with roundish heads, placed at the wings of the stalks embracing them, whose flowers have three stamina, and the leaves are oval and spear-shaped.* Amaranthus tricolor. Lob. Icon. 252. i. e. *Three coloured Amaranthus.*
2. AMARANTHUS (*Melancholicus*) glomerulis triandris axillaribus subrotundis sessilibus foliis lanceolatis acuminatis. Lin. Sp. Plant. 1403. *Flower-gentle with three stamina, roundish heads growing close to the stalk, and acute-pointed spear-shaped leaves.* Amaranthus colore obscuriori sive mas. Tourn. Inst. 236. Amaranthus bicolor.
3. AMARANTHUS (*Tristis*) glomerulis triandris rotundatis subspicatis, foliis ovato-cordatis emarginatis petiolo brevioribus. Lin. Sp. 1404. *Flower-gentle with three stamina, roundish heads growing from the wings of the stalks in spikes, and oval heart-shaped leaves with short foot-stalks.*
4. AMARANTHUS (*Caudatus*) racemis pentandris decompositis cylindricis pendulus longissimis. Hort. Cliff. 443. *Flower-gentle with five stamina, and very long, hanging, cylindrical spikes.* Amaranthus maximus paniculâ longâ pendulâ semine rubello. Raii Hist.
5. AMARANTHUS (*Maximus*) racemis subcylindricis pendulis, caule erecto arboreo. *Flower-gentle with hanging almost cylindrical spikes, and an erect tree-like stalk.* Amaranthus maximus. C. B. P. 120. *Commonly called Tree-like Amaranthus.*
6. AMARANTHUS (*Lividus*) glomerulis triandris subspicatis rotundatis, foliis rotundo-ovatis retusis. Lin. Sp. 1404. *Flower-gentle with roundish spikes of flowers having three stamina, and roundish, oval, blunt leaves.* Blitum pulchrum rectum magnum rubrum. J. B. 2. p. 966.
7. AMARANTHUS (*Flavus*) racemis pentandris compositis, summo infimisque nutantibus, foliis ovatis mucronatis. Lin. Sp. 1406. *Flower-gentle with a compound spike of flowers having five stamina, and oval pointed leaves.*
8. AMARANTHUS (*Blitum*) glomeratis lateralibus trifidis foliis ovatis retusis, caule diffuso. Lin. Sp. Plant. 990. *Flower-gentle with roundish heads at the joints of the stalks, oval blunt leaves, and diffused stalks.* Blitum album minus. C. B. P. 118. *The smaller white Blite.*
9. AMARANTHUS (*Græcizans*) glomerulis triandris axillaribus foliis lanceolatis obtusis. Lin. Sp. Plant. 1405. *Flower-gentle with flowers having three stamina, which grow in clusters from the wings of the stalks, and blunt spear-shaped leaves.* Amaranthus floribus lateralibus congestis foliis lanceolatis obtusis. Flor. Virg. 116. *Commonly called Pellitory-leaved Blite.*
10. AMARANTHUS (*Hybridus*) racemis pentandris decompositis congestis nudis, spiculis conjugatis. Flor. Virg. 148. *Flower-gentle with five stamina, decompounded spikes having double spiculæ.* Amaranthus sylvestris maximus Novæ Angliæ spicis viridibus. Raii Hist. 201. *Or Wild New England Blite with green spikes.*
11. AMARANTHUS (*Hypocondriacus*) racemis pentandris compositis confertis erectis, foliis ovatis mucronatis. Hort. Cliff. 444. *Flower-gentle with five stamina, erect clustered spikes, and oval-pointed leaves.* This is the Amaranthus sylvestris maximus Novæ Angliæ spicis purpureis. Tourn. Inst. R. H. 235. *Commonly called Purple Flower-gentle.*
12. AMARANTHUS (*Spinosus*) racemis pentandris cylindricis erectis axillis spinosis. Hort. Cliff. 444. *Flower-gentle with five stamina, upright cylindrical spikes, and spines at the joints of the stalks.* Amaranthus Indicus spinosus spicâ herbaceâ. H. L. 31.
13. AMARANTHUS (*Sanguineus*) racemis pentandris compositis erectis, lateralibus patentissimis, foliis ovato-oblongis. Lin. Sp. 1407. *Flower-gentle with compound spikes, whose lateral spikes spread out, the upper are erect, and oblong oval leaves.* Amaranthus racemis cylindricis lateralibus terminalibusque cruciatim positis. Fig. Plant. 22.
14. AMARANTHUS (*Retroflexus*) racemis pentandris lateralibus terminalibusque caule flexuoso villoso ramis retrocurvatis. Lin. Sp. Plant. 991. *Flower-gentle with five stamina, spikes proceeding from the wings of the stalks, and also at their extremities, and flexible, hairy, recurved branches.*
15. AMARANTHUS (*Oleraceous*) glomeribus triandris pentandrisque, foliis ovatis obtusissimis emarginatis rugosis. Lin. Sp. 1403. *Flower-gentle whose globes have flowers with three and five stamina, and rough, obtuse, indented leaves.* Blitum album majus. C. B. P. 118.
16. AMARANTHUS (*Viridis*) glomerulis triandris, floribus masculis trifidis, foliis ovatis emarginatis, caule erecto. Lin. Sp. 1405. *Flower-gentle with globular heads whose flowers have three stamina; the male are trifid, oval, indented leaves, and an upright stalk.*
17. AMARANTHUS (*Cruentus*) racemis pentandris decompositis remotis patulo nutantibus, foliis lanceolato-ovatis. Lin. Sp. Pl. 1406. *Flower-gentle with decompounded spikes of flowers with five stamina, the outer spreading asunder, and oval spear-shaped leaves.* Amaranthus sinensis foliis variis, panicula speciosa patula. Cent. tab. 6.

The first sort has been long cultivated in gardens for the beauty of its variegated leaves, which are of three colours, viz. green, yellow, and red; these are very elegantly mixed: and when the plants are in full vigour, the leaves are large, and closely set from the bottom to the top of the stalks, and the branches form a sort of pyramid; so that there is not a more

 beau-

beautiful plant than this, when it is in full luſtre. From the leaves of this plant being partly coloured like the feathers of parrots, ſome botaniſts have ſeparated this ſpecies from the others, and conſtituted a genus of it by the title of Pſittacus.

The ſecond ſort hath been introduced into the Engliſh gardens much later than the former. This grows to the ſame height, and in the manner of its growth greatly reſembles it; but the leaves have only two colours, which are an obſcure purple, and a bright crimſon; theſe are ſo blended as to ſet off each other, and when the plants are vigorous, they make a fine appearance.

The third ſort hath no great beauty; it grows about three feet high with an upright ſtalk, which ſends out ſome lateral branches toward the top; theſe are garniſhed with oval heart-ſhaped leaves. The flowers are produced at the wings of the ſtalks in roundiſh ſpikes, as alſo at the extremity of the branches, but have very little beauty, ſo do not deſerve a place in the flower-garden. The young plants of this ſort are gathered to boil inſtead of Spinach by the inhabitants of India, where it grows naturally, and from thence I received the ſeeds of it as an eſculent plant.

The fourth ſort grows naturally in America. This hath an upright ſtem, three feet high; the leaves and ſtalks are of a pale green colour; the ſpikes of flowers are produced from the wings of the ſtalks, and alſo in cluſters at the extremity of the branches: they are very long and hang downward, being of a bright purple colour. I have meaſured ſome of theſe ſpikes, which were two feet and a half long, ſo that many of them have reached the ground.

The fifth ſort hath a ſtrong ſtem, which riſes to the height of ſeven or eight feet, ſending forth many horizontal branches toward the top, garniſhed with oblong, rough, green leaves. At the extremity of every ſhoot, the cylindrical ſpikes of a purple colour are produced, which hang downward; but theſe are ſeldom half the length of thoſe of the former ſort, and are much thicker. This is the ſort of Amaranth, which is directed by the college to be uſed in medicine.

The ſixth ſort grows near three feet high, putting out ſeveral ſide branches, which are garniſhed with oval blunt leaves; at the ends of the branches the ſpikes are produced in cluſters and grow erect, theſe are of a deep purple colour.

The ſeventh ſort grows near four feet high; the ſtalks are inclined to red; the leaves are of an oval ſpear-ſhaped figure, green colour, marked with purple ſpots, and have very long foot-ſtalks. The ſpikes come out at the extremity of the branches in cluſters, as alſo from the wings of the ſtalks; theſe are of a pale green colour, and grow erect. I have received the ſeeds of this ſort from Portugal, by the title of Bredos, recommending it to be cultivated as a culinary herb.

The eighth ſort grows naturally in moſt of the warm parts of Europe, and alſo in America; for wherever it is permitted to ſcatter its ſeeds, the plants will come up the following ſummer, and become troubleſome weeds, as will alſo the ninth ſort; ſo theſe are ſeldom cultivated, as they are only preſerved in botanic gardens for the ſake of variety. The ſtalks of both theſe ſorts ſpread on the ground.

The tenth ſort grows upward of three feet high, and ſends out many ſide branches, which are hairy, and garniſhed with oblong rough leaves. The ſpikes are produced from the wings of the ſtalks, as alſo at the extremity of the branches, growing horizontally, and are of a green colour. There is little beauty in this plant, therefore is ſeldom admitted to gardens, unleſs for the ſake of variety.

The eleventh ſort has been long in England, and was formerly propagated in flower-gardens, but is now become a common weed, frequently growing upon dunghills: for as the plants abound with ſeeds, ſo where they are permitted to ſcatter, there will be plenty of the plants come up the following ſummer. And theſe ſeeds will remain in the ground ſeveral years, and as often as they are turned up to the ſurface, they will produce plants; ſo that when plants are ſuffered to ſtand till their ſeeds fall, there will be every ſummer freſh crops of the plants for ſeveral years.

The twelfth ſort grows about two feet high, putting out many ſide branches, ſo as to form a buſhy plant; the leaves are oblong, and the ſpikes come out at every joint, where the ſtalks are armed with ſharp prickles, and at the extremity of the branches, the ſpikes are longer than thoſe of the ſide: theſe are ſlender, and are inclining to a brown colour, ſo make no great figure, therefore is rarely allowed to have a place, except in botanic gardens.

The ſeeds of the thirteenth ſort were ſent me from the Bahama Iſlands, as an eſculent plant, bearing fine flowers. This grows three feet high, with purple ſtalks and leaves; the ſpikes are ſhort and cylindrical; theſe are frequently produced from the wings of the ſtalks, but at the extremity of the ſtalk ariſes a large cluſter of ſpikes which are placed croſſwiſe, with one upright ſtalk in the middle. Theſe are of a bright purple colour at firſt, but afterward fade to a darker colour, as the ſeeds ripen.

The fourteenth ſort is a native of North America, from whence the ſeeds were ſent to Europe, but is now become a common weed in many gardens near London, ſo is ſeldom allowed a place, except in botanic gardens.

The fifteenth ſort has no beauty, therefore not worthy of a place in gardens: this and the ſixteenth ſort are eſteemed in ſome parts of India as eſculent herbs; the inhabitants of thoſe warm countries, gather the herbs while young, and dreſs them inſtead of Spinach, but being much inferior to it, they are ſeldom uſed in thoſe countries where Spinach will thrive. Theſe plants grow from two to three feet high, and when they have room, will ſend out many ſide branches; but if their ſeeds are permitted to ſcatter, there will be a plentiful ſupply of plants the following ſummer.

The ſeeds of the ſeventeenth ſort were brought from China, and the two firſt years they were ſown in England, produced beautiful heads of flowers, which made a gay appearance; but afterward the ſeeds degenerated, and the plants which were produced from them had little beauty; which is the caſe with ſome others of this genus, ſo ſhould not be eſteemed as diſtinct ſpecies.

The ſorts which are worthy of a place in the pleaſure-garden, are particularly the firſt and ſecond: theſe are tender, and require ſome art and care to bring them to perfection in England, therefore their management will be hereafter more particularly inſerted.

Next to theſe are the fourth, fifth, and thirteenth ſorts. The ſeeds of theſe ſhould be ſown upon a moderate hot-bed toward the end of March, and when the plants come up, they ſhould have a large ſhare of air admitted to them in mild weather, to prevent their drawing up weak. When they are large enough to tranſplant, there ſhould be another moderate hot-bed provided, to which they ſhould be removed, placing them at ſix inches diſtance every way, obſerving to water them, as alſo to ſhade them from the ſun until they have taken new root; after which the air ſhould be freely admitted to them, at all times when the weather is favourable; their waterings ſhould be frequent, but not given in great quantities. As the plants advance, and the warmth of the ſeaſon increaſes, they ſhould have a greater ſhare of air, that by degrees they may be hardened to bear the open air. The beginning of June they may be taken up with large balls of earth to their roots, and planted ſome into pots, and others into the borders of the pleaſure-garden, obſerving to ſhade them until they have taken good root; after which they muſt be frequently watered in dry weather, eſpecially thoſe in the pots, which will require watering every evening

in warm dry weather. The fifth fort will not thrive in pots, fo fhould be planted in a rich light foil, where, if it is allowed room, and plentifully watered in dry weather, the plants will grow to a very large fize, and make a fine appearance.

The twelfth fort is alfo tender, fo whoever is inclinable to cultivate that plant, fhould treat it in the fame manner as is directed for the former.

The other forts are hardy enough to grow in the open air, fo may be fown on a bed of light earth in the fpring, and when the plants are fit to remove, they may be tranfplanted into any part of the garden, where they will thrive, and produce plenty of feeds, which, if permitted to fcatter, will ftock the garden with plants.

The two firft forts muft be fown on a good hot-bed in February, or the beginning of March at fartheft; and in about a fortnight's time, if the bed is in good temper, the plants will rife; foon after which you muft prepare another hot-bed, covered with good, rich, light earth, about four inches thick; then raife up the young plants with your finger, fo as not to break off the tender roots, and prick them into your new hot-bed about four inches diftance every way, giving them a gentle watering to fettle the earth to their roots; but in doing this, be very cautious not to bear the young plants down to the ground by hafty watering, which rarely rife again, or at leaft fo as to recover their former ftrength in a long time, but very often rot in the ftems, and die quite away.

In the middle of the day keep them fcreened with mats from the heat of the fun, and give them air by raifing up the glaffes; and if the glaffes are wet, it will be proper to turn them every day, in good weather, that they may dry; for the moifture which is occafioned by the fermentation of the dung, and the perfpiration of the plants, is of a noxious quality, and very unkindly to plants; fo that if the weather happens to prove bad, that you cannot turn your glaffes, it will be of great fervice to the plants to wipe off all moifture two or three times a day with a woollen cloth to prevent its dropping upon the plants. When the plants are firmly rooted, and begin to grow, you muft obferve to give them air every day, more or lefs, as the weather is cold or hot, to prevent their drawing up too faft, which greatly weakens their ftems.

In about three weeks or a month's time, thefe plants will have grown fo as to meet, and will ftand in need of another hot-bed, which fhould be of a moderate temper, and covered with the fame rich earth about fix inches thick, in which they fhould be removed, obferving to take them up with as much earth about their roots as poffible, and plant them fix or feven inches diftance every way, giving them fome water to fettle the earth about their roots; but be very careful not to water them heavily, fo as to bear down the plants, as was before directed; and keep them fhaded in the heat of the day, until they have taken frefh roots; and be fure to refrefh them often gently with water, and give them air in proportion to the heat of the weather, covering the glaffes with mats every night, left the cold chill your beds, and ftop the growth of the plants.

The middle of May you muft provide another hot-bed, which fhould be covered with a deep frame, that the plants may have room to grow. Upon this hot-bed you muft fet as many three-penny pots as can ftand within the compafs of the frame; thefe pots muft be filled with good rich earth, and the cavities between each pot filled up with any common earth, to prevent the heat of the bed from evaporating, and filling the frame with noxious fteams: when the bed is in good order to receive the plants, they fhould be carefully taken up with a trowel, or fome fuch inftrument, obferving to preferve as much earth to their roots as poffible; then place each fingle plant in the middle of one of the pots, filling the pot up with the earth before defcribed, and fettle it clofe to the root of the plant with your hands; water them gently, as before, and fhade them in the heat of the day from the violence of the fun, by covering the glaffes with mats.

In about three weeks more thefe plants will have grown to a confiderable fize and ftrength, fo that you muft now raife the glaffes very much in the day-time; and when the air is foft, and the fun is clouded, draw off the glaffes, and expofe them to the open air; and repeat this as often as the weather will permit, which will harden them by degrees to be removed abroad into the places where they are to remain the whole feafon; but it is not adviseable to fet thefe plants in the open air till after the firft week in July, obferving to do it when the air is perfectly foft, and, if poffible, in a gentle fhower of rain.

Let them at firft be fet in fhelter for two or three days, where they may be fcreened from the violence of the fun, and ftrong winds, to which they muft be inured by degrees. Thefe plants, when grown to a good ftature, perfpire very freely, and muft be every day refrefhed with water, if the weather proves hot and dry; otherwife they will ftint, and never produce fo large leaves, as thofe which are fkilfully treated.

This is the proper management, in order to have fine Amaranths, which, if rightly followed, and the kinds are good, in a favourable feafon, will produce large fine leaves, and are the greateft ornament to a good garden for upwards of two months in the latter part of fummer.

Where perfons are curious in having thefe annual plants in great perfection, there fhould be a glafs-cafe erected with upright and floping glaffes on every fide, with a pit in the bottom for tan, in which the pots fhould be plunged; if this is raifed eight or nine feet to the ridge, and the upright glaffes are five feet, there will be room and height enough to raife thefe and other annual plants to great perfection, and in fuch a building, many of thofe tender annual plants, which rarely perfect feeds in this climate without fuch contrivance, may be every year brought fo forward as to ripen their feeds.

AMARANTHUS CRISTATUS. See Celosia.

AMARYLLIS, Lily Daffodil.

The Characters are,

*It hath an oblong compreffed fpatha, (or fheath) which inclofes the flower-buds, and open fide ways, becomes dry, and is permanent; the flower hath fix fpear-fhaped petals. In the center is fituated the roundifh furrowed germen, fupporting a flender ftyle, crowned with a three-cornered ftigma; this is attended by fix awl-fhaped ftamina, which are crowned with incumbent fummits. After the flower is paft, the germen becomes an oval capfule, opening in three parts, having three cells, which contain round feeds.*

This genus is ranged by Dr. Linnæus in the firft fection of his fixth clafs of plants, entitled Hexandria Monogynia, from the flower having fix ftamina and one ftyle.

The Species are,

1. Amaryllis (*Lutea*) fpathâ uniflorâ, corollâ æquali, ftaminibus declinatis. Lin. Sp. 420. *Lily Daffodil with a fingle flower in each fpatha, which is equal, and the ftamina declined.* Lilio Narciffus luteus autumnalis major. Tourn. Inft. 386. *Commonly called autumnal Narciffus.*
2. Amaryllis (*Atamafco*) fpathâ uniflorâ, corollâ æquali, piftillo declinato. Hort. Cliff. 135. *Lily Daffodil with a fingle flower in each fheath, which has equal petals, and the pointal declining.* Lilio Narciffus Indicus pumilus monanthos albus. Mor. Hift. 2. 266. *Commonly called Atamufco Lily.*
3. Amaryllis (*Formofiffima*) fpathâ uniflorâ, corollâ inæquali, petalis tribus genitalibufque declinatis. Hort. Cliff. 135. *Lily Daffodil with one flower in each cover, which has unequal petals, and the ftamina and ftyle are declined.* Lilio Narciffus Jacobæus flore fanguineo nutante. Hort. Elth. 195. *Commonly called Jacobæa Lily.*
4. Amaryllis (*Sarnienfis*) fpathâ multiflorâ, corollis revolutis genitalibus. Hort. Upfal. 75. *Lily Daffodil*

*with many flowers in one cover; the petals equal, spread open, and turned backward, with broken stamina, commonly called Guernsey Lily.*

5. AMARYLLIS (*Regina*) spathâ multiflorâ, corollis campanulatis æqualibus, genitalibus declinatis. Hort. Cliff. 135. *Lily Daffodil with many flowers in one cover, the petals equal and bell-shaped, and the stamina declined.* Lilio Narcissus polyanthos flore incarnato, fundo ex luteo albescente. Sloan. Cat. Jam. 115. *commonly called Belladonna Lily.*

6. AMARYLLIS (*Belladonna*) spâtha multiflorâ corollis campanulatis marginibus reflexis genitalibus declinatis. *Lily Daffodil with many flowers in one cover, the petals equal and bell-shaped, their borders turning backward, and declining stamina.* Lilium Americanum puniceo flore, Belladonna dictum. Par. Bat. 194. *commonly called Mexican Lily.*

7. AMARYLLIS (*Longifolia*) spathâ multiflorâ, corollis campanulatis æqualibus, scapo compresso longitudini umbellæ. Flor. Leyd. 36. *Lily Daffodil with many flowers in one cover, the petals equal, and the cover compressed the length of the umbel.* Lilium Africanum humile longissimis foliis polyanthos saturato colore purpurascens. Par. Bat. 195.

8. AMARYLLIS (*Zeylanica*) spathâ multiflorâ corollis campanulatis æqualibus, genitalibus declinatis scapo tereti ancipiti. Flor. Leyd. 36. *Lily Daffodil with many flowers in one cover, the petals equal, and the cover opening two ways.* Lilio Narcissus Zeylanicus latifolius flore niveo externè lineâ purpureâ striato. Hort. Amst. 1. 73. *commonly called the Ceylon Lily.*

9. AMARYLLIS (*Ciliaris*) spathâ multiflorâ, foliis ciliatis. Flor. Leyd. 37. *Lily Daffodil with many flowers in one cover, and the edges of the leaves hairy.* Lilio Narcissus sphæricus Æthiopicus foliis guttatis & cilii instar pilosis. Pluk. Alm. 220. *commonly called the African Scarlet Lily.*

10. AMARYLLIS (*Vernalis*) spathâ uniflorâ, corollâ æquali, staminibus erectis. *Lily Daffodil with one flower in a cover, with equal petals, and erect stamina.* Lilio Narcissus luteus vernus. Tourn. Inst. 386. *commonly called Spring yellow Lily Narcissus.*

11. AMARYLLIS (*Orientalis*) spathâ multiflorâ corollis inæqualibus foliis linguiformibus. Buttn. *Lily Daffodil with many flowers in a cover, whose petals are unequal, and leaves shaped like a tongue.* Lilio Narcissus Indicus maximus sphæricus floribus plurimis rubris liliaceis. Mor. Hist. 2. 268. *Brunswigia of Dr. Heister.*

12. AMARYLLIS (*Capensis*) spathâ triflorâ corollis campanulatis æqualibus gentialibus declinatis. *Lily Daffodil with three flowers in each cover, whose petals are equal and bell-shaped, with declining stamina.*

The first sort is very hardy, and increases very fast by offsets. The season for transplanting these roots is any time from May to the end of July, when their leaves are decayed, after which it will be too late to remove them; for they will begin to push out new fibres by the middle of August, or sooner if the season be moist, and many times they flower the beginning of September; so that if they are transplanted, it will spoil their flowering. This plant will grow in any soil or situation; but it will thrive best in a fresh, light, dry soil, and in an open situation; i. e. not under the dripping of trees, nor too near walls. It is commonly called by the gardeners, the Yellow Autumnal Narcissus, &c. and is usually sold by them with Colchicums, for autumnal ornaments to gardens; for which purpose this is a pretty plant, as it will frequently keep flowering from the beginning of September to the middle of November, provided the frost is not so severe as to destroy the flowers; for although there is but one flower in each cover, yet there is a succession of flowers from the same root, especially when they are suffered to remain three or four years unremoved. The flowers seldom rise above three or four inches high; they are shaped somewhat like the flowers of the large yellow Crocus; the green leaves come up at the same time, like the Saffron, and after the flowers are past, the leaves increase all the winter. The roots are bulbous, and shaped like those of the Narcissus, so are proper ornaments for such borders as are planted with Cyclamens, Saffron, Autumnal Crocus, Colchicums, and such low autumnal flowers.

The tenth sort is more rare in England than any of the other, at present. It was formerly in several curious gardens, but as it flowers at a season when there are so many finer sorts in beauty, it was neglected and cast out of the gardens, whereby it is almost lost in England: it grows naturally in Spain and Portugal, where it flowers early in January. This is as hardy as the first sort, and may be planted in the open borders, and treated in the same manner, excepting that this will not lose its leaves so soon, so should not be taken out of the ground to transplant, till the end of July, or beginning of August. It flowers in April or the beginning of May, but is not of long duration.

The second sort is a native of Virginia and Carolina, in which countries it grows very plentifully in the fields and woods, where it makes a beautiful appearance when it is in flower. The flowers of this sort are produced single, and at their first appearance have a fine Carnation colour on their outside; but fades away to a pale, or almost white, before the flowers decay. This plant is so hardy, as to thrive in the open air in England, provided the roots are planted in a warm situation, and on a dry soil; it may be propagated by offsets from the roots. The flowers of this sort are almost as large as those of the small Orange Lily, but do not grow above six or eight inches high; they appear the latter end of May, or beginning of June, and sometimes it flowers in August in this country.

The third sort, which is commonly called Jacobæa Lily, is now become pretty common in the curious gardens in England, the roots sending forth plenty of offsets, especially when they are kept in a moderate warmth in winter: for the roots of this kind will live in a good green-house, or may be preserved through the winter under a common hot-bed frame; but then they will not flower so often, nor send out so many offsets, as when they are placed in a moderate stove in winter. This will produce its flowers two or three times in a year, and is not regular to any season; but from March to the beginning of September, the flowers will be produced when the roots are in vigour. The stems of these flowers are produced from the sides of the bulbs, so that after the flowers produced on one side are decayed, there is another stalk arises from the other side of the bulb; but there is no more than one flower produced on the same stalk. The flowers are large, and of a very deep red; the under petals, or flower-leaves, are very large, and the whole flower stands nodding on one side of the stalk, making a beautiful appearance.

It is propagated by offsets, which may be taken off every year; the best time to shift and part these roots is in August, that they may take good root before winter; in doing of this, there should be care taken not to break off the fibres from their roots. They should be planted in pots of a middling size, filled with light kitchen-garden earth; and if they are kept in a moderate degree of warmth, they will produce their flowers in plenty, and the roots will make great increase.

The sixth sort, which is commonly called the Mexican Lily, is not so hardy as the former sort, so must be placed in a warm stove; and if the pots are plunged into a hot-bed of tanners bark, the roots will thrive better, and the flowers will be strong. This is increased by offsets, as the others of this tribe; and flowers usually the beginning of spring, when it makes a fine appearance in the stove: the flower-stems of this sort, seldom rise more than one foot high, each stem supports two, three, or four flowers, rarely more than that number. The flowers are large, and of a bright copper colour, inclining to red; the spatha, or sheath, which covers the buds before they open, divides into two parts to the bottom, standing on each side the umbel of flowers, joined to the small foot-stalks.

The eighth sort is also tender, and must be treated in the same manner as the sixth; this is more common in the gardens in Holland than in this country, and as it is a plant which increases but slowly, will not be very common here. This flowers usually in June and July, and sometimes the same root will flower again in autumn; for if the pots are plunged into a bed of tanners bark, the roots generally flower twice every year, but the flowers are not of long duration. This grows naturally in the West-Indies, from whence I have received roots and seeds.

The seventh and ninth sorts are more hardy, and may be treated in the same manner as the Jacobæa Lily; these will increase pretty fast by offsets, when they are properly managed, especially the ninth, which sends out many offsets, so as to fill the pots with roots, but it seldom flowers in England. The leaves of this are long and narrow, not much unlike those of the Snowdrop. The petals of the flower turn back like those of the Guernsey Lily, but are of a lighter colour, rather inclining to scarlet; the roots of this are small. The seventh sort usually flowers in winter, if the pots are placed in a moderate stove; and as at that season there are few flowers in the open air, these are more valuable on that account.

I received roots of both these sorts from the Cape of Good Hope, which have succeeded in the Chelsea garden. The seventh sort produces a great number of flowers in each umbel, which are of a deep purple colour, but the stalk which supports them, rarely rises more than three or four inches high; these flowers appear in December. The roots of this sort are very large, and the leaves are long, but narrow.

The eleventh sort is figured by Ferrarius in his Garden of Flowers, as also by Morrison in his History of Plants; but Dr. Heister has separated this from the genus, and has constituted a new genus by the title of Brunswigia, in honour to the duke of Brunswic. But although the shape of the flowers in this plant are different from most of the others of this genus, yet as there is a unformity in the characteristic notes of the genus, it should not be separated; for the Jacobæa Lily differs in the form of its flowers, from the other species, full as much as this, therefore might for the same reason be separated from this genus.

This grows naturally at the Cape of Good Hope, from whence I have received the roots, which have succeeded in the Chelsea garden. The bulbs of this sort are large and almost round, the leaves are long, broad, and rounded at their extremities; these spread two ways on the surface of the ground; and do not come up till after the flower-stem appears, which is generally in November; and after the flowers are past, the leaves increase till spring, and in May they begin to decay, so that from the middle of June to October, the roots are entirely naked of leaves.

The twelfth sort is also a native of Africa, I received the roots of this from the Cape of Good Hope with the former. This produces its flowers in February and March. The stems of this rise near two feet high, and have commonly but three flowers inclosed in each sheath, or cover. The flowers are as large as those of the Belladonna Lily, and are of the same form, growing erect, but of a deeper red colour; the leaves are long and narrow, and have a hollow furrow on their upper side, where there is a pale stripe running the length of the leaves, and are very like those of the American Pancratium. These leaves decay in summer, about the same time as those of the former, and appear again at the same season.

Both these sorts may be treated in the same manner, as hath been directed for the Jacobæa Lily, with this difference only, of placing these in winter in a stove, where there is a moderate share of warmth, for the roots of these will not endure so much cold as those, nor should they have so much water given them.

The best time to transplant these roots is about the beginning of August, when their leaves are quite decayed, before they put out new fibres, for it will be very improper to remove them afterwards.

All these bulbous-rooted flowers delight in a loose sandy earth, mixed with good kitchen-garden mould; and in the culture of them there should be but little water given them at those times when their leaves decay, and the roots are not in a growing state, for much moisture at that time will often cause them to rot; but when they are growing, and putting out their flower-stems, they should be frequently refreshed with water, but not given in too great quantities at a time. The pots, with the tender sorts, should constantly be kept in the stove; and in summer they should have as much free air as possible; for although some of these sorts may be kept abroad in summer, yet those do not thrive so well, nor flower so constantly, as those which are treated in the manner here described.

The fifth sort, which is called the Belladonna Lily, was brought to England from Portugal, where the gardens some years ago abounded with these flowers; for the roots increase very fast, especially in such countries where they live in the open air. The gardens in Italy have also great quantities of these flowers, especially about Florence; where, at the season of their flowering, they are commonly sold in the markets to adorn their rooms; the Italians call it Narcissus Belladonna. This plant thrives so well in Italy, as to need no other culture than the common Lily; and although it does not flower until August, yet it commonly produces good seeds in that country, from which they propagate them in great plenty; but with us they require more care, otherwise they cannot be preserved. The roots of this sort were generally planted in pots, and placed under a hot-bed frame, to screen them from the frost in winter; for as their green leaves come out in autumn, and continue growing all the winter, so when they are exposed to the frost, whereby their leaves are killed, the roots will be in danger of perishing; but if they should survive, they will be greatly weakened by it. With this culture the roots were preserved, but they did not constantly flower, nor put out many offsets, so that few gardens were furnished with this plant; and of late years the roots have been scarce in Portugal, for the Jacobæa Lily having been introduced into that country, has supplanted the other, in most of their gardens, so that the roots which have been brought from thence of late years for the Belladonna Lily, have proved the Jacobæa Lily.

The method in which I have cultivated this plant for some years past, with great success, is as follows. I prepared a border close to a south-west aspected wall, of about six feet wide, in the following manner, viz. I removed all the earth to the depth of three feet, then I put some very rotten dung in the bottom, six inches thick, upon which I laid light garden mould about twenty inches deep; after making this level, I placed the roots at six inches distance every way, and then covered them over with light sandy earth, to the height of the border, whereby the upper part of the roots were five or six inches buried, and in the winter I covered the border all over with rotten tanners bark, three inches deep, to prevent the frost from penetrating the ground; and when the frost was very severe, I laid some mats or straw over the leaves to protect them from being killed. With this management the roots have greatly increased, and have constantly flowered every year; some of them have put out two or three stems, which grew near three feet high, and produced many flowers in each umbel, which have made a fine appearance during the month of October. The green leaves come up soon after, and abide all the winter and spring until June, at which time they decay; soon after which the roots should be transplanted, for if they are let stand till July, they will have sent forth new fibres, when it will greatly injure the roots, if they are disturbed. If some of these roots are planted in a warm border, close to a south wall, and on a dry soil, they will thrive very well, especially if they are covered in severe frost; and these roots will flower much stronger

than

than those which are kept in pots, and will multiply faster.

The fourth sort is supposed to come originally from Japan, but has been many years cultivated in the gardens of Guernsey and Jersey; in both which places, they seem to thrive as well as if it was their native country; and from those islands their roots are sent annually to the curious in most parts of Europe, and are commonly called Guernsey Lilies. The roots of this plant are generally brought over in June and July; but the sooner they are taken out of the ground after their leaves decay, they are the better: for although the roots which are taken up when their flower-stems begin to appear, will flower, yet their flowers will not be so large, nor will their roots be near so good after, as those which were removed before they had sent out fresh fibres.

When these roots come over, they should be planted in pots filled with fresh, light, sandy earth, mixed with a little very rotten dung, and placed in a warm situation, observing now and then to refresh the earth with water: but by no means let them have too much wet, which would rot their roots, especially before they come up. About the middle of September, such of the roots as are strong enough to flower, will begin to shew the bud of their flower-stem (which is commonly of a red colour); therefore you should remove these pots into a situation where they may have the full benefit of the sun, and may be sheltered from strong winds: but by no means place them too near a wall, nor under glasses, which would draw them up weak, and render them less beautiful. At this season they should be gently refreshed with water, if the weather be warm and dry; but if it should prove very wet, they should be screened from it.

When the flowers begin to open, the pots should be removed under shelter, to prevent the flowers from being injured by too much wet: but they must not be kept too close, nor placed in a situation too warm, which would occasion their colour to be less lively, and hasten their decay. The flowers of this plant will continue in beauty (if rightly managed) a full month; and though they have no scent, yet, for the richness of their colour, they are justly esteemed in the first rank of the flowery tribe.

After the flowers are decayed, the green leaves will begin to shoot forth in length, and if sheltered from severe cold, will continue growing all the winter; but they must have as much free air as possible in mild weather, and covered only in great rains or frosts; for which purpose, a common hot-bed frame is the properest shelter for them; under which if they are placed, the glasses may be taken off constantly every day in dry open weather, which will encourage the leaves to grow strong and broad; whereas when they are placed in a green-house, or not exposed to the open air, they will grow long and slender, and have a pale weak aspect, whereby the roots will become weak, so that it seldom happens that they produce flowers under such management.

These roost should be transplanted every fourth or fifth year toward the latter end of June, or beginning of July, and planted into fresh earth (but they should not be oftener removed, for that would retard their flowering.) The offsets should also be taken off, and planted into several pots, which, in three years time, will produce flowers; so that after a person is once stocked with these roots, they may increase them, so as to have a supply of blowing roots, without being at the trouble or expence of sending to Guernsey every year for fresh roots; and the roots preserved here will flower stronger than those which are usually brought from thence, for the inhabitants of those islands are not very curious in cultivating them. Their usual method is to plant them at a great distance in a bed of common earth, where they let them remain for many years: in which time they produce such a number of offsets, that many times one single cluster has contained above a hundred roots; by which means, those which grow on the inside are so much compressed by the outer roots, that they are perfectly flatted; and from the number of roots growing in each cluster, they are all rendered weak, and unfit to produce such large stems of flowers, as those which have grown single, and are of a spherical figure.

But when a person is possessed of a large number of these roots, it will be troublesome to preserve them in pots, therefore there should be a bed prepared of the following earth, in some well sheltered part of the garden, viz. Take a third part of fresh virgin earth from a pasture ground, which is light, then put near an equal part of sea sand, to which you should add rotten dung, and sifted lime rubbish, of each an equal quantity. With this earth (when well mixed and incorporated) you should make your bed about two feet thick, raising it about four or five inches above the surface of the ground, if the situation be dry; but if the ground be wet, it should be raised eight or nine inches higher. In this bed, about the beginning of July (as was before directed), you should plant the roots about six or eight inches asunder each way; and in the winter, when the frost begins, you should either cover the bed with a frame, or arch it over, and cover it with mats and straw, to prevent their leaves from being pinched with cold; but in the spring the covering may be entirely removed, and the bed kept constantly clear from weeds, during the summer, observing to stir the surface of the earth now and then; and every year, when the leaves are decayed, you should shift a little fresh earth over the beds, to encourage the roots. In this bed the roots may remain until they are strong enough to produce flowers, when they may be taken up and planted in pots, as was before directed, or suffered to remain in the same bed to flower.

The roots of these plants do not flower again the succeeding year (as in many other sorts of bulbs;) but if their bulbs contain two buds in their center, as is often the case, they very often flower twice within the compass of three years; after which, the same individual root does not flower again in several years, but only the offsets from it.

AMBROSIA [so called from ἀ privative and βροτὸς mortal,] because feigned by the poets to be the food of the gods.

The CHARACTERS are,

*It hath male and female flowers on the same plant. The male flowers are composed of many florets, which are included in one common empalement of one leaf, which is plain, and extended the length of the florets: each floret is of one leaf, funnel-shaped, and cut into five parts at the brim; in the center is situated the five small stamina, which are crowned with pointed erect summits. The female florets are placed under the male in the same spike; these have an empalement of one leaf, which is pointed and permanent: they have no petals, but an oval germen placed in the bottom of the empalement, supporting a slender style, crowned with two long hairy stigma. The germen afterward becomes an oval hard capsule with one cell, crowned with the acute segments of the empalement, and inclosing one roundish seed.*

This genus of plants, is by Dr. Linnæus ranged in the fifth division of his twenty-first class, entitled Monœcia Pentandria, from their having male and female flowers in the same plant, and the male flowers having five stamina.

The SPECIES are,

1. AMBROSIA (*Maritima*) foliis multifidis racemis solitaris pilosis. Lin. Sp. Plant. 988. *Ambrosia with leaves divided into many parts, and single hairy spikes of flowers.* Ambrosia maritima. C. B. P. Sea Ambrosia.

2. AMBROSIA (*Elatior*) foliis bipinnatifidis, racemis paniculatis terminalibus glabris. Hort. Upsal. 284. *Ambrosia with double winged leaves, a smooth loose spike of flowers growing at the extremity of the branches.* Ambrosia maritima foliis artemisiæ inodoris elatior. H. L. 32.

3. AMBROSIA (*Trifida*) foliis trilobis & quinquelobis serratis. Lin. Sp. 988. *Ambrosia with leaves having three and five lobes,*

*lobes, which are sawed on their edges.* Ambrosia Virginiana maxima, platani orientalis folio. Mor. Hist. 3. p. 4.

4. Ambrosia (*Artemisifolia*) foliis bipinnatifidis primoribus ramulorum indivisis integerrimis. Lin. Sp. Plant. 988. *Ambrosia with double winged leaves, and the younger branches having entire leaves.* Ambrosia maxima inodora marrubii aquatici foliis tenuiter laciniatis Virginiana. Pluk. Alm. 27. tab. 10.

5. Ambrosia (*Arborescens*) foliis pinnatifidis hirsutis racemis solitariis terminalibus, caule fruticoso perenne. *Ambrosia with hairy winged leaves, single spikes of flowers growing at the extremity of the branches, and a shrubby perennial stalk.*

The first sort grows naturally in Cappadocia, &c. near the sea shore; this rises about two feet and a half high, sending out branches, garnished with leaves divided into many parts, and upon being handled emit a strong odour. The spikes of flowers are produced from the wings of the stalks, which are long, single, and hairy; the upper part being furnished with many male flowers, and the lower part with female flowers; these grow close to the stalk. After the flowers are past, the female flowers are succeeded by hard leafy capsules having one cell, in which is included a single round seed. This is an annual plant, which seldom perfects its seeds in England, unless the plants are brought forward in the spring; therefore the seeds should be sown in the autumn in a warm border, and when the plants come up in the spring, they should be transplanted into another warm border of poor ground; for when these plants are put into rich moist land, they grow very luxuriantly, so do not flower till late in the season. Therefore the best method to obtain good seeds, is to plant some of the plants in lime rubbish, to prevent their luxuriant growth, which will cause them to flower early, whereby good seeds may be obtained.

If the seeds ripen and are permitted to scatter, the plants will come up the following spring without care; for when the seeds are sown in the spring, the plants seldom come up the same year, but will remain in the ground a year before they vegetate. There is not much beauty in this plant, so it is not often admitted to have a place in gardens, except in those where a variety of plants are preserved.

The second sort grows naturally in the islands of America, as also in Carolina and Virginia; from the two latter countries I have frequently received the seeds, and in the tubs of earth which came with plants from the former, the plants have come up in plenty, so is undoubtedly a common weed there. This grows more than three feet high, dividing into many branches; garnished with winged leaves in shape like those of Mugwort; at the extremity of each branch, the loose spikes of flowers are produced, composed of one long spike in the middle, and three or four shorter lateral spikes: these are smooth, and have male and female flowers ranged in the same manner as the former; the female flowers are succeeded by seeds of the same shape.

This sort will come up and thrive in the open air in England, but the plants so raised will not produce good seeds, unless the season is warm; therefore to obtain them every year, it is necessary to cultivate them in the following manner.

The seeds of this plant should be sown on a moderate hot-bed in March, and when the plants are come up two inches high, they must be transplanted into another moderate hot-bed, allowing each plant three or four inches square; observing to water them pretty well, and shade them until they have taken new root; afterward they must have a large share of fresh air every day, when the weather is warm, and frequent waterings, for they are very thirsty plants. When the plants are grown pretty strong, they must be taken up with balls of earth to their roots, and planted in large pots filled with light earth; and if they are placed on a very moderate hot-bed until they are well rooted, it will greatly forward their flowering. Toward the latter end of May they should be placed abroad with other hardy annual plants, among which they will make a variety. These will flower in July, and their seeds ripen in September.

The third sort is a native of North America, where it is a very common weed. This often grows eight or ten feet high; and if it is planted in a rich moist soil, or is often watered, it will grow much higher, and spread out into many branches. The seeds of this plant, when sown in the spring, seldom come up the first year, but frequently remain in the ground until the following spring; so that when the plants do not come up, the ground must not be disturbed till after the spring following. When the plants come up, some of them may be transplanted into a moist rich soil, allowing them at least four or five feet room every way; if they are frequently watered in dry weather, they will grow to a large size; but their branches must be supported by stakes, otherwise they are very subject to break with strong winds. The flowers of this plant are not more conspicuous than those of the Hemp, to which these are near akin; therefore are only preserved by such persons as are curious in botany, for the sake of variety. If the seeds of this sort ripen and are suffered to scatter, the plants will come up the following spring, provided the ground is not disturbed; or if the seeds are sown in autumn, the plants will come up the following spring, and may be treated as above.

The fourth sort grows naturally in North America, from whence I have frequently received the seeds. This divides into many branches, the lower part of which are garnished with whole leaves, but the upper part hath compound leaves resembling those of the second sort; the spikes of flowers are produced from the wings of the stalks, in which this differs from the second. This may be treated in the same manner as the second sort.

The fifth sort is a native of Peru, from whence the younger Jussieu sent the seeds to the royal garden at Paris, and by the generosity of his brother Dr. Barnard de Jussieu, I was favoured with this plant, which has succeeded in the Chelsea garden, where it annually perfects its seeds.

This grows to the height of ten or twelve feet, with a woody stem, dividing into several branches, garnished with hairy leaves, composed of several winged lobes, and are placed alternately upon the branches; the spikes of flowers are single, hairy, and are produced at the extremity of the branches. The female flowers (which are situated below the male, on the same spikes) grow in small clusters, at separate distances, each having two long narrow segments of the empalement, which rise above the capsule or seed vessel.

This is a perennial plant, and may be propagated by cuttings or seeds; if by the former, they should be planted in a shady border, in either of the summer months; these will require to be frequently watered: in a month or five weeks they will have good roots, therefore should then be taken up and potted; for when they are left longer in the full ground, they will grow very luxuriant, and not so soon recover their removal, as those which are transplanted earlier. These plants are hardy, so may be exposed to the open air in summer; and in the winter, if they are sheltered in a common green-house, with Myrtles and other hardy exotic plants, they will live several years. In mild winters, the roots of this plant have lived in the full ground in a warm border, without any covering, but hard frost will kill them.

The seeds of this sort seldom come up the same year, when they are sown in spring, but those which have fallen in the autumn, have grown the following year, and so have those which have been sown at the same season.

AMELANCHIER. See Chionanthus.

AMELLUS, Star-flower.

The Characters are,

*The common flower-cup is round and scaly; the flower is of the compound radiated kind; the hermaphrodite flowers compose*

*compose the disk, and the female the rays: the hermaphrodite are tubulous, with five segments; the female are tongue-shaped, divided into two or three segments; the first have five short stamina, an oval germen with a slender style, and two stigmas; the female are like them. The flower-cup afterward contains one oval seed, crowned with hairy down.*

This genus of plants is ranged by Dr. Linnæus in the second section of his ninteenth class; the flowers of this section are composed of hermaphrodite florets in the center, and female in the circumference.

The Species are,

1. Amellus (*Lychnitis*) foliis oppositis lanceolatis obtusis, pedunculis unifloris. Lin. Sp. 1276. *Star-flower with spear-shaped obtuse leaves placed opposite, and one flower on each foot-stalk.*

2. Amellus (*Umbellatus*) foliis oppositis triplinerviis subtus tomentosis, floribus umbellatus. Amœn. Acad. 5. p. 407. *Star-flower with opposite leaves having three veins, and flowers in umbels.*

The first sort grows naturally at the Cape of Good Hope. It rises from two to three feet high, sending out branches on every side, garnished with spear-shaped leaves placed opposite, terminated by flower-stalks, each supporting one Violet-coloured flower, with a yellow disk, shaped like those of the Aster, which appear in July or August.

This is a perennial plant, which is easily propagated by cuttings, which, if planted in shade during any of the summer months, and duly watered, will put out roots; these should be taken up with balls of earth to their roots, and planted in pots, that they may be sheltered in winter, either under a common frame, or in a green-house, where they may have plenty of air in mild weather, otherwise they will draw up weak and have little beauty.

The second sort grows naturally in Jamaica; this hath hoary stalks which rise two feet high, sending out side branches, which are garnished with oval leaves placed opposite; the flowers which terminate the branches grow in small umbels, but these have little beauty. It may be propagated by seeds, which should be sown on a hot-bed in the spring; when the plants are fit to remove, two or three of them should be planted in pots, then plunged into a hot-bed of tan, to bring them forward to get ripe seeds in the autumn, otherwise the plants will require a stove in winter.

AMENTACEOUS flowers [of *Amentum, Lat.* a string, thong, or latchet] are such as have an aggregate of summits, hanging down in form of a rope, or cat's tail, which is also called an Iulus; as in Willows, Walnuts, Poplars, &c.

AMETHYSTEA. Lin. Gen. 32. Amethystina. Amman. Haller. Amethyst.

The Characters are,

*The flower hath a permanent bell-shaped empalement of one leaf, cut into five equal pointed segments at the brim; the flower is of one leaf, of the lip kind, divided into five unequal parts at the top; the upper leaf is erect, roundish, concave, and cut into two; the lower lip is cut into three parts, the middle segment being concave and of the same length with the upper lip, but the two side segments are shorter and erect. It hath two slender stamina, which stand under the upper lip, but are longer; these are crowned with roundish summits. In the center is situated a quadrifid germen, supporting a single style, crowned with two acute stigma: after the flower is past, the germen becomes four naked seeds, shut up in the empalement.*

This genus of plants is by Dr. Linnæus ranged in his second class of plants, entitled Diandria Monogynia, the flower having two stamina and one style.

We know but one Species of this genus, viz.

Amethystea. Hort. Upsal. 9. Amethystina montana erecta foliis exiguis digitatis trifidis serratis, flosculis cum comâ è cœruleo-janthinis. Amman. Ruth. 4. i. e. *Mountain upright Amethyst, with small, trifid, sawed leaves, and the heads and flowers of a jacinth blue.*

This plant is a native of the mountains in Siberia, from whence the seeds were sent to the imperial garden at Petersburgh, where the plants flourished and perfected their seeds, part of which were sent me by the late Dr. Amman, which grew in the Chelsea garden, where the plants annually produce seeds.

It is an annual plant with an upright stalk, which rises about a foot high; toward the top it puts out two or three small lateral branches, garnished with small trifid leaves, sawed on their edges, of a very dark green colour; at the extremity of the branches the flowers are produced in small umbels; they are of a fine blue colour, as are also the upper part of the branches, and the leaves immediately under the umbel; so that although the flowers are small, yet from their colour with those of the upper part of the stalks, the plants make a pretty appearance, during their continuance in flower. If the seeds of this plant are sown in the autumn, or are permitted to scatter, the plants will come up early the following spring, and these will flower the beginning of June; but those which are sown in the spring, will not flower till July; and in dry seasons, the seeds will remain in the ground a whole year, so that the best time for sowing them is in the autumn.

When the plants come up, they will require no other care but to keep them clean from weeds, and where they are too close to thin them; for they do not thrive when transplanted, therefore the seeds should be sown where they are to remain.

AMMANNIA. Houst. Nov. Gen. Lin. Gen. Plant. 144.

The Characters are,

*It hath a bell-shaped, oblong, erect, permanent empalement, having four angles, and divided at the brim into eight slender parts. The flower hath no petals, but four slender stamina which are as long as the empalement in which they are inserted. These are crowned with double summits. In the center is situated a large round germen, supporting a short style crowned with a stigma; the empalement afterward becomes a round capsule with four cells, which are filled with small seeds.*

This genus is by Dr. Linnæus ranged in his fourth class of plants, entitled Tetrandria Monogynia, the flower having four stamina and one style.

The Species are,

1. Ammannia (*Latifolia*) foliis semiamplexicaulibus, caule tetragono. Hort. Cliff. 344. *Ammannia with a square stalk, and leaves embracing it half round.* Ammannia palustris, caule quadrangulari foliis angustis. Houst. MSS.

2. Ammannia (*Ramosior*) foliis subpetiolatis caule ramosa. Lin. Sp. Plant. 120. *Ammannia with leaves having short foot-stalks and a branching stalk.* Ludvigia aquatica erecta caule rubente, foliis ad genicula binis longis angustis hyssopi instar flore tetrapetalo albo. Clayt.

3. Ammannia (*Baccifera*) foliis subpetiolatis capsulis calyce majoribus coloratis. Lin. Sp. Plant. 120. *Ammania whose leaves have short foot-stalks, and a coloured seed-vessel larger than the flower-cup.*

The first sort grows naturally in moist places in Jamaica, from whence Dr. Houston sent the seeds to England, which succeeded at Chelsea, and have from thence been distributed to most of the botanic gardens in Europe.

It grows about a foot and a half high, with an upright square stalk, and long narrow leaves set in form of a triangle, whose base half surrounds it; these grow the whole length of the stem. They are of a pale green, and of the consistence of those of Purslane; the stalks are also succulent, and of the same colour with those of that plant. The flowers come out in whorles round the stalks, at the joints where the leaves adhere, in clusters: these have no petals, so make no great appearance, and are soon succeeded by round seed-vessels, which are full of small seeds.

The plant must be raised on a hot-bed in the spring, and afterward removed to another hot-bed to bring it forward. When the plants have acquired strength, they should be transplanted into pots filled with rich

light earth, and placed under a frame, obſerving to ſhade them till they have taken freſh root; then they ſhould be placed in a glaſs-caſe or ſtove to ripen their ſeeds, for the plants are too tender to thrive in the open air in this country, unleſs the ſummer proves very warm.

The ſecond ſort grows naturally in Virginia and Carolina; this is an annual plant, which riſes about a foot high, with red ſucculent ſtalks, putting out ſide branches, which grow oppoſite: the flowers are produced ſingle from the wings on the lower part of the branches, but toward the top they are in cluſters; theſe have no beauty, ſo are only preſerved in botanic gardens for the ſake of variety. This ſort will perfect its ſeeds in the open air, if the plants are raiſed on a hot-bed in the ſpring, and planted in a warm border.

The third ſort grows naturally in China; this is a very low plant, ſeldom riſing more than three inches high; the leaves are placed oppoſite on the branches, and the flowers grow in whorles from the wings of the ſtalk. As this plant has little beauty, it is rarely preſerved in gardens. It muſt be raiſed on a hot-bed in the ſpring, and treated in the ſame manner as the firſt ſort, with which management the ſeeds will ripen in England.

AMMI [Ἄμμι, *Gr.*] Biſhops-weed.

The CHARACTERS are,

*It is an umbelliferous plant; the great umbel is compoſed of many ſmaller, which are diſpoſed like rays. The outer involucrum is compoſed of many narrow-pointed leaves, which are almoſt the length of the umbel. The ſmall umbels have a ſhort many-leaved involucrum. The flowers are difform, each having five petals, which are heart-ſhaped; thoſe in the outer rays being large and unequal in ſize, but thoſe in the center, which compoſe the diſk, are nearly equal. The flowers have five ſlender ſtamina, which are crowned with roundiſh ſummits. In the center of the empalement is ſituated the germen, ſupporting two reflexed ſtyles, crowned with obtuſe ſtigma. The germen afterward becomes a ſmall, round, ſtriated fruit, compoſed of two ſeeds, which are plain within and convex on their outſide.*

This genus of plants is by Dr. Linnæus ranged in the ſecond ſection of his fifth claſs, entitled Pentandria Digynia, the flowers having five ſtamina and two ſtyles.

The SPECIES are,

1. AMMI (*Majus*) foliis inferioribus pinnatis lanceolatis ſerratis, ſuperioribus multifidis linearibus. Hort. Upſal. 59. *Biſhops-weed with under leaves, which are winged, ſpear-ſhaped, and ſawed, and the upper leaves are divided into many narrow ſegments.* This is the Ammi majus. C. B. P. 159. And the Ammi vulgare. Dod. p. 415. *Common Biſhops-weed.*
2. AMMI (*Glaucifolium*) foliorum omnium lacinulis lanceolatis. Guett. 2. p. 433. i. e. *Biſhops-weed with all its leaves cut in ſhape of a ſpear.* Ammi petræum glaucifolium perenne. Mor. Hiſt. 3. p. 295.

The firſt ſort is annual; of this there is a variety, which is mentioned by John Bauhin as a diſtinct ſpecies, under the title of Ammi majus foliis plurimum inciſis & nonnihil criſpis; but I have frequently had this variety ariſe from the ſeeds of the former, ſo I have not enumerated it as a different ſort.

This plant is propagated by ſeeds, which ſhould be ſown in the autumn in the place where it is to remain; and in the ſpring, the ground ſhould be hoed to cut up the weeds, and alſo to thin the plants in the ſame manner as is practiſed for Carrots, leaving them four or five inches aſunder; or if the ground is good where they grow, they muſt be left at leaſt ſix inches, for they will grow large and cover the ground; after this they will require no farther care, but to keep them clean from weeds. In June they will flower, and their ſeeds will ripen in Auguſt, which ſhould be gathered as it ripens, otherwiſe it will ſoon ſcatter. Theſe ſeeds are uſed in medicine, ſo may be had in plenty with this management; for it will grow in any ſituation that is open, but thrives beſt on light ſandy land. When the ſeeds are ſown in the ſpring, they ſeldom come up the ſame year; and if they ſhould, thoſe plants will be weak and produce few ſeeds.

The ſecond ſort is a perennial plant, which is preſerved in botanic gardens for variety, but having little beauty, is rarely admitted into other gardens. It may be propagated by ſeeds, which ſhould be ſown in the autumn, becauſe thoſe ſown in the ſpring, ſeldom come up the ſame year. It will grow in any open ſituation, is very hardy, and thrives beſt on a moiſt ſoil.

AMMI PERENNE. See SIUM.

AMOMUM. Lin. Gen. Plant. 2. Zinziber. C. B. P. 35. Ginger.

The CHARACTERS are,

*The flowers are collected into a ſcaly ſpike, each having a double (ſpatha) or ſheath; the outer ſheath looſely covers the ſcale, and the inner encompaſſes the tube of the flower with the parts of generation: the flower is of one leaf, tubulous below, but divided into three parts at the brim, the middle ſegment being longer and broader than the others. In the boſom of the flower is ſituated an oblong thick nectarium. From the tube of the flower ariſes two ſlender ſtamina, which are crowned with thick ſhort ſummits. Under the receptacle of the flower is placed the round germen, ſupporting a ſingle ſtyle, which is as long as the tube of the flower, crowned with a hairy ſtigma. The germen afterward becomes an oval three-cornered ſeed-veſſel, opening in three parts, containing ſeveral ſeeds.*

This genus of plants is by Dr. Linnæus ranged in his firſt claſs, entitled Monandria Monogynia; but it more properly belongs to his ſecond, for the flowers of this have two ſtamina, one of which is joined to the upper ſegment of the flower, and this ſoon loſes it ſummits, ſo appears to be only a ſegment. This I have conſtantly found in all the flowers which I have examined; the flowers have but one ſtyle.

The SPECIES are,

1. AMOMUM ſcapo nudo ſpicâ ovato. Hort. Cliff. 3. *Amomum with a naked ſtalk and oval ſpike of flowers.* Zinziber. C. B. P. 35. *Ginger.*
2. AMOMUM ſcapo nudo ſpicâ oblongâ obtuſâ. Hort. Cliff. 3. *Amomum with a naked ſtalk and an oblong blunt flower-ſpike.* Zinziber latifolium ſylveſtre. Hort. Lugd. 636. *Broad-leaved wild Ginger, called Zerumbet.*
3. AMOMUM ſcapo bracteis alternis laxis, caule foliorum altiſſimo. *Amomum with flower-ſtalks looſely branching alternately, and very tall leaf-ſtalks.*

The firſt, which is the common Ginger, is cultivated for ſale in moſt of the iſlands of America, but is a native of the Eaſt-Indies, and alſo of ſome parts of the Weſt-Indies, where it is found growing naturally without culture. The dried roots of this ſort furniſh a conſiderable export from the Britiſh colonies in America. The roots are of great uſe in the kitchen, as alſo in medicine; and the green roots preſerved as a ſweatmeat, are preferable to every other ſort.

The roots of this ſort are jointed, and ſpread in the ground; theſe put out many green reed-like ſtalks in the ſpring, which riſe to the height of two feet and a half, garniſhed with long narrow leaves, cloſely embracing the ſtalks at their baſe. The flower-ſtems afterward ariſe by the ſide of theſe, immediately from the root; theſe are naked, ending with an oblong ſcaly ſpike; from each of theſe ſcales is produced a ſingle blue flower, whoſe petals are but little longer than the ſquamoſe covering. The flowers appear in September, and in about a month after the ſtalks entirely decay, ſo that the roots remain inactive three or four months.

The ſecond ſort grows naturally in India; the roots of this are much larger than thoſe of the firſt, but are jointed in the ſame manner. The ſtalks grow from three, to near four feet high, garniſhed with oblong leaves, placed alternately, and embrace the ſtalks at their baſe. The flower-ſtems ariſe immediately from the root; theſe are terminated by oblong, blunt, ſcaly heads; out of each ſcale is produced a ſingle white flower, whoſe petals extend a conſiderable length beyond

beyond their ſcaly covering. Theſe appear in September, and in November all the ſtalks periſh in the ſame manner as the Ginger.

The third ſort hath thick fleſhy roots, reſembling thoſe of the large Flag Iris; in the ſpring theſe ſend forth many green reed-like ſtalks, which riſe to the height of ſeven or eight feet, garniſhed with very long narrow leaves, ſet alternately, cloſely embracing them at their baſe. The ſtalks decay entirely in autumn, and new ariſe from the roots in the ſpring, but it hath not produced any flowers as yet in England, though the roots thrive and increaſe greatly where they are properly managed.

All theſe ſorts are tender, and require a warm ſtove to preſerve them in this country. They are eaſily propagated by parting of their roots; the beſt time for doing this is in the ſpring, before they put out new ſhoots; for they ſhould not be tranſplanted in ſummer when they are in full vigour, nor do they ſucceed ſo well when they are removed in autumn, becauſe they remain long after in an inactive ſtate; and during that time, if wet comes to the roots, it often cauſes them to rot. When the roots are parted, they ſhould not be divided into ſmall pieces, eſpecially if they are deſigned to have flowers; for until the roots have ſpread to the ſide of the pots, they rarely put out flower-ſtems, for which reaſon they ſhould not be planted in very large pots.

Theſe plants thrive beſt in a light rich earth, ſuch as may be found in the kitchen-garden; with this the pots ſhould be filled within two inches of the top, then the roots ſhould be placed in the middle of the pots, obſerving that their crowns are upwards, and the pots filled up with the ſame rich earth; after this the pots ſhould be plunged into a hot-bed of tanners bark, and muſt be ſparingly watered, until their ſtalks appear above ground, when they will require a greater ſhare of moiſture, eſpecially during the warm ſummer months; but in autumn the waterings muſt not be often, nor in great plenty; and during the winter ſeaſon, when the roots are inactive, very little water ſhould be given them. The pots with theſe roots ſhould conſtantly remain plunged in the tan-bed, for if they are taken out and placed on ſhelves in the ſtove, their fibres frequently ſhrink, which often occaſions the roots to decay.

With this management all theſe ſorts have multiplied greatly with me, and the common Ginger has produced roots which have weighed five or ſix ounces, but the others have been near a pound weight.

AMOMUM PLINII. See Solanum.

AMORIS POMUM. See Lycopersicon.

AMORPHA. Lin. Gen. Plant. 768. Baſtard Indigo.

The Characters are,

*The flower hath a permanent empalement of one leaf, which is tubulous, cylindrical, and cut into five ſmall obtuſe parts at the brim. The flower is of the butterfly kind; the upper petal, or ſtandard, is ſmall, concave, and erect; this is inſerted between the two upper ſegments of the empalement. It hath ten ſtamina, joined at their baſe, of unequal lengths, and crowned with ſummits; in the center is ſituated a roundiſh germen, ſupporting an awl-ſhaped ſtyle, which is the length of the ſtamina, and crowned with a ſingle ſtigma; the germen afterward becomes a reflexed moon-ſhaped pod, having one cell, in which are lodged two kidney-ſhaped ſeeds.*

This genus is by Dr. Linnæus ranged in his ſeventeenth claſs of plants, entitled Diadelphia Decandria; the flowers of this claſs have ten ſtamina, nine of which are joined, and one ſtands off.

We know but one Species of this genus, viz.

Amorpha (*Fruticoſa*). Hort. Cliff. 353. *Baſtard Indigo.* Barba Jovis Americana pſeudoacaciæ foliis floſculis purpureis minimis. Cat. Hort. Chelſ. 11.

This ſhrub grows naturally in Carolina, where formerly the inhabitants made a coarſe ſort of Indigo from the young ſhoots, which occaſioned their giving it the title of Baſtard Indigo.

It riſes with many irregular ſtems, to the height of twelve or fourteen feet, garniſhed with very long winged leaves, in ſhape like thoſe of the common Acacia. At the extremity of the ſame year's ſhoots, the flowers are produced in long ſlender ſpikes, which are ſmall, and of a deep purple colour; the ſtamina ſtand out beyond the petals, and are crowned with yellow ſummits; after the flowers are paſt, the germen turns to a ſhort pod, having two kidney-ſhaped ſeeds, but theſe do not ripen in England.

The ſeeds of this plant were ſent to England from Carolina, by Mr. Mark Cateſby, F. R. S. in 1724, from which many plants were raiſed in the gardens near London; theſe were of quick growth, and many of the plants produced flowers in three years. At preſent it is become very common in all the gardens and nurſeries, where it is propagated as a flowering ſhrub, for the ornament of the ſhrubbery. It is generally propagated by ſeeds, which are annually ſent to England from different parts of America; for it is found in many of the northern colonies there, and it may alſo be propagated by laying down of the young branches, which in one year will make good roots, and may then be taken off and planted either in the nurſery, or the places where they are deſigned to remain. If they are put into a nurſery, they ſhould not remain there more than one year; for as the plants make large ſhoots, they do not remove well when they have remained long in a place: they muſt have a ſheltered ſituation, otherwiſe their branches will be broken by the winds. As theſe ſhoots are large and ſoft, their upper parts are generally killed by froſt in winter, but they put out ſhoots again in plenty below the dead part the ſpring following.

AMPHITHEATRE [Ἀμφιθέατρον of ἀμφὶ, around, and θεάομαι, to view, *Gr.*] or temples of view erected on a double riſing, were eſteemed great ornaments to a large and noble garden. If this hill, or riſing ground, is of a ſemicircular figure, it will be ſtill the better.

Theſe amphitheatres are ſometimes formed of Evergreens, as Hollies, Phillyreas, Lauruſtinuſes, Bays, &c. obſerving to plant the ſhorteſt growing ſhrubs in the front, and the talleſt trees behind, as Pines, Firs, Cedars of Lebanon, &c.

They are alſo formed of ſlopes on the ſides of hills, and covered with turf, but are now generally excluded by all perſons of true taſte; for the natural eaſy ſlope of ſuch hills, is infinitely more beautiful than the ſtiff angular ſlopes into which theſe amphitheatres are commonly cut.

AMYGDALUS. Lin. Gen. Plant. 545. [Ἀμύγδαλος, *Gr.*] The Almond-tree.

The Characters are,

*It hath a tubulous empalement of one leaf, which is cut at the brim into five obtuſe ſegments; the flower hath five oval, obtuſe, concave petals, which are inſerted in the empalement; in the center of the outer flower is ſituated a roundiſh hairy germen, ſupporting a ſingle ſtyle the length of the ſtamina, which is crowned by a round ſtigma; this is attended by a great number of ſlender erect ſtamina, which in many ſpecies are not ſo long as the petals of the flower, theſe are crowned with ſlender ſummits. After the flower is paſt, the germen becomes an oval, compreſſed, large fruit, with a thin, tough, hairy covering, having a longitudinal furrow; this opens and falls away, leaving an oval compreſſed nut, which is furrowed and netted, incloſing a ſingle ſeed of the ſame form.*

Dr. Linnæus has joined to this genus the Perſica, or Peach-tree, making them only different ſpecies, ranging it in his twelfth claſs, entitled Icoſandria Monogynia; the flowers having from twenty to thirty ſtamina, which are inſerted to the empalement.

The Species are,

1. Amygdalus (*Communis*) foliis petiolatis ſerratis petalis florum emarginatis. *Almond-tree with ſawed leaves, having foot-ſtalks, and the petals of the flower indented.* Amygdalus ſativa. C. B. P. 441. *Common Almond-tree.*

2. Amygdalus (*Dulcis*) foliis petiolatis marginibus crenatis, corollis calyce vix longioribus. *Almond-tree with*

*with crenated leaves, having foot-ſtalks, and the petals of the flowers no longer than the empalement.* Amygdalus dulcis putamine molliori. C. B. P. 441. *Commonly called Jordan Almond.*

3. Amygdalus (*Sativus*) foliis lineari-lanceolatis acuminatis, marginibus crenatis. *Almond-tree with pointed, narrow, ſpear-ſhaped leaves, crenated on their edges.* Amygdalus ſativa flore albo.

4. Amygdalus (*Orientalis*) foliis lanceolatis integerrimis, argenteis perennantibus petiolo breviore. *Almond-tree with ſpear-ſhaped ſilvery leaves, which are entire, and continue all winter, and very ſhort foot-ſtalks.* Amygdalus Orientalis foliis argenteis ſplendentibus. Du Hamel.

5. Amygdalus (*Nana*) foliis petiolatis ſerratis baſi attenuatis. *Almond with ſawed leaves, which are narrowed at the foot-ſtalk.* Amygdalus Indica nana. Pluk. Alm. 28. tab. 11. *Dwarf Almond with ſingle flowers.*

The firſt is the common Almond, which is cultivated more for the beauty of its flowers, than for its fruit. There are two varieties of this, one with ſweet, the other bitter kernels, which often ariſe from the fruit of the ſame tree.

The ſecond ſort is commonly known by the title of Jordan Almonds; the nuts of this kind are frequently brought to England; theſe have a tender ſhell, and a large ſweet kernel. The leaves of this tree are broader, ſhorter, and grow much cloſer than thoſe of the common ſort, and their edges are crenated. The flowers are very ſmall, and of a pale colour, inclining to white. I have ſeveral times raiſed theſe trees from the Almonds which came from abroad, and always found the plants to maintain their difference from the common Almond.

The third ſort hath narrow ſharp-pointed leaves, which are ſawed on their edges; the flowers are much ſmaller than thoſe of the common Almond, and are white; the ſhoots of this tree are ſmaller, and the joints cloſer than thoſe of the common ſort, nor is the tree ſo hardy, therefore ſhould have the advantage of a warm ſituation, otherwiſe it will not thrive. This ſort flowers early in the ſpring, and rarely produces fruit in England. But from an old tree which grew againſt a ſouth-weſt aſpected wall, I have ſome years had the fruit ripe, which were well flavoured, but their kernels were ſmall.

The fourth ſort was found growing near Aleppo, from whence the fruit was ſent to the duke D'Ayen in France, who raiſed ſeveral of the plants in his curious garden at St. Germains, and was ſo good as to ſend me a ſhare of them, which are flouriſhing in the Chelſea garden, where they have endured the open air for ſome years, againſt a wall, without any covering. The leaves of this tree are ſilvery, and very like thoſe of the Sea Purſlane. Theſe continue moſt of the year; the flowers are very ſmall, and have not been ſucceeded by fruit yet in England. I can give no farther account of its difference from the other ſorts.

The fifth ſort is very common in the nurſeries about London, and is uſually ſold with other flowering ſhrubs to adorn gardens: this ſeldom riſes more than three feet high, ſending out many ſide branches. The roots of this are very ſubject to put out ſuckers, by which it may be increaſed in plenty, but if theſe are not annually taken away, they will ſtarve the old plants. As theſe ſuckers are very apt to creep at the root, and put out ſuckers again, thoſe plants which are propagated by layers are much preferable. This ſhrub flowers in April, at which time all the young ſhoots are covered with flowers, which are of a Peach bloſſom, and make a fine appearance when intermixed with ſhrubs of the ſame growth.

The common Almond is cultivated in all the nurſeries, and the trees are generally planted for the beauty of their flowers. Theſe often appear in February, when the ſpring is forward, but if froſt comes after, the flowers are ſoon deſtroyed, ſo that their beauty is of ſhort duration, and in ſuch ſeaſons there are few of the Almonds which bear fruit; whereas, when the trees do not flower till March, they ſeldom fail to bear plenty of fruit, many of which will be very ſweet, and fit for the table when green, but they will not keep long.

They are propagated by inoculating a bud of theſe trees into a Plumb, Almond, or Peach ſtock, in the month of July (the manner of this operation ſee under the article of Inoculation). The next ſpring, when the buds ſhoot, you may train them up either for ſtandards, or ſuffer them to grow for half ſtandards, according to your own fancy; though the uſual method is to bud them to the height the ſtems are intended to be; and the ſecond year after budding, they may be removed to the places where they are to remain. The beſt ſeaſon for tranſplanting theſe trees, if for dry ground, is in October, as ſoon as the leaves begin to decay; but for a wet ſoil, February is much preferable, and obſerve always to bud upon Plumb ſtocks for wet ground, and Almonds and Peaches for dry.

ALMOND, the Dwarf, with double flowers. See Persica.

AMYRIS. See Toxicodendron.

ANACAMPSEROS. See Sedum.

ANACARDIUM. Lin. Gen. Plant. 467. Acajou. Tourn. Inſt. R. H. 658. tab. 435. The Caſhew-nut, or Acajou.

The Characters are,

*It hath an empalement of one leaf, which is erect, and cut into five acute ſegments at the brim. The flower is of one leaf, having a ſhort tube, cut into five parts at the top, which are reflexed, and are longer than the empalement; the flower hath ten ſlender ſtamina, which are as long as the petal, crowned with ſmall ſummits. In the center is placed a round germen, ſupporting an awl-ſhaped ſtyle, crowned with an acute ſtigma. The germen afterward becomes a large, oval, fleſhy fruit, having a large kidney-ſhaped nut growing to its apex.*

This genus of plants is by Dr. Linnæus ranged in the firſt ſection of his tenth claſs, entitled Decandria Monogynia; the flowers of this having ten ſtamina and a ſingle ſtyle.

We have but one Species of this genus, viz.

Anacardium (*Occidentale*) Hort. Cliff. 161. *the occidental Anacardium, or Caſhew.* Acajou. Piſ. Hiſt. Braſ. 58.

This tree grows to the height of twenty feet or more, in its native country, which is both Indies, but in England the plants are with great difficulty preſerved; though by their firſt ſhoot from the ſeeds, they appear ſo ſtrong and vigorous, as to promiſe a much greater progreſs than they are ever ſeen to make.

They are eaſily raiſed from the nuts, which are annually brought from America in great plenty; each of theſe ſhould be planted in a ſmall pot filled with light ſandy earth, and plunged into a good hot-bed of tanners bark, being careful to prevent their having wet, till the plants come up, for the nuts frequently rot with moiſture. The reaſon of my adviſing the nuts to be each put into a ſeparate pot, is, becauſe the plants ſeldom live when they are tranſplanted. If the nuts are freſh, the plants will come up in about a month after planting, and in two months more they will be four four or five inches high, with large leaves; from this quick growth, many perſons have been deceived by ſuppoſing them hardy, and that they would continue the like progreſs, whereas they ſeldom advance much farther the ſame year.

The plants muſt be conſtantly kept in the ſtove, for they are too tender to live abroad in England, in the warmeſt ſeaſon of the year, nor will they thrive in a common green-houſe in ſummer. As theſe plants abound with a milky acrid juice, they ſhould have but little water, even in ſummer; and in winter, if they are ſparingly watered once in a fortnight, it will be ſufficient, for their roots are tender and ſoon periſh with moiſture.

When theſe plants are tranſplanted, it will be the beſt method to break the pots, for the roots do not put out many fibres to hold the earth about them, ſo that in ſhaking them out of the pots, moſt of the earth



will

will fall away from their roots, and when this happens, the plants seldom survive it; therefore in breaking of the pots, the same caution must be had not to disturb the earth more than can be avoided; then the plant, with the ball of earth to its roots, should be put into a pot one size larger than that in which it had before grown, filling up the pot with light sandy earth, and plunge the pots again into the hot-bed. These plants should not be removed oftener than once a year, nor should they be put into large pots, for unless their roots are confined, they will not thrive.

With this management I have kept these plants several years, but they are of slow growth after the first season, so that I have not raised any of them more than two feet and a half high, and it is very rare to see them in England more than half that height, though I have seen two of them in flower, one in the late Sir Charles Wager's garden at Parsons-green, and the other in Chelsea garden.

The pulpy fruit, to whose apex this nut grows, is as large as an Orange, and is full of an acid juice, which is frequently mixed in the making of punch in America. Many of these fruit have been brought to England, in casks of rum for the same purpose.

The nut is of the size and shape of a hare's kidney, but is much larger at the end which is next the fruit, than at the other. The outer shell is of an Ash colour, and very smooth; under this is another which covers the kernel, between these there is a thick black inflammable oil, which is very caustic; this will raise blisters on the skin, and has often been very troublesome to those who have incautiously put the nuts into their mouths to break the shell.

The milky juice of this tree will stain linen of a deep black, which cannot be washed out again; but whether this has the same property with that of the eastern Anacardium, has not yet been fully experimented; for the inspissated juice of that tree is the best sort of lac, which is used for staining of black in China and Japan.

Dr. Grew mentions the juice being used for staining of cottons, but it is doubtful which of the species he means; though Sir Hans Sloane supposes it to be of the Acajou here mentioned. However, it may be very well worth the trial; if the inhabitants of the British islands in America would tap a few of the trees in the bleeding season, and collect the juice in earthen pots, keeping it in a place free from dust, or covering the pots over with a linen cloth, to prevent dust from mixing with it, and when it is of a proper consistence, some trials may be made with it, to see if it has the same property with the Japan lac, which if it has, may prove a valuable commodity.

ANACYCLUS. Lin. Gen. Plant. 869. Santolinoides. Vall. Acad. Scien.

The Characters are,

*It hath compound flowers, consisting of female and hermaphrodite florets, included in one common scaly empalement; the rays or borders being formed of the female florets, which are tubulous, and stretched out in the form of a tongue beyond the empalement. The hermaphrodite florets which compose the disk, are funnel-shaped, quinquefid, and spread open; these have each five slender stamina, which are crowned with cylindrical summits; in the center is placed an oblong compressed germen, supporting a slender style, crowned with bifid stigma. The female florets have an oblong membraneous germen, supporting a slender style, crowned with two slender reflexed stigma; the hermaphrodite florets are succeeded by one oblong compressed seed. The female florets are succeeded by a single oblong seed with broad borders or wings, which are indented at the top; these are placed on a convex receptacle.*

This genus of plants is ranged by Dr. Linnæus in the third section of his nineteenth class, entitled Syngenesia Polygamia superflua. The plants of this division have female and hermaphrodite flowers included in the same common empalement.

The Species are,

1. Anacyclus (*Creticus*) foliis decompositis linearibus laciniis divisis planis. Hort. Cliff. 417. *Anacyclus with narrow decompounded leaves, whose divisions are plain.* Cotula cretica minima chamæmeli folio capite inflexo. Tourn. Cor. 37.
2. Anacyclus (*Orientalis*) foliis compositis setaceis acutis rectis. Hort. Cliff. 417. *Anacyclus with compound, bristly, upright, pointed leaves.* Chamæmelum Orientale foliis pinnatis. Tourn. Cor. 37.
3. Anacyclus (*Valentinus*) foliis decompositis linearibus laciniis divisis tretiusculis acutis floribus flosculosis. Hort. Cliff. 417. *Anacyclus with decompounded narrow leaves, whose divisions are taper and pointed, and floscular flowers.* Chrysanthemum Valentinum. Clus. Hist. 1. p. 332.

The two first sorts grow naturally in the islands of the Archipelago, from whence Dr. Tournefort sent their seeds to the royal garden at Paris. I have also received the seeds of both these plants from Portugal, so that it may also grow naturally there, as do many of those plants which were discovered by Tournefort in the Levant. These are low plants, whose branches trail on the ground. The first sort has fine cut leaves like those of Chamomile; the flowers are small, white, and grow single, with their heads declining; these are like those of the common Mayweed. The second hath winged leaves like those of the Ox-eye; the flowers are white, and like those of Chamomile.

The third sort grows naturally in Spain, from whence I have received the seeds. This grows a foot and half high, sending out many side branches; the leaves are finely divided like those of Chamomile, and are hairy: the flowers grow single at the extremity of the branches, and are of a bright yellow colour, with a silvery scaly empalement. These are as large as those of the Ox-eye.

All these plants are annual: the seeds should be sown early in the spring in a border of light earth, where they are designed to remain, and require no other care but to keep them clean from weeds, and thin the plants where they are too close. As these have no great beauty, a few plants only may be left for the sake of variety. They flower in July and August, and their seeds ripen in September.

ANAGALLIS. Lin. Sp. Plant. 189. Pimpernel.

The Characters are,

*The empalement is permanent, cut into five sharp segments, which are hollow. The flower is of one leaf spread open, and cut into five parts at the brim; it hath five erect stamina which are shorter than the petals, and are crowned with single summits. In the center is placed the globular germen, supporting a slender inclining style crowned with a blunt stigma. The germen afterward becomes a globular vessel with one cell, opening horizontally, in which are lodged several angular seeds.*

This genus of plants is by Dr. Linnæus ranged in the first division of his fifth class, entitled Pentandria Monogynia, the flowers having five stamina and one style.

The Species are,

1. Anagallis (*Arvensis*) foliis indivisis caule procumbente. Lin. Gen. Plant. 148. *Pimpernel with undivided leaves and a trailing stalk.* Anagallis Phœnicio flore. C. B. P. 252.
2. Anagallis (*Fœmina*) foliis indivisis glaucis caule procumbente flore cæruleo. *Pimpernel with undivided glaucous leaves, a trailing stalk, and blue flower.* Anagallis cæruleo flore. C. B. P. 252.
3. Anagallis (*Monelli*) foliis indivisis caule erecto. Lin. Sp. Plant. 148. *Pimpernel with an undivided leaf and upright stalk.* Anagallis tenuifolia Monelli. Clus. App.
4. Anagallis (*Latifolia*) foliis cordatis amplexicaulibus, caulibus compressis. Lin. Sp. Plant. 149. *Pimpernel with heart-shaped leaves, embracing the stalks which are compressed.* Anagallis Hispanica latifolio flore cæruleo. Horteg.

The first sort is very common in fields, and other cultivated places, in most parts of England. The second sort is sometimes found wild in the fields, but is less common than the first in England. This is supposed to be only a variety of the first, but from

thirty years cultivating it, I can affirm it never alters; and the plants before they shew their flowers are so different, as to be easily distinguished from the first. There is a variety of this with a deeper blue flower, whose seeds I received from Nice, and this hath retained its colour for three years, during which time I have sown it in the Chelsea garden.

These are all annual plants which arise from seeds, and, if suffered to remain till their seeds scatter, will become weeds in the place; so that they are never cultivated, except in botanic gardens for variety. The first and second sorts are directed by the College of Physicians for medicinal use.

The third sort is a very beautiful, small, perennial plant, producing great numbers of fine blue flowers, in April and May: this may be propagated by seeds, which should be sown soon after they are ripe; for if they are kept till spring, they do not always succeed: this plant requires to be sheltered from extreme cold, which will sometimes destroy it in winter.

The fourth sort was sent me from Spain by Mr. Hortega, intendant of the royal gardens at Madrid. This is a trailing annual plant, with broad leaves and blue flowers. It will easily rise from seeds, and requires no other care but to keep the plants clean from weeds.

There are two varieties of the first sort, one with a white, and the other a flesh-coloured flower; but as they are not constant, I have not inserted them as different species. There is also another with a worn-out purple flower, which has several years continued the same in the Chelsea garden; but as there is little difference in the leaves of this and the first, I have not enumerated it.

ANAGYRIS, Stinking Bean-trefoil.

The Characters are,

*It hath a bell-shaped empalement, which is cut into five parts at the brim, the upper segment being much deeper cut than the others. The flower is of the butterfly kind, the standard is heart-shaped, upright, broad, and indented. This is much longer than the empalement; the wings are oblong, plain, and longer than the standard; the keel is long and upright: it hath ten stamina, which rise distinct, and are equal, crowned with single summits. In the center is placed an oblong germen, supporting a single style, having a hairy stigma. The germen afterward becomes a large oblong pod, which is reflexed at the point, in which is lodged several kidney-shaped seeds.*

Dr. Linnæus ranges this genus in his tenth class of plants, entitled Decandria Monogynia, the flower having ten stamina, and one style.

The Species are,

1. Anagyris (*Fœtida*) foliis ovatis floribus lateralibus. *Stinking Bean-trefoil with oval leaves, and flowers proceeding from the wings of the stalks.* Anagyris fœtida. C. B. P. 391.
2. Anagyris (*Cretica*) foliis oblongis racemis longioribus. *Stinking Bean-trefoil with oblong leaves, and longer spikes of flowers.* Anagyris fœtida Cretica oblongis foliis luteis floribus. Barrel. Icon.

The first sort grows wild in the south of France, in Spain and Italy: this is a shrub which usually rises to the height of eight or ten feet, and produces its flowers in April and May, which are of a bright yellow colour, growing in spikes, somewhat like those of the Laburnum: the seeds are never perfected in this country, which is the reason of its present scarcity in England.

The other sort is a native of Candia, and some of the islands of the Archipelago, and at present very rare in the English gardens. This sort hath longer leaves than the former, and flowers later in the summer, so that it never produces seeds.

These may be both propagated by laying down their tender branches in the spring, observing to tongue them in the same manner as the layers of Carnations, being careful in dry weather to supply them with water; which if duly performed, the layers will have taken root by the following spring, when they should be cut off from the old plants, a little time before they begin to put out their leaves, and planted in a warm situation; for if they are too much exposed to cold winds, they will be in danger of being destroyed in a hard winter. This method of propagating these plants, is to supply their defect in not producing ripe seeds in this country; for the plants which are produced from seeds, will be much handsomer, and will rise to a much greater height.

If you propagate these plants from seeds, you should sow them on a moderate hot-bed the beginning of March. If the seeds are good, the plants will appear in a month after the seeds are sown; when they should be inured by degrees to the open air, into which they should be removed toward the end of May, placing them in a sheltered situation; for this purpose the seeds should be sowed in pots, and plunged into a hot-bed, because the plants do not bear transplanting well till the spring following: and as they are impatient of cold while young, so the two first winters it will be proper to shelter them under a common frame, where the glasses may be drawn off every day in mild weather, that the plants may enjoy the open air, which will prepare them for planting abroad when they have acquired proper strength: it will be very proper to keep these plants in pots three years, in which time they will have advanced to be in proper condition for planting them into the places where they are intended to remain; the best time for this is about the beginning of April, just before the plants begin to put out new leaves: at which time they should be turned out of the pots, preserving good balls of earth to their roots, planting some of them against warm aspected walls, where they will not be in danger of suffering by frost; and the others may be planted in warm situations, where, if they are protected in severe winters, by covering the surface of the ground about their roots with tanners bark, and screening their heads with mats, they may be preserved several years. The fourth year from seeds these plants will begin to produce their flowers, and will continue flowering every year after, so will be very proper to intermix with other flowering shrubs of the same growth in warm situations.

ANANAS, the Pine-apple.

The Characters are,

*The flower consists of three oval petals, which are produced from the protuberances of the pyramidal fruit, and are stretched out beyond the empalement. These have six awl-shaped stamina, which stand within the flower, crowned with spear-shaped summits: the germen is situated below the flower, supporting a slender style, crowned with a trifid stigma. The germen afterward becomes a cell, in which is lodged several angular seeds.*

Dr. Linnæus has joined this to the Bromelia of father Plumier, to which he has also added the Karatas of the same author, supposing them to be of the same genus; which mistake he may have been led into by Plumier's figures, for he has joined the fruit of the Caraguata to the flowers of the Karatas, and *vice versa*. The other differences will be exhibited under the article Karatas.

The Varieties of this are,

1. Ananas (*Ovatus*) aculeatus, fructu ovato, carne albida. Plum. *Oval-shaped Pine-apple, with a whitish flesh.*
2. Ananas (*Pyramidalis*) aculeatus, fructu pyramidato, carne aurea. Plum. *Pyramidal Pine-apple, with a yellowish flesh, called the Sugar-loaf Pine.*
3. Ananas (*Glabra*) folio vix serrato. Boerh. Ind. Alt. 2. 83. *Pine-apple with smooth leaves.*
4. Ananas (*Lucidus*) lucide virens, folio vix serrato. Hort. Elth. *Pine-apple with shining green leaves, and scarce any spines on their edges.*
5. Ananas (*Serotinus*) fructu pyramidato olivæ colore, intus aureo. *Pyramidal Olive-coloured Pine-apple, with a yellow flesh.*
6. Ananas (*Viridis*) aculeatus, fructu pyramidato ex viridi flavescente. *The green Pine-apple.*

There are several other varieties of this fruit, some of which may have been obtained from seeds; and I doubt

doubt not but if the seeds were sown frequently, in the countries where they are in plenty, there may be as great variety of these fruit, as there are of Apples or Pears in Europe. And this I have found true by some trials which I have made by sowing the seeds, which have always produced a variety of sorts from those of the same fruit.

This fruit (which is justly esteemed for the richness of its flavour, as it surpasses all the known fruits in the world), is produced from an herbaceous plant, which hath leaves somewhat resembling those of Aloe, and are, for the most part, sawed on their edges, but are much thinner, and not so juicy as the Aloe: the fruit resembles the cones of the Pine-tree, from whence it is supposed to have its name.

Where this plant is a native, I believe is hard to determine; but it is probably an indigenous plant in Africa, where, I have been informed, they grow in uncultivated places in great plenty. They have been long cultivated in the hottest islands of the West-Indies, where they are in great plenty, and extraordinary goodness; but they have not been many years in the European gardens, so as to produce fruit: the first person who succeeded in this affair, was Monsieur Le Cour of Leyden in Holland, who, after a great many trials, with little or no success, did at length hit upon a proper degree of heat and management, so as to produce fruit equally good (though not so large) as those which are produced in the West-Indies, as hath been often affirmed by persons who have lived many years there: and it is to this worthy cultivator of gardening, who did not spare any pains or expence to accomplish it, that all the lovers thereof are obliged, for introducing this king of fruits amongst them; and it was from him that our gardens in England were first supplied, though we have since had large quantities brought from America. I cannot here avoid taking notice of a common error which prevails amongst many people, which is, that the plants brought from America are not so good as those which came from M. Le Cour; which is a great mistake, for were the people who send over these plants from America careful to send the best kinds, there would be found many better than those cultivated by M. Le Cour, who had his from thence at first, as his gardener assured me; and I have seen as good fruit produced from American plants, as any I have yet seen, and some three times larger than any I saw in M. Le Cour's garden.

The first sort is the most common in Europe; but the second sort is much preferable to it, the fruit of this being larger, and much better flavoured: the juice of this sort is not so astringent as that of the first, so that this fruit may be eaten in greater quantity with less danger. This frequently produces suckers immediately under the fruit, whereby it may be increased much faster than the common sort; so that in a few years, it may be the most common sort in England.

The third sort is preserved by some curious persons for the sake of variety, but the fruit is not worth any thing. The sixth sort is at present the most rare in Europe, there being very few of the plants at present. This has been esteemed the best sort known, by some of the most curious persons in America, many of whom have thrown out all the other sorts from their gardens, and cultivate only this kind. The plants of this sort may be procured from Barbadoes and Montserrat, in both which places it is cultivated.

The sort with very smooth grass-green leaves, was raised from seeds taken out of a rotten fruit, which came from the West-Indies to the late Henry Heathcote, Esq; from whom I received one plant, which hath produced large fruit: this, I am told, is what the people of America call the King Pine. I have since raised some plants of this kind from seeds, which were brought me from Jamaica.

These plants are propagated by planting the crowns which grow on the fruit, or the suckers which are produced either from the sides of the plants, or under the fruit, both which I have found to be equally good; although by some persons the crown is thought preferable to the suckers, as supposing it will produce fruit sooner than the suckers, which is certainly a mistake; for by constant experience I find the suckers (if equally strong) will fruit as soon, and produce as large fruit as the crowns.

The suckers and crowns must be laid to dry in a warm place for four or five days, or more (according to the moisture of the part which adhered to the old fruit;) for if they are immediately planted, they will rot, especially the crowns. The certain rule of judging when they are fit to plant, is by observing if the bottom is healed over and become hard; for if the suckers are drawn off carefully from the old plants, they will have a hard skin over the lower part, so need not lie so long as the crowns, or those whose bottoms are moist. But whenever a crown is taken from the fruit, or the suckers from old plants, they should be immediately divested of their bottom leaves, so high as to allow depth for their planting; so that they may be thoroughly dry and healed in every part, lest when they receive heat and moisture, they should perish, which often happens when this method is not observed. If these suckers or crowns are taken off late in the autumn, or during the winter, or early in the spring, they should be laid in a dry place in the stove, for a fortnight or three weeks before they are planted, but in the summer season they will be fit for planting in a few days.

As to the earth in which these should be planted, if you have a rich good kitchen-garden mould, not too heavy, so as to detain the moisture too long, nor over light and sandy, it will be very proper for them without any mixture: but where this is wanting, you should procure some fresh earth from a good pasture; which should be mixed with about a third part of rotten neats dung, or the dung of an old Melon or Cucumber-bed, which is well consumed. These should be mixed six or eight months at least before they are used, but if it be a year, it will be the better; and should be often turned, that their parts may be the better united, as also the clods well broken. This earth should not be screened very fine, for if you only clear it of the great stones, it will be better for the plants than when it is made too fine. You should always avoid mixing any sand with the earth, unless it be extremely stiff, and then it will be necessary to have it mixed at least six months or a year before it is used; and it must be frequently turned, that the sand may be incorporated in the earth, so as to divide its parts: but you should not put more than a sixth part of sand, for too much sand is very injurious to these plants.

In the summer season, when the weather is warm, these plants must be frequently watered, but you should not give them large quantities at a time: you must also be very careful, that the moisture is not detained in the pots, by the holes being stopped, for that will soon destroy the plants. In very warm weather they should be watered twice or three times a week; but in a cool season, once a week will be often enough: and during the summer season, you should once a week water them gently all over their leaves, which will wash the filth from off them, and thereby greatly promote the growth of the plants.

There are some persons who frequently shift these plants from pot to pot, but this is by no means to be practised by those who propose to have large well flavoured fruit; for unless the pots be filled with the roots, by the time the plants begin to shew their fruit, they commonly produce small fruit, which have generally large crowns on them, therefore the plants will not require to be potted oftener than twice in a season: the first time should be about the end of April, when the suckers and crowns of the former year's fruit (which remained all the winter in those pots in which they were first planted) should be shifted into larger pots, i. e. those which were in halfpenny, or three-farthing pots, should be put into penny, or

at moſt three-halfpenny pots, according to the ſize of the plants; for you muſt be very careful not to over-pot them, nothing being more prejudicial to theſe plants. The ſecond time for ſhifting of them is in the beginning of Auguſt, when you ſhould ſhift thoſe plants which are of a proper ſize for fruiting the following ſpring, into two-penny pots, which are full large enough for any of theſe plants. At each of theſe times of ſhifting the plants, the bark-bed ſhould be ſtirred up, and ſome new bark added, to raiſe the bed up to the height it was at firſt made; and when the pots are plunged again into the bark-bed, the plants ſhould be watered gently all over their leaves, to waſh off the filth, and to ſettle the earth to the roots of the plants. If the bark-bed be well ſtirred, and a quantity of good freſh bark added to the bed, at this latter ſhifting, it will be of great ſervice to the plants; and they may remain in the ſame tan until the beginning of November, or ſometimes later, according to the mildneſs of the ſeaſon, and will require but little fire before that time. During the winter ſeaſon theſe plants will not require to be watered oftener than once a week, according as you find the earth in the pots to dry: nor ſhould you give them too much at each time, for it is much better to give them a little water often, than to over-water them, eſpecially at this ſeaſon.

You muſt obſerve never to ſhift thoſe plants which ſhew their fruit, into other pots; for if they are removed after the fruit appears, it will ſtop their growth, and thereby cauſe the fruit to be ſmaller, and retard its ripening, ſo that many times it will be October or November before the fruit is ripe; therefore you ſhould be very careful to keep the plants in a vigorous growing ſtate, from the firſt appearance of the fruit, becauſe upon this depends the goodneſs and ſize of the fruit; for if they receive a check after this, the fruit is generally ſmall and ill taſted.

When you have cut off the fruit from the plants, whoſe kind you are deſirous to propagate, you ſhould trim the leaves, and plunge the pots into a moderate hot-bed, obſerving to refreſh them frequently with water, which will cauſe them to put out ſuckers in plenty; ſo that a perſon may be ſoon ſupplied with plants enough of any of the kinds, who will but obſerve to keep the plants in health.

There is not any thing which can happen to theſe plants of a more dangerous nature, than to have them attacked by ſmall white inſects, which appear at firſt like a white mildew, but ſoon after have the appearance of lice: theſe attack both root and leaves at the ſame time, and if they are not ſoon deſtroyed, will ſpread over a whole ſtove in a ſhort time; and in a few weeks will entirely ſtop the growth of the plants, by ſucking out the nutritious juice, ſo that the leaves will appear yellow and ſickly, and have generally a great number of yellow tranſparent ſpots all over them. Theſe inſects, after they are fully grown, appear like bugs, and adhere ſo cloſely to the leaves, as not to be eaſily waſhed off, and ſeem as if they had no life in them. They were originally brought from America upon the plants which were imported from thence, and I believe they are the ſame inſects which have deſtroyed the ſugar canes of late years in ſome of the Leeward iſlands. Since they have been in England, they have ſpread greatly in ſuch ſtoves, where there has not been more than ordinary care taken to deſtroy them. They have alſo attacked the Orange-trees in many gardens near London, and have done them incredible damage; but I do not find they will endure the cold of our climate in winter, ſo that they are never found on ſuch plants as live in the open air. The only method I have been yet able to diſcover for deſtroying theſe inſects, is by waſhing the leaves, branches, and ſtems, of ſuch plants as they attack, frequently with water, in which there has been a ſtrong infuſion of Tobacco-ſtalks, which I find will deſtroy the inſects, and not prejudice the plants. But this method cannot be practiſed on the Ananas plants, becauſe the inſects will faſten themſelves ſo low between the leaves, that it is impoſſible to come at them with a ſponge to waſh them off; ſo that if all thoſe which appear to ſight are cleared off, they will ſoon be ſucceeded by a freſh ſupply from below, and the roots will be alſo equally infeſted with them. Therefore, wherever theſe inſects appear on the plants, the ſafeſt method will be, to take the plants out of the pots, and clear the earth from the roots; then prepare a large tub, which ſhould be filled with water, in which there has been a ſtrong infuſion of Tobacco-ſtalks; into this tub you ſhould put the plants, placing ſome ſticks acroſs the tub, to keep the plants immerſed in water. In this water they ſhould remain twenty-four hours; then take them out, and with a ſponge waſh off all the inſects from the leaves and roots, which may be eaſily effected when the inſects are killed by the infuſion; then cut off all the ſmall fibres of the roots, and dip the plants into a tub of fair water, waſhing them therein, which is the moſt effectual way to clear them from the inſects. Then you ſhould pot them in freſh earth, and having ſtirred up the bark-bed, and added ſome new tan to give a freſh heat to the bed, the pots ſhould be plunged again, obſerving to water them all over the leaves (as was before directed) and this ſhould be repeated once a week during the ſummer ſeaſon; for I obſerve theſe inſects always multiply much faſter where the plants are kept dry, than in ſuch places where the plants are ſometimes ſprinkled over with water, and kept in a growing ſtate. And the ſame is alſo obſerved in America, for it is in long droughts that the inſects make ſuch deſtruction in the ſugar canes. And in thoſe iſlands where they have had ſeveral very dry ſeaſons of late, they have increaſed to ſuch a degree, as to deſtroy the greateſt part of the canes in the iſlands, rendering them not only unfit for ſugar, but poiſon the juice of the plant, ſo as to diſqualify it for making rum, whereby many planters have been ruined.

As theſe inſects are frequently brought over from America on the Ananas plants which come from thence, thoſe perſons who procure their plants from thence, ſhould look carefully over them when they receive them, to ſee they have none of theſe inſects on them; for if they have, they will ſoon be propagated over all the plants in the ſtove where theſe are placed: therefore, whenever they are obſerved, the plants ſhould be ſoaked (as was before directed) before they are planted into pots.

It was formerly the common practice of thoſe perſons, who cultivated this fruit in Europe, to build dry ſtoves, in which they kept their plants in winter, placing the pots on ſcaffolds (after the manner in which Orange-trees are placed in a green-houſe), and in the ſummer to place them in hot-beds of tanners bark under frames. This was the method practiſed in Holland for raiſing this fruit, which by Monſieur Le Cour's gardener was firſt taught thoſe perſons, whom his maſter was ſo kind as to ſend the plants. But as the culture of theſe plants have ſince become general in England, there has been great improvements made, not only in the contrivances of the ſtoves, but alſo in the culture of the plants. For by the former method, the plants were kept upon ſhelves at leaſt four or five months, whereby the extreme fibres of their roots became dry and hard; for if the plants were too often watered, it occaſioned their rotting; ſo that during the winter ſeaſon, when the plants ſhould be preparing their fruit for the next ſummer, they were at a ſtand, making little or no progreſs, whereby the fruit did not appear early enough in the ſpring to ripen in ſummer, nor were the fruit ſo large.

Therefore, to remedy this inconvenience, it is now the practice of thoſe perſons who are deſirous to propagate the fruit, to erect low ſtoves, with pits therein for the hot-bed, in the manner hereafter deſcribed and figured; theſe are built in different ways, according to the fancy of the contriver. Some perſons build them with upright glaſſes in front, about four feet

high, so that there is just height enough for persons to walk upright on the back-side of the bark-bed. Others make but one slope of glasses, from the top of the stove down to the plate, which lies about six or eight inches above the bark-pit, so that in the front of this stove, there is no walk made between the bark-pit and the glasses; but the inconveniency of watering the plants, as also of coming near those plants which are placed in the front of the stove to clean them, has, in some measure, brought them into disesteem, so that few persons now build them, tho' the expence is much less than of the other kind of stoves; but of both these stoves the figures and descriptions which are hereafter exhibited under the article of stove, will be sufficient for any person to build either of the sorts. One of these stoves about thirty-five feet long in the clear, with the pit or the tan reaching from end to end, and six feet and a half wide, will contain about fourscoure fruiting plants; so that whoever is desirous to have this fruit, may easily proportion their stove to the quantity of fruit which they are willing to have.

But it will be also necessary to have a bark-pit under a deep frame, in order to raise the young plants; in which you should plunge the suckers, when they are taken from the old plants, as also the crowns which come from the fruit, so that this frame will be as a nursery to raise the young plants to supply the stove: but these plants should not remain in these frames longer than till the beginning of November, unless the frame is built with brick-work with flues in it to warm the air (in the manner hereafter described and figured), which are very useful, as nurseries, to keep the young plants till they are of a proper size to produce fruit; so that you may keep these either warmer or cooler than the stove, according as the plants may require, so that the stove may be every autumn filled only with bearing plants, whereby a much greater quantity of fruit may be annually produced, than can be where young and old plants must be crowded into the same stove. But where there are no conveniences of this kind, the young plants, about the middle or latter end of October, must be removed into the stove, and being small, may be crowded in among the larger plants; for as they will not grow much during the winter season, they may be placed very close together. The beginning of March, where there is no nursery for the young plants, they must be removed out into the hot-bed again, which should be prepared a fortnight before, that the tan may have acquired a proper heat: but you should be careful that the tan be not too hot, for that might scald the fibres of the plants, if they are suddenly plunged therein. Therefore if you find the bark too hot, you should not plunge the pots above two or three inches into the tan, letting them remain so until the heat of the tan is a little abated, when you should plunge the pots down to their rims in the bed. If the nights should continue cold after these plants are removed into the bed, you must carefully cover the glasses with mats; otherwise by coming out of a warm stove, they may receive a sudden check, which will greatly retard their growth, therefore must be carefully avoided; because the sooner the plants are set growing in the spring, the more time they will have to gain strength, in order to produce large fruit the following season.

You should not plunge the pots too close together in this frame, but allow them a proper distance, that the lower part of the plants may increase in bulk, for it is on this that the magnitude of the fruit depends; because when the plants are placed too close, they draw up very tall, but do not obtain strength; so that when they are taken out of the bed, the leaves are not able to support themselves; but all the outward long leaves will fall down, leaving the smaller middle leaves naked, and this sometimes will cause them to rot in the center. You must also observe, when the sun is very warm, to raise the glasses of the hot-bed, in order to let out the steam of the bed, and to admit fresh air; for one neglect of this kind, in a very hot day, may destroy all the plants, or at least so scald them, that they will not get over it in several months. It will be also very proper, in extreme hot weather, to shade the glasses in the middle of the day with mats; for the glasses, lying so near to the leaves of the plants, will occasion a prodigious heat at such times.

During the summer season these plants must be frequently watered, giving them but little each time; and in hot weather, they must have free air admitted to them every day, from ten o'clock till four; for if they are kept too close, or have too much wet, they will receive a check in their growth, when the insects will immediately spread over them; for there are generally some of these insects on all these plants, which do not much injury to them while they are in a growing state; but whenever they are unhealthy, the insects multiply greatly, and contribute to their decay. There are some persons who regulate the heat of their stoves by thermometers in summer, but at that season this is unnecessary, for the outward air in hot weather is frequently greater than the Ananas heat marked on the thermometers, so that the heat of the stoves at that season will be much greater. The use of the thermometer is only in the winter, during the time the fires are continued, by which it is easy to judge when to increase or diminish the fires; for at that season, the stoves should not be kept to a greater warmth than five or six divisions above Ananas, nor suffered to be more than as many divisions below it. In winter the plants must have less water, but they will require to have it repeated once a week, giving them but little each time: when the plants are placed into the tan for the winter season (which should be done about the beginning of October) the tan-bed should be renewed, adding two thirds of new tan, to one third of the old. If this be well mixed, and the new tan is good, the bed will maintain a proper degree of warmth till February, at which time it will be proper to stir up the bed, and add a load or two of new tan, so as to raise the bed as much as it sunk since the autumn; this will give a fresh heat to the bed, and keep the plants growing; and as the fruit will now begin to appear, it will be absolutely necessary to keep the plants in a growing state, otherwise the fruit will not be large.

In April it will be proper to stir up the tan again, and if the bed has sunk since the last stirring, it will be proper to add some fresh tan to it; this will renew the warmth of the bed, and forward the fruit. At this time it will be proper to shift the young plants, which are designed to produce fruit the following year; the tan-bed into which these are plunged must be renewed, in order to forward their growth, that they may have strength enough in autumn to produce good fruit, for in this is the principal care required.

Those plants which shew their fruit early in February, will ripen about June; some sorts are at least a month or five weeks longer in ripening their fruit than others, from the time of the appearance of the fruit: but the season in which the fruit is in greatest perfection, is from the beginning of July, to the end of September; though in March, April, and October, I have frequently eaten this fruit in pretty good perfection; but then the plants have been in perfect health, otherwise they seldom are well flavoured.

The method of judging when the fruit is ripe, is by the smell, and from observation; for as the several sorts differ from each other in the colour of their fruit, that will not be any direction when to cut them; nor should they remain so long as to become soft to the touch before they are cut, for then they become flat and dead, as they do also when they are cut long before they are eaten, therefore the surest way to have this fruit in perfection, is to cut it the same day it is eaten; but it must be cut early in the morning, before the sun has heated the fruit, otherwise it will be hot, observing to cut the stalk as long to the fruit as possible, and lay it in a cool, but dry place, preserving the stalk and crown unto it, until it is eaten.

That ſort with green fruit, if ſuffered to ripen well, is of an Olive colour; but there are ſome perſons who cut them before they are ripe, when they are not fit to be eaten, for no other reaſon but to have them green: and although many perſons have much recommended this ſort for its excellent flavour, yet I think the Sugar-loaf ſort is much to be preferred to it.

This Sugar-loaf ſort is eaſily diſtinguiſhed from all the other, by its leaves having purple ſtripes on their inſide the whole length. The fruit is of a paler colour than the others when ripe, inclining to a ſtraw colour. This ſort was brought from Braſil to Jamaica, where it is eſteemed far beyond the other kinds.

The next in goodneſs to this, is what the inhabitants of the iſlands in America call the Montſerrat Pine; the leaves of this are of a dark brown, inclining to purple on their inſide; the protuberances of the fruit are longer and flatter than thoſe of the common ſort. I raiſed ſeveral plants of this ſort from ſeeds which I received from the iſland of St. Thomas, where this fruit is in greater perfection than in any of the Britiſh iſlands.

As ſome of the fruit produce ſeeds in England, when the greater number have no appearance of any, I doubt not whether there are not ſome with male, and others with hermaphrodite flowers; becauſe thoſe fruit which have ſeeds, are remarkably different from the others, when cut through the cells in which the ſeeds are lodged, lying nearer to the center of the fruit than the abortive cells, which are chiefly cloſe to the rind; but not having diſtinguiſhed this difference till the fruit was cut, I had no opportunity of examining their flowers.

I have continued this title of Ananas to the genus, being the moſt generally known and uſed, leſt by altering it, the practical gardeners ſhould be rather confuſed than inſtructed: and I was the rather inclined to this, as Dr. Linnæus has miſtaken the characters of the three genera, which he has joined in one. The different varieties are alſo enumerated, for the ſake of thoſe who cultivate the fruit, though they are not diſtinct ſpecies, but vary in their ſhape, colour, and flavour, the ſame as other fruits. Therefore, as this work is intended to inſtruct the practical gardener, the mentioning theſe varieties is more excuſable here, than in thoſe books which are only intended for the improvement of botany.

ANAPODOPHYLLON. See Podophyllum.

ANASTATICA, Roſe of Jericho.

The Characters are,

*It hath a four leaved empalement, which falls off; the flower has four petals placed croſſwiſe, which ſpread open, whoſe tails are the length of the tube of the empalement, and ſix awl-ſhaped ſtamina, two of which are ſhorter than the other four, crowned with roundiſh ſummits, and a ſmall bifid germen, ſupporting an awl-ſhaped ſtyle the length of the ſtamina, and is permanent, crowned by a headed ſummit. The germen afterward becomes a ſhort bilocular pod, having an awl-ſhaped partition placed obliquely to the pod, and is longer.*

We have but one Species of this genus in the Engliſh gardens, viz.

Anastatica (*Hierocuntica*) foliis obtuſis, ſpicis axillaribus breviſſimis, ſiliculis ungulatis ſpinoſis. Lin. Sp. 895. *Roſe of Jericho with obtuſe leaves, ſhort ſpikes of flowers at the wings of the ſtalks, and prickly pods.*

This plant grows naturally in Paleſtine and Cairo, in ſandy places near the ſea. The ſtalks are ligneous though the plant is annual; it riſes five or ſix inches high, dividing into many irregular branches; the flowers which are ſmall and white, are diſpoſed in ſhort ſpikes at the wings of the ſtalks, and have little beauty; theſe are ſucceeded by ſhort prickly pods, having two cells, in each of which are two ſeeds.

It is preſerved in botanic gardens for the variety, and in ſome curious gardens for the oddneſs of the plant, which, if taken up before it is withered, and preſerved entire in a dry room, may be long preſerved; and after being many years kept in this ſituation, if the root is placed in a glaſs of water a few hours, the buds of flowers will ſwell, open, and appear, as if newly taken out of the ground, to the great ſurpriſe of moſt people.

The plant is annual, ſo can only be propagated by ſeeds, which rarely ripen in England, unleſs the ſeeds are ſown upon a hot-bed in the ſpring, and the plants afterward put into pots, which ſhould be plunged into another hot-bed to bring them forward; for although the ſeeds will come up in the full ground where the ſoil is dry, yet the plants rarely riſe to any ſize, nor do they perfect ſeeds unleſs the ſummer is very hot and dry: but if the plants are kept in a frame, giving them free air in warm weather, they will flower in June, and the ſeeds will ripen in September.

ANATOMY ['Ανατομία, of 'Ανατέμνω, *Gr.* to diſſect], a diſſection.

Anatomy of plants is a cutting, dividing, or ſeparating the parts or members of plants, in order to diſcover the ſize, form, ſtructure, and uſes of their ſeveral veſſels, for the better promoting their culture.

Anatomiſts have obſerved a great ſimilitude betwixt the mechanic frame of plants and animals: the parts of plants ſeeming to bear a conſtant analogy to thoſe of animals; and the œconomy, both vegetable and animal, ſeem to be formed on the ſame model.

The parts of a plant are the root, the wood, the bark, and the pith.

1. The roots of the plants are ſpongeous bodies, whoſe parts are diſpoſed for the eaſy admittance of certain humid particles, which are prepared in the ground. The quality of the root is found much to depend upon the ſize of its veſſels and pores.

Monſieur Renaume ſuppoſes the root of a plant to do the office of all the parts in the abdomen of animals, which ſerve to nutrition, as the ſtomach, inteſtines, &c.

Dr. Boerhaave conſiders the roots of plants to be compoſed of a number of abſorbent veſſels, which are analogous to the lacteals in animals.

The root, according to Dr. Van Royen, is that part of the plant by which the nutriment is taken in, or that by which the aliment is attracted, as Theophraſtus has defined it: but it is not all that part, which is committed to the earth, to be nouriſhed by the matter which is about it, which is properly to be called the trunk of the root; this is to be referred rather to the ſtalk or ſtem, than to the root, in that it conſiſts of the ſame implicated kinds of veſſels; but that part which is by its ſurface contiguous to the exterior matrix, which, being perforated with infinite little mouths, promotes the received moiſtures, that they may be afterwards carried, by veſſels not unlike to lacteal ones, into the very body of the plant; this is properly to be called the root.

Which definition, although it may ſeem too ſtrict, is the moſt general, and applicable to all plants; for it agrees as well with them which have no root, as the vulgar opinion is, as to thoſe which have a manifeſt root; of the former kind there are but very few plants, but of the latter a great many.

As to thoſe that want a manifeſt root, the ſuperficies of them is found to be perforated on all ſides with very ſmall holes, by which they take in their nutriment, as in the Pomo Aurantio, called Neptuni, or Pila Marina by fiſhermen, and many other ſubmarine plants; and in theſe the whole ſuperficies ſerves for roots, as is plainly ſeen in ſome ſtony plants that grow under the ſea, and may be in ſome ſort proved to be deduced from the analogy of animals; for theſe being become *ſui generis*, take in aliment, not only by the mouth, but alſo the whole ſurface, expoſed to the moiſt air, ſeems to ſerve to the ſame deſign. But although theſe ſubmarine bodies have, by moſt naturaliſts, been ranged with vegetables; yet, by later diſcoveries, many of them have been found to conſiſt of beds of inſects, incloſed in ſmall cavities of theſe incruſted bodies, therefore ſhould rather be ranged with minerals.

But those plants that are endued with a conspicuous root, and more obvious to the senses, differ among themselves very much in this part: for some are bulbous, some are squamous, or tuberous, others grumous, others fibrous, and lastly, others nodous; which, as it will be sufficient to have taken notice of the primary differences of roots, I shall omit their particular definition in this place, and refer them to their several heads, where each of them shall be particularly described.

The first part of the root, which is called the Epidermis, or cuticle, is, for the most part, of a brown or dusky colour, very thin, and easily peeled off from the under skin (if it be first soaked in warm water); which being viewed by a microscope, shews its most tender structure much like a net pierced through with many small holes. And these little orifices of the epidermis being dilated, and filled with the received moisture, resembling vesicles, which, being exhausted yearly by the mutation of the air, become consolidated, and perish; to wit, this being driven out by a new cuticle growing under it, after the same manner as squammigerous animals annually cast the old epidermis, a new cuticle coming under it; so that these little vessels, fibrils, or by what name soever they are called, may not unfitly be compared to the veins of animals.

But the other part, which on the outside constitutes the cortex, or outer bark, and on the inside the liber, or inner bark, is called cutis; in which there are parts to be considered of a four-fold kind.

1. Certain strong fibres, cohering and elastic, stretched out vertically with the lateral fibres communicating among themselves, and compacting, or thrusting in the former, they form a hollow cylinder, or zone, under the epidermis; and this hath another under it, which also includes a third; and so of the rest, to the most inward of all, which luxuriates near the wood, and is by a peculiar name called liber, or inward bark. And these zones, or girdles, although they are most innumerable, may all be peeled off as the lamellæ of bulbs, when the sap flows through them; and inasmuch as those fibres in the harder roots of trees are almost of a bony nature, they procure a firmness to the cortex or outward bark; and these fibres are in all plants, and appear as well in grass as in the Cedar tree, although they are more compact in trees, than in plants of a tenderer structure, which are more easily sustained.

2. In the areas, or spaces, which are between the fibres and their anastomoses, there are every where membranaceous vessels full of moisture, or little utricles, which, in the areæ, or intercepted spaces that are of a different figure, are found to be various, and accommodated to all the spaces; but all these utricles communicate among themselves, as is best seen in the greater celandine, when we squeeze out that golden coloured liquor with which it is filled; and the middle spaces betwixt these zones have like utricles, and all the fibres constitute hollow canals; but the utricles have receptacles communicating among themselves.

3. Aereal vessels, or tracheæ, are open from the lower to the upper part of the plant, and are twisted or curled after an admirable manner, and disposed round about with fibres and utricles in form almost of a spiral line, which in their cavities contain an elastic air; which being affected by the external air, first expanded, and afterwards condensed, will be changed after a like manner, and feel the same vicissitudes of cold and heat, and will undergo a reciprocal motion of cold and heat. This action is exerted in the vessels filled with moisture, which when they cannot be condensed, give place, and are driven to those that are higher, and are moved forward.

4. Lastly, besides fibres, utricles, and tracheæ, a peculiar kind of vessels appear, containing the moistures, as it seems secreted by the organical disposition of the plant itself, which water, or moisten not only the cortex, but the wood, and the rest of the parts of vegetables, and are turgid with a concocted juice, which seems far more elaborate than is the moisture contained in the fibres or utricles; and the mouths of these vessels being of a different figure, pour forth sometimes a various liquor, according to its peculiar nature, chiefly near the outward region of the cortex; so the Tithymalus and Cichory commonly distil a milky humour, and the Cypress, Fir, and Pine, a certain species of turpentine.

And by how much these circles are more outward, by so much the middle spaces between the two zones are greater; and are lessened always towards the more inward in a certain proportion, which seems to depend on this, viz. the outward air acting on all sides with an equal pressure, and by a certain power presses the second; and this also by this means, is pressed by its own condensed air, and presses together those which are more inward, because it cannot exert its force upon the external air; therefore the second circle is necessarily more compressed than the first, and the third more than the second, and so of the rest. And the utricles placed between the circles are pressed by the same proportion; which, by degrees, are more and more exhausted; thence the inner circle loses most of all the compressed and condensated utricles, and by degrees grows solid.

And this is properly called Liber (the inward bark), and is that circle, which, being middlemost by place and nature, between the cortex, or outward bark, and the wood, comes nearest to the nature of the wood, and in time passes into it; for the cortex loses every year one such circle, and becomes wood, which may be distinguished from the former circles of the root, stock, or trunk; and if they are cut horizontally, will shew the number of such circles, and how many years the tree is old.

And this successive mutation of the cortex into liber, and of liber into wood, is like to that we observe in the human body in the beginning of a callus; for a callus consists of skin, but so compressed, that all the vessels are lost; and that skin, being become solid, is increased, and grows to a greater bulk.

But besides these hitherto described, there occur certain peculiar vessels (of which mention has been made in describing the cortex), which are found full of turpentine, gum, or a certain concreted juice proper to them; the constant progress of which is not very conspicuous in all of them, by reason of the transparency of the moisture.

5. The fifth and last part is the most inward, the medulla or pith, disposed in the middle center of the root; and as it seems different from the former, seeing this is sometimes wasted, and that never, this appears more fungous, that more durable.

As to the manner of the root's performing its function, it may be observed, that the root having imbibed the saline and aqueous juices of the earth, and saturated itself with them, for the nourishment of the tree, those juices are put into motion by heat; which having entered the mouths of the arterial vessels from the root, they mount to the top with a force answerable to what sets them in motion; and, by this means, they gradually open the minute vessels rolled up, and expand them into leaves.

2. The wood; this is considered as consisting of capillary tubes, running parallel from the root throughout the stalk. Some call the capillary tubes arterial vessels, because the sap rises from the root through these. The aperture of these tubes are, for the most part, too minute to be perceived by the bare eye, unless in a piece of charcoal, cane, or the like.

Wood, says Dr. Grew, by microscopical observations, appears to be only an assemblage of infinitely minute canals, or hollow fibres, some of which arise from the root upwards, and are disposed in form of a circle; and the others, which are called insertions, tend horizontally from the surface to the center, so that they cross each other, and are interwoven like the threads of a weaver's web.

Besides the capillary tubes, &c. before-mentioned, there are other larger veſſels, which ſome call venal veſſels, which are diſpoſed on the outſide of the arterial veſſels, between the wood and the inner bark, and lead down to the covering of the inward root. Theſe veſſels are ſuppoſed to contain the liquid ſap found in plants in the ſpring, &c.

The Rev. Dr. Hales tells us in his excellent treatiſe on Vegetable Statics, that, in order to find whether there was any lateral communication of the ſap and ſap-veſſels, as there is of the blood in animals, by means of the ramifications and lateral communications of their veſſels; he took a young oak-branch, ſeven or eight inches diameter, at its tranſverſe cut, ſix feet high, and full of leaves; and having cut a large gap to the pith, ſeven inches from the bottom, and of an equal depth the whole length, and alſo cut another gap four inches above that on the oppoſite ſide, he ſet the end of the ſtem in water, and in two nights and two days time it imbibed and perſpired thirteen ounces; while another like oak-branch, ſomewhat bigger than that, but with no notches cut in its ſtem, imbibed twenty-five ounces.

From this and many other experiments he there mentions, he ſays, we ſee a moſt free lateral communication of the ſap and ſap-veſſels, thoſe great quantities of liquor having paſſed laterally by the gaps; in that, by ſeveral experiments on cylinders of wood, little evaporated by the gaps.

The bark is the exterior part of trees, ſerving them for a ſkin or covering: it is generally of a ſpongy texture, and communicates with the pith by a multiplicity of ſmall fibres paſſing through the capillary tubes, of which the wood conſiſts: ſo that the roots having imbibed the proper nutriment of the tree, it is carried up by the warmth of the ſun, through the fine arterial veſſel of the tree, to the top of it; and being there condenſed by the cold, it does, by its own gravity, return down by the veſſels which lie between the wood and the inner bark, which perform the office of veins; and as it paſſes by, leaves ſuch parts of its juice as the texture of the bark will receive, and requires for its ſupport.

Some are of opinion, that that ſoft whitiſh rind, or ſubſtance, which lies between the inner bark and the wood, does the office of veins: and ſome call this a third bark, and ſuppoſe it to differ from the other in nothing but having cloſer fibres, and that it contains the liquid ſap, gums, &c. which are found in the plants in the ſpring and ſummer months, which hardens by degrees, by means of the ſap it tranſmits, and is imperceptibly conveyed into the woody part of the tree.

The bark ſerves for divers purpoſes; for it not only tranſmits the nutritious juices of the plants, but alſo contains divers fat oily humours, to defend the inner parts from the injuries of the weather. As animals are furniſhed with a panniculus adipoſus, uſually replete with fat, which inveſts and covers all the fleſhy parts, and ſcreens them from external cold; ſo are plants encompaſſed with a bark, replete with fat juices, by means whereof the cold is kept out, and, in winter-time, the ſpiculæ of ice prevented from fixing and freezing the juices in their veſſels; whence it is, that ſome ſorts of trees remain ever-green throughout the year, by reaſon their barks are more compact, and contain a larger quantity of oil than can be ſpent and exhaled by the ſun.

The pith is the inward central part of a tree or plant, anſwering to the medulla, or marrow of an animal. As for its ſubſtance, it conſiſts of little tranſparent globules, chained or linked together, ſomewhat like the bubbles that compoſe the froth of liquor.

Some ſuppoſe, that the circulation of the ſap is effected by means of the pith, others by the bark, and others by the wood.

Borelli, in his book De Motu Animalium, ſuppoſes the tender growing ſhoot to be diſtended like ſoft wax, by the expanſion of the moiſture in the ſpongy pith; which dilating moiſture, he concludes, is hindered from returning back, while it expands by the ſponginefs of the pith without the help of valves.

And the Rev. Dr. Hales is of opinion, that it is very probable, that the particles of water that immediately adhere to, and are ſtrongly imbibed into, and attracted by, every fibre of the ſpongy pith, will ſuffer ſome degree of expanſion before they can be detached by the warmth of the ſun from each attracting fibre; and, conſequently, the maſs of ſpongy fibres, of which the pith conſiſts, muſt therefore be extended.

And that the pith may be the more ſerviceable for this purpoſe, nature has provided in moſt ſhoots a ſtrong partition at every knot, which partitions ſerve not only as plinths or abutments for the dilating pith to exert its force on, but alſo to prevent the too free retreat of the rarefied ſap from the pith.

But a dilating ſpongy ſubſtance, by equally expanding itſelf every way, would not produce an oblong ſhoot, but rather a globous one, like an apple; to prevent which inconvenience it is obſervable, that nature has provided ſeveral diaphragms, beſides thoſe at each knot, which are placed at ſmall diſtances acroſs the pith, thereby preventing its too great lateral dilatation.

Theſe are very plain to be ſeen in the ſhoots of the Walnut-tree, and the ſame may be obſerved in the pith of the branches of the Sun-flower, and ſeveral other plants, where thoſe diaphragms are not to be diſtinguiſhed while the pith is full and replete with moiſture; yet when it dries up, they are often plain to be ſeen. And it is farther to be obſerved, that where the pith conſiſts of diſtinct veſicles, the fibres of thoſe veſicles are often found to run horizontally, whereby they can the better reſiſt the too great lateral relaxation of the root.

The trunk and branches of a tree, bear a reſemblance to the exterior members and limbs of an animal, which it may ſubſiſt without, though the rotting and mortification of them oftentimes occaſion a total deſtruction of it. Accordingly the like effects are found from the wounding or lopping of a tree, as from the wounding or cutting off a limb, an extravaſation, callus, or the like.

A leaf is part of a plant extended into length and breadth in ſuch a manner, as to have one ſide diſtinguiſhable from the other. The leaves, according to Malpighius, conſiſt of ſo many interwoven utricles, as to be not much unlike a pulmonary net, and ſerve inſtead of lungs to the plant. As the perſpiration and reſpiration are chiefly performed thereby, thoſe veſſels are very conſpicuous when the leaves are diſſected. In the day-time, when the heat hath rarefied the mounting juices, ſo as to become ſpecifically lighter than the air, they flow out through the pores of the leaves, and evaporate, which is the occaſion of the leaves becoming ſo flaccid in very hot weather; but in the night, when by the cold the juices are more condenſed, then the leaves are erected again, and draw in a great ſhare of nouriſhment from the air. Theſe leaves we may obſerve to be of different textures on each ſide, the upper ſurface being for the moſt part ſmooth, the better to ſhoot off the redundant moiſture, while the under ſurface is many times of a rough and cottony texture, by which it is capable of retaining the moiſture; for which reaſon we find, if by bad management, &c. the ſhoots of trees are nailed to a wall, &c. ſo as to turn the ſurfaces of the leaves the wrong ſide upwards, the ſhoots will be at a ſtand, until the leaves have obtained their proper diſpoſition. Theſe leaves, as the learned Dr. Hales obſerves, are carefully diſtributed at ſmall diſtances throughout the whole length of the ſhoots, and ſerve as ſo many jointly-acting powers, placed at different ſtations, thereby with more eaſe to draw plenty of ſap to the extending root.

A flower is the more tender part of a plant, remarkable for its colour, or form, or both, cohering with the rudiment of the fruit, and contains the organs of generation; ſome of theſe flowers contain the male organs, as the ſtamina and apices, which are loaded

with the farina fœcundans, which, when ripe, is ſcattered into thoſe flowers which are female, and conſiſt only of the ovarium, with the ſtyle and ſtigma, which are ſurrounded with the petals. Other flowers there are, which have both ſexes contained in the ſame flower; theſe are called hermaphrodite flowers.

A fruit, Καρπὸς, is not that part of a plant which is eatable, but rather the ſeeds, with their covering, ſhould be called the fruit. This covering cheriſhes the ſeeds until they come to maturity, and defends them from the injuries of the weather, as that they are not hurt thereby; and alſo prepares the juices deſigned for their nouriſhment, that it may with eaſe enter their ſmall bodies in a juſt proportion.

The motion of the nutritious juices of plants is produced much like that of the blood in animals, by the action of the air; and, in effect, there ſeems to be ſomething equivalent to reſpiration throughout the whole plant.

Malpighius was the firſt who obſerved, that vegetables conſiſted of two ſeries, or orders, of veſſels.

1. Thoſe which have been treated of before, which receive and convey the alimental juices, and which anſwer to the arteries, lacteal veſſels, veins, &c. of animals; and,

2. The tracheæ, or air-veſſels, which are long hollow pipes, in which the air is continually received and expelled, i. e. inſpired and expired, within which tracheæ all the former veſſels are contained.

Hence it follows, that the heat of the year, nay, of a ſingle day, hour, or minute, muſt have an effect on the air included in theſe tracheæ, i. e. it muſt rarefy it, and, of conſequence, dilate the tracheæ; and hence alſo a perpetual ſpring or ſource of action muſt ariſe, to promote the motion of the ſap in plants.

For when the tracheæ are expanded, the veſſels which contain the juices, are, by that expanſion, preſſed; and, by that means, the juice contained is continually propelled and accelerated; and, by this propulſion, the juice is continually comminuted, and rendered more and more ſubtil, and adapted to enter into veſſels ſtill finer and finer; the thickeſt part of it being at the ſame time ſecreted, and depoſited into the lateral cells, or loculi of the bark, to defend the plant from cold, and other external injuries.

The veſſels, or containing parts of plants, conſiſt of mere earth, bound or connected together by oil, as a gluten, or glue; which being exhauſted by fire, air, age, or the like, the plant moulders, or returns again into its earth or duſt.

Thus vegetables being burnt by the moſt intenſe fire, the matter of the veſſels is left entire and indiſſoluble, notwithſtanding its utmoſt force; and, of conſequence, is neither water, nor air, nor ſalt, nor ſulphur, but earth alone.

Juice is a liquid ſubſtance, which makes part of the compoſition of plants, and communicates itſelf to all the other parts, and ſerves to feed and increaſe them; and is that to plants that blood is to animals. Theſe juices are of divers ſorts; aqueous, grumous, bituminous, oleaginous, reſinous, vinous; of all taſtes and colours.

This juice or ſap of plants, is a humour furniſhed by the earth, and changed in the plant; it conſiſts of ſome foſſil, or other parts, which are derived from the air or rain; and others, from putrefied animals, plants, &c. ſo that, conſequently, in vegetables are contained all kinds of ſalts, oil, water, earth, and, probably, all kinds of metals too, inaſmuch as the aſhes of vegetables always yield ſomewhat which is attracted by the load-ſtone.

The juice enters plants in the form of a fine ſubtil water, which by how much the nearer it is to the root, ſo much the more it retains of its proper nature; and the farther it is from the root, the more action it has undergone, and approaches the nearer to the nature of the vegetable; and, of conſequence, when the juice enters the root, the bark of which is furniſhed with excretory veſſels, fitted to diſcharge the excrementitious part, it is earthy, watry, poor, acid, and ſcarce oily at all.

It is further prepared in the trunk and branches, though it continue acid ſtill; as is perceived by the tapping or perforating of a tree in the month of February, when it diſtils a watry juice that is ſenſibly acid.

The juice being carried hence to the germs, or buds, is more connected; and when it has here unfolded the leaves, theſe come to ſerve as lungs for the circulation and further preparation of the juice; for when thoſe tender leaves are expoſed to the alternate action of heat and cold, moiſt nights, and hot ſcorching days, they are expanded and contracted alternately; and the more, by reaſon of their net-like texture.

By ſuch means, the juice is farther altered and digeſted, as it is farther yet in the petala, or leaves of the flowers, which tranſmit the juice now brought to a further ſubtilty to the ſtamina; the ſtamina communicate it to the farina, or that duſt which appears on the apices, where it undergoes a further maturation, and ſheds into the piſtil; and there acquiring its laſt perfection, it becomes the original of a new fruit or plant.

ANCHUSA. Lin. Gen. 167. Buglossum. Tourn. Inſt. R. H. 133. tab. 53.

The CHARACTERS are,

*The empalement is oblong, taper, and permanent, cut into five acute ſegments which are erect. The flower is of one leaf, having a cylindrical tube the length of the empalement; at the brim it is cut into five upright ſegments, which ſpread open, but the chaps are cloſed, and have five prominent little ſcales. There are five ſhort ſtamina in the chaps of the flower, which are crowned with oblong ſummits. In the bottom of the flower are ſituated four germen, having a ſlender ſtyle, crowned with an obtuſe ſtigma. The germen afterward becomes four oblong blunt ſeeds ſhut up in the empalement.*

Dr. Linnæus ranges this genus of plants in the firſt ſection of his fifth claſs of plants, entitled Pentandria Monogynia, the flowers having five ſtamina and a ſingle ſtyle.

The SPECIES are,

1. ANCHUSA (*Officinalis*) foliis lanceolatis ſpicis imbricatis ſecundis. Hort. Cliff. 46. *Alkanet with ſpear-ſhaped leaves, and fruitful imbricated ſpikes, or greater Garden Bugloſs.* Blugoſſum anguſtifolium majus. C. B. P. 256.

2. ANCHUSA (*Anguſtifolia*) racemis ſubnudis conjugatis. Prod. Leyd. 408. *Alkanet with conjugated half naked ſpikes.* Borago ſylveſtris perennis flore rufo kermeſino. Zan. Hiſt. 49.

3. ANCHUSA (*Undulata*) ſtrigoſa foliis linearibus dentatis pedicellis bracteâ minoribus calycibus fructiferis inflatis. Læfl. Lin. Sp. Plant. 133. *Alkanet with narrow indented leaves, ſmall foot-ſtalks to the branches, and a ſwelling empalement over the ſeeds.* Bugloſſum Luſitanicum echii folio undulato. Tourn. Inſt. 134.

4. ANCHUSA (*Orientalis*) villoſa-tomentoſa, ramis floribuſque alternis axillaribus, bracteis ovatis. Lin. Sp. 191. *Alkanet with branches and flowers growing alternately from the wings of the ſtalks, and oval bractea or floral leaves.* Bugloſſum Orientale flore luteo. Tourn. Cor. 6.

5. ANCHUSA (*Virginiana*) floribus ſparſis caule glabro. Lin. Sp. Plant. 133. *Alkanet with flowers growing thinly, and a ſmooth ſtalk.* Anchuſa minor lutea Virginiana Puccoon indigens dicta quâ ſe pingunt Americani. Pluk. Alm. 30. *Called by the inhabitants of Virginia, Puccoon.*

6. ANCHUSA (*Sempervirens*) pedunculis diphyllis capitatis. Lin. Sp. Plant. 134. *Alkanet with foot-ſtalks having two leaves.* Bugloſſum latifolium ſerpervirens. C. B. P.

7. ANCHUSA (*Cretica*) foliis lanceolatis verrucoſis ſemiamplexicaulibus, floribus capitatis, caule procumbente. *Alkanet with warted and ſpear-ſhaped leaves embracing the ſtalk half round, flowers growing in a head, and a trailing ſtalk.* Bugloſſum Creticum verrucoſum perlatum quibuſdam. H. R. Par.

8. Anchusa (*Tinctoria*) tomentosa, foliis lanceolatis obtusis, staminibus corolla brevioribus. Lin. Sp. 192. *Anchusa with woolly, spear-shaped, blunt leaves, and the stamina of the flower shorter than the corolla, or true Alkanet of the shops.*

9. Anchusa (*Azurea*) foliis longis hirsutis, floribus capitatis reflexis, pedunculis longissimis. *Alkanet with long hairy leaves, and flowers collected into heads which are reflexed, and very long foot-stalks.* Borago sylvestre Cretica flore azureo. Zan. Hist. 51.

The first sort is the Bugloss, whose flowers are ordered to be used in medicine. This sends up stalks about two feet high, having oblong rough leaves, placed alternately, at the extremity of the shoots. The flowers are produced in clusters, which are of a fine blue colour; these come out with foot-stalks from the wings of the leaves, and are collected into small heads. The flowers are of one leaf, having a long tube, spread open at the top in shape of a funnel. After the flower is past, it is succeeded by four naked seeds, situated at the bottom of the empalement, which drop out as they ripen.

The roots of this sort seldom continue longer than two years, especially in good ground, for they are subject to rot in winter, unless when they happen to grow in rubbish, or out of an old wall, where they will live several years; for in such places the plants are stinted in their growth, so their branches are firmer and not so full of juice as those which grow in better soil. The plants may be easily propagated by seeds, which may be sown in the autumn, upon a bed of light sandy earth; and in the spring, when the plants are strong enough to remove, they should be planted in beds at two feet distance, observing, if the season proves dry, to water them till they have taken root, after which they will require no farther care but to keep them clean from weeds. If the seeds of this plant are permitted to scatter, the plants will rise in plenty, which may be managed in the manner before directed. There is a variety of this with white flowers, but this will not retain its difference from seeds.

The second sort grows to the height of two feet when cultivated in gardens, but in the places where it grows wild, is rarely more than a foot. The leaves of this are narrow, and less hairy than those of the first; the spikes of flowers come out double, and have no leaves about them; the flowers are small, and of a red colour. The roots will continue three or four years in poor land.

The third sort is a biennial plant, which perishes soon after the seeds are ripe. This grows two feet high, and sends out many lateral branches, which are garnished with long, narrow, rough leaves, which are waved on their edges: the flowers are of a bright blue colour, and grow in an imbricated spike; and after these fall, the empalement turns to a swollen vessel inclosing the seeds.

The fourth sort is a perennial plant, with long trailing branches which lie on the ground; the under leaves are long, broad, and hairy, but these diminish as they are nearer the top, and those which come out on the spikes between the flowers are short and roundish. The flowers are yellow, and about the size of those of the common Bugloss; there is a succession of these on the same plants great part of the year, which renders them more valuable. This, though a native of the Levant, is hardy enough to live in the open air in England, if it hath a dry sandy soil. It may be propagated by seeds in the same manner as the first sort, and if the seeds are permitted to scatter, the plants will rise without care.

The fifth sort is a native of North America, where it grows naturally in the woods, and being an early plant, generally flowers before the new leaves come out on the trees; so that in some of the woods, where this plant abounds, the surface of the ground seems covered with bright yellow flowers. It is known in that country by the title Puccoon. It is a perennial plant which seldom rises a foot high in good ground, but not above half that height, where the soil is poor; the flowers grow in loose spikes, upon a smooth stalk. This is propagated by seeds, which, if sown in the spring, seldom grow the first year.

The sixth sort is a very hardy perennial plant, with weak trailing branches, garnished with broad, rough, deep green leaves; the flowers are blue, and come out between the leaves on the spike, like the fourth sort; the plants frequently grow out of the joints of old walls, in those places where any of the plants have been near; for when the seeds are permitted to scatter, there will be an abundant supply of the plants. These flower great part of the year.

The seventh sort is a low, trailing, annual plant, whose branches seldom extend more than six inches; these lie on the surface of the ground, and are thinly set with spear-shaped, small, warted leaves, which half surround the stalk at their base. The flowers are small, of a bright blue colour, and are collected into small bunches at the extremity of the branches. The plants perish soon after their seeds are ripe, which if permitted to scatter, the plants will come up better than when they are sown. These do not bear transplanting, so should remain in the places where they come up.

The eighth sort rises near as high as the first, to which it bears great resemblance in its leaves and branches; but the leaves and branches are more woolly, and the stamina of the flowers are shorter than the corolla; the root also is red. This plant grows naturally in the south of France and Spain, but is equally hardy with the first species, and may be cultivated in the same manner.

The ninth sort is a perennial plant, with broad rough leaves, like those of the sixth; the branches grow more erect, and the flowers which are of a bright azure colour, are collected into spikes, coming out singly from between the leaves. This is a hardy plant, and may be propagated in the same manner as the former.

## ANDRACHNE, Bastard Orpine.

The Characters are,

*It hath male and female flowers on the same plant. The male flower hath a five-leaved empalement, which is equal and withers. The flower is composed of five slender leaves indented at the top, which are shorter than the empalement. At the bottom of each petal is situated an herbaceous nectarium, to which the five slender stamina are joined; these are crowned with single summits. The female flowers come out from the wings of the stalk near the male. These have a permanent five-leaved empalement, but no petals; there are five nectariums as in the male, and a globular germen supporting three slender styles which are bifid, crowned with a round stigma. The germen afterward turns to a three cornered globular capsule, having three cells, in each of which are lodged two triangular obtuse seeds.*

The Species are,

1. Andrachne (*Telephioides*) procumbens herbacea. Lin. Sp. Plant. 1014. *Herbaceous trailing Andrachne.* Telephioides Græcum humifusum flore albo. Tourn. Cor. 50.

2. Andrachne (*Fruticosa*) erecta arborea. Osb. It. 228. *Shrubby tree-like Bastard Orpine.*

3. Andrachne (*Arborea*) foliis ovatis obtusis, subtus incanis, caule arboreo. *Bastard Orpine with oval blunt leaves, hoary on their under side, and a tree-like stalk.*

The first sort is a low plant, whose branches trail upon the ground. The leaves are small, of an oval shape, smooth, and of a sea-green colour. It is found wild in some parts of Italy, and in the Archipelago, from whence Dr. Tournefort sent the seeds to the royal garden at Paris: but being a plant of no great beauty, it is seldom cultivated, except in botanic gardens for variety. If the seeds of this plant are sown on a moderate hot-bed in March, the plants will arise in about a month after, when they may be transplanted each into a small pot, and plunged into another very moderate hot-bed to bring the plants forward, but in mild weather they should have plenty of air admitted to them, and often refreshed with water: in June they will produce flowers, and the seeds will ripen in

August and September, soon after which the plants will decay.

The second sort grows naturally in China, and also at La Vera Cruz in New Spain, where it rises twelve or fourteen feet high; the branches are garnished with spear-shaped, pointed, smooth leaves, under which the foot-stalk of the flowers are produced; these are pretty long and hang downward: the flowers are small, of an herbaceous white colour, some of which are male, and others female, but when the latter are situated at too great distance from the former, there is rarely any seeds within their covers; though they seem very fair to sight, yet upon being opened there will no seeds be found in them; whereby several persons have been deceived, who have sown them, without raising a single plant.

The third sort was discovered by the late Dr. William Houston, growing naturally at Campeachy; this has a strong woody stem, which rises more than twenty feet high, sending out branches on every side, which are garnished with oval blunt leaves, hoary on their under-side, and having pretty deep furrows on their upper, placed alternately on the branches: the flowers I have not seen, for the plant which rose from the seeds in the physic garden did not produce any, tho' it grew upward of fourteen feet high; nor were there any flowers upon the trees at Campeachy, at the time Dr. Houston was there, the seeds being then ripe; of these the doctor sent many to Europe which appeared very fair, but on being opened, no kernels were found within them, so that but one plant was raised from all the seeds.

These two sorts are very tender plants, so that when good seeds can be obtained, they should be planted in pots, plunging them into a hot-bed of tanners bark, observing to water them as the earth becomes dry in the pots; and when the plants come up, and are fit to remove, they should be each planted in a small pot, plunged into a tan-bed, shading them until they have taken fresh root, after which they should have free air admitted to them in warm weather, but must be constantly kept in the bark-stove.

There is also another sort which I have raised from seeds, sent me from Jamaica; the whole form of the seeds agree with those of the third sort, as do also the plants, but the leaves are somewhat like those of the Laurel, but are much larger; this hath not as yet flowered in Europe.

ANDROMEDA. Lin. Gen. Plant. 485. We have no English name for this plant.

The Characters are,

*The empalement is cut into five small acute segments; this is coloured and permanent. The flower is of one leaf, oval, bell-shaped, and divided into five parts at the brim, which are reflexed. It hath ten awl-shaped stamina, which are shorter than the petals to which they are fixed; these are crowned with nodding summits having two horns. In the center of the flower is situated a round germen, supporting a cylindrical style, which is longer than the stamina, and crowned with a blunt stigma. The germen afterward turns to a round pentagonal vessel having five cells, which are filled with small round seeds.*

This genus of plants is ranged by Dr. Linnæus in the first division of his tenth class, entitled Decandria Monogynia, the flowers having ten stamina and one germen.

The Species are,

1. Andromeda (*Polifolia*) pedunculis aggregatis, corollis ovatis, foliis alternis lanceolatis revolutis. Lin. Sp. Plant. 393. *Andromeda with aggregate foot-stalks, oval petals, and spear-shaped leaves growing alternately.* Polifolia. Buxb. Act. 2. p. 345.
2. Andromeda (*Mariana*) pedunculis aggregatis corollis cylindricis foliis alternis ovatis integerrimis. Lin. Sp. Plant. 393. *Andromeda with aggregate foot-stalks, cylindrical flowers, and oval entire leaves placed alternately.*
3. Andromeda (*Paniculata*) racemis fecundis nudis paniculatis, corollis subcylindricis foliis alternis oblongis crenulatis. Lin. Sp. Plant. 394. *Andromeda with naked, fruitful, loose spikes, cylindrical flowers, and oblong crenated leaves placed alternately.* Vitis idæa Americana, longiori mucronato & crenato folio, floribus urceolatis racemosis. Pluk. Alm. 391.
4. Andromeda (*Arborea*) racemis fecundis nudis, corollis rotundo-ovatis. Lin. Sp. Plant. 394. *Andromeda with naked fruitful spikes, and oval roundish flowers.* Frutex foliis oblongis acuminatis floribus spicatis uno versu dispositis. Catesb. Carolin. 1. p. 71. *commonly called Sorrel-tree in Carolina.*
5. Andromeda (*Caliculata*) racemis fecundis foliaceis corollis subcylindricis, foliis alternis lanceolatis obtusis punctatis. Lin. Sp. Plant. 394. *Andromeda with leafy fruitful spikes, cylindrical flowers, and obtuse spear-shaped leaves, with punctures placed alternately.* Chamædaphne. Buxb. Act. 1. p. 241.

The first sort is a low plant which grows naturally on bogs in the northern countries, but is with difficulty preserved in gardens; and having little beauty, is seldom cultivated except in botanic gardens. I received the seeds from Petersburgh, which came up in the Chelsea garden, but did not continue more than one year.

The second sort grows naturally in North America: this is a low shrub, which sends out many woody stalks from the root, garnished with oval leaves placed alternately; the flowers are collected in small bunches: these are shaped like those of the Strawberry-tree, and are of an herbaceous colour. They appear in June and July, and sometimes are succeeded by fruit, which seldom ripen in England.

The third sort is also a native of North America. This shrub grows about four feet high, sending out several branches, which are clothed with oblong leaves placed alternately; the flowers grow in loose spikes from the ends of the branches; they are of the pitcher shape, like those of the Arbutus, but are a little longer, and appear in July, but do not produce seeds in this country.

The fourth sort grows naturally in Virginia and Carolina; in the latter it is much larger than in the former, the climate being warmer; so many of the trees and shrubs grow to a much greater height there. In Virginia, it is a shrub growing ten or twelve feet high, but in Carolina it rises twenty feet. The branches are very slender, bending downward; these are garnished with leaves placed alternately, which are oblong and pointed: the flowers grow in long naked spikes, coming out from the sides of the branches, which are of an herbaceous colour, and are ranged on one side of the stalk; they are oval, and shaped like a pitcher.

The fifth sort grows naturally in Siberia, and also in North America; it is a low shrub which grows on mossy land, so is very difficult to keep in gardens. The leaves are shaped like those of the Box-tree, and are of the like consistence, having several small punctures on them; the flowers grow in short spikes from the extremity of the branches: these are produced single between two leaves, they are white and of a cylindrical pitcher shape.

All the sorts, except the fourth, are very hardy plants, which delight in moist ground; they increase by their creeping roots, which put up suckers at a distance, and may be taken off with roots, and transplanted where they are designed to remain, for they do not bear to be often removed.

The fourth sort requires to be sheltered from hard frost in winter, but in the summer should be frequently watered. It is a difficult plant to keep in gardens, as it grows naturally on boggy places, and requires a greater heat than that of this climate. It may be propagated by seeds, which should be procured from America, where it is known by the name of Sorrel-tree.

ANDROSACE. We have no English name for this plant.

The Characters are,

*The flowers grow in an umbel; they have a many-leaved general involucrum. Each flower hath a five-cornered empalement*

*palement of one leaf, slightly indented at the top in five acute points, this is permanent: the flower is of one leaf, having an oval tube, inclosed by the empalement, but is plain at the brim, where it is divided into five parts. It hath five small stamina within the tube, which are crowned with oblong erect summits. In the center is situated a round germen, supporting a short slender style, crowned by a globular stigma; the empalement afterward becomes a round capsule of one cell opening in five parts, which is full of round seeds.*

Dr. Linnæus ranges this genus of plants in the first section of his fifth class, entitled Pentandria Monogynia, the flower having five stamina and one style.

The Species are,

1. Androsace (*Maxima*) perianthiis fructuum maximis. Hort. Upsal. 36. *Androsace with the largest empalement to the fruit.* Androsace vulgaris latifolia annua. Tourn. Inst. R. H. 123.
2. Androsace (*Septentrionalis*) foliis lanceolatis dentatis glabris perianthiis angulatis corollâ brevioribus. Flor. Suec. 160. *Androsace with smooth, indented, spear-shaped leaves, and an angular empalement shorter than the petals.* Alsine verna Androsaces capitulis. C. B. P. 251.
3. Androsace (*Villosa*) foliis pilosis perianthiis hirsutis. Lin. Sp. Plant. 142. *Androsace with hairy leaves and empalement.* Sedum Alpinum hirsutum lacteo flore. C. B. P. 284.
4. Androsace (*Carnea*) foliis subulatis glabris, umbella involucrum æquante. Lin. Sp. 204. *Androsace with smooth awl-shaped leaves, and the umbel of flowers equal to the involucrum.*
5. Androsace (*Lactea*) foliis linearibus glabris, umbellâ involucris multoties longiore. Lin. Sp. Plant. 142. *Androsace with narrow smooth leaves, and the umbel much longer than the involucrum.* Androsace Alpina perennis angustifolia glabra flore singulari. Tourn. Inst. R. H.

The first sort grows naturally in Austria and Bohemia amongst the corn: this hath broad leaves which spread near the ground, from the center of these the foot-stalks arise, which are terminated by the umbel of flowers, like those of the Auricula; under the umbel of flowers is a large empalement, which is permanent; the flowers are composed of five small white petals; these appear in April and May, the seeds ripen in June, and the plants soon after perish.

The other sorts are much smaller than this, some of them seldom growing more than three inches high, having very small flowers, so make little appearance. They grow naturally on the Alps and Helvetian mountains, as also in Siberia, from whence I have received the seeds of three or four species. These are only preserved in botanic gardens for the sake of variety, and all the sorts except the first should have a shady situation.

The seeds of all the sorts should be sown soon after they are ripe, otherwise they seldom grow the same year. They flower usually the beginning of April, and their seeds are ripe the end of May; which, if permitted to scatter, will come up, and often succeed better than those which are sown. The annual sorts perish as soon as the seeds are ripe, but the others will live in an open border for several years, and require no other care, but to keep them clean from weeds.

ANDROSÆMUM. See Hypericum.

ANDRYALA. Lin. Gen. Plant. 820. Downy Sowthistle.

The Characters are,

*It hath a short, round, hairy empalement, cut into many equal segments; the flowers are composed of many hermaphrodite florets of one leaf, which are uniform, and lie over each other, stretched out like a tongue on one side. There are five stamina in the flowers; these are crowned by cylindrical summits, which are tubulous. The germen is situated at the bottom of each floret, with a slender style, crowned by two reflexed stigma. The germen afterward becomes a single oval seed, crowned with down.*

This genus of plants is by Dr. Linnæus ranged in the first section of his nineteenth class, entitled Syngenesia Polygamia equalis, there being many hermaphrodite flowers included in one common empalement.

The Species are,

1. Andryala (*Integrifolia*) foliis integris ovato oblongis tomentosis. Guett. Stamp. 2. p. 384. *Downy Sowthistle with oval, oblong, entire, downy leaves.* Sonchus lanatus. Dalech. Hist. 1116.
2. Andryala (*Ragusina*) foliis lanceolatis indivisis denticulatis acutis tomentosis, floribus solitariis. Lin. Sp. Plant. 1136. *Downy Sowthistle with indented, spear-shaped, woolly leaves.* Sonchus villosus luteus minor. C. B. P. 124.
3. Andryala (*Sinuata*) foliis runcinatis. Lin. Sp. 1137. *Downy Sowthistle with plain-shaped leaves.*
4. Andryala (*Lanata*) foliis oblongo-ovatis subdentatis lanatis, pedunculis ramosis. Amœn. Acad. 4. p. 288. *Downy Sowthistle with woolly, oblong, oval leaves, and branching foot-stalks.* Hieracium montanium tomentosum. Hort. Elth. tab. 150.

The first is an annual plant, which grows naturally in the south of France, Spain, and Italy, and is preserved in botanic gardens for the sake of variety. This grows a foot and a half high, with woolly branching stalks, having leaves scatteringly set on them, which are oblong and downy. The flowers are produced in small clusters at the top of the stalks, which are yellow, and like those of the Sowthistle, so do not make any great appearance. It is easily raised by seeds, which should be sown in the spring, in the place where the plants are to remain, and will require no other culture but to thin them where they are too close, and keep them clean from weeds. It flowers in July, and the seeds ripen in September.

The second is a perennial plant, which grows naturally in Spain, from whence I received the seeds, as I have also from the Cape of Good Hope. The leaves of this plant are extremely white, and are much indented on their edges; the flower-stalks grow about a foot high, having small clusters of yellow flowers, which appear in July; the seeds sometimes ripen in England, but not every year. The roots creep, by which the plants may be propagated. They love a light dry soil, in which they will live in the open air in this country.

The third sort grows naturally in Sicily, and also near Montpelier; the lower leaves of this sort are indented and woolly, but those upon the stalks are entire; this seldom rises more than a foot high, supporting a few yellow flowers at the top.

The fourth sort grows in Spain and Portugal; the leaves of this are broader, longer, and more downy, than either of the other sorts, the flower-stalks rise more than a foot high, branching into several foot-stalks, each sustaining one large yellow flower, shaped like those of Hawkweed, which are succeeded by oblong black seeds crowned with down.

These two plants are propagated by seeds, in the same manner as the former, which should be sown in autumn, for when they are sown in the spring, the plants seldom rise the same year.

ANEMONE [Ἀνεμώνη, of ἄνεμος, *Gr.* the wind; so called, because the flower is supposed not to open, except the wind blows.] Wind-flower.

The Characters are,

*The flower is naked having no empalement, and consists of two or three orders of leaves or petals, which are oblong, and disposed in three series over each other. It hath a great number of slender stamina which are shorter than the petals, and are crowned by double summits which are erect; between these are situated many germen, which are collected into a head, supporting a pointed style crowned with a blunt stigma. The germen afterward become so many seeds inclosed with a down which adheres to the foot-stalk, and forms an obtuse cone.*

Dr. Linnæus ranges this genus of plants in the sixth section of his thirteenth class, entitled Polyandria Polygynia, from the flowers having many stamina and germen.

The

The Species are,

1. Anemone (*Sylvestris*) pedunculo nudo feminibus subrotundis hirsutis. Lin. Sp. Plant. 540. *Anemone with a naked stalk and a round head of hairy seeds.* Anemone sylvestris alba major. C. B. P. 176.
2. Anemone (*Nemorosa*) seminibus acutis foliolis incisis caule unifloro. Hort. Cliff. 224. *Anemone with pointed seeds, cut leaves, and a single flower.* Anemone nemorosa flore majore. C. B. P. 176.
3. Anemone (*Apennina*) seminibus acutis foliolis incisis petalis lanceolatis numerosis. Lin. Sp. Plant. 541. *Anemone with pointed seeds, cut leaves, and many spear-shaped flower leaves.* Ranunculus nemorosus flore purpureo-cæruleo. Park. Theat. 325.
4. Anemone (*Virginiana*) pedunculis alternis longissimis fructibus cylindricis seminibus hirsutis muticis. Lin. Sp. Plant. 540. *Anemone with very long alternate foot-stalks, and cylindrical spikes of chaffy seeds.* Anemone Virginiana tertiæ Matthioli similis flore parvo. H. L. 645.
5. Anemone (*Coronaria*) foliis radicalibus ternato-decompositis, involucro folioso. Lin. Sp. Plant. 539. *Anemone with lower leaves decompounded, and a leafy involucrum.* Anemone tenuifolia simplici flore. C. B. P. 174.
6. Anemone (*Hortensis*) foliis digitatis. Lin. Sp. Plant. 540. *Anemone with hand-shaped leaves.* Anemone hortensis latifolia. 3 Clus. Hist. 1. p. 249.
7. Anemome (*Dichotoma*) caule dichotoma, foliis sessilibus oppositis amplexicaulibus trifidis incisis. Amæn. Acad. 1. p. 155. *Anemone with a forked stalk, and trifid cut leaves growing opposite, which embrace the stalks.*
8. Anemone (*Thalictroides*) foliis caulinis simplicibus verticillatis, radicalibus duplicato ternatis. Lin. Sp. 763. *Anemone with simple leaves on the stalk, growing in whorles, and those at the root double ternate.*

The first sort grows naturally in many parts of Germany; this approaches near to our Wood Anemone, but the seeds of it are round and hairy; the flower is large and white, but having little beauty, is seldom planted in gardens.

The second sort grows wild in the woods in many parts of England, where it flowers in April and May, making a pretty appearance in those places where they are in plenty. The roots of this may be taken up when their leaves decay, and transplanted in wildernesses, where they will thrive and increase greatly, if they are not disturbed; and in the spring, before the trees are covered with leaves, they will have a very good effect, in covering of the ground and making a pleasing variety at that season.

The third sort is found growing naturally in some parts of England, but particularly at Wimbledon in Surry, in a wood near the mansion-house, in great plenty; but it is not certain that they were not originally planted there, as they are not found in any other place in that neighbourhood. This sort flowers at the same time with the former, and when intermixed with them, make a fine variety. This may be transplanted from the woods as the former.

There are of these two sorts, some with double flowers, which have been obtained from seeds. These make a finer appearance, and continue longer in flower than the single, but are only to be procured from the gardens, where they are cultivated. As these are only seminal varieties, I have not enumerated them with the others.

The fourth sort grows naturally in North America, from whence the seeds are frequently sent to England. This is a very hardy plant, and produces plenty of seeds in England, but having little beauty, scarce deserves a place in gardens, unless for the sake of variety.

The fifth and sixth sorts are natives of the east, from whence their roots were brought originally; but have been so greatly improved by culture, as to render them some of the chief ornaments to our gardens in the spring. The principal colours of these flowers are red, white, purple, and blue, and some are finely variegated with red, white, and purple. There are many intermediate shades of these colours; the flowers are large and very double, and, when properly managed, are extremely beautiful. I shall therefore proceed to give ample directions for their culture, which, if duly observed, every person may have these flowers in perfection.

Take a quantity of fresh untried earth (from a common, or some other pasture land) that is of a light sandy loam, or hazel mould, observing not to take it above ten inches deep below the surface; and if the turf be taken with it the better, provided it hath time to rot thoroughly before it is used: mix this with a third part of rotten cow dung, and lay it in a heap, keeping it turned over at least once a month for eight or ten months, the better to mix it, and rot the dung and turf, and to let it have the advantages of the free air: in doing this be careful to rake out all great stones, and break the clods (but by no means sift or screen the earth, which is found very hurtful to many sorts of roots); for when the earth is made very fine, upon the first great rains of winter or spring, the small particles thereof join closely together, and form one solid mass, so that the roots often perish for want of some small stones to keep the particles asunder, and make way for the tender fibres to draw nourishment for the support of the root.

This earth should be mixed twelve months before it is used, if possible; but if you are constrained to use it sooner, you must turn it over the oftener, to mellow and break the clods; and observe to rake out all the parts of the green sward, that are not quite rotten, before you use it, which would be prejudicial to your roots, if suffered to remain. The beginning of September is a proper season to prepare the beds for planting (which, if in a wet soil, should be raised with this sort of earth six or eight inches above the surface of the ground, laying at the bottom some of the rakings of your heap to drain off the moisture; but in a dry soil, three inches above the surface will be sufficient): this compost should be laid at least two feet and a half thick, and in the bottom there should be about four or five inches of rotten neats dung, or the rotten dung of an old Melon or Cucumber-bed, so that you must take out the former soil of the beds to make room for it.

And observe in preparing your beds, to lay them (if in a wet soil) a little round, to shoot off the water; but in a dry one, let it be nearer to a level; in wet land, where the beds are raised above the surface, it will be proper to fill up the paths between them in winter, either with rotten tan or dung, to prevent the frost from penetrating into the sides of the beds, which often destroy their roots. The earth should be laid in the beds at least a fortnight or three weeks before you plant the roots, that it may settle; and when you plant them, stir the upper part of the soil about six inches deep, with a spade; then rake it even and smooth, and with a stick draw lines each way of the bed at six inches distance, so that the whole may be in squares, that the roots may be planted regularly: then with your three fingers make a hole in the center of each square, about three inches deep, laying therein a root with the eye uppermost; and when you have finished your bed, with the head of a rake draw the earth smooth, so as to cover the crown of the roots about two inches.

The best season for planting these roots, if for forward flowers, is about the latter end of September; and for those of a middle season, any time in October; but observe to perform this work, if possible, at or near the time of some gentle showers; for if the roots are planted when the ground is perfectly dry, and there should no rain fall for three weeks or a month after, they will be very apt to grow mouldy upon the crown, and if they once get this distemper, they seldom come to good after.

You may also reserve some of your Anemone roots till after Christmas, before you plant them, lest by the severity of the winter your early planted roots should be destroyed, which sometimes happens in very hard winters, especially in those places where they

they are not covered to protect them from froſt: theſe late planted roots will flower a fortnight or three weeks after thoſe which were planted in autumn, and many times blow equally as fair, eſpecially if it prove a moiſt ſpring, or that care be taken to refreſh them gently with water.

But then the increaſe of theſe roots will not be near ſo great as thoſe of your firſt planting, provided they were not hurt in winter; and it is for this reaſon all thoſe who make ſale of theſe roots, are forward in planting; for although it may happen, by ſharp pinching froſts in the ſpring, that their flowers are not ſo double and fair as thoſe planted a little later, yet if they can preſerve the green leaves of the plants from being injured, the roots will greatly increaſe in bulk; but in ſuch gardens where theſe flowers are preſerved with care, there is always proviſion made to cover them from the injuries of the weather, by arching the beds over with hoops, or frames of wood, and covering them with garden-mats or cloths, in froſty nights, and bad weather, eſpecially in the ſpring of the year, when their buds begin to appear; for otherwiſe, if you plant the beſt and moſt double flowers, the black froſts and cutting winds in March will cauſe them to blow ſingle, by deſtroying the thrum that is in the middle of the flower; and this many times hath occaſioned many people who have bought the roots, to think they were cheated in the purchaſe of them, when it was wholly owing to their neglect of covering them, that their flowers were ſingle.

In the beginning of April your firſt planted roots will begin to flower, which will continue for three weeks or more, according to the heat of the weather, or the care taken in covering them, during the heat of the day, with mats or cloths: after theſe are paſt flowering, the ſecond planted ſorts will come to ſucceed them, and theſe will be followed by thoſe planted in the ſpring; ſo that you may have theſe beauties continued for near two months together, or ſometimes longer, if the ſeaſon prove favourable, or proper care is taken to ſhade them in the heat of the day.

The beginning of June, the leaves of your firſt blown roots will begin to decay; ſoon after which time you muſt take them out of the ground, clearing them from decayed ſtalks, and waſhing them, to take the earth clean from the root; then ſpread them on a mat in a dry ſhady place till they are perfectly dried, when you may put them up in bags, and hang them out of the reach of mice, or other vermin, which will deſtroy many of the roots if they can come at them.

Obſerve alſo to take up the latter planted roots as ſoon as their leaves decay; for if they are ſuffered to remain long after in the ground, and there ſhould fall ſome ſhowers of rain, they would ſoon put forth freſh fibres, and make new ſhoots, when it would be too late to remove them: at the time when you take up the roots, is the proper ſeaſon for breaking or parting them, which may be done by ſeparating thoſe that you would chooſe to make all poſſible increaſe from, into as many parts as you can conveniently, provided each one of them have a good eye or bud; but thoſe you intend to blow ſtrong, ſhould by no means be parted too ſmall, which greatly weakens their flowering.

The principal colours in Anemonies are, white, red, blue, and purple; and theſe in ſome of them, are curiouſly intermixed; but the moſt prevailing colours amongſt our Engliſh raiſed Anemonies, are white and red; though of late we have received from France great varieties of blues and purples, which are exceeding fine flowers, and being intermixed with the Engliſh flowers, make a fine variety: we ſhould therefore obſerve, in planting the roots, to diſtribute the different colours, ſo as to make an agreeable mixture of each in every bed, which will greatly add to their beauty.

But ſince all the fine varieties of theſe flowers were firſt obtained from ſeeds, no good floriſt, that hath garden room, ſhould neglect to ſow them: in order to which, we ſhould provide ourſelves with a quantity of good ſingle (or what the gardeners call Poppy Anemonies) of the beſt colours, and ſuch as have more leaves than common, and have other good properties; theſe ſhould be planted early, that they may have ſtrength to produce good ſeeds, which will be ripe in three weeks or a month's time, after the flowers are paſt; when you muſt carefully gather it, otherwiſe it will be blown away in a ſhort time, it being incloſed in a downy ſubſtance. You muſt preſerve this ſeed till the beginning of Auguſt, when you may either ſow it in pots, tubs, or a well prepared bed of light earth: in the doing of it you muſt be careful not to let your ſeeds be in heaps, to avoid which is a thing little underſtood, and is what I have been informed of by the late Mr. Obadiah Lowe, gardener at Batterſea, who for ſeveral years raiſed large quantities of theſe flowers from ſeeds. His manner was thus:

After having levelled his bed of earth, in which he intended to ſow his ſeeds, he rubbed the ſeeds well between his hands, with a little dry ſand, in order to make them ſeparate the better; then he ſowed them as regularly as poſſible over the bed; but as theſe ſeeds will ſtill adhere cloſely together by their down, he took a ſtrong hair bruſh, with which he gently ſwept over the whole bed, obſerving not to bruſh off the ſeeds; this bruſh will ſo ſeparate the ſeeds, if carefully managed, as not to leave any entire lumps; then gently ſift ſome light earth, about a quarter of an inch thick over the ſeeds; and, if it ſhould prove hot dry weather, it will be adviſable to lay ſome mats hollow upon the bed in the heat of the day, and now and then give them a little water; but this muſt be given gently, leſt by haſtily watering you waſh the ſeeds out of the ground; but be ſure to uncover the bed at all times when there are gentle ſhowers, and every night, that the ſeeds may have the benefit of the dews; and as the heat of the weather decreaſes, you may begin to uncover your bed in the day time alſo.

In about ten weeks after ſowing, the plants will begin to appear, if the ſeaſon has proved favourable, or your care in management hath not been wanting, otherwiſe they many times remain a whole year in the ground. The firſt winter after their appearing above ground, they are ſubject to injuries from hard froſts, or too much wet, againſt both of which you muſt equally defend them; for the froſt is very apt to looſen the earth, ſo that the young plants are often turned out of the ground, after which a ſmall froſt will deſtroy them; and too much wet often rots their tender roots, ſo that all your former trouble may be loſt in a ſhort time for want of care in this particular; nor do I know of any thing more deſtructive to theſe tender plants, than the cold black froſts and winds of February and March, from which you muſt be careful to defend them, by placing a low reed fence on the north and eaſt ſides of the bed, which may be moveable, and only faſtened to a few ſtakes to ſupport it for the preſent, and may be taken quite away as the ſeaſon advances, or removed to the ſouth and weſt ſides of the bed, to ſcreen it from the violence of the ſun, which often impairs theſe plants when young.

As the ſpring advances, if the weather ſhould prove dry, you muſt gently refreſh them with water, which will greatly ſtrengthen your roots; and when the green leaves are decayed, if your roots are not too thick to remain in the ſame bed another year, you muſt clear off all the weeds and decayed leaves from the bed, and ſift a little more of the ſame prepared good earth, about a quarter of an inch thick over the ſurface, and obſerve to keep them clear from weeds during the ſummer ſeaſon, and at Michaelmas repeat the ſame earthing; but as theſe roots ſo left in the ground, will come up early in the autumn, the beds ſhould be carefully covered in froſty weather, otherwiſe their leaves will be injured, whereby the roots will be weakened, if not deſtroyed. If your roots ſucceed well, many of them will flower the ſecond year, when you may ſelect all ſuch as you like, by marking them with a ſtick; but you ſhould not deſtroy any of them until

until after the third year, when you have seen them blow strong, at which time you will be capable to judge of their goodness; for until the roots have acquired strength, the flowers will not shew themselves to advantage.

By this time your roots will be too thick in the seed-bed to remain, therefore you must, as soon as their green leaves are decayed, sift the earth of your bed through a very fine sieve, in order to get out the roots, which can be no otherwise found, as being small, and so nearly the colour of the ground; but in doing this, observe not to disturb the ground too deep, so as to endanger the burying any of the roots; for, notwithstanding all your care, many small roots will be left behind, therefore as soon as you have sifted your whole bed, and taken out all the roots you can find, you must level the earth of your bed again, and let it remain till next year, when you will find a plentiful crop of roots come up again; the young roots which you take up must be dried, as was directed for the old ones, but should be planted again three weeks before them, that they may increase in strength, so as to flower strongly the succeeding year.

The single (or Poppy) Anemonies will flower most part of the winter and spring, when the seasons are favourable, if they are planted in a warm situation, at which time they make a fine appearance, therefore deserve a place in every flower-garden, especially as they require little culture; for if these roots are taken up every other year, it will be often enough; and when they are taken up, they should be planted again very early in the autumn, otherwise they will not flower till the spring. There are some fine blue colours amongst these single Anemonies, which, with the Scarlets and Reds, make a beautiful mixture of colours; and as these begin flowering in January or February, when the weather is cold, they will continue a long time in beauty, provided the frost is not too severe. The seeds of these are ripe by the middle or end of May, and must be gathered daily as it ripens, otherwise it will soon be blown away by the winds.

The Anemone grows naturally in the Levant, particularly in the islands of the Archipelago, where the borders of the fields are covered with them of all the colours, but the flowers are single, and have been greatly improved by culture. In France they were long cultivated before they were much known in Holland or England. Tournefort mentions two French gentlemen, Messrs. Malaval and Bachelier, who contributed greatly to the improvement of these flowers; and of the latter he relates a pleasant story, as follows: There was a certain lawyer to whom Mr. Bachelier had refused to communicate the seeds of his fine Anemonies, and finding he could not obtain any either by friendship or money, a fancy came into his head, to make a visit to Mr. Bachelier, with some of his friends who were in the secret; he ordered his lacquey who supported the train of his gown, to let it drop on a bed where the Anemonies grew, which he wanted, whose seeds were then ripe. They walked a considerable time talking on various subjects, and when they came to the spot where the Anemonies grew, a merry gentleman of the company began a story, which engaged the attention of Mr. Bachelier; at which time the lacquey, who was no fool, let fall his master's train over the bed, and the seeds having a downy covering, stuck to the gown, which the boy afterwards took up again, and the company went forward. The virtuoso took leave of Mr. Bachelier, and went directly home, where he carefully picked off the seeds which had stuck to his robes, and sowed them, which produced very beautiful flowers.

The seventh sort grows naturally in Canada and Siberia; the roots of this creep and multiply greatly in the ground, the lower leaves are deeply cut; the stalks rise two feet high, garnished with leaves placed opposite, which embrace the stalks, and the flowers are produced from the forks of the stalks upon slender foot-stalks; these flowers are white, and being small, make little appearance, so the plant is rarely preserved, except in botanic gardens for variety: it is a very hardy plant, and multiplies very fast where it is allowed to have a place.

The eighth sort is a very humble plant, seldom rising more than six inches high. This grows naturally in the woods of North America, where it flowers early in the spring, when it makes a pretty appearance, especially if many of the plants grow in clusters: some of these flowers are double, which make a better appearance than the single, and continue longer in beauty. The leaves of this plant are very like those of Meadow Rue; the stalks have leaves growing in whorles, and are terminated by a single flower: this sort should be planted under the shelter of trees, and if the surface of the ground is covered with rotten tanners bark in winter, it will greatly preserve the plants.

ANEMONOIDES. See ANEMONE.

ANEMONOSPERMOS. See ARCTOTIS.

ANETHUM, Dill, from ἄνω and θέειν, to run up, because it is quick of growth.

The CHARACTERS are,

*It is an umbelliferous plant, having many umbels, which have no involucrum. The umbels are uniform, and composed of many smaller ones. The flowers have five spear-shaped petals, each of these have five slender stamina, crowned with blunt summits; under the flower is situated the germen, supporting two small styles crowned with blunt stigma; the germen afterward becomes two compressed seeds having borders.*

This genus of plants is ranged in the second section of the fifth class of Linnæus's genera, which is entitled Pentandria Digynia, the flowers having five stamina and two styles.

We have but one SPECIES of this genus, viz.

ANETHUM (*Graveolens*) fructibus compressis. Hort. Cliff. 106. *Dill with compressed seeds.* Anethum hortense. C. B. P. 147. *Common Dill.*

There are two other varieties which are mentioned as distinct species by the botanists, but I have frequently sown them, and have always found them prove to be only varieties arising from the same seeds.

This plant is propagated by sowing the seeds, which should be done in autumn soon after they are ripe; for if they are kept out of the ground till spring, they frequently miscarry; or if any of the plants come up, they often decay before they have perfected their seeds. They love a light soil, and will not bear to be transplanted, but must be sown where they are to remain, and should be allowed eight or ten inches room to grow, otherwise they will draw up very weak, and produce few lateral branches, whereby their leaves will decay, and be rendered useless, nor will they produce so good seeds; therefore the best way is, when the plants are come up, to hoe them out, as is practised for Onions, Carrots, &c. leaving the plants about eight or ten inches asunder every way, observing to keep them clear from weeds; and when the seeds begin to be formed, you should cut up those that are intended to be put into the pickle for Cucumbers, leaving those that are intended for the use of the seeds until they are ripe; at which time it should be cut, and spread upon a cloth to dry, and then beat out for use: if you let the seeds fall upon the ground, the plants will rise the next spring without any care, so that the trouble of sowing their seeds may be spared.

ANGELICA [of *Angelus*, so called, as some quacks, &c. pretend, from the angels, on account of its excellent qualities.]

The CHARACTERS are,

*It is an umbelliferous plant, the greater umbel being composed of many small ones; the involucrum, or cover of the large umbel, is composed of five small leaves, and those of the smaller of eight, and the empalement of the flowers are indented in five parts. The flowers of the whole umbel are uniform, each of them consist of five petals which fall away; these have five stamina, which are longer than the petals, and are crowned with single summits. The*

*germen is situated below the flower, supporting two reflexed styles, crowned with obtuse stigma; the germen afterward becomes a roundish fruit splitting into two, and composed of two seeds, which are plain on one side, convex on the other, and are bordered.*

This genus of plants is ranged in the second section of Linnæus's fifth class, entitled Pentandria Digynia, from the flowers having five stamina and two styles.

The SPECIES are,

1. ANGELICA (*Sativa*) foliorum impari lobato. Flor. Lapp. 101. *Angelica with leaves composed of an unequal number of lobes.* Angelica sativa. C. B. P. 155. *Garden Angelica.*
2. ANGELICA (*Archangelica*) altissima foliorum lobatis maximis serratis. *Tallest Angelica with leaves composed of large serrated lobes.* Angelica scandiaca Archangelica. Tabern. Icon. 82.
3. ANGELICA (*Sylvestris*) foliis æqualibus ovato-lanceolatis serratis. Hort. Cliff. 97. *Angelica with equal leaves, composed of oval spear-shaped lobes which are sawed.* Angelica sylvestris major. C. B. P. 155.
4. ANGELICA (*Atropurpurea*) extimo foliorum pari coadunato folio terminali petiolato. Prod. Leyd. 103. *Angelica with the extreme pair of leaves joined, and terminated with a foot-stalk.* Angelica Canadensis atropurpurea. Cornut. Canad. 198.
5. ANGELICA (*Lucida*) foliis æqualibus ovatis inciso-serratis. Hort. Cliff. 97. *Angelica with equal leaves and oval lobes, which are cut and sawed.* Angelica lucida Canadensis. Cornut. Canad. 196.

The first sort is the common Angelica, which is cultivated in the gardens for medicinal use, as also for making a sweetmeat, which is by some greatly esteemed. This grows naturally by the side of rivers in northern countries.

The second sort grows naturally in Hungary, and some parts of Germany. This hath been supposed to be only a variety of the first by many modern botanists; but from many years experience in the culture of this plant, I could never observe any alteration in it; for all the plants which I raised from seeds, proved exactly the same as the parent plant, and when planted in the same soil with the common sort, they were twice their size. The leaves were also much larger, and deeper sawed on their edges, the umbels much larger, and the flowers were yellow. This sort seldom continues longer than two or three years, so that young plants should be raised to preserve the species. The seeds should be sown in autumn, for those which are sown in the spring seldom succeed.

The third sort grows naturally in moist meadows, and by the sides of rivers in many parts of England, so is seldom admitted into gardens.

The fourth and fifth sorts grow naturally in North America, from whence their seeds were sent to Europe, where the plants are preserved in gardens for the sake of variety; but as they have no use and but little beauty, they are not admitted into many gardens. They are both very hardy plants, and may be easily propagated by seeds, which should be sown in autumn, and when the plants are large enough to remove, they must be transplanted into a moist soil, and have a shady situation, allowing them two feet room on every side. They grow four or five feet high, and put out many shoots from the root, especially the second year from seed, when they will flower in June, and the seeds ripen in September. The roots of these sorts seldom continue longer than two or three years. The common Angelica delights to grow in a very moist soil; the seeds of this plant should be sown soon after they are ripe, for if they are kept until the spring, seldom one seed in forty will grow. When the plants are come up about six inches high, they should be transplanted at a large distance, for their leaves extend very wide; the best place for this plant is upon the sides of ditches, or pools of water; where being planted about three feet asunder, they will thrive exceedingly. The second year after sowing, they will shoot up to flower; therefore if you have a mind to continue their roots, you should cut down these stems in May, which will occasion their putting out heads from the sides of the roots, whereby they may be continued for three or four years; whereas, if they had been permitted to seed, their roots would perish soon after.

The gardeners near London, who have ditches of water running through their gardens, propagate great quantities of this plant, for which they have a great demand from the confectioners, who make a sweetmeat with the tender stalks of it cut in May.

This plant is also used in medicine, as are also the seeds; therefore where it is cultivated for the seeds, there should be new plantations annually made to supply the places of those which die, for when they are permitted to seed, they last but two years.

ANGUINA. See TRICOSANTHES.

ANGURIA, the Water Melon, or Citrul.

The CHARACTERS are,

*It hath male and female flowers growing at separate distances on the same plant; the flowers of both sexes are of the open bell-shaped kind, of one leaf, and have empalements of the same form. The male flowers have three short stamina, which are joined together at the top; these are crowned by slender summits. The female flowers rest upon an oval germen, supporting a cylindrical style, crowned by three large stigma, which are gibbous; the germen afterward becomes an oblong fleshy fruit, having five cells filled with compressed seeds, which are rounded at their extremity.*

Dr. Linnæus joins this genus to the Gourd, but whoever will allow the fruit to be a characteristic in determining the genera, must keep them separate; for the Gourd hath but three cells, whereas the Anguria has five.

This genus is ranged in the tenth section of Linnæus's twenty-first class of plants, entitled Monœcia Syngenesia, from the flowers being male and female in the same plant, and the stamina and summits growing together.

We have but one SPECIES of this genus, viz.

ANGURIA foliis multipartitis. *Water Melon with leaves cut into many parts.* Anguria Citrullus dicta. C. B. P. 312. Of this there are several varieties which differ in the form and colour of their fruit; but as these vary annually from seeds, it is needless to enumerate them here.

This fruit is cultivated in Spain, Portugal, Italy, and most other warm countries in Europe; as also in Africa, Asia, and America, and is by the inhabitants of those countries greatly esteemed for their wholsome cooling quality; but in England the fruit is not so universally esteemed, though some few persons are very fond of them. I shall therefore give full directions for raising them, so that such persons as are willing to be at the expence and trouble of it, may not be at a loss for instructions.

First provide some seeds, which should be three or four years old; for new seeds are apt to produce vigorous plants, which are seldom so fruitful as those of a moderate strength. The best sorts to cultivate in England, are those with small round fruit, which come from Astracan, those with very large fruit, seldom ripen well in this climate. Having provided good seed, you should prepare a heap of new dung the beginning of February, which should be thrown in a heap for about twelve days to heat, turning it over twice, mixing it well; then you should make a hot-bed, in which these seeds, as also Cucumber-seeds and Musk Melons may be sown. The dung should be well wrought in making the bed, and must be beaten down pretty close with a dung-fork, that the heat may not be too violent, and of longer continuance. When the dung is thus laid, you should cover it about four inches thick with good light earth, and having spread it very even, you should put the frame and glass over it, leaving it to warm four or five days before you put the seeds into it, observing, if the steam rises pretty much, to raise up the glass to let it pass off: then, if you find your bed in proper temper, you may sow your seeds therein in drills, covering them over with earth about half an inch. After

this,

this, if you find your bed very warm, you muſt give air in the day-time by raiſing the glaſſes; but if the bed is cool, you muſt cover it well with mats every night, as alſo in bad weather. In four or five days after, you muſt prepare another hot-bed to receive theſe plants, which will be fit to tranſplant in ten days, or a fortnight at moſt, after the ſeeds are ſown; this bed need not be very large, for a few of theſe plants will fill a large quantity of frames, when they are planted out for good, and while the plants are young, there may be a great quantity kept in one light; ſo that thoſe perſons who raiſe early Cucumbers and Muſk Melons, may alſo raiſe theſe plants in the ſame bed; for two or three lights will be ſufficient to raiſe plants of all three kinds, to ſupply the largeſt families, until they are planted out for good. In the management of theſe plants while young, there is little difference from the directions given for raiſing Muſk Melons, therefore I need not repeat it here. The chief thing to be obſerved, is, to let them have a large ſhare of air whenever the weather will permit, otherwiſe the plants will draw up weak, and be good for little. As theſe plants will require two or three hot-beds to bring the fruit to perfection, it will be the better way to put the plants into baſkets, when they have gotten four leaves, as is directed for raiſing early Cucumbers; but you ſhould not plant more than two plants in each baſket, for if one of them lives it will be ſufficient; therefore when both the plants ſucceed, you ſhould draw out the weakeſt and moſt unpromiſing of them, before they begin to put out their ſide ſhoots, otherwiſe they will entangle and render it difficult to be performed, without greatly injuring the remaining plant.

The baſkets in which theſe plants are to be planted, need not be more than a foot diameter; ſo that one light will contain eight of them, which will be ſufficient for twenty-four lights, when they are planted out for good; for where the plants are vigorous, one ſingle plant will ſpread ſo far as to fill three lights; and if they have not room, they ſeldom ſet their fruit well.

Theſe baſkets may remain in the nurſery-beds until the plants have ſpread, and put out many runners; for when the heat of this bed declines, it is ſoon revived by adding a proper lining of warm dung to the ſides of the bed quite round; ſo that when they are taken out of this bed, and placed in the ridges where they are to remain, the heat of the beds will laſt ſo long as to ſet their fruit, which is of great conſequence; for when the plants are ridged out very young, the beds are generally made of great thickneſs in dung, in order to continue their heat; ſo that for ſome time after they are made, they are ſo extreme hot, as to endanger the ſcalding of the plants; and by the time the fruit begins to appear, there is little heat left in the beds, which often occaſions the fruit to drop off, and come to nothing.

After theſe plants are placed in the beds where they are to remain, you muſt carefully lead the ſhoots as they are produced, ſo as to fill each part of the frame, but not to croud each other; and be careful to keep them clear from weeds, as alſo to admit freſh air whenever the weather will permit; they muſt alſo be frequently watered, but do not give it them in great quantities. In ſhort, there is little difference to be obſerved in the management of theſe, from that of Muſk Melons, but only to give them more room, and to keep the beds to a good temperature of heat, and when the fruit appears, to admit air freely to the plants, in order to ſet their fruit; but when the nights are cold, the glaſſes muſt be covered with mats to keep the beds warm, without which this fruit will ſeldom come to good in this country.

ANIL. See Indigophera.

ANISUM, or ANISE. See Pimpinella.

ANNONA. Lin. Gen. Plant. 613. Guanabanus. Plum. Nov. Gen. 10. *The Cuſtard Apple, &c.*

The Characters are,

*The empalement is compoſed of three ſmall heart-ſhaped leaves, which are concave and pointed. The flower hath ſix petals, three large and three alternately ſmaller. The ſtamina is ſcarce diſcernible, but there are many ſummits on each ſide the germen, which is ſituated at the bottom of the flower, having no ſtyle, but an obtuſe ſtigma. The germen afterward becomes an oval, or oblong fruit, having a ſcaly rind, and one cell, in which are lodged many oval ſmooth ſeeds.*

This genus of plants is ranged in the ſeventh ſection of Linnæus's thirteenth claſs, entitled Polyandria Polygynia, the flowers of this diviſion having many ſtamina and ſeveral germen.

The Species are,

1. Annona (*Reticulata*) foliis lanceolatis fructibus ovatis reticulato-areolatis. Lin. Sp. Plant. 537. *Annona with ſpear-ſhaped leaves, and oval fruit which are netted, or wrought in ſquares.* Guanabanus fructu aureo & molliter aculeato. Plum. Nov. Gen. 43. *The Cuſtard Apple.*
2. Annona (*Muricatis*) foliis ovali-lanceolatis glabris nitidis planis pomis muricatis. Hort. Cliff. 222. *Annona with plain, ſmooth, ſhining, oval, ſpear-ſhaped leaves, and a prickly fruit.* Guanabanus fructu è viridi luteſcente molliter aculeato. Plum. Nov. Gen. 43. *The Sour Sop.*
3. Annona (*Squamoſa*) foliis oblongis fructibus obtusè ſubſquamatis. Lin. Sp. Plant. 537. *Annona with oblong leaves, and obtuſe ſcaly fruit.* Guanabanus foliis odoratis fructu ſubrotundo ſquamoſo. Plum. Nov. Gen. 43. *The Sweet Sop.*
4. Annona (*Paluſtris*) foliis oblongis obtuſis glabris, fructu rotundo, cortice glabro. *Annona with oblong, blunt, ſmooth leaves, and round fruit, with a ſmooth ſkin.* Guanabanus paluſtris fructu lævi viridi. Plum. Nov. *The Water Apple.*
5. Annona (*Cherimola*) foliis latiſſimis glabris, fructu oblongo ſquamato, ſeminibus nitidiſſimis. *Annona with very broad ſmooth leaves, oblong ſcaly fruit, and very ſhining ſeeds.*
6. Annona (*Africana*) foliis ovato-lanceolatis pubeſcentibus fructu glabro ſubcæruleo. *Annona with oval, ſpear-ſhaped, downy leaves, and ſmooth bluiſh fruit.* Guanabanus fructu ſubcæruleo. Plum. Nov. Gen. 43. *The Sweet Apple.*
7. Annona (*Aſiatica*) foliis lanceolatis glabris nitidis ſecundum nervos ſulcatis. Hort. Cliff. 222. *Annona with neat ſpear-ſhaped leaves, with nervous furrows.* Guanabanus fructu purpureo. Plum. Nov. Gen. 43. *The Purple Apple.*
8. Annona (*Triloba*) foliis lanceolatis fructibus trifidis. Lin. Sp. Plant. 537. *Annona with ſpear-ſhaped leaves, and trifid fruit.* Annona fructu luteſcente lævi ſerotum arietis referente. Cateſb. Car. 2. 85. *The North American Annona, called by the inhabitants Papaw.*

The firſt ſort uſually grows to the height of twenty-five feet, or upwards, in the Weſt-Indies, and is well furniſhed with branches on every ſide; the bark is ſmooth, and of an Aſh colour; the leaves are oblong, of a light green colour, and have ſeveral deep tranſverſe ribs or veins, ending in acute points; the fruit is of a conical form, as large as a tennis-ball, of an Orange colour when ripe, having a ſoft, ſweet, yellowiſh pulp, of the conſiſtence of a cuſtard, from whence the title of Cuſtard Apple was given to it.

The ſecond ſort is not ſo large as the firſt, rarely riſing above twenty feet high, and not ſo well furniſhed with branches; the leaves are broader than thoſe, have a ſmooth ſurface without any furrows, and are of a ſhining green colour; the fruit is large, of an oval ſhape, irregular, and pointed at the top, being of a greeniſh yellow colour, and full of ſmall knobs on the outſide; the pulp is ſoft, white, and of a ſour and ſweet taſte intermixed, having many oblong dark-coloured ſeeds.

The third ſort is a tree of humbler growth, ſeldom riſing more than fifteen feet high, and is well furniſhed with branches on every ſide; the leaves of this ſort have an agreeable ſcent when rubbed; the fruit is roundiſh and ſcaly, and when ripe turns of a purple colour, and hath a ſweet pulp.

The fourth sort commonly grows from thirty to forty feet in the West-Indies. This hath oblong pointed leaves, which have some slender furrows, and when rubbed have a strong scent; the fruit of this sort is seldom eaten but by the negroes; the tree grows in moist places in all the islands of the West-Indies.

The fifth sort is much cultivated in Peru for the fruit, and from thence the seeds have been brought to England, and many plants have been raised. This grows to be a very large tree in the natural country of its growth, and is well furnished with branches, which are garnished with leaves of a bright green colour, which are much larger than those of any of the other sorts. The fruit is oblong and scaly on the outside, and of a dark purple colour when ripe; the flesh is soft and sweet, has many brown seeds intermixed, which are very smooth and shining; the fruit is esteemed by the Peruvians as one of their most delicate sorts. This has produced flowers in England, but no fruit.

The sixth and seventh sorts grow in some of the French islands, as also in Cuba, in great plenty; these grow to the height of thirty feet or more; their fruit are esteemed by the inhabitants of those islands, who frequently give them to sick persons, as they reckon them very cooling and wholesome.

The eighth sort grows plentifully in the Bahama islands, where it seldom rises to more than ten feet high, having several stems; the fruit of this sort are shaped like a Pear inverted. This is seldom eaten but by the negroes, and is the food of guanas, and other animals.

This sort will thrive in the open air in England, if it is planted in a warm sheltered situation; but the plants should be trained up in pots, and sheltered in winter for two or three years, until they have acquired some strength; then they may be turned out of the pots in the spring, and planted in the full ground, where they are to remain. This sort has produced flowers in the curious garden of his grace the duke of Argyle, at Whitton, near Hounslow, where it has been growing in the open air for some years, as also in the nursery of the late Mr. Gray, near Fulham. The seeds of this sort are frequently brought to England from North America, which are much larger than those of the other species, and many plants have been lately raised in the gardens near London. The shape of the leaves is also different; this casts its leaves in autumn, whereas all the others retain their leaves, never casting them until the spring, when the leaves come out. The fruit is very different from those of the other species, two or three growing together at their foot-stalks. When the seeds of this sort are sown, they frequently remain a whole year in the ground; therefore the earth in the pots should not be disturbed, where they are sown, if the plants do not come up the first year; and the pots should be sheltered in winter, and the following spring if they are plunged into a new hot-bed, the plants will come up much sooner than those which are sown in the open air, so will have more time to get strength before the winter.

All the other sorts which are natives of the warm parts of America, are to otender to live in this country, if they are not preserved in warm stoves; they come up very easily from the seeds which are brought from America, if they are fresh; but these seeds must be sown on a good hot-bed, or in pots of light earth, and plunged into a hot-bed of tanners bark in February, which is by much the best time; because when the plants come up early, they will have time to get strength before the cold weather comes on in the autumn.

These plants should be kept in the bark-stove, and carefully managed, with which they will make great progress; but in warm weather they should have plenty of fresh air admitted to them, for when the air is excluded from them too much, they are apt to grow sickly, and are often attacked by vermin, which will multiply and spread over the whole surface of the leaves, and cause them to decay; but when carefully managed, their leaves will continue green all the winter, and make a very good appearance in the stove at that season.

As these plants advance in their growth, they should be shifted into larger pots; but this must be done with caution, for nothing is more prejudicial to them than over-potting them. They must also constantly remain in the tan-bed, otherwise they will make but little progress; for although they will live in a dry stove, yet they will make little progress, nor will their leaves appear so fine, as when they are preserved in a vigorous growing state; and it is more for the beauty of their leaves, than any hopes of their producing fruit in this country, that they are preserved in stoves: for though there has been some of the sorts which have produced flowers in England, yet none have ever shewn their fruit here.

Some of these plants are twelve or fourteen feet high in our gardens, and a few years ago there were plants of the fifth sort in the garden at Chelsea, which were more than twenty feet high, and produced flowers two or three years. The stove in which these plants are placed, should, during the winter season, be kept to the Ananas heat, marked on the botanical thermometers. The earth should be light and rich in which they are planted, and the tan-bed should be frequently turned over and refreshed. Their waterings must be frequent in summer, but not in too great quantity. In the winter they must have it but seldom, a little once a week in open weather, and, in frost, once in a fortnight or three weeks, will be sufficient.

ANTHEMIS. Lin. Gen. Plant. 870. Chamomile.

The CHARACTERS are,

*It is a plant with a compound flower, whose common empalement is hemispherical, composed of many scales which are equal. The border, or rays of the flower, is composed of many female florets, whose petals are stretched out like tongues on one side, and are indented in three parts at their extremity. The middle, or disk of the flower, is composed of many hermaphrodite florets, which are funnel-shaped, erect, and cut into five parts at the top. These have five short narrow stamina, which are crowned by cylindrical hollow summits. The germen is situated at the bottom, supporting a slender style, crowned by two reflexed stigma, which afterward becomes an oblong naked seed. The female florets have no stamina, but an oblong germen in the center, supporting two inflexed styles.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, entitled Syngenesia Polygamia superflua, the flowers of this section being composed of many florets, which are female and hermaphrodite, whose stamina are joined at the top.

The SPECIES are,

1. ANTHEMIS (*Nobilis*) foliis pinnato-compositis linearibus acutis subvillosis. Lin. Sp. Plant. 894. *Chamomile with winged leaves, composed of many very narrow-pointed hoary segments.* Chamæmelum nobile sive Leucanthemum odoratius. C. B. P. 135. *Common, or noble Chamomile.*
2. ANTHEMIS (*Arvensis*) receptaculis conicis paleis setaceis seminibus coronato-marginatis. Flor. Suec. 704. *Chamomile with a conical receptacle of bristly chaff, and bordered seeds.* Chamæmelum inodorum. C. B. P. 136. *May Weed.*
3. ANTHEMIS (*Cotula*) receptaculis conicis paleis setaceis seminibus nudis. Lin. Sp. Plant. 894. *Chamomile with a conicle receptacle, bristly chaff, and naked seeds.* Chamæmelum fœtidum. C. B. P. 135. *May Weed.*
4. ANTHEMIS (*Cota*) florum paleis rigidis pungentibus. Flor. Leyd. 172. *Chamomile with stiff pungent chaff between the florets.* Chamæmelum annuum ramosum cotulæ fœtidæ floribus amplioribus capitulis spinosis. Mor. Hist. 3. p. 36.
5. ANTHEMIS (*Altissima*) erecta foliorum apicibus subspinosis. Lin. Sp. Plant. 893. *Upright Chamomile with leaves ending with spines.* Chamæmelum Leucanthemum Hispanicum magno flore. C. B. P. 135.
6. ANTHEMIS (*Maritima*) foliis pinnatis dentatis carnosis nudis punctatis caule prostrato, calycibus subtomentosis.

mentosis. Lin. Sp. Plant. 893. *Chamomile with fleshy pinnated leaves, and a branching trailing stalk.* Chamæmelum maritimum. C. B. P. 134.

7. Anthemis (*Tomentosa*) foliis pinnatifidis obtusis planis, pedunculis hirsutis, foliosis calycibus tomentosis. Hort. Cliff. 415. *Chamomile with plain blunt leaves, winged at their extremity, hairy foot-stalks, and a leafy woolly empalement.* Chamæmelum maritimum incanum folio absinthii crasso. Boerh. Ind. 1. p. 110.

8. Anthemis (*Mixta*) foliis simplicibus dentato-laciniatis. Lin. Sp. Plant. 894. *Chamomile with single, indented, cut leaves.* Chamæmelum Lusitanicum latifolium sive Coronopi folio. Breyn. Cent. 1. 49.

9. Anthemis (*Pyrethrum*) caulibus unifloris decumbentibus foliis pinnato-multifidis. Lin. Hort. Cliff. 414. *Chamomile with single flowers on the stalks lying on the ground, and winged leaves.* Pyrethrum flore bellidis. C. B. P. 148. *Pellitory of Spain.*

10. Anthemis (*Valentina*) caule ramoso foliis pubescentibus tripinnatis, calycibus villosis pedunculatis. Hort. Cliff. 414. *Chamomile with a branching stalk, multifid hairy leaves, and hairy foot-stalks.* Buphthalmum cotulæ folio. C. B. P.

11. Anthemis (*Tinctoria*) foliis bipinnatis serratis subtus tomentosis, caule corymboso. Lin. Sp. 1263. *Chamomile with sawed winged leaves, woolly underneath, and flowers in a corymbus.* Buphthalmum Tanaceti minoris foliis. C. B. P. 134.

12. Anthemis (*Arabica*) caule decomposito calycibus ramiferis. Hort. Cliff. 413. *Chamomile with a decompound stalk, and a branching empalement.* Asteriscus annuus trianthophorus Crassas Arabicus dictus. Shaw. Afr. 58.

The first sort is the common Chamomile, which grows in plenty upon commons and other waste land. It is a trailing perennial plant, which puts out roots from the branches as they lie on the ground, whereby it spreads and multiplies greatly; so that whoever is willing to cultivate this plant, need only procure a few of the slips in the spring, and plant them a foot asunder, that they may have room to spread, and they will soon cover the ground. Formerly this plant was used for planting of walks, which, when mowed and rolled, looked well for some time, but as it was very subject to decay in large patches, the walks became unsightly, for which reason this was disused. The flowers of this sort are ordered for medicinal use, but the market people generally sell the double flowers, which are much larger, but not so strong as the single. The double sort is equally hardy, and may be propagated in the same manner.

The second sort is a common annual weed, which grows among corn; it flowers in May, so was called May Weed, though some have applied that title improperly to the Cotula fœtida, which rarely flowers till late in June.

The fourth, fifth, and eighth sorts are annual plants, which grow naturally in Spain, Portugal, Italy, and the south of France, from whence their seeds have been brought to England, where the plants are preserved in botanic gardens for the sake of variety. They rise easily from seeds sown in the spring, and require no other culture but to thin the plants where they are too close, allowing them a foot and a half room each way, and clean them from the weeds. They flower in July, and their seeds ripen in September.

The sixth and seventh sorts are perennial plants, which grow naturally in Spain, Portugal, and Greece, from whence their seeds have been brought to England, and the plants are preserved in some curious gardens for the sake of variety. They are hardy and may be propagated by seeds, which should be sown in the spring upon poor land, where the plants will continue much longer than in good ground, and will require no other care but to keep them clean from weeds. These plants do not grow tall, but are bushy, so should be allowed room to grow. Their flowers are white, and continue from July to October, and the seeds ripen in autumn.

The ninth sort is the Pellitory of Spain, the roots of which are used for the tooth-ach, being extremely warm; when they are applied to the part affected, they draw out the cold rheum, and are often serviceable in this particular. This is a perennial plant, with a long taper root like that of a Carrot, which grows naturally in Spain and Portugal, from whence the roots are brought to England. The branches of this trail upon the ground, and spread a foot or more each way; these are garnished with fine winged leaves, like those of the common Chamomile; at the extremity of each branch is produced one large single flower, like Chamomile, but much larger, the rays of which are of a pure white within, but purple on their outside. After the flowers are past, the receptacle swells to a large scaly cone; between these scales are lodged the seeds. It flowers in June and July, and the seeds are ripe in September; but unless the season is dry, the seeds do not ripen in England, for the wet falls between the scales, and rots the seeds in embryo.

The eleventh sort is a perennial plant, which is propagated by seeds; these may be sown on a bed of common earth in the spring, and when the plants are strong enough to remove, should be transplanted into large open borders, near shrubs, where they may have room to grow, for they spread very wide, therefore require three feet distance from other plants; in these large open spots they will make a pretty variety from June to November, during which time they continue in flower: some of these are white, others are of a sulphur, and some have yellow flowers, but these vary from seed; the eastern sorts grow taller, and the flowers are larger than the common, but in other particulars they are the same, though many have supposed them different species.

The seeds of the twelfth sort were brought from Africa by the late Dr. Shaw, which were distributed to many curious botanists in Italy, France, and England, where some of the plants were raised. This grows near two feet high, with an upright stem, having a single flower at the top, from whose empalement there are two or three foot-stalks put out horizontally, about two inches long, each having a single flower smaller than the first, like the Childing Marigold, or Hen and Chicken Daisy. The seeds of this should be sown in autumn, and treated in the same manner as is before directed for some other sorts, otherwise the seeds are seldom perfected in England.

ANTHERICUM. Lin. Gen. Plant. 380. Spiderwort.

The Characters are,

*The flower hath no empalement, and is composed of six oblong blunt petals, which spread open. It hath six upright awl-shaped stamina, which are crowned by small summits, having four furrows. The germen which is situated in the center is three-cornered, supporting a single style which is as long as the stamina, crowned by a three-cornered blunt stigma. The germen afterward becomes an oval smooth capsule, having three furrows, opening in three cells, which are filled with angular seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, entitled Hexandria Monogynia, from their flowers having six stamina and but one style.

The Species are,

1. Anthericum (*Revolutum*) foliis planis scapo ramoso corollis revolutis. Lin. Sp. Plant. 310. *Anthericum with plain leaves, a branching stalk, whose petals turn backward.* Asphodelus foliis compressis asperis caule patulo. Tourn. Inst. R. H. 343.

2. Anthericum (*Ramosum*) foliis planis scapo ramoso corollis planis pistillo recto. Lin. Sp. Plant. 310. *Anthericum with plain leaves, a branching stalk, and plain reflexed petals.* Phalangium parvo flore ramosum. C. B. P. 29.

3. Anthericum (*Liliago*) foliis planis scapo simplicissimo corollis planis, pistillo declinato. Hort. Upsal. 83. *Anthericum with plain leaves, a single stalk, and declining pointals.* Phalangium parvo flore non ramosum. C. B. P. 29.

4. ANTHERICUM (*Frutescens*) foliis carnosis teretibus caule fruticoso. Lin. Sp. Plant. 310. *Anthericum with fleshy taper leaves, and a shrubby stalk.* Phalangium capense caulescens foliis cepitiis succosis. H. Elth. 310.

5. ANTHERICUM (*Aloeides*) foliis carnosis subulatis planiusculis. Hort. Upsal. 83. *Anthericum with fleshy, plain, awl-shaped leaves.* Phalangium capense sessile foliis aloeformibus pulposis. Hort. Elth. 123.

6. ANTHERICUM (*Asphodeloides*) foliis carnosis subulatis semiteretibus strictis. Hort. Upsal. 83. *Anthericum with awl-shaped, fleshy, half taper leaves, growing close.* Bulbine acaulis foliis subulatis. Prod. Leyd. 33.

7. ANTHERICUM (*Annuum*) foliis carnosis subulatis teretibus scapo subramoso. Hort. Upsal. 83. *Anthericum with awl-shaped, fleshy, taper leaves, and a branching stalk.* Asphodelus Africanus angustifolius luteus minor. Tourn. Inst. 343.

8. ANTHERICUM (*Altissimum*) acaule foliis carnosis teretibus spicis florum longissimis laxis. Fig. Plant. pl. 39. *Tall African Spiderwort with taper fleshy leaves, and very long loose spikes of flowers.*

9. ANTHERICUM (*Ossifragum*) foliis ensiformibus filamentis lanatis. Flor. Suec. 268. *Anthericum with sword-shaped leaves, and downy stamina.* Asphodelus luteus palustris. Dod. Pempt. 208.

10. ANTHERICUM (*Calyculatum*) foliis ensiformibus perianthiis trilobis filamentis glabris pistillis trigynis. Flor. Suec. 269. *Anthericum with sword-shaped leaves, an empalement with three lobes, smooth stamina, and three styles.* Phalangium alpinum palustre, Iridis folio. Segu.

The first sort grows naturally at the Cape of Good Hope; the roots of this are fleshy, and composed of tubers joined at the crown like those of the Asphodel; the stalk rises near two feet high, and branches out on each side, each branch being terminated by a loose spike of flowers, which are white, and the petals are turned backward to their foot-stalk. The leaves of this sort are flat, and the root is perennial, but the spikes decay in autumn.

The second sort hath a perennial root; the stalks of this rise about the same height as the former, sending out many lateral branches in like manner, which are terminated by loose spikes of flowers, which are white, but the petals are plain, and do not turn back as in the other sort.

The third sort hath plain leaves and an unbranching stalk, in which it chiefly differs from the former. The root of this is perennial.

The two next sorts grow naturally in Spain, Portugal, and other warm countries, and were more common some years ago in the English gardens than at present; for the severe winter in 1740, killed most of their roots. These flower in June and July, and their seeds are ripe in September. They are propagated by seeds, which should be sown in autumn; for those which are sown in the spring, never come up the same year, but remain in the ground till the following spring, or often miscarry. These should be sown in a bed of light sandy earth, in a warm situation, and when the plants come up, they must be kept clean from weeds during the summer; and in autumn, when their leaves decay, they should be carefully taken up, and transplanted into a bed of light earth, at a foot distance from each other. If the winter should prove severe, the bed should be covered with straw, Pease-haulm, or such light covering, to keep out the frost; or if some old tan from a hotbed is spread over the ground, it will prevent the frost from penetrating the ground, and will preserve the roots. In this bed they may remain one year, by which time they will be strong enough to flower; therefore the following autumn they should be carefully taken up, so as not to break their roots, and planted in the borders of the flower-garden, where they will last several years, if they are not killed by frost; to prevent which, some rotten tan should be laid over the roots in winter, which will always secure them.

The fourth sort has been long preserved in many gardens near London, and was formerly known among the gardeners by the title of Onion-leaved Aloe. This plant produces many ligneous branches from the root, each supporting a plant with long taper leaves, in shape of those of the Onion, which are full of a yellow pulp very juicy. These plants send out roots, which run down and fasten themselves into the earth, by which they multiply greatly. The flowers are produced on long loose spikes, are yellow, and appear at different times, so that the plants are not long destitute of flowers. These are succeeded by round smooth seed-vessels, which have three cells, filled with triangular seeds; but as the plant multiplies so fast by offsets, the seeds are little regarded. It grows naturally at the Cape of Good Hope, and requires a little shelter in winter; but in some mild seasons I have had plants live without any cover, which were planted close to a warm wall.

The fifth and sixth sorts grow close to the ground, never rising with any stalk. The fifth hath broad, flat, pulpy leaves, resembling those of some sorts of Aloe, so was formerly by gardeners called Aloe with flowers of Spiderwort. The leaves spread open; the flowers are produced on loose spikes, like the former, but are shorter: the flowers are yellow, and appear at different seasons. This is produced by offsets, which are put out in plenty, and must be planted in pots filled with light sandy earth, and in winter placed in the green-house, and treated as other hardy succulent plants, which come from the Cape of Good Hope, where this plant grows naturally. It must be kept pretty dry in winter, and if it is screened from frost, it will require no artificial warmth.

The sixth sort hath long, narrow, pulpy leaves, which are almost taper, but flatted on their upper side; this sends out many offsets, by which it may be increased plentifully. The flowers are yellow, and grow on long loose spikes, as the former; these appear at different seasons; those of the spring and summer are succeeded by seeds in great plenty, so may be easily propagated thereby, which ripen very well. It must be treated in the same manner as the former.

The seventh sort is annual: this is a low plant growing close to the ground, having pretty long succulent leaves which are taper, but flatted on their upper side; the flowers grow in loose spikes, which are shorter than either of the other sorts. They are yellow, and succeeded by round seed-vessels, like those of the former sorts; the plants perish soon after their seeds ripen. The seeds of this sort should be sown on a warm border of light earth in April, where they are to remain; and when the plants come up, they will require no other care but to keep them clean from weeds, and to thin them where they are too close. This sort flowers in July, and the seeds ripen in October.

The eighth sort never rises to a stalk, but the leaves come out close to the ground. These are long, taper, succulent, and of a sea-green colour, growing erect; the flower-stems rise between the leaves, and are near three feet long; the upper half being thinly garnished with yellow flowers, shaped like those of the other species. These appear at different seasons, so that the plants are seldom long destitute of flowers. This sort doth not send out offsets so freely as some of the others; but as it produces seeds annually, it may be had in plenty. It must be treated in the same manner as the fourth, fifth, and sixth sorts.

The ninth and tenth sorts grow naturally on bogs in most of the northern countries; the tenth is common in many parts of England, but particularly in Lancashire, from whence it had the title of Lancashire Asphodel; it also grows on a bog upon Putney-heath. The other grows naturally in Denmark, Sweden, and Lapland. These are both low plants, having narrow leaves, which grow close to the ground; the flower-stems rise about six inches high, being terminated by a loose spike of small yellow flowers. These differ from each other, the stamina of the tenth being woolly, whereas those of the other are smooth. These

plants, growing naturally upon bogs, are with difficulty preserved in gardens.

ANTHERÆ [from Ἀνθηρὸς flowery,] are the summits or little tops in the middle of a flower, supported by the stamina.

ANTHOLOGY [of Ἄνθος, a flower, and λόγος, *Gr.* a word,] a discourse or treatise of flowers.

ANTHOLYZA. We have no English name for this plant.

The Characters are,

*It hath an imbricated sheath growing alternate, which is permanent; the flower is of one leaf, tubulous, and opens above with compressed jaws. The upper lip is slender, long, erect, and waved; the two jaws are short, and joined at their base; the under lip is trifid, short, and the middle segment turns downward; it hath three long slender stamina, two of which are under the upper lip, and the other lies in the under lip; these are crowned by pointed summits. Under the flower is situated the germen, supporting a slender style the length of the stamina, which is crowned by a slender, trifid, reflexed stigma. The germen afterward becomes a roundish three-cornered vessel having three cells, in which are lodged many triangular seeds.*

This genus of plants is ranged in the first section of Linnæus's third class, entitled Triandria Monogynia, the flowers having three stamina and one style.

The Species are,

1. Antholyza (*Ringens*) corolla labiis divaricatis fauce compresso. Lin. Sp. Plant. 54. *Antholyza whose flower-lips spread asunder.* Gladiolus floribus rictum referens coccineus suprema lacinia erecta & fistulosa. Breyn. 21.
2. Antholyza (*Spicata*) foliis linearibus sulcatis floribus albis uno versu dispositis. Fig. Plant. pl. 40. *Antholyza with narrow furrowed leaves, and white flowers ranged on one side of the stalk.*

The first sort hath round, red, bulbous roots, from which arise several rough furrowed leaves, near a foot long, and half an inch broad; between these comes out the flower-stem immediately from the root, which rises two feet high, is hairy, and hath several flowers coming out on each side. These are of one leaf, cut into six unequal parts at the top: one of these segments is stretched out much beyond the other, standing erect; the margins are waved and closed together, wrapping up the three stamina. The flowers are red, and appear in June, and the seeds ripen in September.

The roots of the second sort are in shape and size like those of the Vernal Crocus, but the outer skin is thin and white; from this arises five or six long narrow leaves, which are deeply furrowed. Between these arise the flower-stem, which is a foot and a half high, bending on one side toward the top, where the flowers come out, ranged on one side, standing erect. These have each a spatha or sheath, of one leaf, divided into two, ending in points, which are permanent. The flower is of one leaf, having a long tube, but is divided into six unequal segments at the top, which spread open, their margins being waved and turned inward. The three stamina rise under the upper segment, which is larger than the others, and below is situated the trifid style, crowned with purple stigma. After the flower is past, the germen becomes a three-cornered seed-vessel, opening in three cells, which are filled with triangular seeds. The flowers of this sort are white, appear in May, and the seeds ripen in August.

These plants are natives of Africa, from whence their seeds have been obtained, and were first raised in the Dutch gardens, where one of the sorts has long been an ornament in the curious gardens of that country.

They are propagated by offsets, which the bulbous roots send forth in pretty great plenty; or by seeds, which are sometimes perfected in Europe. These seeds should be sown soon after they are ripe; for if they are kept out of the ground till the following spring, they often miscarry, or at least remain a year in the ground before they grow. If the seeds are sown in pots of light earth, and plunged into an old bed of tan which has lost its heat, and shaded in the middle of the day in hot weather, the seeds will come up the following winter; therefore they must be kept covered with glasses to screen them from cold, otherwise the young plants will be destroyed. These may remain in the pots two years, if the plants are not too close, by which time they will have strength enough to be planted each into a separate small pot filled with light earth. The time for transplanting of these roots is in July or August, when their leaves are decayed. In summer the pots may be placed in the open air, but in winter they must be removed, and placed under a hot-bed frame, for they are not very tender; but where any damp arises, it is very apt to occasion a mouldiness upon their leaves. The roots shoot up in autumn, and the flowers begin to appear in May; the seeds ripen in August, and soon after their leaves and stalks decay; when the roots may be taken up, and kept six weeks or two months out of the ground, so may be easily transported from one country to another at that time. These flowers are ornamental when they appear, and they are plants which require but little culture, so deserve a place in every good garden.

ANTHOSPERMUM, Amber-tree, vulgò.

The Characters are,

*It is male and female in different plants; the male flowers have no petals, but a coloured empalement of one leaf, which is cut into four parts almost to the bottom. Out of the bottom arises four slender stamina, crowned with oblong square summits, having a deep furrow through their middle. The female flowers have the same structure as the male, but have no stamina; instead of which, there is an oval germen, situated in the bottom, supporting two recurved styles crowned with a slender stigma. The germen afterward becomes a roundish capsule having four cells, which contain several angular seeds.*

Dr. Linnæus has ranged this genus in his twentieth class of plants, but it properly belongs to his twenty-second, because the plants are male and female in different plants; whereas those of his twenty-third, have male, female, and hermaphrodite flowers on the same plant.

Anthospermum (*Æthiopicum*) foliis lævibus. Hort. Cliff. 455. *Amber-tree with smooth leaves.*

This plant has been long known in the curious gardens, under the title of Frutex Africanus, ambram spirans, or *Amber-tree.*

It is preserved in most curious gardens which have collections of tender plants, and is easily propagated by planting cuttings during any of the summer months, in a border of light earth; which will take root in six weeks time, provided they are watered and shaded as the season may require: or if these cuttings are planted in pots, and plunged into a very moderate hot-bed, they will take root sooner, and there will be a greater certainty of their growing. Afterward they should be taken up, with a ball of earth to their roots, and planted into pots filled with light sandy earth, and may be exposed to the open air until October; at which time they should be removed into the conservatory, where they should be placed as free as possible from being over-hung with other plants; and, during the winter season, they must be refreshed with water, but should not have too much given them each time; and should have as much air admitted to them as the weather will permit, for if they are kept too close, they will be subject to grow mouldy, and generally decay soon after; so that if the green-house is damp, it will be difficult to preserve these plants through the winter.

The beauty of this shrub is in its small ever-green leaves, which grow as close as heath; which being bruised between the fingers, emit a very fragrant odour. These plants must be frequently renewed by cuttings, for the old plants are very subject to decay, seldom continuing above three or four years.

It is but of late years there have been any of the female plants in the gardens, for all those which were formerly in the gardens, were the male, which being

propagated by cuttings had been continued, so that no seeds were ever produced in England till within a few years past, when I received some seeds from the Cape of Good Hope, from which I raised many plants of both sexes, and a few among them with hermaphrodite flowers, which have produced seeds, from which many plants have been raised.

ANTHYLLIS. Lin. Gen. Plant. 773. Vulneraria. Tourn. Barba Jovis. Tourn. *Ladies Finger, or Kidney Vetch.*

The CHARACTERS are,

*It hath a swelling, hairy, permanent empalement of one leaf, which is divided at the top into five equal parts. The flower is of the butterfly kind, having a long standard reflexed on both sides beyond the empalement; the two wings are short; the keel is of the same length, and compressed. There are ten stamina, which rise together, and are crowned by single summits. In the center is situated an oblong germen, supporting a single style, crowned by a blunt stigma: the germen afterward becomes a small roundish pod inclosed by the empalement, having one or two seeds.*

This genus is ranged in Linnæus's seventeenth class of plants, entitled Diadelphia Decandria, the flowers having ten stamina joined in two bodies.

The SPECIES are,

1. ANTHYLLIS (*Tetraphylla*) herbacea foliis quaterno-pinnatis floribus lateralibus. Hort. Upsal. 221. *Herbaceous Kidney Vetch with winged leaves, having four lobes, and flowers growing from the side of the stalks.* Vulneraria pentaphyllos. Tourn. Inst.
2. ANTHYLLIS (*Vulneraria*) herbacea foliis pinnatis inæqualibus capitulo duplicato. Lin. Sp. Plant. 719. *Kidney Vetch with unequal winged leaves and double heads.* Vulneraria supina flore coccineo. Raii Syn. Ed. 3. p. 325.
3. ANTHYLLIS (*Rustica*) herbacea foliis pinnatis inæqualibus foliolis caulinis lineari lanceolatis floribus capitatis simplicibus. *Herbaceous Kidney Vetch with unequal winged leaves, whose lobes are narrow, spear-shaped, and single heads of flowers, called Ladies Fingers.* Vulneraria rustica. J. B. II. p. 362.
4. ANTHYLLIS (*Montana*) herbacea foliis pinnatis æqualibus capitulo terminali secundo, floribus obliquatis. Lin. Sp. Plant. 719. *Herbaceous Woundwort with equal winged leaves, terminated by the head of flowers, which are oblique.* Astragalus purpureus. Dalechampii 1347. *Purple Milk Vetch.*
5. ANTHYLLIS (*Cornicina*) herbacea foliis pinnatis inæqualibus capitulis solitaris. Lin. Sp. Plant. 719. *Herbaceous Woundwort, with unequal winged leaves, and a single head of flowers.*
6. ANTHYLLIS (*Barba Jovis*) fruticosa foliis pinnatis æqualibus floribus capitatis. Hort. Cliff. 371. *Shrubby Woundwort, with leaves equally winged, and flowers collected in a head.* Barba Jovis pulchrè lucens. J. B. I. p. 385. *Jupiter's Beard, or Silver Bush.*
7. ANTHYLLIS (*Cytisoides*) fruticosa foliis ternatis inæqualibus calycibus lanatis lateralibus. Lin. Sp. Plant. 720. *Shrubby Woundwort, with three unequal leaves, and a downy flower-cup growing from the sides.* Cytisus incanus folio medio longiore. C. B. P. 390.
8. ANTHYLLIS (*Erinacea*) fruticosa spinosa foliis simplicibus. Lin. Sp. Plant. 720. *Shrubby prickly Woundwort, with single leaves.* Genista Spartium spinosum foliis lenticulæ floribus ex cæruleo purpurascentibus. C. B. P. 394.
9. ANTHYLLIS (*Hermanniæ*) fruticosa, foliis ternatis subpedunculatis, calycibus nudis. Lin. Sp. Plant. 1014. *Shrubby Woundwort of Crete, with ternate leaves, and naked flower-cups.* Barba Jovis Cretica, linariæ folio, flore luteo parvo. Tourn. Cor. 44.
10. ANTHYLLIS (*Heterophylla*) fruticosa, foliis pinnatis, floralibus ternatis. Lin. Sp. Plant. 1013. *Shrubby Woundwort of Portugal, with winged leaves, but those near the flowers ternate.* Barba Jovis minor Lusitanica, flore minimo variegato. Tourn. Inst. 651.

The first sort grows naturally in Spain, Italy, and Sicily. This is an annual plant, with trailing branches, which spread flat on the ground; the leaves grow by fours at each joint, and the flowers come out in clusters on the sides of the stalks, having large swelling empalements, out of which the extreme parts of the petals do but just appear; these are of a yellow colour, and are succeeded by short pods inclosed in the empalement. It flowers in June and July, and the seeds ripen in September. The seeds of this sort should be sown on a bed of light earth in April, where the plants are to remain, and will require no other care, but to thin them to the distance of two feet, and keep them clean from weeds.

The second sort grows naturally in Spain and Portugal, from both which countries I have received the seeds; it also grows wild in Wales, and the isle of Man. This is a biennial plant, having single leaves at bottom, which are oval and hairy; but those which grow out of the stalks are winged, each being composed of two or three pair of lobes terminated by an odd one: the flowers grow collected into heads at the top of the stalks, these are of a bright scarlet colour, so make a pretty appearance: it flowers in June and July, and the seeds ripen in October. When the plants of this sort grow on poor land, they will sometimes continue three years, but in gardens they seldom last longer than two.

The third sort grows naturally upon chalky grounds in many parts of England, so is rarely admitted into gardens. Dr. Linnæus supposes this and the former sort to be the same, but from having cultivated these for many years, I can affirm they are different species, never altering from seed. The leaves of this sort are much narrower than those of the former, and have generally one or two pair of lobes more in each. The heads of flowers in this species are single, whereas the other has generally double heads; add to these, the root being perennial, which makes an essential difference between them.

The fourth sort is a perennial plant with trailing branches, garnished with winged leaves, which have an equal number of hairy lobes at the extremity of the branches; the flowers are produced in heads, these are of a purple colour, and globular form. This sort grows naturally on mountains in the south of France and Italy, from whence I have received the seeds. It is propagated by seeds, which may be sown either in the autumn or spring: those which are sown in the autumn, will rise the following spring, and more certainly grow, than those which are sown in the spring, which seldom grow the same year. When the plants come up, they must be kept clean from weeds; and where they are too close together, they must be thinned. The following autumn, they should be transplanted to the places where they are to remain, and will require no particular management afterward. This sort flowers in June and July, and the seeds ripen in October.

The fifth sort approaches near to the third, but the leaves are hoary, and the flowers are produced on the side of the branches; these are yellow, and collected into small heads. It is an annual, or at most a biennial plant; for when it flowers early in the summer, it commonly decays soon after the seeds are ripe; whereas those plants which flower later in the season, and do not perfect seeds, will abide another year. This may be propagated by seeds, in the same manner as the former.

The sixth sort is the Barba Jovis, or Jupiter's Beard, by many called Silver Bush, from the whiteness of its leaves. This is a shrub which often grows ten or twelve feet high, and divides into many lateral branches, garnished with winged leaves, composed of an equal number of narrow lobes, which are very white and hairy; the flowers are produced at the extremity of the branches, collected into small heads; these are of a bright yellow colour, and appear in June; sometimes they are succeeded by short woolly pods, containing two or three kidney-shaped seeds; but unless the season proves warm, they do not ripen in this country. It is propagated either by seeds or cuttings; if by seeds, they should be sown in the autumn, in pots filled with light earth, and placed under a frame

a frame in winter to protect them from frost. The following spring the plants will rise, and when they are strong enough to remove, they should be each planted in a small pot filled with light earth, and placed in the shade till they have taken new root; after which, they may be placed with other hardy exotic plants, in a sheltered situation, where they may remain till October, when they must be removed into shelter. These plants are always housed in winter, yet I have had some of them live abroad three or four years, which were planted against a south-west aspected wall. It may also be propagated by cuttings, which may be planted during any of the summer months, observing to water and shade them until they have taken root. When the cuttings have taken good root, they should be planted in pots, and treated in the same manner as the former.

The seventh sort is a low shrub, seldom rising above two feet high, but sends out many slender branches, garnished with hoary leaves, which are sometimes single, but generally have three oval lobes, the middle being longer than the other two; the flowers are yellow, and come out from the side of the branches, three or four joined together, having woolly empalements, but these are rarely succeeded by seeds in England. It may be propagated by cuttings or seeds, in the same manner as the former sort, and treated as hath been directed for that. This has been an old inhabitant in the English gardens.

The eighth sort grows naturally in Spain and Portugal, from whence I have received the seeds. This is a shrub which grows nine or ten feet high, having the appearance of one sort of Gorse or Whin, but it hath round leaves growing single. It will live in the open air in mild winters, but hard frost will destroy it. It is propagated by seeds only.

The ninth sort grows naturally in Crete, and also in Palestine; this was formerly in some of the English gardens, but the severe winter of $17\frac{39}{40}$, destroyed most (if not all the plants) in this country, since which time I have not seen it. This shrub grows five or six feet high, the branches are garnished with oblong ternate leaves; the flowers, which are yellow, are produced in small clusters on the side of the branches; these appear in July and August, but are not succeeded by seeds in this country.

This is propagated by cuttings, which should be planted the beginning of June, and if they are closely covered with a bell-glass, and properly shaded, they will put out roots by the end of August, when they should be carefully taken up, and each planted in a small pot, filled with light earth, and placed in the shade until they have taken new root; when they may be placed in the open air till October, and then should be removed into shelter, and treated in the same way as other hardy green-house plants.

The tenth sort grows naturally in Portugal and Spain: this is a very low shrubby plant, whose branches spread near the ground, garnished with silvery winged leaves, which are acute-pointed; the flowers are produced toward the extremity of the branches; these are not succeeded by seeds in England, but the plant is propagated by cuttings in the same manner as the former, and the plants require the same treatment.

ANTIRRHINUM [which in composition sometimes indicates a likeness, Ἀντίῤῥινον, of ἀντὶ and ῥὶν, the nostrils, because it represents a nose:] Snap-dragon, or Calves-snout.

The Characters are,

*The empalement is of one leaf, cut into five parts, the two upper segments being longer than the lower. The flower is ringent, having an oblong tube, divided at the top into two lips, which are closed at the jaw. The upper lip is cut into two, and reflexed on each side; the under lip is divided into three obtuse parts: in the bottom is situated an obtuse nectarium, which is not prominent. There are four stamina which are included in the upper lip, two being longer, and two shorter, crowned by short summits. In the center is placed a roundish germen, supporting a single style, crowned with an obtuse stigma. The germen afterward becomes a round obtuse capsule, having two cells, which are full of small angular seeds.*

This genus is ranged in Linnæus's fourteenth class of plants, entitled Didynamia Angiosperma, the flower having two long and two short stamina, and many seeds included in a capsule. To this genus Linnæus has joined the Linaria and Asarina; but as the flowers of the Linaria have spurs to their petals, and the nectarium being very prominent, which are not so in this genus, so it should be separated from it.

The Species are,

1. Antirrhinum (*Minus*) foliis lanceolatis obtusis alternis caule ramosissimo diffuso. Hort. Cliff. 324. *Snap-dragon with obtuse spear-shaped leaves growing alternate, and a diffused branching stalk.* Antirrhinum arvense minus. C. B. P. 212.
2. Antirrhinum (*Orontium*) floribus subspicatis, calycibus digitatis corolla longioribus. Hort. Upsal. 176. *Snap-dragon with spiked flowers, and fingered empalement longer than the flower.* Antirrhinum arvense majus. C. B. P. 212.
3. Antirrhinum (*Majus*) foliis lanceolatis petiolatis calycibus brevissimis racemo terminali. Vir. Cliff. 61. *Snap-dragon with spear shaped leaves having foot-stalks, and very short flower-cups, terminated by a spike of flowers.* Antirrhinum majus alterum folio longiore. C. B. P. 211.
4. Antirrhinum (*Latifolium*) foliis lanceolatis glabris, calycibus hirsutis racemo longissimo. *Snap-dragon with smooth spear-shaped leaves, hairy flower-cups, and a very long spike of flowers.* Antirrhinum latifolium amplo pallido flore. Bocc. Mus. 2. 49.
5. Antirrhinum (*Italicum*) foliis lineari-lanceolatis hirsutis racemo breviore. *Snap-dragon with narrow, hairy, spear-shaped leaves, and a shorter spike of flowers.* Antirrhinum longifolium majus Italicum flore amplo niveo lactescente. H. R. Par.
6. Antirrhinum (*Siculum*) foliis linearibus floribus petiolatis axillaribus. *Snap-dragon with narrow leaves and flowers, with foot-stalks proceeding from the wings of the leaves.* Antirrhinum siculum linariæ folio niveo flore. Bocc. Mus.

The two first sorts grow naturally on arable land in many parts of England, so are seldom admitted into gardens; these are both annual plants, which come up from scattered seeds. They flower in June and July, and their seeds are ripe in September.

The third sort is not a native of England, but having been first brought into gardens, the seeds have scattered about in so great plenty, that it is become very common upon walls and old buildings in many parts of England. Of this sort there are several varieties, which differ in the colour of their flowers, some having red flowers with white mouths, some with yellow mouths, others have white flowers, with yellow and white mouths. There is also one with striped leaves. The last is propagated by slips and cuttings, which readily take root any time in the spring or summer. The different colours of the flowers are variable from seeds.

The fourth sort grows naturally in the islands of the Archipelago, from whence I received the seeds. The leaves of this are much broader, the flowers greatly larger, and the spikes longer, than in any of the other sorts. The colours of the flowers are as changeable in this sort as the former, when raised from seeds; but as this is the most specious kind, so it better deserves propagating than the common, especially as it is equally hardy.

The fifth sort has long narrow leaves, which are hairy; the flowers are large, and the spike is shorter than the former; there are some varieties in the colour of the flowers of this sort, but it is equally hardy with the common sort.

The sixth sort is an annual plant, which seldom grows more than a foot high; the leaves of this are very narrow and smooth; the flowers come out from the wings of the leaves single, standing on long footstalks; these are very white, with a dark bottom. If the seeds of this sort are permitted to scatter, the plants

plants will come up, and require no other care but to thin them and keep them clean from weeds.

The third, fourth, and fifth ſorts are raiſed from ſeeds, which ſhould be ſown in a dry ſoil, which is not too rich, either in April or May; and in July the plants may be planted out into large borders, where they will flower the ſpring following; or they may be ſown early in the ſpring, for flowering the ſame autumn, but then they are not ſo likely to endure the winter; and if the autumn prove bad, they will not perfect their ſeeds.

Theſe plants grow extremely well upon old walls or buildings, in which places they will endure for ſeveral years; whereas thoſe planted in gardens ſeldom laſt longer than two years, unleſs they are planted in a very poor ſoil, and the flowers often cropped, and not ſuffered to ſeed; but any of theſe ſorts may be continued, by planting cuttings in any of the ſummer months, which will eaſily take root.

All the ſorts of Snap-dragons are pretty ornaments in a garden, and requiring very little culture, are rendered more acceptable. They are all hardy plants, and will reſiſt the cold of our winters extremely well, eſpecially if they are planted on a dry, gravelly, or ſandy ſoil; for when they are planted in a rich moiſt ſoil, they will grow very luxuriant for a time, but are very ſubject to rot in autumn or winter; and are much more ſuſceptible of cold, than when they are in a dry, hungry, rocky ſoil; ſo that theſe plants may be placed amongſt ſtones, or they will grow in the joints of old walls, where they may be placed ſo as to render ſome abject part of a garden very agreeable, for they will continue in flower ſeveral months; and if the ſeeds are permitted to ſhed, there will be a continual ſupply of young plants, without any trouble.

Wherever theſe plants are deſigned to grow on walls, or on a rocky barren ſoil, the ſeeds ſhould be ſown the beginning of March, where they are deſigned to remain; (for if the plants are firſt raiſed in a better ſoil, and afterward tranſplanted into thoſe places, they ſeldom ſucceed well.) When the plants are come up, they will require no other culture but to keep them clear from weeds; and where they come up too thick, to pull ſome of them out, ſo as to give them room to grow. In July theſe ſorts will begin to flower, and will continue flowering till the froſt prevents them. Thoſe plants which grow on walls, will have ſtrong woody ſtems, which will continue two or three years or more, and are rarely hurt by froſt.

APARINE [this plant is ſo called, becauſe it is very rough; it is called Philanthropon, of φιλέω, to love, and ἄνθρωπος, man; becauſe if a perſon walks in uncultivated places, the plant not only applies itſelf to his garments, but it holds them, as if it had a mind to bind man with an amicable band:] Gooſe-graſs or Clivers.

The common ſort grows wild almoſt every where, the ſeeds ſticking to the cloaths of people that paſs by where they grow: it is ſometimes uſed in medicine, but it is too common a weed to be admitted into a garden.

There are ſome other ſorts of this plant which are kept in botanic gardens for the ſake of variety, which I ſhall beg leave to enumerate here.

1. Aparine ſemine lævi. Tourn. *Gooſe-graſs with a ſmooth ſeed.* This is under Gallium in Linnæus.
2. Aparine ſemine coriandri ſaccharati. Park. Theat. *Gooſe-graſs with ſweet ſeeds like Coriander.*
3. Aparine pumila ſupina, flore cæruleo. Tourn. *Low trailing Gooſe-graſs, with a blue flower.* The two laſt are included in Linnæus's genus of Vailantia.

All theſe plants, if they are permitted to ſcatter their ſeeds, will maintain themſelves in a garden without any other culture, than that of preventing other weeds from over-growing them, theſe being all very low plants.

The firſt ſort grows wild in Cambridgeſhire, as doth the third about Liphoeck in Hampſhire, where I have gathered it.

APETALOUS plants, [of α privative, and πέταλον, a flower-leaf, *Gr.*] are ſuch as have no petals or flower-leaves.

APHACA. See Lathyrus.

APICES [of Apex, *Lat.* a top or point] theſe are called ſummits by Vaillant, and are thoſe little knobs that grow on the top of the ſtamina in the middle of the flower: which are generally ſuppoſed to be a kind of male ſperm, which when ripe, diffuſes itſelf to every part of the flower, and fecundates the ovarium and renders it fruitful.

APIOS. See Glycine.

APIUM [Apium is ſo called, as ſome ſay, of Apes, bees, becauſe bees are ſaid to be delighted very much with it,] Parſley.

The Characters are,

*It is a plant with an umbelliferous flower; the rays of the great umbel are few, but thoſe of the ſmaller are many; the involucrum is in ſome ſpecies of one leaf, and in others of many; the petals of the greater umbel are uniform; theſe are round, equal, and turn inward. Each flower has five ſtamina, crowned by roundiſh ſummits. Under the flower is ſituated the germen, ſupporting two reflexed ſtyles, crowned by blunt ſtigma; the germen afterward becomes an oval channelled fruit, dividing into two parts, having two oval ſeeds channelled on one ſide, and plain on the other.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifth claſs, entitled Pentandria Digynia, the flowers having five ſtamina and two ſtyles.

The Species are,

1. Apium (*Petroſelinum*) foliolis caulinis linearibus involucellis minutis. Hort. Cliff. 108. *Parſley with very narrow leaves on the flower-ſtalks.* Apium hortenſe vel petroſelinum vulgò. C. B. P. *Common Parſley.*
2. Apium (*Criſpum*) foliis radicalibus amplioribus criſpis caulinis ovato-multifidis. *Parſley with the lower leaves very broad and curled, the upper oval, and cut into many ſegments.* Apium vel petroſelinum criſpum. C. B. P. 153. *Curled Parſley.*
3. Apium (*Latifolium*) foliis radicalibus trifidis, ſerratis, petiolis longiſſimis. *Parſley with under leaves divided into three parts, which are ſawed, and have very long foot-ſtalks.* Apium hortenſe latifolium maxima craſſiſſima ſuavi & eduli radice. Boerh. Ind. alt. *The large rooted Parſley.*
4. Apium (*Graveolens*) foliolis caulinis cuneiformibus. Hort. Cliff. 107. *Parſley with the lower leaves faſhioned like a wedge.* Apium paluſtre ſive apium officinarum. C. B. P. 154. *Smallage.*
5. Apium (*Dulce*) foliis erectis, petiolis longiſſimis foliolis quinque lobatis ſerratis. *Parſley with upright leaves, having very long foot-ſtalks, and the ſmaller leaves compoſed of five ſawed lobes.* Apium dulce ceteri Italorum. Inſt. R. H. 305. *Upright Celery.*
6. Apium (*Rapaceum*) foliis patulis, petiolis brevibus, foliolis quinis ſerratis, radice rotundo. *Parſley with ſpreading leaves, having ſhort foot-ſtalks, the ſmaller leaves having five lobes, and a round root.* Apium dulce degener, radice rapacea. Juſſ. *Celeriack, or Turnep-rooted Celery.*
7. Apium (*Luſitanicum*) foliis radicalibus tribolatis, caulinis quinque-lobatis crenatis. *Parſley with under leaves having three lobes, and thoſe on the ſtalks five, which are indented.* Apium Luſitanicum maximum, folio trilobato flore luteolo. Boerh. Ind. alt.

The firſt ſort is the common Parſley, which is generally cultivated for culinary uſe; and is what the College of Phyſicians have directed to be uſed in medicine, under the title of Petroſelinum; for when Apium is preſcribed, the Smallage is always intended.

The ſecond ſort has generally been ſuppoſed to be only a variety of the firſt, but from many years trial I have always found, that if the ſeeds are carefully ſaved from plants of the curled-leaved Parſley, it will conſtantly produce the ſame; but there are few perſons who will be at the trouble to ſave the ſeeds ſo carefully, as not to have ſome of the common ſort mixed with it; for when ſeeds are bought at the

ſhops, there is generally a mixture of both: therefore the only method to have it good, is to ſeparate all thoſe plants which have plain leaves from the curled, as ſoon as they are diſtinguiſhable, leaving only ſuch as are of the right kind; if this is duly obſerved, the ſeeds will conſtantly produce the ſame.

The third ſort is chiefly cultivated for their roots, which are now pretty commonly ſold in the London markets; the leaves of this ſort have much longer foot-ſtalks, and their ſubdiviſions are not ſo numerous as in the common Parſley; the lobes of the leaves are much larger, and of a darker green, ſo that it is eaſily diſtinguiſhed from the common ſort by its leaves, but the roots are ſix times as large as the common Parſley can be brought to with the utmoſt culture. I have ſown the ſeeds of both ſorts for ſeveral years on the ſome ſpot of ground, and have thinned the plants when young, to an equal diſtance, and given the ſame culture to both; but when their roots were taken up, thoſe of the common ſort were not larger than a man's little finger, but the other were as large as full grown Carrots, which were very tender and ſweet, whereas the other were ſtringy and ſtrong; and this difference conſtantly holds, ſo it may be allowed to be ſpecifically different. This ſort was many years cultivated in Holland, before the Engliſh gardeners could be prevailed on to ſow it. I brought the ſeeds of it from thence in 1727, and would then have perſuaded ſome of the kitchen-gardeners to make trial of it, but they refuſed to accept of it, ſo that I cultivated it ſeveral years before it was known in the markets.

The fourth ſort is commonly known by the title of Smallage. This is what the phyſicians intend when they preſcribe Apium. Dr. Linnæus has joined to this the Celery, ſuppoſing them to be the ſame, and the only difference to ariſe from culture, but herein he is greatly miſtaken; for I have cultivated the Smallage in gardens forty years, to try if by art it could poſſibly be brought to the ſame goodneſs as Celery, but have not been able to alter it from its original; all that can be done by culture, is to bring it to a larger ſize than it naturally grows wild, and by earthing it, to give it a whiteneſs; but it will not grow tall as Celery, nor will it riſe with a ſtrait ſtem, but ſends out many ſuckers near the root, and when it is blanched, retains its ſtrong rank taſte, which no culture can alter, therefore I make no doubt of its being a diſtinct ſpecies.

The fifth ſort is the Celery before-mentioned, and the ſixth ſort was ſuppoſed to be a degenerate ſpecies from it, but I cannot agree to this opinion; for from many years trial I have never found it vary. The leaves of this ſort are ſhort, when compared with thoſe of the other, and ſpread open horizontally; the roots grow as large as the common Turneps. The difference which I have obſerved to ariſe from the culture, has been only in the ſize of the roots; thoſe on rich ground, which were properly cultivated were much larger than thoſe on poorer land, but the leaves and outward appearance of the plants were never altered, ſo that I make no doubt of its being a different ſpecies.

The ſeeds of the ſeventh ſort I received from the royal garden at Paris, many years ſince, where it had been long preſerved, and maintained its difference; and from more than twenty years cultivating it in the garden at Chelſea, I have found the ſame, ſo that I cannot doubt of its being different from all the other ſpecies.

The broad-leaved Garden Parſley, mentioned by Caſper Bauhin, and the round-leaved Portugal Parſley, mentioned by Tournefort, I believe are only varieties of the common Parſley; for if they are diſtinct ſpecies, all the ſeeds which I have received from different parts of Europe, under thoſe titles, have been wrong; for the plants which have riſen from thoſe ſeeds, have always proved to be the common ſort.

As Tournefort, and many other botaniſts, have enumerated all the varieties of plants which were found in the gardens, and did not diſtinguiſh which of them were ſpecifically different; ſo Dr. Linnæus has gone into the other extreme, and ſuppoſed many plants, which are permanently different, to be only accidental varieties, ariſing from culture. But as he is now cultivating as many plants as the inclemency of the climate where he is ſituated, will permit, there is no doubt of his reforming his error, in this particular, when he finds what plants retain their ſpecific difference.

The common Parſley muſt be ſown early in the ſpring, for the ſeeds remain a long time in the earth, the plants ſeldom appearing in leſs than ſix weeks after the ſeeds are ſown. This ſort is generally ſown in drills by the edges of borders in the kitchen-gardens near London, becauſe it is much eaſier to keep it clear from weeds, than if the ſeeds are ſown promiſcuouſly on a border, and the Parſley is much ſooner cut for uſe: but when the roots are deſired for medicinal uſe, then the ſeeds muſt be ſown thin; and when the plants are come up, they ſhould be hoed out ſingle, as is practiſed for Carrots, Onions, &c. obſerving alſo to cut up the weeds: if this be obſerved, the roots will become fit for uſe by July or Auguſt, and continue ſo till ſpring.

There are ſome perſons who are afraid to uſe Parſley in their kitchens, leſt they ſhould ſuffer by having the leſſer Hemlock mixed with it, whoſe leaves are ſo like Parſley, that perſons who are not ſkilled in botany, may be eaſily deceived; which being a noxious plant, ſeveral perſons have been injured by eating it: but to prevent this, I have for many years cultivated the ſort with curled leaves, which is ſo unlike the Hemlock, that no perſon, however ignorant, can miſtake one for the other, and have conſtantly adviſed thoſe of my acquaintance to do the ſame; for the curled ſort is equally good as the common Parſley, and I have conſtantly found the ſeeds, ſaved from the curled ſort, to produce the ſame.

The common Parſley is, by ſome ſkilful perſons, cultivated in fields for the uſe of ſheep, it being a ſovereign remedy to preſerve them from the rot, provided they are fed twice a week for two or three hours each time with this herb; but hares and rabbets are ſo fond of it, that they will come from a great diſtance to feed upon it; and in countries where theſe animals abound, they will deſtroy it, if it is not very ſecurely fenced againſt them; ſo that whoever has a mind to have plenty of hares in their fields, by cultivating Parſley, will draw all the hares of the country to them, and this will preſerve them ſound.

The beſt time for ſowing it in the fields is about the middle or latter end of February; the ground ſhould be made fine, and the ſeeds ſown pretty thick, in drills drawn at about a foot aſunder, that the ground may be kept hoed between the drills, to deſtroy the weeds, which, if permitted to grow, will ſoon over-run the Parſley. One buſhel of ſeed will ſow an acre of land.

The great Garden Parſley is now more known to us in England than it was ſome years paſt. In Holland it has been long common in all their markets: they bring theſe roots in bunches, as we do young Carrots to market in ſummer; and the roots are much of the ſame ſize: it is called Petroſeline Wortle by the Dutch, who are very fond of it for water ſouche.

It may be cultivated by ſowing the ſeeds in good ground early in the ſpring; and in April, when the plants are up, cut them out with a hoe (as is practiſed for young Carrots) to about five or ſix inches ſquare, and keep them conſtantly clean from weeds; and in July the roots will be fit to draw for uſe, and may be boiled and eaten as young Carrots; and are very palatable and wholſome, eſpecially for thoſe who are troubled with the gravel.

But if theſe plants are cut out, to allow them more room, if the ſoil is good, the roots will grow to the ſize of a middling Parſnep, by September.

Smallage is a common weed by the ſide of ditches and brooks of water, in many parts of England, ſo

ſo that it is ſeldom cultivated in gardens; but if any perſon is willing to propagate it, the ſeeds ſhould be ſown ſoon after they are ripe, on a moiſt ſpot of ground; and when the plants come up, they may be either tranſplanted in a moiſt ſoil, or hoed out, and left ſix or eight inches aſunder, where they may remain for good. The ſeed of this plant is one of the leſſer warm ſeeds; both the herb and ſeeds are uſed in medicine.

The ſeeds of the two ſorts of Celery ſhould be ſown at two or three different times, the better to continue it for uſe through the whole ſeaſon, without running up to ſeed. The firſt ſowing ſhould be in the beginning of March, upon a gentle hot-bed; the ſecond may be a fortnight or three weeks after, which ought to be in an open ſpot of light earth, where it may enjoy the benefit of the ſun; the third time of ſowing ſhould be the end of April, or beginning of May, which ought to be in a moiſt ſoil; and if expoſed to the morning ſun only, it will be ſo much the better, but it ſhould not be under the drip of trees.

The ſeeds which are ſown in the hot-bed will come up in about three weeks or a month after ſowing, when the plants ſhould be carefully cleared from weeds; and if the ſeaſon prove dry, they muſt be frequently watered; and in about a month or five weeks after it is up, the plants will be fit to tranſplant: you muſt therefore prepare ſome beds of moiſt rich earth, in a warm ſituation, in which you ſhould prick theſe young plants, at about three inches ſquare, that they may grow ſtrong; and if the ſeaſon ſhould prove cold, the beds muſt be covered with mats, to ſcreen the plants from morning froſts, which would retard their growth: you muſt alſo obſerve, in drawing theſe plants out of the ſeed-beds, to thin them where they grow too thick, leaving the ſmall plants to get more ſtrength before they are tranſplanted; by which means one and the ſame ſeed-bed will afford three different plantings, which will accordingly ſucceed each other for uſe.

You muſt obſerve, if the ſeaſon proves dry, to keep it diligently watered after it is tranſplanted, as alſo to clear the ſeed-beds from weeds; and after every drawing, keep them duly watered, to encourage the ſmall plants left therein.

The middle of May ſome of the plants of the firſt ſowing will be fit to tranſplant for blanching, which ſhould be planted in a moiſt, rich, light ſoil, upon which the firſt planted Celery will often grow to be twenty inches long in the clean blanched parts, which upon a poor or dry ſoil ſeldom riſes to be ten inches.

The manner of tranſplanting it is as follows: after having cleared the ground of weeds, you muſt dig a trench by a line about ten inches wide, and ſix or ſeven inches deep, looſening the earth in the bottom, and laying it level; the earth that comes out of the trench ſhould be equally laid on each ſide the trench, to be ready to draw in again to earth the Celery as it advances in height. Theſe trenches ſhould be made at three feet diſtance from each other; then plant the plants in the middle of the trench, at about four or five inches diſtance, in one ſtrait row, having before trimmed the plants, and cut off the tops of the long leaves; when they are planted you muſt obſerve to cloſe the earth well to their roots, and to water them plentifully until they have taken freſh root; after which time it will be needleſs, except in dry ſoils, or very dry ſeaſons: as theſe plants advance in height, you muſt obſerve to draw the earth on each ſide cloſe to them, being careful not to bury their hearts, nor ever to do it but in dry weather, otherwiſe the plants will rot.

When the plants have advanced a conſiderable height above the trenches, and all the earth, which was laid on the ſides thereof, hath been employed in earthing them up; you muſt then make uſe of a ſpade to dig up the earth between the trenches, which muſt alſo be made uſe of for the ſame purpoſe, continuing from time to time to earth it up, until it is fit for uſe.

The firſt of your planting out will, perhaps, be fit for uſe by the beginning of July, and will be ſucceeded by the after plantations; and if the latter ſowings are rightly managed, there will be a ſucceſſion of Celery for uſe till April; but you ſhould obſerve to plant the laſt crop in a drier ſoil, to prevent its being rotted with too much wet in winter; and alſo if the weather ſhould prove extreme ſharp, you will do well to cover your ridges of Celery with ſome Peaſe-haulm, or ſome ſuch light covering, which will admit the air to the plants; for if they are covered too cloſe, they will be very ſubject to rot; by this means you may preſerve your Celery in ſeaſon a long time, but you muſt remember to take off the covering whenever the weather will permit, otherwiſe it will be apt to cauſe the Celery to rot. By this method of covering the Celery, the froſt will be kept out of the ground; ſo it may be always taken up for uſe when it is wanted, which, if neglected, it cannot be taken up in hard froſt. The Celery, when fully blanched, will not continue good above three weeks or a month before it will rot or pipe: therefore, in order to continue it good, you ſhould have at leaſt ſix or ſeven different ſeaſons of planting; ſo that if it be only intended to ſupply a family, there need not be much planted at each time, but this muſt be proportioned according to the quantity required.

The other ſort of Celery, which is commonly called Celeriac, is to be managed in the ſame manner as is directed for the Italian Celery, excepting that this ſhould be planted upon the level ground, or in very ſhallow drills, for this plant ſeldom grows above eight or ten inches high, ſo requires but little earthing up; the great excellency of this being in the ſize of the root, which is often as large as ordinary Turneps. It ſhould be ſown about the middle of March, upon a rich border of earth, and, in dry weather, conſtantly watered, otherwiſe the ſeeds will not grow: when the plants are large enough to tranſplant out, they ſhould be placed eighteen inches aſunder, row from row, and the plants ſix or eight inches diſtant in the rows; the ground muſt be carefully kept clean from weeds, but this ſort will require but one earthing up, which ſhould not be performed until the roots are nearly grown: both theſe ſorts of Celery delight in a rich, light, moiſt ſoil, where they will grow to a much larger ſize, and will be ſweeter and tenderer than on a poor or dry ground.

The beſt method to ſave this ſeed, is to make choice of ſome long good roots of the upright Celery, which have not been too much blanched, and plant them out at about a foot aſunder in a moiſt ſoil, early in the ſpring; and when they run up to ſeed, keep them ſupported with ſtakes, to prevent their being broken down by the winds: and in July, when the ſeed begins to be formed, if the ſeaſon ſhould prove very dry, it will be proper to give ſome water to the plants, which will greatly help their producing good ſeeds. In Auguſt theſe ſeeds will be ripe, at which time it ſhould be cut up, in a dry time, and ſpread upon cloths in the ſun to dry; then beat out the ſeeds, and preſerve them dry in bags for uſe.

APIUM ANISUM DICTUM. See Pimpinella.

APIUM MACEDONICUM. See Bubon.

APIUM PYRENAICUM. See Crithmum.

APOCYNUM. Tourn. Inſt. R. H. 91. Lin. Gen. Plant. 269. [Ἀπόκυνον, of ἀπὸ and κυνὸς a dog, becauſe the antients believed this plant would kill dogs.] Dogſbane.

The Characters are,

*The flower hath a permanent empalement of one leaf, cut into five acute ſegments at the top; it hath but one petal, which is of the open bell-ſhape, cut into five parts at the brim, which turn backward; in the bottom of the flower are ſituated five nectariums, which are oval, and ſurround the germen: there are five ſtamina, ſcarce viſible, which are crowned by oblong erect ſummits, which are bifid; in the center are two oval germen, ſupporting ſmall ſtyles, crowned with globular ſtigma, larger than the germen. The germen afterward become two long pointed capſules, opening in two valves, having one cell, which is filled with compreſſed ſeeds, lying over each other like tiles on a houſe, each being crowned with down.*

This

This genus of plants is ranged in the second section of Linnæus's fifth class, entitled Pentandria Digynia, the flowers having five stamina and two styles.

The Species are,

1. Apocynum (*Androsæmi folium*) caule rectiusculo herbaceo foliis ovatis utrinque glabris cymis terminalibus. Lin. Sp. Plant. 213. *Dogsbane with an erect herbaceous stalk, oval leaves, smooth on both sides, and terminated by a head of flowers.* Apocynum Canadense foliis androsæmi majoris. Mor. Hist. 3. p. 609.
2. Apocynum (*Cannabinum*) caule rectiusculo herbaceo foliis oblongis panniculis terminalibus. Lin. Sp. Plant. 213. *Dogsbane with an erect herbaceous stalk, oblong leaves, and stalks terminated by flowers.* Apocynum Canadense maximum flore minimo herbaceo. Pluk. Alm. 35.
3. Apocynum (*Venetum*) caule rectiusculo herbaceo foliis ovato-lanceolatis. Prod. Leyd. 411. *Dogsbane with an upright herbaceous stalk, and oval spear-shaped leaves.* Apocynum maritimum venetum salicis folio flore purpureo. Tourn. Inst. 92.
4. Apocynum (*Speciosissimum*) foliis ovatis petiolatis, superne glabris, floribus amplis pediculis longis hirsutis caule fruticoso. *Dogsbane with oval leaves, which are smooth on their upper side, large flowers with long hairy foot-stalks, and a shrubby stalk.* Apocynum erectum fruticosum, flore luteo maximo & speciosissimo. Sloan. Cat. Jam. 89.
5. Apocynum (*Scandens*) foliis oblongo-cordatis rigidis floribus lateralibus, caule fruticoso volubili. *Dogsbane with stiff, oblong, heart-shaped leaves, flowers growing on the sides of the stalk, and a shrubby twining stalk.* Apocynum scandens foliis citrii siliquis maculatis. Plum. Cat. 2.
6. Apocynum (*Frutescens*) caule erecto frutescente foliis lanceolato-ovalibus corollis acutis fauce villosis. Flor. Zeyl. 114. *Dogsbane with an upright shrubby stalk, oval spear-shaped leaves, acute petals, and hairy jaws.* Apocynum caule erecto arboreo foliis ovatis acutis. Prod. Leyd. 412.
7. Apocynum (*Reticulatum*) caule volubili perenne foliis ovatis venosis. Prod. Leyd. 412. *Dogsbane with a perennial twining stalk, and oval veined leaves.*
8. Apocynum (*Obliquum*) caule volubili foliis ovatis rigidis obliquis cymis lateralibus tubo floris longissimo. *Dogsbane with oval stiff leaves which are oblique, a twining stalk, and flowers growing from the side of the branches.* Apocynum scandens majus folio subrotundo. Sloan. Cat. Jam. 89.
9. Apocynum (*Nervosum*) caule fruticoso scandente foliis ovatis nervosis cymis lateralibus flore luteo magno tubo longissimo. *Dogsbane with a climbing shrubby stalk, oval-veined leaves, and large flowers growing in bunches from the sides of the stalks, having very long tubes.*
10. Apocynum (*Cordatum*) foliis oblongo-cordatis, mucronatis sessilibus floribus lateralibus, caule scandente. *Dogsbane with oblong heart-shaped leaves, which end in a point, flowers growing at the wings of the leaves, and a climbing stalk.* Apocynum scandens foliis oblongis acuminatis floribus amplis patulus & luteis. Houst. MSS. Fig. Pl. num. 8. pl. 44. f. s.
11. Apocynum (*Villosum*) foliis cordatis glabris floribus villosis lateralibus petiolis longioribus caule scandente. *Dogsbane with smooth heart-shaped leaves, hairy flowers growing from the side of the branches, and a climbing stalk.* Apocynum scandens amplo flore villoso luteo siliquis tumidis angulosis. Houst. MSS. Fig. Pl. tab. 44. fig. 2.

The first sort grows naturally in North America. This hath a perennial root; the stalks rise about three feet high, grow upright, and are garnished with smooth oval leaves, growing opposite. These, as also the stalks, abound with a milky juice, which flows out when they are broken; the flowers are white, and collected in a kind of umbel, growing at the top of the stalks. The nectarii in the bottom, have a purplish cast; these flowers are seldom succeeded by pods which ripen in England, but the plant is propagated by parting the roots. It is hardy, so will thrive in the full ground, but the soil should be light or dry, otherwise the roots are apt to rot in winter. The best time to part the roots is in March, before they begin to put out new stalks.

The second sort is a native of the same countries as the first; the roots of this sort creep far in the ground, so that when it is planted in a garden, it is apt to spread so much as to be troublesome. The stalks of this sort are brown, and grow about two feet high, garnished with oblong smooth leaves, set on by pairs, and abound with a milky juice as the former. Towards the upper part of the stalk, the flowers come out from the wings of the leaves, collected in small bunches, which are of an herbaceous white colour, and small, so make no great appearance, therefore are seldom admitted into gardens, except for the sake of variety. This is very hardy, and propagates too fast by its creeping roots. Both these sorts flower in July, and in autumn their stalks decay to the root.

The third sort grows upon a small island in the sea, near Venice, but is supposed to have been originally brought from some other country. There are two varieties of this, one with a purple, and the other with a white flower. The roots of this creep pretty much, by which it is propagated, for it scarce ever produces any seeds either in the gardens where it is cultivated, or at Venice, where it grows without care, as I have been informed by a very curious botanist, who resided many years at Venice, and constantly went to the spot several times in the season, to procure the seeds, if there had been any produced; but he assured me he never could find any pods formed on the plants. The stalks of this rise about two feet high, and are garnished with oval smooth leaves placed opposite; the flowers grow at the top of the stalks in small umbels, shaped like those of the former sorts, but are much larger, so that the sort with purple flowers makes a pretty appearance. It flowers in July and August. This sort will live in the open air, provided it is planted in a warm situation and a dry soil; for although the soil in which it grows wild near Venice, is moist, yet in this country the roots will rot in winter, when they are in a wet ground. The best time to remove and plant the roots is in spring, just before they begin to push out new stalks.

The fourth sort grows naturally in Jamaica, in the Savannas, from whence it had the title of Savanna Flower, by which it is chiefly known in that island. This sort rises three or four feet high, having woody stalks, which send out a few lateral branches, garnished with oval smooth leaves, placed by pairs opposite, of a shining green colour on their upper sides, but pale and veined underneath; the flowers are produced from the sides of the branches, upon long foot-stalks; there are commonly four or five buds at the end of each, but there is seldom more than one of them which comes to flower, the others withering soon. The flower is very large, having a long tube, which spreads open wide at the top, of a bright yellow, so make a fine appearance, especially in the places where the plants grow naturally, being most part of the year in flower. This plant is too tender to thrive in England without the assistance of a stove. It is propagated by seeds, which must be procured from Jamaica, for the plants do not perfect them in England, nor are many of the seeds which are brought from thence good, either from their being unskilfully gathered before they are ripe, or being put up moist, for few of them have succeeded. When the seeds are obtained, they should be sown in pots filled with light sandy earth, and plunged into a hot-bed of tanners bark. If the seeds are good, the plants will appear in a month or five weeks after, when they should be treated in the same manner as other tender plants from the same country, with this difference only, to be sparing in watering them, for these plants which abound with a milky juice, require very little wet. They must be constantly kept in the tan-bed in the stove, and as they advance in height, they will require larger pots, but there must be great care not to over-pot them; for unless their roots are confined, the plants will not thrive. The second year the plants

plants will flower, if they have been skilfully managed, when they will make a fine appearance in the stove; the usual time of their flowering in England, is in July and August, but the plants retain their leaves through the year, which, being of a beautiful green, look very well at all seasons.

The fifth sort was discovered by father Plumier, in some of the French islands in America, who made a drawing of the plant. It was afterwards found by the late Mr. Robert Millar, surgeon, growing plentifully near Carthagena, in New Spain, from whence he sent the seeds, which succeeded in several gardens. This plant hath twining stalks, by which it mounts to the tops of very tall trees, garnished with stiff, oblong, heart-shaped leaves, which are smooth, and of a shining green colour, being of the same thickness with those of the Citron-tree. The flowers are produced in small clusters from the sides of the branches, and are of an herbaceous colour, so do not make any great appearance. These appear in August and September, but are not succeeded by pods in this country.

The sixth sort grows naturally in India, Ceylon, and upon the coasts of Guinea, from whence I have received the seeds. This plant rises with a woody stem to the height of five or six feet, dividing into several branches, garnished with oblong, pointed, smooth leaves, of a shining green above, but pale underneath, placed by pairs opposite. From the wings of the leaves the flowers are produced in loose bunches. These are small, tubulous, and of a purple colour, but are never succeeded by pods in this country. It is a very tender plant, so must be constantly kept in a hot-house, and plunged in the tan-bed, otherwise it will not thrive in England; it may be propagated by cuttings during the summer months, but they should be laid to dry in the stove, three or four days before they are planted; for as the plants abound with a milky juice, so unless the ends of the cuttings where the wounds are made, are well dried and healed over before they are put into the ground, they are very subject to rot. This plant must be sparingly watered, especially in winter, and should be planted in light sandy earth.

The seventh sort grows naturally in India; I received seeds of this from Dr. Van Royen, professor of botany at Leyden. This plant hath a twining stalk, by which it rises to a considerable height, garnished with oblong leaves, which are much veined, and abound with a milky juice, which flows out whenever they are broken. This plant hath not yet produced flowers in England. It is tender, so requires to be constantly preserved in the stove, otherwise it will not thrive in this country.

The eighth sort grows naturally in Jamaica, from whence the seeds were sent me by the late Dr. William Houston. It hath a climbing stalk, which fastens to the neighbouring trees, and rises ten or twelve feet high. The leaves are oval, stiff, and oblique to the foot-stalk; the flowers are produced from the wings of the leaves, of a purplish colour, and have very long tubes, but spread open wide at the top. This doth not produce seeds in England, nor have I been able to propagate it, either by layers or cuttings. It is tender, so must constantly remain in the stove, and should have little water.

The ninth sort hath a climbing woody stalk, and rises to a considerable height, by the support of neighbouring trees. The leaves grow by pairs opposite; they are oval, ending in a sharp point, and have many transverse nerves from the midrib. The flowers come out from the wings of the leaves, each standing upon a separate long foot-stalk; they are large, of a bright yellow colour, with very long tubes, spreading open wide at the top; these are succeeded by long compressed pods, which have borders on one side filled with long channelled seeds, which are crowned with long plumes of soft down. This sort grows naturally at Carthagena, in New Spain, from whence I received the seeds. It is tender, so will not thrive in England, unless it is constantly preserved in the stove. This is propagated by seeds, which must be procured from the country where it grows naturally, for the seeds do not ripen in this country. When the seeds are procured, they must be sown in pots, and plunged into a hot-bed; and when the plants come up, they should be treated in the same manner as hath been before directed for the fourth sort. It flowers in August and September in England, but in its natural country it flowers great part of the year.

The tenth and eleventh sorts were discovered at La Vera Cruz, in New Spain, by the late Dr. William Houston, who sent their seeds to England. These plants have both climbing stalks, by which they mount to the tops of the tallest trees. In England they have climbed over the plants in the stoves, and risen to upward of twenty feet high. The tenth sort has produced flowers in England several times, but the eleventh, which grows more luxuriantly than the other, never had any appearance of flowers. These are both propagated by seeds, which should be sown as the fourth sort, and the plants must be treated in the same manner afterward. All these species of Dogsbane abound with a milky juice, which flows out from any part of their stalks or leaves when they are broken; and this is generally supposed to be hurtful, if taken inwardly, for it doth not raise blisters on the skin, as the juice of Spurge, and other acrid plants, so is not injurious unless inwardly taken. The pods of all the sorts are filled with seeds, which are, for the most part, compressed, and lie over each other (*imbricatim*) like tiles on a house: these have each a long plume, of a cottony down fastened to their crowns, by which, when the pods are ripe and open, the seeds are wafted by the wind to a considerable distance; so that in the countries where these plants naturally grow, they are some of the most troublesome weeds.

The down of these plants is in great esteem in France, for stuffing of easy chairs, making very light quilts, which are warm, and extremely light, so are very proper covering for persons afflicted with the gout, for the down is so extreme light and elastic that it occasions no weight. This the French call Delawad, and in the southern parts of France, where some of the sorts will thrive in the open air, and perfect their seeds, there are many plantations made of these plants for the sake of the down.

As many of these sorts grow plentifully in the uncultivated lands in Jamaica, this cottony down might be easily procured from thence in plenty, and might probably become a vendible commodity in England, which may turn to advantage, if once it becomes a fashionable sort of furniture, especially as the plants require no cultivation, the only trouble being to collect the down, which, in some of the sorts which have large pods, is produced in great quantity, so may be collected with little trouble.

The other sorts which have been ranged under this genus, are now referred to the following genera, to which the reader is desired to turn, for such of them as are not here enumerated, viz. Asclepias, Cynanchum, and Periploca.

APPLE-TREE. See Malus.

APPLES of Love. See Licopersicon and Solanum.

APPLES (MAD). See Melongena.

APRICOT, or ABRICOT. See Armeniaca.

AQUIFOLIUM. See Ilex.

AQUILEGIA [called also *Aquilina*, from *Aquila*, L. an eagle, because the flower resembles that bird]. Columbine.

The Characters are,

*The flower hath no empalement, but is composed of five equal oval petals, which are plain, and spread open, within which are five equal nectarii, ranged alternately with the petals, each of the horns widening upward, the opening being oblique to the side as it ascends, and is fastened to the receptacle within, the lower part lengthening gradually into a long tube, hanging by a blunt incurved apex. It hath many awl-shaped stamina, which are crowned by oblong upright summits, with five oval germen, supporting*

*porting awl-shaped styles, which are longer than the stamina, crowned by erect stigma; the germen afterwards become five cylindrical vessels, which stand upright, are parallel, pointed, and open in one cell, which are filled with oval shining seeds.*

This genus of plants is ranged in the fifth section of Linnæus's thirteenth class, entitled Polyandria Pentagynia, the flowers having many stamina and five styles.

The Species are,

1. Aquilegia (*Vulgaris*) nectaris rectis petalo lanceolato brevioribus. Lin. Sp. Plant. 533. *Columbine with upright nectariums shorter than its petal, which is spear-shaped.* Aquilegia Sylvestris. C. B. P. 144. *Wild Columbine.*
2. Aquilegia (*Alpina*) nectariis rectis, petalis ovatis longioribus. *Columbine with erect nectarii, and longer oval flower-leaves.* Aquilegia montana magno flore. C. B. P.
3. Aquilegia (*Inversa*) nectariis incurvis. Hort. Upsal. *Columbine with nectarii turned inward.* Aquilegia flore pleno inverso. J. B. 485. *Columbine with a double inverted flower.*
4. Aquilegia (*Canadensis*) nectariis rectis staminibus corolla longioribus. Hort. Upsal 153. *Columbine with straight nectarii, and stamina longer than the petals.* Aquilegia pumila præcox Canadensis. Cornut. Canad. 60. *Early dwarf Canada Columbine.*

The first sort is found growing wild in the woods in some parts of England; I have frequently gathered it in the woods, near Bexley, in Kent; and also between Maidstone and Rochester. The flowers of this are blue, the petals are short, and the nectarii are very prominent, in which it differs from the second, whose petals are longer, and the nectarii do not rise so high. This I found growing naturally near Ingleborough Hill, in Yorkshire. The flowers of this are much larger than those of the Garden Columbine, and the seeds which I sowed of this in the garden at Chelsea, produced the same species without the least variation.

The third is the Garden Columbine, of which there are great varieties, not only in the colour and fulness of their flowers, but also in their form. In some there are no visible nectarii, but in place of them a multiplicity of petals, so that the flowers are as double as those of the Larkspur. These are commonly called Rose Columbines; the colours of these are chesnut, blue, red, and white, and some are finely variegated with two colours.

There are others with sharp pointed petals, which expand in form of a star; of these there are single and double flowers, of the several colours as the former. From the different shape of these flowers, any person not well skilled in the culture of plants, would suppose they were distinct from the others; but having several years sown their seeds, which were collected with great care, I have found them always varying from one to the other: therefore I have not enumerated their varieties here, knowing they can never be preserved the same from seeds, however carefully they are saved: however, as the sorts with variegated flowers are esteemed the greatest beauties, so those persons, who are desirous to have them in perfection, should root out all those plants whose flowers are not well marked, or at least cut off their stems so soon as their flowers appear, leaving only the most beautiful to seed, that the farina of the plain flowers, may not impregnate the others, whereby the plants raised from their seeds may not be degenerated, of which too much care cannot be taken.

These plants are all raised by sowing the seeds, or parting the old roots, but the former method is chiefly practised; for the old roots are very apt to degenerate after they have blown two or three years, so as to become quite plain.

The seeds should be sown in a nursery-bed in August or September, for the seeds which are kept till spring seldom grow well, or at least remain in the ground a whole year. The spring following the plants will appear above ground, therefore should be kept clear from weeds, and if the season should be dry, they should be refreshed with water, that they may gather strength.

In the middle or latter end of May, these plants will be strong enough to transplant; therefore some beds of good fresh undunged earth should be prepared, planting them therein at eight or nine inches distance every way, keeping them clear from weeds, and refreshing them with a little water, as they may require it.

In the following autumn, by which time the plants will have acquired strength enough to flower the summer following, the roots should be carefully taken up, and planted in the borders of the flower-garden; but where their roots are designed to be preserved in perfection, all their flower-stems should be cut off, as soon as the flowers are past, to prevent their degenerating by the commixture of the farina from other flowers.

But in order to be sure of having no single or bad flowers in the borders, you may suffer the plants to remain in the nursery-beds until they have blown; at which time you may put a stick by each root you fancy to preserve, or pull out all the single or bad coloured ones, and throw them away, cutting off all the flowers from your best roots as soon as they have shewn themselves, which will greatly add to the preserving them fair in their colours.

In order to keep up a succession of good flowers, fresh seeds should be sown every year; and if you can meet with a friend, at some distance, who is furnished with good flowers of this kind, it will be very advantageous to both parties, to exchange seeds once in two years, by which they will not be so apt to degenerate into plain colours.

In saving the seeds of the variegated columbines, great care should be taken not to suffer any plain flowers to remain for seed, there being generally some plain flowers intermixed with the striped ones on the same plant, and often in the same branches: these should be cut off, for if they are permitted to seed, or if their farina mix and impregnate the striped flowers, they will degenerate into plain colours; so that there cannot be too much care taken in saving the seeds, where the beauty of their flowers are regarded.

The Canada Columbine flowers almost a month before the other sorts; for which reason it is preserved in the gardens of the curious, though there is no great beauty in the flowers. There is another variety of this sort, with taller flower-stems, which flowers a little after the other, but do not differ, either in the shape of its flowers or leaves from this, so I conclude they are but one distinct species. The Canada Columbines flower in April, and their seeds ripen the beginning of August. The other sorts flower toward the end of May, and in cool seasons will continue to produce flowers till the middle of July, and their seeds ripen toward the middle or end of September, according as the season proves more or less favourable.

The first sort is that which is directed for medicinal use in the dispensaries, but at present is very rarely ordered.

ARABIS. Lin. Gen. Plant. 732. Bastard Tower Mustard.

The Characters are,

*The flower hath a four-leaved empalement, two of the opposite leaves being large, and the other two narrow; these fall off. The flower hath four petals in form of a cross, which spread open; at the bottom of each is situated a reflexed nectarium fixed to the empalement, and between these arise six upright stamina, two of which are no longer than the flower-cup, the other four are much longer: these are crowned with heart-shaped summits. In the center is situated a taper germen, which is as long as the stamina, having no style, but the obtuse stigma rests upon it. This afterward becomes a narrow, long, compressed pod opening lengthways, having two valves and a thin partition, between which is lodged a row of flat seeds.*

This genus of plants is ranged in Linnæus's fifteenth class, entitled Tetradynamia Siliquosa: so called, because the flowers have four stamina longer than the other two, and the seeds growing in long pods.

The Species are,

1. Arabis (*Thaliana*) foliis petiolatis lanceolatis integerrimis. Vir. Cliff. 64. *Bastard Tower Mustard, with whole spear-shaped leaves having foot-stalks.* Bursæ pastoris similis siliquosa major. C. B. P. 108.
2. Arabis (*Alpina*) foliis amplexicaulibus dentatis. Hort. Cliff. 335. *Bastard Tower Mustard, with indented leaves embracing the stalks.* Draba alba siliquosa repens. C. B. P.
3. Arabis (*Pendula*) foliis amplexicaulibus siliquis ancipitibus linearibus calycibus subpilosis. Hort. Upsal. 191. *Bastard Tower Mustard with leaves embracing the stalks, narrow pods hanging two ways, and hairy flower-cups.* Turritis latifolia hirsuta siliquis pendulis. Amman. Ruth. 58.
4. Arabis (*Turrita*) foliis amplexicaulibus siliquis decurvis planis linearibus calycibus subrugosis. Hort. Upsal. 192. *Bastard Tower Mustard, with narrow, plain, hanging pods, and rough flower-cups.* Leucoium hesperidis folio. Tourn. Inst. 221. *Stock Gilliflower with a leaf of Dame's Violet.*
5. Arabis (*Lyrata*) foliis glabris, radicalibus lyratis, caulinis linearibus. Flor. Virg. 99. *Bastard Tower Mustard with smooth leaves, those at the root lyre-shaped, but on the stalks linear.*
6. Arabis (*Canadensis*) foliis caulinis lanceolatis dentatis glabris. Flor. Virg. 100. *Bastard Tower Mustard, with spear-shaped, indented, smooth leaves.* Eruca Virginiana, bellidis majoris folio. Pluk. Alm. 136.

The first sort is a low plant, seldom rising more than four or five inches high, sending out many short branches on every side, terminated by small white flowers growing alternately the most part of their length, each having four petals in form of a cross, which are succeeded by long slender pods filled with small round seeds. It grows naturally on sandy dry ground, in many parts of England.

The second sort grows naturally in Istria, from whence I received the seeds; it is also a native of the Alps, and many other mountainous countries. This is a perennial plant, which increases by its creeping roots, which run obliquely near the surface of the ground, and send down roots at every joint. The leaves are collected into heads, spreading circularly like those of the London Pride. These are oblong, whitish, and indented on their edges; out of these heads arise the flower-stalks, which grow near a foot high, garnished with leaves placed alternately, which are broader at their base than those which grow below, and closely embrace the stalks: the flowers grow in loose bunches on the top; these are white, and have leaves in form of a cross, which are succeeded by long flat pods, opening lengthways, having two cells, which are separated by an intermediate partition, each having one row of flat reddish seeds.

This is a very hardy plant, so will thrive in any situation. It produces seeds in plenty, but as it multiplies so fast by its creeping roots, few persons are at the trouble to sow the seeds. It flowers early in the spring, and having many stalks rising from one root, they make a pretty variety in cold situations, where many finer plants will not thrive, so may have place in rural plantations among shrubs, where they will thrive with very little care.

The third sort grows naturally in Siberia, from whence the seeds were brought to Petersburgh. This is a perennial plant, which grows near a foot high; the leaves are broad, hairy, and indented on their edges; these closely embrace the stalks. The flowers grow alternately in loose spikes, and are of a dirty white colour. These are succeeded by long narrow pods, which are filled with flat brown seeds like the former, but the pods of this hang downwards two ways. It flowers early in spring, and perfects seeds very well, by which it may be propagated in plenty.

The fourth sort grows naturally in Hungary, Sicily, and France. I have also found it growing wild upon some old walls at Cambridge and Ely, but the seeds might probably come out of the gardens where they were first planted. The plants of this kind, which grow on walls or ruins, continue much longer than those which are sown in gardens, where they seldom live longer than two years. The leaves of this sort are long, broad, hairy, and a little waved on their edges; of a pale colour, and spread near the ground: from the center of these come out the stalks, which rise about a foot and a half high, having several leaves growing alternately, which closely embrace them. Toward the top of the stalks, they divide into several small branches, which are terminated by long loose spikes of flowers, of a dirty white colour, each having four petals placed in form of a cross. After the flowers are past, the germen becomes long flat pods, which turn backward at their extremity and open lengthways, having two rows of flat-bordered seeds, of a dark brown colour, separated by a thin intermediate partition.

This sort is easily propagated by seeds, which should be sown in the autumn; for those which are sown in the spring frequently miscarry, or lie in the ground a whole year before they grow. When the plants are strong enough to remove, they may be transplanted into a shady border, or in rural plantations, where no other care will be necessary, but to prevent their being overgrown by weeds. The plants flower in May, and their seeds ripen in July. There is little beauty in this plant, yet many persons preserve it in their gardens to make a variety.

The fifth sort is annual, it grows naturally in North America; the leaves near the root are lyre-shaped, but those on the flower-stalks are linear, placed alternately; both are smooth; the flower-stalks rise near a foot high, and are terminated by white flowers, which are succeeded by slender pods.

The sixth sort was brought from Virginia; this is a biennial plant, whose lower leaves spread on the ground, these are deeply indented on their sides; the flower-stalks rise a foot high, sustaining several yellow flowers placed scatteringly at the top, which are succeeded by pretty long flat pods, filled with seeds.

The two last mentioned sorts have little beauty to recommend them, nor are their virtues known, therefore they are rarely admitted into any gardens except for variety. They are easily propagated by seeds, which if permitted to scatter on the ground, will produce plants in plenty on any soil, or in any situation.

ARACHIS, Earth, or Ground Nut.

The Characters are,

*The empalement of the flower opens in two parts, the upper being cut into three at the extremity, the under one is hollow ending in a point, and longer than the other. The flower is of the butterfly kind, having four petals; the standard is large, roundish, and plain; the wings are open and shorter than the standard, the keel is little longer than the empalement, and turns back. The flower hath ten stamina, nine of which coalesce, and the upper one stands off; these are no longer than the keel, crowned by round summits. In the center is situated an oblong germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterward turns to an oblong pod, containing two or three oblong blunt seeds.*

This genus of plants is ranged in Linnæus's seventeenth class, entitled Diadelphia Decandria, from the flowers having ten stamina, which are in two bodies.

We have but one Species of this plant, viz.

Arachis (*Hypogæa.*) Lin. Hort. Cliff. 353. *Earth or Ground Nut.* Arachidna quadrifolia villosa flore luteo. Plum. Nov. Gen. 49.

The native country of this plant I believe is Africa, though at present, all the settlements in America abound with it; but many persons who have resided in that country affirm, they were originally brought by the slaves from Africa there, where they have been spread all over the settlements.

It multiplies very fast in a warm country, but being impatient of cold, it cannot be propagated in the open air

air in England; therefore whoever has an inclination to cultivate this plant, must plant the seeds in a hot-bed in the spring of the year, keeping the glasses over the plants till the middle or end of June; after which time, if the weather prove warm, they may be exposed to the open air by degrees. The branches of this plant trail upon the ground, and the flowers (which are yellow) are produced single upon long foot-stalks; and as soon as the flower begins to decay, the germen is thrust under ground, where the pod is formed and ripened; so that unless the ground is opened, they never appear: the negroes kept this a secret among themselves, therefore could supply themselves with these nuts unknown to their masters. The roots of these plants are annual, but the nuts or seeds sufficiently stock the ground in a warm country, where they are not very carefully taken up. In South Carolina there is great plenty of these nuts, which the inhabitants roast, and make use of as chocolate.

ARALIA, Berry-bearing Angelica.

The Characters are,

*It is an umbelliferous plant with a globular umbel, having a small involucrum; the empalement of the flower is small, indented in five parts, and rests upon the germen. The flower hath five oval petals, which are reflexed; it hath five awl-shaped stamina crowned by roundish summits; the round germen below the empalement supports five short styles, each of which is crowned by a single stigma. The germen afterward turns to a roundish channelled berry, having five cells, each containing one oblong hard seed.*

This genus of plants is ranged in the fifth section of Linnæus's fifth class, entitled Pentandria Pentagynia, the flowers having five stamina and five styles.

The Species are,

1. Aralia (*Racemosa*) caule folioso herbaceo lævi. Hort. Upsal. 70. *Berry-bearing Angelica, with an herbaceous leafy stalk.* Aralia Canadensis. Tourn. Inst. R. H. 300.
2. Aralia (*Nudicaulis*) caule nudo foliis ternatis. Hort. Cliff. 113. *Berry-bearing Angelica with a naked stalk.* Aralia caule nudo radice repente. Cold. Noveb. 66.
3. Aralia (*Spinosa*) arborescens caule foliolisque aculeata. Vir. Cliff. 26. *Tree Berry-bearing Angelica, whose stalk and leaves are prickly.* Aralia arborescens spinosa. Vaill. Serm. *Angelica-tree*, vulgò.

The first sort is pretty common in many gardens near London, but the second is at present more rarely met with. Both these plants grow naturally in North America, from whence their seeds were brought to Europe. They are perennial plants, whose stalks decay in autumn, and new ones arise from their roots in the spring. The first grows three or four feet high, and divides into many irregular branches, garnished with ramose leaves, placed alternately; at the wings of these the flower-stalks are produced, which are terminated by round umbels of small four-leaved flowers, of a whitish colour; these are succeeded by round channelled berries, which when ripe, are black. This flowers in July, and the seeds ripen in October.

The second sort rises to near the same height as the former; the leaves of this have two trifoliate large lobes, which are sawed on their edges. The flower-stalks arise between these immediately from the root, being naked, and are terminated by round umbels of flowers, in shape and colour like the first; these are succeeded by berries, which are smaller than those of the other. This flowers toward the end of July, and the seeds ripen late in the autumn. The roots of this sort were formerly brought over and sold for Sarsaparilla, and at this time several of the inhabitants of Canada make use of it as such, but it is very different from the true sort.

Both these sorts are easily propagated by seeds, which are generally produced in plenty. These should be sown in the autumn soon after they are ripe, for those which are sown in the spring, never grow the same year, so that a whole season is gained by the sowing in autumn. When the plants appear, they must be kept clean from weeds during the summer; and in the autumn following, when their leaves decay, the roots may be taken up, and transplanted where they are to remain. They are very hardy plants, so may be planted in any situation; and as they grow naturally in woods, so they may be planted in wilderness quarters, under trees, where, although they have no great beauty, yet they will add to the variety.

These two sorts may also be propagated by parting of their roots; the best time for doing this is in the autumn, soon after their leaves decay. These should be planted pretty far asunder, for their roots spread to a considerable distance, where they are left undisturbed for some years.

The third sort rises with a woody stem to the height of eight or ten feet, dividing into several branches, garnished with branching leaves, which are compounded of many divaricated wings; the lobes of which are oblong, and the ribs of the leaves, as also the branches and stems of the plants, are armed with strong crooked spines, which renders the places very difficult to pass through where they grow in plenty. The flowers of this sort are produced in large loose umbels, at the extremity of the branches, and are of an herbaceous colour, so make no great figure, but the plants are preserved in most of the curious gardens in England. It flowers in August, but the seeds do not ripen in this country.

This is propagated by seeds, which are easily procured from North America; but as they seldom arrive here till toward the spring, so the plants never come up the first year: therefore when the seeds arrive, they should be sown in pots, filled with light earth, and placed in a shady situation, where they may remain until the next autumn, being careful to weed the pots constantly; otherwise if weeds are permitted to grow till they are large, they cannot be taken out, without drawing up the seeds with their roots. In the autumn, the pots should be plunged either into an old bed of tan, or in a warm border under the shelter of a hedge or wall; and if the winter proves severe, it will be proper to cover the pots with straw or Pease-haulm, to prevent the frost from penetrating deep into the ground. In March the pots should be plunged into a moderate hot-bed, which will bring up the plants early, so that they will have more time to get strength before the following winter. When the plants come up, they should be frequently refreshed with water, and constantly kept clean from weeds: in May they should be inured to the open air, and when they are removed out of the bed, they should have a shady situation. These plants should not be disturbed the first season, but as they are often injured by frost when young, so in October the pots should be placed under a frame, where they may be screened from hard frosts, but in mild weather should be constantly opened to enjoy the free air. The leaves of these plants fall away in the autumn, so that some persons have supposed them dead, and have thrown them out of the pots, which every one should be cautioned against. In the spring, before the plants begin to push, they should be carefully shaken out of the pots, and separated; part of them should be planted singly into small pots, and the other may be planted in a bed of light earth in a warm situation. If those which are planted in the small pots are plunged in a moderate hot-bed, it will greatly forward their growth; but they must be early inured to bear the open air, otherwise they will draw up weak. In the following summer they must have a shady situation, and the next winter should be sheltered again; the spring following they may be shaken out of the pots, and planted where they are designed to remain. Those plants which were planted in the bed, will require protection from the frost the first winter; therefore if the surface of the ground is covered with old tanners bark, it will prevent the frost from penetrating to their roots; and if in hard frosts, some straw, Pease-haulm, or any light covering is laid over the bed, it will secure their stems from being injured. The plants in the bed may remain there two years, by which time they will be strong enough to transplant

to the places where they are designed to grow. As these plants do not come out very early in the spring, so they often continue growing pretty late in the autumn, which causes the extreme parts of their shoots to be very tender, whereby they often suffer from the early frosts in autumn, which frequently kill the upper parts of the shoots; but as their woody stems are seldom injured, so they put out new branches below: and if in very severe winters the stems are destroyed, yet the roots will remain, and put out new ones the following summer, therefore they should not be destroyed.

This plant may also be propagated by its roots, for as they spread far in the ground, so if they are laid open, and some of the strongest are separated from the plant and left in the ground, they will put out new stems and make new plants. Or if part of the roots are taken off and planted on a moderate hot-bed, they will push out stems in plenty, so may be increased with ease.

ARBOR, a tree, is defined to be a gemmiparous plant, with a single trunk or stem, abounding with shoots. This is the only definition which conveys an idea whereby to distinguish a tree from a shrub, which is a gemmiparous plant, with many stems or trunks.

ARBOR CAMPHORIFERA. See LAURUS.

ARBOR CORAL. See ERYTHRINA.

ARBOR JUDÆ. See CERCIS.

ARBOREOUS [*Arboreus*, *Lat.* of, or belonging to, or of the nature of, trees.] An epithet which botanists apply to those funguses, or mosses which grow on trees, in distinction from those that grow on the ground; as Agaric, Jews-ear, &c.

ARBOURS [*Arboreta*, of *Arbor*, *Lat.* a tree.] These were formerly in greater esteem with us than at present; few gardens were without covered arbours, and shady seats; but of late they have been much rejected, and that not without good reason; for besides the great expence in their first erecting, they were a continual charge keeping repaired; for the wet soaking through the leaves of the trees to the wood-work, was, by the continual shade, and for the want of free air, detained so long as to rot the wood (which, if wholly exposed to the weather, would have lasted seven or eight) in two or three years; beside, the seats are continually damp, and unhealthy: for which reason, covered seats or alcoves, are every where, at this time, preferred to them.

Arbours are generally made of lattice-work, either in wood or iron, and covered with Elms, Limes, Hornbeam; or with Creepers, as Honeysuckles, Jasmines, or Passion-flowers; either of which will answer the purpose very well, if rightly managed.

ARBUTUS, the Strawberry-tree.

The CHARACTERS are,

*The flower hath a small, obtuse, permanent empalement, which is cut into five parts, upon which the germen sits. The flower is of one leaf, shaped like a pitcher, and divided into five parts at the brim, which turn backward. It hath ten short stamina, which are joined at the bottom to the flower leaf; these are crowned with bifid summits. At the bottom of the flower is situated the globular germen, supporting a cylindrical style, crowned by a thick blunt stigma. After the flower is past, the germen becomes an oval or round berry, having five cells, which are filled with hard seeds.*

This genus of plants is ranged in the tenth class of Linnæus, entitled Decandria Monogynia, from the flowers having ten stamina and one style.

The SPECIES are,

1. ARBUTUS (*Unedo*) foliis glabris serratis, baccis polyspermis, caule erecto arboreo. *Strawberry-tree with smooth sawed leaves, berries having many seeds, and an upright trunk.* Arbutus folio serrato. C. B. P. 460.
2. ARBUTUS (*Andrachne*) foliis glabris integerrimis, baccis polyspermis caule erecto arboreo. *Strawberry-tree with smooth entire leaves, berries full of seeds, and an erect woody stem.* Arbutus folio non serrato. C. B. P. 46. Andrachne Theophrasti. Clus. Hist. 48. *called Andrachne.*
3. ARBUTUS (*Acadiensis*) caulibus procumbentibus foliis ovatis subserratis floribus sparsis baccis polyspermis. Lin. Sp. Plant. 395. *Arbutus with trailing stalks, oval leaves, somewhat indented, flowers growing loosely, and many seeds.* Vitis idæa Acadiensis foliis Alaterni. Tourn. Inst.
4. ARBUTUS (*Alpina*) caulibus procumbentibus foliis rugosis serratis. Flor. Lap. 161. *Arbutus with trailing stalks and rough sawed leaves.* Vitis idæa foliis oblongis albicantibus. C. B. P. 470.
5. ARBUTUS caulibus procumbentibus foliis integerrimis. Flor. Lap. 162. *Arbutus with trailing stalks and entire leaves.*
6. ARBUTUS (*Uva Ursi*) caulibus diffusis, foliis emarginatis. *Arbutus with diffused stalks and indented leaves.* Uva ursi. Clus. Hist. 1. p. 63. *Bear Berry.*

The first sort grows naturally in Italy, Spain, and also in Ireland, and is now very common in the English gardens. Of this sort there are the following varieties, viz. one with an oblong flower and oval fruit; another with a double flower, and a third with red flowers; but these being only seminal varieties, I have not mentioned them as species; though for the sake of the curious, I shall give a farther account of them.

The second sort grows naturally in the east, particularly about Magnesia, where it is so plenty, as to be the principal fuel used by the inhabitants of the country. This grows to a middle sized tree; the branches are irregular, and are garnished with large oval leaves, somewhat like those of the Bay-tree, but not quite so long; these are smooth and entire, having no serratures on their edges; the flowers are shaped like those of the common Arbutus, but grow thinly on the branches. The fruit is oval, and of the same colour and consistence with the common sort, but the seeds of this are flat, whereas those of the common sort are pointed and angular. Tournefort enumerates three other varieties of this tree, which he observed in the Levant, one with sawed leaves, which is now in many English gardens, and passes for the Andrachne: another with a large oblong fruit, and a third with large compressed fruit: but it is doubtful if they are not accidental varieties, which have been produced from seeds of the first.

The common Strawberry-tree is too well known to require any description of it here, being at present in most of the English gardens, and is one of the greatest ornaments to them in the months of October and November, that being the season when the trees are in flower, and the fruit of the former year is ripe, for the fruit is a whole year growing to perfection; so that the fruit which is produced from the flowers of one year, do not ripen till the blossoms of the succeeding year are fully blown; so that when there is plenty of fruit and flowers upon the trees, they make a goodly appearance, and at a season when most other trees are past their beauty.

Those trees which have large oval fruit, make the greatest figure, the flowers of this being larger, and oblong. The sort with double flowers is a curiosity, but as the flowers have only two orders of leaves, so they make no great appearance; nor do the trees produce fruit in any plenty, therefore the other is more preferable. The sort with red flowers makes a pretty variety, when intermixed with the other; for the outside of them are of a fine red colour at their first appearance, and afterward they change to purple before they fall off. The fruit of this is the same with the common sort. All these varieties are preserved, by inarching or grafting them upon the common Arbutus, for the seeds of either do not produce the same kind; though from the seeds of the oval fruit, there is generally many more of the same produced, than from the seeds of the common sort.

The best method to propagate the Arbutus is from seeds; therefore when the fruit is perfectly ripe, it should be gathered and mixed with dry sand, to preserve them till the time for sowing them; the surest method of raising the plants, is to sow the seeds in

pots,

pots, which ſhould be plunged into an old bed of tanners bark, which has loſt its heat, covering the bed with glaſſes, &c. to keep out froſt; this ſhould be done in December, if the ſeeds are good, and as the ſpring advances, the pots are refreſhed with water, the plants will come up the beginning of April, when they ſhould be frequently but ſparingly watered, and conſtantly kept clean from weeds.

As the ſummer advances, if the plants are ſhaded in the heat of the day, it will greatly promote their growth; but in warm weather they muſt be open all night to receive the dew, ſo ſhould only be covered in the middle of the day: with this management, the plants will riſe to the height of five or ſix inches the firſt ſummer. The beginning of October, theſe plants may be ſhaken out of the pots, and their roots carefully ſeparated, planting them ſingly in ſmall pots filled with light earth; then plunge the pots into an old bed of tanners bark, under a common frame, obſerving to ſhade them from the ſun in the middle of the day, and to give them water as they may require: in this bed the pots ſhould remain during the winter, obſerving to expoſe the plants to the open air, at all times when the weather is favourable; but in froſty weather they muſt be covered, otherwiſe they will be in danger if the ſeaſon proves ſevere. The ſpring following the plants may be removed to a very gentle hot-bed, which will require no other covering but mats. This will enable them to make ſtrong ſhoots early in the ſummer, whereby they will be in a better condition to bear the cold of the ſucceeding winter: in this bed the plants may continue moſt part of the ſummer, for if the pots are taken out and ſet upon the ground, the ſmallneſs of their ſize will occaſion the earth in them to dry ſo faſt, that watering will ſcarcely preſerve the plants alive; but if they are kept growing all the ſummer, they will be more than a foot high by the next autumn: but it will be adviſable to ſcreen them from the froſt during their continuance in pots, by plunging them into the ground in a warm place, and covering them with mats in bad weather.

When the plants are grown to be two or three feet high, you may ſhake them out of the pots, and plant them in the open ground in the places where they are to remain; but this ſhould be done in April, that they may have taken good root before the winter, which would be apt to damage them if newly planted; and as all the earth about their roots may be thus preſerved, there will be no fear of ſucceeding at this ſeaſon.

Theſe plants are tolerably hardy, and are ſeldom hurt, except in extreme hard winters, which many times kill the young and tender branches, but rarely deſtroy the roots; therefore, however dead they may appear after a hard winter, yet I would adviſe the letting them remain till the ſucceeding ſummer has ſufficiently demonſtrated what are living and what are dead; for the winters anno 1728-9, and 1739-40, gave us great reaſon to believe moſt of the trees of this kind were deſtroyed; and many people were ſo haſty, as to dig up or cut down, many of their trees; whereas all thoſe people who had patience to let them remain, found that ſcarce one in five hundred failed to come out again the next ſummer, and many of them made handſome plants that ſeaſon.

This tree delights in a moiſt ſoil, for when they are planted in dry ground, they ſeldom produce much fruit: the flowers of this tree being produced in autumn, if the winter proves ſevere, are generally deſtroyed, which has occaſioned their producing very little fruit in England for ſeveral years: therefore, in order to obtain fruit, the trees ſhould be placed in a warm ſituation; and where the ground is not naturally moiſt, there ſhould be a good quantity of loam and rotten neat's dung laid about their roots; and if the ſpring ſhould prove dry, they muſt be plentifully watered, in order to have plenty of fruit.

The very beſt ſeaſon for tranſplanting of the Arbutus is in September, at which time the bloſſoms are beginning to appear; and at that ſeaſon, if it ſhould prove very dry and they are kept moiſt, they will take root very ſoon; but toward the beginning of November, their roots ſhould be well covered with mulch, to keep out the froſt.

The third ſort grows naturally in Acadia, and other northern parts of America, upon ſwampy land, which is frequently overflowed with water; this is a low buſhy ſhrub, with ſlender trailing branches, which are garniſhed with oval leaves, a little ſawed on their edges; the flowers come out from the wings of the leaves, growing in thin looſe bunches. The fruit of this ſort is never produced in England, and it is with great difficulty the plants are kept alive here.

The fourth ſort grows naturally on the Alps, and the Helvetian mountains. This never riſes high, but ſends out from the root many ſlender branches, which trail upon the ground, garniſhed with oblong rough leaves, of a pale green colour; the flowers are produced from the wings of the leaves, upon long ſlender foot-ſtalks, and are ſucceeded by berries about the ſize of the common black Cherry, which are firſt green, afterward red, and when ripe they are black. Theſe are of a pleaſant taſte, ſo are frequently eaten by the inhabitants of thoſe countries where they grow naturally. This is alſo a very difficult plant to keep alive in gardens, for it is an inhabitant of bogs, growing among moſs, where the ground is never dry.

The fifth ſort grows naturally upon the mountains in Spain, and in moſt of the northern parts of Europe. The branches of this trail on the ground, which are cloſely garniſhed with ſmooth thick leaves of an oval form, placed alternately; the flowers are produced in ſmall bunches toward the extremity of the branches, which are ſhaped like thoſe of the common ſort, but are ſmaller; and are ſucceeded by berries, of the ſame ſize with thoſe of the former ſort, which are red when ripe.

There are few of theſe plants in the Engliſh gardens, for as they are inhabitants of very cold countries, where they are covered with ſnow all the winter, and growing upon bogs among moſs, ſo when they are brought into a garden, they ſeldom continue long, nor do they thrive with the utmoſt care; for in places where artificial bogs have been contrived to receive theſe plants, they have been preſerved two or three years, and then have periſhed; ſo that unleſs the place where they are planted is naturally boggy, there is little hopes of their ſucceeding long.

The ſixth ſort grows naturally upon Mount Cenis in Italy, and upon ſome mountains in Spain; this hath woody ſtalks which riſe two or three feet high, dividing into many diffuſed branches, cloſely garniſhed with roundiſh fleſhy leaves, which are indented at the top; the flowers are produced in a racemus toward the end of the branches, which are ſhaped like thoſe of the Strawberry-tree, of an herbaceous colour, ſtriped with purple. The plants of this kind are very rare in England, nor is this ſort much known among botaniſts, moſt of whom have ſuppoſed the fifth to be the ſort mentioned by Cluſius, in which they are greatly miſtaken.

The Adrachne is at preſent very rare in England; this may be propagated in the ſame manner as hath been directed for the common Arbutus, but as there are no plants in this country which produce fruit at preſent, the ſeeds muſt be procured from the Levant, where they may be had in plenty. As the leaves of this tree are larger than thoſe of the common Arbutus, the trees make a finer appearance, therefore deſerve our care to cultivate them, eſpecially as they will bear the open air when the plants are become woody; for while they are young, they are impatient of much froſt, therefore ſhould be preſerved in pots three or four years, till they have obtained ſtrength, and may then be planted in a warm ſituation and on a dry ſoil, for this ſort will not thrive in wet ground.

ARCTIUM. Lin. Gen. 830. Lappa. Tourn. Inſt. R. H. Burdock.

The Characters are,

*The empalement of the flower is scaly, each scale ending in a long thorn which is reflexed at the point. The flower is composed of many florets, which are tubulous, uniform, and of one leaf. The tube is long and slender, cut into five narrow segments at the top: these have each five short slender stamina, which are crowned by cylindrical summits. The germen is situated at the bottom of the tube, having a hairy tip, supporting a long slender style, crowned by a bifid reflexed stigma; the germen afterward becomes a single, pyramidal, angular seed, crowned with down.*

This genus of plants is ranged in the first section of Linnæus's seventeenth class, entitled Syngenesia Polygamia Æqualis, there being an equal number of female and hermaphrodite flowers included in one common empalement.

The Species are,

1. Arctium (*Lappa*) foliis cordatis inermibus petiolatis capitulis majoribus sparsis. *Burdock with heart-shaped leaves without prickles, having foot-stalks, and large heads growing scatteringly.*
2. Arctium (*Personata*) foliis cordatis inermibus, capitulis minoribus compactis. *Burdock with heart-shaped leaves without spines, and small heads growing close together.*
3. Arctium (*Tomentosis*) foliis cordatis inermibus, capitulis tomento-reticulatis. *Burdock with heart-shaped leaves without spines, and woolly netted leaves.*

The two first sorts are common weeds, growing on the sides of roads and foot-paths in most parts of England, and are not admitted into gardens. The first is ordered for medicinal use by the college of physicians, therefore I have inserted it here: the second is by many supposed to be only a variety of the first, but I have for several years sown the seeds of both sorts in the Chelsea garden, where they have constantly retained their difference, so may be allowed to be distinct species. The first is titled by Caspar Bauhin, Lappa major, sive Arctium Dioscorides. Pin. 192. *Greater Burdock*, or *Arctium of Dioscorides.* The second is titled by Vaillant, Lappa vulgaris capitulo minore. Act. Par. 1718. *Common Burdock with a small head.*

The third sort is not a native of England, but grows naturally on the Apennine mountains. The leaves of this are like those of the common sort, but are whiter on their under side; the heads are more compact, and the florets are of a bright red colour; but the greatest difference is in their empalements, which in this sort are beautifully netted with a fine down all over. This is also supposed to be only a variety of the common sort, but I have cultivated it above forty years, during which time it has never varied, so that it is certainly a distinct species. This is by Caspar Bauhin titled, Lappa major montana capitulis tomentosis. Pin. 198. *Greater Mountain Burdock with woolly heads.*

As these plants are seldom admitted into gardens, it is needless to say any thing of their culture; but where they are troublesome weeds, it may not be amiss to mention, that their roots last but two years, so may be destroyed with less trouble than such as have perennial roots; for if they are cut up before they seed, in two or three years they may be entirely rooted out; for the plants which come up from seed, do not flower till the second year, and when the seeds are perfected their roots decay.

ARCTOTIS. This hath been usually known under the title of Anemonospermos, from the resemblance the seeds of these plants have to that of the Anemone.

The Characters are,

*The common empalement is roundish and scaly, those on the lower part are loose and awl-shaped, the middle oval, and those on the top concave. The flower is composed of many female florets which are ranged on the border; these have one side stretched out like a tongue, which are called the rays, having an oval four-cornered germen situated in their center, crowned with down, supporting a slender style, crowned by two oval stigma; the germen afterward becomes a single roundish seed, covered with a soft down. The middle or disk of the flower is composed of hermaphrodite florets, which are funnel-shaped, and divided at the top into five parts, which are reflexed; these have five stamina, crowned by short summits; in the center is placed a small germen, supporting a cylindrical style with a single stigma. These flowers are abortive.*

This genus of plants is ranged in the fourth section of Linnæus's seventeenth class, entitled Syngenesia Polygamia Necessaria, the flowers of this section being composed of female and hermaphrodite florets; in some species the florets in the disk are fertile, and in others they are sterile.

The Species are,

1. Arctotis (*Tristis*) flosculis radiantibus vicenis tripartitis. Lin. Sp. 1306. *Arctotis with the rays of the flower composed of florets cut into three segments.* Anemonospermos Afra, foliis & facie taraxaci incanis. Breyn. Prod. t. 15.
2. Arctotis (*Angustifolia*) flosculis radiantibus fertilibus, foliis lanceolatis integris dentatis, Lin. Sp. 1306. *Arctotis whose florets in the rays are fertile, and spear-shaped, entire, indented leaves.* Anemonospermos Afra, folio serrato rigido flore intus sulphureo extus puniceo. Boerh. Ind. Alt. 1. p. 1. 100.
3. Arctotis (*Aspera*) flosculis radiantibus fertilibus, foliis pinnato-sinuatis villosis laciniis oblongis dentatis. Lin. Sp. 1307. *Arctotis whose rays of the flower are fertile and woolly, with sinuated, oblong, indented leaves.* Anemonospermos Afra, folio Jacobææ tenuiter laciniato flore aurantio pulcherrimo. Boerh. Ind. Alt. 1. p. 100.
4. Arctotis (*Calendula*) flosculis radiantibus sterilibus duodenis subintegris, foliis lyratis nigro denticulatis. Lin. Sp. 1306. *Arctotis whose rays of the flower are sterile and intire, and the leaves are lyre-shaped and indented.* Anemonospermos Africana Jacobææ maritimæ foliis flore sulphureo. Com. Rar. 36.
5. Arctotis (*Plantaginea*) flosculis radiantibus fertilibus, foliis lanceolato-ovatis nervosis decurrentibus amplexicaulibus. Lin. Sp. 1306. *Arctotis whose rays of the flower are fertile, and oval, spear-shaped, nervous, running leaves embracing the stalks.* Anemonospermos Afra, folio plantaginis, florum radiis intus aureis extus puniceis. Boerh. Ind. 1. p. 100.
6. Arctotis (*Acaulis*) pedunculis radicalibus, foliis lyratis. Lin. Sp. 1306. *Arctotis whose foot-stalks arise from the root, and the leaves are lyre-shaped.* Anemospermos Africana, folio plantiginis flore sulphureo. Com. Rar. 35.
7. Arctotis foliis pinnato-laciniatis crispis caule ramoso fruticoso. *Arctotis with winged, jagged, curled leaves, and a branching shrubby stalk.* Anemonospermos Africana foliis Cardui benedicti florum radiis intus albicantibus. Hort. Amst. 2. 45.
8. Arctotis (*Paleacea*) flosculis radiantibus sterilibus, paleis flosculos disci æquantibus, foliis pinnatis linearibus. Amœn. Acad. 6: Afr. 84. *Arctotis whose rays of the flower are barren, the scales of the flowers in the disk equal, and linear winged leaves.* After foliis integris angustis, flore magno luteo. Burm. Afr. 176.

These plants are natives of the country about the Cape of Good Hope, from whence they have been brought to some curious gardens.

The first sort here mentioned is an annual plant, which may be sown upon a warm border of light earth in the open air, in the middle of April, where they are designed to remain; these flower in August, and if the season proves favourable, they will perfect seeds very well, and the plants will grow much stronger than those raised upon a hot-bed; but, as in cold seasons these may fail to perfect their seeds, it will be a secure method to raise some upon the hot-bed, which never fails to perfect seeds, provided they are not treated too tenderly.

The second, third, fourth, and seventh sorts, grow to the height of four or five feet, sending forth many branches; therefore will require to be frequently pruned, to keep them in tolerable order, especially the seventh, which sends forth strong rambling shoots, when their roots are not much confined in the pots, but more so when they are duly watered.

These

These are seldom destitute of flowers the whole year, unless the winter is severe, which renders them more valuable than those which flower at one season only; for all those plants which flower in the winter-season, make a fine variety in the green-house; and when the plants are set abroad in summer, their flowers being at that season produced in greater plenty, they add to the beauty of a garden.

The shrubby sorts are propagated by planting cuttings in a bed of light fresh earth, in any of the summer months, observing to shade them from the heat of the sun until they have taken root, as also to refresh them often with water; and in six weeks after planting, they will be rooted sufficiently, at which time they should be transplanted into pots filled with fresh earth, setting the pots in a shady place until the plants are new rooted; after which time they should be placed in the open air until the latter end of October, or later, according as the weather is favourable, when they must be removed into the green-house, where they should be placed as near the window as possible, that they may have a good quantity of free air at all times, when the weather is mild; nor should they be over-hung by other plants, which would occasion them to take a mouldiness, and rot; they must also be frequently refreshed with water, giving it them plentifully in mild weather, otherwise their leaves and branches will hang and wither; in summer they can scarce have too much water given them. They will also require to be shifted into other pots two or three times at least every summer, and the pots should be frequently removed, to prevent the plants from striking their roots through the holes of the pots into the ground, which they are very apt to do, then they will shoot very vigorously; but when these roots are torn off, by removing the pots, the plants are often killed.

All these plants should be frequently renewed by cuttings, because the old plants are subject to decay in winter; therefore if young plants are not annually raised, the species may soon be lost.

If the green-house in which these plants are placed in winter is subject to damps, it will be very difficult to preserve some of the sorts; for when the windows are kept close, the tender parts of their shoots are very subject to a mouldiness, which will soon cause the plants to decay, if it is not constantly cleaned off, and free air admitted to dry off the damps.

ARCUATION [from *arcuo*, *Lat.* to bend or bow like an arch;] the method of raising trees by layers. The first thing that is to be done, is, to procure strong mother plants, which are usually called stools. It is no matter whether the trees be crooked, or othertherwise deformed. They are to be planted in a border six feet wide, and in a strait line six feet asunder. The border must be well trenched, or dug, and cleared from all roots, clods, stones, or any other obstructions. These trunks or stools being planted in this trench, will throw out a great many shoots according to their strength, which may be laid about the Michaelmas following: in order to this, the ground round each stool should be carefully dug, breaking the clods and picking out the stones as before. Then the shoots should be bent down in arches, and put into the ground about three inches deep; and to keep them in this situation, each should have a forked stick drove into the ground over the part of the shoot immersed, turning the extremity of each shoot upward.

When the branches are thus laid round the stool, and pegged fast down, the branches, or shoots, will be covered all over, except the very top. Some persons give the branches a twist, in order to make them take root the sooner. Others slit such of the shoots as are not apt to take root without, in the same manner as is practised in laying of Carnations, which is generally a sure way; and if they are afterward mulched, it will be of use to keep out the frost in winter, and also to keep the ground moist the following spring and summer.

About the end of September following they may be opened and examined, to see if they have taken root or not, which it is very probable they will have done; but if not, they must be let alone, to lie till the next autumn, when they are to be taken up, and planted in the nursery.

This may be done to the Dutch, Witch, and English Elms; the Abele, Lime, Alder, Platanus, and many sorts of evergreen trees and flowering shrubs.

AREA is the internal capacity or content of any given boundary or limits, of what figure or shape soever it be.

ARGEMONE [so called from Ἄργεμα, a disease in the eye, which this plant is said to cure; it is also called the Infernal Fig, because the capsule pretty much resembles a Fig, and from its asperity,] Prickly Poppy.

The CHARACTERS are,

*The flower hath a three-leaved empalement, which falls off; it hath five roundish petals, which spread open, and are larger than the empalement; in the center is situated an oval five-cornered germen, crowned by a large obtuse stigma, which is permanent, divided into five parts, attended by a great number of stamina, crowned by oblong erect summits; the germen afterward becomes an oval seed-vessel, having five angles, and as many cells, which are filled with small rough seeds.*

This genus of plants is ranged in Linnæus's thirteenth class, entitled Polyandria Monogynia, the flowers having many stamina and one germen.

We have but one SPECIES of this genus, viz.

ARGEMONE (*Mexicana*) capsulis quinque valvibus, foliis spinosis. Lin. Sp. 727. *Argemone whose capsule hath five valves, and the leaves are prickly; or Pickly Poppy.* Papaver spinosum. C. B. P. 171.

This is an annual plant, which is very common in most parts of the West-Indies, and is, by the Spaniards, called Fico del Inferno, or the Devil's Fig; there is no great beauty or use in this plant that I know of, but whoever hath a mind to cultivate it, should sow it on a bed of light earth, in the spring, where it is to remain; and if it comes up too thick, the plants must be thinned to four inches distance, where, when once it has shed its seed, there will not want a supply of plants for several years after. I have been informed that gumbouge is made from the juice of this plant, but how true I cannot take upon me to determine.

ARGIL [*Argilla*, *Lat.* a sort of white earth like chalk, but more brittle,] Potters Clay.

ARIA THEOPHRASTI. See CRATÆGUS.

ARISARUM. See ARUM.

ARISTA, of corn, is that sharp-pointed needle that stands out from the husk or hose of the grain, called the beard or awn of corn.

ARISTOLOCHIA, [Ἀριστολοχία from ἄριστος, best, and λοχεία, Child Birth, because supposed to be of foreign use on that occasion.] Birthwort.

The CHARACTERS are,

*The flower hath no empalement; it is of one leaf, which is unequal; the base is swelling and globular, afterward is extended into a cylindrical tube, which spreads at the brim, where the lower part is stretched out like a tongue. It hath no stamina, but there are six summits which join the under part of the stigma: the oblong angular germen sits under the flower, supporting a concave globular stigma, divided into six parts; the germen afterward turns to a large seed-vessel, differing in form, which opens in six cells, which are filled with seeds, for the most part compressed.*

This genus of plants is ranged in the fifth section of Linnæus's twentieth class, entitled Gynandria Hexandria, the flowers being male and female in the same species, having no stamina or pointal, and six summits, which rest on the receptacle.

The SPECIES are,

1. ARISTOLOCHIA (*Rotunda*) foliis cordatis, subsessilibus obtusis, caule infirmo, floribus solitariis. Lin. Sp. Plant. 962. *Birthwort with blunt heart-shaped leaves growing close, a weak stalk, and flowers growing singly.*

*ſingly.* Ariſtolochia rotunda flore ex purpurâ nigro. C. B. P. 307.

2. Aristolochia (*Longa*) foliis cordatis petiolatis integerrimis obtuſiuſculis, caule infirmo floribus ſolitariis. Lin. Sp. Plant. 962. *Birthwort with entire, heart-ſhaped, blunt leaves, having foot-ſtalks, a weak ſtalk, and flowers growing ſingly.* Ariſtolochia longa vera. C. B. P. 307.

3. Aristolochia (*Clematitis*) foliis cordatis caule erecto floribus axillaribus confertis. Hort. Upſal. 279. *Birthwort with heart-ſhaped leaves, an upright ſtalk, and flowers growing in cluſters from the ſide.* Ariſtolochia clematitis recta. C. B. P. 307.

4. Aristolochia (*Piſtolochia*) foliis cordatis, crenulatis petiolatis, floribus ſolitariis. Lin. Sp. Plant. 962. *Birthwort with heart-ſhaped indented leaves, having foot-ſtalks, and flowers growing ſingly.* Ariſtolochia piſtolochia dicta. C. B. P. 307.

5. Aristolochia (*Sempervirens*) foliis cordato-oblongis undatis, caule infirmo, floribus ſolitariis. Lin. Sp. Plant. 961. *Birthwort with oblong, heart-ſhaped, waved leaves, a weak ſtalk, and flowers growing ſingly.* Ariſtolochia piſtolochia dicta Cretica foliis ſmilacis ſempervirens. H. L.

6. Aristolochia (*Serpentaria*) foliis cordato-oblongis planis, caulibus infirmis flexuoſis, teretibus floribus ſolitariis. Lin. Sp. Plant. 961. *Birthwort with plain, oblong, heart-ſhaped, flexible, weak ſtalks, and flowers growing ſingly.* Ariſtolochia piſtolochia ſive ſerpentaria Virginiana. Pluk. Alm. 50. *Virginia Snakeroot.*

7. Aristolochia (*Arboreſcens*) foliis cordato-lanceolatis caule erecto fruticoſo. Lin. Sp. Plant. 960. *Birthwort with ſpear-ſhaped leaves in form of a heart, and an upright ſhrubby ſtalk.* Ariſtolochia polyrrhizos auriculatis foliis Virginiana. Pluk. Alm. 50.

8. Aristolochia (*Indica*) foliis cordato-oblongis caule volubili pedunculis multifloris. Flor. Zeyl. 323. *Birthwort with oblong heart-ſhaped leaves, a twining ſtalk, and many flowers upon each foot-ſtalk.* Ariſtolochia ſcandens odoratiſſima floris labello purpureo ſemine cordato. Sloan. Cat. Jam. 60. *Contrayerva of Jamaica.*

9. Aristolochia (*Hirta*) foliis cordatis obtuſiuſculis hirtis floribus ſolitariis pendulis recurvatis ſubtruncatis. Lin. Sp. 1365. *Hairy Birthwort with obtuſe heart-ſhaped leaves, and hanging recurved flowers growing ſingly, formed like a lip.* Ariſtolochia longa ſubhirſuta folio oblongo flore maximo. Tourn. Cor. 8.

10. Aristolochia (*Scandens*) foliis cordatis petiolis longiſſimis, caule ſcandente, floribus terminalibus pedunculis longiſſimis. *Birthwort with a climbing ſtalk, heart-ſhaped leaves with very long foot-ſtalks, and flowers growing at the end of the branches upon very long foot-ſtalks.*

11. Aristolochia (*Conferta*) foliis cordatis petiolatis, caule ſcandente, floribus axillaribus confertis. *Birthwort with heart-ſhaped leaves, a climbing ſtalk, and flowers growing in cluſters from the wings of the ſtalk.*

12. Aristolochia (*Repens*) foliis lanceolatis ſeſſilibus ſubhirſutis, caule erecto floribus ſolitariis longiſſimis. *Birthwort with ſpear-ſhaped hairy leaves growing cloſe to the branches, an upright ſtalk, and very long flowers growing ſingly.* Ariſtolochia erecta flore atro purpureo foliis anguſtis radice repente. Houſt. MSS.

13. Aristolochia (*Maxima*) foliis oblongo-ovatis obtuſis integerrimis, caule ſcandente floribus terminalibus, fructibus hexangularibus maximis. *Birthwort with a climbing ſtalk, oblong, oval, entire, blunt leaves, flowers growing at the ends of the branches, and very large fruit with ſix angles.*

The firſt and ſecond ſorts grow naturally in the ſouth of France, in Spain, and Italy, from whence their roots are brought for medicinal uſe. The roots of the firſt ſort are roundiſh, and grow to the ſize of ſmall Turneps, in ſhape and colour like the roots of the common Cyclamen; the roots of which are frequently ſold in the markets for thoſe of the round Birthwort, which at firſt may have been occaſioned by the ſuppoſed virtues of the roots of the Cyclamen. This ſends out three or four weak trailing branches, which lie on the ground where they are not ſupported, and extend to the length of two feet; the leaves are heart-ſhaped, and rounded at their extremity; theſe are placed alternately on the ſtalks, and cloſe to the foot-ſtalks of the leaves, the flowers come out ſingly, at every leaf, toward the upper part of the ſtalk. They are of a purpliſh black colour, and ſhaped like thoſe of the other ſorts, and are frequently ſucceeded by ſeed-veſſels, having ſix cells, which are full of flat ſeeds. The flowers appear in June and July, and the ſeeds ripen in autumn.

The ſecond ſort hath long tap roots, ſhaped like thoſe of Carrots; theſe ſend out weak trailing branches, which extend little more than a foot; the leaves of this ſort are paler, and have longer foot-ſtalks than the firſt, placed alternately, and the flowers come out from the wings of the leaves like the other, which are not ſo long, and are of a pale purple colour: they are ſometimes ſucceeded by oblong ſeed-veſſels, having ſix cells filled with compreſſed ſeeds. The ſtalks of both theſe ſorts decay in the autumn, and new ones are produced in the ſpring.

They are both propagated by ſeeds, which ſhould be ſown in the autumn, in pots filled with light earth, and placed under a frame, to be ſcreened from the froſt; but the glaſſes ſhould be taken off at all times when the weather is mild. If theſe pots are put into a gentle hot-bed in March, it will bring up the plants much ſooner than they otherwiſe would riſe. As the ſeaſon advances, the plants ſhould be inured by degrees to bear the open air: when the pots are taken out of the bed, they muſt be placed where they may enjoy the morning ſun, but ſcreened from it in the heat of the day. Gentle refreſhings of water muſt be in dry weather given to the plants during the ſummer, but in the autumn, when their ſtalks begin to decay, they muſt have little wet. In the winter the pots muſt be ſheltered as before; and in March, before the roots begin to ſhoot, they ſhould be tranſplanted into ſeparate ſmall pots filled with light earth, and ſet under the frame, where they ſhould remain till ſpring; then they may be removed into the open air, and treated in the ſame manner as in the former ſummer, and ſheltered alſo the following winter. The next ſpring they may be turned out of the pots, and planted in a warm border, where, during the ſummer, they will require no other care but to keep them clean from weeds; and in the autumn when their ſtalks are decayed, if the border is covered with old tanners bark to keep out the froſt, the roots will be ſecured; but where this care is not taken, the roots are frequently killed by froſt. With this management the roots will thrive much better than thoſe which are kept in pots, and continue longer; and when they are three years old, they will flower and produce plenty of ſeeds, whereas thoſe in pots ſeldom perfect their ſeeds in England.

When the ſeeds of theſe plants are ſown in the ſpring, the plants will not appear till the ſpring following; ſo that a whole ſeaſon is loſt, and many times they fail, therefore it ſhould always be ſown in the autumn.

The third ſort grows naturally in France, Spain, Italy, and Hungary, but is preſerved in ſome of the Engliſh gardens, becauſe it is ſometimes uſed in medicine. This is a terrible plant for creeping at the root; ſo that if once it has taken in a garden, it will be difficult to extirpate again, and will over-run whatever plants grow near it; therefore it ſhould be planted in ſome abject part of the garden by itſelf, for it will thrive in almoſt any ſoil or ſituation.

The fourth ſort grows wild in Spain, Italy, and the ſouth of France; but in England it is preſerved, for variety, in botanic gardens. The plants of this ſort muſt be planted in pots filled with light rich earth, and ſheltered from ſevere cold in winter, otherwiſe they will not live; but they ſhould have as much free air as poſſible in mild weather. This produces flowers every year, but never perfects its ſeeds in this country.



The

The fifth sort grows naturally in Crete. The root of this is perennial, and sends out many trailing branches, which extend one foot and a half in length, garnished with oblong heart-shaped leaves, which are waved on their edges, and are evergreen. The flowers come out singly from the wings of the leaves, which are of a dark purple colour, in shape like the others, but the plants never produce seeds in England, so is propagated by parting of the roots: this is too tender to thrive in the open air in winter; the plants are preserved in pots, and placed under a common frame in winter, where they should have as much free air as possible in mild weather, but screened from hard frost; in mild winters I have had this plant live abroad in a warm border, but in hard winters it will be destroyed; therefore one or two plants should be sheltered to preserve the species.

The sixth sort is the Snakeroot, which is greatly used in medicine: these roots are brought from Virginia and Carolina, where there are two species of this plant, but this sort is the best for use. There are some of these preserved in the gardens of those who are curious in collecting rare plants, but as they are sometimes killed by frost in winter, so they are not very common in the English gardens. This is propagated by seeds, which should be sown in the autumn, in small pots filled with light sandy earth, and placed under a common frame in winter, and afterward treated in the same manner as hath been directed for the two first sorts, as should the plants also; with which management they will produce their flowers, and perfect their seeds every year.

The seventh sort grows naturally in North America, and is by some called Snakeroot, but is not near so strong as the former; the branches of this grow erect, and are perennial, whereas those of the other sort decay to the root every winter: this rises about two feet high; the branches are not very woody, but are strong enough to support themselves; the leaves are oblong and heart-shaped; the flowers come out singly at the wings of the leaves. This will live abroad in warm borders, with a little protection in hard frosts. It is generally kept in pots, and sheltered in winter; but those which are planted in the full ground will thrive much better, provided they are screened from hard frosts.

The eighth sort grows naturally in Jamaica, where it is called Contrayerva; the roots are there used as such: this hath long trailing branches, which climb upon the neighbouring plants, and rise to a considerable height; the leaves are placed alternately, and are of the long heart-shaped kind; the flowers are produced in small clusters toward the upper part of the stalks, which are of a dark purple colour; the seed-vessels are oblong and smooth. This is tender, and in winter should have very little wet, therefore must be constantly kept in the stove, otherwise it will not live in England.

The ninth sort was discovered by Dr. Tournefort in the Levant. This hath some resemblance to the second sort, but the leaves are hairy, and not so deeply eared at the bottom; the flowers are also much larger. This may be propagated by seeds, in the same manner as hath been directed for the first and second sorts, and the plants treated so, will thrive very well in England.

The tenth sort sends out climbing stalks, which support themselves by fastening to the neighbouring trees, and thereby rise to a very great height; the leaves are very broad and heart-shaped, having several longitudinal veins; the flowers grow in loose bunches at the extremity of the branches, each having a long foot-stalk: this is tender, so must be kept in a stove, and treated as other exotic plants. It grows naturally about Tolu in New Spain, where it was discovered by the late Mr. Robert Millar, who sent the seeds to England.

The eleventh sort was discovered by the same gentleman at Campeachy in New Spain, from whence he sent the seeds: this sort seldom climbs above three or four feet high; the leaves are short and heart-shaped, in some measure like those of the first; the flowers come out in small clusters from the wings of the leaves, and are of a dark purple colour.

The twelfth sort was discovered at La Vera Cruz in New Spain, by the late Dr. Houston, who sent the seeds to Europe: this rises with an upright stalk, to the height of three feet; the leaves are long, narrow, hairy, and grow close to the branches, having scarce any foot-stalk; the flowers come out singly from the wings of the leaves, which are near four inches long, of a dark purple colour, and grow erect; these are succeeded by slender vessels, about one inch long, which open into six cells, filled with flat heart-shaped seeds. This sort requires a warm stove to preserve it in this country.

The thirteenth sort was discovered by Mr. Robert Millar, near Carthagena in New Spain, who sent it to England; this hath strong climbing stalks, by which it mounts up to the top of the tallest trees; the leaves of this are four inches long and two broad, of an oval shape, rounded at their ends, and are nearly as thick as those of the common Laurel; the flowers come out in loose clusters at the ends of the shoots, each standing on a very long foot-stalk; the seed-vessels are four inches long, and as much in circumference, having six longitudinal ribs, which make so many angles, being very prominent; they open into six cells, which are filled with heart-shaped leaves.

All these sorts, which are natives of the warm parts of America, are too tender to thrive in the open air in this country, therefore require a stove to preserve them. They are propagated by seeds, which must be procured from the countries where the grow naturally, for they do not produce any here. As the seeds are a considerable time in their passage, they should be brought over in their pods; for many of the sorts have very thin light seeds, which are soon dried in a hot country, when they are out of their covers, which will prevent their growing. So soon as the seeds arrive, they should be sown in small pots filled with light earth; and if this happens in the autumn, or winter, the pots should be plunged into the tan in the bark-stove, between some of the pots with large plants, which will screen them from the sun; for as these plants delight in shade, so, by thus placing of the pots, the earth will not dry very fast, which will be of great advantage to the seeds, which should not be too often watered. Here the pots may remain till March, at which time they should be removed, and plunged into a hot-bed, under frames, where, if the seeds are good, the plants will appear in May: but if the seeds arrive in spring or summer, they must be immediately sown in small pots, and plunged into a moderate hot-bed, observing to shade them constantly in the heat of the day; but the seeds sown at this season seldom grow the same year; therefore if the plants do not appear, the pots should be plunged in the tan-bed of the stove in autumn, and in the spring following, treated as before directed, which will bring up the plants. When these are strong enough to transplant, they should be each put into a separate small pot, and plunged into the tan-bed in the stove, and treated as other tender plants from the same countries.

ARMENIACA, the Apricot.

The Characters are,

*The empalement of the flower is bell-shaped, cut into five blunt segments at the top; the flower is composed of five large roundish petals which spread open, whose base are inserted in the empalement; in the center is placed a round germen, supporting a slender style, crowned by a round stigma; this is attended by upward of twenty awl-shaped stamina, which are crowned by short double summits. The germen afterward becomes a roundish pulpy fruit, having a longitudinal furrow inclosing a roundish nut, which is a little compressed on the sides.*

Dr. Linnæus has joined the Armeniaca, Cerasus, Laurocerasus, and Padus, to his genus of Prunus, making them only so many species of the same genus, and

ranges it in his twelfth claſs of plants, entitled Icoſandria Monogynia; the flowers of this claſs have from twenty to thirty ſtamina faſtened to the empalement, and a ſingle ſtyle.

The joining of ſo many plants under the ſame genus, as Linnæus has done, renders it much more difficult to aſcertain their ſpecific difference, than when they are ranged under different genera; and although moſt of them do agree in thoſe parts from whence the characters according to his ſyſtem are taken, yet if their fruits may be allowed as one of the characteriſtic notes (which ſurely ought not to be totally omitted) there will be reaſon for ſeparating ſome of them, eſpecially when we conſider the boundary which nature has ſet between them; for it is well known that all fruits which are of the ſame genus, may be grafted or budded upon each other; but thoſe of different genera will not take upon each other, nor will any two plants of different genera impregnate each other. Now the Cherry and Plum cannot by any art be made to take when grafted or budded upon ſtocks of the other kind; nor will the Apricot take upon the Cherry, the Laurel, or Padus; but it will grow upon the Plum to which it is nearly allied, therefore theſe may be joined together according to the ſtrict rules of botany: yet in a work of this kind, deſigned for the inſtruction of the practical gardener, were theſe fruits to be included under the ſame appellation, it would rather confound than inſtruct, thoſe who had not applied themſelves to the ſtudy of botany: therefore I ſhall continue this genus under its former title, and ſhall enumerate all the varieties of this fruit which are at preſent cultivated in the Engliſh gardens, ranging them according to the orders of their ripening. For although moſt, if not all thoſe which are by the gardeners called different ſorts, may have been produced by culture, ſo ſhould be deemed as one ſpecies; yet as the differences may be continued for ever, by the method in which they are propagated, ſo it would be unpardonable in a book of gardening to omit them.

The ſpecific title given by Linnæus to the Apricot is, Prunus floribus ſubſeſſilibus foliis ſubcordatis. Sp. Plant. 474. i. e. *Plum whoſe flowers want foot-ſtalks, and heart-ſhaped leaves.*

The Varieties are,

1. The Maſculine Apricot.
2. The Orange Apricot.
3. The Algier Apricot.
4. The Roman Apricot.
5. The Turkey Apricot.
6. The Breda Apricot.
7. The Bruſſels Apricot.

The Maſculine is the firſt ripe of all the Apricots; it is a ſmall roundiſh fruit, of a red colour towards the ſun; as it ripens, the colour fades to a greeniſh yellow on the other ſide. It is chiefly preſerved for being the firſt ripe, and there is a quickneſs in the flavour of the fruit when it is not too ripe, which renders it agreeable; the tree is very apt to be covered with flowers, but as they come out early in the ſpring, they are frequently deſtroyed by the cold, unleſs the trees are covered to protect them.

The Orange is the next ripe Apricot; this fruit is much larger than the former, and as it ripens changes to a deep yellow colour. The fleſh of this is dry and not high flavoured, it is better for tarts than for the table.

The Algier is the next in ſeaſon; this is of an oval ſhape, a little compreſſed on the ſides; it turns to a pale yellow, or ſtraw-colour, when ripe; the fleſh is high flavoured, and very full of juice.

The Roman is the next ripe Apricot; this is a larger fruit than the former, and not compreſſed ſo much on the ſides; the colour is deeper, and the fleſh is not ſo moiſt as the former.

The Turkey Apricot is yet larger than either of the former, and of a globular figure; the fruit turns to a deeper colour than the former; the fleſh is firmer, and drier than thoſe of the two former.

The Breda Apricot (as it is called from its being brought from thence into England) was originally brought from Africa: this is a large roundiſh fruit, changing to a deep yellow when ripe; the fleſh is ſoft, full of juice, and of a deep Orange colour within ſide; the ſtone is rounder and larger than any of the other ſorts: this is the beſt Apricot we have, and when ripened on a ſtandard, is preferable to all other kinds.

The Bruſſels is the lateſt ripe of all the Apricots, for when it is planted againſt a wall, it is generally the beginning of Auguſt before it is ripe, unleſs when it is planted to a full ſouth aſpect; which is what ſhould not be practiſed, becauſe the fruit is never well taſted which grows in a warm expoſure. This fruit is of a middling ſize, rather inclining to an oval figure; red on the ſide next the ſun, with many dark ſpots, and of a greeniſh yellow on the other ſide; the fleſh is firm, and of a high flavour; the fruit often cracks before it is ripe. This is commonly preferred to the former ſort by moſt people, but when the other is planted as a ſtandard, the fruit is fuller of juice, and of a richer flavour than this.

Moſt people train theſe trees up to ſtems of ſix or ſeven feet high, or bud them upon ſtocks of that height; but this is a practice I would not recommend to the public, becauſe the higher the heads of theſe trees are, the more they are expoſed to the cutting winds in the ſpring, which too frequently deſtroy the bloſſoms; and the fruit is alſo more liable to be blown down in ſummer, eſpecially if there ſhould happen to be much wind at the time when the fruit is ripe; which by falling from a great height, will be bruiſed and ſpoiled; therefore I prefer half ſtandards, of about two and a half, or three feet in the ſtem, to thoſe which are much taller; or to plant them as dwarfs againſt an eſpalier, where, if they are ſkilfully managed, they will produce a large quantity of good fruit; and the trees in eſpalier may be more conveniently covered in the ſpring, when the ſeaſon proves bad, whereby there will be a greater certainty of fruit every year.

Theſe fruits are all propagated by budding them on Plum-ſtocks, and will readily take upon almoſt any ſort of Plum, provided the ſtock be free and thriving (except the Bruſſels kind, which is uſually budded on a ſort of ſtock, commonly called the St. Julian, which better ſuits this tree, as being generally planted for ſtandards, than any other ſort of Plum will.) The manner of raiſing the ſtocks, and budding theſe trees, ſhall be treated of under their particular articles, to which I refer the reader, and ſhall proceed to their planting and management.

Theſe trees are all (except the two laſt ſorts) planted againſt walls, and ſhould have an eaſt or weſt aſpect; for if they are planted full ſouth, the great heat cauſes them to be meally before they are eatable.

The borders near theſe walls ſhould be ſix or eight feet wide, at leaſt, and if it were more, the better; but I would never adviſe the making of them ſo deep as is the general cuſtom, for if the earth be two feet deep, or two and a half at moſt, it is enough.

If the ground is a wet cold loam or clay, the borders ſhould be raiſed as much above the level of the ſurface as it will admit, laying ſome ſtones or rubbiſh in the bottom, to prevent the roots from running downwards; but if you plant upon a chalk or gravel, it will be better to raiſe the borders above either to a proper thickneſs, with good loamy earth, than to ſink the borders by removing the chalk or gravel; for although theſe are removed the whole breadth of the border, which we may allow to be eight feet, and this trench filled with good earth, yet the roots of the trees will in a few years extend this length, and then meeting with the chalk or gravel, they will receive a check whereby their leaves will fall off early in the ſeaſon, and the fruit will be ſmall, dry, and ill-flavoured, and the ſhoots of the trees will be weak. But where the borders are raiſed upon either to their full height, the roots will not ſtrike down

into the gravel or chalk, but rather extend themſelves near the ſurface, where they will meet with better ſoil: and as the trees are of long duration, and old trees being not only more fruitful than young, but the fruit is alſo better flavoured, therefore the providing for their continuance is abſolutely neceſſary.

The ſoil I would in general adviſe to be uſed for theſe, and all other ſorts of fruit-trees, is freſh untried earth, from a paſture ground, taken about ten inches deep, with the turf, and laid to rot and mellow at leaſt twelve months before it is uſed, mixing a little rotten dung with it; this muſt be often turned, to ſweeten and imbibe the nitrous particles of the air.

When the former ſoil of the border is taken away, this freſh earth ſhould be carried in the place; and if the borders are filled with it two months before the trees are planted, the ground will be better ſettled, and not ſo liable to ſink after the trees are planted: in filling of the borders, the ground ſhould be raiſed four or five inches above the level they are deſigned, to allow for the ſettling.

The borders being thus prepared, make choice of ſuch trees as are but of one year's growth from budding; and if the ſoil is dry, or of a middling temper, October is the beſt ſeaſon for planting, eſpecially having at that time a greater choice of trees from the nurſeries, before they have been picked and drawn over by other people. The manner of preparing theſe trees for planting being the ſame in common with other fruit trees, I ſhall refer the reader to the article of Peaches, where he will find it largely treated of.

At the time of planting no part of the head of the trees ſhould be cut off, unleſs there are any ſtrong foreright ſhoots which will not come to the wall, which may be taken quite away.

The trees being thus prepared, you muſt mark out the diſtances they are to ſtand, which in a good ſtrong ſoil, or againſt a low wall, ſhould be twenty feet or more; but in a moderate one, eighteen feet is a good reaſonable diſtance; then make a hole where each tree is to ſtand, and place its ſtem about four inches from the wall, inclining the head thereto; and after having fixed the tree in the ground, nail the branches to the wall, to prevent their ſhaking, and cover the ſurface of the ground round the root with rotten dung, to keep out the froſt: in this ſtate let it remain till the end of February or the beginning of March, when if the weather is good, you muſt unnail the branches of your trees, ſo as not to diſturb their roots; and, being provided with a ſharp knife, put your foot cloſe to the ſtem of the tree; and having placed your left-hand to the bottom of the tree, to prevent its being diſturbed, with your right-hand cut off the head of the tree, if it has but one ſtem; or where it may have two or more ſhoots, each of them muſt be ſhortened, to about four or five eyes above the bud, ſo that the ſloping ſide may be toward the wall.

In the ſpring, if the weather proves dry, it will be neceſſary to give the trees a gentle refreſhing with water; in the doing of which, if they watered with a roſe to the watering-pot all over their heads, it will greatly help them; and alſo lay ſome turf, in the manner directed for Apples, or ſome other mulch, round their roots, to prevent their drying during the ſummer ſeaſon; and in the ſpring, as new branches are produced, obſerve to nail them to the wall in a horizontal poſition; and ſuch ſhoots as are produced fore-right, muſt be entirely diſplaced. This muſt be repeated as often as is neceſſary, to prevent their hanging from the wall, but by no means ſtop any of the ſhoots in ſummer.

At Michaelmas, when the trees have done growing, their branches ſhould be unnailed, and ſhorten them in proportion to their ſtrength; a vigorous branch may be left eight or nine inches long, but a weak one ſhould not be left above five or ſix. I ſuppoſe many perſons will wonder at this direction, eſpecially having allowed ſuch a diſtance between the trees, as believing, by this management, the wall will never be filled; but my reaſon for it is, that I would have no part of the wall left unfurniſhed with bearing wood; which muſt conſequently be the caſe, if the branches are left to a greater length at firſt; for it ſeldom happens, that more buds than two or three upon each branch ſhoot; and theſe are, for the moſt part, ſuch as are at or near the extreme part of the laſt year's wood; ſo that all the lower part of the ſhoots become naked, nor will they ever after produce ſhoots; and this is the reaſon, we ſee ſo many trees which have their bearing wood ſituated only in the extreme part of the tree.

When you have ſhortened the ſhoots, be ſure to nail them as horizontally as poſſible, for upon this it is that the future good of the tree chiefly depends.

The ſecond ſummer obſerve, as in the firſt, to diſplace all fore-right ſhoots as they are produced, nailing in the other cloſe to the wall horizontally, ſo that the middle of the tree may be kept open; and never ſhorten any of the ſhoots in ſummer, unleſs to furniſh branches to fill vacant places on the wall; and never do this later than the end of April, for reaſons hereafter given in the article of Peaches. At Michaelmas ſhorten theſe ſhoots, as was directed for the firſt year; the ſtrong ones may be left nine or ten inches, and the weak ones ſix or ſeven at moſt.

The following year's management will be nearly the ſame with this, but only obſerve, that Apricots produce their bloſſom buds, not only upon the laſt year's wood, but alſo upon the curſons, or ſpurs, which are produced from the two years wood; a great care ſhould therefore be had in the ſummer management, not to hurt or diſplace theſe: obſerve alſo to ſhorten the branches at the winter pruning, ſo as to furniſh freſh wood in every part of the tree; and be ſure to cut out entirely all luxuriant branches, or diſplace them as ſoon as they are produced; which, if left to grow, would exhauſt the nouriſhment from the bearing branches, which in my opinion, cannot be too ſtrong, provided they are kindly; for the more vigorous the tree is, the more likely it is to reſiſt the injuries of the weather; though we often ſee trees brought to ſo weak a condition, as to be able only faintly to blow their bloſſoms, and then moſt of the bearing branches have died; which has given occaſion to the owner to imagine it was the effect of a blight, when, in reality, it was only for want of right management. And, I am fully perſuaded, half the blights we hear complained of, proceed from nothing elſe but this.

Theſe few rules, well executed, together with a little obſervation and care, will be ſufficient, therefore to pretend to preſcribe particular directions for all the different accidents, or manner of treating fruits, would be impoſſible; but I believe the reader will find what has been ſaid, if duly attended to, will anſwer his deſign; for, without diligent obſervation, there can be no ſuch thing as a ſkilful manager, let him have ever ſo many or good inſtructions laid down to him.

The Bruſſels and Breda Apricots, being, for the moſt part, planted for ſtandards, will require very little pruning or management; only obſerve to take out all dead wood, or ſuch branches as croſs each other; this muſt be done early in autumn, or in the ſpring, after the cold weather is paſt, that the part may not canker where the inciſion is made.

ARMERIUS, Sweet-William. See Dianthus.

ARNICA. Lin. Gen. Plant. 784. Doronicum. Bauh. Pin. 184. Leopardſbane.

The Characters are,

*The common empalement is ſcaly, and ſhorter than the rays of the flower. It hath a compound flower, the border or rays being compoſed of many female florets, which ſpread open, cut into three parts at their end; the diſk, or middle, has many hermaphrodite florets, which are tubulous, cut into three unequal ſegments at the brim; theſe have each five ſhort ſtamina, crowned with oblong ſummits. The female florets have alſo five awl-ſhaped ſtamina, but no ſummits; in the hermaphrodite florets the germen is ſituated below the flower, ſupporting a ſlender ſhort ſtyle, crowned by a bifid ſtigma. The germen afterward becomes a ſingle oblong ſeed, crowned with long ſlender down.*

This

This genus of plants is ranged in the second section of Linnæus's eighteenth class, entitled Syngenesia Polygamia superflua, the flower being composed of hermaphrodite and female florets; and the chief distinction of this genus is in the hermaphrodite and female flowers being of the same shape, and the female having stamina.

The SPECIES are,

1. ARNICA (*Montana*) foliis ovatis integris, caulinis geminis oppositis. Lin. Sp. Plant. 884. *Arnica with entire oval leaves, those on the stalks growing opposite by pairs.* Doronicum plantaginis folio alterum. C. B. P. 185.
2. ARNICA (*Scorpioides*) foliis alternis serratis. Hall. Helvet. 737. *Arnica with sawed leaves growing alternately.* Doronicum radice dulci. C. B. P. 184.
3. ARNICA (*Crocea*) foliis ovalibus serrato denticulatis, subtus tomentosis. Lin. Sp. Plant. 1246. *Arnica with oval indented leaves, whose undersides are woolly.* Dens leonis enulæ folio. Pet. Mus. 393.

The first sort grows naturally upon the Alps, and also upon many of the mountains in Germany, and other cold parts of Europe, and is greatly esteemed by the Germans for its medicinal qualities, where it is prescribed by this title of Arnica. It is also ranged among the medicinal plants in many dispensaries, by the title given to it by Caspar Bauhin.

The roots of this plant, when placed in a proper soil and situation, greatly increase, for they send out thick fleshy roots, which spread very far under the surface; these put out many oval entire leaves, from between which the flower-stems arise, which grow about a foot and a half high, having two or three pair of leaves growing opposite upon each, and the top is terminated by a single yellow flower, composed of many florets, like those of Dandelion. These are succeeded by oblong seeds, which are crowned with down, whereby they are dispersed to a considerable distance when ripe. It flowers in April and May, and the seeds ripen in September.

This plant delights in a moist shady situation; it may be propagated by parting of the root in autumn, when the stalks begin to decay, or by the seeds if sown in autumn, soon after they are ripe, for those sown in the spring often fail; but if the seeds are permitted to scatter, the plants will come up the following spring, so that when one plant is obtained, it will propagate itself fast enough without other care, but to keep it clean from weeds.

The second sort grows naturally on the mountains of Bohemia, as also in Siberia, from whence I received the seeds. The roots of this sort are much jointed, and divide into many irregular fleshy offsets, which are variously contorted; from whence many superstitious persons have been led to imagine, that the roots would expel the poison of scorpions, and cure the wounds made by the bite of that animal. It is a very hardy plant, and is propagated in the same manner as the former.

The third sort grows naturally at the Cape of Good Hope, from whence the seeds have been brought to Europe. This will not live through the winter in the open air in this country, so the plants must be kept in pots, which should be placed under a common hot-bed frame in winter, to screen it from the frost, but should enjoy the free air at all times, when the weather is mild. It propagates by roots and seeds in plenty. This is titled by Dr. Burman, Gerbera foliis planis dentatis flore purpureo. Plant. Afr. 157.

ARTEDIA. Lin. Gen. Plant. 249. We have no English name for this genus.

The CHARACTERS are,

*It is an umbelliferous plant; the greater umbel is spread open, and composed of many small ones; the involucrum of the large one is composed of ten oblong leaves, which extend the length of the umbel, cut at their tips into three parts. The involucrum of the small umbels have but three narrow leaves, which are longer than the umbel; the rays of the large umbel are difform, those of the small ones in the disk are male, and the rays are hermaphrodite. They have five petals, which are erect, heart-shaped, and turned inward. These have each five slender stamina, crowned with roundish summits; those flowers which compose the rays, have a small germen at bottom, supporting two reflexed styles, crowned by a single stigma. The germen afterward becomes a roundish compressed fruit, with a leafy border, which splits into two, and contains two oblong seeds, with scaly borders.*

This genus of plants is ranged in the second section of Linnæus's fifth class, entitled Pentandria Digynia, from their flowers having five stamina and two styles.

We have but one SPECIES of this plant, viz.

1. ARTEDIA (*Squamata*) seminibus squamatis. Hort. Cliff. 89. *Artedia with squamous seeds.* Thapsia Orientalis anethi folio semine eleganter crenato. Tourn. Cor. 22.

This is a native of the east. Rawvolf found it growing upon Mount Libanus; it is an annual plant, whose stalks rise about two feet high, sending out a few side branches, garnished with narrow compound leaves resembling those of Dill; the extremity of the stalk is terminated by a large umbel of white flowers, composed of five unequal petals, those on the outside being much larger than the other. These are succeeded by roundish compressed fruit, each having two seeds, whose borders are scaly.

This plant decays as soon as the seeds are perfected, and many times before they are ripe in England; for unless the seeds are sown in autumn, and the plants come up before winter, they rarely produce good seeds here. The seeds should be sown on a warm border where the plants are to remain, for they will not bear transplanting. All the care they require is to keep them clean from weeds, and thin the plants to six or eight inches distance. They flower in June, and their seeds ripen the end of August.

ARTEMISIA [Ἀρτεμισία, *Gr.* so called, according to some, from Artemisia, wife of Mausolus, king of Caria, who brought this plant into use, and adopted it as hers; whereas, before, it was called Parthenis, the virgin goddess being feigned to have given that name to it.] Mugwort.

The CHARACTERS are,

*The common empalement is scaly and round, as are also the scales. The flower is composed of hermaphrodite and female florets, the border being ranged with the female, which have a small germen at bottom, supporting a slender style, crowned by a bifid stigma. The hermaphrodite florets compose the disk, or middle; these are tubulous, cut into five parts at the brim; in the center is placed the germen, with the like style and stigma as the female, accompanied by five hairy stamina, crowned by cylindrical summits, which are indented in five parts. The germen afterward becomes a single naked seed, sitting upon a naked placenta.*

This genus of plants is ranged in the second section of Linnæus's eighteenth class, entitled Syngenesia Polygamia superflua, the flowers of these being composed of female and hermaphrodite florets, which are both fruitful.

The SPECIES are,

1. ARTEMISIA (*Vulgaris*) foliis pinnatifidis planis incisis; subtus tomentosis, racemis simplicibus floribus ovatis radio quinque floro. Lin. Sp. Plant. 348. *Mugwort with plain cut leaves, ending in many parts, woolly underneath, with single spikes of oval flowers, whose rays are composed of five florets.* Artemisia vulgaris major. C. B. P. 137.
2. ARTEMISIA (*Integrifolia*) foliis lanceolatis subtus tomentosis integerrimis dentatisque florum radio sub quinque floro. Lin. Sp. Plant. 1189. *Mugwort with spear-shaped entire leaves, indented on their edges, whose under sides are woolly, and the rays of the flower composed of five florets.* Artemisia foliis planis lanceolato-linearibus inferioribus sæpe ex pinnato-dentatis. Flor. Sib. 2. p. 109.
3. ARTEMISIA (*Cærulescens*) foliis caulinis lanceolatis integris; radicalibus multifidis, flosculis fœmineis ternis. Lin. Sp. 1189. *Mugwort whose leaves on the stalks are entire,*

*entire, those at the root multifid, and three female floscules compose the rays of the flower.* Absinthium maritimum lavendulæ folio. C. B. P. 139. *Lavender-leaved Sea Wormwood.*

4. Artemisia (*Dracunculus*) foliis lanceolatis glabris integerrimis. Hort. Cliff. 403. *Mugwort with spear-shaped, entire, smooth leaves.* Abrotanum lini folio acriore & odorato. Tourn. Inst. 459. Tarragon.

5. Artemisia (*Minima*) foliis cuneiformibus repandis, caule procumbente, floribus axillaribus sessilibus. Lin. Sp. 1190. *Mugwort with wedge-shaped leaves, a trailing stalk, and flowers growing at the wings of the stalk.*

6. Artemisia (*Abrotanum*) foliis ramosissimis setaceis, caule erecto suffruticoso. Hort. Cliff. 403. *Artemisia with very branching bristly leaves and a shrubby erect stalk.* Abrotanum mas angustifolium majus. C. B. P. 136. *Southernwood.*

7. Artemisia (*Humilis*) foliis setaceis pinnatifidis, caule decumbente suffruticoso. *Mugwort with bristly wing-pointed leaves, and a low shrubby stalk.* Abrotanum humile corymbis majoribus aureis. Tourn. Inst. 459.

8. Artemisia (*Santonicum*) foliis caulinis linearibus pinnato-multifidis, ramis indivisis, spicis secundis reflexis. Zin. Goett. 397. *Artemisia with linear multifid leaves on the stalks, undivided branches, and fertile reflexed spikes.* Semen sanctum. Lob. Icon. 756.

9. Artemisia (*Campestris*) foliis multifidis linearibus, caulibus procumbentibus virgatis. Hort. Cliff. 403. *Artemisia with linear multifid leaves, and trailing spriggy stalks.* Abrotanum campestre. C. B. P. 136. *Wild Southernwood.*

10. Artemisia (*Crithmifolia*) foliis compositis divaricatis linearibus carnosis glabris, caule ascendente paniculato. Lin. Sp. 1186. *Artemisia with compound, linear, smooth, fleshy leaves, and a panicled ascending stalk.*

11. Artemisia (*Maritima*) foliis multipartitis tomentosis, racemis cernuis, flosculis fœmineis ternis. Lin. Sp. 1186. *Mugwort with woolly divided leaves, nodding branches, and three female florets.* Absinthium seriphium Belgicum. C. B. P. 139. See Wormwood.

12. Artemisia (*Rupestris*) foliis pinnatis, caulibus adscendentibus hirsutis, floribus globosis cernuis, receptaculo papposo. Her. Gotl. 285. *Mugwort with winged leaves, hairy ascending stalks, and globular nodding flowers.* Absinthium Alpinum incanum. C. B. P. 139.

13. Artemisia (*Pontica*) foliis multipartitis subtus tomentosis, floribus subrotundis nutantibus, receptaculo nudo. Hort. Upsal. 257. *Artemisia with finely divided leaves, woolly on their under side, and roundish nodding flowers.* Absinthium Ponticum tenuifolium incanum. C. B. P. 138. *Pontick Wormwood.*

14. Artemisia (*Annua*) foliis triplicato-pinnatis utrinque glabris, floribus subglobosis nutantibus, receptaculo glabro conico. Hort. Upsal. 257. *Artemisia with triple winged leaves, which are smooth on both sides, globular nodding flowers, having smooth conical receptacles.* Absinthium tanacetifolio odoratissimum. Amm. Ruth.

15. Artemisia (*Absinthium*) foliis compositis multifidis, floribus subglobosis pendulis, receptaculo villoso. Hort. Cliff. 404. *Artemisia with compound multifid leaves, globular hanging flowers, and hairy receptacles.* Absinthium vulgare. J. B. *Common Wormwood.*

16. Artemisia (*Inodora*) foliis compositis tomentosis, floribus subglobosis, receptaculo villoso. *Artemisia with woolly compound leaves, globular flowers, and hairy receptacles.* Absinthium insipidum Absinthio vulgari simile. C. B. P. *Insipid Wormwood.*

17. Artemisia (*Arborescens*) foliis compositis multifidis linearibus, floribus subglobosis, caule frutescente. Lin. Sp. 1188. *Artemisia with compound linear leaves, globular flowers, and a shrubby stalk.* Absinthium arborescens. Lob. Icon. 753. *Tree Wormwood.*

18. Artemisia (*Æthiopica*) foliis linearibus confertis minimis divisis, caule fruticoso tomentoso. Lin. Sp. 1184. *Mugwort with linear leaves in bunches, and a woolly shrubby stalk.* Absinthium Africanum arborescens, folio vermiculato incano. Tourn. Inst. 458.

19. Artemisia (*Glacialis*) foliis palmatis multifidis sericeis, caulibus adscendentibus, floribus glomeratis sub fastigiatis. Lin. Sp. 1187. *Mugwort with silky multifid leaves, ascending stalks, and glomerated flowers.* Absinthium Alpinum candidum humile. C. B. P. 139.

20. Artemisia (*Tanacetifolia*) foliis bipinnatis subtus tomentosis nitidis, pinnis transversis, racemis simplicibus. Lin. Sp. 1188. *Artemisia with double-winged leaves, woolly on their under side, and a simple racemis of flowers.*

The first sort grows naturally on banks, and by the side of foot-paths, in most parts of England, so is rarely admitted into gardens, where it would soon become a troublesome weed; for the roots creep far under the surface of the ground, so that unless they are stopped, they will soon spread over a large space of ground; but as this plant is used in medicine, I have here mentioned it. This flowers in June, at which time the herb is in perfection for use.

The Moxa, so famous in the eastern countries for curing the gout by burning of the part affected, is the lanugo, or down, which is on the under part of the leaves, of a sort of Mugwort, which is supposed to be different from our common sort, but the dried samples which I have seen brought to England for that, appear to differ in nothing but the size of the plant, that being much less; and I suppose the soft down of the common sort, or of any other plant, will answer the purpose full as well.

The second sort grows naturally in Siberia; this rises up with single stalks about two feet high, which are garnished with plain, narrow, spear-shaped leaves, cut into acute segments on their edges, somewhat like those of Buckshorn Plantain; the flowers come out from the wings of the leaves in small loose spikes, and near the top they are often single; these are larger than those of the common sort, and are of a pale yellow colour.

This sort is as hardy as the common, and multiplies as fast, so is only preserved in botanic gardens for the sake of variety.

The third sort grows naturally near the sea, in Italy, Spain, and France, but is hardy enough to live in the open air in England, provided it is planted in a dry soil: it grows too feet high, having many ligneous branches, which are terminated by spikes of flowers, which have little beauty, therefore the plants are preserved in gardens for the sake of variety.

The fourth sort is the common Tarragon, which is frequently used in sallads, especially by the French: this is a very hardy plant, which propagates greatly by its creeping roots, or may be multiplied fast by planting the young shoots the beginning of May, in the same manner as is practised for Mint, and if they are duly supplied with water in dry weather, will soon spread and meet.

The fifth sort grows naturally in China, but is hardy enough to thrive in the open air here. It is an annual plant, which seldom comes up the first year, if the seeds are sown in the spring; therefore it is much better to let the seeds scatter in the autumn, because these will more surely grow, than those sown by hand.

The sixth sort is the common Southernwood, which is kept in gardens for the agreeable scent of its leaves; it is a low under shrub, seldom rising more than three or four feet high, sending out lateral shrubby branches growing erect, garnished with five bristly leaves, having an agreeable scent when bruised: the flowers are produced in spikes from the extremity of the branches, but unless the autumn proves warm and dry, the flowers rarely open in England.

This is propagated by slips and cuttings, planted in a shady border, about the beginning of April, observing to water them duly in dry weather; in this border they may remain till the following autumn, when they should be transplanted, either into pots or those parts of the garden where they are designed to remain.

The seventh sort is a very low under shrub, the branches bend near the ground, so never rise more

than two feet high, unless when they flower; for the ſpikes are generally more than a foot long; the flowers are yellow, and are ranged in ſpikes which appear in autumn. This is propagated either by ſlips or cuttings in the ſame manner as the former, and is equally hardy.

The eighth ſort produces the Semen Santonicum, which is much uſed for worms in children. It grows naturally in Perſia, from whence the ſeeds are brought to Europe; this hath the appearance of our Wild Mugwort; the branches are ſlender, erect, and garniſhed with linear winged leaves, and terminated by recurved ſlender ſpikes of flowers, which have naked receptacles. This may be propagated by ſlips or cuttings in the like manner as the former; but the plants ſhould be planted in a dry ſoil and ſheltered ſituation, where they will endure the cold of our ordinary winters pretty well, but it will be proper to have a plant or two in pots, which may be ſheltered in winter under a common hot-bed frame to preſerve the ſpecies.

The ninth ſort is our common Wild Southernwood, which grows naturally in ſome parts of Norfolk, ſo is rarely admitted into gardens.

The tenth ſort grows naturally in Portugal; this is a low under ſhrub, ſeldom riſing more than two feet high, and has much of the aſpect of our wild ſort, ſo is rarely kept in gardens in this country.

The eleventh ſort is the common Sea Wormwood, grows naturally on the ſea coaſts in moſt parts of England, where there are ſeveral varieties (if not diſtinct ſpecies) to be found. Theſe are low under ſhrubs, moſt of them creep at their root, whereby they multiply greatly in their natural ſituation, but when tranſplanted into a garden, ſeldom thrive ſo well; however, theſe varieties are now commonly ſubſtituted for the true Roman Wormwood in the London ſhops.

The twelfth ſort grows naturally on the Alps; this is alſo a low under ſhrub, ſeldom riſing more than a foot high, ſending out ſeveral ſlender branches, garniſhed with very white winged leaves, for which the plants are ſometimes admitted into gardens. It is very hardy, and may be eaſily propagated by cuttings in the ſpring.

The thirteenth ſort is the true Roman Wormwood, though at this time never uſed in any of the ſhops; yet by ſkilful perſons is greatly preferred to the Sea Wormwood, being leſs nauſeous and a much pleaſanter bitter, and may be had in as great plenty, provided it was cultivated by thoſe who ſupply the markets with medicinal herbs. This is a low herbaceous plant, whoſe ſtalks die to the root in autumn, and new ones ariſe in the ſpring; theſe are garniſhed with finely divided leaves, whoſe underſide are woolly; the upper part of the ſtalks are furniſhed with globular flowers which nod on one ſide, having naked receptacles. Theſe appear in Auguſt, but are rarely ſucceeded by ſeeds in England.

This ſort is eaſily propagated by its creeping roots, which may be parted in the autumn, and planted two or three feet aſunder, that they may have room to ſpread; the beſt time for this is in the middle of October; it will grow in any ſoil which is not too wet.

The fourteenth ſort grows naturally in Siberia; it is an annual plant which grows two feet high, garniſhed with ſmooth winged leaves, which have an agreeable ſcent; the flowers are globular and nod on one ſide. If the ſeeds of this are permitted to ſcatter in the autumn, the plants will come up better than if ſown with care.

The fifteenth ſort is the common Wormwood which grows naturally in lanes and uncultivated places in many parts of England, ſo is not often cultivated in gardens. This is eaſily propagated by ſeeds, which ſhould be ſown in the autumn ſoon after they are ripe; or if they are permitted to ſcatter, the plants will come up without farther care.

The ſixteenth ſort has been ſuppoſed to be a variety of the common Wormwood: indeed the appearance of the plants are nearly alike, but the ſegments of the leaves of this are broader and whiter than thoſe of the common, and the whole plant is inſipid, and continues ſo from ſeed.

The ſeventeenth ſort is commonly known by the title of Tree Wormword; this grows naturally near the ſea in Italy and the Levant. This riſes with a woody ſtalk ſix or ſeven feet high, ſending out many ligneous branches, garniſhed with leaves ſomewhat like thoſe of the common Wormwood, but more finely divided, and much whiter. The branches are terminated by ſpikes of globular flowers in the autumn, which are ſeldom ſucceeded by ſeeds here. This plant is eaſily propagated by cuttings, which, if planted in a ſhady border during the ſummer ſeaſon, and duly watered, take root freely. In autumn ſome of the young plants ſhould be potted, that they may be ſheltered in winter; the other may be planted in a warm border, where they will live, provided the winter proves favourable.

The eighteenth ſort is a low ſhrubby plant; the ſtalk is woolly, ſending out a few ſhrubby branches, garniſhed with linear leaves growing in cluſters; the flowers grow in a roundiſh bunch, and are ſhaped like thoſe of Wormwood. This grows naturally in Æthiopia. It is propagated by planting the cuttings any time in ſummer, and the plants muſt be ſheltered from hard froſts in winter.

The nineteenth ſort grows naturally on the Alps; this is a low plant, ſeldom riſing more than a foot and a half high; the ſtalks are cloſely garniſhed with very white leaves ſhaped like a hand; the flowers are globular, and produced in cluſters at the extremity of the ſtalk; theſe are rarely ſucceeded by ſeeds in England. This plant may be propagated by planting the ſide ſhoots in a ſhady border during any of the ſummer months, which, if duly watered, will put out roots, and in autumn they may be tranſplanted where they are to remain.

The twentieth ſort grows naturally at Piedmont; it is an herbaceous plant, whoſe ſtalks die to the root in winter, and freſh ſhoots ariſe in the ſpring, which are garniſhed with winged leaves, woolly on their under ſide; the flowers are produced on ſingle ſpikes, which are rarely ſucceeded by ſeeds in England. It may be eaſily propagated by parting the roots in the autumn.

ARTICHOKE is called by the Latins Cinara.

As this plant is much better known by its Engliſh title than the Latin, I ſhall treat of it under this head, and refer for its character to the Latin title of Cinara, under which the other ſpecies will be exhibited.

We have two ſorts of Artichokes which are cultivated in the Engliſh gardens, which we ſhall diſtinguiſh here only by the names they are generally known among the gardeners, and reſerve their farther diſtinctions to their Latin titles.

The beſt ſort is what the gardeners call the Globe Artichoke. This hath large heads with broad brown ſcales, which turn inward; the fleſhy part at the bottom of the ſcales is very thick, therefore is much preferred to the other, which is called the French Artichoke. The ſtalks of this ſort generally grow taller, and the heads are ſmaller, and more conical than thoſe of the other ſort. The ſcales are narrower, of a greener colour, and turn outward. The fleſhy part which is eaten is not near ſo thick, and hath a diſagreeable perfumed taſte; this was almoſt totally rooted out of the Engliſh gardens before the hard froſt in $17\frac{39}{40}$, when the greateſt part of the roots of the other ſort were deſtroyed, ſo many perſons were ſupplied the following ſpring with plants from Guernſey, where they cultivate only the latter ſort; but ſince the other has been increaſed again, this green ſort has been in moſt gardens rooted out, to make way for the Globe Artichoke.

The manner of propagating this plant is from ſlips, taken from the old roots, in February or March, which, if planted in a good ſoil, will produce large


fair

 ART

fair fruit the autumn following; but as this is a plant which few gardeners, that have not been inſtructed in the kitchen-gardens near London, underſtand to manage well, I ſhall be the more particular in my directions about it.

At the latter end of February, or in March, according to the earlineſs of the ſeaſon, or forwardneſs of the old Artichoke roots, will be the proper time for dreſſing them, which muſt be thus performed: with your ſpade remove all the earth from about your ſtock, down below the part from whence the young ſhoots are produced, clearing the earth from between the ſhoots with the hands, ſo as to be able to judge of the goodneſs of each, with their proper poſition upon the ſtock; then make choice of two of the cleareſt, ſtraiteſt, and moſt promiſing plants that are produced from the under part of the ſtock, which are much preferable to the ſtrong thick plants which generally grow upon the crown of the roots; for theſe have hard woody ſtems, ſo never produce good fruit, but are generally what the market people call rogues, which have very little bottom; the ſcales of their heads are irregularly placed; in ſlipping off the plants you muſt be careful not to injure thoſe which are to remain for a crop; then with your thumb force off all the other plants and buds alſo cloſe to the head of the ſtock, from whence they are produced, being very careful not to leave any of the buds, which will ſoon produce plants ſo as to hurt thoſe which are left: then with your ſpade draw the earth about the two plants which are left, and with your hands cloſe it faſt to each of them, ſeparating them as far aſunder as they can conveniently be placed without breaking them, obſerving to crop off the tops of the leaves which hang down with your hands; your ground being levelled between the ſtocks, you may ſow thereon a ſmall crop of Spinach, which will be taken off before the Artichokes will cover the ground, and be ſure to keep them clear from weeds; and toward the latter end of April, or the beginning of May, when your old plants begin to ſhew their fruit, you muſt carefully look over your ſtocks, and draw up all young plants from them, which may have been produced ſince their dreſſing, and cut off all ſuckers which are produced from the ſtems of the Artichoke, leaving only the principal head, by which means your fruit will be the larger; when your Artichokes are fit to gather, you muſt break or cut them down cloſe to the ſurface of the ground, that your ſtocks may make ſtrong freſh ſhoots before the end of October: the ſeaſon for earthing, or, as the gardeners term it, landing them up, is the middle or latter end of November, which is thus done:

Cut off all the young ſhoots quite cloſe to the ſurface of the ground; then dig between every ſtock, raiſing all the earth between each row of ſtocks into a ridge, as is done in the common method of trenching ground, ſo as that the row of Artichokes may be exactly in the middle of each ridge, this will be ſufficient to guard them againſt froſt; and I would here recommend it to the public, as infinitely preferable to long dung, which is by the unſkilful often uſed, and is the occaſion of their fruit being ſmall, and almoſt without any bottoms to them; for there is not any thing ſo hurtful to theſe, as new dung being either buried near, or laid about them.

Since we have experienced, that, in very ſevere froſts theſe roots are ſometimes deſtroyed, therefore it is proper to give ſome directions to prevent it; though this rarely happens in dry ground, in which we have but few inſtances of their being killed, except in the hard froſts of 1683, and $17\frac{39}{40}$. In theſe two winters moſt of the Artichokes were deſtroyed in England; in the laſt of theſe winters, it happened from the little care which was taken of them, there having been no froſt for ſo many years before, which had injured them, that few people uſed any care to preſerve them; but ſince that hard froſt, many people have run into the other extreme of covering all their roots of Artichokes with long dung every winter, which is a very bad method, becauſe the dung lying near the roots, is very apt to rot the beſt plants; therefore I would adviſe the earthing (or as it is called by the gardeners, landing) the Artichokes to be deferred till the latter end of November, or the beginning of December, provided the ſeaſon continues mild; and towards Chriſtmas, if there is any danger of ſevere froſts, to lay a quantity of long dung, Peaſe-haulm, tanners bark, or any other light covering over the ridges of earth, which will keep out the froſt; and this being at a diſtance from the roots, will not injure them; but this covering ſhould be carefully taken off the beginning of February, or ſooner, provided the ſeaſon is mild, or at leaſt ſo ſoon as the weather is ſo, otherwiſe the plants will be injured by its lying too long upon them.

It will alſo be a good method, whenever any roots of Artichokes are dug up in autumn, either to bury them deep in the ground in a pit till ſpring, or lay them in a heap, ſo as that they may be eaſily covered in hard froſts; and theſe may be a ſupply, if thoſe in the ground are deſtroyed.

When you have thus earthed them up, you have nothing more to do till February or March, by which time they will have grown through the ridge of the earth; and, when the weather is proper, muſt be dreſſed as was before directed.

When you have a mind to make a new plantation, after having digged and buried ſome very rotten dung in the ground you have allotted for that purpoſe, make choice of ſuch of your plants as were taken from your old ſtocks, which are clear, ſound, and not woody, having ſome fibres to their bottom; then with your knife cut off that knobbed woody part, which joined them to the ſtock; and if that cuts criſp and tender, it is a ſign of its goodneſs, but if tough and ſtringy, throw it away as good for nothing; then cut off the large outſide leaves pretty low, that the middle or heart leaves, may be above them. Your plants being thus prepared (if the weather is very dry, or the plants have been any time taken from the ſtocks, it will be convenient to ſet them upright in a tub of water for three or four hours before they are planted, which will greatly refreſh them;) you muſt then proceed to planting, which muſt be done by ranging a line acroſs the ground, in order to their being placed exactly in a row; and, with a meaſure ſtick, plant them at two feet diſtance from each other in the rows, and if deſigned for a full crop, five feet diſtance row from row; your plants muſt be ſet about four inches deep, and the earth cloſed very faſt to their roots, obſerving, if the ſeaſon proves dry, to keep them watered two or three times a week, until they are growing, after which they ſeldom require any.

N. B. You may ſow a thin crop of Spinach upon the ground before you plant your plants, obſerving to clear it from about them after it is come up.

Theſe plants, in a kindly ſeaſon, or a moiſt ſoil, will produce the largeſt and beſt Artichokes ſome time in Auguſt and September, after all thoſe from the old ſtocks are paſt; ſo that if you intend to continue your Artichokes through the whole ſeaſon, you muſt make a new plantation every year, otherwiſe you cannot poſſibly have fruit longer than two or three months.

If any of the plants which are planted in the ſpring ſhould not fruit in autumn, you may, at the ſeaſon of earthing up your roots, tie up the leaves with a ſmall Willow twig, &c. and lay the earth up cloſe to it, ſo that the top of the plant may be above ground; and when the froſt comes on, if you will cover the top with a little ſtraw, or Peaſe-haulm, to prevent their being killed by froſt, theſe plants will produce fruit in winter, or early in the ſpring.

But in thoſe plantations where you intend to plant other things between your Artichokes, you muſt allow nine or ten feet between the rows, as is often practiſed by the kitchen-gardeners near London, who ſow the ground between with Radiſhes or Spinach,

and

and plant two rows of Cauliflowers, at four feet diſtance row from row, and two feet and a half aſunder in the rows, ſo that there are always five feet allowed for the Artichokes to grow; and in May, when the Radiſhes or Spinach are taken off, they ſow a row of Cucumbers for pickling, exactly between the two rows of Cauliflowers, at three feet diſtance from each other; and between the rows of Cauliflowers and the Artichokes, plant a row of Cabbages or Savoys for winter uſe, which, when the Cauliflowers are drawn off, and the Artichokes gathered, will have full liberty to grow, and by this means the ground is fully employed through the whole ſeaſon. This has long been the practice of the kitchen-gardeners near London, who pay large rents for their land, ſo are obliged to get as many crops in a year from it as poſſible.

In thoſe which are planted at five feet diſtance row from row, you may plant in every other row a line of Cabbages or Savoys for winter uſe, which will be gone by the time of landing them up; in doing of which you muſt lay the whole five feet of earth into one ridge, except the ground be extreme ſtiff, or the plants young, in both which caſes you may lay only three feet and a half of the ground in the ridge over the roots, and the remainder may be laid in a ſmall ridge between; the ſame compaſs of ground muſt alſo be allowed where they are planted at a wider diſtance.

And if in the ſpring you find your ſtocks ſhoot very weak, which may have been occaſioned either by hard froſt, or too much wet, you muſt then uncover them, and with your ſpade looſen and break the earth about them, raiſing a ſmall hill about each ſtock, levelling the reſt between the rows, which will greatly help them, and in three weeks, or a month's time after, they are commonly fit to ſlip.

Thoſe Artichokes which are planted in a moiſt rich ſoil, will always produce the largeſt and beſt fruit; ſo that where ſuch a ſoil can be obtained, it will be proper to make a freſh plantation every ſpring, to ſucceed the old ſtocks, and ſupply the table in autumn. But the roots will not live through the winter in a moiſt ſoil, ſo that your ſtocks which you intend ſhould remain to ſupply the table early, and to furniſh plants, ſhould be in a drier ſoil. You ſhould always obſerve to plant theſe in an open ſituation, and not under the drip of trees, where they will draw up very tall, and produce ſmall inſignificant fruit.

ARTICHOKES of Jeruſalem. See HELIANTHUS.

ARTICULATION, is the connection of parts that conſiſt of joints, or knees, ſuch as are the ſiliquæ [the huſks] of many plants; as of the Ornithopodium, Coronilla, which are joined together by a ſoluble knot; whence thoſe parts are called articuloſæ, and are ſaid to be connected articulatim, or geniculatim; and ſuch plants are called Articuloſæ, whoſe roots are jointed, although the ſtalks have no joints; ſo the root of Polygonatum is ſaid to be articuloſe, or geniculated.

ARUM, Wake Robin, or Cuckow Pint.

The CHARACTERS are,

*The flower hath a large oblong ſpatha, which is cloſed at the bottom, compreſſed in the middle, and coloured within; the ſpadix is ſingle, ſhaped like a club at the top, and ſhorter than the ſpatha upon which the germen are ſituated. It hath no petals nor ſtamina, but many four-cornered ſummits, ſitting cloſe to the germen, with a double row of hairs between them, which adhere to the ſpadix. There are many oval germen which ſurround the upper part of the ſpadix, having no ſtyles, but have bearded ſtigma: the germen afterward become globular berries, with one cell, having round ſeeds.*

This genus of plants is ranged in the ſeventh ſection of Linnæus's twentieth claſs, entitled Gynandria Polyandria, theſe plants having male and female flowers joined, but have no ſtamina nor ſtyle, but many ſummits.

This plant is called Wake Robin, from the ſharp acrid taſte, which, if eaten, will occaſion a violent pain in every part of the mouth and throat, attended commonly with a great defluxion of water.

The SPECIES are,

1. ARUM (*Maculatum*) acaule foliis haſtatis integerrimis ſpadice clavato. Hort. Upſal. 434. *Arum without ſtalk, ſpear-ſhaped entire leaves, and a club-ſhaped ſpadix.* Arum vulgare maculatum & non maculatum. C. B. P. 195. *The common Arum.*

2. ARUM (*Italicum*) foliis haſtatis acutis petiolis longiſſimis ſpathâ maximâ erectâ. *Arum without ſtalk, pointed ſpear-ſhaped leaves, with long foot-ſtalks, and a large upright ſpatha.* Arum venis albis Italicum maximum. H. R. Par.

3. ARUM (*Proboſcidium*) acaule foliis haſtatis ſpathâ declinatâ filiformi-ſubulatâ. Lin. Sp. Plant. 966. *Arum without ſtalk, ſpear-ſhaped leaves, and a declining awl-ſhaped ſpatha.* Ariſarum flore in tenuem caudam abeunte. Tourn. Inſt. 161. *Friers Cowl.*

4. ARUM (*Ariſarum*) acaule foliis cordato-oblongis ſpathâ bifidâ ſpadice incurvo. Hort. Cliff. 435. *Arum without ſtalk, oblong heart-ſhaped leaves, a bifid ſpatha, and an incurved ſpadix.* Ariſarum latifolium majus. C. B. P. 196. *Broad-leaved Friers Cowl.*

5. ARUM (*Tenuifolium*) acaule foliis lanceolatis ſpadice ſetaceo declinato. Hort. Cliff. 345. *Arum without ſtalk, ſpear-ſhaped leaves, and a briſtly declining ſpadix.* Ariſarum anguſtifolium Dioſcoridis forte. Boerh. Ind. alt. 2. p. 73.

6. ARUM (*Virginicum*) acaule foliis haſtato-cordatis acutis angulis obtuſis. Hort. Cliff. 434. *Arum without ſtalk, pointed, ſpear, heart-ſhaped leaves, with obtuſe angles.*

7. ARUM (*Triphyllum*) acaule foliis ternatis floribus monoicis. Flor. Virg. 113. *Three-leaved Arum without ſtalk.* Arum minus triphyllum ariſarum pene viridi Virginianum. Mor. Hiſt. 3. p. 547.

8. ARUM (*Dracunculus*) foliis pedatis, foliolis petiolatis integerrimis æquantibus ſpatham ſpadice longiorem. Lin. Sp. Prod. Leyd. 7. *Arum with foot-ſhaped leaves, compoſed of ſpear-ſhaped, entire, equal lobes, and the ſpatha much longer than the ſpadix.* Dracunculus polyphyllus. C. B. P. 195. *Common Dragon.*

9. ARUM (*Dracontium*) foliis pedatis, foliolis lanceolatis integerrimis ſuperantibus ſpatham ſpadice breviorem. Prod. Leyd. 7. *Arum with foot-ſhaped leaves, the upper being compoſed of ſpear-ſhaped entire lobes, and the ſpatha ſhorter than the ſpadix.* Arum polyphyllum minus & humilius. H. L. 60.

10. ARUM (*Trilobatum*) acaule foliis ſagittato trilobis flore ſeſſile. Flor. Zeyl. 326. *Trifoliate Arum without ſtalks, and a flower growing cloſe to the root.* Arum humile Zeylanicum latifolium piſtillo coccineo. Hort. Amſt. 1. p. 97.

11. ARUM (*Colocaſia*) acaule foliis peltatis ovatis repandis baſi ſemibifidis. Hort. Cliff. 434. *Arum without ſtalk, target-ſhaped oval leaves, waved and ſinuated at their borders, and divided into two parts at their baſe.* Arum maximum Ægyptiacum quod vulgò Colocaſia. *Called Colocaſia.*

12. ARUM (*Betæ folia*) acaule foliis cordatis nervoſis floribus ſeſſilibus. *Arum without ſtalk, nervous heart-ſhaped leaves, and flowers without petals.* Arum Americanum betæ folio. Cateſb. Hiſt. Car. 1. 71. *Called Scunk Weed.*

13. ARUM (*Divaricatum*) acaule foliis cordatis angulatis divaricatis. Lin. Sp. Plant. 966. *Arum without ſtalk, and heart-ſhaped angular leaves.* Arum acaule foliis ſubhaſtatis. Flor. Zeyl. 325.

14. ARUM (*Peregrinum*) acaule foliis cordatis obtuſis mucronatis angulus rotundatis. Hort. Cliff. 435. *Arum without ſtalk, blunt heart-ſhaped leaves, which are pointed, and the angles rounded, called Edder in America.*

15. ARUM (*Eſculentem*) acaule foliis peltatis ovatis integerrimis baſi ſemibifidis. Hort. Cliff. 453. *Arum without ſtalk, oval target-ſhaped leaves, whoſe baſe are divided in two parts.* Arum minus nymphææ folio eſculentum. Sloan. Cat. Jam. 62.



16. ARUM

16. Arum (*Sagittæ folium*) acaule foliis sagittatis triangulis angulis divaricatis acutis. Hort. Cliff. 345. *Arum without stalk, lance-shaped leaves which are triangular, acute-pointed, and ribbed.* Arum maximum Ægyptiacum quod vulgò Colocasia cauliculis nigricantibus Zeylanica. H. L. B.

17. Arum (*Arborescens*) caulescens rectum, foliis sagittatis. Lin. Sp. 1371. *Arum with an erect stalk, and arrow-shaped leaves, commonly called Dumb Cane.*

18. Arum (*Auritum*) caulescens radicans, foliis ternatis, lateralibus unilobatis. Lin. Sp. 1371. *Arum whose stalks send out roots, and trifoliate leaves.* Arum hederaceum triphyllum & auritum. Plum. Amer. 41. tab. 58.

The first sort grows naturally in woods and on shady banks in most parts of England, so is seldom admitted into gardens; but being a medicinal plant, it is here inserted to introduce the other species. There are two varieties of this, one with plain leaves, and the other hath leaves full of black spots, but these are only accidental varieties which arise from the same seeds. The roots of this are ordered by the College of Physicians to be used in a powder which bears the title of the plant; but these are generally gathered in the spring, when the leaves are in full vigour, so that the roots shrink and soon lose their pungent quality; but those which are taken up in August, when their leaves decay, will continue good a whole year, and retain their pungency the same as when first taken up. The not observing this, has brought the medicine into disrepute. It flowers in April, and the seeds ripen in July.

The second sort grows naturally in Italy, Spain, and Portugal, from whence I have received the seeds. The leaves of this sort rise a foot and a half high, are very large, running out to a point; these are finely veined with white, interspersed with black spots, which, together with the fine shining green of their surface, make a pretty variety. The flowers grow near a foot high, and have very long upright spathas, which are of a pale green, inclining to white; these appear the end of April, or beginning of May, and the seeds are ripe in August; this propagates very fast by offsets from the root, and will thrive in any soil or situation. The best time to transplant them is soon after the seeds are ripe, for by the end of October they will be putting out new fibres.

The third, fourth, and fifth sorts have been generally separated from this genus, and were distinguished by the title of Arisarum, or Friar's Cowl, from the resemblance the flower has in shape to the hoods or cowls worn by the people of that order; the leaves of these have short foot-stalks, the flowers growing close to the ground; they flower in April, but seldom produce seeds in England; however they multiply fast by offsets, and should have a shady situation. The time for transplanting the roots is the same as for the former. They are preserved in some gardens for the sake of variety, but have little beauty to recommend them.

The sixth and seventh sorts grow naturally in Virginia and Carolina, from whence I have received their roots; their leaves arise immediately from the roots, having scarce any foot-stalks; the flowers come up between their leaves, which have short foot-stalks; they appear in May, but have little beauty, so the plants are only kept in botanic gardens for the sake of variety. They will live in the open air, if they are planted in a sheltered situation, or if the surface of the ground is covered with tan to keep out the frost in winter, and will thrive better in the full ground than in pots. They are propagated by offsets.

The eighth sort is the common Dragon, which is used in medicine, and has been generally ranged in a separate genus from this under the title of Dracunculus, in which genus Tournefort has ranged all those species which have compound leaves, and those with single leaves he has placed under Arum.

This sort is used in medicine, so is preserved in gardens to supply the markets: it grows naturally in most of the southern parts of Europe. This plant hath a large, tuberous, fleshy root, which, in the spring puts up a strait stalk about three feet high, which is spotted like the belly of a snake; at the top it spreads out into leaves, which are cut into several narrow segments almost to the bottom, which spread open like a hand; at the top of the stalk the flower is produced, which is in shape like the common Arum, having a very long spatha of a dark purple colour, standing erect, with a large pistil of the same colour, so that when it is in flower, it makes no unpleasing appearance; but the flower hath so strong a scent of carrion, that few persons can endure it; for which reason it hath been banished most gardens, but was it not for this, a few of the plants might merit a place in gardens, for the oddness of the flower. It is very hardy, so will grow in any soil or situation, and propagates very fast by offsets from the root. The time to transplant it is in autumn, when their leaves decay. It flowers in June or July, and their stalks decay in September.

The ninth sort grows naturally in moist places in Virginia and New England, but is very difficult to preserve long in a garden. I received some roots of this from New England a few years ago, which continued two years; but the soil being dry, they decayed in summer: these should have a moist shady situation, otherwise they will not thrive. The leaves of this sort are divided like those of the former, but are smaller, and rarely grow more than nine inches high; the flowers are like those of the common Arum, but the pistil is longer than the spatha. It flowers in June, and the stalks decay in autumn.

The tenth sort grows naturally in Ceylon, and some other parts of India, so is very impatient of cold: it is a plant of humble growth: the leaves come up from the root, having foot-stalks about four inches long; these are divided into three lobes, which terminate in points; the flower rises immediately from the root, standing on a very short foot-stalk; the spatha is long, erect, and of a fine scarlet within, as is also the pistil. This usually appears in May, and the leaves decay in August, but new ones soon after rise from the root. This plant must be placed in the tan-bed of the bark-stove, otherwise it will not thrive in England. It is propagated by offsets from the root, which come out in plenty when the plants are in health.

The eleventh, thirteenth, fourteenth, fifteenth, and sixteenth sorts, have mild roots, which are eaten by the inhabitants of all the hot countries, where they grow naturally, and some of the sorts are cultivated by the inhabitants of the sugar colonies, as esculent plants, their roots being constantly eaten, as also are the leaves of some of the sorts, particularly the fifteenth, which they call Indian Kale: the leaves of this are boiled, and supply the want of other greens. As there is a constant succession of these all the year, a small spot of ground, planted with these roots, will be sufficient to supply a large family. It is esteemed a wholsome green, and in those countries where many of the common European vegetables are with difficulty procured, this proves a good succedanum; but they seem to make little distinction of the species, for I have received the roots of three sorts, by the common title of Edder; but I suppose the fourteenth sort is the most commonly cultivated there for their roots. The sixteenth sort has not been many years introduced among them, for it came originally from the Spanish West-Indies, where it grows in great plenty. Both these have larger roots than the fifteenth, for which reason they are preferred to it.

All these sorts are preserved in the gardens of those persons, who are curious in collecting exotic plants, for the variety of their leaves; their flowers have very little beauty, nor do they often appear in this country. The plants are propagated easily by offsets from their roots, which they put out plentifully: these must be planted in pots filled with light earth, and plunged into a hot-bed, to promote their taking root;

 and

and if they are afterward continued in the bark-ſtove, they will make great progreſs, and their leaves will be larger. They may be kept in a dry ſtove, upon ſhelves, after they are well eſtabliſhed in the pots, but they will not be ſo ſtrong as the other.

The twelfth ſort I was favoured with by Mr. Peter Collinſon, F. R. S. who procured the root from North America, where it naturally grows. This requires a moiſt ſoil, and a ſhady ſituation, but is hardy in reſpect of cold. It flowered two years in the garden at Chelſea, but in a very dry ſeaſon decayed. The flowers came up before there was any appearance of leaves; the ſpatha was large, and the piſtil ſhort and blunt; the female flowers were ranged each between a ſort of cheque work, which was diagonal to the piſtil; the flower decayed without any appearance of ſeed.

The ſeventeenth ſort riſes to the height of ſix or ſeven feet, with a green jointed ſtalk as large as a walking ſtick; the leaves are placed irregularly at the top of the ſtalks, growing in a cluſter: theſe are oblong, and of a light green colour; from between the leaves the flowers come out on the ſide of the ſtalk, having a long ſpatha of a pale green colour, marked with white ſpots, ſitting cloſe to the ſtem of the plant; at their firſt appearance they ſtand erect, ſoon after they are horizontal, and in a little time they decline downward; their lower part is ſwelling ſo far as the flowers are ranged on the piſtil, above which it is greatly contracted, and toward the top enlarges again, where it is a little open, ſo as to ſhew the naked part of the piſtil, but is twiſted again at the top. All the lower part cloſely folds over the piſtil, ſo that it is ſcarce diſcernible, unleſs the ſpatha is opened, which can only be done on one ſide, the other adhering cloſely to the piſtil, ſo far upward as the flowers extend the naked part of the piſtil only being ſeparated from it; ſo that the female flowers and ſtamina are ranged only upon one ſide of the piſtil, in which it differs from all the other ſpecies which I have ſeen.

It grows naturally in the ſugar iſlands, and other warm parts of America, chiefly in the low grounds; the whole plant abounds with an acrid juice, ſo that if a leaf or part of the ſtalk is broken, and applied to the tip of the tongue, it cauſes a very painful ſenſation, and occaſions the ſalivary ducts to ſwell, and brings on a great defluxion of ſaliva; the ſtalks of this plant are ſometimes applied to the mouths of the negroes by way of puniſhment, which is indeed bad enough. This ſort is propagated by cutting off the ſtalks into lengths of three or four joints, which muſt be laid to dry ſix weeks or two months; for if the wounded part is not perfectly healed over before the cuttings are planted, they will rot and decay: theſe ſhould be planted in ſmall pots filled with light ſandy earth, and plunged into a moderate hot-bed of tan, being careful that they have little wet, until they have made good roots; when they are well eſtabliſhed at bottom, ſome of them may be placed in a dry ſtove, and others plunged into the tan-bed in the bark-ſtove, where they will make the greateſt progreſs, and produce more flowers than the others. It is a tender plant, ſo muſt be conſtantly kept in the ſtove, and ſhould have very little wet in winter.

The eighteenth ſort is a ſcandent plant, ſending out roots from the ſtem and branches, the leaves are large, heart-ſhaped, having three lobes or ears; the flowers are incloſed in a large ſpatha; but theſe are not fruitful in England. This is a tender plant, ſo requires to be conſtantly kept in the bark ſtove, and treated as other tender exotic plants, which come from hot countries. It is propagated by cutting off the branches, which readily put out roots, for all theſe ſpecies which are natives of hot countries, never produce ſeeds in England.

ARUM ÆTHIOPICUM. See Calla.

ARUM SCANDENS. See Dracontium.

ARUNDO. Lin. Gen. Plant. 76. The Reed.

The Characters are,

*It is of the Graſs tribe; the flowers grow in ſpikes, and are included in a chaff which is oblong, pointed, and opens with two valves. The petals of the flowers are bivalve and longer than the empalement, having a down at their baſe, which riſes almoſt their length; it hath three hairy ſtamina, crowned with horned ſummits; in the center is ſituated an oblong germen, ſupporting two ſlender ſtyles which are hairy and reflexed, crowned with a ſimple ſtigma. The germen afterward becomes an oblong pointed ſeed, with long down adhering to its baſe.*

This genus of plants is ranged in the ſecond ſection of Linnæus's third claſs, entitled Triandria Digynia, the flowers having three ſtamina and two ſtyles.

The Species are,

1. Arundo (*Phragmitis*) calycibus quinquefloris paniculâ laxâ. Prod. Leyd. 66. *Reed with five flowers in each cup, growing in looſe panicles.* Arundo vulgaris paluſtris. J. B. 2. 485. *The common Marſh Reed.*
2. Arundo (*Donax*) calycibus trifloris paniculâ diffuſâ. Prod. Leyd. 66. *Reed with three flowers included in each cup, growing in diffuſed panicles.* Arundo ſativa quæ Donax Dioſcoridis. C. B. P. 17. This is ſometimes called by gardeners the Ever-green Reed, but for what reaſon I cannot imagine, becauſe the ſtalks decay every autumn, and new ſhoots ariſe from the roots in the ſpring.
3. Arundo (*Verſicolor*) Indica Laconica verſicolor. Mor. Hiſt. 3. p. 219. *Indian Reed with variegated leaves.* Arundo Indica variegata ſeu Laconica Theophraſti. Cornut. Can. 55.
4. Arundo (*Bamboa*) calycibus multifloris, ſpicis ternis ſeſſilibus. Lin. Sp. 120. *Reed with many flowers in the cup, and ſeſſile ſpikes, commonly called Bambu.* Beeſha. Hort. Mal. Vol. V. p. 119. *and the Bambu altera ſpecies.* Raii Hiſt. 1316.
5. Arundo (*Arborea*) caule arboreo foliis utrinque acuminatis. *Reed with a tree-like ſtalk, and leaves which are pointed at both ends.* Ily. Hort. Mal. Vol. I. p. 25.
6. Arundo (*Orientalis*) tenuifolia caule pleno ex quâ Turcæ calamos parant. Tourn. Cor. 39. *Eaſtern Reed with a narrow leaf and a full ſtalk, of which the Turks make their writing pens.*

The firſt ſort is ſo very common by the ſides of rivers and large ſtanding waters in divers parts of England, that it is needleſs for me to ſay any thing of its culture. This is cut in autumn, when the leaves begin to fall, and the ſtems are changed brown, for making hedges in kitchen-gardens, and for many other uſes.

The ſecond ſort, although native of a warm country, yet will bear the cold of our winters in the open ground, provided it is planted in a ſoil not too wet; and if the winter ſhould prove very ſevere, a little mulch be laid over the roots; it dies to the ſurface in autumn, and riſes again the ſucceeding ſpring; and if kept ſupplied with water in dry weather, will grow ten or twelve feet high the ſame ſummer; and is very proper to intermix with trees and ſhrubs, or tall plants and flowers in boſquets, where, by the oddneſs of its appearance, it will have a good effect, in adding to the variety. This is propagated by parting the roots early in the ſpring, before they begin to ſhoot, and will, in a year or two, if your ground be good, make very large ſtools, ſo that from each ſtool you may have eight or ten canes produced; but this never produces any ſpikes of flowers in England.

The ſtalks of this ſort are brought from Portugal and Spain, and are uſed by the weavers, as alſo to make fiſhing-rods.

The third ſort is ſuppoſed to be a variety of the ſecond, differing therefrom only in having variegated leaves. But this I much doubt, becauſe the ſort with variegated leaves is much tenderer than the other, ſo muſt be ſheltered from the froſt, otherwiſe it will not live through the winter in England. The plant never grows to a third part of the height of the other, and the leaves are narrower and much ſhorter; whether theſe differences may not be occaſioned by the weakneſs of the plant, I cannot take upon me to determine; for it is well known, that all thoſe plants which have variegated leaves, are much weaker than the plain

plain, and do not grow so large, nor will they resist the cold so well. But as this is supposed to be a native of a different country, and by all the writers who have mentioned it supposed to be different, I have enumerated it among the species.

The two sorts of Bambu are of great service to the inhabitants of India, who make most of their common utensils of the stems of these canes, which grow to a prodigious magnitude in those countries.

We have plants of the fourth sort in the English gardens, which are more than twenty feet high; and if the stoves in which they are kept were high enough to admit them, they would, according to appearance, rise to twice that height. The shoots of this plant are of quicker growth than any other yet known, which rises with an upright stalk; for a strong shoot from the root will rise to twenty feet in five or six weeks, as I have for several years observed. Some of these stems are as large as a man's wrist, but in general as big as walking-sticks, and when dried are as fit for that purpose as those which are imported. The leaves of this sort are much broader than those of the fifth, particularly at their base; these leaves are generally put round the tea-chests in their package, and are fastened together so as to form a kind of mat.

The fifth sort is more rare at present in Europe, tho' it is the most common on the coast of Malabar.

They are both tender plants, so will not live in this country, unless they are preserved in a warm stove; and as their roots spread very wide, they should not be confined: therefore to have them produce strong stems, they must be planted in large tubs, filled with rich earth, and plunged into the hot-bed in the bark-stove; and as they naturally grow in marshy low places, they require plenty of water, especially when the roots have filled the tubs in which they were planted. When the tubs decay, the boards may be removed, and the plants permitted to root into the tan, which will encourage them to grow to a larger size; but then there must be care taken when the bed is refreshed with new tan, to leave a sufficient quantity of the old tan about the roots of the plants; for if they are too much bared, and the new tan laid near them, when that heats, it will scorch their roots so that the plants are sometimes destroyed by it. Both sorts are propagated by slips from the roots, which should be taken off in the spring, that they may be well established before the winter.

The sixth sort is what the Turks make their writing pens withal; this grows in a valley near mount Athos, as also on the banks of the river Jordan, but there are none of the plants in England. This sort may be managed as the Bambu.

ARUNDO SACCHARIFERA. See Sacharum.

ASARINA. Tourn. Inst. R. H. 171. tab. 76. Bastard Asarum.

The Characters are,

*The empalement is of one leaf, which is cut into five equal segments almost to the bottom. The flower is of one leaf, of the grining kind, having a long cylindrical tube, divided at the top into two lips, the upper one being divided into two parts, whose edges are reflexed. The lower lip is slightly cut into three parts which are obtuse; the two lips join close together, so as to form a kind of snout. It hath four stamina, two of which are longer than the other; in the center is placed a round germen supporting a single style, crowned by an obtuse stigma. The germen afterward turns to a round husk, divided into two cells, which are full of roundish seeds.*

This genus of plants is by Dr. Linnæus joined to his genus of Antirrhinum, which is ranged in the second section of his fourteenth class, titled Didynamia Angiospermia, the flowers having two long and two shorter stamina, and the seeds having a capsule.

The Species are,

1. Asarina (*Procumbens*) caule decumbente foliis oppositis reniformibus crenatis. *Bastard Asarum with a trailing stalk, and kidney-shaped leaves growing opposite, which are indented on their edges.* Asarina hederula saxatilis. Lob. Icon. 601. *Asarina, or Rock Ground-ivy.*
2. Asarina (*Erecta*) caule erecto foliis lanceolatis amplexicaulibus paniculâ dichotomâ. *Upright Bastard Asarum with spear-shaped leaves which embrace the stalks, and spikes of flowers coming out from the division of the branches.* Penstemon. Mitch. Gen. 14.

The first sort is a low trailing annual plant, the branches extend little more than a foot each way, and are weak, so that unless they are supported, they lie upon the ground; these are garnished with leaves like those of Ground-ivy, which grow by pairs; at the wings of the leaves the flowers come out singly on each side the stalk, which are shaped like those of Snap-dragon, but have a long tube; they are of a worn-out purple colour at the top, but below of an herbaceous colour. These come out in June, and the seeds ripen in September, which should be sown soon after, or permitted to scatter, for when they are sown in the spring they seldom grow. The plants should remain where they are sown, and require no other care but to keep them clean from weeds, and thin them where they grow too close. As there is not much beauty in this plant, two or three of them will be enough in a garden, for the sake of variety. It grows naturally in Italy and the south of France.

The second sort grows naturally in North America. This plant hath upright stalks, which grow a foot and a half high, and put out several side branches, garnished with oblong spear-shaped leaves ending in a point, which grow opposite, and embrace the stalks at their base; the flowers come out in short loose spikes from the divisions of the stalks, which are shaped like those of the former, but are less, and of a purple colour. They appear in June and July, and their seeds ripen in September.

The seeds of this sort should be sown in the autumn, for those which are sown in the spring, seldom grow the same year, but remain in the ground till the following spring. When the plants are grown strong enough to remove, they should be transplanted into a shady border, which will prevent their flowering the same year; and in the autumn they may be planted in the borders of the flower-garden, where they will add to the variety. The roots seldom last above two or three years, so that young plants should be annually raised.

ASARUM [from α privative, and ζαίρω, *Gr.* to adorn, as much as to say, a plant not fit for ornament,] Asarabacca.

The Characters are,

*The flowers hath a thick bell-shaped empalement of one leaf, which is coloured, and slightly cut at the brim into three parts, which are reflexed. It hath no petals, but twelve short awl-shaped stamina, crowned by oblong summits, which are fastened in the middle to the stamina; at the bottom of the empalement is inclosed a thick germen, supporting a short cylindrical style, crowned by a reflexed stigma, cut into six parts. The germen afterward turns to a thick capsule having six cells, containing several oval seeds.*

This genus of plants is ranged in Linnæus's eleventh class, entitled Dodecandria Monogynia, the flowers having twelve stamina and one style.

The Species are,

1. Asarum (*Europæum*) foliis reniformibus obtusis binis. Lin. Sp. Pl. 442. *Asarabacca with kidney-shaped leaves, which have two blunt points.* Asarum. C. B. P. 197. *Common Asarabacca.*
2. Asarum (*Canadense*) foliis reniformibus mucronatis. Lin. Sp. Plant. 442. *Asarabacca with kidney-shaped leaves ending in a point.* Asarum Canadense. Cornut. Canad. 24. *Canada Asarabacca.*
3. Asarum (*Virginicum*) foliis cordatis obtusis glabris petiolatis. Flor. Virg. 162. *Asarabacca with smooth, blunt, heart-shaped leaves having foot-stalks.* Asarum Virginianum pistolochiæ foliis subrotundis cyclaminis more maculatis. Pluk. Alm. 53.

The first sort hath thick fleshy roots which are jointed, and send out fibres from every part; the leaves grow singly upon short foot-stalks, arising immediately from the root; these are kidney-shaped, eared at the foot-stalk, and rounded at the top, where they are indented; they are smooth, and of a shining green colour: the flowers grow upon very short foot-stalks close to the ground, so are hid under the leaves. They are composed of a bell-shaped empalement, of a worn-out purple colour, which is cut into three at the top, where it turns backward: in the bottom is situated the germen, attended by twelve short stamina, which afterward turns to a leathery seed-vessel, divided into six cells, which contain several roundish seeds.

The leaves of the second sort are much larger than those of the first, and stand on longer foot-stalks; these are pointed and hairy. The flowers are like those of the other sort, growing close to the root, but are somewhat inclining to green on their outside, in all other respects they agree.

The third sort hath smooth blunt heart-shaped leaves, standing on longer foot-stalks; these are veined and spotted on their upper surface like those of the autumnal Cyclamen; the flowers of this are shaped like the others, but stand on longer foot-stalks, and are of a darker purple colour. These flower in April and May, and their seeds ripen in July and August.

The first of these sorts is very common, and hath been found wild in some parts of England, though but rarely; it delights in a moist shady place, and is increased by parting the roots in autumn. This is the sort which is used in medicine.

The Canada sort is equally hardy, so will endure our common winters in the open ground, being rarely hurt by frosts, if planted in a dry soil, for too much wet often occasions the roots to rot in winter. This is propagated as the other.

The third sort will also live in the open air in England, being seldom injured by frost; but if the plants are too much exposed to the sun in summer, they seldom thrive well; therefore they should be planted in a border where they may have only the morning sun, in which situation they will spread and increase. These two last grow naturally in several parts of North America.

ASCLEPIAS [so called from Æsculapius the first inventor of physic; it is also called Vincetoxicum, from vincere, to ovecome, and τοξικά, poisons, q. d. a plant overcoming poisons,] Hirundinaria, or Swallow-wort.

The Characters are,

*The empalement is of one leaf, which is cut into five acute segments; the petal of the flower is also of one leaf, divided into five oval parts, which are reflexed; in the center is situated five nectarii which encompass the parts of generation; these have horns which turn toward the stamina, and are joined in a truncated body inclosed by five scales, which open every way. There are five stamina which are scarce visible, which have five summits, situated between the nectarii, and inclosed by the scales of the truncated body. It hath two oval pointed germen, supporting two short styles crowned by a single stigma. The germen afterward becomes two large, oblong, swelling pods ending in a point, having one cell, which opens with two valves filled with compressed seeds, lying over each other like tiles on a house, and are crowned with a soft down.*

This genus of plants is ranged in Linnæus's second section of his fifth class, entitled Pentandria Digynia, the flowers having five stamina and two styles.

The Species are,

1. Asclepias (*Alba*) foliis ovatis basi barbatis caule erecto umbelulis proliferis. Lin. Sp. Plant. 314. *Swallow-wort with oval leaves bearded at their base, an upright stalk, and a proliferous umbel.* Asclepias albo flore. C. B. P. 303.

2. Asclepias (*Nigra*) foliis ovatis basi barbatis caule superne subvolubili. Lin. Sp. Plant. 216. *Swallow-wort with oval leaves bearded at their base, and the upper part of the stalk twining.* Asclepias nigro flore. C. B. P. 303.

3. Asclepias (*Lutea*) foliis ovatis acutis caule infirmo, umbellis simplicibus. *Swallow-wort with oval pointed leaves, a weak stalk, and single umbels.* Asclepias angustifolia flore flavescente. H. R. Par.

4. Asclepias (*Verticillata*) foliis revolutis linearibus verticillatis caule erecto. Lin. Sp. Plant. 217. *Swallow-wort with narrow twisting leaves growing in whorles, and an upright stalk.* Apocynum Marianum erectum linariæ angustissimis foliis umbellatum. Pluk. Mant. 17.

5. Asclepias (*Syriaca*) foliis ovalibus subtus tomentosis caule simplicissimo umbellis nutantibus. Lin. Sp. Plant. 214. *Swallow-wort with oval downy leaves, a single stalk, and nodding umbels.* This is the Apocynum majus Syriacum erectum. Corn. Canad. *Greater upright Syrian Dogsbane.*

6. Asclepias (*Amœna*) foliis ovatis subtus pilosiusculis caule simplici umbellis nectariisque erectis. Lin. Sp. Plant. 214. *Swallow-wort with oval leaves, hairy on their under side, a single stalk, with upright umbels and nectarii.* Apocynum floribus amœne purpureis corniculis surrectis. Hort. Elth. 31.

7. Asclepias (*Purpurascens*) foliis ovatis subtus villosis caule simplici umbellis erectis nectariis resupinatis. Lin. Sp. Plant. 214. *Swallow-wort with oval leaves, hairy on their under side, a single stalk, and upright umbels with inclining nectarii.* Apocynum erectum Noveboracense foliis minùs incanis flore ex obsoleto dilutè purpurascente. Par. Bat. 33.

8. Asclepias (*Variegata*) foliis ovatis rugosis nudis caule simplici umbellis subsessilibus pedicellis tomentosis. Lin. Sp. Plant. *Swallow-wort with rough, naked, oval leaves, a single stalk, umbels growing close to the stalk, having woolly foot-stalks.* Apocynum vetus Americanum Wisank dictum. Hort. Elth. 32.

9. Asclepias (*Incarnata*) foliis lanceolatis caule supernè diviso, umbellis erectis. Lin. Sp. Plant. 215. *Swallow-wort with spear-shaped leaves, the upper part of the stalk divided, and erect double umbels.* Apocynum minùs rectum Canadense. Corn. Canad. 9.

10. Asclepias (*Decumbens*) foliis villosis caule decumbente. Lin. Sp. Plant. 216. *Swallow-wort with hairy leaves, and a declining stalk.* Apocynum Carolinianum aurantiacum pilosum. Pet. H. Sicc. 90.

11. Asclepias (*Tuberosa*) foliis alternis lanceolatis caule divaricato piloso. Lin. Sp. Plant. 217. *Swallow-wort with spear-shaped leaves growing alternate, and a hairy divided stalk.* Apocynum Novæ Angliæ hirsutum tuberosa radice floribus aurantiis. H. L. 649. *commonly called Orange Apocynum.*

12. Asclepias (*Glabra*) foliis lineari-lanceolatis glabris caule fruticoso umbellis lateralibus. *Swallow-wort with smooth, narrow, spear-shaped leaves, a shrubby stalk, and umbels coming out of the sides.* Apocynum erectum Africanum villoso fructu salicis folio glabro angusto. Par. Bat. 23.

13. Asclepias (*Fruticosa*) foliis lanceolatis glabris umbellis simplicibus lateralibus caule fruticoso. *Swallow-wort with smooth spear-shaped leaves, single umbels coming from the sides of the branches, and a shrubby stalk.* Apocynum erectum Africanum folio salicis lato glabro fructu villoso. Par. Bat. 24.

14. Asclepias (*Villosa*) foliis lanceolatis villosis acutis umbellis simplicibus erectis caule fruticoso. *Swallow-wort with hairy spear-shaped leaves, single upright umbels, and a shrubby stalk.* Apocynum erectum Africanum villoso fructu salicis folio lato subhirsuto. Par. Bat. 24.

15. Asclepias (*Rotundifolia*) caule erecto fruticoso, foliis subrotundis amplexicaulibus, umbellis congestis. *Swallow-wort with an upright shrubby stalk, roundish leaves embracing it, and close umbels.* Apocynum erectum fruticosum folio subrotundo glauco. Par. Bat. 37.

16. Asclepias (*Nivea*) foliis lanceolatis glabris caule simplici umbellis erectis lateralibus solitariis. Lin. Sp. Plant. 215. *Swallow-wort with a single stalk, smooth spear-shaped leaves, and upright single umbels, proceeding from the wings of the leaves.* Apocynum Americanum foliis Amygdali longioribus. Plum. Cat. 2.

17. Asclepias (*Curassavica*) foliis lanceolatis petiolatis glabris caule simplici umbellis erectis solitariis. Lin. Sp.

Sp. Plant. 215. *Swallow-wort with ſmooth ſpear-ſhaped leaves, having foot-ſtalks, a ſingle ſtalk, and upright ſingle umbels.* Apocynum radice fibroſâ, petalis coccineis corniculis croceis. Hort. Elth. 34. *commonly called Baſtard Ipecacuana.*

18. Asclepias (*Gigantea*) foliis amplexicaulibus oblongo-ovalibus. Flor. Zeyl. 112. *Swallow-wort with oblong, oval leaves, embracing the ſtalks.* Apocynum erectum majus latifolium Indicum. Pluk. Alm. 35. tab. 175. f. 3.

19. Asclepias (*Scandens*) foliis oblongo-lanceolatis ſubhirſutis caule fruticoſo ſcandente umbellis lateralibus congeſtis. *Swallow-wort with oblong, ſpear-ſhaped, hairy leaves, a ſhrubby climbing ſtalk, and compact umbels proceeding from the ſide.*

The firſt ſort is the common Swallow-wort of the ſhops. This is called Vincetoxicum & Hirundinaria, in Engliſh Swallow-wort, or tame poiſon, from its ſuppoſed virtue, being accounted a mighty counter poiſon. The root is the only part which is uſed: it is compoſed of many ſtrong fibres, which are connected at the top, like thoſe of Aſparagus, from which ariſe many foot-ſtalks, in number proportional to the ſize of the roots; which grow near two feet high, are very ſlender at the top; the leaves are oval, ending in a point, and placed by pairs. The flowers are white, growing in umbels near the top of the ſtalk, from which are ſent out ſmaller umbels; the flowers are of one leaf, cut into five parts, in the center of which are placed five horned nectarii, among which the ſtamina and ſtyles are ſituated. After the flower is paſt, the two germen become two long pointed pods, incloſing many compreſſed ſeeds, which are crowned with a ſoft white down. The flowers appear in June, and the ſeeds ripen in September. This ſort grows naturally in the ſouth of France, Spain, and Italy.

The ſecond ſort agrees with the firſt, in the ſhape of its roots, leaves, and flowers, but the ſtalks extend to a greater length, and toward their upper part twiſt round any ſticks, or other plants near them, and the flowers of this are black. This flowers at the ſame time with the firſt, and ſeldom fails to ripen its ſeeds in England.

The third differs from both the other in the narrowneſs of its leaves, and weakneſs of its ſtalks; the umbels of flowers are ſingle, and of a yellow colour. This flowers at the ſame time with the two former ſorts, and generally perfects ſeeds in England. There is a variety of this with broader leaves, which may have come from the ſeeds of this.

Theſe plants are common in the Engliſh gardens, and natives of the ſame countries. They are generally propagated by parting their roots, eſpecially the firſt ſort, which ſeldom produces ſeeds in England. The beſt time for this is in autumn, when their ſtalks begin to decay. They ſhould not be planted nearer together than three feet, for the fibres of their roots extend to a conſiderable diſtance. They are very hardy plants, ſo will thrive in any ſituation, but love a dry ſoil. Their ſtalks die in autumn, and new ones riſe in the ſpring.

The fourth ſort grows naturally in North America; this riſes with ſlender upright ſtalks, garniſhed with very narrow leaves, growing in whorles round the ſtalks, at the top of which grow umbels of ſmall, white, ſtarry flowers. Theſe appear in July, but are never ſucceeded by pods in England, ſo are only propagated by parting their roots; which ſhould be done in the ſpring, before they put out new ſhoots. The roots ſhould be planted in a warm border and dry ſoil, and in winter covered with old tan, to prevent the froſt from penetrating the ground.

The fifth ſort creeps greatly at the root, ſo that it will ſoon ſpread over a large ſpot of ground; this ſends up ſtrong ſtems upward of four feet high, which have thick oval leaves placed oppoſite, hoary on their under ſides. Toward the top of the ſtalks the umbels of flowers come out on the ſide; theſe are of a worn-out purple colour, ſmelling ſweet, and nod downward; ſometimes theſe are ſucceeded by large oval pods, filled with flat ſeeds, crowned by a long ſoft down; it flowers in July. This propagates faſt enough by its creeping root, and will grow in any ſoil or ſituation. It may be tranſplanted any time after the ſtalks decay, or before the roots ſhoot in the ſpring.

The ſixth ſort hath a perennial root, which ſends up ſeveral upright ſtalks in the ſpring, about two feet high, garniſhed with oval leaves growing oppoſite; at the top of the ſtalks the umbels of flowers are produced, which are of a bright purple colour, making a pretty appearance in July, but are not ſucceeded by pods in England; this muſt be treated as the fourth ſort. I was favoured with this by Mr. Peter Collinſon, F. R. S.

The ſeventh ſort grows naturally in North America. This hath a perennial root, which ſends out ſingle ſtalks near three feet high, garniſhed with oval leaves, hairy on their under ſide, placed oppoſite; the flowers grow in erect umbels at the top, and the nectarii are declining. They are of a worn-out purple colour reſembling thoſe of the fifth; it is very hardy, and propagates faſt by its creeping roots, but never produces ſeeds in England. This will grow in any ſoil or ſituation, and may be tranſplanted when the ſtalks decay.

The eighth ſort reſembles the ſeventh, but the leaves are rough, and the umbels of flowers are more compact, and come out on the ſide of the ſtalk; theſe are of an herbaceous colour, and are not ſucceeded by pods in this country, but is propagated by roots as the former ſort.

The ninth ſort came firſt from Canada, but hath ſince been found growing naturally in ſeveral other parts of America. This hath a perennial root, which puts out ſeveral upright ſtalks about two feet high, which have oblong ſmooth leaves placed by pairs; at the top are produced cloſe umbels of purple flowers; theſe appear in Auguſt, but are not ſucceeded by ſeeds here, ſo is only propagated by parting the roots, which do not increaſe very faſt, therefore the plant is not very plenty in the gardens; it is hardy enough to live abroad, if it is planted in a dry ſoil.

The tenth ſort is a native of North America, but is hardy enough to live abroad in England, if it is planted in a warm ſituation and a dry ſoil. This hath declining ſtalks, which are hairy, a foot and a half long; the leaves are narrow, hairy, and placed oppoſite; the umbels grow at the extremity of the branches, which are compact, the flowers are of a bright Orange colour. It is propagated by ſeeds, which ſhould be ſown in pots, and plunged into a moderate hot-bed to bring up the plants, which ſhould be inured to the open air ſo ſoon as the weather will permit; for if they are drawn up weak, they ſeldom recover it. When they are of a proper ſtrength to remove, they ſhould be ſhaken out of the pots, and planted in a warm border ſix inches aſunder, being careful to ſhade them from the ſun until they have taken freſh root, but they muſt have very little water given them, for they are milky plants, which rot with much wet. During the ſummer they muſt be kept clean from weeds, and when their ſtalks decay in autumn, ſome rotten tan ſhould be laid over the ground to keep out the froſt, which ſhould be removed in the ſpring before the plants put out new ſhoots; the following ſummer they will require no other care than before, and alſo the next winter they muſt be covered as in the former. The ſecond ſpring the roots may be tranſplanted where they are to remain; the roots will then be ſtrong enough to flower in ſummer, and will laſt ſeveral years, eſpecially if they are covered with tan to keep out the froſt, but they ſhould not be afterward removed; for when the roots are large, they will not bear tranſplanting.

The eleventh ſort is a native of the ſame countries, and is much like the former, but differs in having upright ſtalks, and the leaves growing alternate. The roots of this grow to a large ſize, ſo will not bear

tranſplanting after the plants are two years old. It is propagated by ſeeds, which ſhould be treated in the manner directed for the former. Theſe flower the latter end of July and in Auguſt; and in warm ſeaſons, ſometimes ripen their ſeeds in England. Neither of theſe plants will live long in pots, for which reaſon I have recommended their being planted in the full ground; but they ſhould have a warm ſituation.

The twelfth, thirteenth, and fourteenth ſorts grow naturally at the Cape of Good Hope. I have alſo received ſeeds of the thirteenth ſort from Alexandria; and Mr. Peter Collinſon, F. R. S. gave me ſome ſeeds of it, which were ſent him from Minorca; but it is not certain that it grows naturally there, but may have been carried thither from Africa.

Theſe riſe with upright ſhrubby ſtems to the height of ſeven or eight feet, and divide into many branches; thoſe of the twelfth ſort are garniſhed their whole length with long, narrow, ſmooth leaves, ending in a point; from the wings of the leaves the umbels of flowers are produced, upon long foot-ſtalks; the flowers are white, and grow looſely on the umbel; theſe are frequently ſucceeded by ſhort, thick, ſwelling pods, ending in a point, which are thick ſet with hairs, and filled with compreſſed ſeeds, crowned with a ſoft down. This flowers from June to October, and the ſeeds ripen in winter.

The thirteenth ſort differs from the twelfth, in having much broader leaves, which are of a darker green; the umbels of flowers are ſmaller, grow upon ſhorter foot-ſtalks, and the ſingle flowers are larger. This flowers at the ſame time with the former.

The fourteenth ſort doth not riſe ſo high as either of the former, and the branches grow at a much greater diſtance; the leaves are ſhorter, and are covered on both ſides with ſhort hairs. The flowers grow in ſmall looſe umbels, and are white; theſe appear in the ſame ſeaſon with the former.

Theſe are propagated by ſeeds, which may be ſown in April on a bed of light earth in the open air, and when the plants are three or four inches high, they ſhould be each planted in a ſmall pot filled with light earth, and ſhaded until they have taken new root, then they may be placed with other exotic plants in a ſheltered ſituation till October, when they muſt be removed into the green-houſe, and during the winter ſhould have but little water; for as they abound with a milky juice, much wet will rot them. The only care theſe will require, is to ſhift them into larger pots as they advance in their growth; but care ſhould be taken not to put them in pots too large, and in the ſummer to place them abroad with other plants from the ſame country.

Theſe three ſorts may alſo be propagated by cuttings, which if planted in July or Auguſt, in a ſhady border, will ſoon take root, and may ſoon after be taken up and planted in pots, and managed as the ſeedling plants. The thirteenth ſort hath lived in the open air in mild winters in the Chelſea garden, but in cold winters they are conſtantly deſtroyed.

The fifteenth ſort grows with an upright ſhrubby ſtalk to the height of ſix or ſeven feet, dividing toward the top into three or four branches, garniſhed their whole length with ſtiff roundiſh leaves, which cloſely embrace them. Toward the upper part, the flowers are produced on their ſides, growing in ſhort compact umbels. Theſe are of an herbaceous colour, ſo make but little appearance; they come out chiefly in autumn and winter. This grows naturally at the Cape of Good Hope, and requires the ſame culture as the former ſorts. There is a variety of this with deep green leaves, which ſome have ſuppoſed to be a different ſpecies, but I have raiſed it from the ſame ſeeds.

The ſixteenth ſort grows naturally in the warm parts of America, the ſeeds were ſent me from La Vera Cruz. This riſes with ſingle ſtalks four feet high, garniſhed with ſmooth ſpear-ſhaped leaves, ending in a point; toward the top of the ſtalk the umbels of flowers are produced from the wings of the leaves, which are white, and ſtand erect; theſe are ſucceeded by oblong pointed pods, filled with compreſſed ſeeds, crowned with ſoft down. It flowers in June and July, and the ſeeds ripen in October.

This plant is tender, ſo muſt be raiſed in a hot-bed, and tranſplanted into pots filled with rich earth, and plunged into the tan-bed in the ſtove. It muſt have but little water, and conſtantly remain in the ſtove, otherwiſe the plants will not thrive here.

The ſeventeenth ſort is alſo a native of the warm parts of America, the roots of which have been ſent to England for Ipecacuana, from which it may be eaſily diſtinguiſhed by its form, this being compoſed of a great number of ſmall fibres; whereas the true Ipecacuana hath jointed roots, which run deep into the ground, and are fleſhy. There have been may accounts of the bad effects of the uſe of theſe roots, as alſo of the poiſonous quality of the plant; ſo that the public ſhould be cautioned not to make uſe of it, and alſo to be careful not to let the milky juice of the plant mix with any thing which is taken inwardly.

This plant riſes five or ſix feet high, with upright ſtems, garniſhed with ſmooth oblong leaves, placed oppoſite; toward the top of the branches the umbels of flowers come out, which are ſingle, and grow erect; the petals of the flowers are of a ſcarlet colour; and the horny nectarii in the middle are of a bright Saffron colour, which make a pretty appearance; there is commonly a ſucceſſion of theſe flowers on the ſame plant from June to October. The flowers are ſucceeded by long taper pods filled with ſeeds crowned by a ſoft down, which ripen late in the autumn.

It is propagated by ſeeds, which muſt be ſown on a hot-bed in the ſpring, and the plants ſhould be treated in the ſame manner as is before directed for the former ſort; the roots of this may be continued three or four years, but after the ſecond year the plants grow naked, and do not produce ſo many flowers as before; ſo that it is much better to raiſe young plants to ſucceed the other, eſpecially as they produce plenty of ſeeds in England.

The eighteenth ſort riſes with upright ſtems ſix or ſeven feet high, which are garniſhed with thick oval leaves placed oppoſite. The umbels of flowers are ſingle; the flowers are white, of a ſtar figure, having five points; the pods of this ſort are very large, in ſhape like an ox's teſticles, and are filled with flat ſeeds, lying over each other like tiles on a houſe. I received the ſeeds of this ſort from the Right Hon. the Earl of Northumberland, who procured it from India.

This plant is tender, ſo muſt be preſerved conſtantly in the ſtove, and treated in the ſame manner as the two former ſorts, and ſhould have very little wet, eſpecially in the winter.

The nineteenth ſort I received from Carthagena; this hath climbing ſtalks, which faſten themſelves to the neighbouring plants, and riſe to the height of ten or twelve feet; the joints of the ſtalks are pretty diſtant from each other; at each are produced two oblong, ſpear-ſhaped, hairy leaves, growing oppoſite, upon very ſhort foot-ſtalks; the umbels of flowers come out from the wings of the leaves, which are very compact, and the flowers are of a ſulphur colour. Theſe appear in Auguſt, but have not been ſucceeded by ſeeds in England.

This plant is tender, ſo muſt be conſtantly preſerved in the ſtove, and treated in the ſame way as is directed for the former ſorts.

ASCYRUM. Lin. Gen. Plant. 737. Hypericoides. Plum. Nov. Gen. 51. tab. 7. St. Peterſwort.

The CHARACTERS are,

*The empalement is four leaved, the two outer being narrow and oppoſite, the two inner are broad, heart-ſhaped, and erect. The flower hath four oval petals, the two outer are large and placed oppoſite, the two inner are ſmall. In the center is ſituated an oblong germen, with a very ſhort ſtyle, crowned by a ſingle ſtigma. This is attended by a great number of briſtly ſtamina, which are* *joined*

*joined at their base into four bodies, and are crowned with round summits. The germen afterward becomes an oblong pointed seed-vessel, opening in two valves, and filled with small round seeds. The seed-vessel is inclosed by the two large leaves of the empalement.*

This genus of plants is ranged in the third section of Linnæus's eighteenth class, entitled Polyadelphia Polyandria, the flowers having many stamina, which are joined in several bodies.

The SPECIES are,

1. ASCYRUM (*Crux Andreæ*) foliis ovatis caule tereti paniculâ dichotomâ. Lin. Sp. Plant. 787. *St. Peterswort with oval leaves, a taper stalk, and flowers growing in loose spikes from the divisions of the branches.* Hypericoides ex terrâ marianâ floribus exiguis luteis. Pluk. Mant. 104. *called St. Andrew's Cross.*
2. ASCYRUM (*Villosum*) foliis hirsutis caule stricto. Lin. Sp. Plant. 788. *St. Peterswort with hairy leaves and a stiff slender stalk.* Hypericum Virginianum frutescens pilosissimum. Pluk. Alm. 189.
3. ASCYRUM (*Hypericoides*) foliis oblongis, ramis ancipitibus. Lin. Sp. 1108. *St. Peterswort with oblong leaves and a flatted stalk.* Hypericoides frutescens erecta flore luteo. Plum. Nov. Gen. 51.

The first sort is a low plant, whose stalks seldom rise more than six inches high, garnished with small oval leaves, placed by pairs; the stalks are slender, and divide into two toward the top. From between the division of the branches, the loose spikes of yellow flowers are produced very small, so make no appearance; therefore the plant is scarce worthy of a place in gardens, except for the sake of variety. The root is perennial, and the plant may be propagated by laying down its branches; it loves a moist soil and a shady situation. This grows naturally in North America; I was favoured with this plant by the Right Hon. the Earl of Northumberland, who procured it from thence.

The second sort grows about three feet high, with upright stalks, garnished with hairy oblong leaves; the flowers are produced at the ends of the stalks, which are of the shape and colour with common St. Johnswort, but have only four leaves. This hath a perennial root, but the stalks decay every autumn. It may be propagated by parting the roots in autumn, when the stalks decay, and should be planted in a loamy soil; this some years will produce seeds in England. It grows naturally in Virginia.

The third sort grows naturally in South Carolina, from whence I received the seeds. This plant rises a foot and a half high, with flat stalks, garnished with oval smooth leaves growing opposite; the stalks are terminated by three or four yellow flowers, growing close together, which are larger than those of the common St. Johnswort, and the petals of the flowers are hollow. This sort rarely produces seeds in England, but it may be propagated by cuttings made of the young shoots in May, which, if planted in pots, and plunged into a very moderate hot-bed, will take root in five or six weeks, when they may be transplanted into a warm border, where they will endure the cold of our ordinary winters; but in severe frosts they are frequently destroyed, unless the roots are covered with tan to keep out the frost.

These plants have little beauty, so are seldom cultivated but in botanic gardens for the sake of variety.

ASCYRUM BALEARICUM.<br>
ASCYRUM MAGNO FLORE.<br>
ASCYRUM VULGARE. } See HYPERICUM.

ASH-TREE. See FRAXINUS.

ASHES are esteemed a good superficial dressing for corn and meadow land, as they give a new ferment to such lands as are in any degree sluggish and inactive, and enrich those which are jejune and slow, being endowed with singular qualities to make them prolific.

All sorts of ashes, indeed, contain in them a very rich fertile salt, and are the best manure of any to lay upon cold wet land; but then they ought to be kept dry, that the rain may not wash away their salt. Experience has shewn, that the ashes of any sort of vegetable are very advantageous to land, by the improvement that has been made in most places in England, by burning bean-stalks, fern, furze, heath, sedge, straw, stubble, &c.

Coal ashes, or such as are made of Newcastle, Scotch, and other pit-coal, are much recommended by some; but the first are most approved of, because they contain a greater quantity of nitrous and sulphureous matter than the others, though the rest are good.

There is no dressing so good for grass ground as the sea-coal ashes, especially for cold wet land, and where it is subject to rushes or moss; for these will destroy both, and occasion the grass to be much finer: but this dressing should be laid on the land early in winter, otherwise they will do harm the first summer; for when they are laid on the ground in the spring, they will cause the grass to burn as soon as the warmth comes on; whereas those that were put on early enough to receive the winter's rain, will be washed into the ground before the warm season, whereby the grass will have the benefit of it the first year. Where the land is poor and sour, producing rushes and moss only, there should be at least twenty loads of ashes laid upon each acre; for a slight dressing will not answer the design of killing weeds and moss, nor will it be sufficient to enrich land which is cold and sluggish, therefore it will be better to lay a good dressing at first, than to do it at several intervals; for one substantial dressing will continue the land longer in heart than three slight ones, besides the advantage before-mentioned.

But these ought to be applied superficially, and not too near the roots of plants; and if so, there are few plants but will receive benefit by them, by their nitrous and sulphureous qualities being washed down by the rain, which will open by the strength of water, and cause it to heave, in some degree, as lime will do when water is thrown upon it.

Wood-ashes are commended as the principal of superficial dressings for land, in that they contain a vegetative kind of salt.

Kiln-ashes, i. e. such as are made of straw, furze, &c. are, by some, accounted as good as any of the spirituous improvements of lands that are lightish; but for such as are heavy, they are looked upon as scarce solid and ponderous enough. These ashes the maltsters in the west country sift over their corn and grass, which are supposed, by their heat, to cause a fermentation, a hollowness and looseness in the mould; by which means the rains enter it the more easily, and dispose the earth for giving up an assumption of its vegetative augment.

But these being light, ought never to be strewed nor sifted in windy weather, because they would be blown away; and if it could be so ordered as to be done just before snow or rain, it would be the better.

Soap-ashes (i. e. after the soap-boilers have done with them) are very proper for lands that are very cold and sour, and to kill weeds of all sorts: and Sir Hugh Plat mentions one at Ware, who having a piece of land over-run with broom and furze, manured it with soap-ashes, and had an incredible crop of wheat for six years successively.

Pot-ashes, after the pot-ash men have done with them, are esteemed good for most sorts of land; but as they have been wet, and most of the salt drawn off by the lee, they ought to be laid on much thicker than other ashes.

Turf-ashes are very good for all sorts of land, but especially for clay lands, but will be much better if mixed with lime.

But all these ashes ought to be kept dry, from the time they are made till they are used, else the rains will both wash away their goodness, and also make them clod, especially some of the last mentioned, which will prevent their spreading.

And besides, one load of ashes that has been kept dry, will go as far as two that have been exposed to the rain: and coal-ashes, if moistened with cham-

chamber-lye or ſoap-ſuds, will greatly add to their ſtrength.

All calcined vegetables cauſe a fiery heat and vegetation, and, when wet comes, ſet the ground to work, by a ſubtle inſinuation unlocking the clods, and quickening the ſluggiſhneſs of the earth, according to that eſtabliſhed maxim among naturaliſts, That all fermentation is cauſed by the interpoſition or mixture of different qualities one with the other.

It is after this manner that coal-aſhes operate ſo admirably in looſening and mouldering ſtiff clayey grounds, and, as it is uſually termed, making it rough, aſhy, or ſandy-like: and after the ſame manner, ſand mixed with clay does well, eſpecially when it is impregnated with ſaline qualities.

ASPALATHUS. Lin. Gen. Plant. 767. African Broom.

The Characters are,

*The empalement is of one leaf, which is cut into five equal ſegments at the top; the flower is of the butterfly kind. The ſtandard is hairy, compreſſed, and blunt-pointed; the wings are blunt, moon-ſhaped, and ſpread open, being ſhorter than the ſtandard; the keel is bifid, and of the ſame length as the wings. It hath ten ſtamina, nine of which are joined and covered by the ſtandard, the other ſtanding ſeparate; theſe are crowned by oblong ſingle ſummits. In the bottom is ſituated an oval germen ſupporting a ſingle ſtyle, crowned by a pointed ſtigma. The germen afterward becomes an oval oblong pod, incloſing one or two kidney-ſhaped ſeeds.*

This genus of plants is ranged in the third ſection of Dr. Linnæus's ſeventeenth claſs, entitled Diadelphia Decandria, the flowers having ten ſtamina joined in two bodies.

The Species are,

1. Aspalathus (*Chenopoda*) foliis confertis ſubulatis mucronatis hiſpidis floribus capitatis. Lin. Sp. Plant. 711. *Aſpalathus with rough, pointed, awl-ſhaped leaves, growing in cluſters, and flowers in heads.* Geniſta Africana lutea, floribus hirſutis in capitula lanuginoſa conglobatis foliis corrodæ aculeatis ſubhiſſutis. Herm. Cat. 11. *Yellow African Broom.*
2. Aspalathus (*Indica*) foliis quinatis ſeſſilibus pedunculis unifloris. Lin. Sp. Plant. 712. *Five-leaved Aſpalathus growing cloſe to the branches, and one flower on a foot-ſtalk.* Dorycnium Indicum floribus ſingularibus rubris in pedicellis oblongis ſiliquis perexiguis. Raii Supp. 471.
3. Aspalathus (*Argentea*) foliis trinis linearibus ſericeis ſtipulis ſimplicibus mucronatis floribus ſparſis tomentoſis. Lin. Sp. Plant. 713. *Aſpalathus with three narrow ſilky leaves, ſingle-pointed ſtipulæ, and woolly flowers growing thinly.* Cytiſus Africanus anguſtifolius ſericea lanugine argentatus ſpicâ lagopoide. Pluk. Mat. 63.

Theſe plants grow naturally about the Cape of Good Hope, from whence I have received their ſeeds. The firſt is a low ſhrub growing about three feet high, with ſlender branches, garniſhed with many trifoliate leaves growing in cluſters, which are awl-ſhaped, pointed, and rough; at the ends of the branches the flowers come out, which are yellow, collected in woolly heads; theſe are rarely ſucceeded by pods in England. It is propagated by ſeeds, which muſt be obtained from the country where the plants grow naturally, and ſhould be ſown in pots filled with light earth as ſoon as they arrive: if this happens in the autumn, the pots ſhould be plunged into an old tan-bed whoſe heat is ſpent, where they may remain till ſpring, when they ſhould be removed into a moderate hot-bed, which will bring up the plants. But when the ſeeds arrive in the ſpring, the pots in which the ſeeds are ſown ſhould be then plunged into a moderate hot-bed; and in warm weather the glaſſes muſt be ſhaded in the middle of the day, and the pots frequently refreſhed with water. Thoſe ſeeds which are ſown in the ſpring, ſeldom grow the ſame year, therefore in the autumn the pots ſhould be put into an old tan-bed, as was directed for thoſe ſown in autumn, and afterward put in a hot-bed the following ſpring. When the plants come up, and are ſtrong enough to remove, they ſhould be each planted into a ſeparate ſmall pot filled with light earth, and plunged into a moderate hot-bed, to encourage their rooting again; and ſo ſoon as they are eſtabliſhed in the pots, they ſhould by degrees be inured to the open air, into which they ſhould be removed in ſummer, placing them in a ſheltered ſituation, where they may remain till autumn, when they muſt be carried into the green-houſe, and in winter ſhould have but little water.

The ſecond ſort grows about five feet high, with ſlender branches, garniſhed with leaves growing by fives cloſe to the branches; the flowers come out ſingly upon long foot-ſtalks, which are of a pale red colour; theſe appear in Auguſt, but ſeldom are ſucceeded by pods here. This is propagated as the former, and requires the ſame treatment.

The third ſort riſes about four feet high, with a ſhrubby ſtalk dividing into ſlender branches, garniſhed with ſilky leaves, coming out by threes; the flowers are purple, downy, and grow thinly on the branches. This is propagated as the two former, and muſt be treated in the ſame way as is directed for the firſt ſort. It flowers late in the ſummer.

ASPARAGUS, the firſt ſprigs of herbs before unfolded into leaves, and the youngeſt and tendereſt branches that are eatable, are called Aſparagus.

ASPARAGUS [Ἀσπάραγος, *Gr.* ſignifies a young ſhoot putting forth,] Aſparagus, Sparagus, corruptly called Sparrowgraſs.

The Characters are,

*There are male and hermaphrodite flowers upon different roots; the male flowers are tubulous, compoſed of ſix narrow petals, which do not ſpread open, having ſix ſhort ſtamina, but no ſtyle or ſtigma; theſe are barren: the hermaphrodite flowers have ſix petals which ſpread open, ſix ſtamina ſurrounding the germen, and a ſhort ſtyle crowned by an obtuſe ſtigma which is prominent. The germen afterward becomes a round berry, having three cells, each including one or two ſeeds, rounded on their outſide, but angular where they join.*

This genus of plants is ranged by Dr. Linnæus in the firſt ſection of his ſixth claſs, titled Hexandria Monogynia, but with more propriety ſhould be placed in the ſecond order of his twenty-firſt claſs, which includes thoſe plants as have the Polygamia on different roots.

The Species are,

1. Asparagus caule herbaceo erecto, foliis ſetaceis, ſtipulis duabus interioribus, una exteriore. Flor. Suec. 272. *Aſparagus with an upright herbaceous ſtalk, briſtly leaves, having two inner and one outer ſtipula.* Aſparagus ſativa. C. B. P. 489. *Garden Aſparagus.*
2. Asparagus (*Maritimus*) caule inermi herbaceo foliis teretibus longioribus faſciculatis. *Aſparagus with a ſmooth herbaceous ſtalk, and longer taper leaves growing in cluſters.* Aſparagus maritimus craſſiore folio. C. B. P. 490.
3. Asparagus (*Acutifolius*) caule inermi fruticoſo, foliis aciformibus rigidulis perennantibus mucronatis æqualibus. Lin. Sp. 449. *Aſparagus with a ſhrubby ſmooth ſtalk and rigid leaves, with points which abide in winter.* Aſparagus foliis acutis. C. B. P. 490.
4. Asparagus (*Albus*) ſpinis retroflexis, ramis flexuoſis, foliis faſciculatis angulatis muticis deciduis. Lin. Sp. 449. *Aſparagus with flexible branches and chaffy leaves growing in cluſters, which fall off in winter.* Aſparagus aculeatis ſpinis horridus. C. B. P. 490.
5. Asparagus (*Retrofractus*) aculeis ſolitariis ramis reflexis retrofractiſque, foliis faſciculatis. Lin. Sp. Plant. 313. *Aſparagus with ſingle ſpines, reflexed branches, and leaves growing in cluſters.* Aſparagus Africanus tenuifolius, viminalibus virgis, foliis laricis ad inſtar ex uno puncto numeroſis ſtellatim poſitis. Pluk. Alm. 40. tab. 375.
6. Asparagus (*Aphyllus*) aphyllus ſpinis ſubulatis ſtriatis inæqualibus divergentibus. Hort. Cliff. 122. *Aſparagus without leaves, and awl-ſhaped unequal ſpines which ſpread from each other.* Aſparagus aculeatus



alter,

alter, tribus aut quatuor spinis ad eundem exortum. C. B. P. 490.

7. ASPARAGUS (*Declinatus*) caule inermi ramis declinatis foliis setaceis. Prod. Leyd. 29. *Asparagus with a smooth stalk, declining branches, and bristly leaves.*

8. ASPARAGUS (*Asiaticus*) aculeis solitariis caule erecto foliis fasciculatis, ramis filiformibus. Lin. Sp. Plant. 313. *Asparagus with single spines, an upright stalk, leaves growing in clusters, and very slender branches.*

9. ASPARAGUS (*Capensis*) spinis lateralibus terminalibusque, ramis aggregatis foliis fasciculatis. Lin. Sp. Plant. 314. *Asparagus with spines growing on the sides and ends of the branches, which are in bunches, and leaves coming out in clusters.*

10. ASPARAGUS (*Sarmentosus*) foliis solitariis lineari lanceolatis caule flexuoso aculeis recurvis. Flor. Zeyl. 124. *Asparagus with single, narrow, spear-shaped leaves, a flexible stalk, and recurved spines.* Asparagus aculeatus Zeylanicus maximus sarmentosus. H. L. 62.

The first sort is the common Asparagus, which is cultivated for the use of the table, and may have probably been brought by culture to the perfection it now is, from the wild sort, which grows naturally in the fens of Lincolnshire, where the shoots are no larger than straws; but if so, it must have been from very long culture and good management; for a friend of mine, who procured some seeds of the wild sort, which he cultivated with great care, in very rich ground, yet could not bring the roots to produce shoots more than half the size of the garden kind, which grew on the same ground; but he always found the wild sort came up a week or ten days earlier in the spring, and the shoots were exceeding sweet.

I have lately had some doubt, whether the sort of Asparagus which grows naturally in England, was the same with that mentioned by Casper Bauhin, because Tournefort and Vaillant both assert that they had cultivated that wild sort in the royal garden at Paris several years, and it had never altered, therefore I procured specimens of that, which I find to be extremely different from the English sort. The leaves are much finer and shorter, and are produced in much larger clusters; the branches grow much closer together, and the foot-stalks of the flowers are longer; therefore I believe it to be a distinct species from our wild sort, which appears to me undoubtedly the same as the Garden Asparagus.

The Garden Asparagus is propagated by seeds, in the procuring of which, there should be particular care to get it from a person of skill, who may be depended upon for his choice of the shoots, and integrity in supplying with his best seeds. But where a person is in possession of some good beds of Asparagus, it is much the best way to save it himself; in order to which, a sufficient number of the fairest buds should be marked early in the spring, and permitted to run up for seeds; because those which run up after the season for cutting the Asparagus is over, are generally so backward, as not to ripen the seeds unless the summer is warm, and the autumn very favourable. In the choice of the buds to be left for seeds, there must be great regard had to their size and roundness, never leaving any that are inclinable to be flat, or that soon grow open headed, always choosing the roundest, and such as have the closest tops. But as several of these produce only male flowers which are barren, a greater number of buds should be left, than might be necessary, if there could be a certainty of their being all fruitful. When the buds are left, it will be proper to thrust a stick down by each, but there must be care had in doing this, not to injure the crown of the root. These sticks will serve as marks to distinguish them from the others when they are all run up. Toward the end of September the berries will be fully ripe, when the stalks should be cut off, and the berries stripped into a tub, in which they may remain three weeks or a month to sweat, by which means the outer husks will be rotten; then fill the tub with water, and with your hands break all the husks by squeezing them between your hands. These husks will all swim upon the water, but the seeds will sink to the bottom; so that by pouring off the water gently, the husks will be carried along with it, and by putting fresh water two or three times, and stirring your seed about, you will make it entirely clean: then spread the seed upon a mat or cloth, and expose it to the sun and air in dry weather, until it is perfectly dry, when it may be put into a bag, and hanged up in a dry place till the beginning of February, which is the proper season for sowing it; at which time you must prepare a bed of good rich earth made very level, whereon you must sow your seeds (but not too thick, which will cause the plants to be small;) then tread the bed all over to bury the seed in the ground, and rake it over smooth.

The following summer keep the ground diligently cleared from weeds, which will greatly add to the strength of the plants; and toward the latter end of October, when the haulm is quite withered, you may spread a little rotten dung over the surface of the ground, about two inches thick, which will preserve the young buds from being hurt with the frosts, &c.

The spring following the plants will be fit to plant out for good (for plants of more than one year's growth are unfit to remove, as I have often experienced; for young plants are much better than old, and will produce finer roots:) you must therefore prepare your ground by trenching it well, burying therein a good quantity of rotten dung at the bottom of each trench, that it may lie at least six inches below the surface of the ground; then level the whole plot very exactly, taking out all large stones: but this should not be done long before you intend to plant your Asparagus, in which you must be governed according to the nature of your soil or the season; for if your soil is dry and the season forward, you may plant early in March; but in a wet soil, it is better to wait till the end of that month, or the beginning of April, which is about the season that the plants are beginning to shoot. I know many people have advised the planting of Asparagus at Michaelmas, but this I have experienced to be very wrong; for in two different years I was obliged to transplant large quantities at that season, but I had better have thrown away the plants; for upon examination in the spring, I found most of the roots were grown mouldy, and decaying, and I am sure, not one in five of them succeeded, and those which did were so weak, as not to be worth their standing.

The season being come for planting, you must, with a narrow pronged dung-fork, carefully fork up the roots, shaking them out of the earth, and separating them from each other, observing to lay their heads even, for the more convenient planting them, which must be performed in this manner:

The plot of ground being levelled, you must begin at one side thereof, ranging a line very tight cross the piece, throwing out a trench exactly strait, by the line about six inches deep, being careful not to turn up the dung; into which trench you may lay your roots, spreading them with your fingers, and placing them upright against the back of the trench, that the buds may stand forward, and be about two inches below the surface of the ground, and at twelve inches distance from each other; then with a rake, draw the earth into the trench again, laying it very level, which will preserve the roots in their right position; then remove the line a foot farther back, and make another trench in the like manner, laying therein your plants as before directed, and continuing the same distance row from row, only observing between every four rows, to leave a distance of two feet four inches for an alley to go between the beds to cut the Asparagus, &c.

The plot of ground being finished and levelled, you may sow thereon a small crop of Onions, which will not hurt the Asparagus, provided the Onions are not too close, and tread in the seeds, raking the ground level.

There are some persons who plant the seeds of Asparagus in the place where the roots are to remain, which is a very good method, if it is performed with care. The way is this: after the ground has been well trenched and dunged, they lay it level, and draw a line cross the ground (in the same manner as is practised for planting of the young plants;) then with a dibble make holes at a foot distance, into each of which they drop two seeds, for fear one should miscarry; these holes should not be more than half an inch deep; then cover the seeds, by striking the earth in upon it, and go on removing the line a foot back for another row; and after four rows are finished, leave a space for an alley between the beds, if it is designed to stand for the natural season of cutting; but if it is to be taken up for hot-beds, there may be six rows planted in each bed, and the distance in the rows need not be more than nine inches. This should be performed by the middle of February, because the seeds lie long in the ground; but if Onions are intended to be sown upon the ground, that may be performed a fortnight or three weeks after, provided the ground is not stirred so deep as to disturb the Asparagus-seeds, in raking the Onion-seeds into the ground.

As the roots of Asparagus always send forth many long fibres which run deep into the ground, so when the seeds are sown where they are to remain, the roots will not be broken or injured, as those must be which are transplanted; therefore will shoot deeper into the ground, and make much greater progress, and the fibres will push out on every side, which will cause the crown of the root to be in the center; whereas in transplanting, the roots are made flat against the side of the trench.

When the Asparagus is come up, and the Onions have raised their seed-leaves upright (which will be in six weeks after planting) you must with a small hoe cut up all the weeds, and thin the crop of Onions where they may have come up in bunches: but this must be done carefully, and in dry weather, that the weeds may die as fast as they are cut up, being careful not to injure the young shoots of Asparagus, as also to cut up the Onions which grow near the shoots. This work must be repeated about three times, which, if well done, and the season not too wet, will keep the ground clear from weeds until the Onions are fit to be pulled up, which is commonly in August, and is known when their greens fall down and begin to wither. When you have drawn off the Onions, it will be necessary to clean the ground well from weeds, which will keep it clean till the alleys are dug to earth the beds, which must be done in October, when the haulm is decayed; for if you cut off the haulm while green, the roots will shoot fresh again, which will greatly weaken them. This young haulm should be cut off with a knife, leaving the stems two inches above ground, which will be a guide for you to distinguish the beds from the alleys; then with a hoe clear off the weeds into the alleys, and dig up the alleys, burying the weeds in the bottom, and throw the earth upon the beds, so that the beds may be about four or five inches above the level of the alleys: then a row of Coleworts may be planted in the middle of the alleys, but never sow or plant any thing upon the beds, which would greatly weaken the roots; nor would I ever advise the planting of Beans in the alleys, as is the practice of many; for that greatly damages the two outside rows of Asparagus. In this manner it must remain till spring, when some time in March, the beds should be hoed over, to destroy all young weeds; then rake them smooth, and observe all the succeeding summer to keep them clear from weeds, and in October dig up the alleys again, as was before directed, earthing the beds, &c.

The second spring after planting, some persons begin to cut some of the buds of Asparagus for use, though it would be much better to stay until the third year; therefore now the beds should be forked with a flat-pronged fork made on purpose, which is commonly called an Asparagus-fork: this must be done before the buds begin to shoot in the spring, and should be performed with care, lest you fork too deep, and bruise the head of the root; then rake the beds over smooth, just before the buds appear above ground, which will destroy all young weeds, and keep your beds clean much longer than if left unraked, or if done so soon as forked. When the buds appear about four inches above ground, you may then cut them; but it should be done sparingly, only taking the large buds, and suffering the small to run up to strengthen the roots; for the more you cut, the greater will be the increase of buds, but they will be smaller and the roots sooner decay. In cutting the buds, you must open the ground with your knife (which should be very narrow-pointed, and long in the blade, and filed with teeth like a saw) to see whether any more young buds are coming up close by it, which might be either broken or bruised in cutting the other, then with the knife saw it off about two inches under ground. This may appear a very troublesome affair to people unacquainted with the practical part, but those who are employed in cutting Asparagus, will perform a great deal of this work in a short time; but care in doing it is absolutely necessary to be observed by all who cut Asparagus.

The manner of dressing the Asparagus-beds is every year the same as directed for the second, viz. keeping them clean from weeds in summer, digging the alleys in October, and forking the beds toward the end of March, &c. only observe every other year to lay some rotten dung (from a Melon or Cucumber-bed) all over the beds, burying some in the alleys also, at the time for digging them up. This will preserve the ground in heart to maintain the roots in vigour, and by this management, a plot of good Asparagus may be continued for ten or twelve years in cutting, and will produce good buds, especially if it is not cut too long each season; for when it is not left to run up pretty early in June, the roots will be greatly weakened, and the buds will be smaller: therefore, in those families where Asparagus is required late in the season, a few beds should be set apart for that purpose, which will be much better than to injure the whole plantation, by cutting it too long.

I cannot help taking notice of a common error that has long prevailed with many people, which is, that of not dunging the ground for Asparagus, believing that the dung communicates a strong rank taste to the Asparagus, which is a great mistake, for the sweetest Asparagus is that which grows upon the richest ground; for poor land occasions that rank taste so often complained of, the sweetness of Asparagus being occasioned by the quickness of its growth, which is always proportionable to the goodness of the ground, and the warmth of the seasons. In order to prove this, I planted two beds of Asparagus, upon ground which had dung laid a foot thick; and these beds were every year dunged extremely thick, and the Asparagus produced from these beds was much sweeter than any I could procure, though they were boiled together in the same water.

The quantity of ground necessary to be planted with Asparagus, to supply a small family, should be at least eight rods, less than that will not do; for if you cannot cut one hundred at a time, it will scarcely be worth while, for you must be obliged to keep it after it is cut two or three days, especially in cold seasons, to furnish enough for one mess; but for a larger family, sixteen rods of ground should be planted, which, if a good crop, will furnish two or three hundred each day in the height of the season.

But as there are several people who delight in having early Asparagus, which is become a very great trade in the kitchen-gardens near London, I shall give proper directions for the obtaining it any time in winter.

You must first be provided with a quantity of good roots (either of your own raising, or purchased from

ſuch gardeners as plant for ſale,) ſuch as have been two or three years planted out from the ſeed-bed; and having fixed upon the time you would willingly have your Aſparagus fit to cut, about ſix weeks before, you ſhould prepare a quantity of new ſtable horſe-dung, which ſhould be thrown in a heap for ten days or more, to ferment, mixing ſome ſea-coal aſhes with it; then it ſhould be turned over into a heap, where it muſt lie another week, when it will be fit for uſe. Then dig out a trench in the ground where you intend to make the bed, the width of the frames that are deſigned to cover it, and the length in proportion to the quantity you intend to have (which if deſigned only to ſupply a ſmall family, three or four lights at a time will be ſufficient,) but for a larger family, ſix or eight lights will not be too much: then lay down your dung into the trench, working it very regularly, and beat it down very tight with a fork, laying it at leaſt three feet in thickneſs or more, when the beds are made in December; then put your earth thereon about ſix inches thick, breaking the clods and laying it level; and at one end, begin laying your roots againſt a little ridge of earth, raiſed about four inches high: your roots muſt be laid as cloſe as poſſible one to the other, in rows, with their buds ſtanding upright; and between every row lay a ſmall quantity of fine mould, obſerving to keep the crown of the roots exactly level. When you have finiſhed laying your bed with roots, you muſt lay ſome ſtiff earth up to the roots, on the outſides of the bed, which are bare, to keep them from drying; and thruſt two or three ſharp-pointed ſticks, about two feet long, down between the roots, in the middle of the bed, at a diſtance from each other. The uſe of theſe ſticks is to inform you what temper of heat the bed is in, which you may find by drawing up the ſticks, and feeling the lower part; and if, after the bed has been made a week, you find it doth not heat, you may lay a little ſtraw or litter round the ſides, and alſo upon the top, which will greatly help it; or if you find it very hot, ſo as to endanger ſcorching of the roots, it will be adviſable to let it remain wholly uncovered, and to thruſt a large ſtick into the dung, on each ſide of the bed, in two or three places, to make holes for the great ſteam of the bed to paſs off, which in a ſhort time will reduce the bed to a moderate heat.

After the bed has been made a fortnight, you muſt cover the crowns of the roots with fine earth, about two inches thick; and when the buds begin to appear above ground through that earth, you muſt again lay on a freſh quantity, about three inches thick; ſo that in the whole, it may be five inches above the crowns of the root, which will be ſufficient.

Then you muſt make a band of ſtraw (or long litter,) about four inches thick, which muſt be faſtened round the ſides of the bed, that the upper part may be level with the ſurface of the ground: this muſt be faſtened with ſtrait ſticks about two feet long, ſharpened at the points, to run into the bed; and upon this band you muſt ſet your frames, and put your glaſſes thereon; but if, after your bed hath been made three weeks, you find the heat decline, you muſt lay a good lining of freſh hot dung round the ſides of the bed, which will add a freſh heat thereto; and in bad weather, as alſo every night, keep the glaſſes covered with mats and ſtraw; but in the day time, let it be all taken off, eſpecially whenever the ſun appears; which, ſhining through the glaſſes, will give a good colour to the Aſparagus.

A bed thus made, if it works kindly, will begin to produce buds for cutting, in about five or ſix weeks, and will hold about three weeks in cutting; which, if rightly planted with good roots, will produce, in that time, about three hundred buds in each light; ſo that where Aſparagus is propoſed to be continued until the ſeaſon of the natural being produced, a freſh bed ſhould be made every three weeks, until the beginning of March, from the time of the firſt bed being made; for if the laſt bed is made about a week in March, it will laſt till the ſeaſon of natural Aſparagus; for the laſt beds will come a fortnight ſooner to cut after making, than thoſe made about Chriſtmas; and the buds will be larger, and better coloured, as they will then enjoy a greater ſhare of the ſun.

Where this method of forcing early Aſparagus is intended, there ſhould be every year ſuch a quantity planted, which you ſhall judge neceſſary (unleſs you intend to buy the roots from ſome other garden;) the quantity of roots neceſſary to plant one light, is commonly known by the meaſure of the ground where they grow; for where there is a good crop, and few roots are miſſing, one rod of ground will furniſh enough for a light; but this calculation is made from the ground planted with roots, which are deſigned to be taken up after two or three years growth for forcing, in which there are ſix rows in a bed, at but ten inches diſtance, and the plants eight or nine inches aſunder in the rows; but where there is a greater ſpace between the rows, and fewer rows in a bed, then there muſt be a greater quantity of ground allotted for each light. Moſt of the kitchen-gardeners about London, take up their Aſparagus roots after two years growth from planting; but where the land is not very good, it will be better to let it have three years growth, for if the roots are weak, the buds of Aſparagus will be very ſmall, ſo not worth the trouble of forcing. The beſt ground for planting Aſparagus, to have large roots for hot-beds, is a moiſt rich ſoil; but for thoſe that are to remain for a natural produce, a middling ſoil, neither too wet nor too dry; but a freſh ſandy loam, when well dunged, is preferable to any other.

The ſecond ſort is mentioned to grow naturally in Wales, and alſo near Briſtol: I have received ſeeds from the iſland of Portland, which have ſucceeded in the Chelſea garden, by which I am convinced it is a different ſpecies from the Garden Aſparagus; and alſo from the wild ſort which grows naturally at Gibraltar, and alſo near Montpelier, is different from both; Mr. Magnol, of Montpelier, was alſo of the opinion that it was a different ſpecies, for he ſays, the common wild Aſparagus and this grew near each other in the neighbourhood of Montpelier, and the young ſhoots of the former were ſweet, whereas thoſe of the latter were bitter. The ſame has been confirmed to me by ſeveral gentlemen, who have reſided many years at Gibraltar and Minorca, where the ſecond ſort grows naturally in plenty.

This ſort is propagated by ſeeds in the ſame manner as the garden kind, but muſt have a warmer ſituation; and the roots ſhould be well covered in winter, to prevent the froſt from penetrating the ground, which will deſtroy it.

The third ſort hath white, crooked, ſhrubby ſtalks, which riſe four or five feet high, but have no ſpines on them; the leaves come out in cluſters from the ſame point, like thoſe of the Larch-tree; theſe are very ſhort, and end in ſharp prickles, ſo that they are troubleſome to handle. This ſort grows naturally in the South of France, Spain, and Portugal. It is propagated by ſeeds as the former ſorts, but is too tender to live abroad in England, ſo the roots ſhould be planted in pots, or near a ſouth wall, and ſheltered in winter.

The fourth ſort grows with ſhrubby ſtalks three or four feet high, with very white bark, and are armed with thorns which are ſingle, coming out juſt below each turf of leaves. Theſe ſtalks continue ſeveral years, and put out many branches, garniſhed with narrow ſhort leaves. Theſe continue green all the winter, if the plants are ſcreened from ſevere froſt.

It is propagated by ſeeds as the former, which may be procured from the Mediterranean, where it grows naturally; ſome of the plants ſhould be kept in pots, that they may be ſheltered in winter, and the others may be planted in the full ground in a warm ſituation, and in hard froſts covered, otherwiſe it will not live abroad in this country.

The fifth ſort grows naturally at the Cape of Good Hope. This hath very crooked irregular ſtalks, which are

are shrubby; and rise eight or ten feet high, putting out several weak side branches, garnished with long narrow leaves, coming out in clusters like those of the Larch-tree; under each of these clusters is placed a single sharp thorn. The stalks continue several years, and the leaves keep green all the winter. This is commonly propagated by parting the roots, because the plants rarely produce seeds in this country; the best time for this is in April. The roots must be planted in pots, and removed into the green-house in the autumn, for these plants will not live abroad in England.

The sixth sort grows naturally in Spain, Portugal, and Sicily, generally in rocky places. This sends up many weak irregular shoots, which have no leaves, but instead thereof, are armed with short stiff thorns, which come out four or five together from the same point, and spread from each other every way. The flowers are small, of an herbaceous colour; the berries are larger than those of the common sort, and are black when ripe. This is tender, so must be treated as the third sort.

The seventh sort grows naturally at the Cape of Good Hope. This sends up from the root several slender stalks, which put out weak branches, declining downward; these are closely garnished with bristly leaves, like those of Garden Asparagus, which continue green through the year. It hath not produced any seeds in England, so is only propagated by parting the roots, as the fifth sort, and the plants should be treated in the same manner.

The eighth sort grows naturally at the Cape of Good Hope; this sends up many weak shoots growing in clusters, which are armed with sharp spines, both on the side and ends of the shoots; the leaves come out in small clusters, which continue green all the year. This doth not produce seeds in England, so is propagated as the fifth sort, and requires the same treatment.

The tenth sort sends out from the root many weak climbing branches which rise five or six feet high, garnished with narrow spear-shaped leaves coming out single; the shoots are armed with short crooked spines, which render it very troublesome to handle the plants; for they are so closely set on, that it is difficult to touch the branches. This is propagated by parting the root; but the plants must be placed in a moderate stove, otherwise it will not thrive in this country. It grows naturally in the island of Ceylon.

These plants are preserved in the gardens of the curious, where they add to the variety; being not difficult to manage, where there is conveniency to house them in winter. They should have a place among other exotic plants.

ASPARAGUS SCANDENS. See Medeola.

ASPEN-TREE. See Populus.

ASPERIFOLIOUS plants [asperifolius, of asper, rough, and folium, *Lat.* a leaf] are such plants as are rough-leaved, having their leaves placed alternately, or without any certain order, on their stalks: the class of plants so denominated by Mr. Ray, have a monopetalous flower, cut or divided into five parts; after every flower there succeed commonly four seeds. Of this class are Buglofs, Borage, Comfrey, Hounds Tongue, &c.

ASPERUGO, small Wild Buglofs.

The Characters are,

*The empalement is of one leaf, cut slightly at the top into five equal parts; the flower is of one leaf, having a short cylindrical tube, cut at the top into five small blunt parts, which are closed at their base: it hath five short stamina, crowned by oblong summits; in the center there are four compressed germen, supporting a short slender style, crowned by a blunt stigma. The germen afterward become four oblong seeds, inclosed in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, entitled Pentandria Monogynia, the flower having five stamina and one style.

We know but one Species of this genus, which is, Asperugo. Flor. Lapp. 76. *Small Wild Buglofs, Great Goose Grass, or German Madwort.* Buglossum sylvestre caulibus procumbentibus. C. B. P. 257.

This is an annual plant, which is found wild in some parts of England, as near Newmarket, at Boxley in Sussex, and in Holy Island. It is preserved in botanic gardens for variety, and may be easily propagated by seeds, which should be sown in autumn; for if the seeds are kept out of the ground till spring, they do not succeed so well. When the plants come up, they require no other culture but to keep them clear from weeds, and in May they will flower: in June their seeds will be perfected, which, if suffered to scatter, will grow again in autumn; so that when this plant is once brought into a garden, it will maintain itself, provided it be allowed a place.

ASPERULA, Woodroof.

This plant grows wild in shady woods in many parts of England, and flowers in April or May, and is sometimes used in medicine.

Dr. Linnæus has joined to this genus the Gallium album, Gallium montanum, and Rubiæ synanchica Saxatilis. C. B. But as these grow wild in England, and are rarely admitted into gardens, I shall pass them over with just mentioning them.

ASPHODELUS ['Ασφόδελος, *Gr.* by Pliny it is called Hastula, or Baccillus Regius, because when it flowers, the stalk resembles a royal scepter.] King's Spear.

The Characters are,

*The flower has no empalement; it is of one leaf, cut into six parts, which spread open; at the bottom is inserted a globular nectarium, having six valves; it hath six awl-shaped stamina, which are inserted in the valves of the nectarium, and are crowned by oblong summits, which are prostrate, and turn upward; between the nectarium is placed a globular germen, supporting an awl-shaped style, crowned by a club-like stigma: the empalement afterward becomes a fleshy globular seed-vessel, having three cells, which are filled with triangular seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, entitled Hexandria Monogynia, the flower having six stamina and one style.

The Species are,

1. Asphodelus (*Luteus*) caule folioso, foliis triquetris fistulosis. Hort. Cliff. 127. *King's Spear with a leafy stalk, and triangular fistular leaves.* Asphodelus luteus & flore & radice. C. B. P. 28.
2. Asphodelus (*Ramosus*) caule nudo foliis ensiformibus carinatis lævibus. Lin. Mat. Med. 172. *King's Spear with a naked branching stalk, and smooth, sword-shaped, carinated leaves.* Asphodelus albus ramosus mas. C. B. P. 28.
3. Asphodelus (*Albus*) caule nudo simplici foliis lineari-ensiformibus. *King's Spear with a single naked stalk, and narrow sword-shaped leaves.* Asphodelus albus non ramosus. C. B. P. 28.
4. Asphodelus (*Fistulosus*) caule nudo foliis strictis subulatis striatis subfistulosis. Hort. Cliff. 83. *King's Spear with a naked stalk, fistular awl-shaped leaves, and an annual root.* Phalangium parvo flore ramosum foliis fistulosis annuum. H. L.

The first sort is the yellow Asphodel, which is directed for use in medicine; this hath roots composed of many thick, fleshy, yellow fibres, joined into a head at the top; from whence arise strong, round, single stalks, near three feet high, garnished their whole length with long triangular leaves, which are boat-shaped, of a sea-green colour; the upper part of the stalk is adorned half way with yellow star-shaped flowers, which begin opening from the bottom, and are followed by others above; so that on the same spike, there is often a succession of flowers for a month. It flowers in June, and the seeds ripen in autumn.

There is a variety of this with a larger flower, mentioned in the catalogue of the Royal Garden at Paris, by the title of Asphodelus spiralis luteus Italicus magno flore, the seeds of which I received from the garden at Pisa, some years ago; and the first year of the plants flowering in Chelsea garden, the flowers were larger, and the spikes longer than those of the common

common ſort; but in two years time, they were ſo like the common ſort as not to be diſtinguiſhed from it, as were alſo the young plants which were raiſed from the ſeed ſaved at Chelſea, therefore it ſhould be eſteemed an accidental variety.

The ſecond ſort hath roots compoſed of many thick fleſhy fibres; to each of which is faſtened an oblong tuber, as large as ſmall potatoes; the leaves are long and flexible, having acute edges; theſe grow in irregular cluſters, from the crown of the root; between theſe come out the ſtalks, which riſe more than three feet high, ſending out ſeveral ſide branches, which are naked; the upper part of theſe are adorned with many white ſtar-ſhaped flowers, conſiſting of one leaf cut into ſix parts, each having a purple line running lengthways on the outſide of each ſegment. The flowers grow in long ſpikes, flowering gradually upward. They appear the beginning of June, and the ſeeds ripen in autumn.

The third ſort hath roots like the ſecond, but the leaves are longer and narrower; the ſtalks of this are ſingle, never putting out any ſide branches; the flowers are of a purer white, and grow in longer ſpikes. This flowers at the ſame time with the former.

The fourth ſort is an annual plant; the roots of this are compoſed of many fleſhy yellow fibres, the leaves are ſpread out from the crown of the root, cloſe to the ground, in a large cluſter; they are convex on their under ſide, but plain above, and hollow like a pipe; the flower-ſtalks riſe immediately from the root, and grow about two feet high, dividing into three or four branches upward, which are adorned with white ſtarry flowers, with purple lines on the outſide. Theſe flower in July and Auguſt, and their ſeeds ripen in October, ſoon after which the Plants decay. It grows naturally in the ſouth of France, Spain, and Italy.

The firſt ſort grows naturally in many of the iſlands of the Archipelago, and alſo in Sicily. The ſecond, third, and fourth ſorts grow naturally in Portugal, Spain, and Italy; the third ſort is not quite ſo hardy as either of the other, ſo in very ſevere froſt is ſometimes killed, unleſs the roots are covered in winter.

The yellow ſort multiplies very faſt by roots, and will ſoon overſpread a large border, if ſuffered to remain unremoved, or the ſide roots are not taken off; but the other ſorts are not ſo productive of ſhoots from their ſides, and are much better kept within bounds.

The ſecond and third ſorts do not increaſe very faſt by their roots, nor ſhould they be often tranſplanted, for that will weaken them, ſo that their flower-ſtems will not riſe ſo tall, or produce ſo many flowers, as when they are left undiſturbed for ſome years; therefore the beſt way is to propagate theſe by ſeeds.

Theſe three ſorts of Aſphodel are very pretty ornaments for a flower-garden, and, requiring very little trouble to cultivate them, are rendered more acceptable. They may be all propagated by ſeeds, which ſhould be ſown ſoon after they are ripe, on a warm border of light freſh earth: in the ſpring the plants will appear, when you ſhould carefully clear them from weeds, and in dry weather they muſt be frequently watered: if this be duly obſerved, the plants will have acquired ſtrength enough to be tranſplanted by the Michaelmas following; at which time you muſt prepare a bed of freſh earth in the flower nurſery, into which you ſhould plant the roots, at about ſix inches diſtance every way; obſerving to plant them ſo low, as that the top of the roots may be three or four inches under the ſurface of the bed; and ſome old tan, or dung, ſhould be ſpread over the furface of the ground, to keep out the froſt: in this bed they may remain one year, during which time they ſhould be kept clear from weeds; by which time, the roots having acquired ſtrength enough to produce flowers the following year, they ſhould, in autumn, when their leaves are decayed, be carefully taken up, and tranſplanted into the flower-garden, obſerving to place them in the middle of the borders, amongſt other hardy kinds of flowers, where being properly intermixed, they will make an agreeable variety, and continue a long time in flower.

The fourth ſort is an annual plant, ſo is only propagated by ſeeds; theſe ſhould be ſown in the autumn, when they will more certainly grow than if ſown in the ſpring: when the plants are up, they will require no other trouble but to keep them clean from weeds, until they have put out four or five leaves, when they ſhould be carefully removed to the places where they are to remain for good. If the ſeeds of this plant are permitted to ſcatter, the plants will come up without care, and thoſe which are not removed, will be the ſtrongeſt plants, and produce a greater number of flowers.

ASPLENIUM, or Ceterach [is ſo called from ἀ privative, and σπλὴν the ſpleen, becauſe good againſt diſeaſes of the ſpleen.] Spleenwort or Miltwaſte.

The Characters are,

*The leaves are like thoſe of the Polypody, but leſs, and pretty round, notched toward the ſide; downy on their under ſide, having a ſquamous duſt, in which, by the help of a microſcope, membranous capſulæ, or ſeed pods, lying cloſe to one another, are perceived, every one furniſhed with a little round cord, which by its conſtruction opening the fruit into two parts, pours forth certain very ſmall ſeeds: the root is fibrous. This plant thrives in ſtony places, as in walls, &c.*

This plant is of the Fern kind, and grows upon old moiſt ſhady walls in divers parts of England; but is never cultivated in gardens. There are ſeveral ſpecies of this plant in America, but they have not been introduced into England.

ASTER [Ἀςὴρ, *Gr.* a Star; ſo called becauſe the flower is radiated with little leaves after the manner of a ſtar.] Starwort.

The Characters are,

*It hath a compound flower, compoſed of ſeveral female and hermaphrodite florets, included in one common ſcaly empalement; the rays or border of the flower is compoſed of ſeveral female florets, whoſe upper parts are ſtretched out on one ſide like a tongue, and indented in three ſegments at the end; the hermaphrodite florets form the diſk or middle; which are funnel-ſhaped, and divided at the top into five parts, ſpreading open, and have each five ſhort ſlender ſtamina, crowned with cylindrical ſummits; in the bottom is placed a crowned germen, ſupporting a ſlender ſtyle, crowned by a bifid ſtigma; the germen afterward becomes an oblong ſeed, crowned with down: the female flowers have a germen ſupporting a ſlender ſtyle, crowned by two oblong ſtigma, which turn backward. Theſe have no ſtamina, but in other reſpects are like the hermaphrodite flowers.*

This genus of plants is ranged in the ſecond ſection of Linnæus's nineteenth claſs, intitled Syngeneſia Polygamia ſuperflua, from the ſame flower having female and hermaphrodite florets included in the ſame empalement.

The Species are,

1. Aster (*Alpinus*) foliis lanceolatis hirtis, radicalibus obtuſis, caule ſimpliciſſimo unifloro. Lin. Sp. Plant. 872. *Starwort with hairy ſpear-ſhaped leaves, thoſe at the root blunt, and a ſingle ſtalk, having one flower.* After montanus cæruleus magno flore foliis oblongis. C. B. P. 267.
2. Aster (*Amellus*) foliis lanceolatis obtuſis ſcabris trinerviis integris, pedunculis nudiuſculis corymboſis ſquamis calycinis obtuſis. Lin. Sp. Plant. 873. *Starwort with rough, blunt, ſpear-ſhaped leaves, which are entire, having three veins, naked foot-ſtalks, flowers in a corymbus, and blunt ſcales to the empalement.* After atticus cæruleus vulgaris. C. B. P. 267. *vulgarly called Italian Starwort.*
3. Aster (*Tripolium*) foliis lanceolatis integerrimis carnoſis glabris ramis inæquatis, floribus corymboſis. Lin. Sp. Plant. 872. *Starwort with ſmooth, fleſhy, ſpear-ſhaped leaves, which are entire, unequal branches, and flowers in a corymbus.* After maritimus Tripolium dictus. Raii Hiſt. 270.
4. Aster (*Linifolius*) foliis linearibus acutis integerrimis, caule corymboſo ramoſiſſimo. Hort. Cliff. 408. *Starwort*

*wort with narrow pointed leaves, which are entire, and a very branchy stalk growing in a corymbus.* Aster Tripolii flore angustissimo & tenuissimo folio. Mor. Hist. 3. 121.

5. Aster (*Novæ Angliæ*) foliis lanceolatis alternis integerrimis semiamplexicaulibus, floribus terminalibus. Hort. Cliff. 408. *Starwort with entire spear-shaped leaves, growing alternate, and half embracing the stalks, which are terminated by flowers.* Aster Novæ Angliæ altissimus hirsutus floribus amplis purpuro-violaceis. Par. bat. 98.

6. Aster (*Undulatus*) foliis cordatis amplexicaulibus undulatis subtus tomentosis, floribus racemosis adscendentibus. Hort. Cliff. 408. *Starwort with heart-spear-shaped waved leaves, woolly on their underside, and flowers growing in ascending spikes.* Aster novæ Angliæ purpureus Virgæ aureæ facie & foliis undulatis. Par. bat. 96.

7. Aster (*Puniceus*) foliis semiamplexicaulibus lanceolatis serratis scabris, pedunculis alternis subunifloris calycibus discum superantibus. Hort. Cliff. 408. *Starwort with rough, sawed, spear-shaped leaves, half embracing the stalks, foot-stalks growing alternate, with a single flower on each foot-stalk, whose empalement is higher than the disk.* Aster Americanus latifolius puniceis caulibus. H. L. 649.

8. Aster (*Miser*) floribus ovatis disco radiis longiore. Lin. Sp. Plant. 877. *Starwort with oval flowers, whose disk is longer than the rays.* Aster ericoides Mellioti agriæ umbone. Hort. Elth. 40.

9. Aster (*Novi Belgii*) foliis lanceolatis subserratis sessilibus caule paniculato ramulis unifloris solitariis calycibus squarrosis. Hort. Cliff. 408. *Starwort with spear-shaped jagged leaves, growing close to the stalk, which is loose and spiked, and branches having a single flower with a rough empalement.* Aster Novæ Belgiæ latifolius umbellatus floribus dilutè violaceis. H. L. 66.

10. Aster (*Linarifolius*) foliis lanceolato-linearibus subcarnosis integerrimis planis floribus corymbosis fastigatis pedunculis foliolosis. Lin. Sp. Plant. 874. *Starwort with narrow, spear-shaped, fleshy leaves, which are plain and entire, flowers gathered into a corymbus, and leafy foot-stalks.* Aster Tripolii flore. C. B. P. 267.

11. Aster (*Concolor*) caule simplicissimo foliis oblongo-ovatis sessilibus integerrimis racemo terminali. Flor. Virg. 178. *Starwort with single stalks, oval entire leaves growing close to the stalks, which end in a loose spike.*

12. Aster (*Ericoides*) foliis linearibus integerrimis, caule paniculato, pedunculis racemosis, pedicellis foliosis. Flor. Virg. 124. *Starwort with linear leaves, a paniculated stalk with branching leafy foot-stalks.* Aster ericoides dumosus. Hort. Elth. 40.

13. Aster (*Cordifolia*) foliis cordatis serratis petiolatis, caule paniculato. Hort. Cliff. 408. *Starwort with sawed heart-shaped leaves, having foot-stalks, and a loose spiked stalk.* Aster latifolius autumnalis. Cornut. Canad. 64.

14. Aster (*Tenuifolius*) foliis sub linearibus integerrimus pedunculis foliosis. Lin. Sp. 1227. *Starwort with narrow spear-shaped entire leaves, and leafy foot-stalks.* Aster Americanus Belvidere foliis floribus ex cæruleo albicantibus spicis prælongis. Pluk. Phyt. tab. 78. f. 5.

15. Aster (*Grandiflorus*) caule corymboso foliis lanceolatis reflexis, floribus solitaris, calycibus squarrosis. Flor. Leyd. 168. *Starwort with a corymbous stalk, spear-shaped, reflected leaves, and single flowers with rough empalements.* Aster Virginianus pyramidatus Hyssopi folius asperis calycis squamulis foliaceis. Mart. Cent. 19.

16. Aster (*Scabris*) foliis lanceolatis scabris integris, caule ramoso, pedunculis foliosis, calycibus obtusis. *Starwort with rough spear-shaped entire leaves, and a branching stalk, with leafy foot-stalks.* Aster Atticus Alpinus alter. C. B. P. 267.

17. Aster (*Glabris*) foliis olongo-lanceolatis acutis serratis caule ramoso floribus terminalibus calycibus linearibus erectis. *Starwort with oblong, spear-shaped, pointed sawed leaves, and a branching stalk, terminated by flowers, whose empalements are very narrow, and erect.* Aster Persicæ foliis serratis glabris, floribus sparsis pallidè cæruleis. Dillen. Cat. Oxon.

18. Aster (*Tradescanti*) foliis oblongis acutis basi latioribus semiamplexicaulibus, caule ramoso floribus terminalibus plerumque solitariis. *Starwort with oblong pointed leaves, broad at their base, half embracing the stalks, which are branchy, and terminated with flowers, for the most part singly.* Aster cæruleus serotinus fruticescens Tradescanti. Raii Hist. 269. *commonly called Michaelmas Daisy.*

19. Aster (*Præcox*) caule erecto hirsuto foliis oblongis acutis scabris acutè dentatis semiamplexicaulibus floribus corymbosis, calycibus hirsutis erectis. *Starwort with a hairy upright stalk, oblong pointed rough leaves, sharply indented, half embracing the stalks, and flowers in a corymbus with hairy erect empalements.* Aster Pyrenaicus precox flore cæruleo majori. H. R. Par.

20. Aster (*Altissimus*) caule altissimo hirsuto simplicissimo foliis oblongis acutis basi latioribus semiamplexicaulibus floribus tribus sessilibus terminalibus. *Starwort with a very tall, hairy, unbranched stalk, oblong pointed leaves, which are broader at the base, and half embrace the stalks, which are terminated by three flowers sitting very close.*

21. Aster (*Ramocissimus*) caule ramocissimo patulo, foliis lineari-lanceolatis rigidis, floribus serratim positis pedunculis foliosis. *Starwort with a very branching spreading stalk, narrow, spear-shaped, stiff leaves, flowers placed one above another, and leafy foot-stalks.*

22. Aster (*Umbellatus*) foliis lanceolatis acutis scabris, caule simplici floribus umbellatis terminalibus. *Starwort with rough pointed spear-shaped leaves, and a single stalk, terminated by flowers, growing in an umbel.*

23. Aster (*Nervosus*) foliis nervosis lanceolatis acutis linearibus caule simplici floribus terminalibus quasi umbellatum dispositis. *Starwort with narrow, spear-shaped, pointed, nervous leaves, a single stalk, terminated by flowers growing almost in an umbel.*

24. Aster (*Paniculatus*) foliis inferioribus ovatis basi semiamplexicaulibus, superioribus lanceolatis parvis caule paniculato ramis unifloris pedunculis foliosis. *Starwort with the lower leaves oval, whose base half embraces the stalks, the upper leaves small and spear-shaped, a stalk terminated by a loose spike, with a single flower on each branch, and a leafy foot-stalk.*

25. Aster (*Rigidus*) floribus terminalibus solitariis foliis linearibus alternis. Flor. Virg. 98. *Starwort with single flowers at the ends of the branches, and very narrow leaves placed alternately.*

26. Aster (*Latifolius*) foliis lineari-lanceolatis glabris trinerviis floribus corymbosis terminalibus. *Starwort with smooth spear-shaped leaves, with three veins, and flowers in a corymbus, which terminate the stalks.* Aster latifolius Tripolii flore. H. R. Par.

27. Aster (*Dumosus*) foliis linearibus integerrimis caule paniculato. Hort. Cliff. 408. *Starwort with very narrow leaves, which are entire, and a loose spike of flowers.* Aster Novæ Angliæ linariæ foliis Chamæmeli flore. Par. Bat. Prod. 95.

28. Aster (*Annus*) foliis lanceolatis lateribus inferiorum crenatis, radice annuâ, caule corymboso pedunculis nudis. Hort. Cliff. 409. *Starwort with spear-shaped leaves, the sides of the lower leaves jagged, an annual root, and stalks ending with a corymbus of flowers, with naked foot-stalks.* Aster ramosus annuus Canadensis. Mor. Hist.

29. Aster (*Fruticosus*) foliis linearibus fasciculatis punctatis, pedunculis unifloris nudis, caule fruticoso rugoso. Hort. Cliff. 409. *Starwort with narrow pointed leaves growing in clusters, naked foot-stalks with one flower, and a shrubby stalk.* Aster Africanus frutescens foliis angustis & plerumque conjunctis. Hort. Amst. 2. p. 53.

30. Aster (*Chinensis*) foliis ovatis angulatis dentatis, petiolatis calycibus terminalibus patentibus foliosis. Hort. Cliff. 407. *Starwort with oval angular indented leaves, and the empalements terminated by spreading leaves.* Aster Chenepodii folio annuus, flore ingenti specioso. Hort. Elth. 38.

31. Aster (*Aurantius*) foliis pinnatis. Hort. Cliff. 407. *Starwort with winged leaves.* After Americanus foliis pinnatis & ferratis floribus aurantis. Houft. MSS.

32. Aster (*Procumbens*) foliis ovatis dentatis caule procumbente, pedunculis nudis axillaribus unifloris. *Starwort with oval indented leaves, a trailing ftalk, and naked foot-ftalks proceeding from the fide with a fingle flower.* After Americanus procumbens bellidis minoris facie. Houft. MSS.

33. Aster (*Mutabilis*) foliis lanceolatis ferratis, calycibus fquarrofis, panicula fubfaftigiata. Lin. Sp. 1230. *Starwort with fawed fpear-fhaped leaves, rough flower-cups, and bundled panicles.* After Novi Belgii latifolius paniculatus, floribus faturate violaceis. H. L. 65.

34. Aster (*Sibiricus*) foliis lanceolatis venofis fcabris extimoferratis, caulibus ftriatis, pedunculis tomentofis. Lin. Sp. 1226. *Starwort with veined fpear-fhaped leaves, ftriated ftalks, and woolly foot-ftalks.*

35. Aster (*Divaricatus*) ramis divaricatis, foliis ovatis ferratis, floralibus integerrimis obtufiufculis amplexicaulibus. Flor. Virg. 123. *Starwort with forked branches, oval fawed leaves, thofe near the flowers are obtufe, entire, and embrace the ftalk.* After Americanus latifolius albus, caule ad fummum brachiato. Pluk. Alm. 56.

The firft fort grows naturally upon the Alps, where it feldom rifes more than nine inches high, and when tranfplanted into a garden, not above fixteen. It fends up fingle ftalks from the root, which are thinly garnifhed with oblong leaves; at the top of each ftalk is one large blue flower, fomewhat like thofe of the Italian Starwort. This flowers in June; the root is perennial, but muft be planted in a fhady fituation, and a moift foil. It is propagated by parting the roots, which fhould be done in autumn.

The fecond fort is the Italian Starwort, which was fome years paft more common in the gardens than at prefent; for fince the great variety of American Starworts have been introduced into England, this fort hath not been fo much cultivated, though it is by no means inferior to the beft of them, and, in fome refpects, preferable to moft of them; for it is not fo fubject to creep by the root, as many of the American forts do, whereby they often become troublefome in fmall gardens, nor do the ftalks require fupporting as they do, for thefe feldom grow more than two feet high, and the ftalks are generally ftrong, fo are very rarely broken by the wind. Thefe grow in large clufters from the root, and each of them branch at the top into eight or ten foot-ftalks, each of which is terminated by a fingle large flower, having blue rays, with a yellow difk. It flowers in October, and, in mild feafons, will often continue till the middle of November, during which time they are very ornamental plants in a garden. This fort is propagated by parting the roots, the beft time for this work is foon after they are out of flower, for thofe which are removed in the fpring will not flower fo ftrong the fucceeding autumn. Thefe roots fhould not be removed oftener than every third year, where they are expected to produce many flowers.

It grows naturally in the vallies of Italy, Sicily, and Narbonne, and is generally fuppofed to be the Amellus mentioned by Virgil in his fourth Georgick, to grow in the paftures; the leaves and ftalks being rough and bitter, the cattle feldom browfe upon it, fo that whenever there are any of thefe roots in the fields, they fend up a thick tuft of ftalks, which, being left after the grafs is eaten bare, thefe being full of flowers, make a fine appearance, and therefore might engage the poet's attention.

The third fort grows naturally in falt marfhes, which are flowed by the tides, and is feldom admitted into gardens. It flowers in July and Auguft.

The fourth fort is a native in North America, but has been many years in the Englifh gardens. It fends up many ftrong fhoots from the root every fpring, which rife between two and three feet high, garnifhed with oblong leaves, placed alternately, and half embrace the ftalk with their bafe; from the main ftalks, many fide branches are put out, for near half their length, thefe are garnifhed with fmaller leaves, which diminifh in their fize to the top, where there is a fingle flower, terminating the ftalk, of a blue colour. This flowers in Auguft and September; it is eafily propagated by parting the roots, foon after the flowers are paft, and will thrive in almoft any foil or fituation.

The fifth fort fends up many ftalks from the root, which rife five feet high; garnifhed with fpear-fhaped leaves which are entire, and half embrace the ftalks, which are terminated by large purple violet flowers, growing in a loofe panicle: it flowers in Auguft, and is very hardy, fo may be planted in any foil or fituation, and is propagated by parting the roots.

The fixth fort grows naturally in North America. This hath broad heart-fhaped waved leaves at the bottom, the ftalks rife between two and three feet high, which fend out fmall fide branches, upon which the flowers come out in loofe fpikes, which are of a very pale blue colour, inclining to white. This flowers in the fame feafon as the former, and may be propagated in the fame manner.

The feventh fort fends up feveral ftrong ftalks, upward of two feet high, which are of a purple colour, garnifhed with fpear-fhaped fmooth leaves, whofe bafe embrace the ftalks half round; the flowers grow upon fingle foot-ftalks, forming a corymbus at the top, and are of a pale blue colour; thefe appear the latter end of September. This comes from North America, and may be propagated in the fame way as the former.

The eighth fort rifes with flender ftalks, upward of three feet high; fending out many weak branches on every fide, garnifhed with very fmall leaves; the flowers come out on fhort foot-ftalks, on every fide of the branches, thefe are fmall, with white rays and a yellow difk. They appear in November, and often continue part of December. This comes from the fame country with the former, and may be propagated as is before directed for them.

The ninth fort rifes near four feet high, having broad leaves at the bottom which diminifh gradually to the top; the flowers are produced in a loofe kind of umbel at the top of the ftalks, which are of a pale blue colour; thefe appear the latter part of Auguft. This is hardy, and may be propagated as the former.

The tenth fort grows naturally in the fouth of France and Italy; the ftalks of this divide into a great number of branches, which divide again toward the top into feveral fmaller, fully garnifhed with very narrow leaves their whole length; the flowers grow in large clufters at the top, forming a fort of corymbus; they are of a pale bluifh colour, and appear the beginning of Auguft. This is hardy, and may be propagated by parting the roots, as the former.

The eleventh fort rifes four feet high, with a fingle ftalk, and oval leaves growing clofe to the ftalks, which are terminated by flender loofe fpikes of pale blue flowers, which appear about Michaelmas. This grows naturally in North America, and is propagated as the forts above-mentioned.

The twelfth fort fends up flender ftalks three feet high, which fend out flender fide branches moft of their length, fo as to form a thick bufh; thefe are garnifhed with very narrow leaves their whole length, and are terminated by fingle flowers.

The thirteenth fort grows about two feet high, having flender ftalks, garnifhed with oblong, pointed, heart-fhaped leaves, which are fharply fawed on their edges; the upper part of the ftalks is divided into feveral fmall branches, which are terminated by white flowers growing in loofe panicles. This flowers in September, and may be propagated as the former.

The fourteenth fort fends up ftalks five feet high, which put out many flender fide branches, garnifhed with narrow fpear-fhaped leaves, and are terminated by fpikes of fmall white flowers, which appear the end of October. This fort fpreads greatly at the root, fo is apt to over-run the borders.



The

The fifteenth ſort hath narrow, oblong, hairy leaves at the bottom; the ſtalks riſe three feet high, garniſhed with ſmall, narrow, rough leaves, which turn backward; the ſtalks ſend out many ſide branches, each being terminated by a ſingle large blue flower. This ſort flowers the end of October, and continues moſt part of November, when it makes a fine appearance. It doth not multiply faſt by its roots, but may be propagated in plenty, by cuttings made from the young ſhoots in May, which, if planted in a bed of light earth, and ſhaded from the ſun, will take root, and flower the ſame year. It is commonly called by the gardeners Cateſby's Starwort, from Mr. Cateſby, who brought it from Virginia.

The ſixteenth ſort ſends up ſeveral ſtalks a foot and a half high, garniſhed with rough ſpear-ſhaped leaves, ſending out many ſide branches which diverge from the ſtalk every way; theſe are terminated for the moſt part by one large blue flower, ſomewhat like thoſe of the Italian Starwort, but paler, and comes earlier to flower. It grows naturally on the Alps, and is propagated by parting the root.

The ſeventeenth ſort riſes to the height of five feet, with branching ſtalks, garniſhed with oblong ſpear-ſhaped leaves, which are ſawed on their edges. Each of the ſide branches are divided at the top into ſeveral foot-ſtalks, which are terminated by large, pale, blue flowers, and are in beauty in October. This is propagated by parting the roots, as the ſorts beforementioned. It grows naturally in North America.

The eighteenth ſort was brought from Virginia many years ago, by Mr. John Tradeſcant, who was a great collector of rarities; and from his garden it was ſoon diſperſed, and became common. It is generally known by the title of Michaelmas Daiſey, from its flowering about old Michaelmas day. The ſtalks of this ſort are numerous, and riſe about three feet and a half high, being fully garniſhed with oblong leaves ending in a point, whoſe baſe half embrace the ſtalks. Theſe ſhoot out many lateral branches, which are terminated by pretty large flowers, of a very pale bluiſh colour, tending to white. The roots of this multiply very faſt, and the ſeeds often are blown about, ſo that it propagates ſo much as often to be troubleſome; it will thrive in any ſituation.

The nineteenth ſort ſends up ſeveral ſtrong hairy ſtalks, which riſe a foot and a half high, having many oblong rough leaves ending in a point, whoſe baſe half embrace the ſtalks, which divide into many ſmall branches at the top, forming a kind of corymbus, each being terminated by one large blue flower, having a very hairy empalement. This flowers the latter end of July. It grows naturally on the Alps, ſo is very hardy, but ſhould have a moiſt ſoil and a ſhady ſituation. It is propagated by parting the roots.

The twentieth ſort riſes with ſtrong hairy ſtalks, to the height of eight or nine feet, which are upright, unbranched, and garniſhed with oblong hairy leaves, ending in a point; their baſe half ſurrounds the ſtalks, which are for the moſt part terminated by three large purple flowers inclining to red, and ſit cloſe to the top of the ſtalk, ſurrounded by a few narrow leaves. This ſort flowers in November. It came from Philadelphia, where it naturally grows, and is propagated by parting the roots; it delights in a moiſt ſoil.

The twenty-firſt ſort hath ſlender purpliſh ſtalks, which riſe about three feet high, ſending out many ſide branches almoſt the whole length, which ſpread horizontally, garniſhed with narrow, ſmall, ſpear-ſhaped leaves; the flowers are produced in a ſort of looſe ſpike, growing one above another on each ſide the ſtalk. Theſe are ſmall, of a pale purpliſh colour, and appear in November. It grows naturally in North America, and is eaſily propagated by parting the roots.

The twenty-ſecond ſort I received from Philadelphia, where it grows naturally. This ſends up ſtiff channelled ſtalks about two feet high, garniſhed with rough ſpear-ſhaped leaves ending in a point, placed alternately on every ſide the ſtalks; the flowers are white, and grow in a ſort of umbel at the top of the ſtalks. It flowers the end of September, and is propagated by parting the roots.

The twenty-third ſort I received from Mr. Peter Collinſon, F. R. S. who procured it from Penſylvania. This hath much the appearance of the former ſort, but the leaves are narrower, whiter on their under ſide, and have three longitudinal veins; the flowers are alſo larger and whiter. It grows about the ſame height, and flowers at the ſame time with the former.

The twenty-fourth ſort riſes four feet high, the bottom leaves are oval and half ſurround the ſtalk at their baſe; the upper leaves are ſmall and ſpear-ſhaped; the ſtalks put out ſide branches toward the top, which grow erect, forming a looſe ſpike, each being terminated by one large blue flower, with a leafy foot-ſtalk; this flowers about the end of October. It grows naturally in North America, and is propagated by parting the roots.

The twenty-fifth ſort ſends up from the root ſeveral ſlender ſtalks near three feet high, garniſhed by many very narrow leaves, and puts out ſide branches, each being terminated by one white flower. This grows naturally in Philadelphia; it flowers in November, and is eaſily propagated by parting the roots.

The twenty-ſixth ſort riſes about a foot and a half high; the ſtalks are garniſhed with narrow, ſpear-ſhaped, ſmooth leaves: the end of the ſtalks are terminated by foot-ſtalks on every ſide, each having one pale blue flower. This grows naturally in Canada, and is propagated by parting the roots. It is titled After Canadenſis linariæ folio. Hort. R. Par.

The twenty-ſeventh ſort grows about two feet high, with erect ſtalks, garniſhed with narrow ſpear-ſhaped leaves, which come out irregularly in cluſters; from the upper part of the ſtalks, there are a few ſide branches produced, which are garniſhed with narrow leaves; the flowers are produced in a panicle, which are of a pale blue colour, and appear in September. This is propagated by parting the roots.

The twenty-eighth ſort is an annual plant, which when once introduced into a garden, the ſeeds will ſcatter, and the plants come up without care. This ſends up ſtrait ſtalks about two feet high, which are terminated by white flowers growing in form of a corymbus. It flowers in Auguſt, and the ſeeds ripen in October, and grows naturally in North America.

The twenty-ninth ſort grows naturally at the Cape of Good Hope. This riſes with a woody ſtem about three feet high, ſending out ſide branches which are ligneous, garniſhed with narrow leaves coming out in cluſters from one point, like thoſe of the Larch-tree; the flowers are produced from the ſide of the branches, upon long ſlender foot-ſtalks ſingly; theſe are of a pale blue colour, and appear the beginning of March; as this plant never produces ſeeds in Europe, it is only propagated by cuttings, which may be performed any time in ſummer. Theſe ſhould be planted in ſmall pots filled with light earth, and plunged into an old hot-bed; where, if they are ſhaded from the ſun, and gently watered, they will put out roots in ſix weeks, when they may be placed in the open air; and in about a month after they ſhould be ſeparated, each planted into a ſmall pot filled with light ſandy earth. In October theſe muſt be removed into the green-houſe, and placed where they may enjoy as much free air as poſſible, but be ſecured from froſt or damps, either of which will deſtroy them; ſo that they are much eaſier preſerved in a glaſs-caſe, where they will enjoy more light and air than in a green-houſe; but they muſt not be placed in a ſtove, for artificial heat will ſoon deſtroy the plants. This ſort is at preſent but in few Engliſh gardens.

The thirtieth ſort is a native of China, from whence the ſeeds were ſent to France by the miſſionaries, where the plants were firſt raiſed in Europe. In the year 1731, I received ſeeds of this, from which I raiſed plants with red, and ſome with white flowers; and in 1736, I received ſeeds of the blue flower, but theſe were all ſingle. They came by the title of La Reine Marguerette, or the Queen of Daiſies, by which title the French ſtill call it. In 1752, I received ſeeds of the double flowers both red and blue, and in 1753, the ſeeds of the double white ſort, from my worthy friend Dr. Job Baſter, F. R. S. of Zirkzee. Theſe have retained their difference from that time without variation, yet as they are generally ſuppoſed to be only varieties, I have not inſerted them as different ſpecies.

As theſe are annual plants, they are only propagated by ſeeds, which muſt be ſown in the ſpring upon a gentle hot-bed, juſt to bring up the plants; for they ſhould be inured to the open air as ſoon as poſſible, to prevent their being drawn up very weak: when the plants are big enough to remove, they ſhould be carefully taken up and planted in a bed of rich earth at ſix inches diſtance each way, obſerving to ſhade them from the ſun till they have taken new root; and if the ſeaſon proves dry, they muſt be often refreſhed with water. In this bed they may remain a month or five weeks, by which time they will be ſtrong enough to tranſplant into the borders of the flower-garden where they are deſigned to remain; the plants ſhould be taken up carefully, with large balls of earth to their roots, and the ground dug up and well broken with the ſpade, where the holes are made to receive the plants: after they are planted, and the earth cloſed about their roots, there ſhould be ſome water given them to ſettle the earth. This work ſhould, if poſſible, be done when there is rain, for then the plants will ſoon take new root, after which time they will require no other care but to keep them clear from weeds.

In Auguſt theſe plants will flower, by which time if the ground is rich in which they are planted, they will be two feet high, and furniſhed with many ſide branches, each of which is terminated by a large radiated flower, ſome white, ſome red, and others blue. Theſe are ſome of the greateſt ornaments in the flower-garden in autumn, during their time of flowering. The feeds ripen the beginning of October, which ſhould be gathered when it is perfectly dry; and in order to preſerve the kinds with double flowers, thoſe which grow upon the ſide branches, which are commonly fuller of leaves than the flowers on the main ſtem, ſhould always be preſerved for ſeeds.

The thirty-firſt ſort was diſcovered by the late Dr. Houſton in the year 1731, at La Vera Cruz in New Spain. This is an annual plant, which riſes with an upright ſtalk about one foot high, garniſhed the whole length with winged leaves, each conſiſting of two or three pair of lobes, terminated by an odd one: each of theſe lobes are heart-ſhaped, and ſawed on their edges; at the top of the ſtalk is produced one large Orange-coloured flower, having a ſingle empalement, cut into many ſlender ſegments which end in points. After the flower is paſt, each floret is ſucceeded by an oblong angular ſeed, crowned with long down. This is propagated by ſeeds, which ſhould be ſown on a moderate hot-bed in the ſpring; and when the plants are fit to remove, they muſt be each planted into a ſeparate ſmall pot filled with rich earth, and plunged into the tan-bed, obſerving to ſhade them until they have taken new root, as alſo to refreſh them with water, and in warm weather admit free air to the plants. When theſe pots are filled with their roots, the plants ſhould be carefully ſhaken out; and after paring off the outſide roots, put into larger pots, filled with light earth, and plunged into the hot-bed again, where they may remain to flower and perfect their ſeeds, for they will not thrive in the open air. This ſort flowers in July, and the ſeeds ripen in September.

The thirty-ſecond ſort was diſcovered by the late Dr. William Houſton, in the year 1729, growing in plenty in the ſandy ground about Vera Cruz, in America, where he drew the figure, and made a deſcription of the plant upon the ſpot; which he ſent to England with the ſeeds, ſome of which grew in the Chelſea garden, and the plants flowered the following ſummer, but did not perfect their ſeeds.

It hath buſhy fibrous roots, which creep in the ground, and ſend out many ſlender round ſtalks, which bend and incline to the ground. Theſe are about four or five inches long, deſtitute of leaves, each ſuſtaining one flower, in ſhape and ſize of thoſe of the common Field Daiſey, of a whitiſh purple colour, but the rays are narrower. The diſk is compoſed of ſeveral florets, which are ſucceeded by ſmall ſeeds crowned with a pappous down. The empalement which includes the flowers, is ſcaly.

As this plant is a native of a warm climate, it will not live in the open air in England; therefore the ſeeds muſt be ſown in a hot-bed, and the plants will require a ſtove to maintain them through the winter.

The thirty-third ſort is a native of North America. This hath upright ſtalks about three feet high, garniſhed with ſpear-ſhaped ſawed leaves; the flowers are produced in bunchy panicles, having rough empalements. It flowers the end of Auguſt, and is propagated by parting the roots in autumn.

The thirty-fourth ſort grows naturally in Siberia; the ſtalks are ſtriated about two feet high, ſending out ſide branches, garniſhed with rough, veined, ſpear-ſhaped leaves; the foot-ſtalks of the flowers are woolly, each ſupporting one large blue flower. This flowers in Auguſt, and is propagated by parting the roots in autumn.

The thirty-fifth ſort ſends up rough ſtalks about two feet high, dividing toward the top into many forked branches, diverging from each other, garniſhed below with oval ſawed leaves; but the flowering ſtalks have entire obtuſe leaves which embrace them with their baſe; the flowers are growing almoſt in an umbel; theſe appear the beginning of September. It is propagated by parting the roots as the former.

ASTERISCUS. See Buphthalmum.

ASTEROIDES, Baſtard Starwort. See Inula.

ASTRAGALOIDES. See Phaca.

ASTRAGALUS, Wild Liquorice, Liquorice Vetch, or Milk Vetch.

The Characters are,

*It hath a butterfly flower, whoſe empalement is of one leaf, cut into five acute ſegments at the top. The ſtandard (or vexillum) is upright, blunt, and reflexed on the ſides; the wings are oblong, and ſhorter than the ſtandard; the keel is the ſame length with the wings, and bordered. It hath ten ſtamina, nine of which are joined, and one ſtands ſingly; theſe are crowned by roundiſh ſummits. At the bottom of the flower is ſituated a taper germen, ſupporting an awl-ſhaped ſtyle, crowned by a blunt ſtigma. The germen afterward becomes a pod having two cells, each having a row of kidney-ſhaped ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's ſeventeenth claſs of plants, entitled Diadelphia Decandria, from the flower having ten ſtamina joined in two bodies.

The Species are,

1. Astragalus (*Glycyphyllos*) cauleſcens proſtratus leguminibus ſubtriquetis arcuatis foliis ovalibus pedunculo longioribus. Lin. Sp. Plant. 758. *Stalky proſtrate Milk Vetch, with crooked pods almoſt triangular, and oval leaves longer than the foot-ſtalk.* Aſtragalus luteus perennis procumbens vulgaris ſylveſtris. Mor. Hiſt. 2. 107. *ſometimes called Wild Liquorice.*
2. Astragalus (*Hamoſis*) cauleſcens procumbens, leguminibus ſubulatis recurvatis glabris. Hort. Upſal. 226. *Stalky trailing Milk Vetch, with ſmooth awl-ſhaped pods bending inward.* Aſtragalus luteus annus Monſpeliacus procumbens. Mor. Hiſt. 2. 108.

3. Astragalus (*Alopecuroides*) caulefcens, fpicis cylindricis fubfeffilibus, calycibus leguminibufque lanatis. Lin. Sp. Plant. 755. *Stalky Milk Vetch with cylindrical fpikes growing clofe to the ftalks, and woolly pods and empalements.* Aftragalus Alpinus procerior Alopecuroides. Tourn. Inft. 416.

4. Astragalus (*Cicer*) caulefcens proftratus, leguminibus fubglobofis inflatis mucronatis pilofis. Hort. Upfal. 226. *Milk Vetch with a proftrate ftalk, and a globular, fwelling, hairy pod, ending in a point.* Aftragalus luteus perennis filiquâ gemellâ rotundâ veficam referente. Mor. Hift. 2. 107.

5. Astragalus (*Epiglottis*) caulefcens procumbens, leguminibus capitatis cordatis acutis reflexis complicatis. Lin. Sp. Plant. 759. *Milk Vetch with trailing ftalks, and pods growing in heads, which are heart-fhaped, pointed, reflexed, and complicated.* Aftragalus Hifpanicus filiquâ epiglottidi fimili flore purpureo major. H. L. 74.

6. Astragalus (*Montanus*) fubacaulos fcapis folio longioribus, floribus laxè fpicatis erectis, leguminibus ovatis acumine inflexo. Prod. Leyd. 392. *Low Milk Vetch with flower-ftalks longer than the leaves, and flowers growing in loofe upright fpikes.* Onobrychis floribus viciæ majoribus cæruleo-purpurafcentibus five foliis tragacanthæ. C. B. P. 351.

7. Astragalus (*Bæticus*) caulefcens procumbens, fpicis pedunculatis, leguminibus prifmaticis rectis triquetris apice uncinatis. Hort. Cliff. 225. *Milk Vetch with trailing ftalks, fpikes of flowers with foot-ftalks, and upright triangular pods fhaped like a prifm pointed at the top.* Aftragalus annuus maritimus procumbens latifolius floribus pediculo infidentibus. Tourn. Inft. 416.

8. Astragalus (*Arenarius*) fubcaulefcens procumbens floribus fubracemofis erectis foliis tomentofis. Lin. Sp. Plant. 759. *Low trailing Milk Vetch with branching flowers growing erect, and woolly leaves.* Aftragalus incanus parvus purpureus noftras. Pluk. Alm. 59.

9. Astragalus (*Phyfodes*) acaulos fcapis folia æquantibus leguminibus inflatis fubglobofis nudis. Lin. Sp. Plant. 760. *Low Milk Vetch with flower-ftalks as long as the leaves, and naked, globular, fwelling pods.* Aftragalus acaulos leguminibus inflatis fubglobofis. Amœnit. Acad.

10. Astragalus (*Chriftianus*) caulefcens erectus floribus glomeratis fubfeffilibus ex omnibus axillis foliaceis. Lin. Sp. 755. *Milk Vetch with upright ftalks, and glomerated flowers growing clofe to them, proceeding from all the wings of the leaves.* Aftragalus Orientalis maximus incanus erectus, caule ab imo ad fummum florido. Tourn. Cor. 29.

11. Astragalus (*Ægyptiacus*) caulefcens fcapis folio longioribus floribus laxè fpicatis erectis, leguminibus arcuatis. *Stalky Milk Vetch with flower-ftalks longer than the leaves, upright flowers growing in loofe fpikes, and arched pods.* Aftragalus Ægyptius floribus fpicatis purpurafcentibus filiquis incurvis. Juff.

12. Astragalus (*Sefameus*) caulefcens diffufus capitulis fubfeffilibus lateralibus leguminibus erectis fubulatis acumine reflexis. Hort. Cliff. 361. *Milk Vetch with diffufed ftalks, flower-heads growing clofe to the fides of the ftalks, and awl-fhaped upright pods reflexed at their points.* Aftragalus annuus foliis & filiquis hirfutis plurimis in foliorum alis feffilibus. Pluk. Alm. 60.

13. Astragalus (*Galegiformis*) caulefcens ftrictus glaber, floribus racemofis pendulis, leguminibus triquetris utrinque mucronatis. Lin. Sp. 1066. *Milk Vetch with fmooth flender ftalks, hanging branching flowers, and three-cornered pointed pods.* Aftragalus Orientalis altiffimus folio galegæ flore parvo flavefcente. Tourn. Cor. 29.

14. Astragalus (*Uralenfis*) acaulos fcapo erecto foliis longiore leguminibus fubulatis inflatis villofis erectis. Hort. Upfal. 226. *Low Milk Vetch, with upright foot-ftalks to the flowers longer than the leaves, and awl-fhaped, upright, fwoln, hairy pods.* Aftragalus non ramofus villofus & incanus fpicatus floribus purpuro-violaceis. Amman. Ruth. 167. p. 126.

2

15. Astragalus (*Carolinianus*) caulefcens erectus lævis pedunculis fpicatis leguminibus ovato-cylindricis ftylo acuminatis. Lin. Sp. Plant. 757. *Smooth, upright, ftalky Milk Vetch, with fpiked ftalks, and oval cylindrical pods ending in fharp points.* Aftragalus procerior non repens flore viridi flavefcente. Hort. Elth. 45.

16. Astragalus (*Canadenfis*) caulefcens diffufus, leguminibus fubcylindricis mucronatis foliolis fubtus fubvillofis. Lin. Sp. Plant. 757. *Milk Vetch with diffufed ftalks, pointed cylindrical pods, and the fmall leaves hairy on their under fide.* Aftragalus Canadenfis flore viridi flavefcente. Tourn. Inft. 416.

17. Astragalus (*Pilofus*) caulefcens erectus pilofus floribus fpicatus leguminibus fubulatis pilofis. Lin. Sp. Plant. 756. *Milk Vetch with hairy upright ftalks, flowers growing in fpikes, and awl-fhaped hairy pods.* Aftragalus villofus erectus fpicatus floribus flavefcentibus. Amman. Ruth. 166.

18. Astragalus (*Procumbens*) incanus caulibus procumbentibus fcapis folio æquantibus floribus glomeratis. *Hoary Milk Vetch with trailing ftalks, foot-ftalks equal with the leaves, and glomerated flowers.* Aftragalus fupinus filiquis villofis glomeratis. Tourn. Inft. R. H. 417.

19. Astragalus (*Incanus*) caulefcens incanus, leguminibus fubulatis recurvatis incanis. *Hoary ftalky Milk Vetch, with awl-fhaped recurved pods which are hoary.* Aftragalus incanus filiquâ recurvâ. Bot. Monfp.

20. Astragalus (*Capitatus*) caulefcens capitulis globofis, pedunculis longiffimis, foliolis emarginatis. Hort. Cliff. 360. *Stalky Milk Vetch with globular heads, very long foot-ftalks, and the fmall leaves crenated at their points.* Aftragalus Orientalis villofiffimus capitulis rotundioribus floribus purpureis. Tourn. Cor. 29.

21. Astragalus (*Chinenfis*) caulefcens procumbens, capitulis pedunculatis, leguminibus prifmaticis rectis triquetris apice fubulatis. *Milk Vetch with trailing ftalks; the foot-ftalks terminated by flowers collected in heads, and three-cornered pods fhaped like prifms.*

22. Astragalus (*Uncatus*) acaulis exfcapus, leguminibus fubulatis hamatis folio longioribus, foliolis obcordatis. Lin. Sp. 1072. *Milk Vetch without ftalks, awl-fhaped hooked pods longer than the leaves, and the fmall leaves almoft heart-fhaped.*

The firft fort grows wild upon chalky ground in many parts of England, fo is not often admitted into gardens. The root of this is perennial, but the ftalks decay every autumn: it creeps at the root, fo that it is too apt to fpread where it is fuffered to grow. It flowers in June, and the feeds ripen in September.

The fecond fort is annual; the branches of this trail upon the ground, which are ftriated; the leaves are winged, compofed of about eight pair of lobes, terminated by an odd one; thefe are crenated at their points. The foot-ftalks of the flowers arife from the wings of the leaves, which are about three inches long, garnifhed toward the top with a few pale yellow flowers rifing one above another; thefe are fucceeded by oblong pods, which bend in form of a fickle, being round on their outer fide, but flatted on the oppofite, ending in a point, opening in two cells, each having a row of fquare feeds. It flowers in June, and the feeds ripen in September. The feeds of this fhould be fown in April, in the place where they are to remain, and require no other care but to draw the plants out where they come up too thick, leaving them a foot and a half afunder, and keep them clean from weeds.

The third fort is a biennial plant, which grows naturally on the Alps. This rifes with an upright hairy ftalk near three feet high, garnifhed with long winged leaves, each having eighteen or twenty pair of oval lobes, terminated by an odd one. The flowers are produced in large cylindrical fpikes from the wings of the leaves, fitting very clofe to the ftalks, which are entirely covered with down, out of which the yellow flowers juft peep; thefe are fucceeded by oval pods

pods ſhut up in the woolly empalements, having two cells, containing three or four ſquare ſeeds in each. It flowers in June and July, and the ſeeds ripen in autumn, ſoon after which the plants decay. The ſeeds of this ſhould be ſown in April, on an open border, where the plants are deſigned to remain; and when the plants come up, they ſhould be thinned, leaving them at leaſt two feet aſunder, and keep them clean from weeds; the ſecond year they will flower, and produce ſeeds.

The fourth ſort hath a perennial root, which ſends out ſeveral ſtriated ſtalks near three feet high, which, if not ſupported, proſtrate themſelves towards the earth. Theſe are garniſhed with winged leaves placed alternately, at two inches diſtance, which are compoſed of about ten pair of oval ſmall lobes, terminated by an odd one. The flowers ariſe from the wings of the leaves, upon foot-ſtalks two inches long, in ſmall looſe ſpikes, which are yellow, and ſhaped like the reſt of this genus, and are ſucceeded by hairy, globular, ſwelling pods, ending with a ſharp point, opening in two cells, in each of which are contained two or three hard reddiſh ſeeds. It flowers in July, and the ſeeds ripen in autumn. This grows naturally in the ſouth of France and Italy. It is eaſily propagated by ſeeds, which ſhould be ſown upon an open border in the ſpring; and when the plants come up, they muſt be thinned and kept clean from weeds till autumn, when they ſhould be tranſplanted to the place where they are to remain, and will afterward require no other culture, but to keep them clean from weeds. One or two of theſe plants in a garden by way of variety, may be admitted, but they have little beauty.

The fifth ſort is annual. This ſends out from the root two or three hairy trailing branches, which are garniſhed with winged leaves, compoſed of ten or twelve pair of blunt lobes, terminated by an odd one: the flowers come out from the wings of the leaves upon naked foot-ſtalks, four or five inches long, and are gathered into a round head; theſe are ſhaped like the others, but are pretty large, and of a deep purple colour, which are ſucceeded by ſhort pods rough on their outſides, and when opened, are ſhaped like a heart, ending in a ſharp point, containing three or four ſeeds.

The ſeeds of this ſhould be ſown on an open border in April, where the plants are to remain, and treated as the other annual ſorts before-mentioned. It flowers in July, and the ſeeds ripen in autumn. It grows naturally in Spain and Portugal, from whence I have received the ſeeds.

The ſixth ſort is a perennial plant, which grows naturally upon the mountains in Spain, from whence I received it. This is a low plant, ſeldom riſing with a ſtem more than three inches high, ſending out winged leaves on every ſide, which are compoſed of many pairs of narrow lobes, ſet very cloſe together on the midrib, terminated by an odd one. The flowers grow upon long foot-ſtalks, which riſe above the leaves; theſe are large and of a purple colour, growing in a looſe ſpike, and ſtand erect, and are ſucceeded by oblong crooked pods opening in two cells, filled with ſquare ſeeds. It flowers in June, and the ſeeds ripen in Auguſt. This is propagated by ſeeds, which ſhould be ſown, and the plants treated in the ſame manner as the fourth ſort, but ſhould have a ſhady ſituation and a ſtronger ſoil.

The ſeventh ſort is annual. This ſends out ſeveral trailing branches near two feet long, which are garniſhed with winged leaves, compoſed of about ten pair of blunt lobes, ſet thinly on the midrib, terminated by an odd one: at the wing of each leaf comes out a foot-ſtalk near two inches long, ſuſtaining four or five yellow flowers at the top, which are ſucceeded by triangular brown pods, ſhaped like a priſm, growing erect, and open in two cells filled with greeniſh ſquare ſeeds. It flowers in July, and the ſeeds ripen in autumn, ſoon after which the plants decay. This may be treated in the ſame manner as the ſecond.

The eighth ſort is a perennial plant, which grows naturally upon hills in ſeveral parts of England, particularly in the North. This is a low plant, ſeldom riſing more than two or three inches high, having many winged leaves compoſed of narrow woolly lobes, placed cloſe on the midrib; the flowers are pretty large, of a purple colour, growing in looſe ſpikes. It flowers in June, and the ſeeds ripen in Auguſt. This may be propagated as the fourth ſort, and ſhould have a ſhady ſituation.

The ninth ſort hath a perennial creeping root, ſending out leaves, which are compoſed of many pair of oval lobes, terminated by an odd one; the flower-ſtalks are as long as the leaves, which ſupport a cylindrical ſpike of yellow flowers, which are ſucceeded by ſwollen pods, opening in two cells, containing ſeveral greeniſh ſeeds. This may be propagated as the fourth ſort, and muſt have a ſhady ſituation. It flowers in June, and grows naturally in Siberia.

The tenth ſort was diſcovered by Dr. Tournefort in the Levant, who ſent the ſeeds to the royal garden at Paris, where they ſucceeded, from whence I was furniſhed with them. This ſends up ſtalks near three feet high, which are large at bottom, and gradually diminiſh to the top; the leaves alſo at bottom are very long, and diminiſh upward, ſo as to form a ſort of pyramid; theſe are winged, and compoſed of many large oval pair of lobes, which are placed thinly on the midrib, and terminated by an odd one; the flowers come out in cluſters from the wings of each leaf, beginning near the root where the foot-ſtalks are the longeſt, and continuing upward, diminiſhing in their number. Theſe are large, of a bright yellow colour, and are ſucceeded by cylindrical pods opening in two cells, filled with ſquare yellow ſeeds. It flowers in July, and in very favourable ſeaſons will perfect ſeeds in England. It is propagated by ſeeds, which ſhould be ſown, and the plants afterward treated as hath been directed for the fourth ſort; with this difference only, to plant them in a warm border and a dry ſoil, otherwiſe the plants will not thrive well in this climate. The third year from ſeed the plants will flower, and continue many years in a proper ſoil.

The eleventh ſort grows naturally in Egypt, from whence the ſeeds were ſent to the royal garden at Paris, and Dr. Juſſieu was ſo good as to ſend me part of the ſeeds; this is an annual plant, which riſes with upright ſtalks a foot and a half high, thinly garniſhed with winged leaves, compoſed of about twelve pair of oval lobes, terminated by an odd one; the foot-ſtalks of the flowers ariſe from the wings of the leaves, and are extended beyond them; theſe are terminated by looſe ſpikes of yellow flowers, which are ſucceeded by ſickle-ſhaped pods. It flowers in July, and the ſeeds ripen in autumn, ſoon after which the plants decay. It may be propagated by ſeeds in the ſame manner as hath been before directed for the annual ſorts, putting the ſeeds in a warm border and a dry ſoil, where the plants will perfect their ſeeds very well.

The twelfth ſort grows naturally in Italy, and the ſouth of France, from whence I received the ſeeds. This is an annual plant, which ſends out ſeveral weak ſtalks without any order, garniſhed with winged leaves, compoſed of ten or twelve pair of lobes, and ſometimes terminated by an odd one; theſe are hairy; at the foot-ſtalks of the leaves the flowers come out in ſmall cluſters, ſitting cloſe to the ſides of the ſtalks, which are of a copper colour, and are ſucceeded by awl-ſhaped pointed pods growing erect, and reflected at their points. This is propagated by ſeeds in the ſame manner as the other annual ſorts before mentioned; it flowers in July, and the ſeeds are ripe in autumn.

The thirteenth ſort was diſcovered by Dr. Tournefort, in the Levant, who ſent the ſeeds to the royal garden

at Paris, where they succeeded, and produced new seeds, so that many of the European gardens have been since supplied with it; this hath a perennial root, which sends out many upright stalks upward of five feet high, which are garnished with winged leaves, composed of about fourteen pair of oval lobes, terminated by an odd one; from the wings of the leaves the foot-stalks of the flowers arise, which are garnished with small yellow flowers, growing in loose spikes, and are extended beyond the leaves; these are succeeded by very short triangular pods, ending in a point, which open in two cells, filled with Ash-coloured square seeds. This flowers in June or July, and the seeds ripen in autumn. It is propagated by seeds, which may be sown in the spring, upon a border of light earth, and treated in the same manner as the fourth sort, till the following autumn, when the plants should be removed to an open situation and a dry soil, and when they have taken root, will require no farther culture. I have a root of this sort growing in the Chelsea garden, which is more than thirty years old, and produces plenty of seeds every year.

The fourteenth sort grows naturally upon the mountains in Germany; this never rises with a stalk, but sends out divers winged leaves from the root, which are composed of many blunt lobes, placed by pairs, and terminated by an odd one; the foot-stalks of the flowers arise immediately from the root, and are longer than the leaves, being terminated by spikes of blue flowers, which are succeeded by swelling awl-shaped pods, which are erect and hairy, having two cells which are filled with greenish seeds. It flowers in July, and the seeds ripen in autumn. The root is abiding, and the plant is propagated by seeds as the fourth sort, but should have an open situation.

The fifteenth sort grows naturally in Carolina, from whence I received the seeds; this hath a perennial root, but an annual stalk, which decays in autumn; from the root arise several upright stalks three feet high, garnished with winged leaves, composed of eighteen or twenty pair of oval smooth lobes, terminated by an odd one; from the wings of the leaves arise the foot-stalks, which are terminated by spikes of greenish yellow flowers, which are succeeded by oval cylindrical pods, to which adhere the style, which extends beyond the pods in a point. This flowers in August, but unless the season is warm, the plants seldom ripen their seeds in England. It is propagated by seeds, which should be sown upon a moderate hot-bed in the spring; and when the plants are fit to remove, they should be each planted in a small pot filled with earth from the kitchen-garden, and plunged again into the hot-bed, to forward their making new roots; and when they are established in the pots, they must be inured to the open air, into which they should be removed the end of May, placing them in a sheltered situation, where they may remain till October, when they should be placed under a common frame to shelter them in winter; and in the spring they may be turned out of the pots, and planted in a warm border, where they will thrive and flower; and if the winter proves very severe, a little old tan should be laid over the roots, which will effectually preserve them.

The sixteenth sort grows naturally in most parts of North America; this hath a perennial root, which sends out many irregular stalks about two feet high, garnished with winged leaves, composed of many pair of oval lobes, hairy on their under side; from the wings of the leaves come out the foot-stalks, supporting spikes of greenish yellow flowers, which are succeeded by cylindrical pods, ending in a point. This flowers in July, and the seeds ripen the beginning of October. It is propagated by seeds, which should be managed as those of the fifteenth sort, but the plants are hardier, so will live thro' the winter in a common bed of light earth without covering.

The seventeenth sort rises with upright hairy stalks two feet high, garnished with winged leaves, composed of many pair of oval woolly lobes, terminated by an odd one; from the wings of the leaves arise the foot-stalks, which are terminated by close spikes of yellow flowers; these are succeeded by hairy awl-shaped pods, having two cells, filled with brown seeds. This flowers in June, and the seeds ripen in autumn. It grows naturally in Siberia, from whence the seeds were sent to Dr. Amman, at Petersburgh, who communicated them to me. It is a perennial plant, and propagated by seeds in the same manner as the fourth sort.

The eighteenth sort is a biennial plant: the seeds of this were sent me from Spain, where the plant grows naturally. This sends out many trailing stalks, which are divided into many smaller branches, garnished with many pair of narrow lobes, terminated by an odd one; the flowers are collected into heads, which terminate the foot-stalks, and are white; the foot-stalks are about the same length as the leaves; the pods are short and triangular, and the whole plant is covered with a silvery down. The seeds of this should be sown upon an open bed of light earth, where the plants are to remain, and the plants afterward treated in the manner directed for the annual sorts: the second year they will flower and perfect their seeds, after which they seldom continue.

The ninteenth sort grows upon the hills near Verona, from whence I received it. This sends up an upright stalk, seldom more than six inches high, garnished with small, winged, hoary leaves; the foot-stalks arise from the wings of the leaves, supporting three or four pale flowers, which are succeeded by sickle-shaped hoary pods. This is a biennial plant, and should be treated in the same manner as the last.

The twentieth sort was discovered by Dr. Tournefort in the Levant, who sent the seeds to the royal garden at Paris. This hath a perennial root, which sends up several erect stalks, garnished with winged leaves, composed of several pair of lobes, indented at the top; from the wings of the leaves come out long foot-stalks, supporting a globular head of purple flowers; these are rarely succeeded by pods in England. It flowers the end of July. It is propagated by seeds, which should be sown upon a moderate hot-bed in the spring, and the plants treated in the same manner as hath been directed for the fifteenth sort.

The twenty-first sort grows naturally in China: the plant is annual; the stalks spread on the surface of the ground, which are closely garnished with winged leaves, composed of eight or ten pair of oval smooth lobes, sitting close to the midrib; these are slightly indented at their end. The foot-stalks of the flowers are produced from the wings of the stalk, two of them generally arising at each place, and are equal to the leaves in length, supporting a globular head of purple flowers, which are succeeded by three-cornered pods growing erect in a compact head, opening in two cells, filled with small triangular seeds. This plant flowers in July and August, and the seeds ripen in autumn.

The seeds of this sort should be sown upon a hot-bed in March, and when the plants come up and are fit to transplant, they should be each put into a small pot filled with light earth, and plunged into another moderate hot-bed, being careful to shade them from the sun until they have taken new root; after which they should have free air admitted to them daily, proportional to the warmth of the season, and frequently but gently watered, with which management the plants will flower and produce seeds.

The twenty-second sort grows naturally about Aleppo, from whence the seeds were brought by Dr. Russel. The plant is annual, sending out a few branching stalks which trail upon the ground, garnished with narrow winged leaves, whose lobes are broader at their points than their base, and are indented so as

to become almost heart-shaped; the flowers are produced at the wings of the stalks in short loose spikes; they are almost white, and are succeeded by sickle-shaped pods, having two cells filled with square brown seeds. This flowers in July and August, and the seeds ripen in autumn.

This is propagated by seeds, which should be sown in the spring upon an open bed of light earth, and the plants treated afterward in the same manner as hath been directed for the annual sorts before-mentioned.

ASTRANTIA, Masterwort.

The CHARACTERS are,

*It is a plant whose flowers grow in an umbel; the general umbel is composed of four or five small ones. The involucrum of the general umbel is in one species composed of two large trifid leaves, and two entire. In another species of several small leaves: the involucrum of the small umbel is composed of many small pointed leaves, which are longer than the umbels, coloured and spread open. The empalement of the flower is permanent, erect, and cut into five short acute segments; the flower is composed of five petals, which are erect, bifid, and bend inward: it hath five stamina the length of the petals, crowned by single summits; the oblong germen is situated below the receptacle, supporting two slender styles, crowned by spreading stigma; the germen afterward becomes an oval, blunt, channelled fruit, divided into two parts, having two oblong oval seeds inclosed in the cover.*

This genus of plants is ranged in the second section of Linnæus's fifth class, entitled Pentandria Digynia, the flower having five stamina and two styles.

The SPECIES are,

1. ASTRANTIA (*Major*) foliis radicalibus quinquelobatis serratis, caulinis trilobatis acutis. *Masterwort with the lower leaves divided into five sawed lobes, and those on the stalks cut into three acute lobes.* Astrantia major coronâ floris purpurascente. Inst. R. H. 314.
2. ASTRANTIA (*Candida*) foliis quinquelobatis lobis tripartitis. Haller. Helv. 439. *Masterwort with leaves having five tripartite lobes.* Astrantia major coronâ floris candidâ. Tourn. Inst. 314.
3. ASTRANTIA (*Minor*) foliis digitatis serratis. Lin. Sp. Plant. 255. *Masterwort with fingered leaves which are sawed.* Helleborus niger saniculæ folio minor. C. B. P. 186.

The first sort hath many spreading leaves rising from the root, which are composed of five large lobes, sawed pretty deep on their edges; from between these the stalks arise near two feet high, having at each joint one leaf deeply cut into three sharp-pointed lobes; at the top of the stalk is produced the umbel of flowers, at the bottom of which is situated the general involucrum, composed of two long trifid leaves, and two entire ones of the same length. The small umbels stand upon long foot-stalks or rays, under which is placed the involucrum, composed of many spear-shaped pointed leaves, which extend beyond the rays, and are of a purplish colour.

The second sort hath much the appearance of the first, so has been supposed to be only a variety of it; but it differs from that in having five lobes to the leaves of the stalks, which are much shorter, and rounder at the point than those of the other. The general involucrum of the umbel is composed of short narrow leaves, and those of the smaller umbels are shorter and white.

The third sort seldom rises a foot high; the foot-stalks of the leaves are four inches long; the leaves are divided into eight segments at the bottom, and spread out like a hand; these are deeply sawed on their edges; the involucrum of the general umbel is composed of several very narrow leaves; the foot-stalks of the separate umbels are very large and slender, and toward the top often divide into three, each having a small umbel. The involucrums of these small umbels are short and white.

These plants are very hardy; they may be propagated either by sowing their seeds, or parting their roots. If they are propagated from seeds, they should be sown in autumn, soon after they are ripe, on a shady border; and, when the plants are come up, they should be carefully weeded, and where they are too close, some of the plants should be drawn out, to allow room for others to grow, until Michaelmas, when they should be transplanted where they are to remain; which should always be in a moist soil and a shady situation. The distance these plants should be placed, is three feet, for their roots will spread to a considerable width, if they are permitted to remain long in the same place. They require no other culture but to keep them clear from weeds, and every third or fourth year to be taken up at Michaelmas, and their roots parted and planted again. These plants are seldom preserved but in botanic gardens, there being no great beauty in their flowers. They all grow naturally upon the Alps.

ATHAMANTA. Lin. Gen. Plant. 301. Meum. Tourn. Inst. R. H. 312. Spignel.

The CHARACTERS are,

*It is a plant with an umbellated flower; the general umbel spreads open, and is composed of many small ones; the involucrum of the great umbel is composed of many narrow leaves, which are shorter than the rays; those of the small ones are narrow, and equal with the rays: the flowers of the great umbel are uniform; those of the smaller have five inflexed heart-shaped petals, which are a little unequal; each flower hath five slender stamina, which are of the same length with the petals, and crowned by roundish summits; the germen is situated below the receptacle, supporting two reflexed styles, crowned by obtuse stigma; the germen afterward becomes an oblong channelled fruit, divided into two parts, each containing one oval channelled seed.*

This genus of plants is ranged in the second section of Linnæus's fifth class of plants, entitled Pentandria Digynia, the flowers having five stamina and two styles.

The SPECIES are,

1. ATHAMANTA (*Meum*) foliolis capillaribus, seminibus glabris striatis. Hort. Cliff. 93. *Spignel with hair-like leaves, and smooth channelled seeds.* Meum foliis Anethi. C. B. P. 148. *commonly called Spignel.*
2. ATHAMANTA (*Cretensis*) foliolis linearibus planis hirsutis, petalis bipartitis, seminibus oblongis hirsutis. Lin. Mat. Med. 143. *Spignel with plain hairy leaves, petals divided into two parts, and oblong hairy seeds.* Daucus Creticus foliis fœniculi tenuissimis. C. B. P.
3. ATHAMANTA (*Sicula*) foliis inferioribus nitidis, umbellis primordialibus subsessilibus, seminibus pilosis. Hort. Upsal. 60. *Spignel with shining under leaves, the umbels at first sitting close, and hairy seeds.* Daucus secundus siculis sophiæ folio. Zan. Hist. 80.
4. ATHAMANTA (*Oreoselinum*) foliolis divaricatis. Flor. Suec. 249. *Athamanta with divaricated leaves.* Apium montanum folio ampliore. C. B. P. 153.
5. ATHAMANTA (*Cervaria*) foliolis pinnatis decussatis, inciso-angulatis, seminibus nudis. Lin. Sp. 352. *Athamanta with winged leaves, whose lobes are angularly cut, and naked seeds.* Daucus montanus Apii folio major. C. B. P. 150.

The first sort is the common Spignel used in medicine. This grows naturally in Westmoreland, and by the inhabitants there is called Bald-Money, or Bawd-Money; by some it is called Meu. This is a perennial plant; the stalks rise a foot and a half high, and are channelled; the leaves are very ramose, and composed of many fine hair-like leaves set pretty close, of a deep green; the stalk is terminated by an umbel of white flowers, which are succeeded by oblong smooth seeds.

This may be propagated by parting the roots at Michaelmas, or from seeds sown soon after they are ripe; the plants should have a shady situation and moist soil. It flowers in June, and the seeds ripen in August.

The second sort is the Daucus Creticus, of which there are two sorts, whose seeds are indifferently used in the shops, one of which is annual, but that here mentioned is a perennial plant, which sends out many

ſtalks, garniſhed with ſlender narrow leaves like thoſe of Fennel, irregularly diſpoſed. The flower-ſtalk riſes about two feet high, ſending out many branches, garniſhed the whole length with the ſame compound capillary leaves, and at the top are terminated by compound umbels, compoſed of near twenty ſmall ones; theſe have white flowers with five petals, which are ſucceeded by oblong, hairy, channelled fruit, divided into two parts, each containing one oblong hairy ſeed.

This ſort is propagated by ſeeds, which ſhould be ſown in autumn on an open bed of light dry ground; and when the plants come up in the ſpring, they ſhould be kept clean from weeds, and thinned where they are too cloſe, ſo that they may have room to grow till the following autumn, when they ſhould be carefully taken up, and planted at about a foot diſtance in a bed of light ſandy earth, where the roots will continue ſeveral years, and annually flower and produce ripe ſeeds. It flowers in June, and the ſeeds are ripe in September. This grows naturally in Candia, but is rarely injured by cold in this country.

The third ſort is a perennial plant; this ſends up from the root ſeveral upright ſtalks, near three feet high, which are terminated by compound umbels; theſe, at their firſt appearance, are very cloſe and compact, but afterward ſpread open, and divide into ſeveral ſmaller umbels; the foot-ſtalks or rays of theſe are ſhort and hairy. The flowers are compoſed of five white petals, which are not quite equal, and are ſucceeded by oblong woolly fruit, divided into two parts, each containing one oblong channelled ſeed.

This may be propagated in the ſame manner as the former, and is equally hardy; it grows naturally in Sicily, and ſome parts of Italy.

The fourth ſort is a perennial plant, which grows naturally in ſome particular parts of England, France, and Germany; the leaves of this are linear, and acutely cut into oblong ſegments; the ſtalks riſe two feet high, dividing toward the top into three or four branches, each being terminated by an umbel of white flowers, which are ſucceeded by oblong ſtriated ſeeds. It flowers in July, and the ſeeds ripen in autumn.

The fifth ſort grows naturally in the ſouth of France, and in Auſtria: this hath a perennial root; the ſtalks riſe three feet high, garniſhed with winged leaves, which are cut into angular ſegments; they are terminated by umbels of white flowers, which are ſucceeded by naked ſeeds. This flowers in July, and the ſeeds ripen in autumn.

Theſe two ſorts are ſeldom admitted into any gardens but thoſe of botaniſts, for the ſake of variety, being plants of little beauty or uſe. They are propagated by ſeeds, which ſhould be ſown in autumn ſoon after they are ripe, and the plants will appear the following ſpring, when they will require no other care but to thin them where they are too cloſe, and keep them clean from weeds. The ſecond ſummer they will flower and produce ripe ſeeds, but the roots will abide ſeveral years where they are deſired.

ATHANASIA. Lin. Gen. 943. Baccharis. Vaill. Act. Gall. 1719. Goldylocks.

The Characters are,

*The empalement is imbricated, oval, and the ſcales are ſpear-ſhaped; the flower is of the compound kind; the florets are uniform and longer than the corolla; the hermaphrodite florets are funnel-ſhaped, cut into five ſegments, which are erect; they have each five ſhort hair-like ſtamina, with cylindrical tubuloſe ſummits, and an oblong germen with a ſlender ſtyle, terminated by an obtuſe bifid ſtigma; each floret has an oblong ſeed with a chaffy down between them.*

This genus of plants is ranged in the firſt order of Linnæus's nineteenth claſs, entitled Syngeneſia Polygamia Æqualis; the florets of this order are all hermaphrodite.

The Species are,

1. Athanasia (*Dentata*) corymbis impoſitis, foliis inferioribus linearibus dentatis, ſuperioribus ovatis ſerratis. Lin. Sp. 1181. *Athanaſia with a compound corymbus, the lower leaves linear and indented, the upper oval and ſawed.* Coma aurea Africana fruteſcens, foliis inferioribus inciſis, ſuperioribus dentatis. Com. Rar. Pl. 41.
2. Athanasia (*Trifurcata*) corymbis ſimplicibus, foliis trilobis cuneiformibus. Lin. Sp. 1181. *Athanaſia with a ſingle corymbus, and wedge-ſhaped leaves with three lobes.* Coma aurea Africana fruticans, foliis glaucis & in extremitate trifidis. Hort. Amſt. 2. p. 97.
3. Athanasia (*Crithmifolia*) corymbis ſimplicibus, foliis ſemitrifidis linearibus. Lin. Sp. 1181. *Athanaſia with a ſimple corymbus, and linear ſemitrifid leaves.* Coma aurea fruticans foliis anguſtiſſimis trifidis. Burm. Afr. 186.
4. Athanasia (*Pubeſcens*) corymbus ſimplicibus, foliis lanceolatis indiviſis villoſis. Amœn. Acad. 4. p. 329. *Athanaſia with a ſimple corymbus, and ſpear-ſhaped, undivided, hairy leaves.* Coma aurea Africana fruticoſa, omnium maxima, foliis tomentoſis & incanis. Hort. Amſt. 2. p. 93.
5. Athanasia (*Annua*) corymbus ſimplicibus coarctatis, foliis pinnatifidis dentatis. Lin. Sp. 1182. *Athanaſia with a ſimple corymbus, and winged indented leaves.* Elichryſum inodorum glabrum, coronopi folio glabrum. Magn. Montp. 307.
6. Athanasia (*Maritima*) pedunculis unifloris ſubcorymboſis, foliis lanceolatis indiviſis crenatis obtuſis tomentoſis. Lin. Sp. 1182. *Athanaſia with ſingle flowers on each foot-ſtalk formed like a corymbus, and ſpear-ſhaped, obtuſe, woolly leaves.* Gnaphalium maritimum. C. B. P. 263.

The firſt ſort grows naturally at the Cape of Good Hope: this hath a low, ſhrubby, branching ſtalk, which ſeldom riſes three feet high; the branches are garniſhed with two ſorts of leaves, thoſe toward the bottom are linear and indented, but the upper are oval and ſawed on their edges: the flowers are diſpoſed in a compound corymbus at the end of the branches; they are of a pale yellow, and appear early in ſummer, and if the ſeaſon proves favourable, will be ſucceeded by ripe ſeeds in autumn.

The ſecond ſort is a native of the Cape of Good Hope: this riſes with a ſhrubby ſtalk five or ſix feet high, dividing into many irregular branches, garniſhed with flat glaucous leaves cut at their extremity into three ſegments; theſe have an agreeable odour when bruiſed. The flowers are produced in a ſimple corymbus at the extremity of the branches; they are of a bright yellow colour, and appear in Auguſt, but are ſeldom ſucceeded by ripe ſeeds in England.

The third ſort grows naturally at the Cape of Good Hope: this hath a ſhrubby branching ſtalk like the former; the leaves are linear, and divided more than half their length, ſome into three, and others into five narrow ſegments: the flowers are produced at the extremity of the branches in a ſimple corymbus, like thoſe of the former ſort in ſhape and colour, of which there is a ſucceſſion on the ſame plant great part of ſummer; but unleſs the ſeaſon is warm, they are rarely ſucceeded by ripe ſeeds in England.

The fourth ſort riſes with a ſhrubby ſtalk ſix or ſeven feet high; the branches are garniſhed with hairy, ſpear-ſhaped, entire leaves; the flowers are yellow, and produced in a ſimple corymbus at the extremity of the branches, but are not ſucceeded by good ſeeds in England.

Theſe four ſorts are eaſily propagated by cuttings during the ſummer months. If theſe are planted either in pots or upon an old hot-bed, and cloſely covered with glaſſes, ſhading them in the heat of the day, and refreſhing them with water when they require it, they will put out roots in five or ſix weeks; and in two months they may be taken up and planted in pots filled with light earth, and placed in a ſhady ſituation until they have taken new root; after which they ſhould be removed to a ſheltered ſituation, mixing them with other exotic plants, where they may remain till the middle or end of October, according as the ſeaſon proves

proves favourable; then should be removed either into a green-house, or a glass case, where they may enjoy as much free air as possible, but secured from frost, with which management they will thrive and produce plenty of flowers; but where they are drawn weak in winter, they will not appear sightly.

The fifth sort is an annual plant, which grows naturally in Africa. This hath an herbaceous stalk about nine inches high, which divides toward the top into three or four branches, garnished with smooth leaves, divided into segments like those of Buckshorn Plantain; the flowers are large, of a bright yellow colour, and are produced at the extremity of the branches in a compact simple corymbus; these appear in July and August, but are rarely succeeded by ripe seeds in this country.

This is propagated by seeds when they can be obtained good, which should be sown on a moderate hot-bed the latter end of March; when the plants are come up they should have air in proportion to the warmth of the season admitted to them, to prevent their drawing up weak; and so soon as they are big enough to remove they should be transplanted on another gentle hot-bed, at three inchesdi stance, observing to shade them until they have got fresh root; after which they must have air and water, and by the end of May, the plants will have acquired strength enough to be transplanted into the open air; when some may be planted in pots to place among other exotic plants in summer, and the others into warm borders, where they will flower all the autumn, but unless the season is very warm, they will not ripen seeds.

The sixth sort grows naturally on the sea coasts in the warm parts of Europe, and also in some parts of Wales, from whence I have received plants. The stalks trail on the ground, seldom growing more than seven or eight inches long, garnished closely with woolly leaves, which are spear-shaped, entire, and obtuse; the flowers are of a bright yellow, each produced on a single foot-stalk, forming a kind of corymbus; they appear in June and July, but rarely ripen seeds in the garden.

This may be propagated by planting slips or cuttings during the summer months, in the same way as the African sorts; some of the plants should be put into pots to be placed under a hot-bed frame in winter, the other may be planted in a warm border, where if the winter proves favourable they will live, but they rarely survive cold winters.

ATMOSPHERE [of Ἀτμὸς, a vapour, and σφαῖρα, *Gr.* a sphere] is an appendage of the earth, which consists of a thin, fluid, elastic substance, called air, surrounding the terraqueous globe to a considerable height.

The whole mass, or assemblage of ambient air, is commonly understood to be the atmosphere.

But the more accurate writers restrain the term atmosphere to that part of the air which is next to the earth, which receives the vapours and exhalations, and which is terminated by the refraction of the light of the sun.

Those spaces that are higher, and beyond these, are called æther; and, being supposed to be possessed by a finer substance, are called the æthereal regions, tho' these, perhaps, are not destitute of air.

This atmosphere insinuates itself into all the vacuities of bodies, and by that means becomes the great spring of most of the mutations here below, as generation, corruption, dissolution of vegetables, &c. to the pressure of the atmosphere, plants owe their vegetation, as well as animals do their respiration, circulation, and nutrition.

ATRACTYLIS. Lin. Gen. Plant. 837. Distaff Thistle.

The Characters are,

*It hath a radiated compound flower, composed of many hermaphrodite florets, which are included in a common scaly unarmed empalement. This hath a permanent involucrum, composed of several narrow plain leaves, which have sharp spines on their sides. The hermaphrodite florets which compose the rays, or border, are stretched out on one side like a tongue, and are slightly indented in five parts. Those which compose the disk, or middle, are funnel-shaped, cut at the top into five parts; these have both five slender stamina in each, which are short, and crowned by cylindrical summits; in those of the disk is situated a short crowned germen, supporting a slender style, crowned by a bifid stigma. The germen afterward becomes a turbinated compressed seed, crowned with a plume of down, shut up in the empalement.*

This genus of plants is ranged in the first section of Linnæus's seventeenth class, entitled Syngenesia Polygamia Æqualis, from the florets of the border and disk being hermaphrodite.

The Species are,

1. Atractylis (*Cancellata*) involucris cancellatis ventricosis, linearibus dentatis calycibus ovatis, floribus flosculosis. Lin. Sp. Plant. 830. *Distaff Thistle with a bellied netted involucrum, an oval, indented, linear empalement, and flosculous flowers.* Cnicus exiguus capite cancellato semine tomentoso. Tourn. Inst. R. H.
2. Atractylis (*Humilis*) foliis dentato-sinuatis, flore radiato obvallato involucro patente, caule herbaceo. Lin. Sp. Plant. 829. *Distaff Thistle with sinuated indented leaves, a radiated flower strongly guarded by its spreading involucrum, and an herbaceous stalk.* Cnicus aculeatus purpureus humilior. Tourn. Inst. R. H. 451.
3. Atractylis (*Gummifera*) flore acaule. Lin. Sp. Plant. 829. *Distaff Thistle with a flower without a stalk.* Cnicus Carlinæ folio acaulos gummifer aculeatus. Tourn. Cor. 33.

The first sort grows naturally in Spain, Sicily, and other warm parts of Europe. This is an annual plant which seldom rises more than eight or nine inches high, with a slender stem, thinly garnished with narrow hoary leaves, having spines on their edges; at the top of the stalk there are two or three slender branches sent out, each being terminated by a head of flowers, like those of the Thistle, with an involucrum composed of several narrow leaves, armed with spines on their side, which are longer than the head of flowers. The empalement is curiously netted over, and is narrow at the top, but swelling below, containing many florets of a purplish colour. These are each succeeded by a single downy seed; it flowers in July, and, if the season be warm and dry, it will ripen its seeds in September, but in cold years never perfects seeds here.

It is propagated by seeds, which must be sown upon an open bed of light earth, where the plants are to remain, and will require no other care but to keep them clean from weeds, and thin the plants where they come up too close together.

The second sort rises with a stalk near a foot high, which is garnished with indented leaves, having small spines on their edges; the upper part of the stalk is divided into two or three slender branches, each supporting a head of purple flowers, having rays in the border, and florets in the disk, inclosed in a scaly empalement. The roots of this will live two or three years; it flowers in June, but unless the summer is warm and dry, it will not perfect seeds in England. The seeds of this sort should be sown where they are to remain, and will require no other culture than the former. It grows naturally about Madrid, from whence I received the seeds.

The third sort grows naturally in Italy, and the islands of the Archipelago, and is what the College of Physicians have placed among the medicinal simples, by the title of Carline Thistle; the root of this is perennial, and sends out many narrow leaves, which are deeply sinuated, and armed with spines on their edges. These lie close on the ground, and between them the flower is situated, without stalk, having many florets, inclosed in a prickly empalement. Those on the border are white, but those which compose the disk are of a yellowish colour. It flowers in July, but never perfects seeds in England.

It

It is propagated by feeds, which muft be obtained from the countries where it grows naturally; thefe fhould be fown upon a border of light earth, in a warm fituation, early in April, and when the plants come up, and are fit to tranfplant, they fhould be thinned, and thofe which are drawn out may be tranfplanted, leaving the other two feet afunder; after which the only culture they require is, to keep them clean from weeds in fummer, and in winter to cover the roots with fome old tanners bark, to prevent the froft from penetrating the ground.

The fourth fort grows naturally at the Cape of Good Hope; this rifes with a fhrubby ftalk near three feet high, garnifhed with oblong leaves, indented on their edges, which have weak fpines at each indenture; there are feveral weak branches fent out on the fides, each of which are terminated by a fingle head of flowers, inclofed in a common empalement, which fpreads open, and are of a golden colour, but are never fucceeded by feeds in England. This is propagated by flips, taken from the flower-ftalks in June, and planted in pots filled with light earth, and plunged into an old bed of tanners bark, where the heat is gone, and fhaded with mats in the heat of the day, until they have taken root; after which time they may be expofed in the open air till October, when they muft be removed into fhelter, and, during the winter, fhould have little water, and in fummer expofed with other hardy exotic plants in a fheltered fituation.

ATRAPHAXIS. Lin. Gen. Plant. 405. We have no Englifh name for this.

The Characters are,

*The flower hath a permanent empalement, compofed of two fmall coloured leaves placed oppofite. The flower hath two roundifh finuated petals larger than the empalement, which are permanent; it hath fix capillary ftamina, which are the length of the empalement, crowned with roundifh fummits; in the center is fituated a compreffed germen, having no ftyle, but crowned by two ftigma; the germen afterward becomes a roundifh compreffed feed, fhut up in the empalement.*

This genus of plants is ranged in the fecond fection of Linnæus's fixth clafs, entitled Hexandria Digynia, the flower having fix ftamina and two ftigma.

The Species are,

1. Atraphaxis ramis fpinofis. Hort. Cliff. 138. *Atraphaxis with prickly branches.* Atriplex orientalis frutex aculeatus flore pulchro. Tourn. Cor. 38.
2. Atraphaxis inermis. Lin. Sp. Plant. 333. *Atraphaxis without fpines.* Arbufcula Africana repens folio ad lateræ crifpo, ad Polygona relata. Hort. Elth. 36.

The firft fort grows naturally in Media, from whence Dr. Tournefort fent the feeds to the royal garden at Paris.

This is a fhrub which rifes four or five feet high, fending out many weak lateral branches, which are armed with fpines, and garnifhed with fmall, fpear-fhaped, fmooth leaves, of an Afh-colour. The flowers come out at the ends of the fhoots in clufters, each confifting of two white leaves tinged with purple; and are included in a two leaved empalement, of a white herbaceous colour; thefe appear in Auguft, but the feeds never ripen here, fo the plant is propagated by cuttings, and muft be fcreened from hard froft, which commonly deftroys thofe which are planted in the open air.

The fecond fort fends out many flender branches, which trail on the ground when they are not fupported, garnifhed with fmall oval leaves, about the fize of thofe of the Knot Grafs, waved and curled on their edges, embracing the ftalk half round at their bafe, and are placed alternate. The flowers come out from the wings of the leaves, and have much the appearance of an apetalous flower, being compofed of four herbaceous leaves, two of which are the empalement, the other two the petals; in the center is fituated the compreffed germen, attended by fix ftamina, but the feeds are never produced in this country. It flowers in June and July. This is a native of the country about the Cape of Good Hope, from whence it was brought into the gardens in Holland, and has been feveral years in the Englifh gardens, where it is allowed a place more for the fake of variety, than its beauty. It may be eafily propagated by cuttings any time in the fummer, and in winter the plants muft be fcreened from froft.

ATRIPLEX, Orach, or Arach.

The Characters are,

*It hath female and hermaphrodite flowers on the fame plant. The hermaphrodite flowers have a permanent empalement of five oval concave leaves, with membranaceous borders; they have no petals, but five awl-fhaped ftamina, placed oppofite to the leaves of the empalement, fupporting double fummits. In the center is placed the orbicular germen, with a fhort bipartite ftyle, crowned with a reflexed ftigma. The germen afterward becomes an orbicular compreffed feed, fhut up in the five-cornered empalement. The female flowers have a two-leaved empalement, which are large, plain, erect, and pointed. They have no petals nor ftamina, but in the center a compreffed germen, fupporting a bipartite ftyle, crowned by a reflexed ftigma. The germen afterward becomes an orbicular compreffed feed, inclofed in the heart-fhaped valves of the empalement.*

This genus of plants is ranged in the firft fection of Linnæus's twenty-third clafs, entitled Polygamia Monœcia, the fame plants having female and hermaphrodite flowers.

The Species are,

1. Atriplex caule erecto herbaceo foliis triangularibus. Hort. Cliff. 469. *Orach with an upright herbaceous ftalk, and triangular leaves.* Atriplex hortenfis alba five pallidè virens. C. B. P. 119.
2. Atriplex caule fruticofo foliis deltoidibus integris. Hort. Cliff. 469. *Orach with a fhrubby ftalk and entire leaves, fhaped like the Greek delta.* Atriplex latifolia five Halimus fruticofus. Mor. Hift. p. 2. 207. *commonly called Sea Purflane-tree.*
3. Atriplex caule fruticofo foliis obovatis. Flor. Suec. 829. *Orach with a fhrubby ftalk and oval leaves.* Atriplex maritima fruticofa, Halimus & Portulaca marina dicta anguftifolia. Raii Syn.

There are feveral other fpecies of this genus, fome of which grow naturally in England, but as they are plants of no beauty, they are rarely admitted into gardens, for which reafon I fhall not enumerate them here.

The firft of thefe plants was formerly cultivated in the kitchen-gardens as a culinary herb, being ufed as Spinage, and is now, by fome perfons, preferred to it; though, in general, it is not efteemed amongft the Englifh; but the French, at prefent, cultivate this plant for ufe.

There are three or four different forts of this, whofe difference is only in the colour of the plants; one of which is of a deep green, another of a dark purple, and a third with green leaves and purple borders. Thefe are fuppofed to be only accidental varieties which have come from the fame feeds, but in forty years which I have cultivated thefe forts, I have never yet obferved them to vary. But as there is no other effential difference, I have not enumerated them here.

Thefe plants are annual, fo muft be fown for ufe early in the fpring, or at Michaelmas, foon after the feeds are ripe; at which time it generally fucceeds better than when it is fown in the fpring, and will be fit for ufe at leaft a month earlier. Thefe plants require no other culture, but to hoe them when they are about an inch high; to cut them down where they are too thick, leaving them about four inches afunder, and to cut down all the weeds. This muft be done in dry weather, otherwife the weeds will take root again, and render the work of little or no ufe. When the plants are grown about four inches high, it will be proper to hoe them a fecond time, in order to clear them from weeds; and, if you obferve the plants are left too clofe in any part, they fhould then be cut out. If this be well performed, and in dry weather,

weather, the ground will remain clean until the plant is fit for use. Where these plants are sown on a rich soil, and allowed a good distance, the leaves will be very large, in which the goodness of the herb consists. This must be eaten while it is young; for, when the stalks become tough, it is good for nothing. Some few plants of each kind may be permitted to stand for seed, to preserve their kinds, which will ripen in August, and may then be cut, and laid on a cloth to dry; after which the seeds may be beaten out, and put up for use. The first sort is ordered by the College of Physicians for medicinal use.

The second sort was formerly cultivated in gardens as a shrub; and, by some persons, they were formed into hedges, and constantly sheared, to keep them thick; but this plant is by no means fit for such purposes, on many accounts, for it grows too vigorous; the shoots, in one month, at the growing season of the year, will be two feet long, provided they have a good soil; so that a hedge of this plant cannot be kept in tolerable order, nor will it ever form a thick hedge. But a worse inconvenience attends this plant; for, in very hard winters, it is often destroyed; as also, in very dry summers, many of the plants will decay, whereby there will become large gaps in the hedge.

But although this plant will not be proper for hedges, yet it may have a place in wilderness quarters, where it will serve to thicken; and the silver-coloured leaves will add to the variety, among other shrubs of the same growth. This will grow eight or ten feet high, and, if suffered to grow wild, without pruning, will spread several feet in compass, and will sometimes produce flowers.

It may be propagated by cuttings, which may be planted in any of the summer months, on a shady border; where, if they are duly watered, they will soon take root, and be fit to transplant the Michaelmas following, when they should be planted where they are to remain; for they do not succeed well in transplanting, especially when they are grown pretty large and woody.

The third sort grows wild in divers parts of England, on the sea side, from whence the plants may be procured; or it may be propagated by cuttings, in the same manner as the former sort. This is a low under shrub, seldom rising above two feet and a half, or at most three feet high, but becomes very bushy. The leaves of this kind are narrow, and of a whitish colour, but are not so white as those of the former. This may have a place amongst other low shrubs; and, if planted on a poor gravelly soil, will abide several years, and make a pretty diversity.

ATROPA. Lin Gen. Plant. 222. Belladonna. Tourn. Inst. R. H. 77. Deadly Nightshade.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, cut into five parts; it is bell-shaped, the tube is short, and swells toward the brim, where it spreads open, and is divided into five equal parts. It hath five awl-shaped stamina rising from the base of the petal where they join, but at the top spread from each other, and are crowned with large summits which stand upward. In the center is situated an oval germen, supporting a slender style, which is crowned by an oblong transverse stigma. The germen afterward becomes a globular berry having three cells, sitting on the empalement, and filled with kidney-shaped seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, entitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. ATROPA (*Belladonna*) caule herbaceo, foliis ovatis integris. Lin. Sp. Plant. 181. *Deadly Nightshade with an herbaceous stalk, and oval entire leaves.* Belladonna majoribus foliis & floribus. Tourn. Inst. R. H. 77.
2. ATROPA (*Frutescens*) caule fruticoso pedunculis confertis, foliis cordato-ovatis obtusis. Lin. Sp. Plant. 182. *Deadly Nightshade with a shrubby stalk, foot-stalks in clusters, and oval, heart-shaped, obtuse leaves.* Belladonna frutescens rotundifolia Hispanica. Tourn. Inst. R. H. 77.
3. ATROPA (*Herbacea*) caule herbaceo, foliis ovatis nervosis marginibus undulatis. *Deadly Nightshade with an herbaceous stalk, and oval veined leaves waved on their edges.*

The first sort grows wild in many parts of England, but is not very frequent near London. I have observed it in Woodstock Park in Oxfordshire, and in great abundance in Uppark in Hampshire. This plant hath a perennial root, which sends out strong herbaceous stalks of a purplish colour, which rise to the height of four or five feet, garnished with oblong entire leaves, which toward autumn change to a purplish colour; the flowers are large and come out between the leaves singly, upon long foot-stalks; bell-shaped, and of a dusky brown colour on their outside, but are purple within. After the flower is past, the germen turns to a large round berry, a little flatted at the top, and is first green, but when ripe turns to a shining black, sitting close upon the empalement, and contains a purple juice of a nauseous sweet taste, and full of small kidney-shaped seeds. In some places this plant is called Dwale, but in general Deadly Nightshade, from its quality. It is rarely admitted into gardens, nor indeed should it be suffered to grow in any places where children resort, for it is a strong poison: there have been several instances within a few years past, of its deadly quality, by several children being killed with eating the berries, which are of a fine black colour, and about the size of a black Cherry, and not unpleasant to the taste.

Mr. Ray gives a good account of the various symptoms it produces, by what happened to a Mendicant Frier, upon his drinking a glass of Mallow wine, in which this plant was infused: in a short time he became delirious, soon after was seized with a grinning laughter, after that several irregular motions, and at last a real madness succeeded; and such a stupidity as those that are sottishly drunk have, which after all, was cured by a draught of vinegar.

There is also an instance of the direful effects of this plant recorded in Buchanan's History of Scotland, wherein he gives an account of the destruction of the army of Sweno, when he invaded Scotland, by mixing a quantity of the juice of these berries with the drink which the Scots by their truce were to supply them with; which so intoxicated the Danes, that the Scots fell upon them in their sleep, and killed the greatest part of them, so that there were scarcely men enough left to carry off their king.

The second rises with a shrubby stem to the height of six or eight feet, and divides into many branches, garnished with round leaves, in shape like those of the Storax-tree; these are placed alternately on the branches. The flowers come out between the leaves upon short foot-stalks, which are shaped like those of the former, but much less, of a dirty yellowish colour, with a few brown stripes; these are never succeeded by berries in England. It grows naturally in Spain, from whence the seeds may be procured. It is propagated by seeds, which should be sown in the spring upon a very moderate hot-bed, just to bring up the plants; when they are fit to remove, they should be each put into a separate small pot, filled with loamy earth, and shaded until they take root; then they may be placed with other hardy exotic plants in a sheltered situation, and in October they must be removed into the green-house, and treated as other plants from the same country. It flowers in July and August.

The seeds of the third sort were sent me from Campeachy; this hath a perennial root, which puts out several channelled herbaceous stalks, which rise about two feet high; and toward the top divide into two or three small branches, garnished with oval leaves four inches long and three broad, having several transverse ribs on their under side, which are prominent. The flowers come out from between the leaves on short foot-stalks; they are white, and shaped like

 those

those of the common sort, but are smaller. It flowers in July and August, but seldom ripens its fruit in England. It is propagated by parting the roots in the spring, and the plants must be kept in the bark-stove to have them thrive well in this country.

AVENA. Lin. Gen. Plant. 85. Tourn. Inst. R. H. 514. Oats.

The CHARACTERS are,

*The flowers are collected in a loose panicle, without beards; these have a bivalvular empalement, swelling in the middle, and pointed at both ends. The petal of the flower is bivalve, the lower valve being of the same size with the empalement, but harder, putting out from the back a spiral beard, twisting, jointed, and reflexed. There are two oval nectarii sitting upon the upper side of the germen, which is obtuse, supporting two reflexed hairy styles, crowned by two plain stigma; these are attended by three slender stamina, crowned by oblong forked summits. The germen afterward becomes an oblong swelling seed, pointed at both ends, having a longitudinal furrow, and closely shut up in the cover or chaff.*

This genus of plants is ranged in the second section of Linnæus's third class, entitled Triandria Digynia, from the flowers having three stamina and two styles.

AVENA (*Dispermis*) calycibus dispermibus seminibus lævibus. Hort. Cliff. 25. *Oats with two smooth seeds in each empalement.* There are three sorts of these Oats cultivated in England, viz. the white, the black, and the brown or red Oat, which are supposed to be only accidental varieties; but where they have been many years separately cultivated, I have never observed them to alter. However, as their principal difference is in the colour of their grain, I shall not enumerate them as distinct species. There is also a naked Oat, which is sometimes cultivated in the distant parts of England, but is rarely seen near London.

The white sort is the most common about London; the black is more cultivated in the northern parts of England, and is esteemed a very hearty food for horses; but the first makes the whitest meal, and is chiefly cultivated where the inhabitants live much upon Oat-cakes.

The naked Oat is less common than either of the others, especially in the southern parts of England; but in the north of England, Scotland, and Wales, it is cultivated in plenty. This sort is esteemed, because the grain threshes clean out of the husk, and need not be carried to the mill to be made into oatmeal or grist. An acre of ground doth not yield so many bushels of these, as of the common Oats, by reason the grain is small and naked, and goes near in measure; but what is wanting in the measure, is supplied in value.

The red Oats are much cultivated in Derbyshire, Staffordshire, and Cheshire, but are rarely seen in any of the counties near London; though, as they are a very hardy sort, and give a good increase, they would be well worth propagating, especially for all strong lands.

The straw of these Oats is of a brownish red colour, as is also the grain, which is very full and heavy, and esteemed better food for horses than either of the former sorts.

Oats are a very profitable grain, and absolutely necessary, being the principal grain which horses love; and are esteemed the most wholsome food for those cattle, being sweet, and of an opening nature; other sorts of grain being apt to bind, which is injurious to labouring horses: but if you feed them with this grain soon after they are housed, before they have sweat in the mow, or are otherwise dried, it is as bad on the other hand, for they are then too laxative.

This grain is a great improvement to many estates in the north of England, Scotland, and Wales; for it will thrive on cold barren soils, which will produce no other sort of grain; it will also thrive on the hottest land: in short, there is no soil too rich or too poor for it, too hot or too cold for it; and in wet harvests, when other grain is spoiled, this will receive little or no damage; the straw and husks being of so dry a nature, that if they are housed wet, they will not heat in the mow, or become mouldy, as other grain usually do; so is of great advantage in the northern parts of England, and in Scotland, where their harvest is generally late, and the autumns wet.

The meal of this grain makes tolerable good bread, and is the common food of the country people in the north. In the south it is esteemed for pottage, and other messes, and in some places they make beer with this grain.

The best time for sowing of Oats is in February or March, according as the season is early or late; and sometimes I have known it sown in April upon cold land, and has been early ripe. The black and red Oats may be sown a month earlier than the white, because they are hardier.

Oats are often sown on land which has the former years produced Wheat, Rye, or Barley. The common method is to plough in the stubble about the beginning of February, and sow the Oats, and harrow them in; but then they must be harrowed the same way as the furrows lay, for if it be done cross-ways, the stubble will be raised on the surface; but this is not a good method of husbandry, for when people have time to plough the stubble in autumn, it will rot in winter; and then giving the land another ploughing and a good harrowing just before the Oats are sown, it will make the ground finer and better to receive the grain. Most people allow four bushels of oats to an acre, but I am convinced three bushels are more than enough; the usual produce is about twenty-five bushels to an acre, though I have sometimes known more than thirty bushels on an acre.

Oats are also sown upon land when it is first broken up, before the ground is brought to a tilth for other grain, and is frequently sown upon the sward with one ploughing; but it is much better to give the sward time to rot before the Oats are sown, for the roots of the grass will prevent those of the Corn from striking downward.

AVENUES are walks of trees leading to a house, which are generally terminated by some distant object.

These were formely much more in request than at present, there being few old seats in the country but have one or more of these avenues; and some have as many of them as there are views from the house; but of late these are, with good reason, disused; for nothing can be more absurd, than to have the sight contracted by two or more lines of trees, which shut out the view of the adjacent grounds, whereby the verdure and natural beauties of the country are lost; and where the avenues are of a considerable length (even where their breadth is proportionable) they appear at each end to be only narrow cuts through a wood, which never can please any person of real taste; and, when the road to the house is through the avenue, nothing can be more disagreeable; for in approaching to the house, it is like going through a narrow lane, where the objects on each side are shut out from the view; and when it is viewed from the house, it at best has only the appearance of a road, which being extended to a length in a strait line, is not near so beautiful as a common road, which is lost by the turnings, so as seldom to be seen to a great extent: but as these avenues must be made exactly strait, so when the trees are grown to any size, they entirely break the view, whatever way the sight is directed through them; and if this is in a park, the lawn of grass through which the avenue is planted, is thereby entirely deprived of the beauty which it naturally would afford, if left open and well kept: therefore, whenever the situation of a house will admit of a large open lawn in front, the road to the house should be carried round at a proper distance; and, if it be carried sometimes through trees, and serpented in an easy natural way, it will be much more beautiful than any stiff formal avenue, how large soever made.

But

But as there may be some persons so much wedded to the old way of laying out and planting grounds, as to prefer the avenues to the most beautiful disposition of lawns, woods, &c. I shall mention the usual methods of designing and planting them, that have been esteemed the best.

The usual width allowed to these avenues was generally as much as the whole breadth of the house and wings; but if they are planted twelve or fourteen feet wider, they will be the better; because when the trees are grown to any considerable size, they will spread and overhang, so will contract the view.

And as for such avenues to woods or prospects, &c. they ought not to be less than sixty feet in breadth; and because such walks are a long time before they are shady, it will be convenient to plant another row on each side, rather than to lose the stateliness that the main walk will afford in time by being broad, where any thing of a prospect is to be gained.

And as to the distance one from another, they should not be planted nearer one another than thirty-five or forty feet, especially if the trees are of a spreading kind; and the same distance, if they are for a regular grove.

As to the trees proper for planting avenues, they may be the English Elm, the Lime-tree, the Horse Chesnut, the common Chesnut, the Beach, and the Abele.

The English Elm is approved for all places where it will succeed, and that it will do in most places, except in very wet or cold shallow grounds. 1. Because it will bear cutting, heading, lopping in any manner whatsoever, and probably, with better success than any other tree.

Secondly, the Lime-tree: this is approved by others, because it will do well in any tolerable soil, if the bottom be not hot and gravelly; and because of the regular shape it has in growing, the agreeableness of its shade, and the beautiful colour of its leaves.

Thirdly, the Horse Chesnut is also to be used in such places as are very well defended from strong winds; because, wherever it grows freely, if it be not skilfully managed now and then by cutting, the branches are subject to split down. This tree is valuable on account of its quick growth, the earliness of its coming out, the nobleness of its leaves, and the beauty of its flowers, being a fine plant both for shade and ornament. This delights in a strong hearty soil, but will do well in any tolerable ground, if good care be taken in the planting of it; but wherever these trees are planted in avenues, they should be placed thirty feet asunder, that their heads may have room to spread, otherwise they will not appear so beautiful.

Fourthly, the common Chesnut will do well in a proper soil, and will rise to a considerable height, if planted close together; but if it be planted singly, where the tree can take its own natural shape, it is rather inclined to spread and grow globous than tall.

Fifthly, the Beech is recommended by some; but this seldom succeeds well after transplanting, without extraordinary care; though it arrives to a very large tree in many places in England, where it grows naturally; and is the most tedious and troublesome to raise, to any tolerable size, in a nursery way.

Sixthly, the Abele: this, indeed, grows more dispersed and loose in its head than any of the former, and consequently, is worse for defence; but yet is not to be left out from the number of trees for avenues, because it is the quickest in growth of all the forest trees, and will thrive tolerably well in almost any soil, and particularly in wet ground, where few of the before-mentioned trees will thrive, and this seldom fails in transplanting.

Seventhly, the Oak; but this is seldom used in planting avenues, because it requires so long a time to raise it up to any tolerable stature in the nursery way; nor is it apt to thrive much after it has been transplanted, if at any bigness.

As for the Alder, Ash, Platanus, and Sycomore, they are but rarely used for planting avenues.

AURANTIUM [this plant is so called from aurum, *Lat.* gold, on account of its golden colour,] the Orange-tree.

The CHARACTERS are;

*The empalement of the flower is small, of one leaf, indented in five parts. The flower hath five oblong spreading petals, and many stamina, which are frequently joined in small separate bodies at bottom, and are crowned by oblong summits. In the center is situated the round germen, supporting a cylindrical style, crowned by a globular stigma. The germen afterward becomes a globular fleshy fruit, compressed at both ends, having a thick fleshy pulp, and divided into several cells, each containing two oval callous seeds.*

This genus of plants, is by Dr. Linnæus joined to the Citron, to which he has also added the Lemon, making them only species of the same genus, and ranges it in his eighteenth class, entitled Polyadelphia Icosandria, the flowers having more than twenty stamina, which are joined in several bodies.

The SPECIES are,

1. AURANTIUM (*Acri*) foliis ovato-lanceolatis glabris. *Orange-tree, with oval, spear-shaped, smooth leaves.* Aurantium acri medullâ vulgare. Ferr. Hesp. *The Seville Orange.*
2. AURANTIUM (*Sinense*) foliis lanceolatis acutis glabris. *Orange-tree, with pointed, spear-shaped, smooth leaves.* Aurantium Sinense. Ferr. Hesp. *The China Orange.*
3. AURANTIUM (*Orientale*) foliis lineari-lanceolatis glabris. *Orange-tree with narrow, spear-shaped, smooth leaves.* Aurantium angusto salicis folio dictum. Boerh. Ind. alt 2. 238. *Willow-leaved Orange, and by some called the Turkey Orange.*
4. AURANTIUM (*Decumana*) foliis ovato-lanceolatis crassis lucidis, fructu maximo. *Orange-tree with thick, shining, oval, spear-shaped leaves, and a large fruit.* Aurantium fructu maximo Indiæ Orientalis. Boerh. Ind. alt. 2. 238. *The Pumpelmoes, or Shaddock.*
5. AURANTIUM (*Humile*) pumilum foliis ovatis floribus sessilibus. *Dwarf Orange-tree with oval leaves, and flowers growing close to the branches.* Aurantium pumilum sub acri medullâ. Bartol. *The Dwarf, or Nutmeg Orange.*

There are many varieties of this, as there is of most other fruits which have arisen from culture; but those here enumerated may strictly be allowed to be distinct species. The varieties in the English gardens are, 1. The yellow and white striped-leaved Orange. 2. The curled-leaved Orange. 3. The horned Orange. 4. The double flowering Orange. And 5. The hermaphrodite Orange.

The China Orange is not so hardy as the Seville, therefore must be treated more tenderly, placing it in winter in the warmest part of the green-house, and housing it earlier in autumn, otherwise the fruit will all drop from the trees. This sort rarely produces good fruit in England, nor are the leaves of the tree near so large or beautiful as those of the Seville Orange; therefore the latter should be preferred, and only a tree or two of the China sort kept for variety.

The Dwarf Orange is also tender, the leaves are very small, growing in clusters; the joints of the branches are very near each other, and the flowers of these grow very close together, and appear like a nosegay, the branches being covered with them. This sort, when in flower, is proper to place in a room or gallery, to adorn them; the flowers being very sweet, will perfume the air of the place; but these are seldom to be found in good health, because they must be treated with more care than the common Orange and Lemon-trees, as must also the Shaddock, otherwise the fruit will always drop off in winter. The Pumpelmoes was brought from the East-Indies by one Capt. Shaddock, from whom the inhabitants of the West-Indies gave this fruit the name. But they have greatly degenerated the fruit since it has been in the West-Indies, by raising the trees from seeds; the greatest part of which produce harsh sour fruit, greatly inferior to the original sort; the flesh or pulp of which is red, whereas the greater part of the trees in America

rica produce fruit with a pale yellow flesh, and by constantly raising these trees from seeds, they degenerate the fruit continually; whereas, if they would bud from the good sort, they might have it in as great plenty as they pleased; but there are few persons in that part of the world who understand the method of grafting or budding fruit trees, and if they did, they are so negligent of their fruits, &c. as to leave the whole to nature, seldom giving themselves any farther trouble than to put the seeds into the ground, and leave them to grow as nature shall incline.

In proof of what I have here said, I cannot omit to mention, that a few years ago, I sent two small trees of the true Seville Orange to Jamaica, where this sort was wanting; and from these many other trees were budded, which have produced plenty of fruit, some of which were sent to England a few years past; and although they were long in their passage, yet when they arrived here, they were greatly superior to any of those fruit which are imported hither from Spain or Portugal, one of those affording three times the quantity of juice, that a fruit of equal size from either of those countries does.

All the sorts of Orange-trees with striped leaves are tender, therefore must be placed in a warm part of the green-house in winter, and must be treated with more care than the common sort, otherwise they will not thrive. These are varieties which some persons are fond of, but they never produce good fruit, nor are the flowers produced in so great plenty, therefore a few only should be preserved for the sake of variety.

The horned Orange differs from the other sorts in the fruit dividing into parts, and the rind expanding in form of horns: this and the distorted Orange are preserved by some curious persons for variety, but are not so beautiful as the common Orange. There is also a great variety of sweet Oranges both in the East and West-Indies, some of which are much more esteemed than those we now have in Europe; but as they are much tenderer, they will not thrive in this country with the common culture; therefore I shall not enumerate them, but shall proceed to give directions for the management of Orange-trees in England.

Where the trees are to be raised for stocks to bud Oranges, you should procure some Citron-seeds which were duly ripened; for the stocks of this kind are preferable to any other, both for quickness of growth, as also that they will take buds of either Orange, Lemon, or Citron; next to these are the Seville Orange seeds. The best seeds are usually to be had from rotten fruits, which are commonly easy to be procured in the spring of the year; then prepare a good hot-bed, of either horse-dung or tanners bark; the last of which is much the better, if you can easily procure it. When this bed is in a moderate temper for heat, you must sow your seeds in pots of good rich earth, and plunge them into the hot bed; observing to give them water frequently, and raise the glasses in the great heat of the day, to give proper air, lest the seeds should suffer by too great heat: in three weeks time your seeds will come up, and if the young plants are not stinted, either for want of proper heat or moisture, they will be in a month's time after their appearance, fit to transplant into single pots: you must therefore renew your hot-bed, and having prepared a quantity of small halfpenny pots (which are about five inches over at the top,) fill these half full of good fresh earth, mixed with very rotten cow-dung; and then shake out the young plants from the large pots, with all the earth about them, that you may the better separate the plants without tearing their roots; and having half filled the pots with earth, put a single plant into each of the small pots; then fill them up with the same earth as before directed, plunging the pots into the new hot-bed, giving them a good watering to fix the earth to their roots; and observe to repeat the same very often (for this plant, when in a hot-bed, requires much water,) but be sure to screen them from the sun in the heat of the day. In this method, with due care, your plants will grow to be two feet high by July, when you must begin to harden them by degrees, in raising your glasses very high, and when the weather is good, take them quite off; but do not expose them to the open sun in the heat of the day, but rather take off the glasses, and shade the plants with mats, which may be taken off when the sun declines; for the violent heat in the middle of the day would be very injurious to them, especially while young. Toward the end of September you must house them, observing to place them near the windows of the green-house, to prevent the damps from moulding their tender shoots. During the winter season they may be often refreshed with water, and in March or April, wash their heads and stems, to clear them from the filth that may have settled thereon, during their being in the house; and you must also give them a moderate hot-bed in the spring, which will greatly forward them; but harden them by the beginning of June, that they may be in right order to bud in August; when you should make choice of cuttings from trees that are healthy and fruitful, of whatever kinds you please, observing that the shoots are round; the buds of these being much better and easier to part from the wood, than such as are flat. When you have budded the stocks, you should remove them into a green-house, to defend them from wet, turning the buds from the sun; but let them have as much free air as possible, and refresh them often with water. In a month's time after budding, you will see which of them has taken; you must then untie them, that the binding may not pinch the buds, and let them remain in the green-house all the winter; then in the spring, prepare a moderate hot-bed of tanners bark; and, after having cut off the stocks about three inches above the buds, plunge their pots into the hot-bed, observing to give them air and water, as the heat of the weather shall require; but be sure to screen them from the violence of the sun during the heat of the day. In this management, if your buds shoot kindly, they will grow to the height of two feet or more, by the end of July; at which time you must begin to harden them before the cold weather comes on, that they may the better stand in the green-house the following winter. In the first winter after their shooting, you must keep them very warm; for, by forcing them in the bark-bed, they will be somewhat tenderer; but it is very necessary to raise them to their height in one season, that their stems may be strait: for in such trees, which are two or more years growing to their heading height, the stems are always crooked. In the succeeding years, their management will be the same as in full grown trees, which will be hereafter treated of: I shall therefore, now, proceed to treat of the management of such trees as are brought over every year in chests from Italy; which is, indeed, by much the quicker way of furnishing a green-house with large trees; for those which are raised from seeds in England, will not grow so large in their stems under eighteen or twenty years, as these are when brought over; and although their heads are small when we receive them, yet in three years, with good management, they will obtain large heads and produce fruit.

In the choice of these trees observe first, the difference of their shoots and leaves (if they have any upon them) to distinguish their different sorts, for the Shaddock and Citrons always make much stronger shoots than the Orange; for which reason, the Italian gardeners, who raise these trees for sale, generally propagate those sorts, so that they bring few of the Seville Orange-trees over, which are much more valuable both for their flowers and fruit; also prefer those that have two good buds in each stock (for many of them have but one, which will always produce an irregular head:) the straitness of the stem, freshness of the branches, and plumpness of the bark, are necessary observations.



When

When you have furnished yourself with a parcel of trees, you must prepare a moderate hot-bed of tanters bark, in length and breadth according to the number of trees to be forced; then put your trees into a tub of water upright, about half way of the stems, leaving the head and upper part of the stem out of the water, the better to draw and imbibe the moisture. In this situation they may remain two or three days (according to their plumpness when you received them;) then take them out, and clean their roots from all filth, cutting off all broken or bruised roots, and all the small fibres, which are quite dried by being so long out of the earth, and scrub the stems with a hard hair-brush, cleaning them afterwards with a cloth; then cut off the branches about six inches from the stem, and having prepared a quantity of good fresh earth, mixed with very rotten neats dung, plant your trees therein, observing never to put them into large pots; for if they are but big enough to contain their roots, it is sufficient at first planting; and be sure to put some potsherds and large stones in the bottom of each pot, to keep the holes at the bottom of the pots from being stopped with earth, that the water may freely pass off, and wrap some haybands round their stems, from bottom to top, to prevent the sun from drying their bark; then plunge these pots into the bark-bed, watering them well to settle the earth to their roots, frequently repeating the same all over their heads and stems, being very careful not to over-water them, especially before they have made good roots; and observe to screen the glasses of your hot-bed from the sun in the heat of the day.

If your trees take to grow kindly (as there is little reason to doubt of, if the directions given be duly observed,) they will have made strong shoots by the beginning of June; at which time you should stop their shoots, to obtain lateral branches to furnish their heads; and now you must give them air plentifully, and begin to harden them, that in the middle of July they may be removed into the open air, in some warm situation, defended from the great heat of the sun, and from winds, that they may be hardened before winter. About the end of September you should house these plants, setting them at first in the front of the green-house, near the glasses, keeping the windows open at all times when the weather will permit; and about the latter end of October, when you bring in the Myrtles, and other less tender trees, you must set your Oranges in the warmest and best part of the house, placing lower plants or trees in the front, to hide their stems. During the winter, let your waterings be frequent, but give them not too much at a time; for now their heads are but small, and therefore incapable to discharge too great a quantity of moisture, and take great care to guard them from frost.

In the spring, when you begin to take out some of your hardiest sorts of plants to thin your house, wash and cleanse the stems and leaves of your Orange-trees, taking out the upper part of the earth in the pots, filling them up again with good, fresh, rich earth, laying thereon a little rotten neats dung round the outside of the pots, but do not let it lie near the stem of the trees; then place them at wider distances in the house, that the air may circulate round their heads, giving them air discretionally, as the weather grows warm; but do not remove them into the open air until the latter end of May, that the weather is settled; for many times, when they are removed out too soon, the mornings often proving cold, give them at least a great check, which will change the colour of their leaves, and many times kill the extreme weak part of the shoots. Let the situation for your Orange-trees, during the summer season, be as much defended from the sun in the heat of the day, and strong winds, as possible, by tall trees or hedges; both of which, if they are exposed thereto, are very hurtful to them.

As these trees advance, it will be necessary in the summer to stop strong shoots where they grow irregularly, to force out lateral branches to fill the head; but do not pinch off the tops of all the shoots (as is the practice of some,) which will fill the tree with small shoots too weak to support fruit; but endeavour to form a regular head, and obtain strong shoots, taking away weak trifling branches where they are too close.

During the summer season, your Orange-trees will require frequent waterings in dry weather, especially if they are large; therefore you should endeavour to have the water as near the trees as possible, to save the trouble of carrying it, which, in a large quantity of trees, takes up much time. Your water should be soft, and exposed to the air, but never add dung of any sort thereto; which, although by many frequently recommended, yet has always been found destructive to these, and all other trees, if much used; it being like hot liquors to human bodies, which, at first taking, seem to add vigour, yet certainly leave the body weaker after some time than before.

Your Orange-trees will require to be shifted and new potted every other year, therefore you must prepare a quantity of good earth, at least a year before you intend to use it, that it may be well mixed and perfectly rotten. The best season for this work is about the end of April, that they may have taken fresh root before they are removed out of the green-house; and when this work is performed, it will be necessary to let them remain in the house a fortnight longer than usual, to be well settled.

In the performing this work, after you have drawn the trees out of the pots, you must cut off all the roots round the outside of the ball of earth, and take away all mouldy roots (if any such be;) then with a sharp iron instrument, get as much of the old earth from between the roots as possible, being careful not to break or tear the roots; then set the root of the tree into a large tub of water for about a quarter of an hour, to soak the under part of the ball of earth; and afterwards scrub the stems of the trees with a hard hair-brush, cleaning them and the heads with water, and a soft woollen cloth. Your pots being prepared, with some potsherds and large stones in the bottom, put some of your fresh earth into the pot, about three or four inches thick; and having placed your tree thereon, in the middle of the pot, upright, fill it up with the same rich earth, pressing it down hard with your hands; then water the tree all over the head, with a watering-pot that has a rose upon the spout, to let the water fall light and thick (as in a shower of rain;) and in watering these trees, do it in the same manner, during the time they abide in the house after shifting; this will greatly refresh their heads, and promote their taking fresh roots.

When you first set these trees abroad after shifting, you should place them near the shelter of hedges, and fasten their stems to strong stakes, to prevent their being disturbed by winds, which sometimes will blow fresh planted trees out of the pots, if too much exposed thereto, and thereby greatly injure their new roots.

If old Orange-trees have been ill managed, and their heads become ragged and decayed, the best method to restore them, is to cut off the greatest part of their heads early in March, and draw them out of the tubs or pots, and shake off the earth from their roots, cutting away all small fibres and mouldy roots; and then soak and clean their roots, stems, and branches, planting them in good earth, and setting them into a hot-bed of tanners bark, as was directed for such trees as came from abroad, managing them in the same manner: by this method they will produce new heads, and in two years time become good trees again. But if these are large trees, and have grown in tubs for several years, your best way will be to prepare a parcel of rough baskets (such as are used for basketing Evergreens, when sent to a distant place:) let these be somewhat less than the tubs you design to plant your trees into; then plant your trees

herein, plunging them into the hot-bed, and about the beginning of July, when your trees have made good ſhoots, you may remove them into the tubs, with their baſkets about them, filling the empty ſpace with the ſame good earth: this will preſerve your tubs from rotting in the bark, and the trees will do equally well as if planted into the tubs at firſt, provided you are careful in removing the baſkets, not to diſturb their roots; and alſo let them remain in the green-houſe a fortnight or three weeks after planting, before you ſet them abroad.

Theſe trees being new potted or tubbed every other year, thoſe years in which they are not ſhifted, you muſt in April obſerve to take out as much of the old earth from the tops of the pots and tubs, and alſo round the ſides of them, as poſſible, without injuring the roots of the trees, and fill them up with freſh earth; you muſt alſo waſh and clean their ſtems and leaves from filth, which will greatly ſtrengthen their flowering, and cauſe them to ſhoot vigorouſly the following ſummer.

In the management of Orange-trees which are in good health, the chief care ſhould be to ſupply them with water duly, and not (as is ſometimes practiſed) ſtarve them in winter, whereby their fibres are dried, and become mouldy, to the great prejudice of the trees; nor to give them water in too great abundance, but rather let their waterings be frequent, and given in moderate quantities. You muſt alſo obſerve, that the water has free paſſage to drain off; for if it be detained in the tubs or pots, it will rot the tender fibres of the trees. During the winter ſeaſon, they muſt have a large ſhare of air when the weather is favourable; for nothing is more injurious to theſe trees than ſtifling of them, nor ſhould they be placed too near each other in the green-houſe; but ſet them at ſuch diſtance, that their branches may be clear of each other, and that the air may circulate freely round their heads. In ſummer they ſhould be placed where the winds are not violent, and to have the morning and evening ſun; for if they are too much expoſed to the mid-day ſun, they will not thrive. The beſt ſituation for them is near ſome large plantation of trees, which will break the force of the winds, and ſcreen them from the violent heat of the ſun. In ſuch a ſituation they may remain until the beginning of October, or later, according as the ſeaſon proves favourable; for if they are carried into the green-houſe early, and the autumn ſhould prove warm, it will occaſion the trees to make freſh ſhoots, which will be weak and tender, and ſo liable to periſh in winter; and ſometimes it will occaſion their flowering in winter, which greatly weakens the trees; nor ſhould they remain ſo long abroad as to be injured by morning froſts.

The beſt compoſt for Orange-trees is two thirds of freſh earth from a good paſture, which ſhould not be too light, nor over ſtiff, but rather a hazel loam; this ſhould be taken about ten inches deep with the ſward, which ſhould be mixed with the earth to rot, and one third part of neats dung; theſe ſhould be mixed together, at leaſt twelve months before it is uſed, obſerving to turn it over every month, to mix it well, and to rot the ſward; this will alſo break the clods, and cauſe the mould to be finer. Before you make uſe of this earth, you ſhould paſs it through a rough ſcreen, to ſeparate the great ſtones and the roots of the ſward therefrom; but by no means ſift the earth too fine, for this is very prejudicial to moſt plants, but particularly to Orange-trees.

Of late years there have been many of theſe trees planted againſt walls, againſt which frames of glaſs are made to fix over them in winter; and ſome few curious perſons have planted theſe trees in the full ground, and have erected moveable covers to put over the trees in winter, which are ſo contrived as to be all taken away in ſummer: where theſe have been well executed, the trees have made great progreſs in their growth, and produced a much larger quantity of fruit, which have ripened ſo well, as to be extremely good for eating. If theſe are planted either againſt walls with deſign of training the branches to the walls, or in borders at a ſmall diſtance, ſo as to train them up as ſtandards, there ſhould be a contrivance of a fire-place or two, in proportion to the length of the wall, and flues carried the whole length of the wall, to warm the air in very cold weather, otherwiſe it will be very difficult to preſerve the trees in very hard winters alive; or, if they do live through the winter, they will be ſo much weakened by the cold, as not to be recovered the following ſummer to a proper ſtrength for bearing; ſo that wherever the trees are intended to be placed againſt or near old walls, the flues ſhould be built up againſt the front, allowing four inches thickneſs of the brick-work on each ſide the flues, obſerving to faſten this with irons, at proper diſtances, to ſecure it from ſeparating from the old wall: the manner of making theſe flues, is fully explained under the article of Hot Walls. Where this contrivance is made, there will be no hazard of loſing the trees, be the winter ever ſo ſevere, with a little proper care; whereas, if this is wanting, there will require great care and trouble to cover and uncover the glaſſes every day, when there is any ſun; and if the wall is not thicker than they are uſually built, the froſt will penetrate through the walls in ſevere winters; ſo that covering and ſecuring the glaſſes of the front will not be ſufficient to preſerve the trees, be it done with ever ſo much care; therefore the firſt expence of the walls will ſave great trouble and charge, and be the ſecureſt method.

If the ground is wet, or of a ſtrong clay, ſo as to detain the moiſture, the borders ſhould be raiſed above the level of the ground, in proportion to the ſituation of the place; for where the wet lies in winter near the ſurface, it will greatly prejudice, if not totally deſtroy the trees; ſo that lime rubbiſh ſhould be laid at leaſt two feet thick in the bottom of the border, to drain off the wet; and the earth ſhould be laid two and a half or three feet thick thereon, which will be a ſufficient depth for the roots of the trees. In theſe borders there may be a few roots of the Guernſey and Belladonna Lilies and Hæmanthus planted, or any other exotic bulbous-rooted flowers, which do not grow high, or draw too much nouriſhment from the borders; and theſe, producing their flowers in autumn or winter, will make a good appearance, and thrive much better than if kept in pots.

The management of the Orange-trees in theſe places, is nearly the ſame as hath been directed for thoſe in pots or tubs, excepting that the borders in theſe places ſhould be dug, and refreſhed with ſome very rotten dung every year.

AURICULA MURIS, or Pilosella. Mouſe Ear.

This is a ſort of Hawkweed with ſmall hairy leaves, which are white underneath: the plant trails upon the ground, taking root at the joints, by which means it will ſoon ſpread over a large compaſs of ground.

This is very common in England; it grows chiefly on dry barren places, or upon old walls, and is too often a troubleſome weed in graſs-plats in gardens.

AURICULA URSI [i. e. Bear's Ear, ſo called becauſe the ancients fancied it reſembled the ear of a bear.] Bear's Ear, or Auricula.

Dr. Linnæus has joined this genus to the Primula veris of Tournefort, making this one ſpecies under the title of Primula.

To enumerate the diverſities of this plant, would be almoſt endleſs and impoſſible; for every year produces vaſt quantities of new flowers, differing in ſhape, ſize, or colour of the flowers; and alſo in the leaves of theſe plants there is as great a variety, ſo that the ſkilful floriſt is oftentimes capable of diſtinguiſhing many of the particular ſorts thereby.

But as it ſeldom happens, that ſuch of theſe flowers as are at one time in great eſteem, continue to be regarded a few years after, (their being ſtill finer or larger flowers produced from ſeeds, which are what the floriſts chiefly ſeek after) it would be needleſs to mention any of them; wherefore I ſhall proceed to give the characters of a good Auricula.

1. *The ſtem of the flower ſhould be lofty and ſtrong.*
2. *The foot-ſtalk of the flower ſhould be ſhort, that the umbel may be regular and cloſe.*
3. *The pipe or neck of each flower ſhould be ſhort, and the flowers large, and regularly ſpread, being no ways inclinable to cup.*
4. *That the colours are very bright, and well mixed.*
5. *That the eye of the flower be large, round, and of a good white, or yellow; and that the tube or neck be not too wide.*

All the flowers of this kind that want any of the above-mentioned properties, are now rejected by every good floriſt; for as the varieties every year increaſe from ſeeds, the bad ones are turned out to make room for their betters; but in ſome people the paſſion for new flowers ſo much prevails, that, ſuppoſing the old flower greatly preferable to a new one, if it is of their own raiſing, the latter muſt take place of the old one.

In order to obtain good flowers from ſeeds, you muſt make choice of the beſt flowers you have, which ſhould be expoſed to the open air, that they may have the benefit of ſhowers, without which they ſeldom produce good ſeeds: the time of their ripening is in June, which you will eaſily know, by their ſeed-veſſel turning to a brown colour, and opening; you muſt therefore be careful leſt the ſeeds be ſcattered out of the veſſel, for it will not be all fit to gather at the ſame time.

The time for ſowing this ſeed is commonly in Auguſt, but if it be ſown any time before Chriſtmas, it will be time enough.

The beſt ſoil for this ſeed is good, freſh, light, ſandy mould, mixed with very rotten neats dung, or very rotten dung from the bottom of an old hot-bed: with this you ſhould fill your pots, boxes, or baſkets, in which you intend to ſow your ſeeds: and having levelled the ſurface of the earth very ſmooth, ſow your ſeeds thereon, covering it very lightly with rotten Willow mould taken out of the ſtems of decayed hollow Willow-trees; then cover the box, &c. with a net or wire, to prevent the cats, birds, &c. from ſcratching out, or burying the ſeeds too deep; for whenever this happens, the ſeeds will remain a year in the ground before the plants appear, if it ſhould grow at laſt; for which reaſon many perſons never cover theſe ſeeds, but leave them upon the ſurface of the earth, in the boxes, for the rain to waſh them into the ground, which is often the beſt method; let theſe boxes, &c. be placed ſo as to receive half the day's ſun, during the winter ſeaſon; but in the beginning of March, remove them where they may only have the morning ſun till ten of the clock; for the young plants will now ſoon begin to appear, which, if expoſed to one day's whole ſun only, will be all deſtroyed.

During the ſummer ſeaſon, in dry weather, often refreſh them with water, but never give them too great quantities at once. In the July following, your plants will be large enough to tranſplant, at which time you muſt prepare a bed, or boxes, filled with the above-mentioned ſoil, in which you may plant them about three inches ſquare; and (if in beds) you muſt ſhade them every day, till they are thoroughly rooted, as alſo in very hot dry weather; but if they are in baſkets or boxes, they may be removed to a ſhady place.

When the ſeedling Auriculas are planted in beds, there ſhould be ſome rotten neats dung laid about ten inches under the ſurface, and beaten down cloſe and ſmooth: this will prevent the worms from drawing the young plants out of the earth, which they generally do where this is not practiſed. This dung ſhould be laid about half a foot thick, which will entirely prevent the worms getting through it until the plants are well eſtabliſhed in the beds; and the roots of the Auriculas will ſtrike down into the dung by the ſpring, which will make their flowers ſtronger than uſual: theſe beds ſhould be expoſed to the eaſt, and ſcreened from the ſouth ſun.

When you have taken all your plants, which are now come up, out of your boxes or pots, level the earth gently again; for it often happens, that ſome of the ſeeds will lie in the ground two years before they appear, eſpecially if they were covered too deep when ſown, as was before obſerved.

The ſpring following many of theſe flowers will ſhew, when you may ſelect ſuch of them as have good properties, which ſhould be removed each of them into a pot of the ſame prepared earth, and preſerved until the next ſeaſon, at which time you will be capable to form a judgment of the goodneſs of the flower; but thoſe that produce plain-coloured or ſmall flowers, ſhould be taken out, and planted in borders in the out-parts of the garden, to make a ſhew, or gather for noſegays, &c. the others, which do not produce their flowers the ſame year, may be taken up, and tranſplanted into a freſh bed, to remain till you ſee how they will prove.

The manner of propagating theſe flowers when obtained, is from offsets, or ſlips, taken from the old roots in April, when the flowers are in bloom: theſe offsets muſt be planted into ſmall pots filled with the ſame ſort of earth as was before directed for the ſeedlings, and, during the ſummer ſeaſon, ſhould be ſet in a ſhady place, and muſt be often (but very gently) refreſhed with water; but in the autumn and winter ſhould be ſheltered from violent rains. The ſpring following theſe young plants will produce flowers, though but weak; ſoon after they are paſt flowering, you muſt put them into larger pots, and the ſecond year they will blow in perfection.

But, in order to obtain a fine bloom of theſe flowers, you muſt obſerve the following directions.

Firſt, Preſerve your plants from too much wet in winter, which often rots and ſpoils them; but let them have as much free open air as poſſible; nor ſhould they be too much expoſed to the ſun, which is apt to forward their budding for flower too ſoon; and the froſty mornings, which often happen in March, thereby deſtroy their buds, if they are not protected therefrom. To prevent which, thoſe who are very curious in theſe flowers, place their pots in autumn under a common hot-bed frame, where, in good weather, the plants may enjoy the full air, by drawing off the glaſſes; and in great rains, ſnow, or froſt, the plants may be ſcreened by covering them. Where this method is practiſed with judgment, the flowers will be much ſtronger, and the plants will increaſe faſter than when they are expoſed abroad.

Secondly, In the beginning of February, if the weather is mild, you muſt take off the upper part of the earth in the Auricula pots, as low as you can without diſturbing their roots, and fill up the pots with freſh rich earth, which will greatly ſtrengthen them for bloom; as alſo prepare your offsets for tranſplanting in April, by cauſing them to puſh out new roots.

Thoſe plants which have ſtrong ſingle heads, always produce the largeſt cluſters of flowers; therefore the curious floriſts pull off the offsets as ſoon as it can be done with ſafety to their growing, to encourage the mother plants to flower the ſtronger; they alſo pinch off the flowers in autumn, where they are produced, and ſuffer them not to open, that the plants ſhould not be weakened thereby.

Thirdly, You muſt cover your pots with mats in froſty weather, during this time of their budding for flower, leſt the ſharp mornings blight them, and prevent their blowing.

Fourthly, When your flower-ſtems begin to advance and the bloſſom buds grow turgid, you muſt protect them from haſty rains, which would waſh off their white meally farina, and greatly deface the beauty of their flowers; but at the ſame time obſerve to keep them as much uncovered as poſſible, otherwiſe their ſtems will be drawn up too weak to ſupport their flowers (which is often the caſe when their pots are placed near walls) give them gentle waterings to ſtrengthen them, but let none of the water fall into the center of the plant, or among the leaves.

Fifthly, When your flowers begin to open, you should remove their pots upon a stage (built with rows of shelves, one above another, and covered on the top, to preserve them from wet: this should be open to the morning sun, but sheltered from the heat of the sun in the middle of the day:) in this position they will appear to much greater advantage, than when the pots stand upon the ground; for, their flowers being low, their beauty is hid from us; whereas, when they are advanced upon shelves, we see them in a full view. In this situation they may remain until the beauty of their flowers is past, when they must be set abroad to receive the rains, and have open free air, in order to obtain seeds, which will fail if they are kept too long under shelter. When your seed is ripe, observe to gather it when it is perfectly dry, and expose it to the sun in a window upon papers, to prevent its growing mouldy, and let it remain in the pods till the season for sowing it.

AURICULA URSI MYCONI. See VERBASCUM.

AXIS of a plant. Axis is properly that round smooth cylinder, about which a wheel is turned; whence, by way of metaphor, that long, round, smooth part, placed in the center of the iuli, or cat tails, on Nut-trees, &c. about which the male organs are disposed, may be called the Axis. The French call it Ame, Noyau, or Poinçon.

AZALEA. Lin. Gen. Plant. 195. American upright Honeysuckle.

The CHARACTERS are,

*It hath a small coloured empalement which is permanent, cut into five acute parts at the top. The flower is funnel-shaped, having a long naked tube, cut into five parts; the two upper segments are reflexed backward, the two sides are bent inward, and the lower one turns downward. It hath five slender stamina of unequal lengths, which have oblong erect summits. The round germen supports a long slender style, crowned with an obtuse stigma; the germen afterward becomes a roundish capsule, having five cells, which are filled with roundish small seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, entitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. AZALEA (*Viscosa*) foliis margine scabris, corollis piloso glutinosis. Lin. Sp. Plant. 151. *Azalea with leaves having rough edges, the petals of the flower hairy and glutinous.* Cistus Virginiana flore & odore periclymeni. Pluk. Phyt. tab. 161. f. 4.
2. AZALEA (*Nudiflora*) foliis ovatis corollis pilosis staminibus longissimis. Lin. Sp. Plant. 150. *Azalea with oval leaves, hairy flowers, and the longest stamina.* Cistus Virginiana periclymeni flore ampliori minus odorato. Pluk. Mant. 49.

There are three or four other species of this genus, two of which grow naturally upon the Alps, chiefly on bogs; these are low plants, which have little beauty, and very difficult to keep in gardens. The others grow one in the east, near Pontus, and the other in India; but as neither of these are in the English gardens, I shall not enumerate them.

The first of these here mentioned, is a low shrub, rising with several slender stems near four feet high. The leaves come out in clusters at the ends of the shoots, without order: they are spear-shaped, but narrow at their base; their edges are set with very short teeth, which are rough. The flowers come out in clusters between the leaves, at the extremity of the branches, which are white, with a mixture of dirty yellow on their outside: they have a tube an inch long, and at the top are pretty deeply cut into five segments; the two upper are reflexed, the two side ones are bent inward, and the lower one is turned downward. There are five slender stamina, which are a little longer than the petals of the flower, supporting oblong Saffron-coloured summits. The style is much longer than the stamina, and crowned by an obtuse stigma. These flowers have much the appearance of those of the Honeysuckle, and are as agreeably scented. They appear the middle of July, but are not succeeded by seeds in England.

The second sort grows taller than the first, and in its native country frequently rises to the height of fifteen feet, but in England is never more than half that height. This sends out several stems from the root, which are garnished with oblong smooth leaves, placed alternately, having foot-stalks. The flower-stalks arise from the division of the branches, which are long and naked, supporting a cluster of red flowers, which are tubulous, swelling at their base like those of the Hyacinth, and contracted at their neck; they are divided at the top into five equal segments, which spread open. The five stamina and the style are much longer than the petals, and stand erect. This flowers about the same time as the former, but is not so well scented.

These plants grow naturally in shade, and upon moist ground in most parts of North America, from whence many of the plants have been sent of late years to England, and several of them have produced their beautiful flowers in many curious gardens.

They must have a moist soil and a shady situation, otherwise they will not thrive. They can only be propagated by shoots from their roots, and laying down their branches, for they do not produce seeds here; and if good seeds could be obtained, they would be difficult to raise, and a long time before they would flower. But when they are in a proper situation, their roots extend, and put out shoots, which may be taken off with roots, and transplanted. When any of them are laid down, it should be only the young shoots of the same year, for the old branches will not put out roots. The best time for this is at Michaelmas, and if they are covered with some old tan, to keep out the frost, it will be of great use to them. The autumn is also the best time to remove the plants, but the ground about their roots should be covered in winter to keep out the frost; and if this is every year practised to the old plants, it will preserve them in vigour, and cause them to flower well.

AZEDARACH. See MELIA.

AZEROLE, or L'AZAROLE. See MESPILUS.

# B.



BACCA, i. e. a berry, is a round fruit, for the most part soft, and covered with a thin skin, containing seeds in a pulpy substance; but, if it be harder, and covered with a thicker flesh, it is called Pomum, i. e. an Apple.

BACCHARIS, Ploughman's Spikenard, vulgò.

The Characters are,

*The flower is composed of many hermaphrodite and female florets, which are included in one common, cylindrical, scaly empalement. The florets are equal, the hermaphrodite and female are intermixed. The hermaphrodite florets are funnel-shaped and quinquefid; these have five slender stamina, crowned by cylindrical summits, and an oval germen, supporting a slender style, crowned by a bifid stigma. The germen afterward becomes a single short seed crowned with a long down. The female flowers have no stamina, but in other respects are the same.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, intitled Syngenesia Polygamia superflua, the flowers being composed of hermaphrodite and female florets, which are both fruitful.

The Species are,

1. Baccharis (*Ivæfolia*) foliis lanceolatis longitudinaliter dentato-serratis. Lin. Hort. Cliff. *Ploughman's Spikenard with spear-shaped leaves, which are longitudinally indented and sawed.* Senecio Africana arborescens folio serrato. Boerh. Ind. alt. 1. 117.
2. Baccharis (*Neriifolia*) foliis lanceolatis superne uno alterove denticulo serratis. Hort. Cliff. 404. *Ploughman's Spikenard with spear-shaped leaves sawed on the edges.* Arbuscula foliis nerii. Boerh. Ind. 2. p. 263.
3. Baccharis (*Halimifolia*) foliis obovatis superne emarginato-crenatis. Hort. Cliff. 405. *Ploughman's Spikenard with oval indented leaves.* Senecio Virginianus arborescens, atriplicis folio. Raii Hist. 1799.
4. Baccharis (*Fœtida*) foliis lanceolatis serrato-dentatis, corymbis foliosis. Flor. Virg. 121. *Ploughman's Spikenard with spear-shaped sawed leaves, and a leafy corymbus.* Conyza Americana frutescens fœtidissima. Hort. Elth. tab. 89.

The English name of Ploughman's Spikenard has been always applied to the Conyza major, or greater Fleabane; but since most of the modern botanists have applied the title of Baccharis to this genus, I have added the old English name to it, of Ploughman's Spikenard, rather than leave it without an English title.

The first sort was brought from the Cape of Good Hope, but grows naturally in Peru, and in other parts of America. This plant has been long preserved by the curious in their gardens. It grows to the height of five or six feet, and is a manageable shrub; it may be propagated by cuttings, which should be planted in a shady border during any of the summer months, or by seeds sown in a common border in the spring of the year. These seeds ripen well in this country; and, if permitted to scatter on the ground, the plants will come up the following spring. It is pretty hardy, and will live abroad in mild winters, if planted in a warm situation; but it is usually kept in green-houses, and placed abroad in summer; it requires much water in warm weather.

The second sort is also a native of Africa; this hath a soft shrubby stalk which rises to the height of eight or ten feet, putting out side branches toward the top, garnished with stiff spear-shaped leaves, having a few indentures toward their top; these are placed without order: the flowers are produced at the extremity of the branches in a close spike, consisting of female and hermaphrodite florets included in the common empalement; they are of an herbaceous colour, so make little appearance, and are not succeeded by seeds in England.

This plant is difficult to propagate, for the cuttings do with great difficulty take root; and it is very rare to find shoots near the root to lay down, so that in Holland they lay down the entire head of young plants, slitting the smaller branches in the same manner as is practised for Carnations, laying them into the ground and forking each down to prevent their rising; these when duly watered put out roots in one year, when they may be taken off, and planted in small pots filled with light earth, and placed in the shade till they have taken new root; after which they may be placed in a sheltered situation in summer, but in winter must be kept in a green-house.

The third sort is pretty common in the nurseries about London, where it is usually called the Groundsell-tree; this is a native of Virginia and other parts of North America; it grows to be a shrub of about seven or eight feet high, and flowers in October; the flowers are white, and not very beautiful; but the leaves continuing green through the year, has occasioned this shrub to be admitted into many curious gardens.

This sort may be propagated by cuttings, which should be planted in April or May, upon a shady border, and duly watered in dry weather, until they have taken root; and, at Michaelmas, they will be fit to transplant where they are to remain; this will live in the open air, and never is injured by the cold of our ordinary winters; but severe frost will sometimes destroy them.

The fourth sort grows naturally in Carolina, and some other parts of North America; it rises with a ligneous stalk six or seven feet high, garnished with long spear-shaped leaves, which are hoary on their under side, having a disagreeable scent when handled; the stalks are terminated by loose umbels of flowers, which appear late in the autumn, so are not succeeded by seeds in this country.

It may be propagated by cuttings, which should be planted toward the end of May, which if shaded and duly watered will put out roots in two months; when they should be potted, that they may be sheltered under a frame in winter.

BACCIFEROUS [Baccifer, *Lat.* of Bacca, a Berry, and fero, to bear] is an epithet applied to trees, shrubs, or plants, that bear berries, as Briony, Lily of the Valley, Asparagus, Butchers Broom, Nightshade, Solomon's Seal, and many others.

BALAUSTIA. See Punica.

BALAUSTIUM is the cup of the flower of the wild Pomegranate.

BALLOTE [Βαλλωτὴ, *Gr.*] Black Horehound.

This is a common weed, growing on the sides of banks in most parts of England, so is seldom allowed a place in gardens; there are two varieties of it, one with a white, and the other a purple flower. As these are not cultivated, I shall not trouble the reader with a farther description of them.

BALM. See Melissa.

BALSAMINA. The female Balsamine. See Impatiens.

BALSAMITA. See Tanacetum.

BAMIA MOSCHATA. See Hibiscus.

BANANA. See Musa.

BANISTERIA. Houſt. MSS. Lin. Gen. 509. Acer Scandens. Sloan. Cat. 137. Plum. Cat. 18.

The CHARACTERS are,

*It hath a ſmall permanent empalement, cut into five acute ſegments to the bottom; the flower hath five petals, which are ſhaped like thoſe of the papilionaceous tribe, but ſpread open, having in ſome ſpecies one, in others two, and in ſome, ſeveral nectarious glands. It hath ten ſhort ſtamina, crowned with ſimple ſummits. There are in ſome ſpecies three, and in others but one germen, each ſupporting a ſingle ſtyle, crowned by an obtuſe ſtigma; the germen afterward become ſo many winged fruit, like thoſe of the Maple, each containing a ſingle ſeed.*

The title of this genus was given by the late Dr. Houſtoun, in honour to the memory of Mr. Baniſter, a curious botaniſt, who loſt his life in the ſearch of plants in Virginia.

The Doctor ranged this genus in the claſs of papilionaceous flowers, to which it has great affinity by the form of its flower; but the ten ſtamina ſtanding ſeparate, induced Dr. Linnæus to place it in his tenth claſs; but although he has put it under his third ſection, yet it would with greater propriety come under his ſecond, the greater number of ſpecies having but two ſtyles.

The SPECIES are,

1. BANISTERIA (*Anguloſa*) foliis ovato-oblongis rigidis racemis terminalibus caule fruticoſo ſcandente. *Baniſteria with oblong, oval, ſtiff leaves, ſpikes of flowers terminating the branches, and a ſhrubby climbing ſtalk.* Sir Hans Sloane titles it, Acer ſcandens foliis Laurinis. Cat. Jam. 137.
2. BANISTERIA (*Fulgens*) foliis ovatis glabris, floribus corymboſis terminalibus, caule fruticoſo ſcandente. *Baniſteria with oval ſmooth leaves, flowers growing in a corymbus at the extremity of the branches, and a ſhrubby climbing ſtalk.* Acer ſcandens minus Apocyni facie folio ſubrotundo. Sloan. Cat. 138.
3. BANISTERIA (*Brachiata*) foliis ovatis acuminatis floribus laxè ſpicatis, ramis diffuſis ſcandentibus. *Baniſteria with oval pointed leaves, flowers growing in looſe ſpikes, and climbing diffuſed branches.* Baniſteria ſcandens & fruteſcens folio ſubrotundo, flore ex aureo Coccineo. Houſt. MSS.
4. BANISTERIA (*Laurifolia*) foliis ovatis nervoſis ſubtus incanis, floribus lateralibus, caule fruticoſo ſcandente. *Baniſteria with nervous heart-ſhaped leaves, hoary on their under ſide, flowers growing from the ſide of the branches, and a ſhrubby climbing ſtalk.* Acer Americanum ſcandens foliis ſubrotundis ſubtus pubeſcentibus. Millar. Cat.
5. BANISTERIA (*Benghalenſis*) foliis ovato-oblongis acuminatis racemis lateralibus ſeminibus patentibus. Flor. Zeyl. 176. *Baniſteria with oblong, oval, pointed leaves, ſpikes of flowers growing from the ſide of the branches, and ſpreading ſeeds.* Acer ſcandens foliis Citrei flore cæruleo ſpicato. Plum. Cat. 18.
6. BANISTERIA (*Aculeata*) foliis pinnatis, foliolis oblongis obtuſis, floribus ſpicatis caule ramoſo aculeato. *Baniſteria with winged leaves, whoſe ſmall leaves are oblong and blunt, flowers growing in a ſpike, and a prickly branching ſtalk.*
7. BANISTERIA (*Purpurea*) foliis pinnatis foliolis ovatis ſpicis lateralibus ſeminibus erectis. *Baniſteria with winged leaves, whoſe ſmall leaves are oval, ſpikes of flowers growing from the ſide of the branches, and erect ſeeds.* Baniſteria foliis ovatis ſpicis lateralibus ſeminibus erectis. Lin. Sp. Plant. 427.

The firſt grows naturally in Jamaica. This hath a woody ſtalk, which twiſts itſelf round the neighbouring trees, and riſes to their top. It is garniſhed with leaves as large as thoſe of the Bay-tree, and of the ſame thickneſs, growing oppoſite; the flowers are produced in long branching ſpikes at the ends of the branches, which are yellow, compoſed of five ſmall leaves; theſe are ſucceeded by two or three winged ſeeds like thoſe of the greater Maple.

The ſecond ſort grows naturally in Jamaica, at Campeachy, and ſeveral other parts of America. This hath ſlender winding ſtalks, which riſe five or ſix feet high, and are thinly garniſhed with oval ſmooth leaves; the flowers grow in a round bunch at the extremity of the branches, which are of a browniſh yellow colour, and are ſucceeded by winged ſeeds like the former, but ſmaller, and have narrower wings.

The third ſort was ſent me from Carthagena, where it naturally grows. This ſends out many branches, which divide again into others, growing without order, and become very buſhy upward, ſending out tendrils by which they faſten themſelves to the neighbouring trees, and mount to a great height; theſe are garniſhed with oval ſtiff leaves, ending in a point. The flowers are produced in looſe ſpikes at the ends of the branches, which are firſt of a gold colour, and fade to a ſcarlet. Theſe are ſucceeded by ſeeds of the ſame ſhape with the former, but are ſlender, thin, and for the moſt part ſingle.

The fourth ſort was ſent me from Campeachy, by Mr. Robert Millar; this hath many irregular climbing ſtalks, which faſten themſelves to the neighbouring trees, and riſe to a great height, garniſhed with oval leaves, which are hairy on their under ſide, where they have many tranſverſe ribs. The flowers come out thinly from the ſide of the branches, which are of a pale yellow colour, and are ſucceeded by large winged ſeeds, which are double.

The fifth ſort hath ſtrong woody ſtalks, which twine about the trees which grow near it, and riſes twenty feet high, garniſhed with oblong pointed leaves like thoſe of the Bay-tree, growing oppoſite; from the wings of the leaves the flowers are produced in looſe ſpikes, upon long foot-ſtalks, which are blue, and are ſucceeded by ſlender winged ſeeds, which ſpread open from each other.

The ſixth ſort was ſent me from Tolu in New Spain, where it grows naturally. This hath climbing ſtalks, which divide into many branches, garniſhed with long winged leaves, compoſed of about twenty pair of ſmall, oblong, blunt pinnæ, each having a deep furrow on the under ſide. At the wings of the leaves the ſtalks are armed with ſhort ſtrong ſpines, a little crooked. The flowers grow in long looſe ſpikes at the end of the branches, which are ſucceeded by ſingle ſeeds, as large as thoſe of the greater Maple.

The ſeventh ſort hath ſtrong ligneous ſtalks, covered with an Aſh-coloured bark, and divide into many branches, garniſhed with winged leaves, compoſed of five or ſix pair of oval ſmall leaves, nearly of the ſize with thoſe of the common Acacia, but are whitiſh on their under ſide; from the wings of the leaves are produced ſlender bunches of flowers, growing in a racemus like thoſe of the Currant-buſh, of a purpliſh colour; theſe are ſucceeded by broad winged ſeeds, growing erect. It was ſent me from Campeachy, where it grows naturally.

Theſe plants are all of them natives of warm countries, ſo cannot be preſerved in England, unleſs they are kept in a bark-ſtove. They are propagated by ſeeds, which muſt be procured from the countries where they grow naturally. Theſe ſeeds ſhould be fully ripe when gathered, and put into ſand or earth, in which they ſhould be ſent to England, otherwiſe they will looſe their vegetative quality; for from a large parcel of theſe ſeeds which were ſent over in papers, as freſh as they could poſſibly arrive here, there was very few plants raiſed, and thoſe did not appear till the ſecond year; for theſe ſeeds are not only in ſhape like thoſe of the Maple, but alſo are of the ſame quality, requiring to be ſown as ſoon as poſſible when they are ripe, or preſerved in ſand or earth till they are ſown, otherwiſe they rarely ſucceed; therefore when the ſeeds arrive, they ſhould be immediately ſown in pots, and, if it happens in autumn or winter, the pots ſhould be plunged into a hot-bed of tanners bark, where the heat is very moderate, and ſecured from froſt and wet, till ſpring, when they muſt be removed to a freſh hot-bed, which will bring up the plants; but if they ſhould not appear the firſt year, the pots ſhould be preſerved till the next ſpring,

to see if the seeds will grow. When the plants come up, they must be planted in separate pots, filled with light earth, and plunged into the bark-bed, after which they must be treated like other tender plants from the same countries.

BAOBOB. See ADANSONIA.

BARBA CAPRÆ. See SPIRÆA.

BARBA JOVIS. See ANTHYLLIS.

BARBAREA. See ERYSIMUM.

BARDANA. See ARCTIUM.

BARLERIA.

The name was given to this genus of plants by father Plumier, in honour of Jacobus Barelier, of Paris, who was a famous botanist.

The CHARACTERS are,

*It hath a permanent empalement, divided into four parts, two large and two smaller, opposite. The flower is of the lip kind, of one leaf, funnel-shaped, and divided into five parts at the top; the upper segment being broad and erect, the two side ones narrower, and the under one which turns downward is divided into two. It hath four slender stamina, two of which are very short; the two upper are longer, crowned by oblong summits. In the center is placed the oval germen, supporting a slender style, crowned by a bifid stigma. The germen afterward becomes an oblong, quadrangular, membranaceous vessel, with two cells, which is very elastic, containing two or three roundish compressed seeds.*

This genus of plants is by Dr. Linnæus ranged in the second order of his fourteenth class, titled Didynamia Angiospermia, whose flowers have two long and two short stamina, and their seeds are included in a capsule.

The SPECIES are,

1. BARLERIA (*Solanifolia*) spinis axillaribus foliis lanceolatis denticulatis. Lin. Sp. 887. *Barleria with spines on the side of the branches, and spear-shaped indented leaves.* Barleria aculeata solani folio angustiore flore cæruleo. Plum. N. G. 31.
2. BARLERIA (*Prionitis*) spinis axillaribus quaternis foliis integerrimis. Lin. Sp. Plant. 636. *Barleria with spines growing by fours from the side of the branches, and entire leaves.* Coletta-veetla. Hort. Mal. 9. p. 77.
3. BARLERIA (*Buxifolia*) spinis axillaribus oppositis solitaris, foliis subrotundis integerrimis. Lin. Sp. 887. *Barleria with spines at the wings of the stalk, and roundish entire leaves.* Barleria Americana spinossima frutescens, buxi folio parvo flore. Amm. Herb. 104.
4. BARLERIA (*Coccinea*) inermis foliis ovatis denticulatis petiolatis. Lin. Sp. 888. *Barleria without spines, and oval indented leaves having foot-stalks.* Barleria solani folio, flore coccineo. Plum. Nov. Gen. 31.

The first sort rises with upright square stalks three feet high, garnished with two oblong entire leaves at every joint; above which the flowers come out in whorls surrounding the stalks, and under each whorl there are six sharp spines, which are as long as the empalement of the flowers. These joints are about three inches distance; the flowers are blue, and have more of the form of the labiated flowers, than any of the other species. I received this from Panama.

The second sort has been long in the curious gardens in Holland, but has not been many years in this country. This sends out many slender stems from the root, which rise eight or nine feet high, garnished with oval pointed leaves, two growing opposite at each joint, which are attended by four long spines standing cross-ways. This plant hath not as yet flowered in England, though there are large plants of it in the Chelsea garden.

The third sort hath shrubby stalks which rise five or six feet high, garnished with roundish entire leaves placed opposite, under which are placed strong spines; the flowers are produced in whorls toward the upper part of the stalk; these are succeeded by short seed-vessels, containing three or four flat seeds. This grows naturally in Jamaica.

The fourth sort grows naturally in the warm parts of America. The stalks of this are smooth; they rise four feet high, are garnished with two oval indented leaves standing opposite; the flowers are scarlet, and are placed in whorls at the joints of the stalks; these appear in July, August, and September, and are succeeded by short pods inclosing flat seeds.

The roots of the first sort will continue three or four years, but after the second year, the plants grow too rambling, and the lower part of the branches are naked, so are not so sightly as the young plants; therefore a succession of these should be raised, and the old ones turned out. They are propagated by seeds, which will sow themselves in the pots which are near them in the stove, when the plants are once obtained; but where the seeds are received from abroad, they must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they must be each planted in a separate pot, and plunged into a hot-bed of tanners bark, where they must constantly remain, and managed in the same manner as other tender exotics from the same countries; giving them water frequently in summer, and letting the fresh air to them every day in warm weather, but in winter they should have less water and be kept warm. They flower from June to November, and their seeds ripen soon after.

The second sort hath flexible perennial stalks, which if cut off during the summer months, and made into lengths of six or eight inches, and planted in pots, plunging them into a hot-bed, and duly watered and shaded from the sun, will soon put out roots, so may be planted each in a small pot, and plunged into the tan-bed in the stove; for although this sort may be kept in a dry stove through the winter, yet the plants will not grow near so fast, nor will their leaves be so large as those which are plunged into bark. By this method the plants may be propagated in plenty, but as they rarely produce flowers in England, so two or three plants will be sufficient to maintain the species.

The third and fourth sorts will produce seeds in England, provided the plants are kept in the tan-bed in the stove, so these may be propagated by seeds, which should be sown in the hot-bed, and the plants afterward treated in the same manner as the first sort.

BAROMETER [from βάρος, a weight, and μέτρον, a measure,] is an instrument or machine for measuring the weight of the atmosphere, or the minute variation of the weight or pressure of the incumbent air, in order to determine the changes of weather.

This machine is founded on the Torricellian experiment, so called, from the inventor Torricellius.

1. It consists of a long tube of glass, hermetically sealed at one end; and being filled with quicksilver, is inverted so as to have one end of it immerged in a bason of stagnant quicksilver, and the other hermetically sealed, which is exposed to the pressure of the outward air; out of which open end (after such immersion) the quicksilver in the tube being suffered to run as much as it will into the stagnant quicksilver, in which that mouth or open end is immersed, there is wont to remain a cylinder of quicksilver suspended in the tube, about twenty-eight, twenty-nine, or thirty inches high, measuring from the surface of the stagnant quicksilver perpendicularly; but more or less within such limits, according as the weight or pressure of the air incumbent on the external stagnant quicksilver exposed to it, is greater or lesser, leaving the upper part of the tube void, or at least empty of common air.

The phænomena of the barometer are various, and the causes assigned for them, by several authors, as various; nor is the use of it in predicting the weather, yet perfectly ascertained.

The greatest height the mercury has been known to stand at in London, is thirty inches three-eighths, and its least, twenty-eight inches: and though, as Mr. Boyle observes, the phænomena of the barometer are so very precarious, that it is very difficult to form any general rules about the rise and fall thereof, since

in

in that which seems to hold most universally, viz. that when the high winds blow, the mercury is the lower, they sometimes fail, yet the following observations have been made by several authors.

Dr. Halley observes, that in calm weather, when the air is inclined to rain, the mercury is continually low; in serene good settled weather, high.

That on great winds, though unaccompanied with rain, the mercury is lowest of all, with regard to the point of the compass the wind blows on; that, *cæteris paribus*, the greatest heights of the mercury are on easterly and north-easterly winds; that after great storms of wind, when the mercury has been low, it rises again very fast.

That in calm frosty weather it stands high.

That the more northerly places find greater alterations than the more southern; and that within the tropics, and near them, there is little or no variation of the mercury at all.

Dr. Beal observes, that, *cæteris paribus*, the mercury is higher in cold weather than in warm, and usually higher in morning and evening than at mid-day.

That the mercury is higher in settled and fair weather, than either a little before, or after, or in the rain; and that it generally descends lower after rain, than it was before it; if it chance to rise higher after rain, it is generally followed by a settled serenity.

That there are frequently great changes in the air, without any perceptible alterations in the barometer.

As to the predictions from the barometer, Dr. Halley has found,

That the rising of the mercury forebodes fair weather after foul, and an easterly or north-easterly wind.

That the falling of the mercury portends southerly or westerly winds, with rains, or stormy winds, or both.

That in a storm the mercury beginning to rise, is a pretty sure sign that it begins to abate.

Mr. Patrick observes, that the falling of the mercury in hot weather presages thunder; that when foul weather happens after the fall of the mercury, it seldom holds long; and the same is observed, if fair weather succeeds presently after its rise.

Hence Mr. Pointer conceives, that the principal cause of the rise and fall of the mercury, is from the variable winds which are found in the temperate zones, and whose great inconstancy here in England is most notorious.

A second cause he takes to be, the uncertain exhalation and perspiration of the vapours lodging in the air, whereby it comes to be at one time much more crowded than at another, and consequently heavier; but this latter, in a great measure, depends upon the former.

And from these principles, he endeavours to explain the several phænomena of the barometer.

1. The mercury's being low, inclines it to rain; because the air being light, the vapours are no longer supported thereby, being become specifically heavier than the medium wherein they are floated; so that they descend towards the earth, and in their fall, meeting with other aqueous particles, they incorporate together, and form little drops of rain; but the mercury's being at one time lower than another, is the effect of two contrary winds blowing from the place where the barometer stands, whereby the air of that place is carried both ways from it, and consequently the incumbent cylinder of air is diminished, and accordingly the mercury sinks. As for instance, if in the German ocean it should blow a gale of westerly wind, and at the same time an easterly wind in the Irish sea; or if in France it should blow a northerly wind, and in Scotland a southerly, it must be granted, that that part of the atmosphere impendent over England, would thereby be exhausted and attenuated, and the mercury would subside; and the vapours which before floated in those parts of the air, of equal gravity with themselves, would sink to the earth.

2. The greater height of the barometer is occasioned by two contrary winds blowing towards the place of observation, whereby the air of other places is brought thither and accumulated; so that the incumbent cylinder of air being increased both in height and weight, the mercury pressed thereby must needs rise and stand high, as long as the winds continue so to blow; and then the air being specifically heavier, the vapours are better kept suspended, so that they have no inclination to precipitate and fall down in drops, which is the reason of the serene good weather, which attends the greater heights of the mercury.

3. The mercury sinks the lowest of all by the very rapid motion of the air in storms of winds.

For the tract of the region of the earth's surface, wherein these winds rage, not extending all round the globe, that stagnant air which is left behind, as likewise that on the sides, cannot come in so fast as to supply the evacuation made by so swift a current; so that the air must necessarily be attenuated when and where the said winds continue to blow, and that more or less, according to their violence: add to which, that the horizontal motion of the air being so quick as it is, may, in all probability, take off some part of the perpendicular pressure thereof; and the great agitation of its particles is the reason why the vapours are dissipated, and do not condense into drops, so as to form rain, otherwise the natural consequence of the air's rarefaction.

4. The mercury stands the highest upon an easterly or north-easterly wind; because, in the great Atlantic ocean, on this side the thirty-fifth degree of north latitude, the westerly and south-westerly winds blow almost always trade: so that whenever here the winds come up at east and north-east, it is sure to be checked by a contrary gale as soon as it reaches the ocean; wherefore, according to what is made out in the second remark, the air must needs be heaped over this island, and consequently, the mercury must stand high, as often as these winds blow.

5. In calm frosty weather, the mercury generally stands high, because, as he conceives, it seldom freezes but when the winds come out of the northern or north-eastern quarters, or at least, unless those winds blow at no great distance off.

For the northern parts of Germany, Denmark, Sweden, Norway, and all that tract, from whence north-eastern winds come, are subject to almost continual frost all the winter, and thereby the lower air is very much condensed, and in that state is brought hitherward by those winds; and, being accumulated by the opposition of the westerly wind blowing in the ocean, the mercury must needs be pressed to a more ordinary height; and, as a concurring cause, the shrinking of the lower parts of the air into lesser room by cold, must needs cause a descent of the upper parts of the atmosphere, to reduce the cavity made by this contraction to an equilibrium.

6. After great storms of winds, when the mercury has been very low, it generally rises again very fast: he says, he once observed it to rise an inch and a half in less than six hours, after a long continued storm of south-west wind.

The reason is, because the air being very much rarefied by the great evacuations that such continued storms make thereof, the neighbouring air runs in more swiftly, to bring it to an equilibrium, as we see water runs the faster for having a greater declivity.

7. The variations are greater in the more northerly places, as at Stockholm greater than at Paris [compared by Mr. Paschal;] because the more northerly parts have usually greater storms of wind than the more southerly, whereby the mercury should sink lower in that extreme; and then the northerly winds bringing the condensed and ponderous air from the neighbourhood of the pole, and that again being checked by a southerly wind, at no great distance, and so heaped up, must of necessity, make the mercury in such case stand higher in the other extreme.

8. This remark, that there is little or no variation near the equinoctial, does, above all others, confirm the

the hypothesis of the variable winds being the cause of these variations of the height of the mercury; for in the places above-named, there is always an easy gale of wind, blowing nearly upon the same point, viz. E. N. E. at Barbadoes, and E. S. E. at St. Helena; so that there being no contrary currents of the air to exhaust or accumulate it, the atmosphere continues much in the same state.

Mr. Patrick gives us the following rules and observations for the rising and falling of the mercury, in order to foreknow the weather by the barometer.

1. It has been observed, that the motion of the mercury does not exceed three inches in its rising or falling in the barometer of the common form.

2. That its least alterations are to be minded, in order to the right finding of the weather by it.

3. The rising of the mercury presages in general fair weather, and its falling, foul, as rain, snow, high winds, and storms.

4. In very hot weather, the falling of the mercury foreshews thunder.

5. In winter, the rising of the mercury presages frost; and in frosty weather, if the mercury falls three or four degrees, there will certainly follow a thaw; but if the mercury rises in a continued frost, it will certainly snow.

6. When foul weather happens soon after the falling of the mercury, you may expect but little of it; and you may judge the same, when the weather proves fair shortly after the mercury has risen.

7. When the mercury rises much and high in foul weather, and continues so for two or three days before the foul weather is over, you may expect a continuance of fair weather to follow.

8. When the mercury falls much and low in fair weather, and continues so for two or three days before the rain comes, then you may expect a great deal of wet, and probably high winds.

9. The unsettled motion of the mercury denotes uncertain and changeable weather.

10. You are not so strictly to mind the words engraven on the plates, though for the most part they will agree with them, as the rising and falling of the mercury; for if it stands at much rain, and rises up to changeable, it presages fair weather, although not to continue so long as it would have done, if the mercury were higher, and so on the contrary.

These rules and observations are sufficient to instruct persons who are unacquainted with this instrument, how to make their observations; and with constantly remarking what alterations happen in the weather on the variations of the mercury, a person may nearly predict the great alterations of the weather a day or two before they happen, which is frequently of great use to the gardener and farmer, but particularly to the latter, who may begin to mow his grass when he finds there is a prospect of fair weather, or postpone it a few days until he foresees a likelihood of such. The same also may be of great moment in reaping his corn, as also in sowing his grain, and most of his other business. Therefore the use of this instrument should be more generally known by the practical farmer and gardener.

BARTRAMIA. See TRIUMFETTA.

BASELLA, or climbing Nightshade from Malabar.

The CHARACTERS are,

*The flower hath no empalement; it is shaped like a pitcher, fleshy at the base and swelling, but closed toward the brim, where it is divided into six parts, two of which are larger than the others. It hath five awl-shaped stamina, which are equal, fastened to the petal, crowned with roundish summits. The globular germen, which is situated in the center, supports three slender styles, crowned by oblong stigma. The petal of the flower remains, and incloses a roundish fleshy berry, including one round seed.*

This genus of plants is ranged in the third section of Linnæus's fifth class, entitled Pentandria Trigynia, the flower having five stamina and three styles.

The SPECIES are,

1. BASELLA (*Rubra*) foliis planis, pedunculis simplicibus. Lin. Sp. 390. *Basella with plain leaves and simple foot-stalks.* Cuscuta foliis subcordatis. Hort. Cliff. 39. *Climbing Nightshade.*

2. BASELLA (*Alba*) foliis ovatis undatis, pedunculis simplicibus folio longioribus. Lin. Sp. 390. *Basella with oval waved leaves, and foot-stalks longer than the leaf.* Basella Sinica, foliis & caulibus viridibus minus succulentibus fructu minore. Juss.

The first sort has thick, strong, succulent stalks and leaves, which are of a deep purple colour. The plant requires to be supported, for it will climb to the height of eight or ten feet, when the plants are kept in a stove or glass-case, and produce a great number of side branches: but if they are exposed to the open air, they will not grow so large, nor will they perfect their seeds, except it be in very warm seasons; when they are placed in the bark-stove, they will often live through the winter, and produce great quantities of flowers and seeds. The flowers of this plant have no great beauty, but the plant is preserved for the odd appearance of the stalks and leaves.

The seeds of the second sort I received from Dr. Jussieu of Paris, from whence I have obtained two varieties; one of which hath purple stalks and leaves, and the other hath leaves variegated with white; but both of them retain their small stalks, and oblong flaccid leaves, smaller flowers and fruit, in which they essentially differ from the first.

These plants are propagated by seeds, which should be sown in a hot-bed in the spring; and when the plants are fit to remove, they should be each planted into a separate pot filled with rich earth, and plunged into the tan-bed, where they must be treated in the same manner as other tender exotics. They may also be propagated by cuttings, which should be laid to dry a day or two after they are taken from the plants, before they are planted, that the wound may heal, otherwise they will rot. These cuttings must be planted into pots filled with light fresh earth, and plunged into a moderate hot-bed of tanners bark, where they will take root in a fortnight or three weeks time, when they should be treated in the same manner as the seedling plants. But as these rise so easily from seeds, it is seldom they are propagated any other way, because they are plants of short duration. These flower from June to autumn, and the seeds ripen in September and December.

These plants will climb to a considerable height, and send forth a great number of branches, so that they should have a place near the back of the stove, where they may be trained up to a trellise, or fastened to the back of the stove, otherwise they will twist themselves about whatever plants stand near them, and be very injurious to the other plants; whereas, when they are regularly trained to a trellise, they will have a good effect in adding to the variety.

From the berries of the first sort, I have seen a beautiful colour drawn, but when used for painting, did not continue very long, but changed to a pale colour; though I believe there might be a method invented, whereby this beautiful colour might be fixed, so as to become very useful; for I have been assured, that the juice of these berries has been used for staining of callicoes in India.

BASILICUM, or BASIL. See OCYMUM.

BASONS or fountains, &c. which serve either for the ornament or use of gardens, are made in divers forms, some round, some oblong or oval, others square, octangular, &c. but their most common form is circular; and, if the ground will permit, the larger they are the better; and when they exceed in size, they are called pieces of water, canals, fish ponds, pools, and reservoirs.

In making these, care ought to be taken to avoid both the extremes, and not to make them either too big or too little, that a water work may not take up the best part of a small spot of ground; nor to make too little a bason in a large spot. This must depend entirely on the judgment of the designer of the garden.

Some would have the size of a bason to be proportioned to the Jet d' Eau, that the water thrown up in the air, may not, by being blown by the air, be carried beyond the edge of the bason, but all fall down without wetting the walk.

As to the depth of basons it is usually from two to three feet, this depth being sufficient to secure the bottom of the basons from frost, and to dip watering pots.

But if they are to serve for reservoirs, or to keep fish in, then they may be made four or five feet deep, which will both hold water enough, and be deep enough for the fish to breed in, and also to bear a boat.

Deeper than this they need not be, and if they were deeper, they would be dangerous as to the drowning of persons who might chance to fall in.

In making basons, great care ought to be taken in making them at first; for the water always naturally endeavouring to run away, and by its weight and pressure in a bason, making its way out at the least cranny, it will grow constantly bigger and bigger; so that if it be not well made at first, it will be very difficult to repair it.

Basons are made either with clay, cement, or lead; they are most usually made of clay; in making such, at the marking out the dimensions, the diameter ought to be four feet bigger on each side, yet the bason will not be the wider, for it will be taken up with the walls on each side; and the clay-work, which is to fill the space between; the bason must also be dug two feet deeper than the depth of the water is designed to be, because it is to be laid over eighteen inches thick with clay, and six inches with gravel and paving.

The clay ought to be well wrought with the hands and water, and when it is spread, should be trodden in with the naked feet, that the water of the bason may not dilute through it, and the roots of any trees that may grow near, may not penetrate into the outward wall, which may be made of shards, rubble, or flints, with mortar made of the natural earth, and is called the ground wall, because it is only made to resist the pressure of the ground about it. The inward wall ought to be made with good rubble stones that will not scale and come off in flashes in the water, or else of flints and stones from the hills, which will make durable work, but will not look so neat as the pointed rubble; and there ought to be laid here and there stones, the thickness of the wall, to render it the more substantial.

The method of making basons of cement is as follows: after you have marked out the dimensions of the bason, as before, if you enlarge it one foot nine inches, it will be sufficient, and the same depth deeper at the bottom will be enough.

This being done, you must begin to back up and raise against the ground; cut perpendicularly a wall of masonry a foot thick, which must go to the bottom, and should be built with shards and rubble stones laid in mortar of lime and sand.

When the wall is finished round the circumference, then the bottom is to be wrought a foot thick with the same materials; and the solid work or lining of cement is to be backed up against the walls nine inches thick, including the plastering and inward surface. This solid ought to be made of small flints, laid in beds of mortar made of lime and cement.

When this solid is eight inches thick, it ought to be plastered over the whole surface of the bottom with cement well sifted before it be tempered with lime; and with this it should be wrought over smooth with the trowel.

The proportion of this cement should be two thirds of cement or powdered tile to one third of lime.

This cement has the property to harden so under water, that it will be as hard as stone or marble, and the body will be so solid as never to decay.

After the finishing of the bason, the plastering should be for four or five days successively anointed over with oil, or bullock's blood, to prevent it from cracking or flawing; this being done, the water should be let into the bason as soon as may be.

Those basons which are made of lead, are to be thus wrought; the outlines ought to be enlarged one foot of a side, and digged half a foot deeper than the bason is to be.

The wall must be made a foot thick, that it may be able to bear up against the earth lying against it; but the bottom will not require to be more than half a foot thick.

These walls must be built in rubble laid in mortar all of plaster, because the lime will eat the lead, and then the lead must be laid on the walls and bottom, and be seamed with solder.

But basons of lead are not much in use, because of their great charge in making, and the danger of the lead being stolen.

Great care ought to be taken to keep the upper edge and superficies of a bason upon a level, that the water may cover all the walls equally.

As to the waste pipes of basons, whether at the bottom or superficies, they ought not to be made too small, lest they should be choked, notwithstanding the cawls that are drawn before them.

When this waste water is only to be lost in sinks and common sewers, it is carried away in drains or earthen pipes; but when it serves to play the basons that lie below it, it must pass through leaden pipes.

These basons are now pretty generally rejected by persons of good taste, as being no ways ornamental; therefore where there is a necessity to make reservoirs for water for the use of gardens, they are commonly dug in the lowest part of gardens, or where the spot is most convenient for receiving the water, which may run from the adjacent grounds in hard rains; these ponds should have their sides made very easy, for, if they are too upright, the earth frequently breaks down by the water washing, and making it hollow below; the sides and bottoms of these ponds should be laid nine or ten inches thick with well wrought clay; and, as the clay is finished, it should be well covered to prevent the sun and wind from cracking it before the water is let in. The figures of these ponds should not be regular, for the shape of the hollow, where they are made, should be followed, which will save expence, and have a better appearance.

BASTERIA. Nov. Gen. All-spice.

As this plant had no proper title given to it, I have given it this in honour of my worthy friend Dr. Job Baster, F. R. S. of Zurick Zee, in Holland, who is a gentleman well skilled in botany, and has a fine garden stored with rare plants, of which he is very communicative to his friends, as I have many years experienced.

The Characters are,

*The empalement of the flower is short, of one leaf, and cut into five narrow segments at the top. It hath a double series of narrow petals, which spread open, and turn inward at their extremity. Under the receptacle is situated an oval germen, having no style, but five stigma resting upon it, and is surrounded by many short stamina, crowned by obtuse summits. The germen afterward becomes a roundish fruit, compressed at both ends, having cells, containing oblong seeds.*

We have but one Species of this genus at present in England, which is,

Basteria foliis ovatis oppositis, floribus lateralibus caule fruticoso ramoso. *Basteria with oval leaves placed opposite, flowers coming from the sides of the stalks, and a branching shrubby stalk.* Frutex Corni foliis conjugatis floribus Anemones stellatæ, petalis crassis rigidis colore sordidè rubente, cortice Aromatico. Catesb. Hist. Carol. Vol. I. p. 46. *commonly called in Carolina All-spice.*

This shrub grows naturally in America. Mr. Catesby, who first introduced it into the English gardens, procured it from the continent, some hundred miles on the back of Charles Town, in Carolina.

It

It seldom rises more than four feet high in this country, dividing into many slender branches near the ground, which are garnished with two oval leaves placed opposite at every joint, which are entire; these have short foot-stalks; the flowers grow single at the extremity of the foot-stalk, which comes out from the wings of the leaves; they have two series of narrow thick petals, which spread open, and turn inward at the top, like those of the Starry Anemone, or the Virgin's Bower: these are of a sullen purple colour, and have a disagreeable scent; they appear in May. The embryo sits beneath the flower, and supports five stigma; this afterward appears to have five cells, but it never comes to perfection in this country, therefore I can only give a description of it from an imperfect rudiment, which a few years past, was fairer than any I had before seen. The bark of this shrub is brown, and has a very strong aromatic scent; from whence the inhabitants of Carolina gave it the title of All-spice, by which it is generally known in the nurseries near London.

This shrub will thrive in the open air in England, if it is planted in a warm situation and a dry soil. It is propagated by laying down the young branches, which will take root in one year, and may then be taken from the mother plant, and planted where they are designed to remain, for they do not bear transplanting well, after they are grown to any size. When the layers are transplanted, the surface of the ground should be covered with mulch, to prevent the drying winds from penetrating the ground to their roots; and if the season proves dry, they must be watered once a week, but should not have too much wet, for that will rot their tender fibres.

The best time for laying down the branches, is in the autumn, but they should not be transplanted till the spring twelve months after, for the spring is the safest time to remove these plants. After the branches are laid down, there should be some old tanners bark laid upon the surface of the ground, to keep out the frost, which should also be done every winter, while the plants are young, which will prevent the frost from penetrating to their root, and thereby secure them.

This plant was very scarce in England, till within a few years past, that many of them have been brought from Carolina, where they have been greatly increased in the gardens near Charles Town.

Dr. Kempfer has given a figure and description of a plant, in his Amœnitates Exoticarum, which seems to be of this genus; but he mentions the fruit to be composed of eight cells; whereas, so far as I have been able to examine this, it appears to have but five; however, the flower and general structure of the plant, agrees very well with this, but I suppose it to be a distinct species, the leaves of this being much longer, and the flowers stand upon naked foot-stalks; whereas those of our sort have commonly two small leaves, which are narrower, and more pointed than those upon the branches: but I find Dr. Linnæus and Monsieur Du Hamel, both suppose they are the same plant.

After I had given a figure of this plant, in plate LX. of my Figures of Plants, I received Monsieur Du Hamel's book of the trees and shrubs, which will grow in the open air about Paris, in which he has given a bad figure of this plant, under the title of Butneria; but as my plate was first published, and I was not apprised of his title, I have continued my title to it; not from any attachment to it, as being my own, but rather to avoid confusion, which must attend the frequent alteration of the names of plants, which is too much in fashion at present.

BAUHINIA, Mountain Ebony, *vulgò*. This plant was so named by father Plumier, in honour of the two famous botanists, John and Caspar Bauhin.

The Characters are,

*The empalement of the flower is permanent, tubulous, of one leaf, and cut into five parts at the top; the flower is composed of five petals, which in some species are spear-shaped, waved and reflexed, but in others roundish and concave: it hath ten stamina, which are of unequal lengths; some of these are crowned by oval summits, but others have none. The oblong germen sits upon the foot-stalk, supporting a slender declining style, which turns upward at the point, crowned by an obtuse stigma; the germen afterward becomes a long taper pod, inclosing a row of roundish compressed seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, entitled Decandria Monogynia, the flower having ten stamina and one style.

The Species are,

1. Bauhinia (*Aculeata*) caule aculeato. Hort. Cliff. 156. *Bauhinia with a prickly stalk.* Bauhinia aculeata folio rotundo emarginato. Plum. Nov. Gen. 23.
2. Bauhinia (*Tomentosa*) foliis cordatis, lobis semiorbiculatis tomentosis. Lin. Sp. 536. *Bauhinia with heart-shaped leaves, and semiorbicular woolly lobes.* Bauhinia flore luteo spicato folio subrotundo bicorni. Houst.
3. Bauhinia (*Acuminata*) foliis ovatis lobis acuminatis semi-ovatis. Lin. Sp. Plant. 375. *Bauhinia with oval leaves, and pointed lobes which are half oval.* Bauhinia non aculeata folio ampliori & bicorni. Plum. Nov. Gen. 23.
4. Bauhinia (*Ungulata*) foliis, lobis parallelis. Lin. Sp. 535. *Bauhinia with oval leaves, whose lobes are parallel.* Bauhinia non aculeata folio nervoso bicorni, floribus albicantibus. Houst.
5. Bauhinia (*Emarginata*) caule aculeato, foliis cordatis lobis orbiculatis, subtus tomentosis. *Bauhinia with a prickly stalk, and heart-shaped leaves with round lobes, which are woolly on their under side.* Bauhinia aculeata folio rotundo emarginato flore magno albo. Houst.
6. Bauhinia (*Purpurea*) folio subcordatis bipartitis rotundatis, subtus tomentosis. Lin. Sp. 536. *Bauhinia with almost heart-shaped leaves divided in two roundish lobes woolly on their under side.* Bauhinia non aculeata folio subrotundo bicorni, floribus albis. Houst.
7. Bauhinia (*Rotundata*) foliis subcordatis bipartitis rotundatis caule aculeato, floribus sparsis. *Bauhinia with heart-shaped, bifid, rounded leaves, a prickly stalk, and flowers growing sparsly.* Bauhinia aculeata foliis subrotundis bicornis flore magno albo. Houst.
8. Bauhinia (*Variegata*) foliis cordatis lobis coadunatis obtusis. Lin. Sp. Plant. 375. *Bauhinia with heart-shaped leaves, and obtuse lobes which join together.* Chovanna-mandaru. Hort. Mal. 1. p. 57.
9. Bauhinia (*Scandens*) caule cirrhifero. Lin. Sp. Plant. 374. *Bauhinia with a stalk having tendrils.*
10. Bauhinia (*Divaricata*) foliis ovatis lobis divaricatis. Lin. Sp. Plant. 374. *Bauhinia with oval leaves, whose lobes spread different ways.* Bauhinia foliis quinquenerviis laciniis acuminatis remotissimis. Hort. Cliff. 156.

The first sort grows plentifully in Jamaica, and the other sugar islands in America, where it rises to the height of sixteen or eighteen feet, with a crooked stem, and divides into many irregular branches, armed with short strong spines, garnished with compound winged leaves, each having two or three pair of lobes, ending with an odd one, which are oblique, blunt, and indented at the top. The stalks are terminated by several long spikes of yellow flowers, which are succeeded by bordered pods, about three inches long, which contain two or three swelling seeds. These pods are glutinous, and have a strong balsamic scent, as have also the leaves when bruised. It is called in America, the Indian Savin-tree, from its strong odour, somewhat resembling the common Savin.

The second sort was sent me from Campeachy, in 1730, by the late Dr. Houston, where he found it growing naturally. This rises to the height of twelve or fourteen feet, with a smooth stem, dividing into many branches, garnished with heart-shaped leaves, having two smooth-pointed lobes; the extremity of every branch is terminated by a long spike of yellow flowers, so that when these trees are in flower, they

make a fine appearance. The pods are swelling, and about five inches long, each containing five or six roundish compressed seeds.

The third sort grows naturally in both Indies, where it rises with several pretty strong, upright, smooth stems, sending out many slender branches, garnished with oval leaves, deeply divided into two lobes. The leaves come out without order, and have long foot-stalks, but are much thinner than those of the species before-mentioned. The flowers come out at the extremity of the branches, three or four in a loose bunch; the petals are red, or striped with white, others are plain upon the same branch; the stamina and style are white, and stand out beyond the petals. These flowers are succeeded by long flat pods of a dark brown colour, each containing five or six roundish compressed seeds. The wood of this tree is very hard, and veined with black, from whence the inhabitants of America call it Mountain Ebony.

The fourth sort grows naturally at Campeachy, from whence I received the seeds. This rises to the height of twenty feet, with a smooth stem, dividing into many small branches, garnished with oblong heart-shaped leaves, having two pointed parallel lobes, which have each three longitudinal veins. The leaves are placed alternately on the branches, which are terminated by loose bunches of white flowers; these are succeeded by very long narrow compressed pods, which have eight or ten compressed roundish seeds in each.

The fifth sort was sent me from Carthagena, in New Spain, where it grows in plenty. This seldom rises more than ten feet high, dividing into many irregular branches, armed with short crooked spines; the leaves grow alternate, are heart-shaped, and have two roundish lobes; they are woolly on their under side, and have short foot-stalks. The flowers grow at the extremity of the branches, two or three together; these are large, and of a dirty white colour, and are succeeded by short flat pods, each containing two or three seeds.

The sixth sort grows naturally at La Vera Cruz. This rises to the height of twenty-five, or thirty feet, with many irregular stems, which divide into many slender branches; garnished with heart-shaped leaves, having two roundish lobes. The flowers come out in loose spikes at every joint from the wings of the leaves, with naked foot-stalks, and are of a dirty white colour, and are succeeded by oblong compressed pods, which are broadest at their extremity, where they are rounded, each containing three or four compressed seeds.

The seventh sort grows naturally at Carthagena, in New Spain. This rises twenty feet high, with a strong upright stem, which sends out many branches toward the top; armed with spines growing by pairs, which are strong and crooked. The leaves are heart-shaped and grow alternately, having two rounded lobes. The flowers are large and white, coming out thinly at the ends of the branches. The petals of these are near two inches long, and spread open wide; the stamina and style are nearly of the same length. The flowers are succeeded by long flat pods, which are narrow, each containing five or six seeds.

The eighth sort grows naturally in both Indies. This rises with a strong stem, upward of twenty feet high, dividing into many strong branches, garnished with heart-shaped leaves, having obtuse lobes which close together. The flowers are large and grow in loose panicles; at the extremity of the branches, of a purplish red colour, marked with white, and have a yellow bottom. These have a very agreeable scent. The flowers are succeeded by compressed pods, about six inches long, and three quarters of an inch broad, containing three or four compressed seeds in each.

The ninth sort grows naturally in both Indies, where it rises with many slender stalks, which put out tendrils, and fasten themselves to the neighbouring trees, whereby they rise to a great height; the leaves come out alternately, are heart-shaped, standing upon long foot-stalks; these are six inches long, and three inches and a half broad in the middle, and are deeply cut into two pointed lobes, each having three prominent ribs running longitudinally. This hath not produced flowers in England, nor had I any account of them with the seeds, which were sent me from Campeachy.

The tenth sort grows naturally in great plenty on the north side of the island of Jamaica. This is a low shrub, seldom rising more than five or six feet high, but divides into several branches, garnished with oval leaves, divided into two lobes, which spread from each other. The flowers grow in loose panicles at the end of the branches, which are white, and have a very agreeable scent. These appear the greatest part of summer, so is one of the great beauties of the hot-house. The flowers are succeeded by taper pods, about four inches long, each containing four or five roundish compressed seeds, of a dark colour.

All these plants are natives of the warm countries, so will not thrive in England, unless they are kept in a warm stove. They are propagated by seeds, which must be procured from the countries where they grow naturally, for they do not perfect their seeds in England.

The last sort has several times produced pods in the Chelsea garden, but they have never come to maturity. The seeds should be brought over in their pods, which will preserve them good. These must be sown in pots filled with light fresh earth, and plunged into a moderate hot-bed of tanners-bark; if the seeds are good, the plants will come up in about six weeks, and in a month after, will be fit to transplant, when they should be carefully shaken out of the seed pot, so as not to tear off the roots, and each planted into a separate small pot filled with light loamy earth, and plunged into the hot-bed again, being careful to shade them until they have taken fresh root, after which they should have fresh air admitted to them every day in warm weather. In the autumn they must be placed in the bark-stove, and treated in the same way as other tender exotics, giving them but little water in winter. As these plants frequently flower, they are worthy of a place in the stove.

BAY. See Laurus.

BEANS. See Faba.

BEANS, (KIDNEY or FRENCH.) See Phaseolus.

BEAN-TREFOIL. See Cytisus.

BEAR's-EAR. See Auricula.

BEAR's-EAR SANICLE. See Verbascum.

BEAR's-FOOT. See Helleborus.

BECABUNGA, or Brook-lime.

This is a sort of Veronica, or Water Speedwell; of which there are two sorts, one with a long leaf, and the other round; they are both very common in ditches, and watery places, almost every where in England; the second sort is used in medicine.

BEE, or GNAT-FLOWER. See Orchis.

BEECH-TREE. See Fagus.

BELLADONA. See Atropa.

BELL-FLOWER. See Campanula.

BELLIS [is so called Bellus, *Lat.* pretty, handsome, &c.] the Daisy.

The Characters are,

*It hath a radiated discous flower, composed of many hermaphrodite florets in the disk, and female florets in the rays; included in a common empalement, with a double series of small leaves of equal length. The hermaphrodite florets in the disk, are funnel-shaped, and cut into five parts at the brim; the female florets are tongue-shaped, and make the border; these have no stamina, but an oval germen supporting a slender style, crowned by two spreading stigma; the hermaphrodite florets have an oval germen, supporting a simple style, crowned by a bordered stigma. This is attended by five short stamina, crowned by tubular cylindrical summits. The germen afterward becomes a single naked seed placed vertically.*

This

This genus of plants is ranged in the second section of Linnæus's nineteenth class, intitled Syngenesia Polygamia superflua, the flowers being composed of female and hermaphrodite florets, included in a common empalement.

The Species are,

1. Bellis (*Perennis*) scapo nudo unifloro. Hort. Cliff. 418. *Daisy with a naked stalk, having one flower.* Bellis sylvestris minor. C. B. P. 267. *Smaller wild Daisy.*
2. Bellis (*Annua*) caule subfolioso. Lin. Sp. Plant. 887. *Daisy with leaves on the lower part of the stalk.* Bellis minor pratensis caule folioso. Bocc. Mus. 2. p. 96.
3. Bellis (*Hortensis*) hortensis flore pleno majore. C. B. P. 261. *Garden Daisy with a larger double flower.*

The first sort is the common Daisy, which grows naturally in pasture land in most parts of Europe, and is often a troublesome weed in the grass of gardens, so is never cultivated.

The second sort is a low annual plant, which grows naturally on the Alps, and the hilly parts of Italy. This seldom rises more than three inches high, with an upright stalk, which is garnished with leaves on the lower part; but the upper part is naked, supporting a single flower like that of the common Daisy, but smaller. This is preserved in some botanic gardens for the sake of variety; it was sent me from Verona, near which place it grows wild.

The Garden Daisy is generally supposed to be only a variety of the wild sort, which was first obtained by culture. This may probably be true, but there has not been any instance of late years of the wild sort having been altered by culture; for I have kept the wild sort in the garden upward of forty years, and have constantly parted the roots, and raised many plants from seeds, but they have constantly remained the same; nor have I ever observed the Garden Daisy to degenerate to the wild sort, where they have been some years neglected, tho' they have altered greatly with regard to the size and beauty of their flowers. I have also observed the several varieties of the Garden Daisy vary from one to the other, therefore I shall not consider them as distinct species, but shall only mention the varieties, which are cultivated in the gardens.

1. The red and white Garden Daisy, with double flowers.
2. The double variegated Garden Daisy.
3. The Childing, or Hen and Chicken Daisy.
4. The Cockscomb Daisy with red and white flowers.

The Garden Daisies flower in April and May, when they make a pretty variety, being intermixed with plants of the same growth; they should be planted in a shady border, and a loamy soil without dung, in which they may be preserved without varying, provided the roots are transplanted and parted every autumn; which is all the culture they require, except the keeping them clear from weeds.

These were formerly planted for edgings to borders, but they are very unfit for this purpose; because where they are fully exposed to the sun, they frequently die in large patches, whereby the edgings become bald in many places.

BELLIS MAJOR. See Chrysanthemum.

BELLONIA.

This plant was so named by Father Plumier, in honour of the famous Petrus Bellonius, who has left many valuable tracts on natural history, &c.

The Characters are,

*It hath a permanent empalement which is of one leaf, cut into five parts at the top; the flower is wheel-shaped, of one leaf, with a short tube, but spread open above, and cut into five obtuse segments. It hath five awl-shaped stamina, which are short, and crowned by short erect summits, which close together. The germen is situated under the receptacle of the flower, supporting an awl-shaped style, which is longer than the stamina, and crowned by an acute stigma. The germen afterward becomes an oval turbinated seed-vessel, ending in a point, having one cell filled with small round seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

We have but one Species of this genus, viz.

Bellonia. Lin. Sp. Plant. 172. Bellonia frutescens, folio melissæ aspero. Plum. Nov. Gen. 19.

This plant is very common in several of the warm islands in America, from whence I have received the seeds.

It hath a ligneous stalk, which rises ten or twelve feet high, sending out many lateral branches, garnished with oval rough leaves placed opposite; the flowers come out from the wings of the leaves, in loose panicles, which are of the wheel shape, of one leaf, divided into five parts; these are succeeded by oval capsules, ending in a point, which are full of small round seeds.

It is propagated by seeds, which should be sown early in the spring, in a pot filled with light fresh earth, and plunged into a hot-bed of tanners barks, observing to water it frequently, as the earth appears dry; but you must be careful not to wash the seeds out of the ground. When the plants are come up half an inch high, they should be carefully transplanted into pots filled with light fresh earth, and plunged into the hot-bed again, observing to water and shade them until they have taken root; after which time they should have air admitted to them every day, when the weather is warm; they must also be frequently watered. When the plants have filled these pots with their roots, they should be carefully shaken out of them, and their roots trimmed, and put into larger pots filled with light fresh earth, and plunged into the hot-bed again. In warm weather they should have free air admitted to them every day; but in autumn they must be plunged into the bark-stove, and treated in the same manner as other tender exotic plants. The second year these plants will sometimes flower, but they rarely produce good seeds in this climate; however, they may be propagated by cuttings in the summer months, provided they are planted in light earth on a moderate hot-bed, and carefully watered and shaded until they have taken root. These plants must be constantly kept in the stove, and should have a large share of free air in warm weather; but if they are set abroad, they will not thrive in this climate.

BELVEDERE. See Chenopodium.

BENZOIN, the Benjamin-tree. See Laurus.

BERBERIS, the Barberry, or Pipperidge-bush.

The Characters are,

*It hath a coloured empalement, which spreads open, composed of six concave leaves, three of which are alternately larger than the other; the flower is of six leaves, which are roundish, concave, and little larger than the empalement; there are two coloured nectarii, fastened to the base of each petal, and six obtuse, compressed, erect stamina, with two summits fastened on each side their apex. The germen is cylindrical, the length of the stamina, having no style, but crowned by an orbicular stigma broader than the germen, having a sharp border: the germen afterward becomes an obtuse, cylindrical, umbilicated berry, having a puncture, and one cell inclosing two cylindrical seeds.*

This genus is ranged in Linnæus's first section of his sixth class, intitled Hexandria Monogynia, the flower having six stamina and one style.

The Species are,

1. Berberis (*Vulgaris*) pedunculis racemosis. Mat. Med. 290. *Barberry with branching foot-stalks.* Berberis dumetorum. C. B. P. 454. *The common Barberry.*
2. Berberis (*Canadensis*) foliis obversè-ovatis. *Barberry with oval obverse leaves.* Berberis latissimo folio Canadensis. H. R. Par.
3. Berberis (*Cretica*) pedunculis unifloris. Lin. Sp. Plant. 331. *Barberry with a single flower on each foot-stalk.* Berberis Cretica buxi folio. Tourn. Cor. 42.

The first sort grows naturally in the hedges in many parts of England, but is also cultivated in gardens for its fruit, which is pickled, and used for garnishing dishes. This shrub rises with many stalks from

 the

the root, to the height of eight or ten feet, which have a white bark, yellow on the inside; the stalks and branches are armed with sharp thorns, which commonly grow by threes; the leaves are oval, obtuse, and slightly sawed on their edges. The flowers come out from the wings of the leaves, in small ramose bunches, like those of the Currant-bush, which are yellow; these are succeeded by oval fruit, which are first green, but when ripe turn to a fine red colour. The flowers appear in May, and the fruit ripens in September.

There are two or three varieties of this shrub, which have been mentioned as distinct species; one is the Berberis sine nucleo. C. B. P. *Barberry without stone.* The second is Berberis fructu albo. *Barberry with white fruit.* The third is the Berberis orientalis procerior fructu nigro suavissimo. Tourn. Cor. *Taller Eastern Barberry with a black sweet fruit.* The first of these is certainly accidental, because the suckers, taken from those bushes being transplanted, commonly produce fruit with stones; so it is the age of the plant which occasions that variation. The sort with white fruit seldom bears; the leaves of this are of a lighter green colour, and the bark of the stalks are whiter than those of the common, which are the only differences between them, for the fruit is seldom produced here. The third sort appears the same with the common, and only differs in the colour and flavour of the fruit, so is only a variety.

The common sort is generally propagated by suckers, which are put out in great plenty from the root; but these plants are very subject to send out suckers, in greater plenty than those which are propagated by layers; therefore the latter method should be preferred. The best time for laying down the branches is in the autumn, when their leaves begin to fall; the young shoots of the same year are the best for this purpose; these will be well rooted by the next autumn, when they may be taken off, and planted where they are designed to remain. Where this plant is cultivated for its fruit, it should be planted single, (not in hedges, as was the old practice) and the suckers every autumn taken away, and all the gross shoots pruned out: by this method the fruit will be much fairer, and in greater plenty, than upon those which are suffered to grow wild. A few of these shrubs may be allowed to have place in wildernesses, or plantations of shrubs, where they will make a pretty variety, and the fruit will be food for the birds; but they should not be planted in great quantities, near walks which are much frequented, because their flowers emit a very strong disagreeable odour.

The Canada sort was more common in the English gardens, some years past, than at present. The leaves of this are much broader, and shorter than those of the common sort, and the fruit is black when ripe. This may be propagated in the same way as the common sort, and is equally hardy.

The Box-leaved sort is at present very rare in England; and while young, the plants are somewhat tender, so have been killed by severe frost. This never rises more than three or four feet high in England, but sends out many stalks from the root, which are strongly armed with spines at every joint; the leaves are produced without order, and are shaped like those of the narrow-leaved Box-tree; the flowers come out from between the leaves, each upon a slender foot-stalk; but these are not succeeded by fruit in England.

This sort may be propagated by laying down the branches in the same manner as the first; but when the young plants are taken off, they should be planted in pots, and sheltered under a frame in the winter, till they have obtained strength, when they may be turned out of the pots, and planted in a warm situation.

BERMUDIANA. See Sisyrinchium.

BERNARDIA. See Croton.

BESLERIA

This plant was named after Basilius Besler, an apothecary at Nuremberg, who was the author of a book, intitled Hortus Eystetensis.

The Characters are,

*The flower is of the personated or lip kind, with an empalement of one leaf, which is erect, and cut into five acute parts at the brim: the flower is of one leaf, and quinquefid; the segments being roundish, the lower being large, and the two upper are less divided; it hath four stamina in the tube of the flower, two of which are longer than the other, crowned by small summits: the oval germen supports an awl-shaped style, crowned by an acute stigma; this afterward becomes an oval berry, with one cell filled with small seeds.*

This genus of plants is ranged in the second section of Linnæus's twelfth class, intitled Didynamia Angiospermia, the flower having two long and two short stamina, and the seeds being included in a capsule.

The Species are,

1. Besleria (*Melittifolia*) pedunculis ramosis, foliis ovatis. Lin. Sp. Plant. 619. *Besleria with branching foot-stalks and oval leaves.* Besleria Melissæ Tragi foilo. Plum. Nov. Gen. 29.
2. Besleria (*Lutea*) pedunculis simplicibus confertis, foliis lanceolatis. Lin. Sp. Plant. 619. *Besleria with simple foot-stalks growing in clusters, and spear-shaped leaves.* Besleria virgæ aureæ foliis flore luteo minor. Plum. Nov. Gen. 29.
3. Besleria (*Cristata*) pedunculis simplicibus solitariis, involucris pentaphyllis propriis. Lin. Sp. Plant. 619. *Besleria with simple stalks growing single, and a five-leaved involucrum.* Besleria scandens cristata fructu nigro. Plum. Nov. Gen. 29.

The first sort hath a smooth woody stalk which is jointed; at each joint are placed two oval nervous leaves opposite, which are crenated on their edges; the flowers come out from the wings of the leaves, upon short branching foot-stalks, each sustaining six or eight flowers, which stand each upon a separate smaller foot-stalk. These are of one leaf, of an anomalous figure, and quinquefid; after the flower is past, the germen becomes an oval soft berry, with one cell filled with small seeds.

The second sort rises with a ligneous stem six or seven feet high, dividing toward the top into many irregular branches, garnished with spear-shaped sawed leaves, which have many transverse veins; the flowers come out at the wings of the leaves, in large clusters, each having a separate foot-stalk: these are small, tubulous, and of a pale yellow colour, and are succeeded by round soft berries, inclosing many small seeds.

The third sort hath a creeping stalk, which sends out roots at every joint, garnished with oval leaves placed opposite, which have many transverse ribs, and are sharply sawed on their edges; from the wings of the leaves come out the foot-stalks of the flowers single, each sustaining one tubulous, irregular, hairy flower, divided at the top into five obtuse parts, with a large five-leaved involucrum, deeply sawed on the border: after the flower is past, the germen becomes a hairy placenta, in the center of the empalement, containing many small seeds.

These plants grow naturally in the warm parts of America. The seeds should be sown on a hot-bed early in the spring; and when the plants are come up half an inch high, they should be each transplanted into a small pot filled with light fresh earth, and plunged into a hot-bed of tanners bark, observing to water and shade them until they have taken root; after which time they should have air and water in proportion to the warmth of the season, and the heat of the bed in which they are placed. When the plants have filled these small pots with their roots, they should be shaken out of them, and their roots trimmed, and put into larger pots filled with light fresh earth, and plunged into the hot-bed again; where they should have a large share of air in warm weather, and must be frequently watered. With this management the plants will thrive very well in summer, but

but in winter they must be removed into the stove, where they must be placed in a temperate warmth, and should be often, but sparingly, watered. The second year these plants will flower, and sometimes they will perfect their seeds in this country; but they must be constantly preserved in the stove, for they will not live in the open air.

BETA, the Beet.

The CHARACTERS are,

*The flower hath a five-leaved concave empalement, which is permanent. It hath no petal, but five awl-shaped stamina, placed opposite to the leaves of the empalement, crowned by roundish summits. The germen is situated below the receptacle, supporting two short erect styles, crowned by pointed stigma. The germen afterward becomes a capsule with one cell, having a single seed, wrapped up in the empalement.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flower having five stamina and two styles.

The SPECIES are,

1. BETA (*Maritima*) caulibus decumbentibus, foliis triangularibus petiolatis. *Beet with declining stalks, and triangular leaves having foot-stalks.* Beta sylvestris maritima. C. B. P. 118.
2. BETA (*Hortensis*) foliis radicalibus petiolatis, caulinis sessilibus, spicis lateralibus longissimis. *Beet with the lower leaves having foot-stalks, those upon the stalks without, and very long spikes of flowers.* Beta alba vel pallescens, quæ cicla officinarum. C. B. P. 118.
3. BETA (*Vulgaris*) caule erecto. Lin. Sp. 322. *Common red Beet.* Beta rubra radice rapaceâ. C. B. P. 118. *Red Beet with a Turnep root.*

There are several varieties of this genus, some of which are cultivated in the gardens for the kitchen; but as these have been improved by culture, so they must not be deemed distinct species. There are some who have supposed all the species were only seminal variations, but from having cultivated them upward of forty years, I could never observe, that either of the three species here enumerated have altered from one to the other. The only alteration which I have observed in the third species, has been in the colour of the leaves and roots, which will be hereafter mentioned.

The first sort grows naturally on the banks of the sea, and in salt marshes in divers parts of England. This has been supposed by many, to be the same with the second species; but I have brought the seeds from the places where they grow naturally, many times, and have cultivated the plants with care, but could not find any of the plants vary from their parent plants in their characters, so that I can make no doubt of its being a distinct species.

The second sort is cultivatad in gardens for its leaves, which are frequently used in soups; the root of this sort seldom grows larger than a man's thumb; the stalks grow erect, and are garnished with oblong spear-shaped leaves, growing close to the stalk; the spikes of flowers come out from the wings of the leaves, which are long, and have narrow leaves placed between the flowers. The lower leaves of the plant are thick and succulent, and their foot-stalks are broad. The varieties of this are, the White Beet, the Green Beet, and the Swiss or Chard Beet. These will vary from one to the other by culture, as I have often experienced, but never alter to the first or third sort.

The third sort hath large, thick, succulent leaves, which are for the most part of a dark red, or purple colour. The roots of this are large, and of a deep red colour, on which their goodness depends; for the larger these roots grow, the tenderer they will be; and the deeper their colour, the more they are esteemed. The varieties of this are, the common Red Beet, the Turnep-rooted Red Beet, the Green-leaved Red Beet, and the Yellow-rooted Beet.

The second sort, which is cultivated in gardens for its leaves, which are used in the kitchen, is commonly sown by itself, and not mixed with other crops. This is sown the beginning of March, upon an open spot of ground, not too moist; the seeds should be sown thinly, because the plants require room to spread; for when they are too close, the leaves will be small and full of fibres, so unfit for the purposes designed. When the plants have put out four leaves, the ground should be hoed, as is practised for Carrots, carefully cutting up all the weeds, and also the plants where they are too near each other, leaving them at least four inches asunder: if this is performed in dry weather, all the present weeds will be destroyed; but as young weeds will soon appear, so in three weeks or a month's time, the ground should be a second time hoed over, to cut up the weeds, and thin the plants to a greater distance; for by this time they will be past danger, so should not be left nearer than six inches, if regard is had to the goodness of their leaves: and if it is of the Swiss kind, with broad leaves, the plants must not be nearer than nine or ten inches. If the second hoeing is well performed, and in dry weather, the ground will remain clean a month longer, when it should be hoed over a third time; which, if properly done, will destroy all the weeds; so that after this, the plants will spread and prevent the weeds from growing, therefore will want but little cleaning for a considerable time, and the leaves will soon be fit for use, when the outer large leaves should be first gathered, leaving the small inner leaves to grow larger; so that a small spot of ground will supply a moderate family, and will furnish a new supply of leaves for two years, provided the plants are not permitted to run up to seed, for after that, their leaves will not be good: therefore those who are curious in their herbs, must sow a fresh spot of ground annually, because these plants naturally run up the second year; and although the roots may be continued longer, by cutting off the stalks when they begin to shoot, yet the leaves will not be so large or tender upon these roots, as upon the young plants.

The Red Beet is frequently sown with Carrots, Parsneps, or Onions, by the kitchen gardeners near London, who draw up their Carrots or Onions when they are young, whereby the Beets will have room to grow, when the other crops are gathered; but where the crops are not timely removed from them, it will be a better method to sow them separately. This sort requires a deep light soil, for as their roots run deep in the ground, so in shallow ground they will be short and stringy. The seeds should be sown in March, and must be treated in the same manner as the former sort; but the plants should not be left nearer than a foot distance, or in good land a foot and a half, for the leaves will cover the ground at that distance. The roots will be fit for use in the autumn, and continue good all the winter; but in the spring, when they begin to shoot, they will be hard and stringy. A few roots may be left for seed, or some of the fairest roots transplanted to a sheltered spot of ground, where they may be defended from strong winds, which frequently break down their stalks, if they are not well supported, especially when the seeds are formed; which becoming heavy as it increases in bulk, is apt to weigh down the slender stalks upon which they grow. The seed will ripen in September, when the stalks should be cut off, and spread on mats to dry, and afterward threshed out and cleaned, and put up in bags for use.

BETONICA [or Vettonica, so called from the Vettones, an ancient people of Spain, who first used this plant], Betony.

The CHARACTERS are,

*It hath a permanent empalement of one leaf, which is tubulous, cut at the brim into five parts. The flower is of one leaf, of the lip kind, with a cylindrical incurved tube; the upper lip is roundish, plain, erect, and entire; the lower lip is cut into three parts, the middle segment being broad, roundish, and indented at the end. It hath four awl-shaped stamina, two long and two shorter, which incline to the upper lip; these have roundish summits. The germen is quadripartite, supporting a style of the length*

*and*

*and figure of the stamina, crowned by a bifid stigma. The germen afterward becomes four naked oval seeds, lodged in the empalement.*

This genus of plants is ranged in the first section of Linnæus's twelfth class, intitled Didynamia Gymnospermia, the flower having two long and two shorter stamina, which are succeeded by naked seeds.

The Species are,

1. Betonica (*Officinalis*) spicâ interruptâ, corollarum laciniâ labii intermediâ emarginatâ. Flor. Leyd. Prod. 316. *Betony with an interrupted spike, and the middle segment of the lower lip of the flower indented at the end.* Betonica purpurea. C. B. P. 235. *Purple or Wood Betony.*
2. Betonica (*Danica*) foliis radicalibus ovato-cordatis, caulinis lanceolatis obtusis spicâ crassiore. *Betony whose under leaves are heart-shaped, those on the stalks spear-shaped and obtuse, and a thicker spike of flowers.* Betonica major Danica. Park. Theat. 615. Mor. Hist. 3. 365.
3. Betonica (*Alpina*) foliis triangularibus obtusis spicâ breviore. *Betony with obtuse triangular leaves, and a shorter spike of flowers.* Betonica minima Alpina Helvetica. Park. Theat. 650.
4. Betonica (*Orientalis*) spicâ integrâ, corollarum laciniâ labii intermediâ integerrimâ. Flor. Leyd. Prod. 316. *Betony with a whole spike, and the middle segment of the lower lip entire.* Betonica Orientalis angustissimo & longissimo folio, spicâ florum crassiori. Tourn. Corol. 13.
5. Betonica (*Incana*) foliis lanceolatis obtusis incanis spicâ florum crassiori. *Betony with obtuse, spear-shaped, hoary leaves, and a thicker spike of flowers.* Betonica Italica incana flore carneo. Barrel. Icon. 340.

The first sort grows naturally in woods and on shady banks in most parts of England, so is seldom cultivated in gardens. This is the sort which is used in medicine, and is greatly esteemed as a vulnerary herb. There is a variety of this with a white flower, which I have often found growing naturally in Kent.

The second sort grows naturally in Denmark. This differs greatly from our common sort, the lower leaves being much broader and heart-shaped; those upon the stalks are spear-shaped and rounded at the end, and the stalks are larger, stand upright, and are terminated by thicker spikes of flowers. These differences are constant, for I have many years propagated them by seeds, and have never found the plants so raised to vary.

The third sort grows naturally upon the Alps, where it seldom rises more than four inches high; and when cultivated in a garden, not above seven or eight. The leaves of this are much broader at the base than those of the common sort, and are very different in their shape, being triangular and blunt at the end. The flowers grow in very short close spikes, on the top of the stalks. These differences constantly hold in the plants raised from seeds.

The fourth sort was discovered by Dr. Tournefort in the Levant. The leaves of this are very long, narrow, and hairy, and are neatly crenated on their edges. The flowers grow in very close thick spikes at the top of the stalks, which are larger, and of a lighter purple colour than those of the common sort.

The fifth sort grows naturally in Italy, upon the hills, from whence I received the seeds. The leaves of this sort are broader, and not so long as those of the common sort, and are hoary; the stalks are shorter and much thicker, as are also the spikes of flowers, than those of the common, and the flowers are larger and of a flesh colour. This sort constantly keeps the same from seeds.

There is another sort which Tournefort and others mention, by the title of Betonica rubicundissimo flore montis aurei; which differs but little from the fifth, except in the colour of the flower, so I doubt of its being specifically different from that.

All the sorts are perennial plants, which may be propagated by seeds, or parting of their roots. They are all very hardy, but require a shady situation and a moist stiff soil, in which they will thrive better than in rich ground. The best time to transplant and separate the roots is in the autumn, but the seeds should be sown in the spring upon a shady border, and when the plants come up, they will require no other care but to keep them clean from weeds, and to thin them where they are too close.

These all of them flower in May and June, and the seeds ripen in August.

BETONICA AQUATICA. See Scrophularia.

BETONICA PAULI. See Veronica.

BETULA, the Birch-tree.

The Characters are,

*It hath male and female flowers, at separate distances on the same tree; the male flowers are collected in a cylindrical katkin, which is scaly, loose, and imbricated on every side, each scale having three flowers, which have two minute scales on the side. The flower is composed of three equal florets, fixed to the empalement by a single scale; each floret is of one leaf, divided into four oval segments which spread open; these have four small stamina, crown'd by double summits. The female flowers grow in a katkin, in the same manner as the male. The common katkin is imbricated, having three scales which are every way opposite, fastened to the central string or axis, having two heart-shaped flowers pointing toward the apex, where it is situated. They have no visible petals, but a short oval germen, supporting two bristly styles, which are the length of the scales of the empalement, and crowned with a plain stigma. It hath no pericarpium, but the seeds are included in the scales of the katkin, which are oval and winged.*

This genus of plants is ranged in the fourth section of Linnæus's twenty-first class, intitled Monœcia Tetrandia, there being male and female flowers on the same plant, and the male having four stamina.

The Species are,

1. Betula (*Alba*) foliis ovatis acuminatis serratis. Hort. Cliff. 442. *Birch-tree with oval sawed leaves ending in points; the common Birch-tree.*
2. Betula (*Nana*) foliis orbiculatis. Flor Lap. 266. *Birch-tree with round crenated leaves.* Betula pumila foliis subrotundis. Amman. *Dwarf Birch.*
3. Betula (*Lenta*) foliis cordatis oblongis acuminatis serratis. Lin. Sp. Plant. 983. *Birch-tree, with oblong, pointed, heart-shaped, sawed leaves.*
4. Betula (*Nigra*) foliis rhombeo-ovatis acuminatis duplicato-serratis. Lin. Sp. Plant. 982. *Birch-tree with rhomboid, oval, pointed leaves, which are doubly sawed.* Betula nigra Virginiana. Pluk. Alm. 67. *Black Virginia Birch-tree.*

The first is the common Birch-tree, which is so well known as to need no description. This is not much esteemed for its wood, but however it may be cultivated to advantage upon barren land, where better trees will not thrive; for there is no ground so bad, but this tree will thrive in it; for it will grow in moist springy land, or in dry gravel or sand, where there is little surface: so that upon ground which produced nothing but moss, these trees have succeeded so well, as to be fit to cut in ten years after planting, when they have been sold for near 10 l. per acre standing, and the after produce has been considerably increased. And as many of the woods near London, which were chiefly stocked with these trees, have been of late years grubbed up, so the value of these plantations have advanced in proportion. Therefore those persons who are possessed of such poor land, cannot employ it better, than by planting it with these trees, especially as the expence of doing it is not great.

The best method to cultivate this tree, is to furnish yourself with young plants from the woods where they naturally grow, and are generally found there in great plenty; but in places where there are no young plants to be procured near, they may be raised from seeds, which should be carefully gathered in the autumn, as soon as the scales under which they are lodged begin to open, otherwise they will soon fall out and be lost; the seeds are small, so should not be buried deep

deep in the ground. The autumn is the best season to sow them, and in a shady situation, the plants will thrive better than when they are exposed to the full sun; for in all places where there are any large trees their seeds fall, and the plants come up well without care; so that if the young plants are not destroyed by cattle, there is generally plenty of them in all the woods where there are any of these trees. These wild plants should be carefully taken up, so as not to destroy their roots. The ground where they are to be planted, will require no preparation; all that is necessary to be done, is to loosen it with a spade or mattock, in the places where the plants are to stand, making holes to receive their roots, covering them again when the plants are placed, and closing the earth hard to their roots. If the plants are young, and have not much top, they will require no pruning; but where they have bushy heads, they should be shortened to prevent their being shaken and displaced by the wind. When the plants have taken root, they will require no other care, but to cut down the great weeds which would over-hang the plants; which may be done with a sickle, being careful not to cut or injure the young trees. This need not be repeated oftener than two or three times in a summer the two first years, after which time the plants will be strong enough to keep down the weeds, or at least be out of danger from them.

These may be planted any time from the middle of October till the middle of March, when the ground is not frozen; but in dry land the autumn is the best season, and the spring for moist. The distance which they should be planted, is six feet square, that they may soon cover the ground, and by standing close, they will draw each other up; for in situations where they are much exposed, if they are not pretty close, they will not thrive so well.

If the plants take kindly to the ground, they will be fit to cut in about ten years; and afterward they may be cut every seventh or eighth year, if they are designed for the broom-makers only; but where they are intended for hoops, they should not be cut oftener than every twelfth year.

The expence of making these plantations in places where the young plants can be easily procured, will not exceed forty shillings per acre, and the after expence of cleaning about twenty shillings a year more; so that the whole will not be more than 3l. and if the land so planted be of little value, the proprietor cannot make better use of his money; for when the wood is cut, it will repay the expence with interest, and a perpetual stock upon the ground. I have seen several of these plantations made upon land which would not lett for one shilling per acre, which has produced from 10 to 12l. an acre, clear of the expence in cutting, and this every twelfth year. The broom-makers are constant customers for Birch, in all places within twenty miles of London, or where it is near water carriage; in other parts the hoop-benders are the purchasers; but the larger trees are often bought by the turners, and the wood is used for making ox-yokes, and other instruments of husbandry.

In some of the northern parts of Europe, the wood of this tree is greatly used for making of carriages and wheels, being hard and of long duration. In France it is generally used for making wooden shoes. It makes very good fuel.

In some places these trees are tapped in the spring, and the sap drawn out to make Birch wine, which has been recommended for the stone and gravel, as is also the sap unfermented. The bark of the Birch-tree is almost incorruptible. In Sweden the houses are covered with it, where it lasts many years. It frequently happens, that the wood is entirely rotten, and the bark perfectly sound and good.

The second sort grows naturally in the northern parts of Europe, and upon the Alps; this seldom rises above two or three feet high, having slender branches, garnished with round leaves, but seldom produces either male or female flowers here. It is preserved in some curious gardens for the sake of variety, but is a plant of no use.

The third and fourth sorts grow naturally in North America, from whence their seeds have been brought to Europe, and many of the plants have been raised, which thrive very fast here. In Canada these trees grow to a large size, where the third sort is called Merisier. The natives of that country make canoes of the bark of these trees, which are very light, and of long duration.

Both these sorts may be propagated by seeds in the same manner as the first, and are equally hardy; some of the trees now begin to produce their katkins in England, so that we may hope to have plenty of their seeds of our own growth, for at present we are supplied with them from America. As these grow more vigorously than the common sort, and thrive on the most barren ground, they may be cultivated to great advantage in England, for their wood is much esteemed in Canada, where the trees grow to a large size: and they are by no means an unsightly tree in parks, for their stems are strait, the bark smooth, and their leaves are much larger than those of the common Birch, so may be planted in such places where few other trees will thrive.

BIDENS. Tourn. Inst. R. H. 362. tab. 262. Lin. Gen. Plant. 840. Water Hemp Agrimony.

The CHARACTERS are,

*The common empalement is erect, and often equal, composed of small, oblong, concave leaves; it hath a compound flower; the middle or disk is composed of hermaphrodite florets, which are funnel-shaped and quinquefid. These have five short capillary stamina, with cylindrical summits, and an oblong germen supporting a single style the length of the stamina, crowned by two oblong reflexed stigma. The female florets which compose the border are naked; these are all succeeded by a single, angular, obtuse seed, having two or more bristles or teeth, by which they fasten themselves to whatever passes by them when ripe.*

This genus is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia æqualis, the flowers being composed of hermaphrodite and female florets, which are succeeded by seeds.

There are several species of this plant, which are seldom admitted into gardens, some of which are common weeds in England, therefore I shall only mention those which are frequently preserved in the gardens of the curious.

1. BIDENS (*Frondosa*) foliis pinnatis serratis seminibus erecto-constantibus calycibus frondosis corollis radiatis. Lin. Sp. Plant. 832. *Water Hemp Agrimony with winged sawed leaves, seeds standing erect, a very bushy empalement, and radiated flower.* Bidens Canadensis latifolia flore luteo. Tourn. Inst. 362.
2. BIDENS (*Nodiflora*) foliis oblongis integerrimis caule dichotomo floribus solitariis sessilibus. Lin. Sp. Plant. 832. *Hemp Agrimony with oblong entire leaves, a forked stalk, and a single flower growing close to the stalk.* Bidens nodiflorâ brunellæ folio. Hort. Elth. 52.
3. BIDENS (*Nivea*) foliis simplicibus subhastatis serratis petiolatis, floribus globosis, pedunculis elongatis seminibus lævibus. Lin. Sp. Plant. 833. *Hemp Agrimony with single sawed leaves having foot-stalks, globular flowers with longer foot-stalks, and smooth seeds.* Bidens scabra flore nivea, folio trilobato. Hort. Elth. 55.
4. BIDENS (*Frutescens*) foliis ovatis serratis petiolatis, caule fruticoso. Hort. Cliff. 399. *Hemp Agrimony with oval sawed leaves having foot-stalks, and a shrubby stalk.*
5. BIDENS (*Scandens*) foliis ternatis acutis serratis caule scandente floribus paniculatis. *Three-leaved Hemp Agrimony, with pointed sawed lobes, a climbing stalk, and flowers growing in panicles.* Chrysanthemum trifoliatum scandens, flore luteo semine longo rostrato bidente. Sloan. Cat. Jam. 125.
6. BIDENS (*Bullata*) foliis ovatis serratis, inferioribus oppositis, superioribus ternatis intermedio majore. Lin.

 Sp.

Sp. Plant. 833. *Hemp Agrimony with oval sawed leaves, the lower ones growing opposite, but the upper having three lobes, the middle of which is the largest.* Crysanthemum conyzoides nodiflorum semine rostrato bidente. Sloan. Cat. Jam. 126.

The first sort grows naturally in Virginia, Maryland, and Canada, where it is often a troublesome weed. It rises about three feet high, sending out many horizontal branches, garnished with trifoliate leaves, deeply sawed on their edges; the flowers are produced at the end of the branches in small clusters, which are yellow, and succeeded by oblong square seeds, having two crooked horns, by which they fasten themselves to the clothes of those who pass near them. There are two sorts of this, one whose flowers have a short empalement, which is Tournefort's broad-leaved Canada Bidens; the other hath a leafy empalement, and is by Jussieu distinguished by the title of Capite folioso. But I am not very sure of their being distinct species, though I have many years cultivated both; for their seeds when ripe spread so far, that in a small garden they cannot be kept separate. It is easily propagated by seeds sown in the spring, in an open situation, where, if the seeds are permitted to scatter, the plants will come up the following spring, and two or three of them may be transplanted where they are to grow, and after they are rooted, will require no farther care. This is an annual plant, so decays soon after the seeds are ripe.

The second sort grows naturally in warm countries. This is an annual plant, which rises near three feet high, dividing upward into several branches, which are garnished with oblong entire leaves; the flowers come out single at the divisions of the branches, sitting close; these are white, and succeeded by smooth seeds.

This sort must be sown upon a moderate hot-bed in the spring, and afterward treated like other hardy annual plants, planting them into the full ground the latter end of May. They will flower in June, and their seeds ripen in autumn, soon after which the plants will decay.

The third sort grows naturally in South Carolina, and also at Campeachy. This is also an annual plant, which rises three feet high, dividing upward into many slender branches, whose joints are far asunder; the leaves come out by pairs at each joint upon long slender foot-stalks, which are oval, ending in a point. The flowers grow at the extremity of the branches in small globular heads, which are very white, standing upon very long foot-stalks, and are succeeded by smooth seeds. This must be sown upon a hot-bed, and treated as the former. It flowers and seeds about the same time.

The fourth sort rises with a shrubby stalk to the height of six or seven feet, dividing into many branches, whose joints are very distant, at each of which are placed two oval leaves, slightly sawed on their edges, and have short foot-stalks. The flowers are produced at the end of the branches in small clusters, each standing upon a long naked foot-stalk; these are succeeded by flat seeds, having two short teeth at their extremity. I received the seeds of this sort from Carthagena in New Spain. This is propagated by seeds, which should be sown on a hot-bed in the spring; and when the plants are fit to remove, they must be each planted into a separate small pot, and plunged into a fresh hot-bed, and treated as other tender plants from the same countries, and in autumn placed in the stove: the following summer they will abide some years with proper management.

The fifth sort rises with a climbing slender stalk to the height of ten feet, dividing into many branches, garnished with trifoliate sawed leaves: the flowers grow in large panicles at the end of the branches; they are yellow, and are succeeded by flat seeds having two teeth. This plant grows naturally in Jamaica, from whence I received the seeds. It must be treated in the same manner as the former sort, and will continue two or three years.

The sixth sort is annual. This rises about two feet high, and sends out several lateral shoots, which at the bottom have oval leaves placed by pairs at the joints, but upward they are trifoliate, the middle lobe being very large, and the two side ones small; the flowers are produced at the wings of the leaves upon short leafy foot-stalks, and are yellow, but very small. It flowers in July, and the seeds ripen in autumn; the seeds of this must be sown upon a hot-bed, and treated as the second sort.

BIFOLIUM, Twyblade. See Ophrys.

BIGNONIA. Tourn. Inst. 164. Lin. Gen. Plant. 677. [M. Tournefort called this plant Bignonia, in memory of abbot Bignon, librarian to Lewis XIV. king of France, he being a great encourager of learning.] The Trumpet Flower, or Scarlet Jasmine.

The Characters are,

*The empalemnet is cup-shaped, quinquefid, and of one leaf. The flower is of the ringent, or grinning kind, tubulous, with long chaps, which are swelling, and bell-shaped, divided into five parts at the top; the two upper segments are reflexed, and the under spread open; it hath four awl-shaped stamina shorter than the petal, two longer than the other, having oblong reflexed summits. In the center is an oblong germen, supporting a slender style, crowned by a roundish stigma. The germen afterward becomes a bivalve pod, with two cells, filled with compressed winged seeds, lying over each other imbricatim.*

This genus of plants is ranged in the second division of Linnæus's fourteenth class, intitled Didynamia Angiospermia, the flower having two long and two short stamina, and the seeds included in a capsule.

The Species are,

1. Bignonia (*Radicans*) foliis pinnatis, foliolis incisis, caule geniculis radicatis. Lin. Hort. Cliff. 217. *Bignonia with winged leaves, which are cut on their edges, and roots coming out at the joints of the stalk.* Bignonia Americana Fraxini folio flore amplo Phœnicio. Tourn. Inst. 164.
2. Bignonia (*Catalpa*) foliis simplicibus cordatis, caule erecto, floribus diandris. Lin. Sp. Plant. 622. *Bignonia with single heart-shaped leaves, an upright stalk, and flowers with two stamina.* Bignonia Urucu foliis, flore sordidè albo, intus maculis purpureis & luteis adsperso, siliquâ longissimâ & angustissimâ. Catesb. Carol. 1. p. 49.
3. Bignonia (*Frutescens*) foliis pinnatis, foliolis lanceolatis acutis serratis, caule erecto, floribus paniculatis erectis. *Bignonia with winged leaves, having acute sawed lobes, an upright stalk, and flowers growing in panicles erect.* Bignonia arbor flore luteo Fraxini folio. Plum. Sp. Plant. 5.
4. Bignonia (*Pubescens*) foliis conjugatis cirrhosis foliolis cordato-lanceolatis foliis imis simplicibus. Vir. Cliff. 59. *Bignonia with conjugated leaves having tendrils, the leaves spear-shaped, and the lower leaves single.* Bignonia Americana Capreolis donata siliqua breviore. Breyn. Ic. 33.
5. Bignonia (*Unguis Cati*) foliis conjugatis, cirrho brevissimo arcuato tripartito. Lin. Sp. Plant. 623. *Bignonia with conjugated leaves, and short arched tendrils, divided into three parts.* Bignonia Americana capreolis aduncis donatâ, siliquâ longissimâ. Tourn. Inst. 164.
6. Bignonia (*Æquinoctialis*) foliis conjugatis cirrhosis, foliolis ovato-lanceolatis, pedunculis bifloris siliquiis linearibus. Lin. Sp. 869. *Bignonia with conjugated leaves, having tendrils, whose lobes are oval, spear-shaped, and linear pods.*
7. Bignonia (*Sempervirens*) foliis simplicibus lanceolatis caule volubili. Lin. Sp. Plant. 623. *Bignonia with single spear-shaped leaves, and a twining stalk.* Gelseminum sive Jasminum luteum odoratum Virginianum scandens & sempervirens. Park. Catesb. 1. p. 53.
8. Bignonia (*Pentaphylla*) foliis digitatis foliolis integerrimis obovatis. Hort. Cliff. 497. *Bignonia with fingered leaves, whose lobes are entire.* Bignonia arbor pentaphylla flore roseo. Plum. Sp. Plant. 5.

9. Bignonia (*Leucoxylon*) foliis digitatis foliolis integerrimis ovatis acuminatis. Lin. Sp. Plant. 870. *Bignonia with fingered leaves, whose lobes are oval, pointed, and entire.* Leucoxylon arbor siliquosa, quinis foliis, floribus Nerii, alato semine. Pluk. Alm. 215. tab. 200. f. 4. *commonly called in America Tulip Flower.*

10. Bignonia (*Paniculata*) foliis conjugatis cirrhosis, foliolis cordato-ovatis, floribus racemoso-paniculatis. Lin. Sp. Plant. 623. *Bignonia with conjugated leaves, having tendrils, the lobes oval and heart-shaped, and flowers in branching panicles.* Bignonia bifolia scandens, flore violaceo odoro, fructu ovato duro. Plum. Cat. 5.

11. Bignonia (*Cærulea*) foliis bipinnatis foliolis lanceolatis integris. Lin. Sp. Plant. 625. *Bignonia with double winged leaves, which are entire and spear-shaped.* Arbor Guajaci latiore folio, Bignoniæ flore cæruleo, fructu duro in duas partes dissiliente seminibus alatis imbricatim positis. Catesb. Carol. 1. p. 42.

12. Bignonia (*Crucigera*) foliis conjugatis cirrhosis foliolis cordatis. Vir. Cliff. 60. *Bignonia with conjugated heart-shaped leaves, having tendrils, and a stalk having tendrils.* Pseudo Apocynum folliculis maximis obtusis seminibus amplissimis alis membranaceis. Mor. Hist. 3. p. 62.

13. Bignonia (*Capreolata*) foliis conjugatis cirrhosis foliolis cordato-lanceolatis, foliis imis simplicibus. Lin. Sp. 870. *Bignonia with conjugated heart-shaped leaves, having tendrils, whose lower leaves are single, growing in panicles, and long compressed pods.*

14. Bignonia (*Triphylla*) foliis ternatis glabris, foliolis ovatis acuminatis, caule fruticoso erecto. Lin. Sp. 870. *Smooth three-leaved Bignonia, with oval lobes ending in a point, and a shrubby stalk.* Bignonia frutescens triphylla glabra, siliquis longis compressis. Houst. Cat.

The first sort grows naturally in Virginia and Canada. It hath large rough stems, which send out many trailing branches, putting out roots at their joints, which fasten themselves to the trees in their natural places of growth, whereby they climb to a great height; and in Europe, where they are generally planted against walls, they fasten themselves thereto by their roots, which strike into the mortar of the joints so strongly, as to support their branches, and will rise to the height of forty or fifty feet. The branches are garnished with winged leaves at every joint, placed opposite, composed of four pair of small leaves, terminated by an odd one; these are sawed on their edges, and end in a long sharp point. The flowers are produced at the ends of the shoots of the same year, in large bunches; these have long swelling tubes, shaped somewhat like a trumpet, from whence it had the appellation of Trumpet Flower. They are of an Orange colour, and appear the beginning of August.

This sort is very hardy, so will thrive in the open air; but as the branches trail, they must be supported, therefore are usually planted against walls or buildings, where, if the branches have room, they will spread to a great distance, and rise very high, so are very proper for covering of buildings, which are unsightly. They may also be trained up against the stems of trees, where they may be so managed, as to make a fine appearance when they are in flower.

This is propagated by seeds, but the young plants so raised do not flower in less than seven or eight years; therefore those which are propagated by cuttings or layers from flowering plants, are most esteemed, because they will flower in two or three years after planting. The old plants also send out many suckers from the roots, which may be taken off, and transplanted where they are to remain, for these plants will not transplant safely if they are old.

The necessary culture for these plants after they are established, is to cut away all the small weak shoots of the former year in winter, and shorten the strong ones to about two feet long, that young shoots may be obtained for flowering the following summer; these plants are of long duration. There are some in gardens which have been planted more than sixty years, which are now very vigorous, and produce flowers in plenty every season.

If the plants are propagated by seeds, they should be sown upon a moderate hot-bed to bring them up, which should be soon inured to the open air, to prevent their being drawn up weak; and the first winter these young plants should be screened from hard frost, which will kill their tender shoots; but the spring following they may be planted in the full ground, in a nursery-bed, at a foot distance from each other, where they may remain one or two years to get strength, and afterwards be planted where they are designed to grow.

The second sort was brought into England by Mr. Catesby, about forty years past, who found it growing naturally on the back of South Carolina, at a great distance from the English settlements. It is now very plenty in the English gardens, especially near London, where there are some of them near twenty feet high, with large stems, and have the appearance of trees.

This sort rises with an upright stem, covered with a smooth brown bark, and sends out many strong lateral branches, garnished with very large heart-shaped leaves, placed opposite at every joint. The flowers are produced in large branching panicles toward the end of the branches, of a dirty white colour, with a few purple spots, and faint stripes of yellow on their inside. The tube of the flower is much shorter, and the upper part more expanded, than those of the former sort, and the segments deeper cut, and waved on their edges. The flowers are in America succeeded by very long taper pods, filled with flat winged seeds, lying over each other like the scales of fish. In England there has not as yet been any of the pods produced, but the seeds are annually brought over from South Carolina. These should be sown in pots, and plunged into a moderate hot-bed to bring up the plants, which should be inured to the open air by degrees; and, in the beginning of June, placed abroad in a sheltered situation till autumn, when they should be placed under a common frame to screen them from frost in winter; but in mild weather they must be fully exposed to the open air. The following spring these may be taken out of the pots, and planted in a nursery-bed, in a warm situation, where they may remain two years to get strength, and afterwards planted in the places where they are designed to remain. These plants, when young, are frequently injured by frost, for they shoot pretty late in the autumn, so that the early frosts often kill the extremity of their branches; but as the plants advance in strength, they become more hardy, and are seldom injured but in very severe winters. It is late in the spring before these trees come out, which has often caused persons to believe they were dead; and some have been so imprudent, as to cut them down on that supposition, before the tree was well known.

It may also be propagated by cuttings, which should be planted in pots in the spring before the trees begin to push out their shoots, and plunged into a moderate hot-bed, observing to shade them from the sun in the middle of the day, and refresh them occasionally with water, which must not be given to them in too great plenty. In about six weeks these will have taken root, and made shoots above, so should have plenty of air admitted to them constantly, and hardened by degrees to bear the open air, into which they should be removed, and treated in the same manner as the seedling plants, and the spring following planted out into a nursery-bed, as is before directed.

As these trees have very large leaves, they require a sheltered situation; for where they are much exposed to strong winds, their leaves are often torn and rendered unsightly, and many times their branches are split and broken by the winds, their leaves being so large, as that the wind has great force against them. These produce their flowers in August. They delight in a light moist soil, where they make great progress, and in a few years will produce flowers. It is generally known in the gardens by the Indian title of Catalpa.

The third ſort is a native of the warmer parts of America, where it was diſcovered by father Plumier, who made a drawing of it, and gave the title of Clematitis to it, which he afterward altered to Bignonia, when he became better acquainted with Tournefort's Syſtem of Botany. This riſes with an upright ſtem, to the height of twelve or fourteen feet, ſending out many ſide branches, garniſhed at every joint by two long winged leaves placed oppoſite; the ſmall leaves which compoſe theſe, are long and ſpear-ſhaped, ending in a point, and ſlightly ſawed on their edges, each leaf being compoſed of ſix pair, terminated by an odd one. The flowers are produced in looſe panicles at the ends of the branches, and are ſhaped like thoſe of the other ſpecies, but ſpread open more at the top. Theſe are yellow, and ſucceeded by compreſſed pods about ſix inches long, having two rows of flat winged ſeeds, like thoſe of the other ſpecies.

I received this ſort firſt in 1729, from La Vera Cruz, in New Spain, where the late Dr. Houſtoun found it growing naturally in great plenty; ſince which time I have received the ſeed from the iſland of Bermuda, by the title of Candle Wood.

It is propagated by ſeeds, which muſt be ſown on a hot-bed, and the plants afterward tranſplanted into ſeparate ſmall pots, filled with light freſh earth, and plunged into a freſh hot-bed to bring them forward, that they may obtain ſtrength before winter; in the autumn they muſt be removed into the bark-ſtove, and during the winter ſhould have but little water, but in ſummer they muſt be frequently refreſhed with it, but not given in too great plenty. The plants ſhould conſtantly remain in the bark-ſtove, and be treated in the ſame manner as other tender plants from thoſe countries. The third year from ſeed they will flower, but they do not produce ſeeds in England.

The fourth ſort grows naturally in Virginia, and ſeveral other parts of America; this hath very ſlender trailing ſtalks, which muſt be ſupported; in the places where it naturally grows, the branches faſten themſelves by their tendrils to whatever plants are near them, and extend to a great diſtance. In this country they require the aſſiſtance of a wall, and to have a good aſpect, for they are impatient of much cold, ſo ſhould be ſheltered in ſevere froſt; the branches are garniſhed with oblong leaves, which are green all the year; theſe are often ſingle at bottom, but upward are placed by pairs oppoſite at each joint; the flowers are produced at the wings of the leaves, which are yellow, and ſhaped like thoſe of the Foxglove. Theſe appear in Auguſt, but are not ſucceeded by pods in this country. This is propagated by ſeeds, which ſhould be ſown on a moderate hot-bed, and treated in the ſame manner as the firſt ſort. When theſe plants are planted in the full ground againſt walls, the ground about the roots ſhould be covered in the autumn with ſome old tanners bark to keep out the froſt in winter; and in very ſevere froſt, the branches ſhould be covered with mats, to prevent their being deſtroyed. With this management I have had the plants flower very well in the Chelſea garden.

The fifth ſort hath ſlender ſtalks like the former, which require the ſame ſupport; theſe are garniſhed with ſmall oval leaves, which are entire, placed oppoſite at every joint; at the ſame places come out the tendrils, by which they faſten themſelves to the plants which grow near them; theſe end in three diſtinct parts; the flowers come out from the wings of the leaves, which are ſhaped like thoſe of the former ſort, but are ſmaller, and are not ſucceeded by ſeeds in this country. This grows naturally in Carolina and the Bahama Iſlands, but will live in the open air, if it is planted againſt a wall to a ſouth aſpect, and ſheltered in very ſevere froſt. It is propagated in the ſame manner as the former ſort.

The ſixth ſort hath very weak ſlender branches, which put out tendrils at the joints, by which they faſten themſelves to the neighbouring plants: at each joint there are four leaves, two on each ſide oppoſite; theſe are oval pointed, and waved on their edges, of a bright green, and continue through the year; the branches ramble very far where they have room: the flowers are large, yellow, and are produced at the joints of the ſtalks, but are not ſucceeded by pods in this country. I received this ſort from La Vera Cruz, in New Spain; but it thrives againſt a warm wall in the open air very well, with the ſame treatment as the two former ſorts.

The ſeventh ſort grows naturally in South Carolina, where it ſpreads over the hedges, and at the ſeaſon of flowering, perfumes the air to a great diſtance; it alſo grows in ſome parts of Virginia, but not in ſo great plenty as at Carolina. The inhabitants there call it Yellow Jaſmine, I ſuppoſe from the ſweet odour of its flowers.

This riſes with ſlender ſtalks, which twiſt themſelves round the neighbouring plants, and mount to a conſiderable height; the branches are garniſhed with oblong pointed leaves, which come out ſingle and oppoſite to each other at every joint; theſe remain green through the year. The flowers come out from the wings of the leaves at every joint, ſometimes but two, at other times four at each joint; theſe ſtand erect, are trumpet-ſhaped, yellow, and have a very ſweet ſcent; and in the countries where they naturally grow, they are ſucceeded by ſhort taper pods, filled with ſmall winged ſeeds.

The plants of this ſort, when young, are impatient of cold, ſo muſt be ſheltered in the winter until they have obtained ſtrength, when they ſhould be planted againſt a warm wall, and in winter protected from froſt by coverings of mats, and the ground about their roots covered with tan. With this management I have had them flower very well in the Chelſea garden. It is propagated by ſeeds in the ſame manner as the former ſorts.

The eighth ſort was ſent me from Jamaica by the late Dr. Houſtoun. This riſes with an upright ſtem near twenty feet high, ſending out many lateral branches, covered with a white bark. The leaves come out oppoſite at the joints upon long foot-ſtalks; they are compoſed of five oval ſtiff leaves, which are joined in one center at their baſe, where they are narrow, but widen toward the top, where they are rounded and obtuſe. They are of a pale green, inclining to white on their under ſide; the flowers are produced at the ends of the branches four or five together, on very ſhort foot-ſtalks; they are narrow at bottom, but the tube enlarges upward, and at the top ſpreads open wide, of a pale bluiſh colour, and ſmell ſweet; they are ſucceeded by taper crooked pods about four inches long, which are filled with oval compreſſed ſeeds, with wings of a ſilver colour.

This ſort is a native of the warmer parts of America, therefore will not thrive in this country, but in a ſtove. It is propagated by ſeeds, which muſt be ſown on a hot-bed, and the plants treated in the ſame manner as the fourth ſort.

The ninth ſort I received from Barbadoes, by the title of White Wood. This riſes with an upright ſtem to the height of forty feet, in the natural country of its growth; and the ſeeds are diſperſed by wind to the neighbouring lands, where the plants come up in great plenty. This and the former ſort have been generally confounded, and ſuppoſed to be the ſame, but the growing plants are extremely different; for the under leaves of this are ſometimes compoſed of five, at other times of four oval leaves; and on the upper part of the branches, they come out ſingle, placed by pairs oppoſite: theſe are as large as thoſe of the Bay-tree, and of equal thickneſs, rounded at their end; each of theſe have a long foot-ſtalk, whereas thoſe of the former join at their baſe to one center. The flowers of this ſort are produced ſingle at the wings of the leaves, which have a narrow tube near two inches long, but ſpread open very wide at the top, where they are cut into five unequal ſegments, which are fringed on their borders. The flowers are

white,

white, and have an agreeable odour, but the pod I have not ſeen.

The plants muſt be preſerved in the bark-ſtove, and treated as the fourth ſort. It is propagated by ſeeds, and will alſo take root from cuttings in the ſummer, if they are planted in pots, and plunged into a bark-bed. It has flowered ſeveral years in the Chelſea garden, in Auguſt.

The tenth ſort was ſent me from La Vera Cruz, by the late Dr. Houſtoun; this riſes with ligneous ſtalks, which put out tendrils at the joints, whereby they faſten themſelves to the neighbouring plants; the leaves come out on each ſide the branches, upon pretty long foot-ſtalks, two at each joint oppoſite, which are heart-ſhaped and entire, having a fine hairy down on their under ſide. The flowers grow in looſe ſpikes at the end of the branches, which are tubulous, and do not ſpread much at the top; they are of a Violet colour, and ſmell very ſweet. Theſe in their native country are ſucceeded by oval, hard, ligneous ſeed-veſſels, which open in four parts, and are full of compreſſed winged ſeeds.

This ſort is propagated by ſeeds, which muſt be ſown on a hot-bed, and the plants muſt be treated in the ſame manner as the third ſort, for they will not thrive in this country unleſs they are placed in the bark-ſtove.

The eleventh ſort grows naturally in the Bahama Iſlands, from whence Mr. Cateſby ſent the ſeeds in 1724, and many of the plants were raiſed in the gardens near London. This, in the country where it grows naturally, riſes to the height of twenty feet, ſending out many lateral branches, garniſhed with compound winged leaves, each having eleven alternate wings, with ſpear-ſhaped ſmall lobes, which grow alternate, and are entire; at the ends of the branches the flowers are produced in very looſe panicles; the foot-ſtalks branching into three or four, each ſuſtaining a ſingle blue flower, with a long ſwelling tube, cut into five unequal ſegments at the top, where it ſpreads open. The flowers are ſucceeded by oval ſeed-veſſels, which open in two parts, and are filled with flat winged ſeeds.

The twelfth ſort hath a woody ſtem, ſending out many branches, which have four narrow borders or wings running longitudinally, ſo as to reſemble a ſquare ſtalk; the leaves are produced by pairs, on each ſide the branches; they are heart-ſhaped, ſmooth, and have ſhort foot-ſtalks; theſe have tendrils coming out by their foot-ſtalks, which faſten themſelves to the plants which grow near them, and thereby riſe to a great height. The flowers are produced in ſmall cluſters from the wings of the leaves, which have pretty long tubes, ſpread open at the top, and are of a pale yellow colour; theſe are ſucceeded by flat pods a foot in length, which have two rows of flat winged ſeeds, joined to the intermediate partition.

This ſort was ſent me from Campeachy, where it naturally grows, and riſes to the tops of the talleſt trees, to whoſe branches theſe plants faſten themſelves by their tendrils or claſpers, and are thereby ſupported. This is propagated by ſeeds, which muſt be ſown on a hot-bed, and the plants treated in the ſame manner as the fourth ſort; for they will not thrive in this country, unleſs they have a warm ſtove, where the branches will riſe to the height of twenty feet in three years; and if permitted, will ſpread to a great diſtance. It has flowered in the garden at Chelſea, but doth not produce pods in England.

The thirteenth ſort was ſent me from Campeachy, by Mr. Robert Millar; this hath woody ſtalks, which riſe to a great height, climbing on the trees which grow near it, faſtening themſelves to their branches by its claſpers, and ſending out many ligneous branches, which are garniſhed with oval heart-ſhaped leaves, by fours, two on each ſide, growing oppoſite at the joints; theſe are covered on their under ſide with a ſoft hairy down, of a yellowiſh colour. The flowers are produced in looſe panicles at the end of the branches, which are ſhaped like thoſe of the Foxglove, and are of a pale yellow colour, and are ſucceeded by flat pods a foot long, having a border on each ſide, and contain two rows of flat winged ſeeds.

This plant is tender, ſo muſt be conſtantly kept in the bark-ſtove, and treated in the ſame manner as the fourth ſort. It is propagated by ſeeds, which muſt be obtained from the country where it grows naturally, for it doth not produce any in England.

The fourteenth ſort was ſent me from La Vera Cruz in New Spain, by the late Dr. Houſton. This hath a woody ſtem covered with an Aſh-coloured bark, which riſes to the height of ten feet, ſending out many ſide branches, garniſhed with trifoliate leaves, placed oppoſite at each joint, which are very ſmooth, oval, and ending in points. The flowers come out at the extremity of the branches in looſe panicles, and are of a dirty white colour. Theſe are ſucceeded by flat narrow pods, containing two rows of flat winged ſeeds.

This ſort is propagated by ſeeds, which muſt be ſown on a hot-bed, and the plants afterward treated as the fourth ſort, and muſt conſtantly remain in the bark-ſtove.

BIHAI. See Musa.

BINDWEED. See Convolvulus.

BIRCH-TREE. See Betula.

BISCUTELLA. Lin. Gen. Plant. 724. Thlaſpidium. Tourn. Inſt. R. H. 214. tab. 101. Buckler Muſtard, or Baſtard Mithridate Muſtard.

The Characters are,

*The empalement is compoſed of four leaves, which are pointed. The flower hath four petals, placed in form of a croſs, which are obtuſe and ſpread open; it hath ſix ſtamina, four long and two ſhort, placed oppoſite, having ſingle ſummits. In the center is ſituated an orbicular compreſſed germen, ſupporting a ſingle permanent ſtyle, crowned with an obtuſe ſtigma; the germen afterward becomes a plain, compreſſed, erect capſule, with two convex lobes, having two cells, terminated by the rigid ſtyle, which is joined to the ſide of the partition, each cell containing one compreſſed ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifteenth claſs, intitled Tetradynamia Siliculoſa, the flower having four long, and two ſhort ſtamina, and are ſucceeded by very ſhort pods.

The Species are,

1. Biscutella (*Auriculata*) calycibus nectario utrinque gibbis, ſiliculis in ſtylum coëuntibus. Lin. Hort. Cliff. 329. *Buckler Muſtard, with the cup of the nectarium ſwelling on each ſide, and ſmall pods joined to the ſtyle.* Thlaſpidium hirſutum calyce floris auriculato. Inſt. R. H. 214.
2. Biscutella (*Didyma*) ſiliculis orbiculato-didymis à ſtylo divergentibus. Hort. Cliff. 329. *Buckler Muſtard, with a double orbicular pod diverging from the ſtyle.* Thlaſpidium Monſpelienſe hieracii folio hirſuto. Tourn. Inſt. 214.
3. Biscutella (*Apula*) hirſuta foliis oblongis dentatis ſemiamplexicaulibus floribus ſpicatis ſtylo breviore. *Hairy Buckler Muſtard, with oblong indented leaves which half embrace the ſtalk, flowers growing in ſpikes, and a ſhorter ſtyle.* Thlaſpidium Apulum ſpicatum. Tourn. Inſt. 214.

The firſt ſort grows naturally in the ſouth of France and Italy, where it riſes about a foot high; but in a garden generally grows near two feet high, dividing into ſeveral branches; and at every joint there is one oblong entire leaf a little indented, thoſe on the lower part of the ſtalk being broader and more obtuſe than thoſe on the upper. The flowers are produced at the ends of the branches in looſe panicles, which are compoſed of four obtuſe petals of a pale yellow colour; theſe are ſucceeded by double, round, compreſſed ſeed-veſſels, ſwelling in the middle, where is lodged a ſingle, round, flat ſeed, the ſtyle of the flower ſtanding upright between the two ſmall veſſels, joined to their borders.

The ſecond ſort grows naturally in the ſouth of France, Italy, and Germany, from whence I received the

the seeds, and dried samples of the plant, which are not more than six inches high, though they are the entire plants with their roots, but in the garden they grow almost two feet high. This hath many long, narrow, hairy leaves, spreading near the ground, which are deeply indented on each side, resembling those of Hawkweed; from the center arises the stalk, which divides upward into many small branches, having no leaves on them, and are terminated by loose panicles of yellow flowers, composed of four petals, placed in form of a cross. These are succeeded by round compressed seed-vessels like the former, but are smaller, and the style of the flowers bends from them.

The third sort sends out many oblong hairy leaves, which are slightly indented on their edges; from among these there arises a hairy branching stalk, which grows two feet high, and at each joint is placed one oblong indented leaf, which half embraces the stalk at the base; each branch is terminated by a close spike of pale yellow flowers, which are succeeded by round compressed seed-vessels like the other sorts, but the style of the flower, which is joined to them, is shorter than those of the other species.

These are all annual plants, which perish soon after they have perfected their seeds. These should be sown either in spring, or the autumn, upon a border of light earth, in an open situation, where they are to remain for good. Those which are sown in autumn will come up in about three weeks, and the plants will live through the winter without any protection, so will flower earlier the following summer, whereby good seeds may always be obtained; whereas those which are sown in the spring, do, in bad seasons, decay before their seeds are ripe. The autumnal plants flower in June, and the spring in July, and their seeds ripen about six weeks after; which, if permitted to scatter, there will be plenty of young plants produced without any care.

These require no farther culture, but to keep them clean from weeds, and thin the plants where they are too close, leaving them eight or nine inches asunder. They are preserved in the gardens of those who are curious in botany, but they have no great beauty to recommend them. I have cultivated these sorts many years, and have never observed either of them to vary, therefore make no doubt of their being distinct species.

BISERRULA. Lin. Gen. Plant. 800. Pelecinus. Tourn. Inst. 417. tab. 234.

The CHARACTERS are,

*The flower hath a tubulous empalement of one leaf, which is erect, and slightly indented at the top in five equal parts, the two upper standing at a distance. The flower is papilionaceous, having a large roundish standard, whose edges are reflexed. The wings are oblong, but shorter than the standard; and the obtuse keel is of the same length with the wings, bending upward. It hath ten stamina, nine of which are joined, and the other single, with their ends pointing upward. In the center is situated an oblong compressed germen, supporting an awl-shaped style, crowned by a single stigma; these are included in the keel. The germen afterward becomes a flat narrow pod, indented on both edges like the saw of the sword fish, having two cells, filled with kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, the flower having ten stamina, joined in two bodies.

We have but one SPECIES of this genus, which is,

BISERRULA. (*Pelecinus.*) Hort. Cliff. 361. We have no English name for this plant. Pelecinus vulgaris. Tourn. Inst. 417.

This is an annual plant, which grows naturally in Italy, Sicily, Spain, and the south of France. It sends out many angular stalks, which trail on the ground, subdivided into many branches, garnished with long winged leaves, composed of many pair of lobes, terminated by an odd one; these are heart-shaped: toward the upper part of the branches come out the foot-stalk of the flowers, which sustains several small Butterfly flowers, of a purplish colour, collected together, which are succeeded by plain pods, about one inch long, indented on both sides the whole length, divided in the middle by a longitudinal nerve, containing two rows of kidney-shaped seeds.

It is propagated by seeds, which in this country should be sown in the autumn, on a bed of light earth, where the plants will come up in about three weeks, and will live in the open air very well. These should be sown where they are designed to remain, or transplanted very young; for when they are large, they will not bear removing. When the plants are come up, they will require no other care, but to keep them clean from weeds; and where they are too near, they should be thinned to about a foot distance from each other. They flower in June, and the seeds ripen in September.

The seeds of this plant may also be sown in the spring, and treated in the same manner as before directed; but these will not flower till the middle or end of July, so unless the autumn proves warm, they will not ripen seeds; for which reason I have directed their being sown in the autumn, as soon as they are ripe. Two or three of these plants may be allowed a place in gardens for the sake of variety, but they have not much beauty.

BISLINGUA. See RUSCUS.

BISTORTA [so called, because the root is turned or wreathed into various rings or spires,] Bistort, or Snakeweed.

This genus is joined to the Polygonum by Dr. Linnæus. This plant flowers in May, and if the season proves moist, will continue to produce new spikes of flowers till August: it may be propagated by planting the roots in a moist shady border, either in spring or autumn, which will soon furnish the garden with plants, for it greatly increases by its creeping roots.

The roots of this plant have been recommended for tanning of leather, but the trouble of procuring them in a sufficient quantity is too great to answer the intention.

BIVALVULAR, or Bivalve [of bivalvis] Husk, is one that opens and gapes the whole length, like a door that opens in two parts.

BIXA. Lin. Gen. Plant. 581. Urucu. Sloan. Cat. Jam. Orleana. H. L. Mitella. Tourn. Inst. 242. Anotta, by the French Roucou.

The CHARACTERS are,

*It hath a plain, small, obtuse empalement, which is permanent; the flower hath a double series of petals, the outer consisting of five, which are large, oblong, and equal, the inner of the same number and shape, but narrower. It hath a great number of bristly stamina, which are but half the length of the petals, terminated by erect summits. In the center is situated an oval germen, supporting a slender style of the same length with the stamina, crowned by a bifid, compressed, parallel stigma. The germen afterward becomes an oval heart-shaped capsule, a little compressed, covered with sharp bristles, opening with two valves, with one cell, and filled with angular seeds, adhering to a linear receptacle, which runs longitudinally through the capsule.*

This genus is ranged in the first section of Linnæus's thirteenth class, intitled Polyandria Monogynia, the flower having many stamina and one style.

We have but one SPECIES of this genus, viz.

BIXA. (*Orellana.*) Hort. Cliff. 211. *The Arnotta, or Anotta, by the French Roucou.* Mitella Americana maxima tinctoria. *Achioti of Hernandez.*

This shrub grows naturally in the warm parts of America, where it rises with an upright stem to the height of eight or ten feet, sending out many branches at the top, forming a regular head. These are garnished with heart-shaped leaves ending in a point, which have long foot-stalks, and come out without any order. The flowers are produced in loose panicles at the end of the branches, of a pale Peach colour, having large petals, and a great number of bristly stamina of the same colour, in the center. After the

flower is paſt, the germen becomes a heart-ſhaped, or rather a mitre-ſhaped ſeed-veſſel, covered on the outſide with briſtles, opening with two valves, and filled with angular ſeeds, covered with a red pulp or paſte, which colours the hands of thoſe who touch it, and is collected for the uſe of dyers and painters.

This plant is propagated by ſeeds, which are annually brought from the Weſt-Indies in plenty. Theſe ſhould be ſown in a ſmall pot, filled with light rich earth, and plunged into a hot-bed of tanners bark; where, if the bed is of a proper temperature of heat, the plants will appear in about a month after: when theſe are about an inch high, they ſhould be ſhaken out of the pot and carefully ſeparated, ſo as not to tear off their tender roots, and each planted in a ſmall pot filled with ſome rich light earth, and plunged into a freſh hot-bed of tanners bark, obſerving to ſhade them every day until they have taken new root; after which they muſt be treated as other tender plants from the ſame country, by admitting freſh air to them in proportion to the warmth of the ſeaſon; and when the heat of the tan declines, it ſhould be turned up to the bottom, and, if neceſſary, ſome freſh tan added to renew the heat. The plants muſt be refreſhed three times a week with water in ſummer, but they muſt not have it in great quantities, for their roots often rot with much wet. If the plants are raiſed early in the ſpring, and properly managed, they will be a foot and a half high by the autumn, when they ſhould be removed into the bark-ſtove, and plunged into the tan-bed. During the winter, they muſt have but little water, and while the plants are young, they muſt have a good ſhare of warmth, otherwiſe they are very ſubject to caſt their leaves, and frequently loſe their tops, which renders them unſightly. They muſt be conſtantly kept in the bark-ſtove, for thoſe plants which have been placed in a dry ſtove, have never made much progreſs. I have had many of theſe plants ſeven or eight feet high, with ſtrong ſtems and large heads, but have only had one produce flowers; nor have I heard of its flowering in any of the gardens in Europe, for in the Dutch gardens they have no plants of any ſize.

The paſte which ſurrounds the ſeeds is taken off, by ſteeping the ſeeds in hot water, and with the hands waſhed until the ſeeds are clean; then after pouring away the water, they leave the ſediment to harden, and make it up in balls, which are ſent to Europe, where they are uſed in dying and painting. It is alſo uſed by the Americans to dye their chocolate, and the natives uſed to paint their bodies with it when they went to the wars.

BLADDER-NUT. See STAPHYLEA.

BLATTARIA. See VERBASCUM.

BLIGHTS.

There is nothing ſo deſtructive to a fruit garden as blights; nor is there any thing in the buſineſs of gardening which requires more of our ſerious attention, than the endeavouring to prevent or guard againſt this great enemy of gardens.

In order therefore to remedy this evil, it will be neceſſary firſt to underſtand the true cauſes of blights; for, although many curious perſons have attempted to explain the cauſes of them, yet very few of them have come near the truth, except the Rev. and learned Dr. Hales, who hath, in his curious book, intitled Vegetable Statics, given us ſome accurate experiments upon the growth and perſpiration of plants, together with the various effects the air hath upon vegetables; that by carefully attending thereto, together with diligent obſervations, we need ſeldom to be at a loſs how to account for the cauſes of blights whenever they may happen.

But here I cannot help taking notice of the ſeveral cauſes of blights, as they have been laid down by ſome of our modern writers on gardening, together with their various methods preſcribed to prevent their deſtruction of fruits, &c.

Some have ſuppoſed, that blights are uſually produced by an eaſterly wind, which brings vaſt quantities of inſects eggs along with it from ſome diſtant place; which, being lodged upon the ſurface of the leaves and flowers of fruit-trees, cauſe them to ſhrivel up and periſh. To cure this diſtemper, they adviſe the burning of wet litter on the windward ſide of the trees, that the ſmoke thereof may be carried to them by the wind, which they ſuppoſe will ſtifle and deſtroy thoſe inſects, and thereby cure the diſtemper.

Others direct the uſe of Tobacco-duſt, or to waſh the trees with water wherein Tobacco-ſtalks have been infuſed for twelve hours, which, they ſay, will deſtroy theſe inſects, and recover the trees; and Pepper-duſt, ſcattered upon the bloſſoms of fruit-trees, has been recommended as very uſeful in this caſe: and there are ſome that adviſe the pulling off the leaves of the tree, as the beſt remedy when they are ſhrivelled up and wither; and to cut off the ſmaller branches when they produce crooked and unnatural ſhoots, and to ſprinkle the tree with a watering-pot, or a hand-engine.

Theſe conjectures concerning blights, how ſpecious ſoever they may appear at firſt ſight, yet, when duly conſidered, will be found far ſhort of the true cauſe, as will hereafter be ſhewn.

But let us now examine the true cauſes of blights, ſo far as we have been enabled to judge from repeated obſervations and experiments.

1. Blights then are often cauſed by a continued dry eaſterly wind for ſeveral days together, without the intervention of ſhowers, or any morning dew, by which the perſpiration in the tender bloſſoms is ſtopped, ſo that in a ſhort time their colour is changed, and they wither and decay; and if it ſo happen, that there is a long continuance of the ſame weather, it equally affects the tender leaves; for their perſpiring matter is hereby thickened and rendered glutinous, cloſely adhering to the ſurface of the leaves, and becomes a proper nutriment to thoſe ſmall inſects, which are always found preying upon the leaves and tender branches of fruit-trees, whenever this blight happens; but it is not theſe inſects which are the firſt cauſe of blights, as hath been imagined by ſome; though it muſt be allowed, that whenever theſe inſects meet with ſuch a proper food, they multiply exceedingly, and are inſtrumental in promoting the diſtemper; ſo that many times, when the ſeaſon proves favourable to them, and no proper care hath been taken to prevent their miſchief, it is ſurpriſing to think how whole walls of trees have ſuffered by this infection.

The beſt remedy for this diſtemper, that I have yet known ſucceed, is, gently to waſh and ſprinkle over the trees, from time to time, with common water (that is, ſuch as hath not had any thing ſteeped in it;) and the ſooner this is performed (whenever we apprehend danger,) the better; and if the young and tender ſhoots ſeem to be much infected, waſh them with a woollen cloth, ſo as to clear them, if poſſible, from all this glutinous matter, that their reſpiration and perſpiration may not be obſtructed; and if we place ſome broad flat pans or tubs of water near the trees, that the vapours exhaled from the water may be received by the trees, it will keep their tender parts in a ductile ſtate, and greatly help them; but whenever this operation of waſhing the trees is performed, it ſhould be early in the day, that the moiſture may be exhaled before the cold of the night comes on; eſpecially if the nights are froſty: nor ſhould it be done when the ſun ſhines very hot upon the wall, which would be ſubject to ſcorch up the tender bloſſoms.

Another cauſe of blights in the ſpring is, ſharp hoary froſts, which are often ſucceeded by hot ſunſhine in the day time; which is the moſt ſudden and certain deſtroyer of fruits that is known; for the cold of the night ſtarves the tender parts of the bloſſoms, and the ſun riſing hot upon the walls before the moiſture is dried from the bloſſoms (which, being in ſmall globules, collects the rays of the ſun,) a ſcalding heat

is

is thereby acquired; which ſcorches the tender flowers, and other parts of plants.

But that blights are frequently no more than an inward weakneſs or diſtemper in trees, will evidently appear, if we conſider how often it happens, that trees againſt the ſame wall, expoſed to the ſame aſpect, and equally enjoying the advantages of ſun and air, with every other circumſtance which might render them equally healthy, yet very often are obſerved to differ greatly in their ſtrength and vigour; and as often we obſerve the weak trees to be continually blighted, when the vigorous ones, in the ſame ſituation ſhall eſcape very well; which muſt, therefore, in a great meaſure, be aſcribed to their healthy conſtitution. This weakneſs, therefore, in trees, muſt proceed either from a want of a ſufficient ſupply of nouriſhment to maintain them in perfect vigour, or from ſome ill qualities in the ſoil where they grow, or, perhaps, from ſome bad quality in the ſtock, or inbred diſtemper of the buds or cyons, which they had imbibed from their mother tree, or from miſmanagement in the pruning, &c. all which are productive of diſtempers in trees, and of which they are with difficulty cured. Now, if this is occaſioned by a weakneſs in the tree, we ſhould endeavour to trace out the true cauſe; firſt, whether it has been occaſioned by ill management in the pruning, which is too often the caſe; for how common is it to obſerve Peach-trees trained up to the full length of their branches every year, ſo as to be carried to the top of the wall in a few years after planting, when at the ſame time the ſhoots for bearing have been ſo weak, as ſcarcely to have ſtrength to produce their flowers: but this being the utmoſt of their vigour, the bloſſoms fall off, and, many times, the branches decay, either the greateſt part of their length, or quite down to the place where they were produced; and this, whenever it happens to be the caſe, is aſcribed to a blight.

Others there are, who ſuffer their trees to grow juſt as they are naturally diſpoſed, during the ſummer ſeaſon, without ſtopping of ſhoots, or diſburdening their trees of luxuriant branches; by which means two, three, or four ſhoots ſhall exhauſt the greateſt part of the nouriſhment of the trees all the ſummer; which ſhoots, at the winter pruning, are entirely cut out; ſo that the ſtrength of the tree was employed only in nouriſhing uſeleſs branches, while the fruit branches are thereby rendered ſo weak, as not to be able to preſerve themſelves. The remedies to this evil ſhall be explained in the article of Pruning Peach-trees, &c.

But if the weakneſs of the tree proceeds from an inbred diſtemper, it is the better way to remove the tree at firſt; and after renewing your earth, plant a new one in its place.

Or if your ſoil be a hot burning gravel or ſand, in which your Peach-trees are planted, you will generally find this will be conſtantly their caſe, after their roots have got beyond the earth of your borders; for which reaſon, it is much more adviſeable to dig them up, and plant Grapes, Figs, Apricots, or any other ſort of fruit, which may do well in ſuch a ſoil, rather than to be annually diſappointed of your hopes; for, by a variety of experiments, it hath been found, that Apricots attract and imbibe moiſture with a much greater force than Peaches and Nectarines; and conſequently, are better able to attract the nutritive particles from the earth, than the other, which require to be planted in a generous ſoil, capable of affording them a ſufficiency of nouriſhment without much difficulty: and it is in ſuch places we often ſee Peaches do wonders, eſpecially if aſſiſted by art; but as for the Vine and Fig-tree, they perſpire very ſlowly, and are very often in an imbibing ſtate (ſo that a great part of that fine racy flavour, with which their fruits abound when planted in a dry ſoil, is probably owing to thoſe refined aërial principles, which are collected when in a ſtate of reſpiration;) and therefore, as theſe trees delight not in drawing much watery nouriſhment from the earth, ſo they will much better ſucceed in ſuch a ſoil, than in one that is more generous: we ſhould therefore always endeavour to ſuit the particular ſorts of fruits to the nature of our ſoil, and not pretend to have all ſorts of fruit good in the ſame.

But there is another ſort of blight, againſt which it is very difficult to guard our fruit-trees; this is ſharp, pinching, froſty mornings, which often happen at the time when the trees are in flower, or while the fruit is very young, and occaſion the bloſſoms or fruit to drop off; and, ſometimes, the tender parts of the ſhoots and leaves are greatly injured thereby.

The only method yet found out to prevent this miſchief, is, by carefully covering the walls, either with mats, canvas, reeds, &c. which being faſtened ſo as not to be diſturbed with the wind, and ſuffered to remain on during the night, and taking them off every day, if the weather permits, is the beſt and ſureſt method that hath yet been found ſucceſsful; which, although it has been ſlighted, and thought of little ſervice by ſome, yet the reaſon of their being not ſo ſerviceable as has been expected, was, becauſe they have not been rightly uſed, either by ſuffering the trees to remain too long covered; by which means the younger branches and leaves have been rendered too weak to endure the open air, when they are expoſed to it; which has often proved of worſe conſequence to trees, than if they had remained entirely uncovered, or by incautiouſly expoſing them to the air, after having been long covered.

Whereas, when the covering before-mentioned has been performed as it ought to be, it has proved very ſerviceable to fruits; and many times, when there has been almoſt a general deſtruction of fruits in the neighbouring gardens, there has been a plenty of them in ſuch places where they have been properly covered: and though the trouble may ſeem to ſome very great, yet, if theſe coverings are fixed near the upper part of the wall, and are faſtened to pullies, ſo as to be drawn up, or let down, it will be ſoon and eaſily performed; and the ſucceſs will ſufficiently repay the trouble.

But there is another ſort of blight that ſometimes happens later in the ſpring, viz. in April or May, which is often very deſtructive to orchards, and open plantations, and againſt which we know of no remedy. This is what is called a fire blaſt; which, in a few hours, hath not only deſtroyed the fruit and leaves, but, many times, parts of trees, and, ſometimes, entire trees have been killed by it.

This is ſuppoſed to be effected by volumes of tranſparent flying vapours, which, among the many forms they revolve into, may ſometimes approach ſo near to an hemiſphere, or hemicylinder, either in their upper or lower ſurfaces, as thereby to make the beams of the ſun converge enough to ſcorch the plants or trees they fall upon, in proportion to the greater or leſs convergency of the ſun's rays.

The learned Boerhaave, in his Theory of Chemiſtry, obſerves, "That thoſe white clouds which appear in "ſummer time, are, as it were, ſo many mirrors, "and occaſion exceſſive heat: theſe cloudy mirrors "are ſometimes round, ſometimes concave, poly-"gonous, &c. When the face of the heavens is co-"vered with ſuch white clouds, the ſun, ſhining "among them, muſt, of neceſſity, produce a ve-"hement heat; ſince many of his rays, which would "otherwiſe, perhaps, never touch our earth, are "hereby reflected to us: thus, if the ſun be on one "ſide, and the clouds on the oppoſite one, they will "be perfect burning glaſſes: and hence the phæno-"menon of thunder.

"I have ſometimes, continues he, obſerved a kind "of hollow clouds, full of hail and ſnow, during "the continuance of which the heat was extreme; "ſince, by ſuch condenſation, they were enabled to "reflect much more ſtrongly: after this came a ſharp "cold, and then the clouds diſcharged their hail in "great quantities, to which ſucceeded a moderate "warmth. Frozen concave clouds therefore, by "their

" their great reflexions, produce a vigorous heat; " and the same, when resolved, excessive cold." Whence (as Dr. Hales observes) we see, that blasts may be occasioned by the reflexions of the clouds, as well as by the above-mentioned refraction of dense transparent vapours.

Against this enemy to fruits, &c. as hath been said, there is no guard to our fruit-trees, nor any remedy to cure it: but as this more frequently happens in close plantations (where the stagnating vapours from the earth, and the plentiful perspirations from the trees, are pent in for want of a free air to dissipate and dispel them; which are often observed, in still weather, to ascend in so plentiful a manner, as to be seen by the naked eye, but especially with reflecting telescopes, so as to make a clear and distinct object become dim and tremulous,) than in those that are planted at a greater distance, or are not surrounded with hills or woods; this directs us, in the first planting of kitchen-gardens and orchards, &c. that we should allow a greater distance between the trees, and to make choice of clear healthy situations, that the air may freely pass between the trees to dissipate those vapours before they are formed into such volumes, whereby the circumambient air will be clear, and less subject to injuries; as also the fruits which are produced in this clearer air, will be much better tasted than those that are surrounded with a thick rancid air; for as fruits are often in a respiring state, they consequently, by imbibing a part of these vapours, are rendered crude and ill-tasted, which is often the case with a great part of our fruits in England.

BLITUM. Lin. Gen. Plant. 14. Chenopodio-morus. Boerh. Ind. Morocarpus. Rupp. Strawberry Blite.

The CHARACTERS are,

*It hath a tripartite spreading empalement, which is permanent; the flower hath no petals, but one bristly stamina the length of the empalement, with a double summit. In the center is situated an oval pointed germen supporting two styles, the length of the stamina, with a single stigma. The empalement afterward becomes an oval compressed capsule, including one globular compressed seed, the size of the capsule.*

This genus of plants is ranged in the second order of Linnæus's first class, intitled Monandria Digynia, the flower having but one stamina and two styles.

The SPECIES are,

1. BLITUM (*Capitatum*) capitellis spicatis terminalibus. Hort. Upsal. 3. *Blite with spikes terminated by little heads.* Chenopodio-morus major. Boerh. Ind. alt. 2. 91. *Commonly called Strawberry Blite, or Strawberry Spinach.*
2. BLITUM (*Virgatum*) capitellis sparsis lateralibus. Hort. Upsal. 3. *Blite with small heads growing scatteringly from the sides of the stalks.* Chenopodio-morus minor. Boerh. Ind. alt. 2. 91. *Wild Atriplex with a Mulberry fruit.*
3. BLITUM (*Tartaricum*) foliis triangularibus acutè dentatis, capitellis simplicibus lateralibus. *Blite with triangular leaves sharply indented, and single heads proceeding from the sides of the stalks.* Blitum fragiferum maximum polyspermum. Amman. Ruth.

The first sort grows naturally in Spain and Portugal, but hath been long preserved in the English gardens. This is an annual plant, which hath leaves somewhat like those of Spinach; the stalk rises about two feet and a half high, the lower part of which is garnished with leaves of the shape with those at bottom, but smaller; the upper part of the stalk hath flowers coming out in small heads at every joint, and is terminated by a small cluster of the same: after the flowers are past, the little heads swell to the size of Wood Strawberries, and when ripe have the same appearance; being very succulent, and full of a purple juice, which stains the hands of those who bruise them, of a deep purple colour.

The second sort grows naturally in the south of France and Italy. This seldom grows more than one foot high, with smaller leaves than the first, but of the same shape; the flowers are produced at the wings of the leaves, almost the length of the stalk, which are small, and collected in little heads, which are shaped like those of the first, but smaller and not so deeply coloured.

The seeds of the third sort were sent me by the late Dr. Amman, who was professor of botany at Petersburgh. This rises near three feet high; the leaves are triangular, ending in very acute points, as do also the indentures on the edges of the leaves. The flowers come out from the wings of the leaves in small heads, which are succeeded by berries of the same shape and colour as those of the first, but smaller. This sort differs from the first in the shape and indentures of the leaves, and in having leaves placed between the berries the whole length of the stalk, which is not terminated by heads as the first, but hath leaves above the heads.

These are all of them annual plants, which will drop their seeds if permitted, and the plants will come up in plenty the following spring: or if the seeds of either of the sorts are sown in March or April, upon a bed of common earth, in an open situation, the plants will come up in a month or five weeks after; and, if they are to remain in the place where they are sown, will require no other care but to keep them clear from weeds, and to thin them out, so as to leave them six or eight inches apart; and in July the plants will begin to shew their berries, when they will make a pretty appearance. But many people transplant them into the borders of the flower-gardens, and others plant them in pots, to have them ready for removing to court-yards, or to place upon low walls, among other annual flowers, to adorn those places.

When these plants are designed to be removed, they should be transplanted before they shoot up their flower-stems, for they will not bear transplanting well afterward: and if they are planted in pots, they will require to be duly watered in dry weather, otherwise the plants will stint, and not grow to any size; and, as the flower-stems advance, they should be supported by sticks; for if they are not, the branches will fall to the ground, when the berries are grown pretty large and weighty.

BLOODWORT. See LAPATHUM.

BOCCONIA.

This plant was so called after the Reverend Paul Boccone, of Sicily, who has published some curious books of botany.

The CHARACTERS are,

*The flower hath an empalement composed of two oval, obtuse, concave leaves; it hath four narrow petals, with a great number of very short stamina, crowned by erect summits, which are the length of the empalement. In the center is situated a roundish germen, contracted at both ends, supporting a single style, which is bifid at the top, crowned by a single stigma. The germen afterward becomes an oval fruit, contracted at both ends, and a little compressed, having one cell, full of pulp, including a single round seed.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, intitled Polyandria Monogynia, the flower having many stamina and one style.

There is but one SPECIES of this genus at present known, which is,

BOCCONIA. (*Frutescens.*) Lin. Sp. Plant. 505. Bocconia racemosa, sphondylii folio tomentoso. Plum. Nov. Gen.

This plant is called, by Sir Hans Sloane, in his Natural History of Jamaica, Chelidonium majus arboreum, foliis quercinis; or *Greater Tree Celandine with Oak leaves.*

It is very common in Jamaica, and several other parts of America, where it grows to the height of ten or twelve feet, having a strait trunk as large as a man's arm, which is covered with a white smooth bark. At the top it divides into several branches, on which the leaves are placed alternately. These leaves are eight or nine inches long, and five or six broad, deeply

finuated, fometimes almoft to the mid-rib, and are of a fine glaucous colour; fo that this plant makes a beautiful variety among other exotic plants in the ftove. The whole plant abounds with a yellow juice like the greater Celandine, which is of an acrid nature; fo that it is ufed by the inhabitants of America, to take off warts, and fpots from the eyes.

It is propagated by feeds, which fhould be fown in a pot filled with light frefh earth, early in the fpring, and plunged into a hot-bed of tanners bark, obferving to water it now and then gently, otherwife the feeds will not grow. When the plants are come up, they fhould be each tranfplanted into feparate fmall pots filled with light fandy earth, and plunged into the hot-bed again, obferving to fhade the glaffes in the heat of the day, until the plants have taken root. They muft be alfo gently watered, but it fhould be done fparingly while they are young; for their ftems being very tender, and full of juice, will rot, if they receive too much moifture; but after their ftems are become woody, they will require it often, efpecially in hot weather; when alfo they fhould have a large fhare of air, by raifing the glaffes of the hot-bed. The plants, in two months after tranfplanting, will have filled thefe fmall pots with their roots; therefore they fhould be fhaken out of them, and planted into pots one fize larger, filled with light frefh earth, and plunged into the bark-ftove, where they fhould have a good fhare of frefh air in warm weather. With this management I have raifed thefe plants upwards of two feet high in one feafon, which were alfo very ftrong in their ftems: they muft be conftantly kept in the ftove, being too tender to thrive in this country in any other fituation. This plant has flowered in the phyfic garden at Chelfea, and perfected feeds; but if it were not to flower, the fingular beauty of the plant renders it worthy of a place in every curious collection of plants; and it feems the Indians were very fond of it, for Hernandez tells us, the Indian kings planted it in their gardens.

BOERHAAVIA. This genus of plants was fo named by Monf. Vaillant, profeffor of botany at Paris, in honour of the famous Dr. Boerhaave, who was profeffor of botany, chemiftry, and phyfic, in the univerfity of Leyden.

The Characters are,

*The flower hath no empalement, and but one bell-fhaped petal, which is pentangular and entire. It hath in fome fpecies one, and in others two fhort ftamina, crowned by a double globular fummit. The germen is fituated below the receptacle, fupporting a fhort flender ftyle, with a kidney-fhaped ftigma; the germen afterward becomes a fingle oblong feed, having no cover.*

This genus of plants is ranged in the firft fection of Linnæus's firft clafs, intitled Monandria Monogynia, the flower having but one ftamina and a fingle ftyle.

The Species are,

1. Boerhaavia (*Erecta*) caule erecto glabro. Lin. Sp. Plant. 3. *Boerhaavia with an erect ftalk.* Boerhaavia Solanifolia erecta glabra, floribus carneis laxiùs difpofitis. Houft. MSS.
2. Boerhaavia (*Diffufa*) caule diffufo. Lin. Sp. Plant. 3. *Boerhaavia with a diffufed ftalk.* Boerhaavia Solanifolia major. Vail. Def. 50.
3. Boerhaavia (*Scandens*) caule fcandente floribus diandris. Lin. Sp. Plant. 3. *Boerhaavia with a climbing ftalk.* Boerhaavia alfines folio fcandens, floribus pallidè luteis majoribus in umbellæ modum difpofitis femine afpero. Houft. MSS.
4. Boerhaavia (*Coccinea*) foliis ovatis, floribus lateralibus compactis, caule hirfuto procumbente. *Boerhaavia with oval leaves, flowers coming from the wings of the leaves in clofe heads, and a hairy trailing ftalk.* Boerhaavia Solanifolia procumbens & hirfuta floribus coccineis compactis. Houft. MSS.

The firft fort was difcovered by the late Dr. Houftoun, at La Vera Cruz, in 1731. This rifes with an upright fmooth ftalk, two feet high, and at each joint hath two oval pointed leaves growing oppofite, upon foot-ftalks, an inch long, of a whitifh colour on their under fide. At the joints, which are far afunder, come out fmall fide branches, growing erect; thefe, as alfo the large ftalk, are terminated by loofe panicles of flefh-coloured flowers, which are each fucceeded by oblong glutinous feeds.

The feeds of the fecond fort were fent me by the fame gentleman from Jamaica, where it naturally grows. This fends out many diffufed ftalks a foot and a half or two feet long, garnifhed with fmall roundifh leaves at each joint. The flowers grow very fcatteringly upon long branching foot-ftalks from the wings of the leaves, as alfo at the end of the branches, which are of a pale red colour, and are fucceeded by feeds like the former.

The third fort was fent me from Jamaica with the former. This fends out feveral ftalks from the root, which divide into many branches, and trail over whatever plants grow near them, and rife to the height of five or fix feet, garnifhed with heart-fhaped leaves, growing by pairs at each joint upon long foot-ftalks, which are of the colour and confiftence of thofe of the greater Chickweed. The flowers grow in loofe umbels at the extremity of the branches, which are yellow, and are fucceeded by fmall, oblong, vifcous feeds.

The fourth fort was fent me from Jamaica with the two former: this fends out many trailing hairy ftalks, which divide into fmaller branches, garnifhed with oval leaves at every joint; and at the wings of the leaves come out the naked foot-ftalks, fuftaining a fmall clofe head of fcarlet flowers, which are very fugacious, feldom ftanding more than half a day before their petals drop; thefe are fucceeded by fhort oblong feeds.

The firft, fecond, and fourth forts are annual plants, which decay in autumn, but the third fort is perennial: they are all tender plants, fo will not thrive in the open air in England; they are propagated by feeds, which muft be fown on a hot-bed in the fpring, and when the plants are fit to be removed, they fhould be each planted in a fmall pot and plunged into the hot-bed, and treated as other tender exotic plants. When they are grown too tall to remain under a common frame, a plant or two of each fort fhould be placed in the ftove; the other may be turned out of the pots, and planted in a warm border, where, if the feafon proves warm, they will perfect their feeds; but as thefe are fubject to fail in cold feafons, fo thofe in the ftove will always ripen their feeds in autumn; the third fort may be preferved in a warm ftove two or three years.

BOMBAX. Lin. Gen. Plant. 580. Ceiba. Plum. Nov. Gen. 32. Silk Cotton-tree.

The Characters are,

*It hath a permanent empalement of one leaf, which is bell-fhaped, erect, and quinquefid. The flower is quinquefid and fpreading, the petals are oval and concave. It hath many awl-fhaped ftamina, which are the length of the petal, crowned with oblong incurved fummits. In the center is fituated the round germen, fupporting a flender ftyle the length of the ftamina, with a round ftigma. The empalement afterward becomes a large, oblong, turbinated capfule, having five cells, opening with five valves, which are ligneous, containing many roundifh feeds, wrapped in a foft down, and fixed to a five-cornered column.*

This genus of plants is ranged in the fifth order of Linnæus's fixteenth clafs, intitled Monadelphia Polyandria, the flower having many ftyles and ftamina joined to a column.

The Species are,

1. Bombax (*Ceiba*) floribus polyandris, foliis quinatis. Jacq. Amer. 26. *Silk Cotton-tree whofe flowers have many ftyles, and leaves with five lobes.* Ceiba viticis foliis caudice aculeato. Plum. Nov. Gen. 42.
2. Bombax (*Pentandrum*) floribus pentandris. Jacq. Amer. 26. *Silk Cotton-tree whofe flowers have five ftyles.* Ceiba viticis foliis caudice glabro. Plum. Nov. Gen. 42.

3. BOMBAX (*Villosus*) foliis quinque-angularibus villosis, caule geniculato. *Silk Cotton with five-cornered hairy leaves, and a jointed stalk.*

The first and second sorts grow naturally in both Indies, where they arrive to a great magnitude, being some of the tallest trees in those countries; but the wood is very light, and not much valued, except for making of canoes, which is the chief use made of them. Their trunks are so large, as when hollowed, to make very large ones. In Columbus's first voyage it was reported, there was a canoe seen at the island of Cuba, made of the hollowed trunk of one of these trees, which was ninety-five palms long, and of a proportional width, which would contain a hundred and fifty men: and some modern writers have affirmed, that there are trees of these sorts now growing in the West-Indies, so large, as not to be fathomed by sixteen men, and so tall as that an arrow cannot be shot to their top.

These trees generally grow with very strait stems; those of the first sort are closely armed with short strong spines, but the second hath very smooth stems, which in the young plants are of a bright green, but after a few years, they are covered with a grey, or Ash-coloured bark, which turns to a brown as the trees grow older: they seldom put out any side branches till they arrive to a considerable height, unless their leading shoot be broken or injured. The branches toward their top are garnished with leaves composed of five, seven, or nine oblong smooth lobes, which are spear-shaped, and join to one center at their base, where they adhere to the long foot-stalk. These fall away every year, so that for some time the trees are naked, and before the new leaves come out, the flower-buds appear at the end of the branches, and soon after the flowers expand, which are composed of five oblong purple petals, with a great number of stamina in the center; when these fall off, they are succeeded by oval fruit larger than a swan's egg, having a thick ligneous cover, which, when ripe, opens in five parts, and is full of a dark short cotton, inclosing many roundish seeds as large as small Pease.

The down which is inclosed in these seed-vessels is seldom used, except by the poorer inhabitants to stuff pillows or chairs, but it is generally thought to be unwholesome to lie upon.

These two species have been supposed the same by many writers on natural history, who have affirmed, that the young trees only have prickles on their trunks, and as they grow old, their trunks become smooth; but from many years experience I can affirm, that the seeds which have been sent me of the two sorts, have always produced plants of the different kinds for which they were sent, and continue the same in plants, which are more than twenty years growth.

There was a few years past a fine plant of another sort in the garden of the late Duke of Richmond, at Goodwood, which was raised from seeds that came from the East-Indies. The stem of this was very strait and smooth; the leaves were produced round the top upon very long foot-stalks, each being composed of seven or nine long, narrow, silky, small lobes, joined at their base to the foot-stalk, in the same manner as those of the two former, but they were much longer, and reflexed backward, so that at first sight it appeared very different from either of them. This may be the species, titled by Jacquin, Bombax floribus pentandris, foliis septenatis. Amer. 26.

The third sort was sent me from the Spanish West-Indies, where it grows naturally, but I do not know to what size; the plants which have been raised here, have soft herbaceous stalks very full of joints, and do not appear as if they would become woody, for the plants of several years growth have soft pithy stems. The leaves come out on long hairy foot-stalks toward the top of the plants; these have the appearance of those of the Mallow-tree, but are larger, and of a thicker consistence; on their under side are covered with a short, brown, hairy down, and are cut on their edges into five angles. These plants have not as yet flowered in England, nor have I received any information what flower they produce; but by the pods and seeds, it appears evidently to be of this genus. The down inclosed in these pods, is of a fine purple colour; and I have been informed that the inhabitants of the countries where the trees grow naturally, spin it, and work it into garments, which they wear without dyeing it of any other colour.

I received a few years since, a few pods of another sort from Panama, which were not so large as those of the common, but were rounder. The down of these was red, but the plants raised from the seeds were so like those of the third sort, as not to be distinguished from them, so I doubt of their being distinct species. I also received some seeds from Siam, which produced plants of the same kind, so that these trees may be common to many of the hot countries.

The plants are propagated by seeds, which must be sown on a hot-bed in the spring; if the seeds are good, the plants will appear in a month, and those of the two first sorts will be strong enough to transplant in a month after, when they should be each planted in a small pot, filled with fresh loamy earth, and plunged into a moderate hot-bed of tanners bark, being careful to shade them from the sun till they have taken fresh root; after which they should have a large share of air admitted to them when the weather is warm, to prevent their being drawn up weak; they must also be frequently refreshed with water, which must not be given in large quantities, especially the third sort, whose stalks are very subject to rot with much moisture. In this bed they may remain till autumn (provided there is room for the plants under the glasses) but if the heat of the bed declines, the tan should be stirred up, and fresh added to it; and if the plants have filled the pots with their roots, they should be shifted into pots a little larger; but there must be care taken not to over-pot them, for nothing is more injurious to these plants, than to be put into large pots, in which they will never thrive. In the autumn they must be removed into the bark-stove, where they must constantly remain, being too tender to thrive in this country in any other situation. In winter they must have but little wet, especially if they cast their leaves; but in the summer they should be frequently refreshed with water, and in warm weather must have plenty of fresh air admitted to them. With this management the plants will make great progress, and in a few years will reach the glasses on the top of the stove, especially if the building is not pretty lofty.

The plants make an agreeable variety in a large stove where they have room to grow, their leaves having a different appearance from most other plants; but as they are several years old before they flower in the countries where they grow naturally, there is little hopes of their producing any in England.

BONDUC. See GUILANDINA.

BONTIA. Lin. Gen. Plant. 709. Plum. Nov. Gen. 23. Hort. Elth. 49. Barbadoes Wild Olive.

The CHARACTERS are,

*It hath a small erect empalement, which is quinquifid and permanent. The flower is of the ringent kind, having a long cylindrical tube, gaping at the brim; the upper lip is erect and indented, the lower lip is trifid and turns backward. It hath four awl-shaped stamina, which are as long as the petal, and incline to the upper lip, two of them being longer than the other, having single summits. In the center is situated the oval germen, supporting a slender style the length of the stamina, crowned by a bifid obtuse stigma. The germen afterward becomes an oval berry with one cell, including a nut of the same form.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, the flower having two long and two short stamina, and the seeds are included in a cover.

The

The Species are,

1. Bontia. (*Daphnoides.*) Lin. Sp. Plant. *Barbadoes Wild Olive.* Bontia arborefcens thymelææ facie. Plum. Nov. Gen. 32.

2. Bontia (*Germinans*) foliis oppofitis, pedunculis fpicatis. Lin. Sp. Plant. 891. *Bontia with leaves growing oppofite, and fpiked foot-ftalks of flowers.* Avicennia. Flor. Zeyl. 57.

The firft fort is greatly cultivated in the gardens at Barbadoes, for making of hedges, than which there is not a more proper plant for thofe hot countries, it being an Evergreen, and of quick growth. I have been informed, that from cuttings (planted in the rainy feafon, when they have immediately taken root) there has been a complete hedge, four or five feet high, in eighteen months. And as this will very well bear cutting, it is formed into a very clofe thick hedge, which makes a beautiful appearance. In England it is preferved in ftoves, with feveral curious plants of the fame country. It may be raifed from feeds, which fhould be fown on a hot-bed early in the fpring (that the plants may acquire ftrength before winter.) When the plants are come up, they muft be tranfplanted out each into a feparate half-penny pot filled with light frefh earth, and plunged into a moderate hot-bed of tanners bark, obferving to water and fhade them until they have taken root; after which they muft have a large fhare of air in warm weather, and be often refrefhed with water. In winter they muft be placed in the ftove, where they fhould have a moderate degree of warmth, and but little water during that feafon. In fummer they muft have a great fhare of air, but will not do well if expofed abroad, efpecially in cold fummers; fo that they fhould remain in the ftove among plants which require a great fhare of air, which may be admitted by opening the glaffes in very hot weather. With this management, thefe plants will produce flowers and fruit in three or four years from feed. They may alfo be propagated by cuttings, which fhould be planted in the fummer. They muft be put into pots filled with light rich earth, and plunged into a moderate hot-bed, obferving to water and fhade them until they have taken root; after which they muft be treated as hath been directed for the feedling plants. Thefe plants being evergreen, and growing in a pyramidal form, make a pretty variety in the ftove amongft other exotic plants.

The fecond fort is fuppofed to be the Anacardium Orientale; but whether this is the true fort, I cannot determine, having feen only the feeds of that plant, which are frequently brought to Europe for marking nuts; and thofe have been too old to grow, fo I cannot take upon me to determine how far Mr. Jacquin is right.

BONUS HENRICUS. See Chenopodium.

BORBONIA. Lin. Gen. Plant. 764.

The Characters are,

*It hath a turbinated empalement of one leaf, cut at the top into five acute fegments, which are ftiff, pungent, and about half the length of the petals. The flower hath five leaves, and is of the butterfly fhape. The ftandard is obtufe and reflexed. The wings are heart-fhaped and fhorter than the ftandard. The keel hath obtufe lunulated leaves. It hath nine ftamina joined in a cylinder, and one upper ftanding fingle, turning up its point. Thefe have fmall fummits. In the center is fituated an awl-fhaped germen, fupporting a fhort ftyle, crowned by an obtufe indented ftigma. The germen afterward becomes a round pointed pod terminated with a fpine, having one cell, inclofing a kidney-fhaped feed.*

This genus of plants is ranged in the third order of Linnæus's feventeenth clafs, intitled Diadelphia Decandria, the flower having ten ftamina, nine of which are joined, and the other ftands feparate.

The Species are,

1. Borbonia (*Lanceolata*) foliis lanceolatis multinerviis integerrimis. Lin. Sp. Plant. 707. *Borbonia with entire fpear-fhaped leaves having many nerves.* Genifta Africana frutefcens rufci nervofis foliis. Raii Hift. 3. 107.



2. Borbonia (*Cordata*) foliis cordatis multinerviis integerrimis. Lin. Sp. Plant. 737. *Borbonia with entire heart-fhaped leaves having many nerves.* Spartium Africanum frutefcens rufci folio caulem amplexante. Com. Hort. Amft. 2. 195.

3. Borbonia (*Trinervia*) foliis lanceolatis trinerviis integerrimis. Lin. Sp. Plant. 707. *Borbonia with entire fpear-fhaped leaves, having three veins.*

Thefe plants grow naturally at the Cape of Good Hope, from whence I received their feeds. In the natural place of their growth, they rife to the height of ten or twelve feet; but in Europe they feldom are more than four or five, having flender ftems divided into feveral branches, which are garnifhed with ftiff leaves, placed alternately; thofe of the firft fort are narrow, long, and end in a fharp point. The flowers come out from between the leaves at the end of the branches in fmall clufters; thefe are yellow, and fhaped like thofe of the Broom. It flowers in Auguft and September, but doth not perfect feeds in England.

The fecond fort hath broader leaves than the firft: the ftalks of this are flender, covered with white bark. The leaves embrace thefe at their bafe, where they are broadeft, and are terminated by fharp points like thofe of Kneeholm, or Butchers Broom. The flowers are produced in fmall clufters at the end of the branches, which are the fame fhape and colour as thofe of the former, but larger. This flowers at the fame time with the former, but never produces feeds here.

The third fort hath ftronger ftalks than either of the former, garnifhed almoft their whole length, as are alfo the branches with ftiff fpear-fhaped leaves, having three longitudinal nerves on each; thefe are placed clofer together than thofe of the other fpecies. The flowers are produced at the extremity of the branches, each ftanding on a feparate foot-ftalk: they are of the fame fhape and colour with the former, but larger.

As thefe plants do not perfect their feeds in this country, they are with difficulty propagated here. The only method by which I have yet fucceeded, hath been by laying down their young fhoots; but thefe are commonly two years before they put out roots fit to be feparated from the old plant. In laying of thefe down, the joint which is laid in the ground fhould be flit upward, as is practifed in laying Carnations, and the bark of the tongue at bottom taken off. The beft time to lay thefe down, is in the beginning of September; and the fhoots moft proper for this purpofe, are thofe which come out immediately, or very near the root, and are of the fame year's growth, not only from their fituation being near the ground, and thereby better adapted for laying, but thefe are alfo more apt to put out roots than any of the upper branches.

But where good feeds can be procured, that is the more eligible method of propagating the plants; for thofe raifed from the feeds make the ftraiteft plants, and are quicker of growth. When good feeds are obtained, they fhould be fown in pots filled with light loamy earth, as foon as they are received; which, if it happens in the autumn, the pots fhould be plunged into an old bed of tanners bark, under a frame, where they may remain all the winter, being careful that they are fecured from froft, and have not much wet. In the fpring, the pots fhould be plunged into a hot-bed, which will bring up the plants in five or fix weeks. When thefe are fit to remove, they fhould be each planted into a feparate fmall pot, filled with the like loamy earth, and plunged into a moderate hot-bed, obferving to fhade them until they have taken frefh root, as alfo to refrefh them with water, as they may require it. After this they muft by degrees be inured to the open air, into which they fhould be removed in June, and placed in a fheltered fituation, where they may remain till autumn, when they muft be removed into the green-houfe, and placed where they may enjoy the air and fun; during the winter

winter ſeaſon, theſe plants muſt be ſparingly watered; but in ſummer, when they are placed abroad, they will require to be frequently refreſhed, but muſt not have too much water given them each time.

Theſe plants make a pretty variety in the green-houſe in winter, and as they do not require any artificial heat to preſerve them, they are worthy of a place in every garden where there is conveniency for keeping them.

BORDERS. The uſe of theſe in a garden, is to bound and incloſe parterres, to prevent them being injured by walking in them: theſe are commonly rendered very ornamental by means of the flowers, ſhrubs, &c. that are planted in them.

Theſe ought to be laid with a riſing in the middle, becauſe, if they are flat, they are not agreeable to the eye.

As for their breadth, five or ſix feet are often allowed for the largeſt, and four for the leſſer.

Borders are of four ſorts: thoſe are the moſt common, that are continued about parterres without any interruption, and are wrought with a gentle riſing in the middle, like an aſs's back, and planted with flowers.

The ſecond ſort of borders is ſuch as are cut into compartments, at convenient diſtances, by ſmall paſſages; and being alſo raiſed in the middle, as beforementioned, are likewiſe ſet off with flowers.

The third ſort is ſuch as are laid even and flat without flowers, having only a verge of graſs in the middle, being edged with two ſmall paths, raked ſmooth and ſanded. Theſe are ſometimes garniſhed with flowering ſhrubs, and flowers of large growth, or with vaſes and flower-pots, placed regularly along the middle of the verge of graſs.

The fourth ſort is quite plain, and only ſanded, as in the parterres of orangery, and is filled with caſes ranged in a regular order along thoſe borders which are edged with Box on the ſides next to the walks; and on the other, with verges and graſs-work next the parterre.

Borders are either made ſtrait, circular, or in cants, and are turned into knots, ſcrolls, and other compartments.

Floriſts alſo make borders either along walks, or detached, and in theſe they raiſe their fineſt and choiceſt flowers. Theſe are frequently encompaſſed with border-boards painted green, which make them look exceeding neat.

But, in large parterres, this is not to be expected; ſince, if they be ſtocked with flowers ſucceeding one another in their ſeveral ſeaſons, it is ſufficient, ſo that nothing appears bare and naked.

It is uſual to diſcontinue the borders at the ends next to the houſe, that the embroidery and riſe of the parterre may not be hidden by the ſhrubs and flowering plants, and that the deſign may be better judged of.

Since the modern way of gardening has been introduced in England, all the French taſte of parterres, ſcroll-borders, and fret-work in Box, has been juſtly baniſhed our gardens: therefore I have only mentioned them here, to expoſe the taſte of thoſe architect-gardeners, who have no idea of the noble ſimplicity of an open lawn of graſs, properly bounded by plantations; but, inſtead of this, divide the part of the garden near the houſe, into various forms of borders edged with Box, with ſand, ſhell, or gravel-walks leading about them, by which the ground is cut into many angles, ſcrolls, &c. which is very hurtful to the eyes of a judicious perſon: therefore, where flowers are deſired, there may be borders continued round the extent of the lawn, immediately before the plantations of ſhrubs; which, if properly planted with hardy flowers to ſucceed each other, will afford a much more pleaſing proſpect than the ſtiff borders made in ſcrolls and compartments, after the French manner, can poſſibly do.

Theſe borders may be made ſix or eight feet wide, in proportion to the extent of the garden and ſize of the lawn: for a ſmall lawn ſhould not have very broad borders, nor ought a large lawn to be bounded by ſmall borders; ſo that a due proportion ſhould be always obſerved in the laying out of gardens.

BORRAGO [or Borago, which ſignifies much the ſame as courage, becauſe it is a good raiſer of the ſpirits.] Borage.

The CHARACTERS are,

*The empalement is divided into five parts at the top, and is permanent. The flower is of one leaf, having a ſhort tube, ſpread wide open above, being divided into five acute ſegments at the brim. The chaps of the flower are crowned by five prominences, which are obtuſe and indented. It hath five ſtamina which are joined together, crowned by oblong ſummits. It hath four germen ſituated in the center, and a ſingle ſtyle longer than the ſtamina, ſupporting a ſingle ſtigma. The four germen afterward become ſo many roundiſh rough ſeeds, inſerted in the cavities of the receptacle, and included in the large ſwollen empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, intitled Pentandria Monogynia, the flower having five ſtamina and a ſingle ſtyle.

The SPECIES are,

1. BORRAGO (*Officinalis*) foliis omnibus alternis, calycibus patentibus. Hort. Upſal. 34. *Borage with all the leaves growing alternate, and a ſpreading flower-cup.* Borrago floribus cæruleis. J. B.
2. BORRAGO (*Orientalis*) calycibus tubo corollæ brevioribus, foliis cordatis. Hort. Cliff. 45. *Borage with a flower-cup ſhorter than the tube of the flower, and heart-ſhaped leaves.* Borrago Conſtantinopolitana flore reflexo cæruleo calyce veſicareo. Tourn. Cor. 6.
3. BORRAGO (*Africana*) foliis ramificationum oppoſitis petiolatis, calycinis foliolis ovatis acutis erectis. Lin. Sp. 197. *African Borage with leaves growing oppoſite to the branches upon foot-ſtalks, and the leaves of the empalement oval, pointed, and erect.* Cynogloſſum Boraginis folio & facie Æthiopicum. Pluk. Alm.
4. BORRAGO (*Indica*) foliis ramificationum oppoſitis calycinis foliolis ſagittatis. Lin. Sp. Plant. 137. *Borage with oppoſite leaves on the branches, and ſpear-ſhaped leaves to the flower-cup.* Cynogloſſoides folio caulem amplexante. Iſnard. Act. Scien. 1718.

The firſt is the common Borage, whoſe flowers are uſed in medicine, and the herb for cool tankards in ſummer. Of this there are three varieties, which generally retain their difference from ſeeds; one hath a blue, the other a white, and another a red flower; and there is one which hath variegated leaves. Theſe variations have continued ſeveral years in the Chelſea garden, with very little alteration; but as they do not differ in any other reſpect from the common, I have only mentioned them as varieties.

This is an annual plant, which, if permitted to ſcatter its ſeeds, the plants will come up in plenty without care; the ſeeds may alſo be ſown either in ſpring or autumn, but the latter ſeaſon is preferable, on a ſpot of open ground where the plants are deſigned to remain; when the plants have obtained a little ſtrength, the ground ſhould be hoed to deſtroy the weeds, and the plants muſt be cut up where they are too near each other, leaving them eight or ten inches aſunder. After this they will require no farther care, unleſs the weeds ſhould come up again; then the ground ſhould be a ſecond time hoed over to deſtroy them, which, if well peformed, and in dry weather, will clear the ground from weeds, ſo it will require no more cleaning till the Borage is decayed. The plants which are raiſed in the autumn, will flower in May, but thoſe which are raiſed in the ſpring, will not flower till June; ſo that where a continuation of the flowers are required, there ſhould be a ſecond ſowing in the ſpring, about a month after the firſt; but this ſhould be on a ſhady border, and if the ſeaſon ſhould prove dry, the ground muſt be watered frequently, to bring up the plants; this latter ſowing will continue flowering till the end of ſummer.

The ſecond ſort was brought from Conſtantinople, where it grows naturally. This is a perennial plant, having thick fleſhy roots, which ſpread under the ſurface of the ground, and is thereby propagated with great facility. This ſends out many oblong heart-ſhaped leaves from the root, without any order, having long hairy foot-ſtalks; from the root ariſes the flower-ſtem, which is more than two feet high when fully grown, having at the joints a ſingle ſmall leaf without a foot-ſtalk. The upper part of the ſtalk branches out into ſeveral ſmall foot-ſtalks, which are terminated by looſe panicles of flowers; theſe are of a pale blue colour, and the petal is reflexed backward, ſo that the connected ſtamina and ſtyle are left naked. After the flowers are fallen, the four germen become ſo many rough ſeeds, ſmaller than thoſe of the common Borage. It flowers in March, and the ſeeds ripen in May. When the flower-ſtalk firſt appears, the flowers ſeem collected into a cloſe ſpike, ſome of which often ſpread open before the ſtalk is ſix inches high; but as the ſtalks advance, they divide into many looſe ſpikes.

It is eaſily propagated by the root, which may be parted in the autumn: theſe ſhould have a dry ſoil and a warm ſituation, for as the flower-ſtalks appear early in the ſpring, ſo when they are much expoſed, they are often killed by the froſt, and thereby prevented flowering; if theſe plants are planted in dry rubbiſh, they will not grow too luxuriant, ſo will not be in danger of ſuffering by froſt. Some of the ſeeds of this have ſcattered into the joints of an old wall in the Chelſea garden, where the plants have grown without care for ſome years, and are never injured by cold or heat.

The third and fourth ſorts grow naturally in Africa; theſe are both annual plants, which rarely riſe a foot high, having rough ſtalks; thoſe of the third ſort are ſet on by pairs oppoſite, with ſhort foot-ſtalks, but the leaves of the fourth cloſely embrace the ſtalks at their baſe; the flowers come out on ſhort foot-ſtalks from the wings of the leaves, and alſo at the top of the ſtalks. Thoſe of the third ſort are white, and thoſe of the fourth a pale fleſh colour; but neither of them make any great appearance, ſo are ſeldom cultivated but in botanic gardens for variety.

The ſeeds of theſe plants ſhould be ſown upon a hot-bed in March, and when the plants are ſtrong enough to be removed, they ſhould be each planted in a ſmall pot filled with light earth, and plunged into a new hot-bed to bring them forward, otherwiſe they will not perfect their ſeeds in this country; but in hot weather they muſt have a great ſhare of air, otherwiſe they will draw up weak, and fail before the ſeeds are ripe.

BOSEA, Yervamora, or Shrubby Golden-rod.

The Characters are,

*It hath an empalement compoſed of five roundiſh, concave, equal leaves; it hath no corolla, but five awl-ſhaped ſtamina longer than the empalement, terminated by ſingle ſummits; and an oblong, oval, pointed germen, with two ſtigma ſitting cloſe upon it. The empalement afterward becomes a globular berry with one cell, incloſing one roundiſh ſeed.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifth claſs, intitled Pentandria Digynia, the flower having five ſtamina and two ſtyles.

We have but one Species of this plant, viz.

Bosea. (*Yervamora.*) Lin. Hort. Cliff. 84. Arbor baccifera Canarienſis, ſyringiæ cærulæ foliis, purpurantibus venis, fructu monopyreno Yervamora Hiſpanorum. Pluk. Phyt. *Commonly called Golden-rod-tree.*

This plant is a native of the iſlands of the Canaries, and it hath alſo been ſince found in ſome of the Britiſh iſlands in America; but was firſt brought into England from the Canaries, and has been long an inhabitant of the Engliſh gardens; but I have not as yet ſeen any of theſe plants in flower, though I have had many old plants under my care more than forty years: it makes a pretty ſtrong woody ſhrub, growing with a ſtem as large as a middling perſon's leg; the branches come out very irregular, and make conſiderable ſhoots in ſummer, which ſhould be ſhortened every ſpring, to preſerve the heads of the plants in any tolerable order: theſe branches retain their leaves till toward the ſpring, when they fall away, and new leaves are produced ſoon after: it may be propagated by cuttings planted in the ſpring, and the plants muſt be houſed in winter, being too tender to live in the open air through the year, in this country.

BOSQUETS are little groves; ſo called from Boſchetto, Italian, which is a diminutive of Boſco, a wood or grove.

Theſe are ſmall compartments in gardens, which are formed of trees, ſhrubs, or tall large growing plants, planted in quarters; and are either diſpoſed regularly in rows, or in a more wild or accidental manner, according to the fancy of the owner: theſe quarters are commonly ſurrounded with Evergreen hedges, and the entrance formed into regular porticos with Yews, which are by far the beſt and moſt tonſile trees for this purpoſe. In the inſide of theſe quarters may be made ſome walks, either ſtrait or winding; which, if the quarters are large, ſhould be five or ſix feet broad, and may be laid with turf, and kept well mowed and rolled, which will render the walking much eaſier and pleaſanter than if the walks are only the common earth; which in ſmaller quarters cannot be otherwiſe, for if the trees are cloſe, and the walks narrow, ſo as to be ſhaded and over-hung by the trees, the graſs will not grow.

Theſe quarters may be alſo ſurrounded with hedges of Lime, Elm, Hornbeam, or Beech; which ſhould be kept well ſheared, and not ſuffered to riſe too high; that the heads of the trees may be fully ſeen over them, and the ſtems only hid from the ſight, when in the walks on the outſide of the quarters.

In the planting of theſe boſquets, you ſhould obſerve to mix the trees, which produce their leaves of different ſhapes, and various ſhades of green, and hoary or mealy leaves, ſo as to afford an agreeable proſpect: beſides, there is a great variety of different fruits, which theſe trees produce in autumn; which, altho' of little or no uſe, that we know of, yet have a very good effect, in affording an agreeable variety for ſome time after the leaves are gone; as the Euonymus, or Spindle-tree, the Opulus, or Marſh Elder, the Cockſpur Hawthorn, with many other ſorts, too numerous to mention in this place; whoſe berries afford food for the birds, ſo that they will be thereby invited to ſtay and harbour in theſe little groves, which by their different notes, will render theſe places very agreeable in the ſpring. But I would adviſe never to mix Evergreens with deciduous trees; for, beſides the ill effect it hath to the ſight (eſpecially in winter,) they ſeldom thrive well together; ſo that thoſe quarters where you intend to have Evergreens, ſhould be wholly planted therewith; and in the other parts mix as many varieties of different trees, which caſt their leaves, as you can conveniently; and alſo plant ſome of the largeſt growing flowers (eſpecially near the outſide of the quarters,) which will add greatly to the variety, if they have but air enough to grow; but if any of the Evergreen trees are mixed with the deciduous, it ſhould be only to border the wood.

Theſe boſquets are proper only for ſpacious gardens, being expenſive in their firſt making, as alſo in keeping.

BOTRYS. See Chenopodium.

BOX-TREE. See Buxus.

BRABEJUM, African Almond, vulgò.

The Characters are,

*The flower hath no empalement; it is compoſed of four narrow obtuſe petals which are erect, forming a tube, but are turned backward at top; it hath four ſlender ſtamina which are inſerted in the bottom of the petals, and are of the ſame length, having ſmall ſummits. In the center is a ſmall hairy germen, ſupporting a ſlender ſtyle, crowned by a ſingle ſtigma; the germen afterward becomes an oval, hairy, dry berry, incloſing an oval nut.*

This

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia, the flower having four stamina and one style.

We have but one Species of this plant, viz.

Brabejum. (*Stellatifolium.*) Hort. Cliff. Amygdalus Æthipica, fructu holoserico. Breyn. Cent. *African, or Ethiopian Almond.*

This tree is a native of the country about the Cape of Good Hope.

In Europe it seldom grows above eight or nine feet high, but in its native soil it is a tree of middling growth; but as it must be kept in pots, or tubs, being too tender to live through the winter in the open air, so we cannot expect to see it grow to a great size. It rises with an upright stem, which is soft, and full of pith within, covered with a brown bark. From the stem are sent out horizontal branches at every joint, the lower being the longest, and every tier diminishing to the top, so as to form a sort of pyramid. The branches are garnished with leaves at each joint, which are from four to five inches long, and half an inch broad in the middle, of a deep green on their upper side, but of a pale russet colour on their under, indented on their edges, standing on very short foot-stalks. The flowers are produced toward the end of the shoots, coming out from between the leaves quite round the branches, which are of a pale colour, inclining to white; these appear early in the spring, and fall away without any fruit succeeding them in this country.

This plant is, with difficulty, propagated by layers; being often two years before they make roots strong enough to be taken from the old plants; when the branches are laid down, it will be a good method to slit them at a joint (as is practised in laying Carnations) which will promote their taking root.

These must have but little water given them, especially in winter, for as the young shoots are chiefly pith within, so they are very subject to rot with much moisture. The best time to make the layers is in April, just as the plants are beginning to shoot; the layers must always be made of the former year's shoots. As this plant is very difficult to propagate, so it is very scarce in Europe, there being very few in the Dutch gardens at present.

The plants must have a good green-house in winter, but in summer should be set abroad in a sheltered situation, where they will thrive, and annually produce flowers in the spring, so will make a pretty variety among other exotic plants in the green-house.

BRANCA URSINA. See Acanthus.

BRASSICA, the Cabbage.

The Characters are,

*The empalement is composed of four upright, spear-shaped, small leaves, which are convex at their base, and fall off. The flower is cross-shaped, having four oval plain petals, which spread open, and are entire. It hath four oval nectarious glands, one being situated on each side of the short stamina and pointal, and one on each side the empalement. It hath six stamina, which are awl-shaped and erect, two of which are opposite, and the length of the empalement, the other four are longer; these have erect pointed summits. It hath a taper germen the length of the stamina, having a short style thicker than the germen, and crowned by an entire stigma. The germen afterward becomes a long taper pod, depressed on each side, and is terminated by the apex of the intermediate partition, which divides it into two cells, filled with round seeds.*

This genus of plants is ranged in the second section of Linnæus's fifteenth class, intitled Tetradynamia Siliquosa, the flowers having four long and two short stamina, and are succeeded by long pods.

I shall first enumerate the species, which are distinct, and afterward mention the varieties, which are cultivated for the table; for although most of these may be continued distinct by proper care, without alteration; yet as they are liable to vary when planted near each other for seeds, so we must not admit of their being different species. To this genus Dr. Linnæus has joined the Turnep, Navew, and Rocket, which by their generical characters, may in a system of botany, come under the same title; but in a treatise of gardening, it may occasion confusion; therefore I shall treat of them under their former titles, by which they are generally known.

The Species are,

1. Brassica (*Oleracea*) radice caulescente tereti carnosâ. Hort. Cliff. 338. *Cabbage with a taper fleshy stalk.* Brassica capitata alba. C. B. P. 111. *The common white Cabbage.*
2. Brassica (*Napobrassica*) radice caulescente orbiculari carnoso, foliis sessilibus. *Cabbage with a round fleshy stalk, and leaves growing close to the stalks.* Brassica radice napiformi. Tourn. Inst. R. H. 219. *Turnep-rooted Cabbage.*
3. Brassica (*Botrytis*) radice caulescente tereti carnosâ, floralibus multicaulis. *Cabbage with a taper fleshy stalk at the root, and many branching flower-stalks.* This is the Brassica Cauliflora. Casp. Bauh. Pin. 111. *The Cauliflower.*
4. Brassica (*Sylvestris*) radice cauleque tenui ramoso perenni foliis alternis marginibus incisis. *Cabbage with a branching perennial stalk and root, and leaves growing alternate, which are cut on their edges.* Brassica maritima arborea sive procerior ramosa. Mor. Hist. 2. p. 208. *Taller shrubby Sea Cabbage.*
5. Brassica (*Violacea*) foliis lanceolato-ovatis glabris indivisis dentatis. Hort. Upf. 191. *Cabbage with entire, oval, spear-shaped, smooth leaves, which are indented.*
6. Brassica (*Purpurea*) foliis oblongo-cordatis amplexicaulibus, integerrimis. *Cabbage with oblong heart-shaped leaves embracing the stalks, which are entire.* Brassica campestris perfoliata flore purpureo. C. B. P. 112.
7. Brassica (*Orientalis*) foliis cordatis amplexicaulibus glabris. Lin. Sp. 931. *Colewort with heart-shaped smooth leaves which embrace the stalk.* Brassica Orientalis perfoliata flore albo siliquâ quadrangulâ. Tourn. Cor. 16.
8. Brassica (*Gongylodes*) radice caulescente tereti, foliis inferioribus petiolatis superioribus semiamplexicaulibus. *Cabbage with a taper stalk, the under leaves with foot-stalks, and the upper half embracing the stalk.* Napus Sylvestris. C. B. P. 95. *The wild Navew, or Cole Seed.*

The Varieties of the first sort are,

1. Brassica (*Sabauda*) sabauda hyberna. Lob. Icon. *The Savoy Cabbage, commonly called Savoy.*
2. Brassica (*Rubra*) capitata rubra. C. B. P. 111. *The Red Cabbage.*
3. Brassica (*Pyramidalis*) capitata alba pyramidalis. *The Sugar-loaf Cabbage.*
4. Brassica (*Præcox*) capitata alba præcox. *The early Cabbage.*
5. Brassica (*Peregrina*) peregrina moschum olens. H. R. Par. *Foreign Musk Cabbage.*
6. Brassica (*Muscovitica*) capitata alba minor Muscovitica. H. A. *Small Russia Cabbage.*
7. Brassica (*Capitata*) capitata alba compressa. Boerh. Ind. alt. 11. *The large sided Cabbage.*
8. Brassica (*Viridis*) capitata viridis sabauda. Boerh. Ind. 11. *The green Savoy.*
9. Brassica (*Laciniata*) fimbriata. C. B. P. 111. *The Borecole.*
10. Brassica (*Selenisia*) fimbriata virescens. Boerh. Ind. 2. 12. *Green Borecole.*
11. Brassica (*Fimbriata*) fimbriata Siberica. Boerh. Ind. 2. 12. *Siberian Borecole, called by some Scotch Kale.*

The second sort is undoubtedly a distinct species, for I have always found the seeds produce the same, with this difference only, that in good ground the stalks will be much larger than in poor land.

The Varieties of the third sort are,

1. Brassica Italica purpurea Broccoli dicta. Juss. *Purple Broccoli.*
2. Brassica Italica alba Broccoli dicta. Juss. *White Broccoli.*

The second sort, I believe, never varies, for I have cultivated it many years, and have not found it to alter.

alter. This grows naturally on the sea-shore, near Dover. It hath a perennial branching stalk, in which it differs from all the other species. I have continued these three or four years, and have eaten the young shoots after they had been much frozen, when they were very sweet and good; but at other times they are very strong and stringy. In very severe winters, when the other sorts are destroyed, this is a necessary plant, for the most severe frosts do not injure it. The leaves of this are inclining to a purple colour, and are placed alternately on the branches. The flower-stalks grow from the end of the branches, and spread out horizontally; but those which arise from the center of the plants, grow erect, and seldom put out branches.

The third sort, which is the Cauliflower, has been supposed a variety of the common Cabbage; but from more than fifty years experience in cultivating these plants, I could never find the least appearance of either species approaching each other; and they are so different in their leaves, as to be easily distinguished by persons of skill, when the plants are young. But there is one essential difference between them in their flower-stems; for the common Cabbage puts out one upright stem from the center of the Cabbage, which afterward divides into several branches, whereas the Cauliflower sends out many flower-stems from the part which is eaten; which is only a compact collection of the heads of these stalks, which afterward divides into so many stems, branching out into many spreading shoots, so as to form a large spreading head when in flower, but never rises pyramidically like the Cabbage.

The two sorts of Broccoli I take to be only varieties of the Cauliflower, for although these may with care be kept distinct, yet I doubt, if they were to stand near each other for seeds, if they would not intermix; and I am the rather inclined to believe this, from the various changes which I have observed in all these sorts; for I have frequently had Cauliflowers of a green colour, with flower-buds regularly formed at the ends of the shoots, as those of Broccoli, though the colour was different; and the white Broccoli approaches so near to the Cauliflower, as to be with difficulty distinguished from it; yet when these are cultivated with care, and never suffered to stand near each other, when left to produce seeds, they may be kept very distinct in the same garden; for the variations of these plants is not occasioned from the soil, but the mixing of the farina of the flowers with each other, where they are planted near together; therefore those persons who are curious to preserve the several varieties distinct, should never suffer the different kinds to stand near each other for seed.

The Cauliflower was first brought to England from the island of Cyprus, where I have been informed they are in very great perfection at present: but it is supposed, they were originally brought thither from some other country: most of the old writers mention it to have been brought from that island, to the different parts of Europe, so that from thence all the gardens in Europe have been supplied; and although this plant was cultivated in a few English gardens long since, yet it was not brought to any degree of perfection, till about 1680, at least not to be sold in the markets; and since the year 1700, they have been so much improved in England, as that such of them as before were greatly admired, would at present be little regarded.

This plant has been much more improved in England, than in any other parts of Europe. In France they rarely have Cauliflowers till near Michaelmas, and Holland is generally supplied with them from England. In many parts of Germany there was none of them cultivated till within a few years past; and most parts of Europe are supplied with seeds from hence.

The eighth sort, which is generally known by the title of Rape or Cole Seed, is much cultivated in the isle of Ely, and some other parts of England for its seed, from which the Rape Oil is drawn; and it hath also been cultivated of late years in other places, for feeding of cattle, to great advantage. This hath been lately joined to the Napus Sativa, or Garden Navew, supposing them to be the same species; but I have cultivated both sorts more than twenty years, and could never observe either of them to vary; indeed the whole appearance of the plants, is sufficient to determine them as distinct species; but as the Garden Navew approaches nearer the Turnep than the Cabbage, so I shall treat of that under the title of Rapa.

The Cole Seed, when cultivated for feeding of cattle, should be sown about the middle of June. The ground for this should be prepared in the same manner as for Turneps. The quantity of seeds for an acre of land, is from six to eight pounds, and as the price of the seeds is not great, so it is better to allow eight pounds; for if the plants are too close in any part, they may be easily thinned when the ground is hoed. When the plants have put out six leaves, they will be fit to hoe, which must be performed in the same manner as is practised for Turneps, with this difference only, of leaving these much nearer together; for as they have fibrous roots and slender stalks, so they do not require near so much room. These plants should have a second hoeing, about five or six weeks after the first, which, if well performed in dry weather, will entirely destroy the weeds, so they will require no farther culture. By the middle of November these will be grown large enough for feeding, when, if there is a scarcity of fodder, this may be either cut or fed down; but where there is not an immediate want of food, it had better be kept as a reserve for hard weather, or spring feed, when there may be a scarcity of other green food. If the heads are cut off, and the stalks left in the ground, they will shoot again early in the spring, and produce a good second crop in April, which may be either fed off, or permitted to run to seeds, as is the practice where this is cultivated for the seeds: but if the first is fed down, there should be care taken that the cattle do not destroy their stems, or pull them out of the ground. As this plant is so hardy as not to be destroyed by frost, so it is of great service in hard winters for feeding of ewes; for when the ground is so hard frozen, as that Turneps cannot be taken up, these plants may be cut off for a constant supply. In several places where I have sown this seed, I have found that one acre of land will produce as much food, as almost two acres of Turneps; and this will afford late food after the Turneps are run to seed; and if it is afterward permitted to stand for seed, one acre will produce as much as, at a moderate computation, will sell for five pounds, clear of charges.

Partridges, pheasants, turkeys, and most other fowl, are very fond of this plant; so that wherever it is cultivated, if there are any birds in the neighbourhood, they will constantly lie among these plants.

The seeds of this plant are sown in gardens for winter and spring sallads, this being one of the small sallad-herbs.

The common white, red, flat, and long-sided Cabbages are chiefly cultivated for winter use: the seeds of these sorts must be sown the end of March, or beginning of April, in beds of good fresh earth; and in May, when the young plants will have about eight leaves, they should be pricked out into shady borders, about three inches square, that they may acquire strength, and to prevent their growing long shanked.

About the beginning of June you must transplant them out, where they are to remain for good (which in the kitchen-gardens near London, is commonly between Cauliflowers, Artichokes, &c. at about two feet and a half distance in the rows;) but if they are planted for a full crop in a clear spot of ground, the distance from row to row should be three feet and a half, and in the rows two feet and a half asunder: if the season should prove dry when they are transplanted out,

out, you must water them every other evening, until they have taken fresh root; and afterwards, as the plants advance in height, you should draw the earth about their stems with a hoe, which will keep the earth moist about their roots, and greatly strengthen the plants: you must also observe to keep them clear from weeds, which are apt to draw the plants up tall (if suffered to grow amongst them,) and often spoil them.

These Cabbages will some of them be fit for use soon after Michaelmas, and will continue until the end of February, if they are not destroyed by bad weather; to prevent which, the gardeners near London pull up their Cabbages in November, and trench their ground up in ridges, laying their Cabbages against their ridges as close as possible on one side, burying their stems in the ground: in this manner they let them remain till after Christmas, when they cut them for the market; and although the outer part of the Cabbage be decayed (as is often the case in very wet or hard winters,) yet, if the Cabbages were large and hard when laid, the inside will remain sound.

The Russian Cabbage was formerly in much greater esteem than at present, it being now only to be found in particular gentlemens gardens, who cultivate it for their own use, and is rarely ever brought to the market. This must be sown late in the spring of the year, and managed as those before directed; with this difference only, that these must be sooner planted out for good, and must have an open clear spot of ground, and require much less distance every way; for it is but a very small hard Cabbage. These will be fit for use in July or August, but will not continue long before they will break, and run up to seed. The best method to have these Cabbages good, is to procure fresh seeds from abroad every year, for it is apt to degenerate in England in a few years.

The early and Sugar-loaf Cabbages are commonly sown for summer use, and are what the gardeners about London commonly call Michaelmas Cabbages. The season for sowing of these is about the end of July, or beginning of August, in an open spot of ground; and when the plants have got eight leaves, you must prick them into beds at about three inches distance every way, that the plants may grow strong and short shanked; and in the middle of October you should plant them out for good; the distance that these require is, three feet row from row, and two feet and a half asunder in the rows. The gardeners near London commonly plant these Cabbages upon the same spot of ground, where their winter Spinach is sown; so that when the Spinach is cleared off in the spring, the ground will have a crop of Cabbages upon it; you must therefore clear off the Spinach just round each plant early in the spring, that with a hoe you may draw the earth up to the stem; and when all your Spinach is cleared off, which is commonly in the beginning of April, you must hoe down all the weeds, and draw up the earth again about your Cabbage plants.

In May, if your plants were of the early kind, they will turn in their leaves for cabbaging; at which time, the gardeners near London, in order to obtain them a little sooner, tie in their leaves close with a slender Osier-twig to blanch their middle; by which means, they have them at least a fortnight sooner than they could have if they were left untied.

The early Cabbage being the first, we should choose (if for a gentleman's use) to plant the fewer of them, and a greater quantity of the Sugar-loaf kind, which comes after them; for the early kind will not supply the kitchen long, generally cabbaging apace when they begin, and as soon grow hard, and burst open; but the Sugar-loaf kind is longer before it comes, and is as slow in its cabbaging; and, being of an hollow kind, will continue good for a long time. I have known a large quarter of ground, which was planted with this sort of Cabbage for market use, which hath afforded a supply for near three months together. This, though of singular service to a gentleman's garden, is not so much for the advantage of the market gardener, who loves to have his ground cleared sooner, that he may have another crop upon it, of Celery, Endive, &c. which is more to his purpose; for they, paying large rents for their land, are obliged to have as many crops in a year as possible.

Although I before have advised the planting out of Cabbages for good in October, yet the Sugar-loaf kind may be planted out in February, and will succeed as well as if planted earlier, with this difference only, that they will be later before they cabbage. You should also reserve some plants of the early kind in some well-sheltered spot of ground, to supply your plantation, in case of a defect; for in mild winters many of the plants are apt to run to seed, especially when their seeds are sown too early, and in severe winters they are often destroyed.

The Savoy Cabbages are propagated for winter use, as being generally esteemed the better when pinched by the frost: these must be sown about the middle of April, and treated after the manner as was directed for the common white Cabbage; with this difference, that these may be planted at a closer distance than those; two feet and a half square will be sufficient. These are always much better when planted in an open situation, which is clear from trees and hedges; for in close places they are very subject to be eaten almost up by caterpillars, and other vermin, especially if the autumn prove dry.

The Borecole may be also treated in the same manner, but need not be planted above one foot, asunder in the rows, and the rows two feet distance: these are never eaten till the frost hath rendered them tender, for otherwise they are tough and bitter.

The seeds of the Broccoli, (of which there are several kinds, viz. the Roman, or purple, and the Neapolitan, or white, and the black Broccoli, with some others; but the Roman is chiefly preferred to them all) should be sown about the latter end of May, or beginning of June, in a moist soil; and when the plants are grown to have eight leaves, transplant them into beds (as was directed for the common Cabbage;) and toward the middle of July they will be fit to plant out for good, which should be into some well sheltered spot of ground, but not under the drip of trees: the distance these require is about a foot and a half in the rows, and two feet row from row. The soil, in which they should be planted, ought to be rather light than heavy, such as are the kitchen gardens near London: if your plants succeed well (as there will be little reason to doubt, unless the winter prove extreme hard,) they will begin to shew their small heads, which are somewhat like a Cauliflower, but of a purple colour, about the end of December, and will continue eatable till the middle of April.

The brown or black Broccoli is by many persons greatly esteemed, though it doth not deserve a place in the kitchen-garden, where the Roman Broccoli can be obtained, which is much sweeter, and will continue longer in season: indeed, the brown sort is much hardier, so that it will thrive in the coldest situations, where the Roman Broccoli is sometimes destroyed in very hard winters. The brown sort should be sown in the middle of May, and managed as hath been directed for the common Cabbage, and should be planted at the same distance (which is about two feet and a half asunder.) This will grow very tall, so should have the earth drawn up to their stems as they advance in height. This doth not form heads so perfect as the Roman Broccoli; the stems and hearts of the plants are the parts which are eaten.

The Roman Broccoli (if well managed) will have large heads, which appear in the center of the plants, like clusters of buds. These heads should be cut before they run up to seed, with about four or five inches of the stem; the skin of these stems should be stripped off, before they are boiled: these will be

very tender and little inferior to Aſparagus. After the firſt heads are cut off, there will be a great number of ſide ſhoots produced from the ſtems, which will have ſmall heads to them, but are full as well flavoured as the large. Theſe ſhoots will continue good until the middle of April, when the Aſparagus will come in plenty to ſupply the table.

The Naples Broccoli hath white heads, very like thoſe of the Cauliflower, and eats ſo like it, as not to be diſtinguiſhed from it. This is much tenderer than the Roman Broccoli, ſo is not ſo much cultivated in England; for as the gardens near London generally produce great plenty of late Cauliflowers, which, if the ſeaſon prove favourable, will continue till Chriſtmas, the Naples Broccoli, coming at the ſame time, is not ſo valuable.

Beſides this firſt crop of Broccoli (which is uſually ſown the end of May,) it will be proper to ſow another crop the beginning of July, which will come in to ſupply the table the latter end of March, and the beginning of April, and being very young, will be extremely tender and ſweet.

In order to ſave good ſeeds of this kind of Broccoli in England, you ſhould reſerve a few of the largeſt heads of the firſt crop, which ſhould be let remain to run up to ſeed, and all the under ſhoots ſhould be conſtantly ſtripped off, leaving only the main ſtem to flower and ſeed. If this be duly obſerved, and no other ſort of Cabbage permitted to ſeed near them, the ſeeds will be as good as thoſe procured from abroad, and the ſort may be preſerved in perfection many years.

The manner of preparing the Naples Broccoli for the table is this: when your heads are grown to their full bigneſs (as may be eaſily known by their dividing, and beginning to run up,) then you ſhould cut them off, with about four inches of the tender ſtem to them; then ſtrip off the outer ſkin of the ſtem, and after having waſhed them, boil them in a clean linen cloth (as is practiſed for Cauliflowers,) and ſerve them up with butter, &c. and, if they are of a right kind, they will be tenderer than any Cauliflowers, though very like them in taſte.

The Turnep-rooted Cabbage was formerly more cultivated in England than at preſent, for ſince other ſorts have been introduced which are much better flavoured, this ſort has been neglected. There are ſome perſons who eſteem this kind for ſoups; but it is generally too ſtrong for moſt Engliſh palates, and is ſeldom good but in hard winters, which will render it tender and leſs ſtrong.

It may be propagated by ſowing the ſeeds in April, on a bed of light freſh earth; and when the plants are come up about an inch high, they ſhould be tranſplanted out in a ſhady border, at about two inches diſtance every way, obſerving to water them until they have taken root; after which time they will require no other culture but to keep them clear from weeds, unleſs the ſeaſon ſhould prove extremely dry; in which caſe it will be proper to water them every four or five days, to prevent their being ſtinted by the mildew, which is ſubject to ſeize theſe plants in very dry weather.

In the beginning of June, the plants ſhould be tranſplanted out where they are to remain, allowing them two feet diſtance every way, obſerving to water them until they have taken root; and as their ſtems advance, the earth ſhould be drawn up to them with a hoe, which will preſerve a moiſture about their roots, and prevent their ſtems from drying and growing woody, ſo that the plants will grow more freely; but it ſhould not be drawn very high, for as it is the globular part of the ſtalk which is eaten, ſo that ſhould not be covered. In winter they will be fit for uſe, when they ſhould be cut off, and the ſtalks pulled out of the ground, and thrown away, as being good for nothing after the ſtems are cut off.

The curled Colewort of Siberian Borecole, is now more generally eſteemed than the former, being extreme hardy, ſo is never injured by cold, but is always ſweeter in ſevere winters than in mild ſeaſons. This may be propagated by ſowing the ſeeds the beginning of July; and when the plants are ſtrong enough for tranſplanting, they ſhould be planted in rows about a foot and a half aſunder, and ten inches diſtance in the rows; this work ſhould be performed at a moiſt time, when the plants will ſoon take root, and require no farther care. Theſe will be fit for uſe after Chriſtmas, and continue good until April, ſo that they are very uſeful in a family.

The Muſk Cabbage has, through negligence, been almoſt loſt in England, though for eating it is one of the beſt kinds we have; but being tenderer than many other ſorts, is not profitable for gardeners who ſupply the markets; but thoſe who cultivate them for their own table, ſhould make choice of this, rather than any of the common Cabbage, for it is always looſer, and the leaves more criſp and tender, and has a moſt agreeable muſky ſcent when cut. This may be propagated in the ſame manner as the common Cabbage, and ſhould be allowed the ſame diſtance. It will be fit for uſe in October, November, and December; but, if the winter proves hard, theſe will be deſtroyed much ſooner than the common ſort.

The common Colewort, or Dorſetſhire Kale, is now almoſt loſt near London, where the markets are uſually ſupplied with Cabbage plants, inſtead of them; and theſe being tenderer, and more delicate in winter, are much more cultivated than the common Colewort, which is better able to reſiſt the cold in ſevere winters than thoſe, but is not near ſo delicate till pinched by froſt. And ſince the winters in England have been generally temperate of late years, the common Cabbage plants have conſtantly been cultivated by the gardeners near London, and ſold in the markets as Coleworts, which, if they are of the Sugar-loaf kind, is one of the ſweeteſt greens from December to April yet known. Indeed, where farmers ſow Coleworts to feed their milch-cattle in the ſpring, when there is a ſcarcity of herbage, the common Colewort is to be preferred, as being ſo very hardy that no froſt will deſtroy it. The beſt method to cultivate this plant in the fields is, to ſow the ſeeds about the beginning of July, chooſing a moiſt ſeaſon, which will bring up the plants in about ten days or a fortnight; the quantity of ſeed for an acre of land is nine pounds: when the plants have got five or ſix leaves, they ſhould be hoed, as is practiſed for Turneps, cutting down all the weeds from amongſt the plants, and alſo thinning the plants where they are too thick; but they ſhould be kept thicker than Turneps, becauſe they are more in danger of being deſtroyed by the fly: this work ſhould be performed in dry weather, that the weeds may be killed; for if it ſhould prove moiſt ſoon after, the weeds will take root again, and render the work of little uſe. About ſix weeks after, the plants ſhould have a ſecond hoeing, which, if carefully performed in dry weather, will entirely deſtroy the weeds, and make the ground clean, ſo that they will require no farther culture. In the ſpring they may either be drawn up and carried out to feed the cattle, or they may be turned in to feed upon them as they ſtand; but the former method is to be preferred, becauſe there will be little waſte; whereas, when the cattle are turned in amongſt the plants, they will tread down and deſtroy more than they eat, eſpecially if they are not fenced off by hurdles.

The perennial Colewort is alſo little cultivated in the gardens near London at preſent. This is very hardy, and may be cultivated in the ſame manner as the former ſort. This will continue two years before it runs up to ſeed, and will afterwards produce many ſide ſhoots, and in poor land will continue three or four years; but in rich ſoils it will not laſt ſo long. This may be uſed as the former ſort, to feed cattle; for it is not ſo good for the table (unleſs in very ſevere froſt) as the plants which are now cultivated for that purpoſe.

The fifth sort came from China, where it is cultivated as an esculent plant; of this there are two or three varieties which I have cultivated some years, but I find them as variable as our common Cabbage. These are annual plants, which, if sown in April, will flower in July, and perfect their seeds in October. They never close their leaves to form a head, like the common Cabbage, but grow open and loose, more like the wild Navew, and are very unfit for the table. As these are generally in their perfection for use the beginning of July, I imagined their strong flavour and toughness might be occasioned by the warmth of the season; therefore I sowed some of the seeds in July, that I might make trial of them in winter; but in the midst of frost, I found them much worse than our common Colewort, so I thought them not worth propagating.

The other two sorts of Cabbage are varieties fit for a botanic garden, but are plants of no use. These may be propagated by sowing their seeds on a bed of light earth, early in the spring, in the place where they are designed to remain (for they do not bear transplanting well.) When the plants are come up pretty strong, they should be thinned, so as to leave them four or five inches apart; and they must be constantly kept clear from weeds. In June they will flower; and their seeds will ripen the beginning of August, which, if permitted to fall, the plants will come up, and maintain themselves without any farther care but to keep them clear from weeds. They are annual plants, and perish when they have perfected their seeds.

The best method to save the seeds of all the best sorts of Cabbages is, about the end of November you should make choice of some of your best Cabbages, which you should pull up, and carry to some shed, or other covered place, where you should hang them up for three or four days by their stalks, that the water may drain from between their leaves; then plant them in some border, under a hedge or pale, quite down to the middle of the Cabbage, leaving only the upper part of the Cabbage above ground, observing to raise the earth about it, so that it may stand a little above the level of the ground; especially if the ground is wet, they will require to be raised pretty much above the surface.

If the winter should prove very hard, you must lay a little straw or Pease-haulm lightly upon them, to secure them from the frost, taking it off as often as the weather proves mild, lest by keeping them too close they should rot. In the spring of the year these Cabbages will shoot out strongly, and divide into a great number of small branches: you must therefore support their stems, to prevent their being broken off by the wind; and if the weather should be very hot and dry when they are in flower, you should refresh them with water once a week all over the branches, which will greatly promote their feeding, and preserve them from mildew.

When the pods begin to change brown, you will do well to cut off the extreme part of every shoot with the pods, which will strengthen your seeds; for it is generally observed, that those seeds which grow near the top of the shoots, are very subject to run to seed before they cabbage; so that by this there will be no loss, but a great advantage, especially if you have more regard to the quality than to the quantity of the seeds, which indeed is not always the case, when it is intended for sale; but those who save it for their own use, should be very careful to have it good.

When your seeds begin to ripen, you must be particularly careful, that the birds do not destroy it; for they are very fond of these seeds. In order to prevent their mischief, some use old nets, which they throw over their seeds, to prevent their getting to it: but this will not always do, for, unless the nets are very strong, they will force their way thro' them, as I have often seen; but the best method I know, is to get a quantity of birdlime, and dawb over a parcel of slender twigs, which should be fastened at each end to stronger sticks, and placed near the upper part of the seed, in different places, so that the birds may alight upon them, by which means they will be fastened thereto, where you must let them remain a considerable time, if they cannot get off themselves: and although there should be but few birds caught, yet it will sufficiently terrify the rest, that they will not come to that place again for a considerable time after (as I have experienced.)

When your seed is fully ripe, you must cut it off; and, after drying, thresh it out, and preserve it in bags for use.

But in planting Cabbages for seed, I would advise never to plant more than one sort in a place, or near one another: as for example, never plant red and white Cabbages near each other, nor Savoy with either white or red Cabbages; for I am very certain they will, by the commixture of the effluvia, produce a mixture of kinds; and it is wholly owing to this neglect, that the gardeners rarely save any good red Cabbage-seed in England, but are obliged to procure fresh seeds from abroad, as supposing the soil or climate of England alters them from red to white, and of a mixed kind between both; whereas, if they would plant red Cabbages by themselves for seeds, and not suffer any other to be near them, they might continue the kind as good in England, as in any other part of the world; for in the Dutch gardens, from whence the best seeds of red Cabbages are procured, they cultivate no other sort.

Cauliflowers have of late years been so far improved in England, as to exceed in goodness and magnitude what are produced in most parts of Europe; and by the skill of the gardener, are continued for several months together; but the most common season for the great crop, is in May, June, and July. I shall therefore begin with directions for obtaining them in this season.

Having procured a parcel of good seed, of an early kind, you must sow it about the twenty-first of August, upon an old Cucumber or Melon-bed, sifting a little earth over the seeds, about a quarter of an inch thick; and if the weather should prove extreme hot and dry, you should shade the bed with mats, to prevent the earth from drying too fast, which would endanger the spoiling your seed; and give it gentle waterings, as you may see occasion. In about a week's time your plants will appear above ground, when you must take off your coverings by degrees, but do not expose them too much to the open sun at first. In about a month's time after sowing, your plants will be fit to prick out, you should therefore put some fresh earth upon your old Cucumber or Melon-beds; or where these are not to be had, some beds should be made with a little new dung, which should be trodden down close, to prevent the worms from getting thro' it; but it should not be hot dung, which would be hurtful to the plants at this season, especially if it proves hot; into this bed you should prick your young plants, at about two inches square, observing to shade and water them at first planting; but do not water them too much after they are growing, nor suffer them to receive too much rain, if the season should prove wet, which would be apt to make them black shanked (as the gardeners term it, which is no less than a rottenness in their stems,) and is the destruction of the plants so affected.

In this bed they should continue till about the thirtieth of October, when they must be removed into the place where they are to remain during the winter season, which, for the first sowing, is commonly under bell or hand-glasses, to have early Cauliflowers, and these should be of an early kind: but in order to have a succession during the season, you should be provided with another more late kind, which should be sown four or five days after the other, and managed as was directed for them.

In order to have very early Cauliflowers, you should make choice of a good rich spot of ground, that is well defended from the north, east, and west winds, with

with hedges, pales, or walls; but the first is to be preferred, if made with reeds, because the winds will fall dead in these, and not reverberate as by pales or walls. This ground should be well trenched, burying therein a good quantity of rotten dung; then level your ground, and if it be naturally a wet soil, you should raise it up in beds about two feet and a half, or three feet broad, and four inches above the level of the ground; but if your ground is moderately dry, you need not raise it at all: then plant your plants, allowing about two feet six inches distance from glass to glass, in the rows, always putting two good plants under each glass, which may be at about four inches from each other; and if you design them for a full crop, they may be three feet and a half, row from row: but if you intend to make ridges for Cucumbers or Melons between the rows of Cauliflower plants (as is generally practised by the gardeners near London,) you must then make your rows eight feet asunder.

When you have planted your plants, if the ground is very dry, you should give them a little water, and then set your glasses over them, which may remain close down upon them, until they have taken root, which will be in about a week or ten days time, unless there should be a kindly shower of rain; in which case you may set off the glasses, that the plants may receive the benefit of it; and in about ten days after planting, you should be provided with a parcel of forked sticks or bricks, with which you should raise your glasses about three or four inches on the side toward the south, that your plants may have free air. In this manner your glasses should remain over the plants night and day, unless in frosty weather, when you should set them down as close as possible: or if the weather should prove very warm, which many times happens in November, and sometimes in December; in this case, you should keep your glasses off in the day-time, and put them on only in the night, lest, by keeping the glasses over them too much, you should draw them into flower at that season, which is many times the case in mild winters, especially if unskilfully managed.

Toward the latter end of February, if the weather proves mild, you should prepare another good spot of ground, to remove some of the plants into from under the glasses, which should be well dunged and trenched (as before;) then set off the glasses, and, after making choice of one of the most promising plants under each glass, which should remain for good, take away the other plant, by raising it up with a trowel, &c. so as to preserve as much earth to the root as possible; but have a great regard to the plant that is to remain, not to disturb or prejudice its roots: then plant your plants which you have taken out, at the distance before directed, viz. if for a full crop, three feet and a half, row from row; but if for ridges of Cucumbers between them, eight feet, and two feet four inches distance in the rows: then, with a small hoe, draw the earth up to the stems of the plants which were left under the glasses, taking great care not to let the earth fall into their hearts; and set your glasses over them again, raising your props an inch or two higher than before, to give them more air, observing to take them off whenever there may be some gentle showers, which will greatly refresh the plants.

In a little time after, if you find your plants grow so fast as to fill the glasses with their leaves, you should then slightly dig about the plants, and raise the ground about them in a bed broad enough for the glasses to stand about four inches high, which will give your plants a great deal of room by raising the glasses so much higher, when they are set over them; and by this means they may be kept covered until April, which otherwise they could not, without prejudice to the leaves of the plants: and this is a great advantage to them; for many times we have returns of severe frosts at the latter end of March, which prove very hurtful to these plants, if exposed thereto, especially after having been nursed up under glasses.

After you have finished your beds, you may set your glasses over your plants again, observing to raise your props pretty high, especially if the weather be mild, that they may have free air to strengthen them; and in mild soft weather set off your glasses, as also in gentle showers of rain; and now you must begin to harden them by degrees to endure the open air: however, it is adviseable to let your glasses remain over them as long as possible, if the nights should be frosty, which will greatly forward your plants; but be sure do not let your glasses remain upon them in very hot sun-shine, especially if their leaves press against the sides of the glasses; for I have often observed, in such cases, that the moisture which hath risen from the ground, together with the perspiration of the plants, which, by the glasses remaining over them, hath been detained upon the leaves of the plants, and when the sun hath shone hot upon the sides of the glasses, hath acquired such a powerful heat from the beams thereof, as to scald all their larger leaves, to the no small prejudice of the plants: nay, sometimes I have seen large quantities of plants so affected therewith, as never to be worth any thing after.

If your plants have succeeded well, toward the end of April some of them will begin to fruit; you must therefore look over them carefully every other day, and when you see the flower plainly appear, you must break down some of the inner leaves over it to guard it from the sun, which would make the flower yellow and unsightly, if exposed thereto; and when you find your flower at its full bigness (which you may know by its outside, parting, as if it would run,) you must then draw it out of the ground, and not cut them off, leaving the stalk in the ground, as is by some practised; and if they are designed for present use, you may cut them out of their leaves; but if designed to keep, you should preserve their leaves about them, and put them into a cool place: the best time for pulling of them is in a morning, before the sun hath exhaled the moisture; for Cauliflowers, pulled in the heat of the day, lose that firmness which they naturally have, and become tough.

But to return to our second crop (the plants being raised and managed as was directed for the early crop, until the end of October;) you must then prepare some beds, either to be covered with glass-frames, or arched over with hoops, to be covered with mats, &c. These beds should have some dung laid at the bottom, about six inches or a foot thick, according to the size of your plants; for if they are small, the bed should be thicker of dung, to bring them forward, and so *vice versa:* this dung should be beat down close with a fork, in order to prevent the worms from finding their way through it; then lay some good fresh earth about four or five inches thick thereon, in which you should plant your plants about two inches and a half square, observing to shade and water them until they have taken fresh root: but be sure do not keep your coverings close, for the warmth of the dung will occasion a large damp in the bed, which, if pent in, will greatly injure the plants.

When your plants have taken root, you must give them as much free open air as possible, by keeping the glasses off in the day-time as much as the weather will permit; and in the night, or at such times as the glasses require to be kept on, raise them up with bricks or other props to let in fresh air, unless in frosty weather; at which time the glasses should be covered with mats, straw, and Pease-haulm, &c. but this is not to be done except in very hard frosts: you must also observe to guard them against great rain, which in winter time is very hurtful to them; but in mild weather, if the glasses are kept on, they should be propped to admit fresh air; and if the under leaves grow yellow and decay, be sure to pick them off; for if the weather should prove very bad in winter, so that you should be obliged to keep them close covered for two or three days together, as it sometimes happens,

happens, theſe decayed leaves will render the incloſed air very noxious; and the plants perſpiring pretty much at that time, are often deſtroyed in vaſt quantities.

In the beginning of February, if the weather proves mild, you muſt begin to harden your plants by degrees, that they may be prepared for tranſplantation; and the ground where you intend to plant your Cauliflowers out for good (which ſhould be quite open from trees, &c. and rather moiſt than dry,) having been well dunged and dug, ſhould be ſown with Radiſhes a week or fortnight before you intend to plant out your Cauliflowers: the reaſon why I mention the ſowing of Radiſhes particularly, is this, viz. that if there are not ſome Radiſhes amongſt them, and the month of May ſhould prove hot and dry, as it ſometimes happens, the fly will ſeize your Cauliflowers, and eat their leaves full of holes, to their prejudice, and ſometimes their deſtruction; whereas, if there are Radiſhes upon the ſpot, the flies will take to them, and never meddle with the Cauliflowers ſo long as they laſt. Indeed, the gardeners near London mix Spinach with their Radiſh-ſeed, and ſo have a double crop, which is an advantage where ground is dear, or where perſons are ſtraitened for room; otherwiſe it is very well to have only one crop amongſt the Cauliflowers, that the ground may be cleared in time.

Your ground being ready, and the ſeaſon good, about the middle or end of February, you may begin to plant out your Cauliflowers: the diſtance which is generally allowed by the gardeners near London (who plant other crops between their Cauliflowers to ſucceed them, as Cucumbers for pickling, and winter Cabbages) is every other row four feet and a half apart, and the intermediate rows two feet and a half, and two feet two inches diſtance in the rows; ſo that in the latter end of May, or beginning of June (when the Radiſhes and Spinach are cleared off,) they put in ſeeds of Cucumbers for pickling, in the middle of the wide rows, at three feet and a half apart; and in the narrow rows, plant Cabbages for winter uſe, at two feet two inches diſtance, ſo that theſe ſtand each of them exactly in the middle of the ſquare between four Cauliflower-plants; and theſe, after the Cauliflowers are gone off, will have full room to grow, and the crop be hereby continued in a ſucceſſion thro' the whole ſeaſon.

About three weeks or a month after your Cauliflowers are planted out, the Radiſhes between them will be fit to hoe; at which time, when you are hoeing out the Radiſhes where they are too thick, you ſhould cut off all ſuch as grow immediately about the Cauliflowers, and would prove hurtful to them, by drawing them up tall and weak; and alſo at that time draw the earth up to the ſtems of the plants, being careful not to let any get into their hearts (as was before directed;) and when your Radiſhes are fit to pull, be ſure to clear round the Cauliflowers firſt, and keep drawing the earth up to their ſtems as they advance in height, which will keep their ſtems from being hardened by the weather, and be of ſingular ſervice to your plants.

There are many people who are very fond of watering Cauliflower-plants in ſummer, but the gardeners near London have almoſt wholly laid aſide this practice, as finding a deal of trouble and charge to little purpoſe; for if the ground be ſo very dry as not to produce tolerable good Cauliflowers without water, it ſeldom happens, that watering them renders them much better; and when once they have been watered, if it is not conſtantly continued, it had been much better for them if they never had any; as alſo if it be given them in the middle of the day, it rather helps to ſcald them: ſo that, upon the whole, if care be taken to keep the earth drawn up to their ſtems, and clear them from every thing that grows near them, that they may have free open air, you will find that they will ſucceed better without than with water, where any of theſe cautions are not ſtrictly obſerved.

When your Cauliflowers begin to fruit, you muſt often look over them, to turn down their leaves, as was before directed, to preſerve their whiteneſs; and when they are full grown, obſerve the former directions in pulling them, &c. but wherever you meet with an extraordinary good Cauliflower, whoſe curd is hard and white, and perfectly free from any frothineſs about the edges, you ſhould ſuffer it to remain for ſeed, keeping the leaves cloſe down upon it until the flower hath ſhot out ſtems, and then remove the leaves from them by degrees, but do not expoſe them too much to the open air at firſt. As the ſtems advance, you muſt take the leaves quite away; and when they begin to branch out, you ſhould fix three pretty ſtrong ſtakes, at equal angles, about it, ſurrounding them with packthread, &c. to ſupport their branches, which would be otherwiſe liable to break with the wind.

When your pods begin firſt to be formed, if the weather proves dry, you ſhould give them a little water all over (with a watering-pot that hath a roſe to it;) which will promote the progreſs of the ſeeds, and preſerve them from mildew, which is often hurtful to the ſeeds; and, when your ſeeds are ripe, you muſt cut it off, and hang it up to dry, and rub it out as was directed for Cabbage-ſeed: and although your flowers do not produce ſo much ſeed as thoſe which were of a ſofter or frothy nature, yet the goodneſs of ſuch ſeeds will ſufficiently recompenſe for the quantity; and any perſon who was to purchaſe his ſeeds, had better give ten ſhillings an ounce for ſuch ſeed than two for the ſeeds commonly ſaved for ſale, as the gardeners about London have experienced, who will never buy any ſeeds of this kind, if they do not know how they were ſaved.

But in order to have a third crop of Cauliflowers, you ſhould make a ſlender hot-bed in February, in which you ſhould ſow the ſeeds, covering them a quarter of an inch thick with light mould, and covering the bed with glaſs-frames: you ſhould now and then gently refreſh the bed with water, obſerving to raiſe the glaſſes with bricks or props in the daytime, to let in freſh air; and when the plants are come up, and have gotten four or five leaves, you ſhould prepare another hot-bed to prick them into, which may be about two inches ſquare; and in the beginning of April harden them by degrees, to fit them for tranſplanting, which ſhould be done the middle of that month, at the diſtance directed for the ſecond crop, and muſt be managed accordingly: theſe (if the ſoil is moiſt where they are planted, or the ſeaſon cool and moiſt) will produce good Cauliflowers about a month after the ſecond crop is gone, whereby their ſeaſon will be greatly prolonged.

There is alſo a fourth crop of Cauliflowers, which is raiſed by ſowing the ſeed about the 23d of May; and being tranſplanted, as hath been before directed, will produce good Cauliflowers in a kindly ſeaſon and good ſoil, after Michaelmas, and continue thro' October and November; and, if the ſeaſon permit, often a great part of December.

The reaſon why I fix particular days for the ſowing of this ſeed, is becauſe two or three days often make a great difference in their plants; and becauſe theſe are the days uſually fixed by the gardeners near London, who have found their crops to ſucceed beſt when ſown at thoſe times, although one day, more or leſs, will make no great odds. I have alſo, in this edition, altered the days to the new ſtyle.

BREYNIA. See CAPPARIS.

BROMELIA. Plum. Nov. Gen. 46. tab. 8. Lin. Gen. Plant. 356.

The CHARACTERS are,

*It hath a three-cornered permanent empalement cut into three parts, upon which the germen is ſituated. The flower hath three long narrow petals, which are erect, each having a nectarium joined to it above the baſe. It hath ſix ſtamina the length of the petals, which are terminated by oblong ſummits. The germen is ſituated below the receptacle, ſupporting a ſlender ſtyle, crowned by a trifid obtuſe ſtigma. The empalement afterward becomes*

*an oblong capsule, divided by a partition in the middle, to which the seeds are fixed quite round; these are smooth and almost cylindrical.*

This genus of plants is ranged in the first section of Linnæus's sixth class, intitled Hexandria Monogynia, the flower having six stamina and one style. Dr. Dillenius has supposed this to be the same with Plumier's Karatas, which mistake he was led into by Plumier's drawing, where the flower of his Caraguata is joined to the fruit of his Karatas, and *vice versa*; and from hence Dr. Linnæus has been induced to join these and the Ananas together, making them only species of the same genus.

The Species are,

1. Bromelia (*Nudicaulis*) foliis radicalibus dentato-spinosis caulinis integerrimis. Lin. Sp. Plant. 286. *Bromelia with lower leaves indented and prickly, and those of the stalks entire.* Bromelia pyramidata, aculeis nigris. Plum. Nov. Gen. 46.
2. Bromelia (*Lingulata*) foliis serrato-spinosis obtusis, spicis alternis. Lin. Sp. Plant. 285. *Bromelia with sawed, prickly, obtuse leaves, and spikes of flowers growing alternate.* Bromelia ramosa & racemosa foliis Arundinaceis serratis. Plum. Nov. Gen. 46.

The first sort hath leaves very like some of the sorts of Aloes, but not so thick and succulent, which are sharply indented on their edges, where they are armed with strong black spines; from the center of the plant arises the flower-stalk, which is near three feet high, the lower part of which is garnished with entire leaves, placed alternately at every joint. The upper part of the stalk is garnished with flowers, set in a loose spike or thyrse; these have three narrow herbaceous petals sitting upon the germen, and six slender stamina, with the style, which are shorter than the petals. These flowers in the country where they naturally grow, are succeeded by oval seed-vessels, having a longitudinal partition, in the center of which are fastened cylindrical seeds on every side, which are smooth.

The second sort hath shorter leaves than the first, which stand erect, and are narrow at the base, increasing in width gradually to the top, where they are broadest; these are sharply sawed on their edges, and are of a deep green colour. The flower-stem arises from the center of the plant, which divides upward into several branches; the upper part of these are garnished with spikes of flowers, which come out alternately from the sides of the branches, each having a narrow entire leaf just below it, which is longer than the spike. The flowers are placed very close on the spikes, each having three short petals situated upon the globular empalement; when these decay, the empalement turns to an oval pointed seed-vessel, inclosing seeds of the same shape with the former.

Both these plants grow naturally in very warm countries. Father Plumier, who gave this title to the genus, found them growing in the French Islands in America; and the late Dr. Houstoun observed them growing in Jamaica, and in several parts of the Spanish West-Indies. The first sort also grows on the coast of Guinea, from whence I received the seeds; and the second sort was sent me from St. Christopher's.

These plants are propagated by seeds, which must be procured from the country where they grow naturally, for they do not produce any in England. These must be sown in small pots filled with light kitchen-garden earth, and plunged into a moderate hot-bed of tanners bark; the earth in these pots should be sprinkled over with water two or three times a week, according to the heat of the weather, but must not have too much moisture. If the seeds are good, the plants will appear in about five or six weeks, and in a month after will be fit to transplant, when they should be carefully shaken out of the pots, and each planted in a separate small pot filled with the same earth as before; then they must be plunged again into a moderate hot-bed, observing frequently to sprinkle them over with water, but be cautious of giving them too much, lest the roots should be thereby rotted. During the summer season the plants should have a moderate share of air, in proportion to the heat of the weather; and, in autumn, they must be removed in the bark-stove, and treated in the same manner as the Ananas, or Pine Apple, with which management they will make good progress; but after the first winter, they may be placed upon stands in the dry stove, though they will thrive much better if they are constantly kept in the tan-bed, and treated like the Ananas, and will flower in three or four years; whereas those in the dry stove will not flower in twice that time.

The other parts of their culture is only to shift them into fresh earth when they require it; but they should by no means be put into large pots, for they will not thrive if they are over-potted; nor must they have much wet, especially in winter.

These plants make a pretty variety in the hot-house, so those who have room, may allow a plant or two of each sort to have a place in their collection of exotic plants.

BROOM, the common. See Spartium.

BROOM, the Spanish. See Spartium and Genista.

BROWALLIA. Lin. Gen. Plant. 691. Hort. Cliff. 318.

The Characters are,

*The empalement is tubulous, of one leaf, and indented at the top in five unequal parts. The flower is funnel-shaped, of one leaf, having a cylindrical tube twice the length of the empalement; the upper part is spread open, and divided into five parts, the upper segment or lip being a little larger than the others, which are equal. It hath four stamina included in the chaps of the petal, the two upper being very short, and the two under broad, longer, and reflexed to the mouth of the tube, which inclose them; these are terminated by single incurved summits. In the center is situated an oval germen, supporting a slender style the length of the tube, crowned by a thick, compressed, indented stigma. The empalement afterward becomes an oval obtuse vessel with one cell, opening at the top in four parts, and filled with small compressed seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, the flower having two long and two short stamina, and the seeds included in a capsule.

The Species are,

1. Browallia (*Demissa*) pedunculis unifloris. Hort. Cliff. 318. *Browallia with one flower on a foot-stalk.* The title of Browallia was given to it by Dr. Linnæus, in honour of professor Browall, of Amsterdam.
2. Browallia (*Elata*) pedunculis unifloris multiflorisque. Lin. Sp. 880. *Browallia with one flower on each foot-stalk, and sometimes many.*

The seeds of the first sort were sent me by Mr. Robert Millar, from Panama, in the year 1735; which succeeded in the Chelsea garden, where it has continued to flower, and produce seeds every year, but the plants are annual, so perish in autumn: the seeds of this plant must be sown upon a hot-bed in the spring, and the plants brought forward on another, otherwise they will not perfect their seeds in England. Some of these plants may be transplanted in June into the borders of the flower-garden, where, if the season proves warm, they will flower and perfect seeds; but lest these should fail, there should be two or three plants kept in the stove for that purpose. The plants usually grow about two feet high, and spread out into lateral branches, garnished with oval leaves which are entire, ending in a point, having short foot-stalks. Toward the end of the branches the flowers are produced singly, upon pretty long foot-stalks, arising from the wings of the leaf. These have a short empalement of one leaf, which is cut into five parts; out of the center of the empalement the flower arises, which is crooked and bent downward; the top of the tube is spread open, and the brim, or open part of the flower, has some resemblance to a lipped flower, being irregular. It is of a

bright blue colour, sometimes inclining to a purple or red, and often there are flowers of three colours on the same plant. When these fall away, the germen in the center becomes an oval capsule of one cell, filled with small, brown, angular seeds. It flowers in July, August, and September, and the seeds are ripe in five or six weeks after.

When this plant was first raised in the Chelsea garden, I gave it the title of Dalea, in honour to Mr. Dale, an eminent botanist, and a great friend of Mr. Ray's. By this title it was delivered to the Royal Society, and printed in the Philosophical Transactions, and also in the catalogue of the Chelsea garden: and by the same I communicated the seeds to Doctor Linnæus, who afterward changed the name to Browallia, and printed it in the catalogue of Mr. Clifford's garden; where there is a figure of it exhibited, so that this latter title is become almost universal among botanists.

The second sort grows naturally in Peru, from whence the younger Jussieu sent the seeds; this plant rises about the same height as the first, but hath stronger stalks, and sends out a greater number of branches, so is much more bushy than that; the flowers are produced upon foot-stalks, which proceed from the wings of the leaves; some of these foot-stalks sustain one, others three, or more flowers, of a dark blue colour; these are succeeded by oval capsules, filled with small angular seeds.

This plant is annual, and requires the same culture as the first sort, with which it will produce plenty of seeds.

BRUNELLA, Self-heal. See PRUNELLA.

BRUNSFELSIA. Plum. Nov. Gen. 12. Lin. Gen. Plant. 230. This plant takes its name from Dr. Brunsfelsius, a famous physician.

The CHARACTERS are,

*The empalement is permanent, bell-shaped, and of one leaf, which is cut into five blunt segments at the top. The flower is of one leaf, and funnel-shaped, having a long tube, but spreads open at the top, where it is divided into five obtuse segments; it hath five stamina the length of the tube, which are inserted in the petal, and are terminated by oblong summits. In the center is placed a small round germen, supporting a slender style the length of the tube, which is crowned by a thick stigma. The empalement afterward becomes a globular berry with one cell, inclosing a great number of small seeds, which adhere to the skin of the fruit.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and but one style.

We know but one SPECIES of this genus, viz.

BRUNSFELSIA. (*Americana.*) Lin. Sp. Plant. 191. *American Brunsfelsia.* Brunsfelsia flore albo, fructu croceo molli. Plum. Nov. Gen. 12.

This plant rises with a woody stem to the height of eight or ten feet, sending out many side branches, which are covered with a rough bark, garnished with oblong leaves which are entire, and on the lower part of the branches come out single; but toward their extremity, they are placed on every side, and are unequal in size. At the extremity of the branches, the flowers are produced, generally three or four together. These are almost as large as those of the greater Bindweed, but have very long, narrow, hairy tubes; the brim is expanded in the form of the Convolvulus, but is deeply divided into five obtuse segments, which are indented on their border. After the flower is past, the empalement turns to a round soft fruit, inclosing many oval seeds, which are situated close to the cover or skin, to which they adhere.

This plant grows naturally in most of the sugar islands in America, in which places they call it Trumpet Flower; but in the English gardens, it is at present very rare. It may be propagated from seeds, which should be sown early in the spring in pots filled with light earth, and plunged into a hot-bed of tanners bark, observing to water the earth as often as you find it necessary. When the plants are come up, they should be transplanted each into a separate small pot filled with fresh light earth, and plunged into the hot-bed again, observing to water and shade the plants until they have taken root; after which they must have air admitted to them every day, in proportion to the warmth of the season. When the plants have advanced so high as not to be contained in the frames, they should be removed into the bark-stove, where, during the summer months, they should have a large share of free air, but in winter they must be kept very close. With this management the plants will be very strong, and produce their flowers every season. These plants may also be increased by planting cuttings in the spring, before they begin to make new shoots, in pots filled with fresh light earth, and plunged into a hot-bed of tanners bark, observing to water and shade them until they have taken root; after which, they must be managed as hath been directed for other tender exotic plants from the same countries.

BRUSCUS. See RUSCUS.

BRYONIA [this plant is so called from Βρύον, moss, or hair, because it bears a flower which is soft and hairy,] Briony.

The CHARACTERS are,

*It hath male and female flowers on the same plant. The male flowers have an empalement of one leaf, which is bell-shaped, and indented in five parts at the top. The flower is bell-shaped, adhering to the empalement, and cut into five segments. It hath three short stamina and five summits, two of the stamina having double summits, and the other one. The female flowers sit upon the germen, and have a deciduous empalement, but the petal is the same with those of the male. The germen which is under the flower, supports a trifid spreading style, crowned by a spreading indented stigma. The germen afterward becomes a smooth globular berry, containing oval seeds adhering to the skin.*

This genus of plants is ranged in the tenth section of Linnæus's twenty-first class, intitled Monoecia Syngenesia, from its having male and female flowers on the same plant, and the stamina joined with the style.

The SPECIES are,

1. BRYONIA (*Alba*) foliis palmatis utrinque calloso-scabris. Hort. Cliff. 453. *Bryony with palmated leaves, which are rough and callous on both sides.* Bryonia aspera, sive alba baccis rubris. C. B. P. 297. *White Briony with red berries.*
2. BRYONIA (*Africana*) foliis palmatis quinquepartitis utrinque lævibus, laciniis pinnatifidis. Lin. Sp. 1438. *Briony with palmated leaves cut into five segments, which are smooth on each side.* Bryonia Africana laciniata, tuberosa radice, floribus herbaceis. Par. Bat. 107.
3. BRYONIA (*Cretica*) foliis palmatis supra calloso-punctatis. Hort. Cliff. 453. *Cretan Briony with palmated leaves, whose upper surface is studded with callous spots.* Bryonica Cretica maculata. C. B. P. 297.
4. BRYONIA (*Racemosa*) foliis trilobis suprà calloso-punctatis, fructu racemoso ovali. *Briony with trilobate leaves, whose upper sides are marked with callous spots, and oval fruit growing in bunches.* Bryonia olivæ fructu rubro. Plum. Cat. 3.
5. BRYONIA (*Variegata*) foliis palmatis, laciniis lanceolatis, suprà punctatis infernè lævibus, fructu ovato sparso. *Briony with palmated leaves, whose segments are spear-shaped, and their upper side spotted, but their under smooth, and an oval scattered fruit.* Bryonia Americana fructu variegato. Dillen.
6. BRYONIA (*Bonariensis*) foliis palmatis quinquepartitis hirsutis, laciniis obtusis. *Briony with hairy palmated leaves divided into five parts, and obtuse segments.* Bryonia Bonariensis fici folio. Hort. Elth. 58.

The first sort grows upon dry banks, under hedges, in many parts of England; but may be cultivated in a garden for use, by sowing the berries, in the spring of the year, in a dry poor soil; where they will in two years time, grow to be large roots, provided they are not too close. The roots of this plant have been

been formerly, by impostors, brought into an human shape, and carried about the country, and shewn for Mandrakes to the common people, who were easily imposed on by their credulity, and these got good livings thereby. The method which these people practised, was to find a young thriving Briony plant, then they opened the earth all round the plant, being careful not to disturb the lower fibres; and (being prepared with such a mould, as is used by the people who make plaster figures) they fixed the mould close to the root, fastening it with wire, to keep it in its proper situation; then they filled the earth about the root, leaving it to grow to the shape of the mould, which is effected in one summer; so that if this be done in March, by September it will have the shape. The leaves of this plant are also often imposed on the people in the market for Mandrake leaves, although there is no resemblance between them, nor any agreement in quality.

The second and fourth sorts are perennial plants, their roots remaining several years, but their branches decay every winter. These roots must be planted in pots filled with fresh light earth, and in winter must be placed in the green-house, to protect them from frost and great rains; which would destroy them, if they were exposed thereto. During the winter season, they should have very little water given them; but in summer, when they are exposed to the open air, they must be frequently refreshed with water in dry weather. They flower in July, and in warm summers will perfect their seeds.

The third, fifth, and sixth sorts, are annual plants; these must be raised on a hot-bed early in the spring, and when the plants are about three inches high, they should be each transplanted into a small pot filled with fresh light earth, and plunged into a hot-bed of tanners bark, observing to water and shade them until they have taken root. When the plants are grown so large, as to ramble about on the surface of the bed, and begin to entangle with other plants, they should be shifted into larger pots, and placed in the bark-stove, where their branches may be trained to the wall, or against an espalier, that they may have sun and air, which is absolutely necessary for their producing fruit. When these plants are full of fruit, they make a pretty variety in the stove amongst other exotic plants.

The second and fourth sorts are also propagated from seeds, which should be sown on a hot-bed; and when the plants are fit to transplant, they should be put into pots; and after they have taken root, should be inured to bear the open air by degrees; where they may remain during the summer season, but in winter they must be sheltered under a hot-bed frame. The fourth sort is much tenderer than the former.

BRYONIA NIGRA. See Tamnus.

BUBON. Lin. Gen. Plant. 312. Apium. C. B. 154. Ferula. Herm. Par. 163. Macedonian Parsley.

The Characters are,

*It hath an umbelliferous flower; the greater, or general umbel, is composed of about ten smaller, those which are situated in the middle being the shortest; the small umbels have near twenty rays. The general involucrum hath five pointed spear-shaped leaves, which spread open and are permanent; those of the smaller umbels, consist of many little leaves of the same length with the umbel: the empalement of the flower is permanent, small, and indented in five parts; the flower is composed of five spear-shaped petals, which turn inward; it hath five stamina the length of the petals, terminated by single summits. The oval germen is situated below the flower, supporting two bristly styles which are permanent, and the length of the stamina, crowned by obtuse stigma. The germen afterward becomes an oval, channelled, hairy fruit, dividing in two parts, each having an oval seed, plain on one side, but convex on the other.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flower having five stamina and two styles.

The Species are,

1. Bubon (*Macedonicum*) foliolis rhombeo-ovatis crenatis, umbellis numerosissimis. Hort. Cliff. 95. *Bubon with oval, rhomboid, crenated leaves, and many umbels.* Apium Macedonicum. C. B. P. 154. *Macedonian Parsley.*
2. Bubon (*Rigidius*) foliolis linearibus. Hort. Cliff. 95. *Bubon with very narrow leaves.* Ferula durior sive rigidis & brevissimis foliis. Boccon. Mus. 2. 84.
3. Bubon (*Galbanum*) foliolis rhombeis dentatis glabris striatis umbellis paucis. Hort. Cliff. 96. *Bubon with smooth rhomboid leaves and few umbels.* Ferula Africana galbanifera folio & facie ligustici. Par. Bat. 163.
4. Bubon (*Gumiferum*) foliolis glabris inferioribus rhombeis serratis, superioribus pinnatifidis tridentatis. Prod. Leyd. 100. *Bubon with smooth rhomboid under leaves which are sawed, and upper leaves winged and indented in three parts.* Ferula Africana galbanifera folio myrrhidis. Hort. Amst. p. 115.

The first sends out many leaves from the root, the lower growing almost horizontally, spreading near the surface of the ground: the foot-stalk of each leaf divides into several other smaller, garnished with smooth rhomb-shaped leaves, which are of a bright, pale, green colour, indented on their edges. In the center of the plant arises the flower-stem, which is little more than a foot high, dividing into many branches, each being terminated by an umbel of white flowers, which are succeeded by oblong hairy seeds. It flowers in July, and the seeds ripen in autumn, soon after which the plant decays.

This plant in warm countries is biennial; the plants which rise from seeds one year, produce flowers and seeds the next, and then perish: but in England, they seldon flower till the third or fourth year from seed; but whenever the plant flowers, it always dies.

It is propagated by seeds, which should be sown on a bed of light sandy earth, either early in the autumn, or in April; and if the season prove warm and dry, the ground should be shaded in the heat of the day, and frequently refreshed with water, which is a sure method to bring up the plants; for where this is not practised, the seeds often fail, or remain long in the ground. When the plants come up, they will require no other care but to be kept clean from weeds, till the beginning of October, when they should be carefully taken up, and planted in a warm border of dry ground; and a few of them should be put into pots, that they may be sheltered under a frame in winter; for in severe frost, those which are exposed to the open air, are frequently killed; though, in moderate winters, they will live abroad without covering; but it is a secure way to preserve the species, to keep two or three plants in pots, in shelter, during the winter, lest those abroad should be destroyed. The seeds of this plant is one of the ingredients in Venice treacle.

The second sort grows naturally in Sicily, from whence I received the seeds. This is a low perennial plant, having short stiff leaves, which are very narrow: the flower-stalk rises near a foot high, which is terminated by an umbel of small white flowers, which are succeeded by small, oblong, channelled seeds. It flowers in June, and the seeds ripen in September. It is propagated by seeds, and should have a dry soil and a warm situation, where the plants will continue several years. It is a plant of little beauty or use, so is only preserved for the sake of variety.

The third sort rises with an upright stalk to the height of eight or ten feet, which at bottom is ligneous, having a purplish bark, covered with a whitish powder, which comes off when handled; the upper part of the stalk is garnished with leaves at every joint, the foot-stalks half embracing them at their base; branching out into several smaller, like those of the common Parsley, and are set with leaves like those of Lovage, but smaller, of a grey colour; the top of the stalk is terminated by an umbel of yellow flowers,

flowers, which are succeeded by oblong channelled seeds, having a thin membrane or wing on their border. It flowers in August, but hath not produced seeds in England. When any part of the plant is broken, there issues out a little thin milk of a cream colour, which hath a strong scent of Galbanum.

The fourth sort rises with a ligneous stalk about two feet high, garnished with leaves at each joint, which branch out like the former; but the small leaves or lobes are narrow and indented, like those of Bastard Hemlock. The stalk is terminated by a large umbel of small white flowers, which are succeeded by seeds like those of the former sort.

These plants are both natives of Africa. They are propagated by seeds, which should be sown in pots filled with light loamy earth, as soon as they arrive; which, if it happens toward autumn, should be plunged into a bed of tanners bark, where the heat is gone, and screened from frost in winter. In the spring the plants will come up, and by the middle of April will be fit to remove, when they should be carefully shaken out of the pots, being careful not to tear off their roots, and plant them each into a separate small pot, filled with the same earth as before; then plunge the pots into the tan again, and water them to settle the earth to the roots of the plants, and shade them from the sun in the day time, until they have taken new root; after this they must be inured gradually to bear the open air; into which they should be removed in June, and placed with other exotic plants in a sheltered situation, where they may remain till autumn, when they must be removed into the green-house, and placed where they may enjoy as much of the sun and air as possible, but defended from frost.

In winter these plants should have but little water given them, for much wet is very injurious to them: in summer, when they are exposed to the open air, they must be frequently refreshed with water in dry weather; but at no time should have too much wet, for that will rot their roots.

These plants make a pretty variety in the green-house in winter, and when they are placed abroad in the summer with other green-house plants, they have a good effect, especially when they are grown to a large size. They generally flower the third year from seeds, but their flowers are produced so late in summer, that the seeds have seldomtime to form before the cold comes on in the autumn; at least for some years past, as the seasons have been cold and moist; but in warm summers, the fourth sort will perfect seeds, if they stand in a warm sheltered situation.

The Galbanum of the shops is supposed to be procured from the third sort, for upon breaking the leaves, the juice which flows out from the wound, hath a strong odour of the Galbanum, which is a confirmation of it.

BUCKSHORN, or HARTSHORN. See Plantago.

BUDDING. See Inoculating.

BUDDLEJA. Houst. MSS. Lin. Gen. Plant. 131.

The Characters are,

*It hath a small permanent empalement, which is slightly cut at the top into five acute parts. The flower is of one leaf, bell-shaped, and quadrifid, the petal being stretched out beyond the empalement; it hath four short stamina, which are placed at the divisions of the petal, terminated by short summits. The oblong germen is situated in the center, supporting a short style, crowned by an obtuse stigma; the germen afterward becomes an oblong capsule, having two cells filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia, the flower having four stamina and but one style.

The Species are,

1. Buddleja (*Americana*) foliis ovatis serratis oppositis floribus spicatis racemosis, caule fruticoso. *Buddleja with oval sawed leaves, growing opposite, flowers growing in branching spikes, and a shrubby stalk.* Buddleja frutescens foliis conjugatis & serratis floribus spicatis luteis. Houst. MSS.

2. Buddleja (*Occidentalis*) foliis lanceolatis acuminatis integerrimis oppositis, spicis interruptis. *Buddleja with pointed spear-shaped leaves which are entire, placed opposite, and broken spikes of flowers.* Buddleja frutescens foliis oblongis mucronatis, floribus spicatis albis. Houst. MSS.

The first sort grows naturally in Jamaica, and most of the other islands in America, where it rises to the height of ten or twelve feet, with a thick woody stem, covered with a grey bark; this sends out many branches toward the top, which come out opposite; as are also the leaves so placed, which are oval, and covered with a brown hairy down. At the end of the branches the flowers are produced in long close spikes, branching out in clusters, which are yellow, consisting of one leaf, cut into four segments; these are succeeded by oblong capsules, filled with small seeds. This was sent me by Dr. Houstoun, from Jamaica, in 1730, under the title Verbasci folio minor arbor, floribus spicatis luteis tetrapetalis seminibus singulis oblongis in singulis vasculis siccis. Sloan. Cat. Jam. 139. But as this was a vague title, the doctor afterward constituted a new genus, and gave it the title of Buddleja, in memory of Mr. Buddle, an eminent English botanist.

The second sort the same gentleman sent me from Carthagena, where it grows naturally. This is the Ophioxylon Americanum, foliis oblongis mucronatis, leviter serratis bardanæ instar, subtus lanuginosis. Pluk. Alm. 270. tab. 210. fig. s. and was by Plukenet supposed to be the same with the former, which was denied by Sir Hans Sloane in his History of Jamaica.

This sort rises much taller than the first, and divides into a great number of slender branches, which are covered with a russet hairy bark, garnished with long spear-shaped leaves, ending in sharp points: these grow opposite at every joint; at the end of the branches are produced branching spikes of white flowers, growing in whorls round the stalks, with small spaces between each. It hath long, narrow, spear-shaped leaves growing between the spikes, whereas those of the other sort are naked. The leaves of this are much thinner than those of the first sort, and have scarce any down on their under side; the spikes of flowers grow more erect, so form a large loose spike at the end of every branch.

The plants grow naturally in gullies or other low sheltered spots, in the West-Indies, their branches being too tender to resist the force of strong winds, so are rarely seen in open situations.

They are propagated by seeds, which should be obtained from the countries where they naturally grow, for they do not perfect them in England. These should be brought over in their capsules or pods, for those which are taken out before they are sent seldom grow. They should be sown in small pots, filled with rich light earth, and very lightly covered with the same; for as these seeds are very small, so if they are buried deep in the ground, they perish. The pots should be plunged into a moderate hot-bed, and must be every third or fourth day gently watered, being very careful not to wash the seeds out of the ground, by too hasty watering them. If the seeds are fresh and good, the plants will come up in about six weeks, provided they are sown in the spring; and if they grow kindly, will be large enough to transplant in about two months after. Then they should be carefully separated, and each planted into a small pot, filled with light rich earth, and plunged into the hot-bed again, observing to shade them from the sun until they have taken new root, as also to refresh them with water when they require it. After the plants have taken fresh root in the pots, there should be fresh air admitted to them every day, in proportion to the warmth of the season; they must also be frequently, but moderately, refreshed with water. If the plants thrive well, they will have filled these

ſmall pots with their roots by the middle of Auguſt, at which time it will be proper to ſhift them into pots one ſize larger, that they may have time to take good root again, before the cold weather comes on. When theſe are new potted, the tan ſhould be turned over to renew the heat; and if it is wanted, ſome freſh tan muſt be added to the bed, to encourage the roots of the plants. In this bed they may remain till autumn, when they muſt be removed into the ſtove, and plunged into the tan-bed; where they muſt conſtantly remain, for they are too tender to thrive in this country, if they are not ſo treated. During the winter they muſt have but little water, and ſhould be kept warm; but in ſummer they ſhould have freſh air admitted to them conſtantly when the weather is warm, and frequently ſprinkled all over with water. With this management, the plants will flower the fourth year from ſeeds, and continue ſo to do every year after, and will make a good appearance in the ſtove.

BUGLOSSUM. See ANCHUSA, and LYCOPSIS.

BUGULA. Tourn. Inſt. R. H. 208. tab. 98. Ajuga. Lin. Gen. Plant. 624. Bugle.

The CHARACTERS are,

*It hath a ſhort permanent empalement of one leaf, which is ſlightly cut into five parts; the flower is of one leaf, of the lip kind, having an incurved cylindrical tube; the upper lip is very ſmall, erect, and bifid; the under lip or beard is large, open, and divided into three obtuſe ſegments, the middle being large, and the two ſides ſmall; it hath four erect ſtamina, two of which are longer than the upper lip, and two ſhorter, terminated by double ſummits. In the center is ſituated the four germen, ſupporting a ſlender ſtyle the length of the ſtamina, crowned by two ſlender ſtigma. The germen afterward become four naked ſeeds incloſed in the empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourteenth claſs, intitled Didynamia Gymnoſpermia, the flower having two long, and two ſhort ſtamina, and is ſucceeded by naked ſeeds.

The SPECIES are,

1. BUGULA (*Reptans*) foliis caulinis ſemiamplexicaulibus, ſtolonibus reptatricibus, *Bugle whoſe leaves half embrace the ſtalks, and ſhoots which put out roots.* Bugula. Dod. Pempt. 135. *Common Bugle.*
2. BUGULA (*Decumbens*) foliis oblongo-ovatis, caulibus decumbentibus, verticillis diſtantibus. *Bugle with oblong oval leaves, declining ſtalks, and the whorls of flowers wide aſunder.* Bugula folio maximo flore pallide cæruleo. Boerh. Ind. alt. 1. 184.
3. BUGULA (*Pyramidalis*) foliis obtuſe-dentatis, caule ſimplici. *Bugle with blunt indented leaves, and a ſingle ſtalk.* Ajuga tetragono pyramidalis. Lin. Sp. Plant. 561.
4. BUGULA (*Genevenſis*) foliis oblongis tomentoſis, calycibus hirſutis, *Bugle with oblong woolly leaves, and hairy flower-cups.* Bugula carneo flore. Cluſ. Hiſt. 2. p. 43.
5. BUGULA (*Orientalis*) villoſa, foliis ovato-dentatis ſeſſilibus, floribus reſupinatis. *Hairy Bugle with oval indented leaves, placed cloſe to the ſtalks, and inverted flowers.* Bugula orientalis villoſa flore inverſo candido cum oris purpureis. Tourn. Cor. 14.

The firſt ſort grows naturally in woods, and ſhady moiſt places, in moſt parts of England, where it ſpreads and increaſes greatly by the ſide ſhoots, which put out roots at their joints. There are two varieties of this, one with a white, and the other a pale purple flower, which I obſerved growing in ſeveral parts of Weſtmoreland; but theſe do not differ in any other reſpect than in the colour of their flowers from the common, therefore I have only mentioned them as varieties.

The common Bugle is greatly eſteemed as a vulnerary herb, and is uſed both internally and externally; it enters as an ingredient into the vulnerary decoctions of the ſurgeons, and is commended externally, applied to ulcers. This is conſtantly mixed with the vulnerary herbs, imported from Switzerland. It is titled Conſolida Media, or *Middle Conſound.* As this grows naturally wild in great plenty, ſo it is ſeldom admitted into gardens.

The ſecond ſort grows naturally on the Alps; the leaves of this are much longer than thoſe of the common Bugle, the ſtalks are weaker, and decline on every ſide, and the whorls of flowers are much ſmaller, and are ranged at a greater diſtance. This is admitted into ſome gardens for the ſake of variety, and propagates in plenty by its trailing ſtalks. This requires a moiſt ſhady ſituation.

The third ſort grows naturally in France, Germany, and other countries, but is not a native in England. This grows about four or five inches high, with a ſingle ſtalk, which is garniſhed with leaves at each joint, placed oppoſite; theſe are oval, and indented bluntly on their edges. The flowers grow in whorls round the ſtalks, and toward the top form a cloſe thick ſpike; and are of a fine blue colour.

The fourth ſort grows naturally in many parts of Europe. This approaches near to the common Bugle, but the leaves of this are woolly, and the flower-cups are very hairy, in which the chief difference conſiſts. There are two varieties of this, one with a white, and the other a red flower.

The fifth ſort was brought from the Levant by Dr. Tournefort, and is preſerved by thoſe who are curious in collecting rare plants. There are two or three varieties of it, which only differ in the colour of their flowers.

This ſort requires a little protection in winter, therefore the plants ſhould be planted in pots filled with a loamy ſoil, and placed in a ſhady ſituation in ſummer; but in the winter they muſt be removed under a common frame, where they may enjoy as much free air as poſſible in mild weather; but in hard froſt ſhould be covered, otherwiſe they will not live thro' the winter in this country, unleſs it proves very favourable.

This may be propagated by ſeeds, which ſhould be ſown ſoon after it is ripe, in a pot filled with loamy earth, and placed in a ſhady ſituation till autumn, when it ſhould be removed under a frame, where it may be ſcreened from hard froſt. In the ſpring the plants will come up, which ſhould be tranſplanted into ſeparate pots as ſoon as they are ſtrong enough to remove, and, in ſummer, placed in the ſhade, and treated as the old plants. It flowers in May, and the ſeeds ripen the latter end of July. It may alſo be increaſed by offsets, but this is a ſlow method, becauſe the plants put out but few of them, eſpecially while they are young, ſo the other method is chiefly practiſed.

All the other ſorts are hardy enough, and are eaſily multiplied by their ſide ſhoots; theſe delight in a moiſt ſhady ſituation, where they are apt to ſpread too much, eſpecially the two firſt ſorts.

BULB [*Bulbus, Lat.* of Βολβὸς, *Gr.*] Bulbous roots are of two ſorts, viz. tunicated (or coated) and ſquamous (or ſcaly.) A tunicated root conſiſts of many coats, involving each other; as in the Onion, Tulip, &c. whoſe roots, if cut through the middle, plainly ſhew the ſeveral coats. A ſquamous root conſiſts of many ſcales, lying over each other like tiles upon a houſe, or ſcales on fiſh; of this kind are the Lily, Martagon, &c.

BULBINE. See ANTHERICUM.

BULBOCASTANUM. See BUNIUM.

BULBOCODIUM. Tourn. Cor. 50. Lin. Gen. Plant. 368.

The CHARACTERS are,

*The flower hath no empalement, it is funnel-ſhaped, and compoſed of ſix petals, which are concave, having long, narrow necks, connected at the mouth, but are ſpear-ſhaped above. It hath ſix awl-ſhaped ſtamina ſhorter than the petals, and are inſerted in their middle, having incumbent ſummits. It hath an oval, blunt, three-cornered germen, ſupporting a ſlender ſtyle, crowned by three oblong erect ſtigma. The germen afterward becomes a triangular pointed capſule, having three cells, which are filled with angular ſeeds.*

This

This genus of plants is ranged in the firſt ſection of Linnæus's ſixth claſs, intitled Hexandria Monogynia, the flower having ſix ſtamina and one ſtyle.

The Species are,

1. Bulbocodium (*Alpinum*) foliis ſubulato-linearibus. Prod. Leyd. 41. *Bulbocodium with narrow awl-ſhaped leaves.* Bulbocodium Alpinum juncifolium flore unico intus albo extus ſquallide rubente. Raii Syn. Ed. 3. p. 374.
2. Bulbocodium (*Vernum*) foliis lanceolatis. Prod. Leyd. 41. *Bulbocodium with ſpear-ſhaped leaves.* Colchicum vernum Hiſpanicum. C. B. P. 69.

The firſt ſort grows naturally upon the Alps, and alſo upon Snowdon hills, in Wales. This hath a ſmall bulbous root, which is covered with a rough hairy ſkin; from which ariſes a few long narrow leaves, ſomewhat like thoſe of the Saffron, but narrower; in the middle of theſe the flower comes out, which ſtands on the top of the foot-ſtalk, growing erect, and is ſhaped like thoſe of the Crocus, but ſmaller; the foot-ſtalk riſes about three inches high, and hath four or five ſhort narrow leaves placed alternately upon it below the flower. This flowers in March, and the ſeeds are ripe in May, when it grows in a garden, but where it grows naturally it is much later.

The ſecond ſort grows naturally in Spain, but hath been long cultivated in gardens. It hath a bulbous root, ſhaped like thoſe of the Snowdrop, covered with a brown ſkin, ſending out three or four ſpear-ſhaped concave leaves, between which comes out the flower, ſtanding on a very ſhort foot-ſtalk, compoſed of ſix petals, three ſtanding on the outſide, and three within between the other; theſe, when they firſt appear, are of a pale colour, but afterward change to a bright purple; when theſe decay, they are ſucceeded by triangular ſeed-veſſels, which are full of ſmall roundiſh ſeeds. It produces the flowers about the ſame time with the firſt.

Theſe plants are propagated by offſets, in the ſame manner as other bulbous rooted flowers. The time to remove them, is ſoon after their leaves decay, but the roots may be kept out of the ground two months without prejudice at that ſeaſon. They ſhould not be removed oftener than every third year, for their roots do not multiply very faſt, ſo by ſuffering them to remain, they will flower much ſtronger, and make a greater increaſe than if they are often taken up.

The firſt ſort requires an eaſtern aſpect, for if it hath too much ſun, it will not thrive; but the ſecond ſhould have a warmer ſituation, ſo may be planted in a ſouth border, and ſhould have a freſh loamy ſoil, but not dunged. They may alſo be propagated by ſeeds, which ſhould be ſown in pots filled with freſh loamy earth in September, and the latter end of October, the pots ſhould be placed under a frame, to protect them from ſevere froſt; in the ſpring the plants will appear, when they may be removed out of the frame, and placed where they may have the morning ſun, but ſcreened from the ſouth. In very dry weather, they ſhould be refreſhed now and then with a little water, while their leaves continue green; but, when theſe decay, the pots ſhould be removed to a ſhady ſituation, where they may remain till autumn, obſerving to keep them clean from weeds. In October there ſhould be a little freſh earth laid on the ſurface of the other, and the pots placed in ſhelter again till the following ſpring, when they muſt be treated in the ſame manner as the former year, till their leaves decay; then the roots ſhould be carefully taken up, and tranſplanted into the borders of the flower-garden, treating them as the old roots; the ſpring following they will produce their flowers.

BUNIAS. Lin. Gen. Plant. 737.

The Characters are,

*The empalement is compoſed of four oblong ſpreading leaves, which fall away. The flower hath four petals, placed in form of a croſs, which are oval, and double the length of the empalement, joined at their baſe, and erect. It hath ſix ſtamina the length of the cup, two of which are oppoſite, and ſhorter than the other four, terminated by erect ſummits, which are bifid at their baſe. In the center is ſituated an oblong germen, having no ſtyle, but crowned by an obtuſe ſtigma. The germen afterward becomes an irregular, ſhort, oval pod, with four angles, one or other of which is prominent and pointed, incloſing one or two roundiſh ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifteenth claſs, intitled Tetradynamia Siliquoſa, the flowers having four long and two ſhort ſtamina, and are ſucceeded by pods.

The Species are,

1. Bunias (*Orientalis*) ſiliculis ovatis gibbis verrucoſis. Lin. Sp. Plant. 670. *Bunias with oval convex pods, having protuberances.* Crambe Orientalis dentis leonis folio erucaginis facie. Tourn. Cor. 14.
2. Bunias (*Erucago*) ſiliculis tetragonis angulis bicriſtatis. Lin. Sp. Plant. *Bunias with ſhort four-cornered pods, whoſe angles are doubly creſted.* Erucago Monſpeliaca ſiliqua quadrangula echinata. C. B. P. 99.
3. Bunias (*Cakile*) ſiliculis ovatis lævibus ancipitibus. Lin. Sp. Plant. 670. *Bunias with ſmooth oval pods, ſtanding on each ſide the ſtalk.* Eruca maritima Italica, ſiliqua haſtæ cuſpidi ſimili. C. B. P. 99.

The firſt ſort grows naturally in the Levant, from whence Dr. Tournefort ſent the ſeeds to the Royal Garden at Paris. This hath a perennial root, and an annual ſtalk. It ſends out many oblong leaves, which ſpread on every ſide near the ground, and are deeply jagged on their edges, like thoſe of the Dandelion; from between theſe ariſe the ſtalks, which grow upwards of two feet high, ſending out branches garniſhed at each joint by one oblong ſharp-pointed leaf, eared at the baſe, where they ſit cloſe to the ſtalk. The branches are terminated by long looſe ſpikes of yellow flowers, compoſed of four leaves, ſhaped like thoſe of the Cabbage; theſe are ſucceeded by ſhort, oval, rough pods, ending in a point, incloſing one round ſeed. It flowers in June, and the ſeeds are ripe in September.

The ſecond ſort grows naturally in the ſouth of France and Italy; this is an annual plant, ſending out many branches, which ſpread, and incline toward the ground; garniſhed with glaucous leaves, which are deeply divided into many ſegments, almoſt like thoſe of Swines Creſs. The flowers are produced ſingly from the wings of the leaves, toward the extremity of the branches; theſe are very ſmall, of a pale yellowiſh colour, compoſed of four petals, placed in form of a croſs, which are ſucceeded by ſhort pods, which are creſted on each ſide, containing one or two roundiſh ſeeds.

The third ſort grows naturally about Montpelier; this is alſo an annual plant, ſending out many oblong leaves near the root, which are hairy, deeply cut on each ſide, and ſpread on the ground; between theſe ariſe two or three ſtalks, which grow a foot and a half high, ſending out ſeveral ſide branches, garniſhed with oblong rough leaves, indented on their edges; the upper part of the branches are deſtitute of leaves, but have flowers placed alternately on each ſide, ſtanding on ſhort foot-ſtalks, which are purple, and compoſed of four petals; theſe are ſucceeded by oval-pointed pods, containing one or two roundiſh ſeeds; there is a variety of this with narrow leaves.

Theſe plants are all propagated by ſeed: the firſt ſort may be ſown where the plants are deſigned to remain, in the beginning of April, and when the plants come up, they ſhould be thinned, leaving them two feet aſunder, after which they will require no other care but to keep them clean from weeds. The ſecond year they will produce flowers and ſeeds, and the roots will abide many years after.

The other two ſorts muſt be ſown where they are to remain, but the beſt time is in autumn, becauſe thoſe which are ſown in the ſpring often fail, or do not come up time enough to perfect their ſeeds. Theſe require no other culture but to keep them clean from weeds, and thin the plants to one foot diſtance.

BUNIUM. Lin. Gen. Plant. 298. Bulbocaſtanum. Tourn. Inſt. 312. tab. 161. Pig Nut, or Earth Nut.

The

The Characters are,

*The great or general umbel is composed of near twenty rays or small umbels, which are short, and close together. The involucrum of the great umbel is composed of many short narrow leaves, those of the smaller are the same, but are as long as the umbels. The proper empalement of the flower is scarce discernible. The rays of the great umbel are uniform. The flowers have five heart-shaped petals which are equal, and turn inward; they have five stamina which are shorter than the petals, terminated by single summits; the oblong germen is situated below the receptacle, supporting two reflexed styles, crowned by a blunt stigma. The germen afterward becomes an oval fruit, dividing in two parts, containing two oval seeds, plain on one side, and convex on the other.*

This genus of plants is ranged in the second section of Linnæus's fifth class of plants, intitled Pentandria Digynia, the flower having five stamina and two styles.

The Species are,

1. Bunium (*Bulbocastanum*) bulbo globoso. Sauv. Monsp. 256. *Earth Nut with a globular root.* Bulbocastanum majus folio Apii. C. B. P. 162.
2. Bunium (*Creticum*) radice turbinato. *Earth Nut with a turbinated root.* Bulbocastanum Creticum radice napi-formi. Tourn. Cor.
3. Bunium (*Saxatile*) foliis tripartitis filiformibus linearibus. *Earth Nut with very narrow tripartite leaves.* Bulbocastanum minus saxatile Peucedani folio. Tourn. Inst. 312.

The first sort grows naturally in moist pastures, and in woods, in many parts of England. Of this there is a variety, supposed to be larger than that which grows commonly here, but I could never observe any essential difference between them; for in some places it is found much larger than in others, but when they have been transplanted into a garden, they have proved to be the same. This hath a tuberous solid root which lies deep in the ground, and puts out fibres from the bottom and sides. The leaves are finely cut, and lie near the ground. The stalk rises a foot and a half high, which is round, channelled, and solid, the lower part being naked; but above, where it branches out, there is one leaf placed below every branch, which are cut into finer segments than those below. The flowers are white, and shaped like those of other umbelliferous plants; the seeds are small, oblong, and when ripe are channelled. It flowers in May, and the seeds ripen in July, soon after which, the whole herb decays to the ground.

The roots of this sort are frequently dug up, and by the poorer sort of people are eaten raw, having much resemblance in taste to the Chesnut, from whence it had the title of Bulbocastanum. These roots, when boiled, are very pleasant and delicious, and are supposed to afford great nourishment. The swine are very fond of these roots, and will root them up, when they are admitted where they grow, and will soon become fat with feeding on them.

The second sort was discovered by Dr. Tournefort in the island of Crete, but it grows naturally in many other parts of the Levant. I received dried samples and seeds of this from Zant, where it grows plentifully.

The third sort I received from the Alps. This is a very low plant, seldom rising above six inches high.

These plants delight to grow among grass, so cannot be made to thrive well long in a garden.

BUPHTHALMUM. Lin. Gen. Plant. 876. Asteriscus. Tourn. Inst. R. H. tab. 285. Ox-eye.

The Characters are,

*The empalement is different in the several species. It hath a compound radiated flower, composed of hermaphrodite and female florets. The hermaphrodite florets compose the disk; these are funnel-shaped, and cut into five parts at the brim, which spread open, and have five slender stamina, which are short, terminated by cylindrical summits. In the center is situated an oval compressed germen, supporting a slender style, crowned by a thick stigma. The germen afterward becomes an oblong seed, whose border is cut into many parts; the female flowers which compose the rays (or border) are stretched out on one side like a tongue, which spreads open, and is indented at the top in three parts; these have no stamina, but a double-headed germen, supporting a slender style, crowned by two oblong stigma. The germen becomes a single compressed seed, cut on each side.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, intitled Syngenesia Polygamia superflua, the flowers having hermaphrodite and female florets, included in one common empalement, which are both fruitful.

The Species are,

1. Buphthalmum (*Helianthoides*) calycibus foliolis, foliis oppositis ovatis serratis triplinerviis caule herbaceo. Hort. Upsal. 264. *Ox-eye with a leafy empalement, oval sawed leaves placed opposite, having three veins, and an herbaceous stalk.* Chrysanthemum Scrophulariæ folio Americanum. Pluk. Alm. 99. tab. 22. fig. 1.
2. Buphthalmum (*Grandiflorum*) foliis alternis lanceolatis subdenticulatis glabris, calycibus nudis caule herbaceo. Hort. Cliff. 415. *Ox-eye with smooth spear-shaped leaves (indented below,) naked empalements, and an herbaceous stalk.* Asteroides Alpina salicis folio glabro. Tourn. Cor. 51. tab. 487.
3. Buphthalmum (*Salicifolium*) foliis alternis lanceolatis subserratis villosis calycibus nudis caule herbaceo. Hort. Cliff. 414. *Ox-eye with spear-shaped leaves placed alternate, sawed below and hairy, naked empalements, and an herbaceous stalk.* After luteus major, foliis succisæ. C. B. P. 266.
4. Buphthalmum (*Spinosum*) calycibus acutè foliosis, ramis alternis, foliis lanceolatis amplexicaulibus integerrimis caule herbaceo. Hort. Cliff. 414. *Ox-eye with acute leafy empalements, branches placed alternate, and entire leaves embracing the stalks, which are herbaceous.* Asteriscus annuus, foliis ad florem rigidis. Tourn. Inst. 497.
5. Buphthalmum (*Sessile*) floribus axillaribus calycibus foliosis, spinis terminalibus, foliis oblongis obtusis sessilibus. *Ox-eye with flowers coming from the forks of the branches, leafy empalements ending with spines, and oblong blunt leaves growing close to the branches.* Asteriscus annuus maritimus patulus. Tourn. Inst. 498.
6. Buphthalmum (*Maritimum*) calycibus obtusè foliosis pedunculatis, ramis foliis alternis, spatulatis caule herbaceo. Hort. Cliff. 414. *Ox-eye with blunt leafy empalements, having foot-stalks, alternate leaves, and an herbaceous stalk.* Asteriscus maritimus perennis patulus. Tourn. Inst. 498.
7. Buphthalmum (*Aquaticum*) calycibus obtusè foliosis sessilibus axillaribus, foliis alternis oblongis obtusis caule herbaceo. Hort. Cliff. 414. *Ox-eye with blunt leafy empalements sitting close to the forks of the stalk, oblong blunt leaves, and an herbaceous stalk.* Asteriscus annuus Lusitanicus odoratus. Boerh. Ind. alt. 105.
8. Buphthalmum (*Frutescens*) foliis oppositis lanceolatis petiolatis bidentatis caule fruticoso. Hort. Cliff. 415. *Ox-eye with spear-shaped leaves growing opposite, having foot-stalks with two teeth, and a shrubby stalk.* Asteriscus frutescens leucoii foliis sereceis & incanis. Hort. Elth. 44. tab. 38.
9. Buphthalmum (*Arborescens*) foliis oppositis lanceolatis crassis, glabris utrinque viridibus floribus pedunculatis. *Ox-eye with thick, smooth, spear-shaped leaves growing opposite, green on both sides, flowers having foot-stalks, and a tree-like stalk.* Asteriscus frutescens leucoii foliis viridibus & splendentibus. Hort. Elth. 43. tab. 38.
10. Buphthalmum (*Incanum*) foliis oppositis lineari-lanceolatis crassis incanis, floribus sessilibus caule fruticoso. *Ox-eye with thick, hoary, narrow, spear-shaped leaves placed opposite, flowers growing close to the branches, and a shrubby stalk.* Asteriscus frutescens leucoii foliis angustissimis sereceis & incanis. Ind. Hort. Chelf. 27.

The first sort grows naturally in North America. This hath a perennial root and an annual stalk: from the root there arises many stalks, in number proportional to the size of the roots; these grow upward of six

fix feet high, garniſhed at each joint with two oblong heart-ſhaped leaves placed oppoſite, which have three longitudinal veins, the baſe on one ſide being ſhorter than the other. The flowers come out at the extremity of the branches, having a leafy empalement; they are radiated, of a bright yellow colour, reſembling a ſmall Sun-flower, from whence the inhabitants of America have given it that appellation. It flowers in Auguſt, and when the autumns prove favourable, the ſeeds will ripen in England; but as it propagates eaſily by parting the roots, there are few perſons who are ſolicitous about the ſeed. The beſt time to tranſplant and part the roots, is toward the end of October, when the ſtalks begin to decay. Theſe ſhould be removed every other year, to prevent their ſpreading too far; they are very hardy, ſo will thrive in any ſituation: but as the roots are apt to extend, they are not proper for the borders of ſmall flower-gardens; but in large borders, on the ſides of rural walks, or in ſpaces between ſhrubs, they will be ornamental during their ſeaſon of flowering.

The ſecond ſort grows naturally on the Alps, as alſo in Auſtria, Italy, and the ſouth of France. This hath a perennial root, and an annual ſtalk; it grows near two feet high, with ſlender branching ſtalks, garniſhed with oblong ſmooth leaves ending in a point; the flowers grow at the extremity of the branches, which are of a bright yellow colour, radiated round their borders like thoſe of the Starwort. It flowers in June and July, and the ſeeds ripen in autumn. There are two or three varieties of this, differing in the breadth of their leaves and ſize of their flowers, but from the ſame ſeeds all theſe have been produced.

This ſort is generally propagated by parting the roots, which may be performed at the ſame time, and in the ſame manner as is directed for the firſt ſort. As this doth not ſpread ſo much as the former, a few roots may be allowed room in the borders of the flower-garden, eſpecially thoſe which have little ſun, where theſe will continue a long time in flower.

The third ſort is ſomewhat like the ſecond, but the leaves are broader and obtuſe; the ſtalks and leaves are alſo hairy, in which conſiſts their difference. This flowers at the ſame time with the former, and is propagated in the ſame manner.

The fourth ſort riſes a foot and a half high: the ſtalks divide into many branches upward; the ſide branches riſe much above the middle ſtalk, garniſhed with ſpear-ſhaped hairy leaves, placed alternately; the flowers are produced at the forks of the branches on ſhort foot-ſtalks; the empalement conſiſts of ſeven long, ſtiff, ſpear-ſhaped leaves, ending in a ſharp point; theſe ſpread out beyond the rays of the flower in form of a ſtar. The flower ſits cloſe upon the empalement, the border or rays being compoſed of many female florets, which have one ſide ſtretched out like a tongue, and indented at the end in three parts; the middle or diſk of the flower is compoſed of hermaphrodite flowers, which are tubulous, funnel-ſhaped, and ſlightly indented in five parts at the brim; they are of a bright yellow colour, and are ſucceeded by oblong compreſſed ſeeds. The plants flower in June and July, and their ſeeds ripen in September, ſoon after which the plants decay.

The ſeeds of this ſhould be ſown the beginning of April, on open borders, where they are to remain, and will require no other care, but to keep them clear of weeds, and thin them to the diſtance of a foot and a half, that their branches may have room to ſpread. If the ſeeds are ſown in the autumn, or are permitted to fall when ripe, the plants will come up ſoon after, and theſe will more certainly ripen ſeeds than the ſpring plants.

The fifth and ſeventh ſorts are alſo annual plants, which grow naturally in the ſame countries with the laſt. Theſe ſeldom grow more than one foot high in gardens, and where they are wild not ſo high, but ſend out many ſpreading alternate branches near the root: their leaves, which are oblong, blunt, and hairy, are placed alternate, growing cloſe to the branches without any foot-ſtalks; the leaves of the empalement of the fifth ſort end in a very ſharp ſpine, and are much broader at their baſe than either of the other. The flowers of all theſe have much the appearance of thoſe of the laſt, but ſome are ſmaller, and thoſe of the ſeventh ſort have an agreeable odour. They flower at the ſame ſeaſon, and are propagated in the ſame manner.

The ſixth ſort is a low perennial plant with a ſhrubby ſtalk, which rarely riſes a foot high, ſending out many ſpreading branches from the ſtem, garniſhed with hairy leaves, which are narrow at their baſe, but broad and roundiſh at their extremity; the flowers are produced at the end of the branches, they are yellow, and ſhaped like thoſe of the former ſorts, but the leaves of the empalement are ſoft and obtuſe. Theſe are ſeldom ſucceeded by ſeeds in England, but the plant is eaſily propagated by ſlips during the ſummer ſeaſon; if the cuttings are planted in a bed of freſh loamy earth, and covered with a hand-glaſs, obſerving to ſhade them from the ſun in the heat of the day, and frequently refreſhed with water, they will take root in about ſix weeks, when they ſhould be carefully taken up, and each planted in a ſeparate ſmall pot filled with freſh undunged earth, and placed in a ſhady ſituation till they have taken freſh root; after which they may be removed to a ſheltered ſituation, where they may remain till the end of October, when they muſt be removed to a frame for the winter ſeaſon, being too tender to live abroad in winter in this country; but as they only require protection from hard froſts, they will thrive better when they have a great ſhare of air in mild weather, than if confined in a green-houſe; therefore the beſt method is to place them in a common frame, where they may be fully expoſed in mild weather, but ſcreened from the froſt. This ſort grows naturally in Sicily. It flowers great part of the year, which renders it the more valuable.

The eighth ſort riſes with ſeveral woody ſtems from the root, which grow to the height of eight or ten feet, garniſhed with leaves very unequal in ſize, ſome of which are narrow and long, others are broad and obtuſe; theſe are intermixed, ſometimes coming out at the ſame joint, and often at the intermediate one; they are ſoft, hoary, and placed oppoſite. The foot-ſtalks of the larger leaves have, on their upper ſide, near their baſe, two ſharp teeth ſtanding upward, and a little higher there are generally two or three more, growing on the edge of the leaves. The flowers are produced at the ends of the branches ſingle; theſe are of a pale yellow colour, and have ſcaly empalements. It grows naturally in America. I received another ſort of this from the Havannah, which was found growing naturally there by Dr. Houſtoun, who ſent it by the following title, Chryſanthemum fruticoſum maritimum, foliis glaucis oblongis, flore luteo. Sloan. Hiſt. Jam. 1. p. 125. The leaves of this are ſhorter and thicker than thoſe of the tenth ſort, and have no teeth on their foot-ſtalks, but in other reſpects are very like it; the plants are not ſo hardy. The eighth has been long preſerved in the Engliſh gardens, and was originally brought from Virginia, as I was informed by the Biſhop of London's gardener, who raiſed it in 1696 at Fulham.

The ninth ſort grows naturally in the Bahama Iſlands, from whence I have ſeveral times received the ſeeds. This ſeldom grows much more than three feet high, ſending out many ſtalks from the root, which are ſucculent, except near the root, where they are ligneous, garniſhed with thick, ſucculent, ſpear-ſhaped leaves placed oppoſite; the flowers are produced at the end of the branches upon foot-ſtalks which are two inches long. Theſe flowers are larger than thoſe of the eighth ſort, of a bright yellow colour. They appear in July, Auguſt, and September, but often continue till the end of October.

The tenth sort grows in the Bahama islands, from whence I received the seeds. This sends out many slender stalks from the root, which rise near three feet high, garnished with long, narrow, thick, succulent leaves, which are very hoary, growing opposite, embracing the stalk at their base; the flowers are yellow, and are produced at the end of the shoots, having very short foot-stalks. These appear at the same time with those of the ninth sort.

As these three sorts do not perfect their seeds in this country, they are propagated by cuttings. They should be planted in July, when the plants have been for some time exposed to the open air, whereby their shoots will be hardened and better prepared to take root, than when they first come abroad. The cuttings should be planted in small pots filled with light loamy earth, and plunged into a very gentle warmth, observing to shade them from the sun in the heat of the day, and gently refresh them with water, but it must be given to them sparingly, for much wet will rot them. In about six weeks these will have taken root, when they must be gradually inured to bear the open air; and soon after they should be each planted in a separate small pot filled with light loamy earth, and placed in the shade until they have taken fresh root; after which they may be removed to a sheltered situation, where they may remain till the middle of October, when they must be removed in the green-house. The eighth sort being hardier than either of the other, may be placed in a common green-house; but the other two will thrive better in a warm glass-case, where they will receive more sun, and have a drier air. During the winter, they should have but little moisture, and in very mild weather they should have fresh air admitted to them. In the summer they must be placed abroad in a sheltered situation, and treated in the same manner as other exotic plants.

BUPLEUROIDES. See Phyllis.

BUPLEURUM [so called, from Βοῦς, *Bos*, and πλευρὸν, *costa*, *latus*, because it is commonly believed, that if cows eat of it, it will burst their bellies.] Lin. Gen. Plant. 291. Hare's-ear.

The Characters are,

*It is a plant with an umbellated flower; the rays of the principal umbel are thin, consisting of ten smaller umbels, which are erect and spread. The involucrum of the great umbel is composed of many oval pointed leaves, those of the small have five. The flower hath five small heart-shaped petals, which are inflexed; it hath five slender stamina, which are terminated by roundish summits. The germen is situated below the flower, supporting two small reflexed styles, crowned by a small stigma. The germen afterward becomes a roundish compressed fruit which is channelled, dividing in two parts, containing two oblong channelled seeds, convex on one side, and plain on the other.*

This genus of plants is ranged in the second section of Linnæus's fifth class, entitled Pentandria Digynia, the flower having five stamina and two styles.

The Species are,

1. Bupleurum (*Rotundifolium*) involucris universalibus nullis, foliis perfoliatis. Hort. Upsal. 64. *Hare's ear, whose greater umbel hath no involucrum, and the stalks growing through the leaves.* Perfoliata vulgatissima sive arvensis. C. B. P. 277.
2. Bupleurum (*Angulosum*) involucellis pentaphyllis orbiculatis, universali triphyllo ovato, foliis amplexicaulibus cordato-lanceolatis. Lin. Sp. Plant. 236. *Hare's-ear with the small involucrum composed of five orbicular leaves, the larger of three oval ones, and heart spear-shaped leaves embracing the stalk.* Perfoliata Alpina angustifolia major folio anguloso. C. B. P.
3. Bupleurum (*Odontitis*) involucellis pentaphyllis acutis, universali triphyllo, flosculo centrali altiore, ramis divaricatis. Lin. Sp. Plant. 237. *Hare's-ear with smaller involucrii, composed of five pointed leaves which are acute, those of the larger three-leaved, the flower in the center taller, and the branches spreading from each other.* Perfoliata minor angustifolia, Bupleuri folio. C. B. P. 277.
4. Bupleurum (*Rigidum*) caule dichotomo subnudo, involucris minimis acutis. Lin. Sp. Plant. 238. *Hare's-ear with stalks growing from the division of the branches, which have no leaves below, and a very small pointed involucrum.* Bupleurum folio rigido. C. B. P. 278.
5. Bupleurum (*Tenuissimum*) umbellis simplicibus alternis pentaphyllis subtrifloris. Lin. Sp. Plant. 238. *Hare's-ear with single umbels growing alternate, and five leaves under each three flowers.* Bupleurum angustissimo folio. C. B. P. 278.
6. Bupleurum (*Fruticosum*) frutescens, foliis obovatis integerrimis. Lin. Sp. Plant. 238. *Shrubby Hare's-ear with oblong oval leaves which are entire.* Bupleurum arborescens salicis folio. Tourn. Inst. 310. Seseli Æthiopicum frutex. Dod. Pempt. 312. *Shrubby Hartwort of Æthiopia.*
7. Bupleurum (*Difforme*) frutescens, foliis vernalibus decompositis planis incisis, æstivalibus filiformibus angulatis trifidis. Lin. Sp. Plant. 238. *Shrubby Hare's-ear, whose spring leaves are decompounded, plain, and cut, and the summer leaves are narrow, angular, and trifid.* Bupleurum frutescens foliis ex uno puncto plurimis junceis tetragonis. Burman. Afr. 195. tab. 71. fol. 1.

The first sort grows naturally upon chalky land among wheat, in several parts of England, so is seldom admitted into gardens. The leaves and seeds of this plant are used in medicine; the herb is esteemed good for dissolving scrophulous tumours, and is by some used for internal ailments, ruptures, and bruises from a fall. It is called Thoroughwax in English.

The second, third, fourth, and fifth sorts are annual. The fifth sort grows naturally in several parts of England, the others are natives of the Alps and Pyrenees; these are seldom cultivated but in botanic gardens for the sake of variety. Those who are desirous to have any of these species in their gardens, should sow their seeds in autumn, where the plants are designed to remain, for they do not bear transplanting well; and keep the plants clean from weeds, which is all the culture they require. They flower in June and July, and their seeds ripen in September.

The sixth sort hath a woody stem, which sends out many branches, so as to form a large head or bush, covered with a purplish bark, and garnished with oblong, oval, stiff leaves, which are very smooth, of a sea-green colour; the ends of the branches are terminated by umbels of yellow flowers somewhat like those of Fennel. These come out in August, but are seldom succeeded by perfect seeds in England. It grows naturally in the south of France and Italy, near the borders of the sea.

It is commonly known among gardeners by the title of Shrubby Æthiopian Hartwort, and is now propagated in the nursery-gardens for sale. This grows five or six feet high, forming a large regular bush, the leaves continuing green through the year render it more valuable. It is hardy, so will thrive in the open air, and may be intermixed with other ever-green shrubs of the same growth, in the front of taller trees, where their stems are designed to be excluded from sight. It is propagated by cuttings, which should be planted in pots filled with fresh loamy earth, and in winter sheltered under a hot-bed frame; in the spring the cuttings will put out roots, but they will not be fit to transplant till the autumn following; so the pots should be placed in a shady situation in summer, and in dry weather they must be refreshed with water. The young plants may be planted in a nursery-bed at two feet distance for a year or two to get strength, and then transplanted where they are to remain.

The seventh sort grows naturally at the Cape of Good Hope, from whence it was introduced to the gardens in Holland. This rises with a shrubby stalk to the height of five or six feet, sending out some side branches, which in the spring have their lower parts garnished with leaves composed of many small plain lobes, which are finely cut like those of Coriander, of

of a ſea-green colour, theſe leaves ſoon fall off, and the upper part of the branches are cloſely covered with long ruſh-like leaves having four angles, which come out in cluſters from each joint. The flowers grow in ſpreading umbels at the extremity of the branches, which are ſmall and of an herbaceous colour, and are ſucceeded by oblong channelled ſeeds.

This ſort is commonly propagated by cuttings, which readily take root, if they are planted in April in pots filled with light earth, and plunged into a moderate hot-bed, and when they have taken root, they ſhould be inured to the open air by degrees, and after they have obtained ſtrength, may be planted each into a ſeparate pot filled with light loamy earth, placing them in the ſhade, till they have taken freſh root, when they may be placed with other exotic plants in a ſheltered ſituation, where they may remain till the autumn, when they muſt be removed into the green-houſe, and placed with ſuch hardy plants as require a large ſhare of air in mild weather, and only require a protection from froſt.

If this plant is propagated by ſeeds, they ſhould be ſown in the autumn, ſoon after they are ripe, in pots filled with light earth, which muſt be ſheltered under a frame in winter, and in the ſpring removed to a very gentle hot-bed, which will ſoon bring up the plants; theſe muſt be inured to bear the open air by degrees, and then treated in the ſame manner as thoſe raiſed from cuttings. This plant flowers in July, and the ſeeds ripen in September.

BURMANNIA. Lin. Gen. 397. This genus was ſo titled by Dr. Linnæus, in honour to his friend Dr. Burman, profeſſor of botany at Amſterdam.

The Characters are,

*It hath a cylindrical coloured empalement of one leaf, having three longitudinal membranaceous angles, the flower hath three ſmall oblong petals, ſituated in the mouth of the empalement, it hath ſix ſmall ſtamina, the ſummits are at the mouth of the empalement, two at each; the germen is cylindrical, half the length of the empalement, ſupporting a ſlender ſtyle the length of the corolla, having three obtuſe concave ſtigma: the empalement becomes a triangular cylindrical covering to the ſeeds, opening in three valves, having three cells filled with ſmall ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's ſixth claſs, intitled Hexandria Monogynia, the flower having ſix ſtamina and one ſtyle.

The Species are,

1. Burmannia (*Diſticha*) ſpica gemina. Burm. Zeyl. 50. *Burmannia with a double ſpike of flowers.*
2. Burmannia (*Biflora*) flore gemino. Lin. Sp. 411. *Burmannia with two flowers.* Burmannia ſcapo biflorae. Flor. Virg. 36.

The firſt ſort grows naturally in Ceylon, in places covered with water moſt part of the year, the root is compoſed of many capillary fibres, from which come out ſix or eight narrow ſpear-ſhaped leaves, near two inches long, which are entire. The flower-ſtalk riſes a ſpan high, garniſhed with five or ſix narrow ſpear-ſhaped leaves which embrace it at their baſe; the ſtalk is terminated by a double ſpike of flowers ſpreading each way: theſe are garniſhed with ſmall blue flowers, included in a ſwelling ſpatha, or ſheath; theſe have each three ſhort petals, ſix ſtamina, and one ſtyle; and in its native ſoil, the empalement of the flower becomes a triangular cover to the ſeeds.

The ſecond ſort grows naturally in Virginia and Carolina, in watery places, this hath a ſtrong fibrous root, from which ariſe ſeveral oblong oval leaves, four or five inches long, which are ſmooth and entire; between theſe ariſes the foot-ſtalk of the flower, which is ſix or eight inches high, terminated by ſpikes of flowers, two growing in each ſpatha or ſheath; theſe are blue, and in their native ſoil are ſucceeded by ſmall ſeeds incloſed in the triangular empalement.

Theſe plants are very difficult to preſerve in gardens; for as they naturally grow in marſhy places, which are covered with water great part of the year, they will not thrive when planted in dry ground, and being too tender to live abroad in England, renders them very difficult to preſerve; therefore whoever is deſirous to have them, ſhould plant them in pots, which ſhould be plunged in troughs of water, ſo deep as to cover the ſurface of the mould therein about three inches. Thoſe troughs in which the firſt ſort is planted, ſhould be placed in a warm ſtove, where they ſhould conſtantly remain, being careful to ſupply the water as it may diminiſh in the troughs from time to time. The troughs in which the ſecond ſort is put, ſhould be placed in a green-houſe in winter to protect the plants from froſt, but in ſummer they may be expoſed in the open air, with this management, if carefully attended to, the plants may be preſerved, and ſometimes may be brought to produce flowers.

BURNET. See Poterium and Sanguisorba.

BURSA PASTORIS, Shepherds-pouch. This is a common weed in moſt parts of England; which propagates ſo faſt by ſeeds, as not to be eaſily cleared when they are permitted to ſhed; for there are commonly four generations of this plant from ſeeds in a year, ſo faſt does the ſeed ripen, and the plants come up; therefore it cannot be too ſoon or carefully rooted out of a garden.

BUTOMUS, [Βȣ́τομον, of βȣ̃ς, an ox, and τέμνω, to cut, ſo called, becauſe the leaves of it are ſo acute, that the tongue and lips of oxen, which are great lovers of this plant, are wounded by it, ſo that the blood iſſues forth: it is alſo called Juncus Florida, becauſe it has the leaves of a Ruſh, and produces a fine bunch of flowers.] The Flowering-Ruſh, or Water-Gladiole.

The Characters are,

*The flowers grow in a ſingle umbel, having a ſhort three leaved involucrum. The flower hath ſix roundiſh concave petals, which are alternately ſmaller and more pointed, it hath nine awl-ſhaped ſtamina, ſix of which ſurround the other, and are terminated by double lamellated ſummits; it hath ſix oblong pointed germen, ſupporting a ſingle ſtigma; the germen afterward become ſix oblong pointed capſules, having one cell filled with oblong ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's ninth claſs, intitled Enneandria Hexagynia, the flower having nine ſtamina, and ſix germen.

We know but one Species of this genus, viz.

Butomus (*Umbellatus*) Fl. Lap. 159. *The Flowering-Ruſh, or Water-Gladiole.* Juncus floridus major. C. B. P. 112. *Greater Flowering-Ruſh.*

There are two varieties of this plant, one with a roſe coloured flower, and the other with a white, but theſe are only accidental variations, therefore not to be enumerated as diſtinct ſpecies.

The Roſe coloured ſort is pretty common in ſtanding waters, in many parts of England; the other is a variety of this, though leſs common with us near London. Theſe plants may be propagated in boggy places, or by planting them in ciſterns, which ſhould be kept filled with water, that ſhould have about a foot thickneſs of earth in the bottom, into which the roots ſhould be planted, or the ſeed ſown as ſoon as they are ripe; theſe, though common plants, yet produce very pretty flowers, and are worth propagating for variety, eſpecially if in any part of the garden there ſhould be conveniency for an artificial bog, or where there are ponds of ſtanding water, as is many times the caſe, and perſons are at a loſs what to plant in ſuch places, that may appear beautiful; whereas, if theſe, and a few more wild plants, which naturally grow in ſuch places, were taken into the garden, they would have a very good effect in diverſifying the ſeveral parts thereof.

There is another ſpecies, or at leaſt a variety, of this plant, which is found growing near London, intermixed with the common ſort, but not half ſo large either in leaf, ſtalk, or flower; but in other reſpects ſo like it, as to render it very difficult to be diſtinguiſhed from it, for which reaſon I have not enumerated it; though many of the plants ſettled in the

river Thames, close by the Chelsea garden, where they continued their usual small size many years.

BUXUS, the Box Tree.

The CHARACTERS are,

*It hath male and female flowers on the same plant; the male flowers have a three-leaved, and the female a four-leaved empalement, which are concave. The male flowers have two, and the female three concave petals, which are larger than the empalement. The male flowers have four upright stamina, terminated by double erect summits with a rudiment of a germen, but no style or stigma: the female flowers have roundish, blunt, three-cornered germen, supporting three very short styles, crowned by obtuse prickly stigma. The empalement afterward becomes a roundish capsule, shaped like an inverted pottage pot, opening in three cells, each having two oblong seeds, which are cast forth by the elasticity of the pod when ripe.*

This genus of plants is ranged in the fourth section of Linnæus's twenty-first class, intitled Monœcia Tetrandria, there being male and female flowers on the same plant, and the male flowers having four stamina.

The SPECIES are.

1. BUXUS (*Arborescens*) arborescens, foliis ovatis. *Tree Box with oval leaves.* Buxus arborescens. C. B. P. 232.
2. BUXUS (*Angustifolia*) arborescens foliis lanceolatis. *Tree Box with spear-shaped leaves.* Buxus angustifolia. Raii Syn. 445. *Narrow-leaved Box.*
3. BUXUS (*Suffruticosa*) humilis foliis orbiculatis. *Dwarf Box with round leaves.* Buxus humilis. Dod. pempt. 782. *Dwarf or Dutch Box.*

These are three certainly distinct species. The two sorts of Tree Box have been frequently raised from seeds, and constantly produced plants of the same kind from those the seeds were taken from; and the Dwarf Box will never rise to any considerable height with any culture, nor have I ever seen this sort flower, where the plants have been encouraged to grow many years in the greatest luxuriancy. There are two or three varieties of the first sort, which are propagated in the gardens, one with yellow, and the other white striped leaves. The other hath the tops of the leaves only marked with yellow, which is called Tiped Box.

The first and second sorts grow in great plenty upon Box-hill, near Darking in Surry, where were formerly large trees of these kinds; but of late they have been pretty much destroyed, yet there are great numbers of the trees remaining, which are of a considerable bigness. The wood of this tree is very useful for turners, engravers, and mathematical instrument-makers, the wood being so hard, close, and ponderous, as to sink in water, which renders it very valuable for divers utensils.

All the varieties of the tree or large Box are proper to intermix in clumps of Evergreens, &c. where they add to the variety of such plantations; these may be propagated by planting the cuttings in autumn in a shady border, observing to keep them watered until they have taken root, when they may be transplanted into nurseries, till they are fit for the purposes intended. The best season for removing these trees is in October, though indeed, if care be used to take them up with a good ball of earth, they may be transplanted almost at any time, except in summer. These trees are a very great ornament to cold and barren soils, where few other things will grow; they may also be propagated by laying down the branches, or from seeds: the last being the best method to have them grow to be large, the seeds must be sown soon after they are ripe in a shady border, which must be duly watered in dry weather.

The Dwarf kind of Box is used for bordering flower-beds or borders; for which purpose it far exceeds any other plant, it being subject to no injuries from cold or heat, and is of long duration, is very easily kept handsome, and, by the firmness of its rooting, keeps the mould in the borders from washing into the gravel-walks, more effectually than any plant whatever. This is increased by parting the roots, or planting the slips; but as it makes so great an increase of itself, and so easily parts, it is hardly worth while to plant the slips that have no roots. It is now become so common, that it may be purchased from the nurseries at a cheap rate.

The manner of planting this in edgings, &c. is so well understood by every working gardener, that it would be needless to mention any thing of that kind here.

BYTTNERIA. See BASTERIA.

# C.



CAAPEBA. See CISSAMPELUS.

CABBAGE. See BRASSICA.

CABINET, in a garden, is a conveniency which differs from an arbour, in this, that an arbour or summer-house is of great length, and arched over head in the form of a gallery; but a cabinet is either square, circular, or in cants, making a kind of salon, to be set at the ends, or in the middle of a long arbour.

CACALIANTHEMUM. See CACALIA.

CACALIA, Foreign Coltsfoot.

The CHARACTERS are,

*It hath compound flowers which are included in one common, cylindrical, scaly empalement: the flowers are tubulous and funnel-shaped, cut at the top into five parts which stand erect; these have each five short slender stamina, terminated by cylindrical summits. The germen is crowned with down, supporting a slender style, crowned by two oblong recurved stigma; the germen afterward becomes a single oblong seed, crowned with long down.*

This genus of plants is ranged in the first section of Linnæus's twenty-first class, intitled Syngenesia polygamia æqualis; these have all hermaphrodite flowers which are fertile.

The SPECIES are,

1. CACALIA (*Alpina*) foliis reniformibus acutis denticulatis calycibus subtrifloris. Gouan. Monsp. 429. *Cacalia with kidney-shaped leaves which are sharply indented, and generally three flowers in each empalement.* Cacalia foliis crassis hirsutis. C. B. P. 197.
2. CACALIA (*Glabra*) foliis cutaneis acutioribus & glabris. C. B. P. 198. *Cacalia with smooth leaves, having acute points.* Cacalia glabro folio. Clus. Hist. 2. p. 115.
3. CACALIA (*Suaveolens*) caule herbaceo foliis hastato-sagittatis denticulatis, petiolis supernè dilatatis. Hort. Upsal. 254. *Cacalia with an herbaceous stalk, spear-shaped indented leaves, and the upper side of the foot-stalk spreading.* Cacalia Americana procerior, folio triangulari per basin auriculato, floribus albis. Edit. prior.

4. Cacalia (*Atriplicifolia*) caule herbaceo, foliis subcordatis dentato-sinuatis, calycibus quinquefloris. Lin. Sp. Plant. 835. *Cacalia with an herbaceous stalk, heart-shaped sinuated leaves, and five florets in each empalement.* Nardus Americana procerior, foliis cæsiis. Pluk. Alm. 251.

5. Cacalia (*Ficoides*) caule fruticoso, foliis compressis carnosis. Lin. Sp. Plant. 834. *Cacalia with a shrubby stalk, and fleshy compressed leaves.* Senecio Africanus arborescens, ficoidis folio & facie. Com. Rar. Plant. 40.

6. Cacalia (*Kleinia*) caule fruticoso composito, foliis lanceolatis planis, petiolorum cicatricibus obsoletis. Lin. Sp. Plant. 834. *Cacalia with a compound shrubby stalk, plain spear-shaped leaves, and the foot-stalks leaving scars.* Cacalianthemum folio nerii glauco. Hort. Elth. 61. tab. 54.

7. Cacalia (*Papillaris*) caule fruticoso obvollato spinis petiolaribus truncatis. Lin. Sp. Plant. 834. *Cacalia with a shrubby stalk, guarded on every side with broken rough foot-stalks.* Cacalianthemum caudice papillari. Hort. Elth. 63. tab. 55.

8. Cacalia (*Ante-euphorbium*) caule fruticoso, foliis ovato-oblongis, petiolis basi linea triplici deductis. Lin. Sp. Plant. 834. *Cacalia with a shrubby stalk, oblong oval leaves, and three lines connected to the base of the foot-stalk.* Kleinia foliis carnosis planis ovato-oblongis. Hort. Cliff. 395.

9. Cacalia (*Sonchifolia*) caule herbaceo, foliis lyratis amplexicaulibus dentatis. Lin. Sp. 1169. *Cacalia with an herbaceous stalk, and lyre-shaped indented leaves embracing the stalk.*

10. Cacalia (*Lutea*) caule herbaceo, foliis quinquepartitis acutis subtus glaucis, floribus terminalibus pedunculis longissimis. *Cacalia with an herbaceous stalk, leaves divided into five acute parts, glaucous on their under side, and flowers with long foot-stalks terminating the stalks.*

The first sort grows naturally in Austria, and the Helvetian mountains, but is frequently preserved in curious gardens for the sake of variety. This hath a fleshy root which spreads in the ground, from which spring up many leaves, standing on single foot-stalks, shaped like those of Ground Ivy, but of a thicker texture, of a shining green on their upper side, but white on their under; between these arise the foot-stalk, which is round, branching toward the top, and grows a foot and a half high; under each division of the stalk is placed a single leaf, of the same shape with those below, but much smaller; the branches are terminated by purplish flowers, growing in a sort of umbel. These are succeeded by oblong seeds, crowned with down.

The second sort hath the appearance of the first, but the leaves are almost heart-shaped, pointed, and sharply sawed on their edges, and on both sides very green; the stalks rise higher; the leaves upon the stalks have much longer foot-stalks than those of the first. The flowers of this are of a deeper purple colour. This grows naturally on the Alps. They flower toward the end of May, or the beginning of June.

The third sort grows naturally in North America. This hath a perennial creeping root, which sends out many stalks, garnished with triangular spear-shaped leaves, sharply sawed on their edges, of a pale green on their under side, but a deep shining green above, placed alternately. The stalks rise to the height of seven or eight feet, and are terminated by umbels of white flowers, which are succeeded by oblong seeds crowned with down. It flowers in August, and the seeds ripen in October. This plant multiplies greatly by its spreading roots, and also by the seeds, which are spread to a great distance by the wind, the down which adheres to them being greatly assisting to their conveyance. The roots of this plant, which have been cast out of the Chelsea garden, have been carried by the tides to a great distance, where they have lodged on the banks of the river, and fastened themselves to the ground, and have increased so much, as that in a few years, it may appear as a native of this country. The stalks decay in autumn, and new ones arise in the spring.

The fourth sort is a native of America, but has been many years in some curious gardens. This hath a perennial root, and an annual stalk. The root is composed of many fleshy spreading tubers, sending out several strong stalks in the spring, which rise four or five feet high, garnished with roundish heart-shaped leaves, greatly indented on their edges, of a sea-green on their under side, but darker above, placed alternately the length of the stalks, which are terminated by umbels of yellowish herbaceous flowers, appearing in July and August, and are succeeded by seeds like those of the former sort, which ripen in October.

The first and second sorts are propagated by parting their roots, for they seldom produce good seeds in England. The best time to transplant and part their roots is in autumn. They require a loamy soil and a shady situation.

The third and fourth sorts propagate in great plenty, both by their spreading roots, and also their seeds. The roots should be transplanted in autumn, and require a moist soil and an open situation. If the seeds are permitted to scatter, the plants will come up in the spring without any care.

The fifth sort grows naturally at the Cape of Good Hope. This rises with strong round stalks to the height of seven or eight feet, which are woody at bottom, but soft and succulent upward, sending out many irregular branches, garnished more than half their length with thick, taper, succulent leaves, a little compressed on two sides, ending in points, covered with a whitish glaucous farina, which comes off when handled. These, when broken, emit a strong odour of turpentine, and are full of a viscous juice; at the extremity of the branches the flowers are produced in small umbels; they are white, tubulous, and cut into five parts at the top. The stigma which crowns the style is of a dark purple colour, and stands erect above the tube. The stamina are much shorter, and surround the oblong germen, which is situated in the center of the tube, and is crowned by long, white, hairy down. The germen afterward becomes an oblong seed, with the same down adhering to it; but these do not ripen in England. Some of the noblemen in France have the leaves of this plant pickled; in doing of which, they have a contrivance to preserve the white farina with which they are covered, and thereby render them very beautiful.

This sort is easily propagated by cuttings during the summer months: these should be cut from the plants and laid to dry a fortnight, that the wound may be healed over before they are planted. Most people plunge the pots, in which these are planted, into a moderate hot-bed, to forward their putting out roots; but if they are planted in June or July, they will root as well in the open air. I have frequently had the branches broken off by accident, and fallen on the ground, which have put out roots without any care. These branches may be kept six months out of the ground, and will take root if planted. This should have a light sandy earth, and in winter be placed in an airy glass-case, where they may enjoy the sun and air in mild weather, but must be protected from frost. During the winter season, the plants must have but little water; and in summer, when they are placed in the open air, it should not be given them too often, nor in great quantity, but treated like the Ficoides, and other succulent plants from the same country. It flowers usually in autumn, but is not constant to any season.

The sixth sort grows naturally in the Canary Islands, but has been long an inhabitant in the English gardens. This rises with a thick fleshy stem, divided at certain distances, as it were, in so many joints; each of these divisions swell much larger in the middle than they do at each end; the stalks divide into many irregular branches of the same form, which, toward their extremities, are garnished with long, narrow, spear-shaped leaves, of a glaucous colour, standing all round the stalks without order. As these fall

off, they leave a ſcar at the place, which always remains on the branches. The flowers are produced in large cluſters, at the extremity of the branches, which are tubulous, and of a faint Carnation colour. They appear in Auguſt and September, but continue great part of October, and are not ſucceeded by ſeeds in this country. There have been ſtones and foſſils dug up at a great depth in ſome parts of England, which have very perfect impreſſions of this plant upon them; from whence Dr. Woodward has ſuppoſed, the plants were lodged there at the univerſal deluge; and finding the impreſſions of many other plants and animals, which are natives of thoſe iſlands, he concludes that the waters flowed hither from the ſouth-weſt.

This plant has been called Cabbage-tree by the gardeners, I ſuppoſe from the reſemblance which the ſtalks of it have to that of the Cabbage: others have titled it Carnation-tree, from the ſhape of the leaves, and colour of the flowers.

It is propagated by cuttings, in the ſame manner as the former ſort, and the plants require the ſame culture; but muſt have a dry warm glaſs-caſe in winter, and very little water, being very ſubject to rot with wet. In ſummer they muſt be placed in the open air, in a warm ſheltered ſituation, and in very dry weather refreſhed moderately with water. With this management the plants will flower annually, and grow to the height of eight or ten feet.

The ſeventh ſort reſembles the ſixth in its form and manner of growth, but the leaves are narrower and more ſucculent. Theſe do not fall off entire like the other, but break off at the beginning of the foot-ſtalk, which are very ſtrong and thick; and always continue, ſo that the main ſtalk of the plant, and the lower part of the branches, which are deſtitute of leaves, are ſet round on every ſide with theſe truncated foot-ſtalks. This ſort hath not as yet produced any flowers in England. It is propagated in the ſame manner as the two former ſorts, from cuttings, and the plants muſt be treated as hath been directed for the fifth ſort, but require to be kept drier, both in winter and ſummer; therefore, in very wet ſeaſons, the plants ſhould be ſheltered from hard rains, which often cauſe them to rot, when they are expoſed thereto; but they require the open air in ſummer. This ſort grows naturally at the Cape of Good Hope.

The eighth ſort has been long preſerved in the Engliſh gardens, and was generally titled Ante-euphorbium, ſuppoſing it to have a contrary quality to the Euphorbium. This riſes with many ſucculent ſtalks from the root, as large as a man's finger, which branches out upward, into many irregular ſtalks of the ſame form, but ſmaller, garniſhed with flat, oblong, ſucculent leaves, placed alternately round the branches; under each foot-ſtalk there are three lines or ribs, which run longitudinally through the branches joined together. This ſort very rarely flowers in Europe, but is propagated by cuttings in the ſame manner as the fifth, and is equally hardy. It muſt have very little wet, eſpecially in winter, and requires a dry, ſandy, poor ſoil.

The ninth ſort grows naturally in Ceylon, China, and alſo in the Spaniſh Weſt-Indies, from whence I received the ſeeds. This ſort ſeldom continues longer than to ripen its ſeeds. The ſtalk riſes near two feet high, branching a little toward the top; the leaves are cut on their ſides, and ſinuated ſomewhat like thoſe of Muſtard, ſitting cloſe to the ſtalks, which are terminated by flowers formed almoſt in an umbel; theſe are in ſome plants yellow, and in others purple; they are ſmall, and are ſucceeded by oblong oval ſeeds, having a feathery down. It flowers in July, and the ſeeds ripen in September, ſoon after which the plant decays.

This is propagated by ſeeds, which, if ſown in the autumn ſoon after they are ripe in a pot, and plunged into the tan-bed in the ſtove, will more certainly ſucceed than thoſe ſown in the ſpring; but where there is not ſuch conveniency, the ſeeds ſhould be ſown on a hot-bed in the ſpring, and when the plants are fit to remove, they ſhould be planted on another hot-bed to bring them forward, ſhading them till they have taken new root, after which air ſhould be daily admitted to them in proportion to the warmth of the ſeaſon. When the plants have acquired ſtrength, they ſhould be planted in pots, and either plunged into a moderate hot-bed under a deep frame, or placed in a glaſs-caſe, where they will flower and perfect their ſeeds.

The tenth ſort grows naturally at St. Helena, from whence I received the plants: the roots of this ſort ſpread and increaſe under the ſurface, ſo is eaſily propagated by parting the roots; the leaves ariſe immediately from the root, having very ſhort foot-ſtalks; theſe are cut into five or ſix long acute ſegments almoſt to the midrib, the ſegments are alſo acutely cut on their ſides in two or three places: the under ſide of the leaves are glaucous, their upper ſide of a dark green. The flower-ſtalk ariſes between the leaves immediately from the roots; this is naked, about eight inches high, terminated by ſix or eight yellow compound flowers ſtanding on long foot-ſtalks, almoſt umbellatim; the flowers are ſucceeded by oblong ſeeds, which rarely ripen in England.

As this plant increaſes ſo faſt by its root, there is little want of the ſeeds; therefore the roots may be parted either the beginning of September, or the latter end of March, and ſhould be planted in pots filled with light earth, and plunged into the tan-bed in the ſtove, where it ſhould be conſtantly kept, being too tender to thrive elſewhere in this climate.

CACAO. Tourn. Inſt. R. H. 660. Theobroma. Lin. Gen. 806. The Chocolate-nut.

The Characters are,

*The empalement is compoſed of five ſpear-ſhaped leaves, which ſpread open. The flower hath five petals, which are irregularly indented, and ſpread open; it hath five erect ſtamina, which are as long as the petals, terminated by pointed ſummits. In the center is placed the oval germen, ſupporting a ſingle ſtyle, the length of the ſtamina, crowned by an erect ſtigma. The germen afterward becomes an oblong pod, ending in a point; which is woody, warted, and divided into five cells, which are filled with oval, compreſſed, fleſhy ſeeds.*

This genus of plants was conſtituted by father Plumier, who communicated the characters, which he had drawn in America, to Dr. Tournefort, who has inſerted it in the Appendix to his Inſtitutions. Dr. Linnæus has joined this to the Guazuma of Plumier, under the title of Theobroma; but as the fruit of theſe plants are very different from each other, I ſhall keep them under different genera.

We have but one Species of this plant, which is,

Cacao. Cluſ. Exot. *The Chocolate-nut-tree.*

This tree is a native of America, and is found in great plenty in ſeveral places between the tropics, but particularly at Caracca and Carthagena, on the river Amazons, in the iſthmus of Darien, at Honduras, Guatimala, and Nicaragua. At all theſe places, it grows naturally without culture; but it is cultivated in many of the iſlands which are poſſeſſed by the French and Spaniards, and was formerly planted in ſome of the iſlands which are in the poſſeſſion of the Engliſh; but it has been neglected for many years paſt, ſo that at preſent it is ſo ſcarce in thoſe places, that the Engliſh are ſupplied with it by the French and Spaniards, who make the inhabitants pay them a good price for it; and as there is a great quantity of it conſumed in England, conſequently it muſt make an alteration in the balance of trade greatly to the prejudice of the Engliſh; which might be eaſily remedied, if the planters in our colonies were but the leaſt induſtrious; ſince, as it formerly grew on thoſe iſlands, ſo as to produce not only a ſufficient quantity for their own conſumption, but to ſupply Europe with great quantities, there can be no objection to the planting it in thoſe iſlands again, eſpecially in thoſe ſituations where the ſugar canes do not thrive to advantage.

I ſhall therefore ſubjoin the beſt account of this plant, and the culture which it requires in thoſe countries, with the profits which have ariſen from it to thoſe who have planted ſome of theſe trees of late years, by way of experiment, in order to excite others to follow their example; and ſhall afterward give directions for cultivating it in England, by way of curioſity.

In making a plantation of Chocolate-trees, you muſt firſt be very careful in the choice of the ſituation, and the ſoil, otherwiſe there will be ſmall hopes of ſucceſs. As to the ſituation, it ſhould be in a place where the trees may be protected from ſtrong winds, to which if they are expoſed, they will ſoon be deſtroyed: ſo that in ſuch places where torrents of water have waſhed away the earth ſo as to leave broad and deep furrows (which the inhabitants of thoſe iſlands call gullies,) theſe trees will thrive exceedingly: and as theſe are very frequently to be found in thoſe iſlands, and many of them are of large extent, and not much cultivated, it may be a great improvement to ſome eſtates, which, at preſent, are of ſmall value. The ſoil in theſe gullies is generally rich and moiſt, which is what theſe trees require; ſo that they will make great progreſs in theſe places, as hath been experienced by thoſe perſons, who have lately made trials of the plants in theſe ſituations; but where there are not a ſufficient number of theſe gullies, choice ſhould be made of a ſituation which is well ſheltered by large trees; or, if there are not trees already grown, there ſhould be three or four rows planted round the ſpot which is deſigned for the Chocolate-trees, of ſuch ſorts which are of quickeſt growth; and within theſe rows there ſhould be ſome Plantain-trees, planted at proper diſtances, which being very quick of growth, and the leaves very large, will afford a kindly ſhelter to the young Chocolate-trees placed between them.

The Chocolate-trees which are cultivated, ſeldom grow to more than fourteen or fifteen feet in height, nor do they ſpread their branches very wide; ſo that if the Plantain-trees are placed in rows, about twenty four feet aſunder, there will be room enough for two rows of Chocolate-trees between each row of Plantains; and if they are placed at ten feet diſtance in the rows, it will be ſufficient room for them. Thoſe trees which are found wild in uncultivated places, are generally of much larger growth, which may be occaſioned by the other trees, amongſt which theſe are found growing; for, being protected from the winds by thoſe, they are not ſo much in danger therefrom, as thoſe which are cultivated: and the other trees cloſely ſurrounding them, will naturally draw them up to a greater height: however, that is not a deſirable quality in theſe trees; for the lower they are, the better the fruit may be gathered without hurting the trees, and the leſs they are expoſed to the injuries of the weather; ſo that the inhabitants never deſire to have their trees above twelve or fourteen feet high.

The ſoil upon which theſe trees thrive to moſt advantage, is a moiſt, rich, deep earth; for they generally ſend forth one tap root, which runs very deep into the ground, ſo that wherever they meet with a rocky bottom near the ſurface, they ſeldom thrive, nor are they of long continuance; but in a rich, deep, moiſt ſoil, they will produce fruit in pretty good plenty the third year from ſeed, and will continue fruitful for ſeveral years after.

Before the plantation is begun, the ground ſhould be well prepared by digging it deep, and clearing it from the roots of the trees, and noxious plants, which, if ſuffered to remain in the ground, will ſhoot up again after the firſt rain, and greatly obſtruct the growth of the plants; ſo that it will be almoſt impoſſible to clear the ground from thoſe roots, after the Chocolate plants are come up, without greatly injuring them.

When the ground is thus prepared, the rows ſhould be marked out by a line, where the nuts are to be planted, ſo as that they may be placed in a quincunx order, at equal diſtance every way, or at leaſt that the Plantain-trees between them may form a quincunx, with the two rows of Chocolate-trees, which are placed between each row of them.

In making a plantation of Chocolate-nut-trees, the nuts muſt be planted where the trees are to remain; for if the plants are tranſplanted, they ſeldom live; and thoſe which ſurvive it, will never make thriving trees; for, as I before obſerved, theſe trees have a tender tap root, which, if broke, or any way injured, the tree commonly decays.

The nuts ſhould always be planted in a rainy ſeaſon, or at leaſt when it is cloudy weather, and ſome hopes of rain falling ſoon after. As the fruit ripens at two different ſeaſons, viz. at Midſummer and at Chriſtmas, the plantation may be made at either of thoſe; but the chief care muſt be to chooſe ſuch nuts as are perfectly ripe and ſound, otherwiſe the whole trouble and expence will be loſt. The manner of planting the nuts is, to make three holes in the ground, within two or three inches of each other, at the place where every tree is to ſtand; and into each of theſe holes ſhould be one ſound nut planted about two inches deep, covering them gently with earth. The reaſon for putting in three nuts at every place is, becauſe they ſeldom all ſucceed; or, if moſt of them grow, the plants will not be all equally vigorous; ſo that when the plants have had one year's growth, it is very eaſy to draw up all the weak unpromiſing plants, and leave the moſt vigorous; but in doing this, great care ſhould be had to the remaining plants, ſo as not to injure or diſturb their roots in drawing the other out.

It is very proper to obſerve, that the Chocolate-nuts will not retain their growing faculty long after they are taken from the trees, ſo that there is no poſſibility of tranſporting them to any great diſtance for planting; nor ſhould they be kept long out of the ground, in the natural places of their growth. There are ſome authors who have written the hiſtory of this tree, and diſtinguiſh three different ſorts of the nuts, from the colour of their ſkins, one of which is of a whitiſh green colour, one of a deep red, and the third of a red and yellow colour; but theſe are not ſpecifically different, but all ariſe from ſeeds of the ſame tree, as is the caſe of our Filberts, which differ in the colour of their ſkins, but are of the ſame colour within, and have the ſame taſte. There are others, who would diſtinguiſh theſe nuts by their ſize and form, ſome being large and thick, others almoſt as flat as Beans; but theſe differences, I have been credibly informed, ariſe from ſome accident, as thoſe trees which are young and vigorous, and grow upon a deep rich ſoil, will always produce larger and better nouriſhed fruit, than thoſe which ſtand on a ſhallow dry ground, and are unthriving trees: as will alſo the age of a tree make a great alteration in the ſize of the fruit; for old trees are generally obſerved to produce ſmaller and flatter nuts than thoſe which are young, or than the ſame trees did bear while they were vigorous.

When the Chocolate-trees firſt appear above ground, they are very tender, and ſubject to great injuries from the ſtrong winds, the ſcorching ſun, or great droughts, for which reaſon the planters are obliged to guard againſt all theſe enemies, firſt, by making choice of a ſheltered ſituation, or at leaſt by planting trees to form a ſhelter; and, if poſſible, to have the plantation near a river, for the conveniency of watering the plants the firſt ſeaſon, until they have made ſtrong roots, and are capable of drawing their nouriſhment from ſome depth in the earth, where they meet with moiſture. But in order to ſhelter the plants from the ſcorching rays of the ſun, they generally plant two rows of Caſſada between each row of Chocolate-trees, which will grow about ſeven or eight feet high, and ſcreen the young plants from the violence of the ſun the firſt ſeaſon; after which time, they will be in leſs danger of injury therefrom;

and the following season, when the Cassada is taken up for use, the ground should be worked between the young plants, being very careful not to injure their roots by this operation. This method of planting the Cassada between the young Chocolate-trees, is of great advantage to the planter; for when the roots of the Cassada are taken up for use, it will defray the expence of keeping the ground clean from weeds, without which the young plants will come to nothing. The Plantains also, which will be fit to cut in about twelve months after planting, will defray the whole expence of preparing the ground, so that the produce of the Chocolate-trees will be neat profit; for as the Plantains produce fruit and decay, they will be succeeded by suckers, which will produce fruit in eight months after; whereby there will be a continual supply of food for the negroes, which will more than pay for keeping the ground wrought, and clear from weeds, until the Chocolate-trees begin to produce fruit, which is generally the third year after planting.

The planters usually set the Plantain-trees two or three months before the Chocolate-nuts are ripe, that they may be large enough to afford shelter to the young plants when they come up; and the Cassada is always planted a month or six weeks before the Chocolate-nuts, for the same reason. Some people plant Potatoes, others Cucumbers and Melons, or Water Melons, between the rows of Chocolate plants; which, they say, will prevent the weeds from rising to injure the young plants; for as all these trail on the ground, they occupy the whole surface, and prevent the weeds from growing: but where this is practised, it should be done with great caution, lest, by being over-covetous, you injure the young Chocolate-nuts so much, that they may never recover it; therefore great care should be taken to reduce the shoots of these plants, whenever they approach the Chocolate-trees; otherwise they will soon greatly injure, if not totally destroy them.

In about seven or eight days after the Chocolate-nuts are planted, the young plants will begin to appear above ground; when they should be carefully looked over, to see if any of them are attacked by insects; in which case, if the insects are not timely destroyed, they will soon devour all the young plants; or if there should be any weeds produced near the plants, they should be carefully cut down with a hoe; in doing which, great care should be taken that neither the tender shoot, nor the rind of the bark are injured. About twenty days after the plants have appeared, they will be five or six inches high, and have four or six leaves, according to the strength of the plants. These leaves are always produced by pairs, opposite to each other, as are also the branches; so that they make very regular handsome heads, if they are not injured by winds. In ten or twelve months they will be two feet and a half high, and have fourteen or sixteen leaves. By this time the Cassada, which was planted between the rows of Chocolate plants, will have large roots fit for use, therefore should be taken up; and the ground being then wrought over again, will greatly encourage the young plants.

In two years time the plants will have grown to the height of three feet and a half, or sometimes four feet, many of which will begin to flower; but the careful planters always pull off all these blossoms; for if they are permitted to remain to produce fruit, they will so much weaken the trees, that they seldom recover their strength again, so as to become vigorous. When these plants are two years and a half old, they will produce flowers again, some of which are often left to bear fruit; but the most curious planters pull off all these, and never leave any to produce fruit until the third year; and then but a few, in proportion to the strength of the trees; by which method, their trees always produce larger and better nourished fruit, than those which are suffered to bear a larger quantity, and will continue much longer in vigour. The fourth year they suffer their trees to bear a moderate crop, but they generally pull off some flowers from those trees which are weak, that they may recover strength before they are too old.

From the time when the flowers fall off, to the maturity of the fruit, is about four months. It is easy to know when the fruit is ripe by the colour of the pods, which become yellow on the side next the sun. In gathering the fruit, they generally place a negro to each row of trees; who, being furnished with a basket, goes from tree to tree, and cuts off all those which are ripe, leaving the others for a longer time to ripen. When the basket is full, he carries the fruit, and lays it in a heap at one end of the plantation; where, after they have gathered the whole plantation, they cut the pods lengthways, and take out all the nuts, being careful to divest them of the pulp which closely adheres to them; and then they carry them to the house, where they lay them in large casks, or other vessels of wood, raised above ground, and cover them with leaves of the Indian Reed and mats, upon which they lay some boards, putting some stones thereon to keep them down close, in order to press the nuts. In these vessels the nuts are kept four or five days; during which time, they must be stirred and turned every morning; otherwise they will be in danger of perishing from the great fermentation they are usually in. In this time they change from being white to a dark red or brown colour. Without this fermentation, they say the nuts will not keep; but will sprout, if they are in a damp place, or shrivel and dry too much, if they are exposed to heat.

After the nuts have been thus fermented, they should be taken out of the vessels and spread on coarse cloths, where they may be exposed to the sun and wind; but at night, or in rainy weather, they must be taken under shelter, otherwise the damp will spoil them. If the weather proves fair, three days time will be long enough to dry them, provided they are carefully turned from time to time, that they may dry equally on every side. When they are perfectly dry, they may be put up in boxes or sacks, and preserved in a dry place until they are shipped off, or otherwise disposed of. The fresher these nuts are, the more oil is contained in them; so that the older they are, the less they are esteemed.

These trees do not produce their fruit on the young branches, or at their extremities, as most other trees do; but from the trunk, and the larger branches, come out the buds for flowers and fruit. While the trees are young, they do not produce their fruit in great plenty; for before the trees are eight years old, they reckon it a good crop to have twenty-eight or thirty pods on each tree at one gathering, especially that at Midsummer; which is always a much worse crop than the Christmas season, which is occasioned by the much greater drought of the spring; for the autumns being the rainy seasons, the Chocolate-trees produce a much greater quantity of fruit. When the trees are full grown and vigorous, they will sometimes produce two hundred, or two hundred and forty pods at one season; which will make ten or twelve pounds of Chocolate, when dried; so that it is a very profitable commodity, and can be managed with very little charge, when compared with sugar. I have been credibly informed by a person of great worth and integrity, who resided some years in America, that he has seen as much Chocolate gathered from one tree in a year, as hath been worth thirty shillings sterling on the spot: so that the trouble of gathering and preparing for the market, being much less than for many other commodities which are manufactured in the British colonies, it is surprising it should be neglected; especially as it yields so large a share of sustenance to the wealthier inhabitants of those colonies, that they cannot live comfortably without it, and purchase it from the French and Spaniards at a considerable price; which in time must greatly impoverish the colonies.

The Chocolate-trees, if planted on a good ſoil, and properly taken care of, will continue vigorous and fruitful twenty-five or thirty years: therefore the charge of cultivating a plantation of theſe trees, muſt be much leſs than that of Sugar; for although the ground between the rows of plants will require to be often hoed and wrought, yet the firſt working of a ground to make a new plantation of Sugar, Indigo, Caſſada, &c. is a larger expence than the after-workings are. Beſides, Sugar-canes require as much labour in their cultivation, as any plant whatever; and ſince the inſects which deſtroy the Sugar-canes, have ſpread ſo much in the Britiſh colonies, nothing is a more uncertain crop than Sugar; for which reaſon, I think it would be greatly worth thoſe planters care, who are poſſeſſed of proper lands for the Chocolate-trees, to make ſome ſmall trials at leaſt, to be convinced of the truth of this fact.

The leaves of theſe trees being large, make a great litter upon the ground when they fall; but this is not injurious, but rather of ſervice to the trees; for the ſurface of the ground being covered with them, they preſerve the moiſture in the ground, and prevent its evaporating; which is of great uſe to the young tender roots, which are juſt under the ſurface; and when the leaves are rotten, they may be buried in digging the ground, and it will ſerve as good manure. Some planters let the pods, in which the Chocolate is incloſed, lie and rot in a heap (after they have taken the nuts out) which they alſo ſpread on the ground inſtead of dung. Either of theſe manures are very good, provided they are well rotted before they are laid on the ground; and great care ſhould be had, that no vermin ſhould be carried on the plantation with the dung.

Beſides the ordinary care of digging, hoeing, and manuring the plantations of Chocolate-trees, there is alſo another thing requiſite in order to their doing well; which is, to prune the decayed branches off, and to take away ſmall ill placed branches, wherever they are produced. But you ſhould be cautious how this work is performed; for there ſhould be no vigorous branches ſhortened, nor any large amputations made on theſe trees; becauſe they abound with a ſoft, glutinous, milky juice, which will flow out for many days whenever they are wounded, which greatly weakens the trees. However, ſuch branches whoſe extreme parts are decayed, ſhould be cut off, to prevent the infection from proceeding farther; and ſuch branches as are much decayed, ſhould be taken off cloſe to the ſtem of the tree; but this ſhould be performed in dry weather, ſoon after the crop of fruit is gathered.

Some people may perhaps imagine, that what I have directed, is a tedious laborious work, and not to be performed by a few ſlaves: but this is a great miſtake, for I have been credibly informed, that five or ſix negroes will cultivate a plantation of ten thouſand of theſe trees, provided they are properly inſtructed; which is a ſmall number, when compared to the quantity neceſſary to cultivate a Sugar plantation of the like extent of ground. And when the profits of both are compared, there will be a great difference: for, ſuppoſing we ſet the price of five ſhillings per annum, for the produce of each tree, when grown, (which I am of opinion is very moderate, conſidering what has been related;) then a plantation of ten thouſand trees will produce twenty-five hundred pounds a year; which, managed by ſix or ſeven negroes, without the expence of furnaces, &c. is a much greater profit than, I think, can be drawn from any other production.

In order to cultivate this plant in Europe, by way of curioſity, it will be neceſſary to have the nuts planted into boxes of earth (in the countries where they grow) ſoon after they are ripe; becauſe, if the nuts are ſent over, they will loſe their growing quality before they arrive. Theſe boxes ſhould be placed in a ſhady ſituation, and muſt be frequently watered, in order to forward the vegetation of the nuts. In about a fortnight after the nuts are planted, the plants will begin to appear above ground; when they ſhould be carefully watered in dry weather, and protected from the violent heat of the ſun, which is very injurious to theſe plants, eſpecially while they are young: they ſhould alſo be kept very clear from weeds; which, if ſuffered to grow in the boxes, will ſoon overbear the plants and deſtroy them. When the plants are grown ſtrong enough to tranſport, they ſhould be ſhipped and placed where they may be ſcreened from ſtrong winds, ſalt water, and the violent heat of the ſun. During their paſſage they muſt be frequently refreſhed with water; but it muſt not be given them in great quantities, leſt it rot the tender fibres of their roots, which will deſtroy the plants; and when they come into a cool latitude, they muſt be carefully protected from the cold, when they will not require ſo frequently to be watered: for in a moderate degree of heat, if they have gentle waterings once a week, it will be ſufficient.

When the plants arrive in England, they ſhould be carefully taken out of the boxes, and each tranſplanted into a ſeparate pot filled with light rich earth, and plunged into a moderate hot-bed of tanners bark, being careful to cover the glaſſes in the heat of the day, to ſcreen the plants from the ſun: they muſt alſo be frequently watered, but it muſt be done with caution, not to rot their roots. In this hot-bed the plants may remain till Michaelmas, when they muſt be removed into the bark-ſtove, and plunged into the tan, in the warmeſt part of the ſtove. During the winter ſeaſon the plants muſt be frequently refreſhed with water, but it muſt be given to them in ſmall quantities, yet in ſummer they will require a more plentiful ſhare. Theſe plants are too tender to live in the open air in this country, even in the hotteſt ſeaſon of the year; therefore muſt conſtantly remain in the bark-ſtove, obſerving in very warm weather to let in a large ſhare of freſh air to them, and in winter to keep them very warm. As the plants increaſe in bulk, they ſhould be ſhifted into larger pots; in doing of which, there muſt be particular care taken not to tear or bruiſe their roots, which often kills the plants; nor muſt they be placed in pots too large, becauſe that is a ſlow, but ſure death to them. The leaves of theſe plants muſt be frequently waſhed to clear them from filth, which they are ſubject to contract by remaining conſtantly in the houſe; and this becomes an harbour for ſmall inſects, which will infeſt the plants, and deſtroy them, if they are not timely waſhed off. If theſe rules are duly obſerved, the plants will thrive very well, and may produce flowers in this climate: but it will be very difficult to obtain fruit from them; for, being of a very tender nature, they are ſubject to many accidents in a cold country.

CACHRYS. Lin. Gen. Plant. 304.

The Characters are,

*It hath an umbellated flower, the great or general umbel being compoſed of many ſmaller; the involucrum of both is compoſed of many narrow ſpear-ſhaped leaves; the great umbel is uniform. The flower hath five ſpear-ſhaped, erect, equal petals. It hath five ſingle ſtamina the length of the petals, terminated by ſingle ſummits. The turbinated germen is ſituated under the receptacle, ſupporting two ſtyles, crowned by roundiſh ſtigma. The empalement afterward becomes a large, oval, blunt fruit, dividing in two parts, each having one large fungous ſeed, convex on one ſide, and plain on the other.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifth claſs, intitled Pentandria Digynia, the flower having five ſtamina and two ſtyles.

The Species are,

1. Cachrys (*Trifidus*) foliis bipinatis, foliolis linearibus trifidis, ſeminibus lævibus. *Cachrys with bipinnated leaves, whoſe lobes are linear, and a ſmooth fruit.* Cachrys ſemine fungoſo lævi, foliis ferulaceis. Mor. Umb. 62.
2. Cachrys (*Sicula*) foliis bipinnatis, foliolis linearibus acutis, ſeminibus ſulcatis hiſpidis. Lin. Sp. 355. *Cachrys*

*chrys with double winged leaves, whose lobes are linear, acute, and prickly furrowed seeds.* Cachrys semine fungoso sulcato aspero, foliis peucedani latiusculis. Mor. Hist. 3. p. 267.

3. Cachrys (*Libanotis*) foliis bipinnatis, foliolis acutis multifidis, seminibus sulcatis lævibus. Lin. Sp. 355. *Cachrys with double winged leaves, whose lobes are acute, multifid, and smooth furrowed seeds.* Cachrys semine fungoso sulcato plano minore, foliis peucedani angustis. Mor. Hist. 3. p. 267.

4. Cachrys (*Linearia*) foliis pinnatis foliolis linearibus multifidis seminibus sulcatis planis. *Cachrys with very narrow, multifid, winged leaves, and a plain channelled fruit.* Cachrys semine fungoso sulcato plano majore foliis peucedani angustis. Mor. Umb. 62.

5. Cachrys (*Hungarica*) foliorum impari lobato, hirsuto, semine fungoso sulcato plano. *Cachrys with hairy leaves, terminated with an odd lobe, and a plain, fungous, channelled seed.* Cachrys Hungarica Panacis folio. Tourn. Hist. 325.

The first sort hath a thick fleshy root which strikes deep in the ground, from which springs out many narrow winged leaves resembling those of Giant-fennel, which spread near the ground; from between these arise a hollow fungous stalk about two feet high, terminated by a large umbel of yellow flowers, which are succeeded by oval, smooth, fungous fruit, dividing into two parts, each inclosing an oblong seed.

The second sort hath a large, firm, sweet-smelling root, which sends out several pinnated leaves like those of Hog's-fennel, but shorter. The stalk is smooth jointed, and rises four or five feet high, which is terminated by large umbels of yellow flowers like those of Dill; these are succeeded by oblong, fungous, channelled seeds, which are prickly.

The third sort hath a thick fleshy root like Fennel, which runs deep into the ground, sending out several narrow pinnated leaves, ending in many points; between these arise a smooth jointed stalk about three feet high, which is terminated by large umbels of flowers like those of the former sort, which are succeeded by smaller fungous plain seeds which are furrowed.

The fourth sort hath very thick roots which strike deep in the ground, sending out very narrow winged leaves like those of Hog's-fennel. The stalk rises five or six feet high, and is jointed like those of Fennel, terminated by large umbels of yellow flowers, which are succeeded by large, oval, fungous seeds, which are deeply furrowed.

The fifth sort has a thick fungous root, from which shoot out many winged leaves, having large hairy lobes placed alternate, terminated by an odd one: the stalk is hollow, rising four feet high, terminated by an umbel of yellow flowers like those of the former sorts. This grows naturally in Hungary.

The first sort grows naturally in the south of France and Spain; the second and third in Italy; the fourth in Sicily. They flower in June, and their seeds ripen in autumn.

These plants are all propagated by seeds, which should be sown soon after they are ripe; for if they are kept out of the ground till the following spring, they often miscarry, and when they succeed, they never come up until the spring after; so that by sowing them in autumn, a whole year is saved, and the seeds seldom miscarry. These seeds should be sown on a shady border, where the plants are to remain; for the plants having long tap roots, will not bear transplanting so well as many other kinds. The distance to be observed for the sowing of their seeds should be three feet apart; so that if each kind is sown in a drill, when the plants are come up, they may be thinned, leaving two of the most promising plants of each kind to remain. These plants will begin to appear early in April, when they must be carefully cleared from weeds; and in dry weather, if they are gently watered while young, it will greatly promote their growth; after which time they will require no farther care but to keep them clean from weeds, and every spring to dig the ground carefully between them, so as not to injure the roots.

These plants decay to the ground every autumn, and come up again in the spring: they commonly flower in the beginning of June, and their seeds are ripe in September. Their roots sometimes run down three or four feet deep in the earth, provided the soil be light, and are often as large as Parsneps. They will continue many years, and if the soil is moist and rich, they will annually produce good seeds; but when they grow on a dry soil, the flowers commonly fall away, and are not succeeded by seeds.

There is but little to be said of the uses of this genus of plants; the Hungarians in the neighbourhood of Erlaw, and those who border on Transylvania, Servia, &c. eat the root of the fifth species in a scarcity of corn, for want of other bread.

CACTUS. Lin. Gen. Plant. 539. Melocactus. Tourn. Append.

This genus was first titled Melocarduus, and also Echinomelocactus, or Hedgehog Melon-thistle; but these names being compounded, Dr. Linnæus has changed the name to Cactus, and has added to this genus, the Cereus and Opuntia.

The Characters are,

*The empalement of the flower is of one leaf, tubulous, short, and cut into six parts. The flower is composed of six petals, which spread open at the top, and rests upon the embryo; it hath six long slender stamina, which are terminated by erect summits. The oval germen, which is situated below the petals, supports a cylindrical style, crowned by a blunt stigma; afterward becomes a pyramidal fleshy fruit with one cell, filled with small angular seeds surrounded with pulp.*

This genus of plants is ranged in the first section of Linnæus's twelfth class, intitled Icosandria Monogynia. This class includes those plants whose flowers have from twelve to twenty stamina; which, with the corolla, are fastened to the inner side of the empalement.

The Species are,

1. Cactus (*Melocactus*) subrotundus quatuordecem angularis. Hort. Cliff. 181. *Roundish Cactus with fourteen angles.* Melocactus Indiæ occidentalis. C. B. P. 384. *Commonly called Great Melon-thistle.*

2. Cactus (*Intortus*) subrotundus quinquedecem angularis, angulis in spiram intortis, spinis erectis. *Roundish Cactus or Melon-thistle, with fifteen angles spirally twisted, and erect spines.* Melocactus purpureis striis in spiram intortis. Plum. Cat.

3. Cactus (*Recurvus*) subrotundus quinquedecem angularis, spinis latis recurvis creberrimis. *Roundish Melon-thistle with fifteen angles, having broad recurved spines set very close.*

4. Cactus (*Mamillaris*) subrotundus tectus tuberculis ovatis barbatis. Hort. Cliff. 181. *Roundish Cactus closely covered with bearded tubercles.* Melocactus Americana minor. Boerh. Ind. alt. 2. 84. *Smaller American Melon-thistle.*

6. Cactus (*Proliferus*) proliferus subrotundus, tectus tuberculis ovatis barbatis longis albidis. *Roundish prolific Cactus, with oval tubercles closely joined, having long white beards, commonly called Small Childing Melon-thistle.*

These plants are natives of the West-Indies, where there are more sorts than are here enumerated, if persons of skill were to examine those islands. There have been about four of the large kinds brought to England, some of which have been crowned with a prickly brown cap, in form of one of those fur caps, which are worn by the Turks; and others, which have been destitute of these caps, although the plants were full as large as those which had them; therefore some persons have supposed them to be distinct species, especially since these have been many years preserved in the gardens, and no appearance of any caps as yet have been produced; but as these have been rarely propagated by seeds, it is difficult to determine if they are essentially different. Those which have these caps, produce their fruit in circles round the

upper

upper part of the cap; whereas, the ſmaller ſorts produce their fruit from between the tubercles, round the middle of the plant: and in ſome figures of the larger ſorts of theſe plants, the fruit is repreſented as coming out near the crown of the plant; ſo that if a ſkilful botaniſt was to examine theſe plants in the places of their growth, there would probably be found a much greater variety of them than is at preſent known.

Theſe ſtrange plants commonly grow upon the ſteep ſides of rocks in the warmeſt parts of America, where they ſeem to be thruſt out of the apertures, having little or no earth to ſupport them; their roots ſhooting down into the fiſſures of the rock to a conſiderable depth, ſo that it is troubleſome to get the plants up, eſpecially as they are ſo ſtrongly armed with thorns as to render it very dangerous to handle them; and as theſe plants delight in thoſe rocky places, they ſeldom live long when they are tranſplanted into better ſoil by the inhabitants of thoſe iſlands.

The great ſorts were ſome years ſince brought over to England in much greater plenty than of late; but then the greateſt part of them were deſtroyed, by the unſkilfulneſs of thoſe perſons who had the care of them in the voyage; for, by giving them water, they generally cauſed them to rot before they were taken out of the ſhips; and ſome of thoſe which have appeared to be ſound, have been ſo replete with moiſture, as to rot ſoon after they have been placed in the ſtoves; therefore whoever propoſes to bring theſe plants from abroad, ſhould be very careful to take up their roots as entire as poſſible, and to plant them in tubs filled with ſtones and rubbiſh, mixing very little earth with it, and to plant three or four plants in each tub, in proportion to their ſizes; for if they are placed cloſe together, it will ſave room; and as they do not increaſe their growth during their paſſage, there need not be any room allowed them for that purpoſe. There ſhould be ſeveral pretty large holes bored thro' the bottom of theſe tubs, to let the moiſture paſs off; and if theſe plants are planted in the tubs a month before they are put on board the ſhip, they will in that time have made new roots, which will be the moſt ſecure method to have them ſucceed; but, during their continuance in the country, they ſhould have no water given them, and after they are put on board the ſhip, they muſt not have any moiſture whatever; therefore it will be a good method to cover the plants with tarpaulin, to keep off the ſpray of the ſea in bad weather, and expoſe them at all times to the open air when the ſea is calm. By obſerving theſe directions, the plants may be brought to England in good health, provided they are brought in ſummer.

Some of the large ſort which have been brought to England, have been more than a yard in circumference, and two feet and a half high, including their caps; but I have been informed by ſeveral perſons who have reſided in the Weſt-Indies, that there are plants near twice as large.

The third ſort was brought into England by the late Dr. William Houſtoun, who procured the plants from Mexico; but as they were long in their paſſage, and had received wet, they were decayed before they arrived in England; but from the remains of them which were left, they appeared to be the moſt ſingular of all the ſpecies yet known. This has two orders of thorns; one of which are ſtrait, and ſet on at the joints in cluſters, ſpreading out from the center each way like a ſtar; and in the middle of each cluſter is produced one broad flat thorn near two inches in length, which ſtands erect, and is recurved at the point, and is of a browniſh red colour. Theſe thorns are, by the inhabitants of Mexico, ſet in gold or ſilver, and made uſe of for picking their teeth, and the plant is by them called Viſnaga, i. e. tooth-pick.

The ſort with ſpiral ribs, as alſo that with white ſpines, I received from Antigua, with the common ſort; but whether theſe are only accidental varieties, ariſing from the ſame ſeeds, or real different ſpecies, I cannot take upon me to determine; ſince, in this country, they are very rarely propagated by ſeeds; nor could I obſerve, in the ſeveral years that I have had theſe plants under my care, there was the leaſt diſpoſition in either of them to produce fruit; when, at the ſame time, the common large ſort produced plenty of fruit out of their caps every year, from the ſeeds of which I have raiſed ſome young plants; but although ſome of theſe have grown to a conſiderable ſize, yet none of them have as yet produced caps, therefore no fruit can be yet expected from them.

The fifth ſort produces quantities of fruit annually; and as the ſeeds grow very readily, it is now very common in thoſe gardens where there are ſtoves to keep them; for if the fruit is permitted to drop upon the earth of the pots, and that is not diſturbed, there will plenty of plants come up without any farther trouble; and theſe ſeedling plants may be taken up as ſoon as they are of a proper ſize to remove, and planted ſix or ſeven of them into a ſmall halfpenny pot, where they may ſtand one year; by which time they will be large enough to be each planted into a ſeparate pot, and afterward they will make great progreſs, eſpecially if they are plunged into a hot-bed of tanners bark in ſummer; for although this ſort is much more hardy than the large kind, and may be preſerved in a moderate ſtove, yet the plants will not make near the progreſs as thoſe which are kept in a greater degree of heat. This ſort will continue many years with proper care, and the plants will grow to be a foot high or more; but when they are ſo tall, the lower part of them is not ſo ſightly, their green being decayed, and the ſpines changed to a dark dirty colour, they appear as if dead, ſo that the upper part of theſe old plants only ſeem to have life; whereas the plants of the middling ſize appear healthy from top to bottom. The flowers of this ſort appear in July and Auguſt, and are ſucceeded by the fruit quite round the plant, which are of a fine ſcarlet colour, and continue freſh upon the plants through the winter, which renders them very beautiful at that ſeaſon. And in the ſpring, when the fruit ſhrivels and becomes dry, the ſeeds will be ripe, and may then be rubbed out, and ſown upon the ſurface of the earth in ſmall pots, which ſhould be plunged into a hot-bed of tanners bark to bring up the plants.

The ſixth ſort is but little larger than the fifth, growing nearly in the ſame form; but this produces a great number of young plants from the ſides, by which it is increaſed. This ſort produces tufts of a ſoft white down upon the knobs, and alſo between them at every joint, which makes the whole plant appear as if it was covered with fine cotton. The flowers of this ſort are produced from between the knobs round the ſides of the plants, which are in ſhape and colour very much like thoſe of the fifth ſort, but larger. Theſe flowers are not ſucceeded by any fruit, at leaſt all thoſe which I have under my care, have not produced any, although they have produced plenty of flowers for ſome years; but from the ſame places where the flowers have appeared, there have been young plants thruſt out the following ſeaſon. Theſe young plants I have taken off, and after laying them to dry for two or three days, I have planted them, and they have ſucceeded very well.

All the ſpecies of this genus are plants of a ſingular ſtructure, but eſpecially the larger kinds of them, which appear like a large fleſhy green Melon, with deep ribs, ſet all over with ſtrong ſharp thorns; and when the plants are cut through the middle, their inſide is nothing but a ſoft, green, fleſhy ſubſtance, very full of moiſture. And I have been aſſured by perſons of credit, who have lived in the Weſt-Indies, that in times of great drought, the cattle repair to the barren rocks, which are covered with theſe plants, and after having ripped up the large plants with their horns, ſo as to tear off the outſide ſkin with the thorns, they have greedily devoured all the fleſhy moiſt parts of the plants, which has afforded them both meat

and

and drink; but how any animal ſhould ever attack plants which are ſo well defended by ſtrong thorns, which are as hard and ſtiff as whalebone, or any other bony ſubſtance, is difficult to conceive; nor could any thing but diſtreſs for moiſture ever have tempted them to venture amongſt theſe troubleſome plants to ſearch for relief, ſince they muſt encounter with many difficulties, before they could find a method of diſlodging the thorns.

The fruit of all the ſorts of Melon-thiſtles, are frequently eaten by the inhabitants of the Weſt-Indies; there is ſcarce any difference in the fruits of all the kinds I have yet ſeen, either in ſize, ſhape, colour, or taſte. They are about three quarters of an inch in length, of a taper form, drawing to a point at the bottom toward the plant, but blunt at the top, where the empalement of the flower was ſituated. The taſte is an agreeable acid, which, in a hot country, muſt render the fruit more grateful.

All the ſorts of theſe plants require a very good ſtove to preſerve them through the winter in England, nor ſhould they be expoſed to the open air in ſummer; for although they may continue fair to outward appearance, when they have been ſome time expoſed abroad, yet they will imbibe moiſture, which will cauſe them to rot ſoon after they are removed into the ſtove. And this is frequently the caſe of thoſe plants which are brought from abroad, which have a fair healthy appearance many times at their firſt arrival, but ſoon after decay, and this will happen very ſuddenly. Scarce any appearance of diſorder will be ſeen, till the whole plant is killed; which, in a few hours time, has often been the fate of thoſe plants, when they have been placed in the ſtove.

If theſe plants are plunged into a hot-bed of tanners bark in ſummer, it will greatly forward them in their growth; but when this is practiſed, there ſhould be ſcarce any water given to the plants, for the moiſture which they will imbibe from the fermentation of the tan, will be ſufficient for them, and more would cauſe them to rot. The beſt method to preſerve all the large kinds is, in winter, to place the pots, either upon the tops of the flues, or, at leaſt, very near them, that they may have the warmeſt place of the ſtove; and during that ſeaſon, never to give them any water; but when the ſeaſon comes for leaving out the fire in the ſtove, to remove them into a bed of tanners bark, which will ſoon ſet them in a growing ſtate, and recover their verdure. The ſoil in which theſe ſhould be planted, muſt be of a ſandy nature, and if mixed with ſome dry lime rubbiſh, it will be ſtill better. In the bottom of the pots ſhould be placed ſome ſtones, in order to drain off any moiſture which may be in the earth; for as theſe plants naturally grow upon the hot dry burning rocks which have no earth, and, were it not for theſe plants, would be abſolutely barren, we muſt imitate their natural ſoil as near as poſſible, making ſome allowance for the difference of climates.

The great ſorts may be propagated by ſeeds, which muſt be ſown and managed as hath been directed for the ſmaller ſort; but as the plants which are raiſed from ſeeds in England, will be ſome years in arriving to any conſiderable ſize, it will be much the beſt way to procure ſome plants from the Weſt-Indies; and if the plants arrive here in any of the ſummer months, ſo as that there may be time for them to get new root before the cold comes on in autumn, the plants will more certainly ſucceed. When the plants come over, it will be proper to take them out of the earth as ſoon as poſſible, and lay them in the ſtove upon the ſhelves, to dry for a fortnight or three weeks; and when they are planted, they ſhould be plunged into a good warm bed of tanners bark, to promote their making new roots. In this bed they may remain till the beginning of October, when they muſt be removed into the ſtove, and treated in the manner before directed.

The two ſmall ſorts propagate ſo faſt in England, as to render it unneceſſary to ſend for plants of theſe kinds from abroad; for whoever hath a mind to be plentifully ſtocked with them, may be ſoon ſupplied with the fifth ſort from ſeeds, and the ſixth from the young plants which are thruſt out from the ſide of the old.

CÆSALPINA. Plum. Nov. Gen. 9. Braſiletto.

This plant was ſo named by father Plumier, who diſcovered it in America, in honour of Andreas Cæſalpinus, an eminent botaniſt, and one of the firſt writers on a method of claſſing plants.

The Characters are,

*It hath a quinquefid pitcher-ſhaped empalement, the under lobe being large. The flower hath five almoſt equal petals, of the butterfly kind. It hath ten declining ſtamina which are diſtinct, and terminated by roundiſh ſummits, and an oblong germen ſupporting a ſingle ſtyle the length of the ſtamina, crowned by a blunt ſtigma. The empalement afterward becomes an oblong compreſſed pod, with one cell incloſing three or four compreſſed ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's tenth claſs, intitled Decandria Monogynia, the flower having ten ſeparate ſtamina and one ſtyle.

The Species are,

1. Cæsalpina (*Braſilienſis*) foliis duplicato-pinnatis, foliolis emarginatis, floribus decandris. *Cæſalpina with doubly winged leaves, whoſe ſmall leaves are indented at the end, and flowers with ten ſtamina.* Pſeudo-ſantalum croceum. Sloan. Hiſt. Jam. Vol. II. p. 184. *Saffron-coloured Baſtard Saunders, commonly called Braſiletto.*
2. Cæsalpina (*Ariſta*) foliis duplicato-pinnatis foliolis ovatis integerrimis floribus pentandriis. *Cæſalpina with doubly winged leaves, whoſe ſmall leaves are oval and entire, and flowers with five ſtamina.* Cæſalpina polyphylla aculis horrida. Plum. Nov. Gen. 28.

The firſt ſort is the tree which affords the Braſiletto wood, which is much uſed in dyeing. It grows naturally in the warmeſt parts of America, from whence the wood is imported for the dyers; and the demand for it has been ſo great, that there are no large trees left in any of the Britiſh colonies, the biggeſt ſcarce exceeding eight inches in diameter, and fifteen feet in height. It hath very ſlender branches, which are armed with recurved thorns. The leaves are winged, branching out into many diviſions, each being garniſhed with ſmall oval lobes which are indented at the top, and are placed oppoſite. The foot-ſtalks of the flowers come out from the ſide of the branches, and are terminated by a looſe pyramidal ſpike of white flowers, which are ſhaped ſomewhat like thoſe of the butterfly kind, having ten ſtamina which are much longer than the petals, and terminated by roundiſh yellow ſummits. The germen afterward becomes a long compreſſed pod with one cell, incloſing ſeveral oval flat ſeeds.

The ſecond ſort grows naturally in the ſame countries with the firſt, but is of larger ſize: it ſends out many weak irregular branches, armed with ſhort, ſtrong, upright thorns. The leaves branch out in the ſame manner as the firſt, but the lobes (or ſmall leaves) are oval and entire. The flowers are produced in long ſpikes like thoſe of the former, but are variegated with red; theſe have each but five ſtamina, therefore, according to Linnæus's ſyſtem, ſhould not be ranged in this claſs; but as in all the other characters they agree, I have continued them together.

Dr. Linnæus has joined theſe two ſpecies together, in which he has been followed by Dr. Burman; but if either of them had ſeen the plants, they could not have committed this miſtake. To this genus Linnæus has added two other ſpecies, one of which is a Guilandina, and the other a Bauhinia: to the latter he has added the Synonime of Colutea Veræ Crucis Veſicaria, which is a plant totally different, being a genuine Colutea. I received this from the late Dr. Houſtoun, who found it growing naturally at La Vera Cruz, in New Spain.

Theſe plants are propagated by ſeeds, which ſhould be ſown in ſmall pots filled with light rich earth early in the ſpring, and plunged into a hot-bed of tanners bark, obſerving to water the earth as often as it appears

pears dry, in order to promote the vegetation of the seeds; and if the nights should prove cold, the glasses of the hot-bed should be covered with mats, to keep the bed in a moderate warmth. In about six weeks after, the plants will begin to appear, when they must be carefully cleared from weeds, and frequently refreshed with water; and, in warm weather, the glasses of the hot-bed should be raised in the middle of the day, to admit fresh air to the plants, which will greatly strengthen them, otherwise they are apt to draw up weak. When the plants are about three inches high, they should be carefully taken out of the pots, and each transplanted into a separate small pot filled with fresh light earth, and plunged into the hot-bed again, observing to water them, and screen them from the heat of the sun until they have taken new root; after which time, the glasses of the hot-bed should be raised every day, in proportion to the heat of the weather, to admit fresh air to the plants. In this hot-bed the plants may remain till autumn, when they should be removed into the stove, and plunged into the bark-bed, where they may have room to grow. These plants being tender, should always be kept in the bark-stove, and have a moderate share of heat in the winter, and being placed among other tender exotic plants of the same country, will afford an agreeable variety.

CAINITO. See CHRYSOPHYLLUM.

CAKILE, Sea Rocket. See BUNIAS.

CALABA, Indian Mastich-tree. See CORNUS.

CALAMINTHA. See MELISSA.

CALCEOLUS, Ladies Slipper. See CYPRIPEDIUM.

CALCITRAPA. See CENTAUREA.

CALEA.

The CHARACTERS are,

*It hath a uniform compound flower, composed of many equal hermaphrodite florets, included in a loose imbricated empalement; the florets are tubulous, divided into five segments; they have each five stamina with cylindrical summits, and an oblong germen, with a slender style the length of the corolla, crowned by two recurved stigma. The florets are succeeded by an oblong seed, crowned with a hairy down, having a chaffy substance between each seed.*

This genus of plants is ranged in the first order of Linnæus's nineteenth class, intitled Syngenesia Polygamia æqualis, the flowers being composed of hermaphrodite flowers.

The SPECIES are,

1. CALEA (*Oppositifolia*) corymbus congestis, pedunculis longissimis, foliis lanceolatis, caule herbaceo. Amœn. Acad. 5. p. 404. *Calea with a close corymbus, very long foot-stalks to the flowers, spear-shaped leaves, and an herbaceous stalk.* Santolina Americana foliis oblongis integris, floribus albis. Houst. MSS.

2. CALEA (*Amellus*) floribus subpaniculatis, calycibus brevibus, seminibus nudis, foliis ovato-lanceolatis petiolatis. Amœn. Acad. 5. p. 404. *Calea with flowers in panicles, short empalements, naked seeds, and oval spear-shaped leaves on foot-stalks.* Santolina scandens Americana Lauri foliis, floribus racemosis. Houst. MSS.

These plants grow naturally in Jamaica. The first hath an upright herbaceous stalk three feet high, garnished with entire spear-shaped leaves, placed opposite at the joints; the stalk is terminated by three foot-stalks, one in the middle, and one on each side, supporting a small corymbus of white flowers closely joined together.

The second sort hath ligneous branches, which spread over the neighbouring plants, and rise eight or ten feet high, garnished with thick spear-shaped leaves placed opposite; from these stalks are put out many side branches, garnished with smaller leaves placed opposite, and terminated by panicles of yellow flowers, having short empalements: these are succeeded by naked seeds inclosed in the flower-cup.

These plants are both propagated by seeds, which should be sown upon a hot-bed early in the spring; when the plants come up, they should be tenderly treated while young, admitting fresh air to them daily in proportion to the warmth of the season, giving them water frequently, but sparingly; when they have obtained strength enough to be removed, those of the first sort should be transplanted into another hot-bed, allowing them four inches distance. The plants of the second sort should be put into small pots plunged into the tan-bed, observing to shade them until they have taken new root; after which they should be treated in the same manner as other tender exotic plants, watering them frequently in warm weather, and admitting fresh air to them daily. When the plants of the first sort have grown so strong as to meet, they should be carefully planted in pots, and removed either into the stove or glass-case, where they may remain to ripen seeds, after which they soon die. The plants of the second sort will live many years if they are preserved in the bark-stove, but they are too tender to thrive in the open air in this country; however, they should have plenty of fresh air admitted to them in summer when the weather is warm.

CALENDULA. Lin. Gen. Plant. 885. Marigold.

The CHARACTERS are,

*It hath a compound radiated flower, consisting of hermaphrodite and female florets, included in a common single empalement, the border or rays being composed of female florets, which are stretched out on one side like a tongue; these have no stamina, but an oblong three-cornered germen, supporting a slender style, crowned by two reflexed stigma. The hermaphrodite florets, which compose the disk, are tubulous and quinquefid, having five short slender stamina, terminated by cylindrical summits. The germen is situated under the petal, supporting a slender style, crowned by an obtuse bifid stigma. These florets are barren, but the female florets are each succeeded by one oblong incurved seed, with angular membranes.*

This genus of plants is ranged in the fourth section of Linnæus's nineteenth class, intitled Syngenesia Polygamia necessaria; in which are included all those plants which have hermaphrodite barren flowers in the disk, and fruitful female flowers in the border.

The SPECIES are,

1. CALENDULA (*Arvensis*) seminibus cymbiformibus muricatis incurvatis. Flor. Suec. 711. *Marigold with rough boat-shaped seeds.* Caltha arvensis. C. B. P. 275.

2. CALENDULA (*Sancta*) seminibus urceolatis obovatis lævibus, calycibus submuricatis. Lin. Sp. 1304. *Marigold with smooth pitcher-shaped leaves, and a rough empalement.* Caltha media folio longo cinereo, flore pallido. Bobart. *Middle Marigold with a long Ash-coloured leaf, and a pale flower.*

3. CALENDULA (*Officinalis*) seminibus cymbiformibus muricatis, incurvatis omnibus. Lin. Sp. 1304. *Marigold with boat-shaped, prickly, incurved seeds.* Caltha vulgaris. C. B. P. 275. *Common Marigold.*

4. CALENDULA (*Pluvialis*) foliis lanceolatis sinuato-denticulatis caule folioso, pedunculis filiformibus. Hort. Upsal. 274. *Marigold with spear-shaped indented leaves, and slender foot-stalks.* Caltha Africana flore intus albo extus violaceo. Tourn. Inst. R. H. 499.

5. CALENDUDA (*Nudicaulis*) foliis lanceolatis sinuato-dentatis caule subnudo. Lin. Sp. Plant. 922. *Marigold with sinuated, indented, spear-shaped leaves, and a naked stalk.* Caltha Africana flore intus albo, extus leviter violaceo, semine plano cordato. Boerh. Ind. alt. 1. p. 113.

6. CALENDULA (*Hybrida*) foliis lanceolatis dentatis caule folioso, pedunculis supernè incrassatis. Hort. Upsal. 274. *Marigold with indented spear-shaped leaves, and the upper part of the foot-stalk swelling.* Cardispermum Africanum pubescens foliis incisis parvo flore. Vaill. Mem. Acad. Sc. 1724.

7. CALENDULA (*Graminifolia*) foliis linearibus subintegerrimis caule subnudo. Lin. Sp. Plant. 922. *Marigold with narrow entire leaves, and a naked stalk.* Caltha Africana foliis Croci angustis, florum petalis externè purpurascentibus, internè albis. Boerh. Ind. alt. 1. p. 113.

8. Calendula (*Fruticosa*) foliis obovatis subdentatis, caule fruticoso. Amœn. Acad. 5. p. 25. *Marigold with obverse, oval, indented leaves, and a shrubby stalk.*

9. Calendula (*Decumbens*) foliis oppositis pinnatifidis asperis, subtus incanis, ramis decumbentis, pedunculis nudis. *Marigold with rough pinnatifid leaves growing opposite, which are white on their under side, trailing branches, and naked foot-stalks.* Caltha Americana foliis laciniatis flore luteo. Houst. MSS.

10. Calendula (*Americana*) caule erecto ramoso, foliis oblongis oppositis hirsutis, floribus lateralibus. *Marigold with an upright branching stalk, oblong hairy leaves growing opposite, and flowers proceeding from the sides of the stalk.* Caltha Americana erecta, & hirsuta, flore parvo ochroleuco. Houst. MSS.

The first sort grows naturally in the south of France, Spain, and Italy; it rises with a slender branching stalk, which spreads near the ground, and is garnished with narrow, spear-shaped, hairy leaves, which half surround the stalk at their base; the flowers are produced at the extremity of the branches upon long naked foot-stalks. They are very small, and of a pale yellow colour; the rays are very narrow, as are also the leaves of the empalement. The seeds are long, narrow, and on their outside armed with prickles. The root is annual, and perishes soon after the seeds are ripe. If the seeds of this plant are permitted to scatter, there will be a fresh supply of young plants: so that from May, when the flowers first appear, till the frost puts a stop to them, there will be a succession of plants in flower. There are several botanists who suppose the common Marigold, which is cultivated in gardens, to be only a variety of this, arising from culture; but I have cultivated this in the garden more than forty years, without finding the least alteration in it, therefore cannot doubt of its being a distinct species.

The second sort I gathered in the garden at Leyden, where it had been several years cultivated without altering; the leaves of this sort are smooth, and much larger than those of the former, but not so large as those of the common Marigold; the flowers are also of a middle size between them, and are of a very pale yellow colour. This is also an annual plant. If the seeds are permitted to scatter, there will be a constant supply of young plants come up.

The third sort is the common Marigold, which is cultivated for use in the gardens; this is so well known, as to require no description. Of this there are the following varieties; the common single; the double flowering; the largest very double flower; the double Lemon-coloured flower; the greater and smaller childing Marigold.

These varieties are supposed to have been originally obtained from the seeds of the common Marigold, but most of these differences continue, if the seeds are properly saved; nor have I ever observed the common sort approaching to either of these, where they have been long cultivated in the greatest plenty; but as the two childing Marigolds, and the largest double, are subject to degenerate, where care is not taken in saving their seeds, I conclude they are not distinct species. The best way to preserve these varieties, is to pull up all those plants, whose flowers are less double, as soon as they appear, that they may not impregnate the others with their farina, and save the seeds from the largest and most double flowers; and the childing sort should be sown by itself in a separate part of the garden, and the seeds saved from the large center flowers only, not from the small ones which come from the empalement of the other, for the seeds of these are apt to change.

The seeds of these may be sown in March or April, where the plants are to remain, and will require no other culture but to keep them clean from weeds, and to thin the plants where they are too close, leaving them ten inches asunder, that their branches may have room to spread. These plants will begin to flower in June, and continue in flower until the frost kills them. The seeds ripen in August and September, which, if permitted to scatter, will furnish a supply of young plants in the spring; but as these will be a mixture of bad and good, the best method is to save the best seeds, and sow each of the varieties distinct, which is the sure way to have them in perfection. The flowers of the common Marigold are used in the kitchen.

The fourth sort grows naturally at the Cape of Good Hope. This plant is annual, and perishes soon after the seeds are perfected.

The lower leaves are oblong, spear-shaped, and deeply indented on their edges; they are fleshy, and of a pale green colour. The stalks are produced on every side the root, which decline toward the ground, and are from six to eight inches long, garnished with leaves from the bottom, to within two inches of the top. The leaves on the stalks are much narrower, and more indented than those at the root. The upper part of the stalk is very slender, upon which rests one flower, shaped like those of the common Marigold, having a purple bottom; and the rays (or border) of the flower are of a Violet-colour on their outside, and of a pure white within; these open when the sun shines, but shut up in the evening, and remain so in cloudy weather. When the flower decays, the pedicle (or foot-stalk) becomes weak, and the head hangs down, during the formation and growth of the seeds; but when they are fully ripe, the foot-stalk raises itself again, and the heads of the seeds stand upright.

The fifth sort is a native of the Cape of Good Hope. This is also an annual plant, and has much the appearance of the former, but the leaves are more deeply indented on their edges; the stalks grow about the same length as the former; the flower is a little smaller, and the outside of the rays are of a fainter purple colour. The seeds of this are flat and heart-shaped, but those of the former are long and narrow.

The sixth sort was brought from the same country with the two former, and is also an annual plant; the leaves of this are much longer than those of either of the former sorts, and broader at the end; they are regularly indented near the root, but those on the stalks have but few and shallow indentures. The stalks of this sort are much longer and thicker than those of the former; and at the top, just below the flower, swell larger than at the bottom; the flower is smaller than those of the other sorts, but is of the same colour. These plants flower in June, July, and August, and their seeds ripen about six weeks after; so that they must be gathered at different times as they come to maturity.

The seeds of these plants should be sown in the spring in the borders of the garden where the plants are designed to remain, for they do not bear transplanting well; therefore they may be treated in the same manner, and sown at the same time, with Candy Tuft, Venus Looking Glass, and other hardy annual plants, putting four or five seeds in each patch; if they all grow, there should not be more than two plants left in each patch: after this, they require no farther care but to keep them clean from weeds. If the seeds of these plants are permitted to scatter, the plants will come up the following spring without care, and these will flower earlier than those which are sown in the spring.

The seventh sort is also a native of the same country. This is a perennial plant, which divides near the root into several tufted heads, which are closely covered with long grassy leaves coming out on every side without order; some of these have one or two indentures on their edges, but the most part are entire. From between the leaves arise naked foot-stalks about nine inches long, sustaining one flower at the top, which is about the size of the common Marigold, having a purple bottom; the rays are also purple without, but of a pure white within. These expand when the sun shines, but always close in the evening, and in cloudy weather. The general season of their

beauty is in April and May, when they have the greatest number of flowers upon them; but there is commonly a succession of flowers late in the autumn, though not in so great plenty. This sort doth not often produce good seeds in Europe, but it is easily propagated by slips taken off from the heads, in the same manner as is practised for Thrift. They may be planted any time in summer, in pots filled with light fresh earth, which may be plunged into a very moderate hot-bed, to forward their putting out roots; or otherwise the pots may be sunk in the ground up to their rims, and covered with a Melon-glass, which, in the middle of summer, will answer full as well, but in the spring or autumn, the former method is to be preferred: when these are planted, the glasses must be shaded in the heat of the day, and the slips must be frequently refreshed with water, but it must not be given them too liberally, for much wet will rot them: after they have got strong roots, they should be each planted into separate small pots, filled with fresh light earth, and placed in a shady situation, till they have taken fresh root, when they may be placed in the open air, in a sheltered situation, where they may remain till autumn, and then should be placed in a dry, airy, glass-case, for the winter season, or under a common hot-bed frame; for these plants do not thrive in artificial heat, they only require protection from frost and wet, and should enjoy the air at all times when the weather is mild. The seeds of this sort are heart-shaped, like those of the fifth. I have sometimes had one or two heads of them ripen in a season, but this is very rare; and if the seeds are not sown in autumn, they seldom grow.

The eighth sort has been of late years introduced into the Dutch gardens from the Cape of Good Hope. This was sent me by Dr. Van Royen, professor of botany at Leyden, some years past. It hath a slender, shrubby, perennial stalk, which rises to the height of seven or eight feet, but requires support; this sends out a great number of weak branches, from the bottom to the top, which hang downward, unless they are supported; they are garnished with oval leaves, having short flat foot-stalks; most of these are slightly indented toward the top, and many of them are entire; they are of a shining green colour on their upper side, but paler underneath; the flowers come out at the end of the branches, on short naked foot-stalks, and are in size and colour like those of the sixth sort; these are sometimes succeeded by flat heart shaped seeds. The flowers appear during the summer months.

This is easily propagated by cuttings, which may be planted any time in summer in a shady border, or otherwise shaded with mats in the heat of the day: in five or six weeks, these will have taken root, when they should be carefully taken up, and each put into a separate pot, filled with light sandy earth, but not dunged, and placed in the shade till they have taken fresh root; then they may be placed with other hardy exotic plants in a sheltered situation where they may remain till the frost begins, when they must be removed into the green-house, placing them near the windows that they may enjoy the free air, for this plant only requires protection from frost. The earth in which these are planted, should be light, but very poor, for in rich earth they grow too luxuriant, and seldom flower.

The ninth sort was sent me from La Vera Cruz, in New Spain, by the late Dr. Houstoun, where he found it growing naturally in great plenty. This sends out many herbaceous stalks from the root, which are hairy, and trail upon the ground. The leaves are placed by pairs opposite; these are long, narrow, and indented on their edges in two or three places opposite to each other, so as to appear like three, five, or seven lobes: they are rough, and of a deep green on their upper side, but hoary on their under, covered with slender hairs. From the divisions of the branches and the wings of the leaves, come out long naked foot-stalks, terminated by single yellow flowers, about the size of those of the Field Daisy; which are succeeded by long, flat, rough seeds. It grows naturally in poor sandy ground, and flowers in the spring. This plant is annual; the seeds must be sown in the spring upon a hot-bed, and when the plants are fit to remove, they should be planted in pots filled with light sandy earth, and plunged into a hot-bed of tanners bark, observing to shade them until they have taken new root; then they must have air admitted to them every day, in proportion to the warmth of the season, and treated in the same manner as other tender plants from the same countries. With this management, the plants will flower in August, and the seeds ripen in October.

The tenth sort rises with an upright stalk about eight inches high, sending out slender stiff branches on every side, those near the ground being much longer than the upper; these are garnished with oblong hairy leaves without foot-stalks, placed opposite. From the wings of the stalk, arises the foot-stalk of the flower, having two small leaves placed opposite, just below the flower, which hath a single empalement, like the other species. The flowers are of a yellowish white colour. This sort was sent me with the former from La Vera Cruz, by the same gentleman. It is an annual plant, and requires the same treatment as the former sort.

CALF's SNOUT. See Antirrhinum.

CALLA. Lin. Gen. Plant. 917. Wake Robin, or Ethiopian Arum.

The Characters are,

*It hath a large open spatha of one leaf, which is oval and heart-shaped, ending in a point, it is coloured and permanent, and a single upright spadix, to which the flowers and fruit adhere. This hath male and female flowers, intermixed toward the upper part of the club (or spadix.) The male flowers consist of many very short stamina, terminated by small yellowish summits; the female flowers have a compressed style, resting upon an obtuse germen, crowned by a pointed stigma. These flowers, at their first appearance, have a short green empalement which soon falls off, leaving the style naked. The germen afterward becomes a globular pulpy fruit, compressed on two sides, inclosing two or three obtuse seeds.*

This genus of plants is ranged in the seventh section of Linnæus's twentieth class, intitled Gynandria Polyandria. This class includes those plants whose male and female flowers are intermixed; and this section, those whose male parts have many stamina.

The Species are,

1. Calla (*Æthiopica*) foliis sagitato-cordatis, spathâ cucullatâ, spadice supernè masculo. Hort. Cliff. 436. *Calla with arrow-headed heart-shaped leaves, a hooded spatha or sheath, and male flowers situated on the upper part of the spadix.* Arum Africanum flore albo odorato. Par. Bat. Prod.
2. Calla (*Palustris*) foliis cordatis, spathâ plana, spadice undique hermaphrodito. Hort. Cliff. 436. *Calla with heart-shaped leaves, a plain sheath, and every part of the foot-stalk hath hermaphrodite flowers.* Dracunculus aquatilis. Dod. Pempt. 330.
3. Calla (*Orientalis*) foliis ovatis. Gron. Orient. 282. *Calla with oval leaves.* Arum minus Orientale, rotundioribus foliis. Mor. Hist. 3. p. 544.

This plant hath thick, fleshy, tuberous roots, which are covered with a thin brown skin, and strike down many strong fleshy fibres into the ground. The leaves arise in clusters, having foot-stalks more than a foot long, which are green and succulent. The leaves are shaped like the point of an arrow, they are eight or nine inches in length, and of a shining green, ending in a sharp point, which turns backward; between the leaves arise the foot-stalk of the flower, which is thick, smooth, of the same colour as the leaves, and rises above them, and is terminated by a single flower, shaped like those of the Arum; the hood or spatha being twisted at the bottom, spreads open at the top, and is of a pure white colour. In the center of this is situated the spadix or club, which is of an herbaceous yellow colour, upon which the small herbaceous

baceous flowers are placed, and so closely joined, as that the male and female parts are very difficult to distinguish, without the assistance of glasses. When these fade, part of those which are situated at the top of the club, are succeeded by roundish fleshy berries compressed on two sides, each containing two or three seeds.

This plant grows naturally at the Cape of Good Hope, but has been long an inhabitant in the English gardens. It propagates very fast by offsets, which should be taken off the latter end of August, at which time the old leaves decay; but this plant is never destitute of leaves, for before the old ones decay, there are young leaves produced, which advance in height all the winter; but at this season the roots are in their most inactive state. These roots have generally a great number of offsets about them, so that unless there is a want of them, the largest only should be chosen; which should be separated from all the smaller, and each planted in a separate pot, filled with kitchen-garden earth, and placed with other hardy exotic plants in the open air till autumn, when they must be removed into shelter for the winter season, during which time, they must not have too much wet, for that will rot the roots. This plant is so hardy as to live in the open air in mild winters, without any cover, if they are planted in warm borders, and have a dry soil; but with a little shelter in hard frost, they may be preserved in the full ground very well. It flowers in May, and the seeds ripen in August; but as the roots increase so plentifully, few persons care to sow the seeds, because the young plants will not flower in less than three years. The flowers of this plant have but little sweetness, altho' by Herman's title, it should have a very agreeable odour; but unless a person places it near him, it cannot be perceived. I have frequently received the seeds of this from the Cape of Good Hope, but have always found they produced the same sort.

The second sort grows naturally in moist or marshy grounds in many parts of Europe, so is rarely admitted into gardens.

The third sort grows naturally on the mountains near Aleppo. This hath a thick tuberous root, from which spring up several oval leaves, standing on pretty long foot-stalks; the spadix of the flower rises between the leaves, about six or eight inches high, supporting one white flower at the top.

The roots of this sort should be planted in pots filled with light earth, and in summer they may be placed with other exotic plants in the open air; but in winter they should be placed under a common hot-bed frame, to screen them from frost, to which if they are exposed the roots will be destroyed; there is little beauty in this plant, so it is only preserved in botanic gardens for variety.

CALLACARPA. See JOHNSONIA.

CALTHA. Lin. Gen. Plant. 623. *Marsh Marigold.*

The CHARACTERS are,

*The flower hath no empalement, but is composed of five large, oval, concave petals, which spread open. It hath a great number of slender stamina, which are shorter than the petals, terminated by obtuse erect summits: in the center there are several oblong compressed germen situated, which have no styles, but are crowned by single stigma. The germen afterward become so many short pointed capsules, containing many roundish seeds.*

This genus of plants is ranged in the seventh section of Linnæus's thirteenth class, intitled Polyandria Polygynia, the flowers of this class having many stamina, and of this section several germen.

The SPECIES are,

1. CALTHA (*Major*) foliis orbiculatis crenatis, flore majore. *Marsh Marigold with round crenated leaves, and a larger flower.* Populago flore majore. Tourn. Inst. 273.
2. CALTHA (*Minor*) foliis orbiculato-cordatis crenatis flore minore. *Marsh Marigold with round heart-shaped leaves which are crenated, and a smaller flower.*

These two sorts are supposed to be the same, but I have never observed either of them to vary, either in their natural places of growth, or when they are removed into a garden. They both grow upon moist boggy land, in many parts of England, but the first is the most common; of this there is a variety with very double flowers, which for its beauty is preserved in many gardens. This is propagated by parting the roots in autumn, and should be planted in a moist soil and a shady situation; and as there are often such places in gardens, where few other plants will thrive, so these may be allowed to have room, and during their season of flowering, will afford an agreeable variety. This sort with double flowers, doth not appear so early in the spring as the single, but continues much longer in beauty. It flowers in May, and if the season is not very warm, will continue till the middle of June.

CALYCANTHUS. See BASTERIA.

CALYX [with botanists, signifies the cup of a flower before it opens: this is styled the empalement of the flower; in some plants this continues, and becomes afterward a cover to the seeds of herbs, and fruit of trees.] *Lat.* The cup inclosing or containing the flower.

CAMARA.. See LANTANA.

CAMERARIA. Plum. Nov. Gen. 18. tab. 29. Lin. Gen. Plant. 264.

This plant was so named by father Plumier, in honour of Joachim Camerarius, a physician and botanist of Nuremberg; who published an edition of Matthiolus, in Latin and High Dutch, with new figures of the plants, and many observations.

The CHARACTERS are,

*The flower hath a short permanent empalement of one leaf, cut into five acute segments at the top: the flower is of one leaf, salver-shaped, having a long cylindrical tube at bottom, which is enlarged above, and divided at the top into five acute segments. It hath five short inflexed stamina, which are terminated by obtuse membranaceous summits. In the bottom of the tube are situated two roundish germen, having one common style, which is cylindrical, and the length of the stamina, crowned by two stigma; the under one is orbicular and flat, the other is concave. The germen afterward becomes two long, taper, leafy capsules, filled with oblong cylindrical seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flowers of this class having five stamina, and those in this section but one style.

The SPECIES are,

1. CAMERARIA (*Latifolia*) foliis ovatis, utrinque acutis transverse stratis. Hort. Cliff. 76. Lin. Sp. Plant. 210. *Cameraria with roundish leaves ending in points transversly ribbed.* Cameraria lato Myrti folio. Plum. Nov. Gen. 18.
2. CAMERARIA (*Angustifolia*) foliis linearibus. Lin. Sp. Plant. 210. *Cameraria with long narrow leaves.* Cameraria angusto linariæ folio. Plum. Nov. Gen. 18.

The first sort was sent me from the Havanna by the late Dr. Houstoun, where he found it growing naturally in great plenty. This rises with a shrubby stalk to the height of ten or twelve feet, dividing into several branches, garnished with roundish pointed leaves placed opposite, having many smooth transverse veins running from the midrib to the borders. The flowers are produced at the end of the branches in loose clusters, which have long tubes enlarging gradually upward, and at the top are cut into five segments, broad at their base, but end in sharp points: the flower is of a yellowish white colour. After the flowers are fallen, the germen become two leafy capsules joined at their base, and have two swelling protuberances on each side at the bottom, the middle being extended considerably longer; these have one cell, filled with cylindrical seeds. It flowers in August, but never produces any seeds in England.

The second sort hath an irregular shrubby stalk, which rises about eight feet high, sending out irregular branches, garnished with very narrow thin leaves placed opposite; these have two ribs running longitudinally

tudinally through each. The flowers are produced ſcatteringly at the end of the branches, which are ſhaped like thoſe of the former ſort, but ſmaller. Both theſe plants abound with an acrid milky juice like the Spurge. The ſecond ſort grows naturally in Jamaica.

Theſe plants are propagated by ſeeds, which muſt be procured from the places of their growth, for they do not perfect their ſeeds in England. They may alſo be propagated by cuttings planted in a hot-bed during the ſummer months: they muſt have a bark-ſtove, for they are very tender plants; but in warm weather muſt have plenty of air.

CAMOCLADIA, the Maiden Plumb.

The Characters are,

*It hath a tripartite coloured empalement of one leaf, ſpreading open; the flower hath three plain, oval, ſpreading petals, and three awl-ſhaped ſtamina ſhorter than the corolla, terminated by roundiſh incumbent ſummits, and an oval germen, but no ſtyle, crowned by an obtuſe ſtigma; the empalement afterward becomes an oblong Plumb, having three punctures at the top, incloſing a nut of the ſame form.*

This plant is ranged in the firſt order of Linnæus's third claſs, intitled Triandria Monogynia, the flower having three ſtamina and one ſtyle.

The Species are,

1. Camocladia (*Integrifolia*) foliolis integris. Jacq. Amer. 12. *Camocladia with entire lobes.* Prunus racemoſa, caudice non ramoſa, alato fraxini folio non crenato, fructu rubro ſubdulci. Sloan. Cat. 184. *The Maiden Plumb.*
2. Camocladia (*Dentata*) foliolis ſpinoſo-dentatis. Jacq. Amer. 12. *Camocladia with prickly indented leaves.*

The firſt ſort grows naturally in Jamaica, and alſo in many other of the iſlands in the Weſt Indies; this riſes with an upright ſtem near twenty feet high, garniſhed with long winged leaves, whoſe pinnæ are entire; at the top there are a few branches ſent out about a foot long, which ſuſtain the flowers and fruit.

The ſecond ſort grows naturally at the Havanna, where it riſes about the ſame height with the former; but as the flowers and fruit of this are unknown to the author, he can give no farther account of them.

Theſe plants are propagated by ſeeds, when they can be obtained from the places of their growth, which ſhould be ſown in pots and plunged into a hot-bed; the plants, when fit to remove, ſhould be each planted in a ſmall pot, and plunged into a tan-bed, and in the autumn ſhould be plunged into the bark-bed in the ſtove, and treated as other tender plants.

CAMPANIFORM flowers [of campana, a bell; and forma, *Lat.* ſhape,] ſuch flowers as in ſhape reſemble a bell.

CAMPANULA. Tourn. Inſt. R. H. 108. tab. 38. Lin. Gen. Plant. 201. [ſignifies a little bell, as tho' parva campana, *Lat.* ſo called, becauſe the flowers reſemble a little bell.]

The Characters are,

*The empalement is divided into five acute parts, is upright, ſpreading, and reſts upon the germen. The flower is of one leaf, ſhaped like a bell, ſpreading at the baſe where there are holes. In the bottom is ſituated the five cornered nectarium, which is joined to the top of the receptacle. It hath five ſhort ſtamina, which are inſerted in the top of the valves of the nectarium, terminated by long compreſſed ſummits: below the receptacle is ſituated the angular germen, ſupporting a ſtyle which is longer than the ſtamina, crowned by a thick, oblong, tripartite ſtigma. The empalement afterward becomes a roundiſh angular capſule, which in ſome ſpecies have three, and in others five cells, each having a hole toward the top, through which the ſeeds are ſcattered when ripe.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, intitled Pentandria Monogynia; the flowers of this claſs have five ſtamina, and in this ſection but one ſtyle.

The Species are,

1. Campanula (*Pyramidalis*) foliis ovatis glabris ſubſerratis, caule erecto paniculato, ramulis brevibus. Lin. Sp. 233. *Bell-flower with oval ſmooth leaves ſawed below, an upright paniculated ſtalk, and ſhort branches.* Campanula pyramidata altiſſima. Tourn. Inſt. 109. *Talleſt pyramidal Bell-flower.*
2. Campanula (*Decurrens*) foliis radicalibus obovatis, caulinis lanceolato-linearibus ſubſerratis ſeſſilibus remotis. Lin. Sp. Plant. 164. *Bell-flower with lower leaves oval, and thoſe on the ſtalks narrow, ſpear-ſhaped, ſawed, and growing cloſe to the ſtalks at remote diſtances.* Campanula perſicæ folio. Cluſ. Hiſt. 171. *Peach-leafed Bell-flower.*
3. Campanula (*Medium*) capſulis quinquelocularibus tectis, calycis ſinubus reflexis. Vir. Cliff. 16. *Bell-flower with a covered capſule, having five cells, and the borders of the cup reflexed.* Campanula hortenſis folio & flore oblongo. C. B. P. 94. *Commonly called Canterbury Bell-flower.*
4. Campanula (*Trachelium*) caule angulato, foliis petiolatis, calycibus ciliatis, pedunculis trifidis. Vir. Cliff. 16. *Bell-flower with an angular ſtalk, leaves having foot-ſtalks, a hairy empalement, and trifid foot-ſtalks to the flowers.* Campanula vulgatior, foliis urticæ vel major & aſperior. C. B. P. 94. *Nettle-leaved Bell-flower.*
5. Campanula (*Latifolia*) foliis ovato-lanceolatis, caule ſimpliciſſimo tereti, floribus ſolitaris pedunculatis fructibus cernuis. Vir. Cliff. 17. *Bell-flower with oval ſpear-ſhaped leaves, a ſingle taper ſtalk, flowers growing ſingly upon foot-ſtalks, and pendent fruit.* Campanula maxima foliis latiſſimis. C. B. P. 94. *Greateſt Bell-flower with broadeſt leaves.*
6. Campanula (*Rapunculus*) foliis undulatis radicalibus lanceolato-ovalibus, paniculâ coarctatâ. Hort. Upſal. 40. *Bell-flower with waved leaves, thoſe growing near the ſtalk oval and ſpear-ſhaped, and a compreſſed panicle.* Campanula radice eſculentâ. H. L. *Commonly called Rampion.*
7. Campanula (*Glomerata*) caule angulato ſimplici, floribus ſeſſilibus capitulo terminali. Vir. Cliff. 16. *Bell-flower with a ſingle angular ſtalk, flowers growing cloſe, and terminating in a head.* Campanula pratenſis flore conglomerato. C. B. P. 94. *Meadow Bell-flower with flowers gathered in bunches.*
8. Campanula (*Speculum*) caule ramoſiſſimo diffuſo foliis oblongis ſubcrenatis, calycibus ſolitariis corollâ longioribus, capſulis priſmaticis. Hort. Upſal. 41. *Bell-flower with a very branching diffuſed ſtalk, oblong crenated leaves, ſolitary flower-cups which are longer than the petal, and priſmatic capſules.* Campanula arvenſis erecta Euphraſiæ luteæ, ſeu Triſſaginis appulæ foliis. H. Cath. *Commonly called upright Venus Looking-glaſs.*
9. Campanula (*Hybrida*) caule baſi ſubramoſo ſtricto, foliis oblongis crenatis, calycibus aggregatis corollâ longioribus, capſulis priſmaticis. Lin. Sp. Plant. 168. *Bell-flower with a ſtalk branching at the bottom, oblong crenated leaves, flower-cups gathered together, which are longer than the petal, and priſmatic capſules.* Campanula arvenſis minima erecta. Mor. Hiſt. 2. 457. *Small Venus Looking-glaſs.*
10. Campanula (*Erinus*) caule dichotomo, foliis ſeſſilibus utrinque dentatis. Hort. Cliff. 65. *Bell-flower with a forked ſtalk, and leaves growing cloſe to the ſtalks, which are indented on both ſides.* Campanula minor annua, foliis inciſis. Mor. Hiſt. 1. 458. *Smaller annual Bell-flower with cut leaves.*
11. Campanula (*Pentagonia*) caule ſubdiviſo ramoſiſſimo, foliis linearibus acuminatis. Hort. Cliff. 66. *Bell-flower with a very branching divided ſtalk, and narrow pointed leaves.* Campanula pentagonia flore ampliſſimo Thracia. Tourn. Inſt. 112. *Five-cornered Bell-flower of Thracica.*
12. Campanula (*Perfoliata*) caule ſimplici, foliis cordatis dentatis amplexicaulibus, floribus ſeſſilibus aggregatis. Hort. Upſal. 40. *Bell-flower with a ſingle ſtalk, heart-ſhaped indented leaves which embrace the ſtalk, and flowers gathered together, growing cloſe to the ſtalk.*

Campanula pentagonia perfoliata. Mor. Hist. 2. p. 457. *Five-cornered perfoliate Bell-flower.*

13. Campanula (*Americana*) caule ramoso, foliis linguiformibus crenulatis margine cartilagineo. Prod. Leyd. 246. *Bell-flower with a branching stalk, and tongue-shaped crenulated leaves with stiff edges.* Campanula minor Americana, foliis rigidis flore cæruleo patulo. H. L. 107. *Smaller American Bell-flower.*

14. Campanula (*Canariensis*) foliis hastatis dentatis oppositis petiolatis, capsulis quinquelocularibus. Lin. Sp. Plant. 168. *Bell-flower with spear-shaped indented leaves growing opposite, having foot-stalks and capsules with five cells.* Campanula Canariensis, atriplicis folio, tuberosâ radice. *Canary Bell-flower.*

15. Campanula (*Patula*) foliis strictis, radicalibus lanceolato-ovalibus, panicula patula. Flor. Suec. 186. *Bell-flower whose radical leaves are oval, spear-shaped, and spreading flowers in panicles.* Campanula esculenti facie, ramis & floribus patulis. Hort. Elth. 1. 68.

16. Campanula (*Cervicaria*) hispida, floribus sessilibus, capitulo terminali, foliis lanceolato-linearibus undulatis. Lin. Sp. 235. *Rough Bell-flower with sessile flowers terminating the stalks, and linear, spear-shaped, waved leaves.* Campanula foliis echii. C. B. 36.

17. Campanula (*Saxatilis*) foliis obovatis crenatis, floribus alternis nutantibus, capsulis quinquecarinatis. Lin. Sp. 237. *Bell-flower with oval crenated leaves, nodding flowers placed alternate, and boat-shaped capsules with five cells.* Campanula Cretica saxatilis, bellidis folio, magno flore. Tourn. Inst. 111.

There are several other species of this genus, some of which grow naturally in England, and others in the northern parts of Europe, which have but little beauty, therefore are seldom cultivated in gardens, so I shall not enumerate them here. There are also several varieties of some of the sorts here mentioned, which I shall take notice of in their proper place; but as they are not distinct species, they are omitted in the above list.

The first sort hath thick tuberous roots which are milky; this sends out three or four strong, smooth, upright stalks, which rise near four feet high, and are garnished with smooth oblong leaves, whose edges are a little indented. The lower leaves are much broader than those which adorn the stalks. The flowers are produced from the side of the stalks, and are regularly set on for more than half their length, forming a sort of pyramid; these are large, open, and shaped like a bell. The most common colour of the flowers is a light blue; but there have been some with white flowers, which make a variety when intermixed with the blue, but the latter is most esteemed.

This plant is cultivated to adorn halls, and to place before the chimnies in the summer, when it is in flower, for which purpose there is no plant more proper; for when the roots are strong, they will send out four or five stalks, which will rise as many feet high, and are garnished with flowers great part of their length. These upright stalks send out some short side branches, which are also adorned with flowers, so that by spreading the upright stalks to a flat frame composed of slender laths (as is usually practised) the whole plant is formed into the shape of a fan, and will spread near the width of a common fire-place. When the flowers begin to open, the pots are removed into the rooms, where, being shaded from the sun, and kept from the rain, the flowers will continue long in beauty; and if the pots are every night removed into a more airy situation, but not exposed to heavy rains, the flowers will be fairer, and continue much longer in beauty.

Those plants which are thus treated, are seldom fit for the purpose the following season, therefore a supply of young plants should be annually raised. The common method of propagating this plant, is by dividing the roots. The best time for doing this is in September, that the offsets may have time to get strong roots before winter.

This method of propagating by the offsets is the quickest, therefore generally practised, but the plants which are raised from seeds, are always stronger; the stalks will rise higher, and produce a greater number of flowers, therefore I recommend it to the practice of the curious; but in order to obtain good seeds, there should be some strong plants placed in a warm situation, near a pale, or wall, in autumn; and, if the following winter should prove severe, they should be covered either with hand-glasses or mats, to prevent their being injured by the frost; and, in the summer, when the flowers are fully open, if the season should prove very wet, the flowers must be screened from great rains, otherwise there will be no good seeds produced: the not observing this, has occasioned many to believe that the plants do not bear seeds in England, which is a great mistake, for I have raised great numbers of the plants from seeds of my own saving; but I have always found that the plants which have been long propagated by offsets, seldom produce seeds, which is the same with many other plants which are propagated by slips, or cuttings, which in a few years become barren.

When the seeds are obtained, they must be sown in autumn in pots, or boxes, filled with light undunged earth, and placed in the open air till the frost or hard rains come on, when they should be placed under a hot-bed frame, where they may be sheltered from both, but in mild weather the glasses should be drawn off every day, that they may enjoy the free air; with this management the plants will come up early in the spring, and then they must be removed out of the frame, placing them first in a warm situation; but when the season becomes warm, they should be removed where they may have the morning sun only. During the following summer they must be kept clean from weeds, and in very dry weather, now and then refreshed with water, which must be given with great caution, for the roots are very subject to rot with too much moisture. In September the leaves of the plants will begin to decay, at which time they should be transplanted; therefore there must be one or two beds prepared, in proportion to the number of plants. These beds must be in a warm situation, and the earth light, sandy, and without any mixture of dung, which last is an enemy to this plant. If the situation of the place is low, or the natural soil moist, the beds must be raised five or six inches above the surface of the ground, and the natural soil removed a foot and a half deep, putting lime rubbish eight or nine inches thick in the bottom of the trench, to drain off the moisture. When the beds are prepared, the plants must be taken out of the pots, or cases, very carefully, so as not to break or bruise their roots, for they are very tender, and, on being broken, the milky juice will flow out plentifully, which will greatly weaken them. These should be planted at about four inches distance each way, with the head or crown of the root half an inch below the surface; if there happens a gentle shower of rain soon after they are planted, it will be of great service to the plants; but as the season sometimes proves very dry at this time of the year, in that case, it will be proper to give them a gentle watering three or four days after they are planted, and to cover the beds with mats every day, to prevent the sun from drying the earth; but these must be taken off in the evening, that the dew may fall on the ground. Towards the end of October the beds should be covered over with some old tanners bark to keep out the frost, and where there is not conveniency of covering them with frames, they should be arched over with hoops, that in severe frosts they may be covered with mats; for these plants, when young, are often destroyed in winter, where this care is wanting. In the spring the coverings must be removed, and the following summer the plants must be kept clean from weeds; and, if the season should prove very dry, they must now and then be refreshed with water. The following autumn the surface of the ground should be stirred between the plants, and

ſome freſh earth ſpread over the beds, and in the winter covered as before. In theſe beds the plants may remain two years, during which time they muſt be treated in the manner before directed; by which time the roots will be ſtrong enough to flower: in September they ſhould be carefully taken up, and ſome of the moſt promiſing planted in pots; the others may be planted into warm borders, or in a freſh bed, at a greater diſtance than before, to allow them room to grow. Theſe plants which are potted ſhould be ſheltered in winter from great rains and hard froſts, otherwiſe they will be in danger of rotting, or at leaſt be ſo weakened, as not to flower with any ſtrength the following ſummer; and thoſe which are planted in the full ground, ſhould have ſome old tanners bark laid round them, to prevent the froſt from entering deep to the roots; with this management theſe plants may be brought to the utmoſt perfection, and a conſtant ſucceſſion of good roots raiſed, which will be much preferable to thoſe which are propagated by offsets. I have been informed that there is a double flower of this kind, but as I have not ſeen any, I can give no farther account of it. This ſort is by ſome called Steeple Bell-flower.

The ſecond ſort grows naturally in the northern parts of Europe, but has been long cultivated in the Engliſh gardens; of this there are the following varieties, viz. the ſingle, blue, and white flower, which have been long here; and the double flower of both colours, which has not been more than twenty-eight years in England, but has been propagated in ſuch plenty, as to have almoſt baniſhed thoſe with ſingle flowers from the gardens. All theſe varieties are eaſily propagated by parting their roots in autumn, every head which is then ſlipped off will take root; they are extreme hardy, ſo will thrive in any ſoil or ſituation, therefore are very proper furniture for the common borders of the flower-garden.

This hath a root compoſed of many fibres, and ſends up an angular, or channelled ſtiff ſtalk, about two feet and a half high, garniſhed with oblong, oval, ſtiff leaves near the root, which are placed without order; but thoſe on the ſtalks are longer and narrower, having their edges ſlightly indented, and are of a ſhining green. The flowers are produced towards the upper part of the ſtalk upon ſhort foot-ſtalks. Theſe are ſhaped like thoſe of the former ſort, but are ſmaller, and more expanded. This flowers in June and July, and in cool ſeaſons there will be ſome continue great part of Auguſt.

The third ſort is a biennial plant, which periſhes ſoon after it hath ripened ſeeds. It grows naturally in the woods of Italy and Auſtria, but is cultivated in the Engliſh gardens for the beauty of its flowers. Of this ſort there are the following varieties, the blue, the purple, the white, the ſtriped, and the double flowering, but the laſt two are not very common in England.

This hath oblong, rough, hairy leaves, which are ſerrated on their edges, coming out without order from the root; from the center of theſe a ſtiff, hairy, furrowed ſtalk, ariſes about two feet high, ſending out ſeveral lateral branches, from the bottom upward, garniſhed with long, narrow, hairy leaves, ſawed on their edges, and are placed alternately; from the ſetting on of theſe leaves, come out the foot-ſtalks of the flower, thoſe which are on the lower part of the ſtalk and branches being four or five inches long, diminiſhing gradually in their length upward, and thereby form a ſort of pyramid. The flowers of this kind are very large, ſo make a fine appearance; they come out the beginning of June, and, if the ſeaſon is not very hot, will continue a month in beauty. The ſeeds ripen in September, and the plants decay ſoon after.

It is propagated by ſeeds, which muſt be ſown in the ſpring on an open bed of common earth, and when the plants are fit to remove, they ſhould be tranſplanted into the flower-nurſery, in beds ſix inches aſunder, obſerving to water them frequently till they have taken new root; after which they will require no other culture, but to keep them clean from weeds till the following autumn, when they ſhould be tranſplanted into the borders of the flower-garden. As theſe plants decay the ſecond year, there ſhould be annually young ones raiſed to ſucceed them.

The fourth ſort hath a perennial root, which ſends up ſeveral ſtiff hairy ſtalks, having two ribs or angles. Theſe put out a few ſhort ſide branches, garniſhed with oblong, pointed, hairy leaves, deeply ſawed on their edges. Toward the upper part of the ſtalks the flowers come out alternately, upon ſhort trifid foot-ſtalks, having hairy empalements. The flowers are of the ſhape of the former, but ſhorter, ſpread more at the brim, and are pretty deeply cut into many acute ſegments. This flowers in June, and the ſeeds ripen in autumn.

The varieties of this are, the deep and pale blue; the white with ſingle flowers, and the ſame colours with double flowers. The double ſorts are propagated by parting their roots in autumn, which ſhould be annually performed, otherwiſe the flowers are apt to degenerate to ſingle; to prevent which, the roots ſhould be every autumn tranſplanted and parted. The ſoil ſhould not be too light or rich, in which they are planted, for in either of theſe they will degenerate; but in a ſtrong freſh loam their flowers will be in the greateſt perfection. Theſe plants are extreme hardy, ſo may be planted in any ſituation; thoſe with ſingle flowers do not merit a place in gardens.

The fifth ſort grows naturally in the northern parts of England: this hath a perennial root, compoſed of many fleſhy fibres, which abound with a milky juice, from which ariſe ſeveral ſtrong, round, ſingle ſtalks, which never put out branches, but are garniſhed with oval ſpear-ſhaped leaves, ſlightly indented on their edges, which are placed alternately. Toward the upper part of the ſtalk the flowers come out ſingly upon ſhort foot-ſtalks; theſe ſpread open at the brim, where they are deeply cut into five acute ſegments. After the flowers are paſt, the empalement becomes a five-cornered ſeed-veſſel, which turns downward till the ſeeds are ripe, when it riſes upward again.

The varieties of this are, the blue, purple, and white flowering. This ſort is eaſily propagated by ſeeds, which it furniſhes in great plenty, and, if ſuffered to ſcatter, the plants will come up in as great plenty the following ſpring; when they may be tranſplanted into the nurſery till autumn, at which time they ſhould be tranſplanted where they are deſigned to remain. As this ſort delights in ſhade, the plants may be planted under trees, or in ſhady borders where few better things will thrive, they will afford an agreeable variety when they are in flower. It flowers in June and July, and the ſeeds ripen in autumn.

The ſixth ſort hath roundiſh fleſhy roots which are eatable, and are much cultivated in France for ſallads, and ſome years paſt it was cultivated in the Engliſh gardens for the ſame purpoſe, but is now generally neglected. It grows naturally in ſeveral parts of England, but the roots never grow to half the ſize of thoſe which are cultivated. This is propagated by ſeeds, which ſhould be ſown in a ſhady border the latter end of May, and when the plants are about an inch high, the ground ſhould be hoed, as is practiſed for Onions, to cut up the weeds, and thin the plants to the diſtance of three or four inches; and when the weeds come up again, they muſt be hoed over to deſtroy them: this, if well performed in dry weather, will make the ground clean for a conſiderable time, ſo that being three times repeated, it will keep the plants clean till winter, which is the ſeaſon for eating the roots, when they may be taken up for uſe as they are wanted. Theſe will continue good till April, at which time they will ſend out their ſtalks, when they will become hard and unfit for uſe, as do alſo thoſe roots which have flowered; ſo that the young roots only are ſuch which are fit for the table, therefore when the ſeeds are ſown too early, the plants frequently run up to flower the ſame year, which ſpoils their roots.

This ſort ſends out upright ſtalks about two feet high, which are garniſhed with oblong ſpear-ſhaped leaves, placed alternately. Towards the upper part of the ſtalk the ſmall Bell-flowers are produced, ſtanding upright cloſe to the ſtalk; ſome of theſe flowers are blue, and others white; they come out in June and July, and the ſeeds ripen in autumn.

The ſeventh ſort grows naturally upon chalky paſtures in many parts of England, where the ſtalks do not riſe many times a foot high, and in other places it grows to double that height, which has occaſioned their being taken for two diſtinct plants. This hath a perennial root, which ſends up ſeveral round hairy ſtalks, which often riſe upward of two feet high; the bottom leaves are broad, and ſtand upon long foot-ſtalks, and are ſlightly ſawed on their edges. Thoſe which are upon the ſtalks are long, narrow, have no foot-ſtalks, and are placed alternately at conſiderable diſtances. From the wings of the leaves, towards the upper part of the ſtalk, come out long naked foot-ſtalks, ſupporting two or three bell-ſhaped flowers, cloſely joined together in a head, and the main ſtalk is terminated by a large cluſter of the ſame flowers, which are ſucceeded by roundiſh capſules filled with ſmall ſeeds. This plant is eaſily propagated either by ſeeds, or parting their roots, and will thrive in any ſoil or ſituation. It flowers in July, and the ſeeds ripen in autumn.

The eighth ſort is an annual plant, which riſes with ſlender ſtalks a foot high, branching out, garniſhed with oblong leaves, a little curled on their edges; from the wings of the leaves come out the flowers, ſitting cloſe to the ſtalks, which are of a beautiful purple, inclining to a Violet-colour, divided into five ſegments, which reſemble ſo many leaves, and in the evening contract and fold into a pentagonal figure; from whence it is by ſome titled Viola Pentagonia, or five-cornered Violet. The empalement which encompaſſes the flower, is compoſed of five, long, narrow, green leaves, which ſpread open, and are much longer than the petals of the flower; theſe remain on the top of the priſmatic ſeed-veſſel, which is filled with ſmall angular ſeeds. If this plant is ſown in autumn, it will grow much taller, and flower a month earlier than when the ſeeds are ſown in the ſpring. The autumnal plants will flower in May, and the ſpring plants in June and July. There is a variety of this with white flowers, and another with pale purple.

The ninth ſort is the common Venus Looking-glaſs, which hath been long cultivated in the Engliſh gardens. This ſort ſeldom riſes more than ſix inches high, with a ſtalk branching from the bottom upward, garniſhed with oval leaves, ſitting cloſe to the ſtalks, from the baſe of which the branches are produced, which are terminated by flowers very like thoſe of the former ſort.

The tenth ſort grows naturally in the ſouth of France and Italy. This is alſo a low annual plant, which ſeldom riſes ſix inches high, but divides into many branches, garniſhed with ſhort oval leaves, ſitting cloſe, which are deeply indented on both ſides. The flowers are produced at the ends of the branches, which are ſhaped like thoſe of the other ſort laſt mentioned, but they are ſmall, their colours leſs beautiful, and the leaves of the empalement are broader.

The eleventh ſort grows naturally in Thrace, but hath been long in the Engliſh gardens. This is alſo a low annual plant, which riſes little more than ſix inches high; the ſtalks divide by pairs, and frequently there ariſes a branch from the middle of the diviſions; the lower leaves are oblong and obtuſe, but thoſe which come out toward the end of the branches are much narrower, and pointed. The flowers come out ſingle at the end of the branches, having a long five-leaved empalement, and are larger than thoſe of the three laſt ſorts, of a fine blue colour; the ſeeds are like thoſe of the eighth ſort.

The twelfth ſort is an annual plant, which, in good ground, will riſe a foot and a half high, but in poor land, or if where it grows wild among corn, ſcarcely riſes to the height of ſix inches. The ſtalk is ſingle, rarely putting out any branches, unleſs near the root, from whence there are ſometimes one or two ſhort lateral branches produced. The leaves are roundiſh, and embrace the ſtalk at their baſe; their edges are ſharply ſawed, and from their baſe comes out a cloſe tuft of flowers, ſurrounded by the leaf, as in an empalement. The flowers are five-cornered, ſhaped like thoſe of the Venus Looking-glaſs, but are much ſmaller; theſe are produced the whole length of the ſtalk. The ſeeds are incloſed in ſhort capſules, which are ſhaped like thoſe of the former ſorts. It grows in Italy, and alſo in Virginia. If the ſeeds of this ſort are permitted to ſcatter, the plants will come up without care; or the ſeeds may be ſown in the ſpring, in the ſame manner as thoſe of the laſt ſorts, and treated in the ſame way.

The thirteenth ſort is a native of America, but has been long cultivated in the gardens of the curious, both in England and Holland. This hath many rigid oblong leaves coming out from the root on every ſide, which form a ſort of head like thoſe of Houſeleek, crenated, having a ſtrong rib running on their border longitudinally. From the center of the plant proceeds the ſtalk, which riſes about a foot high, and is thinly garniſhed with very narrow ſtiff leaves, of a ſhining green. From the wings of the leaves come out the foot-ſtalks of the flower, which are from two to four inches long, each being terminated by one ſpreading bell-ſhaped flower, whoſe empalement is ſhort, and cut into five acute ſegments. The ſtyle of this is longer than the petal, and is crowned by a bifid ſtigma. There is a white and a blue flower of this ſort in the gardens, but in Holland they have it with a double flower. This ſort doth not produce ſeeds in England, ſo is only propagated by offſets; theſe may be taken off from the old plants in Auguſt, that they may get good root before the cold weather begins: they muſt be planted in ſmall pots filled with freſh, light, loamy earth, and placed in the ſhade until they have taken root; then they may be placed with other hardy exotic plants, and in autumn they muſt be removed into ſhelter, for in ſevere winters theſe plants are often deſtroyed which are expoſed; though in mild winters they will live in the open air. It flowers in July and Auguſt.

The fourteenth ſort is a native of the Canary Iſlands, from whence it was introduced to the gardens in Europe, where it hath been many years cultivated; and of late years great numbers of the plants have been raiſed from ſeeds which were brought from thence, but the flowers of theſe new-raiſed plants are not ſo well coloured as thoſe of the old ones.

This hath a thick fleſhy root, which is of an irregular form, ſometimes running downward like a Parſnep, at other times dividing into ſeveral knobs near the top, and when any part of the root is broken, there iſſues out a milky juice at the wound. There are many ſtrong fleſhy fibres ſent out, which ſtrike deep into the ground, and from theſe a numerous quantity of ſmall ones. From the head, or crown of the root, ariſe one, two, three, or more ſtalks, in proportion to the ſize of the root; but that in the center is generally larger, and riſes higher than the others. Theſe ſtalks are very tender, round, and of a pale green; their joints are far diſtant from each other, and when the roots are ſtrong, the ſtalks will riſe ten feet high, ſending out ſeveral ſmaller ſide branches. At each joint they are garniſhed with two, three, or four ſpear-ſhaped leaves, with a ſharp pointed beard on each ſide. Theſe are of a ſea-green, and, when they firſt come out, are covered ſlightly with an Aſh-coloured pounce. From the joints of the ſtalk the flowers are produced, which are of the perfect bell-ſhape, and hang downward; they are of a flame colour, marked with ſtripes of a browniſh red; the flower is divided into five parts, at the bottom of each is ſituated a nectarium, covered with a white tranſparent ſkin, much reſembling thoſe of the Crown Imperial, but

are ſmaller; upon each of theſe is ſituated a ſtamen, which riſes almoſt the length of the petal, and is terminated by oblong ſummits. In the center of the flower is ſituated the ſtyle, which is longer than the ſtamina, and is crowned by a trifid ſtigma, which is reflexed. The flowers begin to open in the beginning of October, and there is often a ſucceſſion of them till March. The ſtalks decay to the root in June, and new ones ſpring up in Auguſt.

It is propagated by parting their roots, which muſt be done with caution; for if the roots are broken or wounded, the milky juice will flow out plentifully, ſo that if theſe are planted before the wounds are ſkinned over, it occaſions their rotting; therefore whenever any of them are broken, they ſhould be laid in the green-houſe a few days to heal. Theſe roots muſt not be too often parted, eſpecially if they are expected to flower well; for by frequent parting the roots are weakened. The beſt time for tranſplanting and parting their roots, is in July, ſoon after the ſtalks are decayed. The earth in which theſe ſhould be planted, ſhould not be rich, for that will cauſe them to be luxuriant in branches, and but thinly garniſhed with flowers. The ſoil in which they have ſucceeded beſt, is a light ſandy loam, mixed with a fourth part of ſcreened lime-rubbiſh: when the roots are firſt planted, the pots ſhould be placed in the ſhade; and, unleſs the ſeaſon is very dry, ſhould not be watered, for during the time they are inactive, wet is very injurious to them. About the middle of Auguſt the roots will begin to put out fibres, at which time, if the pots are placed under a hot-bed frame, and as the nights grew cool, covered with the glaſſes, but opened every day to enjoy the free air, it will greatly forward them for flowering, and increaſe their ſtrength; when the ſtalks appear, the plants muſt be now and then refreſhed with water, which muſt not be given too often, nor in great quantity. The plants thus managed, by the middle of September, will have grown ſo tall, as not to be kept longer under the frame, ſo they ſhould be removed into a dry airy glaſs-caſe, where they may enjoy the free air in mild weather, but ſcreened from cold. During the winter ſeaſon they muſt be frequently refreſhed with water, and guarded from froſt; and in ſpring, when the ſtalks begin to decay, the pots ſhould be ſet abroad in the ſhade, and not watered.

The fifteenth ſort grows naturally in ſome of the north-weſt counties of England. It is a biennial plant, very like the eatable ſort, but the branches grow more horizontal, and the flowers ſpread wider open.

This is propagated by ſeeds, which ſhould be ſown in the autumn; for thoſe ſeeds which are ſown in the ſpring often fail, or at leaſt lie a year in the ground before they grow. When the plants come up, they ſhould be thinned and kept clean from weeds, which is all the culture they require.

The ſixteenth ſort grows naturally in Germany and Sweden; this hath rough leaves: the ſtalk riſes two feet high, garniſhed with narrow ſpear-ſhaped leaves, and are terminated by an obtuſe ſpike of flowers.

The ſeventeenth ſort grows naturally in Crete, upon rocks, where the roots penetrate the fiſſures, whereby the plants continue much longer than when they are tranſplanted into gardens. The ſtalks of this riſe a foot high, garniſhed with oval crenated leaves; the flowers are large, blue, and placed alternate, nodding toward the ground; theſe open in July, and are ſucceeded by ſeed-veſſels, having five cells filled with ſmall ſeeds.

Theſe plants are propagated by ſeeds, which, if ſown in the autumn, will more certainly ſucceed than when ſown in the ſpring. When the plants are fit to remove, they ſhould be tranſplanted into beds, and treated in the ſame manner as the hardy ſorts beforementioned; but a few plants of the laſt ſort may be planted in pots, to be ſheltered in winter.

CAMPHORA. See LAURUS.

CAMPHOROSMA. Camphorata. Tourn. Inſt.

The CHARACTERS are,

*It hath a pitcher-ſhaped four-pointed empalement, which is permanent, but no corolla. It has four ſlender ſtamina which are equal, terminated by oval ſummits, and an oval compreſſed germen, ſupporting a ſlender ſtyle longer than the empalement, crowned by acute ſtigma. The empalement afterward becomes a capſule crowned with one cell open at the top, incloſing one compreſſed ſeed.*

The SPECIES are,

1. CAMPHORASMA (*Monſpeliaca*) foliis hirſutis linearibus. Amœn. Acad. 1. p. 392. *Camphorata with linear hairy leaves.* Camphorata hirſuta. C. B. P. 486.
2. CAMPHORATA (*Glabra*) foliis ſubtriquetris glabris inermibus. Amœn. Acad. p. 393. *Camphorata with ſmooth three-cornered leaves.*

The firſt ſort grows naturally about Montpelier. It is an annual plant, whoſe branches trail on the ground, and extend each way a foot and more in length, garniſhed with linear hairy leaves placed cloſe on the branches; the flowers are produced from the joints of the ſtalks, which are ſo ſmall as to be ſcarce perceptible, having no petals but a pitcher-ſhaped empalement, which afterward becomes a capſule to the ſeed. This is an annual plant, which is propagated by ſeeds, which, if ſown in the autumn, will more probably ſucceed, than if ſown in the ſpring; and if the ſeeds are permitted to fall in the autumn, there will be a ſupply of young plants the following ſpring.

The ſecond ſort grows naturally in the Helvetian mountains. This is a perennial plant, whoſe branches trail on the ground; the leaves are ſmooth, three-cornered, and unarmed. The flowers are not more viſible than thoſe of the firſt ſort, and the empalement becomes a cover to the ſeeds.

Theſe plants are preſerved in ſome gardens, more for the ſake of variety, than for either beauty or uſe; if the ſeeds are ſown in any abject part of the garden, and when the plants come up, they are thinned, and afterward kept clean from weeds, they will ripen their ſeeds, which, if permitted to ſcatter, there will be a ſupply of plants.

CAMPION. See LYCHNIS.

CANDLE-BERRY-TREE. See MYRICA.

CANDY-TUFT. See IBERIS.

CANNA. Lin. Gen. Plant. 1. Indian flowering Reed. In French Baliſier.

The CHARACTERS are,

*The flower hath a three-leaved empalement, which is permanent, erect, and coloured. It hath one petal, which is divided into ſix parts: the three upper ſegments are erect, and broader than the lower, which are longer, two of which are erect, and the other turns back and is twiſted. It hath one ſpear-ſhaped ſtamina riſing as high as the petal, having the appearance of a ſegment, which hath a ſlender ſummit ſitting upon its border. Below the empalement is ſituated a roundiſh rough germen, ſupporting a flat ſtyle, with a ſlender ſtigma faſtened to its border. After the flower is paſt, the germen becomes an oblong, roundiſh, membranaceous capſule, having three longitudinal furrows, crowned by the empalement, which hath three cells filled with round ſmooth ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's firſt claſs, intitled Monandria Monogynia. The flowers of this claſs have but one ſtamen, and in this ſection but one ſtyle.

The SPECIES are,

1. CANNA (*Indica*) foliis ovatis utrinque acuminatis nervoſis. Prod. Leyd. 11. *Canna with oval nervous leaves pointed at both ends.* Cannacorus latifolius vulgaris. Tourn. Inſt. 367.
2. CANNA (*Latifolia*) foliis oblongo-ovato, acuminatis, ſegmentis florum anguſtioribus. *Canna with oblong, oval, pointed leaves, and the ſegments of the flower narrow.* Cannacorus ampliſſimo folio flore rutilo. Tourn. Inſt. 367.
3. CANNA (*Coccinea*) foliis ovatis obtuſis nervoſis, ſpicis florum longioribus. *Canna with oval, obtuſe, nervous leaves, and longer ſpikes of flowers.* Cannacorus flore Coccineo ſplendente. Tourn. Inſt. 367.

4. Canna (*Lutea*) foliis ovatis petiolatis nervosis spatha floribus longiore. *Canna with oval, obtuse, nervous leaves, having foot-stalks, and a longer hood to the flower.* Cannacorus flore luteo punctato. Tourn. Inst. R. H. 367.

5. Canna (*Glauca*) foliis lanceolatis petiolatis enervibus. Prod. Leyd. 11. *Canna with spear-shaped smooth leaves having foot-stalks.* Cannacorus glaucophyllus, ampliore flore, Iridis palustris facie. Hort. Elth. 69.

The first sort grows naturally in both Indies: the inhabitants of the British islands in America, call all the species without distinction Indian Shot, from the roundness and hardness of the seeds.

This plant hath a thick, fleshy, tuberous root, which divides into many irregular knobs, spreading wide near the surface of the ground, sending out many large oval leaves without any order; these, at their first appearance, are twisted like a horn, but afterwards expand and are near a foot long, and five inches broad in the middle, lessening gradually to both ends, and terminating in points. They have many large transverse veins running from the midrib to the sides, which are prominent on their under side; and between each of these run two smaller, parallel, pointed veins, which are peculiar to this species. The stalks are herbaceous, rising four feet high, encompassed by the broad leafy foot-stalks of the leaves; these are compressed on two sides; at the upper part of the stalk the flowers are produced in loose spikes, each being at first covered by a leafy hood, which afterward stands below the flower, and turns to a brown colour. Each flower hath one petal, which is cut almost to the bottom into six slender segments, the three upper being broadest; these are of a pale red colour. The flower is encompassed by a three-leaved empalement, which sits upon a small, roundish, rough germen, which, after the flower is fallen, swells to a large fruit or capsule oblong and rough, having three longitudinal furrows, and is crowned by the three-leaved empalement of the flower which remains. When the fruit is ripe, the capsule opens lengthways into three cells, which are filled with round, hard, black, shining seeds. The principal season of these plants flowering, is in June, July, and August.

As this sort is a native of the warmest parts of America, it requires to be placed in a moderate stove in winter, otherwise the roots will decay. I have frequently tried to keep these roots through the winter in a green-house, but could not succeed; for although some have escaped, yet they were so much weakened by the cold, as not to recover their strength the following summer, so as to flower in any tolerable degree of perfection; so that I have since constantly kept them in winter in a moderate stove, where they always flower in that season, at which time they make a fine appearance; and in the summer, place them abroad in a sheltered situation with other tender exotic plants, where they flower again, and produce ripe seeds annually.

The second sort grows naturally in Carolina, and some of the other northern provinces of America. The leaves of this sort are longer than those of the former, and terminate in sharper points. The stalks grow taller, and the segments of the flower are much narrower; the colour is a pale red, so it makes no great appearance. The seeds are like those of the former sort. If the roots of this sort are planted in warm borders and a dry soil, they will live through the winter in the open air. I have plants of this sort in the Chelsea garden, which have survived twelve winters in a south-west border without cover, and flower well every year, but do not produce seeds.

The third sort hath larger leaves than either of the former; the stalks rise much taller. I have received the seeds of this from America, and from the Brazils, by the title of Wild Plantain. The flower-stalks of this sort rise more than six feet high. The leaves are very large, and those near the root have long foot-stalks. The flowers are produced in larger spikes than those of the former sort, and are of a much brighter scarlet. The seed-vessels are longer, and the seeds larger than those; and these differences are permanent from seeds, so that I make no doubt of its being a distinct species.

The fourth sort is less common in America than either of the former. I received the seeds of this from India, but have had two varieties arise from the seeds, one with a plain yellow, and the other a spotted flower, which I find are apt to change from one to the other, when propagated by seeds. This sort hath shorter and rounder leaves than either of the former sorts. The stalks seldom rise higher than three feet, and the spikes of flowers are like those of the first species, excepting the colour of the flowers.

The seeds of the fifth sort I received from Carthagena in New Spain, in the year 1733, which produced very strong plants the first year, some of which flowered the same autumn. The roots of this are much larger than either of the former sorts, and strike down strong fleshy fibres deep in the ground. The stalks rise seven or eight feet high. The leaves are near two feet long, narrow, smooth, and of a sea-green colour. The flowers are produced in short thick spikes at the extremity, which are large, and of a pale yellow colour; the segments of the petal are broad, but their shape like those of the other sorts. The seed-vessels are larger, and much longer than those of the other sorts, but contain fewer seeds, which are very large. The young plants which are raised from seeds of this sort, do more certainly flower than the old roots, or the offsets taken from them; for the roots send out many offsets, which will spread to a considerable distance where they have room, but seldom produce flowers; so that it is the best way to raise a succession of plants from seeds, and to throw out the old ones after they have perfected their seeds.

All the sorts are propagated by seeds, which should be sown on a hot-bed in the spring; and when the plants are fit to remove, they should be transplanted into separate small pots, filled with rich kitchen-garden earth, and plunged into a moderate hot-bed of tanners bark, observing to shade them till they have taken root; after which, they should have a large share of free air admitted to them every day in warm weather, and be frequently refreshed with water. As these plants will make great progress in their growth, they must be shifted into larger pots filled with the same sort of earth, and part of them plunged into the hot-bed again; and the others may be placed abroad in June, with other exotic plants, in a warm situation. Those which are placed in the hot-bed, will be strong enough to flower well in the stove the following winter; but those in the open air, will not flower before the following summer. These may remain abroad till the beginning of October, when they must be removed into the stove, and treated in the same manner as the old plants; and in May, if a gentle hot-bed is made, and covered a foot thick with rich earth, and the plants turned out of the pots, planting them with their balls of earth upon the hot-bed, covering each with a bell-glass, which may be raised on one side every day to admit air to the plants; and as these advance, they must be gradually inured to bear the open air. With this management the plants will grow much taller, and flower stronger than those which are kept in pots, and from these good seeds may be expected in autumn. These plants will continue many years with proper management; but as young plants always flower better than the old roots, it is scarce worth while to continue them after they have borne good seeds.

The second sort, which is much hardier than either of the other, should have a different treatment. The young plants of this must be earlier inured to the open air, where they may remain till the frost begins; then they must be placed in the green-house, and should have but little wet in winter; and the beginning of May, these should be turned out of the pots, and planted in a warm south border, in a dry soil, where they will thrive and produce flowers annually;

but

but as there is little beauty in this ſort, a few plants for variety will be as many as moſt perſons will chooſe to keep. There is a variety of this with variegated leaves, which is preſerved in ſome gardens, and is propagated by parting the roots; but this hath little beauty, ſo is ſcarce worth cultivating.

CANELLA. See WINTERANA.

CANNABINA. See DATISCA.

CANNABIS [Κάνναβις, *Gr.*] Lin. Gen. Plant. 988. Hemp.

The CHARACTERS are,

*It is male and female in different plants. The male flowers have a five-leaved empalement which is concave, but have no petals; they have five ſhort hairy ſtamina, terminated by oblong ſquare ſummits. The female flowers have permanent empalements of one leaf, which are oblong and pointed. They have no petals, but a ſmall germen, ſupporting two long ſtyles, crowned by acute ſtigma; the ſmall germen afterward becomes a globular depreſſed ſeed, incloſed in the empalement.*

This genus of plants is ranged in the fifth ſection of Linnæus's twenty-ſecond claſs, intitled Diœcia Pentandria, the male and female flowers being in ſeparate plants, and the male having five ſtamina.

We have but one SPECIES of this plant, which is,

CANNABIS. Lin. Sp. Plant. 1027. Hemp. Cannabis ſativa. C. B. P. 320. *Manured Hemp.* Moſt of the old writers have applied the latter title to the female Hemp, and the male they have titled Cannabis erratica, or Wild Hemp; but as both ariſe from the ſame ſeeds, ſo they ſhould not be made different plants.

This plant is propagated in the rich fenny parts of Lincolnſhire, in great quantities, for its bark, which is uſeful for cordage, cloth, &c. and the ſeeds afford an oil, which is uſed in medicine.

Hemp is always ſown on a deep, moiſt, rich ſoil, ſuch as is found in Holland, in Lincolnſhire, and the fens in the iſle of Ely; where it is cultivated to great advantage, as it might in many other parts of England, where there is the like ſoil; but it will not thrive on clay, or ſtiff cold land: it is eſteemed very good to deſtroy weeds, which is no other way effected, but by robbing them of their nouriſhment; for it will greatly impoveriſh the land, ſo that this crop muſt not be repeated on the ſame ground.

The land on which Hemp is deſigned to be ſown, ſhould be well ploughed, and made very fine by harrowing; about the middle of April is a good ſeaſon for ſowing the ſeed: three buſhels is the uſual allowance for an acre, but two is fully ſufficient. In the choice of the ſeed, the heavieſt and brighteſt coloured ſhould be preferred; and particular care ſhould be had to the kernel of the ſeed, ſo that ſome of them ſhould be cracked to ſee if they have the germ or future plant perfect; for in ſome places the male plants are drawn out too ſoon from the female, i. e. before they have impregnated the female plants with the farina: in which caſe, though the ſeeds produced by theſe female plants may ſeem fair to the eye, yet they will not grow, as is well known by the inhabitants of Bickar, Swineſhead, and Dunnington, three pariſhes in the fens of Lincolnſhire, where Hemp is cultivated in great abundance, who have dearly bought their experience.

When the plants are come up, they ſhould be hoed out in the ſame manner as is practiſed for Turneps, leaving the plants a foot or ſixteen inches apart; obſerve alſo to cut down all the weeds, which, if well performed, and in dry weather, will deſtroy them. This crop will require a ſecond hoeing about a month or ſix weeks after the firſt, in order to deſtroy the weeds. If this be well performed, it will require no farther care; for the Hemp will ſoon after cover the ground, and prevent the growth of weeds.

The firſt ſeaſon for pulling the Hemp, is uſually about the middle of Auguſt, when they begin to pull what they call the Fimble Hemp, which is the male plants; but it would be much the better method to defer this a fortnight or three weeks longer, until theſe male plants have fully ſhed their duſt, without which, the ſeeds will prove abortive, produce nothing if ſown the next year, nor will thoſe concerned in the oil-mills give any thing for them, there being only empty huſks, without any kernels to produce the oil. Theſe male plants begin to decay ſoon after they have ſhed their farina.

The ſecond pulling is a little after Michaelmas, when the ſeeds are ripe: this is uſually called Karle Hemp, it is the female plants which were left at the time when the male were pulled. This Karle Hemp is bound in bundles of a yard compaſs, according to ſtatute meaſure, which are laid in the ſun for a few days to dry; and then it is ſtacked up, or houſed to keep it dry, till the ſeed can be threſhed out. An acre of Hemp on a rich ſoil, will produce near three quarters of ſeed, which, together with the unwrought Hemp, is worth from ſix to eight pounds.

Of late years the inhabitants of the Britiſh colonies in North America, have cultivated this uſeful plant, and a bounty was granted by parliament for the Hemp, which was imported from thence; but whether the inhabitants of thoſe colonies grew tired of cultivating it, or the bounty was not regularly paid, I cannot ſay; but whatever has been the cauſe, the quantity imported has by no means anſwered the expectation of the public, which is greatly to be lamented; becauſe, as this commodity is ſo eſſential to the marine, which ſhould be the principal object of this kingdom, the being furniſhed with it from our own plantations, will not only ſave the ready money paid for it, but ſecure to the country an ample ſupply at all times, without being obliged to our neighbours for it.

CANNACORUS. See CANNA.

CAPERS. See CAPPARIS.

CAPILLAMENTS [*Capillamenta, Lat.*] the ſtrings or threads about the roots of plants.

CAPILLARY plants, [of *Capillaris, Lat.* of, or like hair,] are ſuch plants as have no main ſtem, but the leaves ariſe from the root upon pedicles, and produce their ſeeds on the back of their leaves, as the Fern, Maiden Hair, &c.

CAPITULUM; i. e. a little head; the head or top of any flowering plant.

CAPNOIDES. } See FUMARIA.
CAPNORCHIS. }

CAPPARIS. Lin. Gen. Plant. 567. The Caper Buſh.

The CHARACTERS are,

*The empalement is compoſed of three oval concave leaves; the flower hath four large roundiſh petals, which are indented at the top, and ſpread open; it hath a great number of ſlender ſtamina, which are as long as the petals, terminated by ſingle ſummits. In the midſt of theſe ariſe a ſingle ſtyle longer than the ſtamina, with an oval germen, crowned by a ſhort obtuſe ſtigma. The germen afterward becomes a fleſhy turbinated capſule, with one cell, filled with kidney-ſhaped ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's thirteenth claſs, intitled Polyandria Monogynia, the flower having many ſtamina and but one ſtyle.

The SPECIES are,

1. CAPPARIS (*Spinoſa*) pedunculis ſolitariis unifloris, ſtipulis ſpinoſis foliis annuis, capſulis ovalibus. Lin. Sp. 720. *Caper with one flower on each foot-ſtalk, prickly ſtipula, annual leaves, and oval fruit.* Capparis ſpinoſa, fructu minore, folio rotundo. C. B. P. 480.
2. CAPPARIS (*Baducca*) pedunculis ſubſolitariis, foliis perſiſtentibus ovato-oblongis nudis determinate confertis. Lin. Sp. 720. *Caper with ſingle foot-ſtalks, oblong, oval, naked leaves in cluſters, which are always green.* Capparis arboreſcens Indica Baducca dicta. Raii Hiſt. 1630. *Indian Tree Caper, called Baducca.*
3. CAPPARIS (*Arboreſcens*) foliis lanceolato-ovatis perennantibus caule arboreſcenti. *Caper with oval ſpear-ſhaped leaves which continue through the year, and a tree-like ſtalk.*
4. CAPPARIS (*Cynophallophora*) pedunculis multifloris terminalibus angulatis, foliis perſiſtantibus ovalibus obtuſis.

obtusis. Lin. Sp. 721. *Caper with angular branches terminated by foot-stalks, having many flowers, and evergreen, obtuse, oval leaves.* Capparis arborescens Lauri foliis fructu longissimo. Plum. Cat. 7. *Tree Caper with Bay leaves, and the longest fruit.*

5. Capparis (*Racemosis*) foliis ovatis oppositis perennantibus floribus racemosis. *Caper with oval leaves placed opposite, which continue through the year, and flowers growing in bunches.*

6. Capparis (*Siliquosa*) pedunculis unifloris compressis, foliis persistentibus lanceolato-oblongis acuminatis subtus punctatis. Lin. Sp. 721. *Caper with compressed foot-stalks having one flower, and oblong, spear-shaped, evergreen leaves, with punctures on their under side.* Breynia arborescens, foliis ovatis utrinque acuminatis, siliqua torosa longissima. Brown. Hist. Jam. 247.

7. Capparis (*Fruticosa*) foliis lanceolatis acutis confertis perennantibus, caule fruticoso. *Caper with pointed spear-shaped leaves growing in clusters, which continue through the year, and a shrubby stalk.*

8. Capparis (*Confertis*) foliis lanceolatis alternis petiolis longissimis floribus confertis. *Caper with spear-shaped leaves placed alternate on very long foot-stalks, and flowers growing in clusters.* Capparis alia arborescens Lauri foliis fructu oblongo ovato. Plum. Cat. 7.

9. Capparis (*Breynia*) pedunculis racemosis, foliis persistentibus oblongis, pedunculis calycibusque tomentosis, floribus octandris. Jacq. Amer. tab. 103. *Caper with branching foot-stalks, oblong evergreen leaves, flowers with eight stamina, whose foot-stalks and cups are woolly.*

10. Capparis (*Trifloris*) foliis lanceolatis nervosis perennantibus pedunculis trifloris. *Caper with nervous spear-shaped leaves which continue through the year, and three flowers upon each foot-stalk.*

The first is the common Caper, whose full grown flower-bud is pickled, and brought to England annually from Italy, and the Mediterranean. This is a low shrub, which generally grows out of the joints of old walls, the fissures of rocks, and amongst rubbish, in most of the warm parts of Europe: the stalks are ligneous, and covered with a white bark, which sends out many lateral slender branches; under each of these are placed two short crooked spines, between which and the branches come out the foot-stalk of the leaves, which are single, short, and sustain a round, smooth, entire leaf; at the intermediate joints between the branches, come out the flowers upon long foot-stalks; before these expand, the bud, with the empalement, is gathered for pickling; but those which are left expand in form of a single Rose, having five large, white, roundish, concave petals; in the middle is placed a great number of long stamina, surrounding a style, which rises above them, and is crowned with an oval germen, which afterward becomes a capsule, filled with kidney-shaped seeds.

This sort is cultivated upon old walls about Toulon, and in several parts of Italy. Mr. Ray observed it growing naturally on the walls and ruins at Rome, Sienna, and Florence.

The second sort hath a tree-like stem dividing into branches, which are smooth, having no spines on them; the leaves are oblong, oval, and smooth, which continue through the year. From the wings of the leaves come out the foot-stalks of the flowers, which are produced singly; these flowers are like those of the former, but are much larger, as are also the buds.

The plants of the first sort are with difficulty preserved in England, for they delight to grow in crevices or rocks, and the joints of old walls or ruins, and always thrive best in an horizontal position; so that when they are planted either in pots, or the full ground, they rarely thrive, though they may be kept alive for some years. They are propagated by seeds in the warm parts of Europe, but it is very difficult to get them to grow in England. I have several times sowed these seeds without success, as have many other persons; I never had raised any of the plants from seeds, excepting in the years 1738 and 1765, when I had three plants come up in an old wall, which being young and tender, were destroyed in the year 1740; but in the year 1765, raised a good number of plants from seeds, which were sown the year before. There is an old plant growing out of a wall in the gardens at Cambden-House, near Kensington, which has resisted the cold for many years, and annually produces many flowers, but the young shoots of it are frequently killed to the stump every winter.

The roots of this plant are annually brought from Italy, by the persons who import Orange-trees, some of which have been planted in walls, where they have lived a few years, but have not continued long.

The third sort I received from Carthagena in New Spain, near which place it grows naturally. This rises with a woody stem to the height of twelve or fourteen feet, sending out many lateral branches, covered with a russet bark, garnished with oblong oval leaves, standing upon long foot-stalks; the flowers are produced from the side of the branches, single, standing upon long foot-stalks, which are like those of the last sort.

The fourth sort was sent me from Carthagena by the late Mr. Robert Millar, surgeon. This grows with a strong upright trunk near twenty feet high, sending out many lateral branches, garnished with a very white bark, and closely garnished with large, oblong, stiff leaves, of a thicker consistence than those of the common Laurel, of a splendid green, having several transverse nerves from the midrib to the border, which are prominent on their under side; the flowers come out from the side of the branches, which are large, and the summits of the stamina are purple.

The fifth sort was sent me from the same country. This rises with a trunk about twenty feet high, sending out many long slender branches, which are covered with a brown bark, and garnished with leaves like those of the Bay-tree, but longer, and deeply ribbed on their under side, standing upon pretty long foot-stalks opposite. The flowers are produced upon long branching foot-stalks, which terminate the branches, each sustaining two or three flowers, which are large, white, and are succeeded by pods two or three inches long, the thickness of a man's little finger, which are filled with large kidney-shaped seeds: these pods have a thick fleshy cover.

The sixth sort was sent me from Tolu in America. This rises with a shrubby stalk to the height of eight or ten feet, sending out many ligneous branches, covered with a reddish brown bark, garnished with oblong, spear-shaped, stiff leaves, having punctures on their under side; from the wings of the leaves arise the foot-stalks of the flowers, which are long, slender, and compressed, each of which sustains a small white flower, which is succeeded by an oval pod, containing many small kidney-shaped seeds.

The seventh sort rises with a shrubby stem to the height of twelve or fourteen feet, sending out many strong lateral branches, covered with a dark brown bark, garnished with spear-shaped pointed leaves, placed alternately, having very short foot-stalks; the leaves are of a thicker consistence than those of the Bay-tree; at the foot-stalk of each leaf comes out a single flower, almost the whole length of the branches, which are small, and stand upon short foot-stalks; the summits of these flowers are of a purplish colour, but the stamina are white. This sort was sent me from Tolu.

The eighth sort rises with a shrubby stalk to the height of ten or twelve feet, sending out slender horizontal branches, which are covered with a reddish bark; the joints of these branches are far distant; at each of these come out several leaves in clusters, without order, standing upon pretty long foot-stalks; they are six inches long, and three broad in the middle, and as thick as those of the Laurel, of a shining green, smooth on their upper side, but have many transverse ribs on their under side, which are prominent. I received this sort from Tolu, with the former.

The ninth sort grows naturally in most of the islands in the West Indies; it hath a strong woody stem, twenty-five or thirty feet high, dividing into many branches, covered with an Ash-coloured bark, and garnished with oblong oval leaves, downy on their under side, but smooth on their upper, placed without order; the flowers are produced in loose panicles at the extremity of the branches; these consist of four pretty large concave petals, of a purple colour, including eight long purple stamina, with a very long style crowned by an obtuse stigma; the germen afterward turns to an oblong fleshy pod, containing four or five seeds.

The tenth sort hath slender shrubby stalks, which rise seven or eight feet high, sending out many ligneous branches, garnished with very long, nervous, spear-shaped leaves. The flowers come out at the end of the branches, three standing upon each foot-stalk; these are small, white, and are succeeded by oval fruit.

These last nine sorts are natives of warm countries, so will not live through the winter in England, without the assistance of a stove. They are propagated by seeds, which must be procured from the countries where they grow naturally, for they do not produce any in England; these must be sown in small pots, filled with light sandy earth, and plunged into a hot-bed of tanners bark; which should be now and then refreshed with water, but by no means should have it given in too great plenty: these seeds frequently remain in the ground a year before they vegetate, therefore the pots in which they are sown should be protected in winter; and the spring following must be plunged into a fresh hot-bed of tanners bark, which will bring up the plants if the seeds were good; when the plants appear they must have but little wet, and a good share of air in warm weather; but when they are large enough to remove, they must be each transplanted into a separate small pot, filled with the same earth, and then plunged into the hot-bed again, observing to shade them until they have taken fresh root; after which they should have fresh air admitted to them every day, in proportion to the warmth of the season. In the autumn they must be removed into the stove, and plunged into the bark-bed, where they should constantly remain, and will require the same treatment as other tender exotic plants from the same countries; with this difference only, that they require but little water, especially during the winter, for the roots of these plants are very subject to rot with wet.

If the seeds are brought over in their capsules, they will keep much better than without them; but these should be secured from insects, by wrapping them in Tobacco leaves which are well dried; without this precaution, the seeds will be destroyed before they arrive.

CAPER [BEAN.] See ZYGOPHYLLUM.

CAPRARIA. Lin. Gen. Plant. 686. Sweet Weed.

The CHARACTERS are,

*It hath a permanent empalement of one leaf, cut into five oblong narrow segments, which are erect and stand asunder; the flower is bell-shaped, of one leaf, divided at the top into five equal parts, the two upper standing erect; it hath four stamina, which are inserted in the base of the petal, and but little more than half so long, two of the under being shorter than the other, and terminated by heart-shaped summits; it hath a conical germen supporting a slender style, longer than the stamina, crowned by a bivalve heart-shaped stigma. The germen afterward becomes an oblong conical capsule, compressed at the point, having two cells, divided by a partition filled with roundish seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, the flower having two long and two short stamina, and the seeds being included in a capsule.

We have but one SPECIES of this genus, viz.

CAPRARIA (*Biflora*) foliis alternis floribus geminis. Jacq. tab. 15. *Capraria with alternate leaves, and foot-stalks with two flowers.* Capraria Curassavica. Par. Bat. 110.

This plant grows naturally in the warm parts of America, where it is often a troublesome weed in the plantations; it rises with an angular green stalk about a foot and a half high, sending out branches at every joint, which sometimes come out by pairs opposite, but generally there are three at a joint standing round the stalk; the leaves are also placed round the branches by threes; these stand upon short foot-stalks, are oval, hairy, and a little indented on their edges. The flowers are produced at the wings of the leaves, coming out on each side the stalk, each foot-stalk sustaining two flowers; they are white, and succeeded by conical capsules compressed at the top, opening in two parts, and filled with small seeds.

This plant is preserved in botanic gardens for the sake of variety; but as it hath no great beauty, so is seldom admitted into other gardens.

It is propagated by seeds, which must be sown upon a hot-bed in the spring of the year, and the plants must be brought forward by planting them upon a second hot-bed; and about the middle or latter end of June they may be transplanted either into pots of rich earth, or a warm border, and may then be exposed to the open air, where they will perfect their seeds in autumn.

CAPREOLATE plants [of capreolus, *Lat.* the tendril of a Vine,] such plants as twist and climb upon others, by means of tendrils.

CAPRIFOLIUM. See PERICLYMENUM.

CAPSICUM. Lin. Gen. Plant. 225. [takes its name of capsa, *Lat.* a chest; because the seeds of this plant are included, as it were, in a little chest; or else of κάπτω, to bite, because it is a burning pungent plant.] Guinea Pepper; in French, *Poivre d'Inde ou de Guinée.*

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, divided into five parts, which are erect. It hath but one petal, which is wheel-shaped, having a very short tube, spread open above, and divided into five parts; it hath five small stamina, terminated by oblong summits, which are connected. It hath an oval germen, supporting a slender style, longer than the stamina, and crowned by an obtuse stigma. The germen afterward becomes a soft fruit, or capsule, of an indeterminate figure, having two or more cells, divided by intermediate partitions, to which adhere many compressed kidney-shaped seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and but one style.

The SPECIES are,

1. CAPSICUM (*Annuum*) caule herbaceo, fructu oblongo propendente. *Capsicum with an herbaceous stalk, and an oblong fruit hanging downward.* Capsicum siliquis longis propendentibus. Tourn. Inst. 152.
2. CAPSICUM (*Cordiforme*) caule herbaceo, fructu cordiformi. *Capsicum with an herbaceous stalk, and an heart-shaped fruit.* This is the Capsicum siliqua propendente oblonga & cordiformi. Tourn. Inst. 152.
3. CAPSICUM (*Tetragonum*) caule herbaceo, fructu maximo anguloso obtuso. *Capsicum with an herbaceous stalk, and a large angular obtuse fruit.* Capsicum fructu longo, ventre tumido, per summum tetragono. Tourn. Inst. 153. *Bell Pepper.*
4. CAPSICUM (*Angulosum*) caule herbaceo, fructu cordiformi anguloso. *Capsicum with an herbaceous stalk, and an angular heart-shaped fruit.* Capsicum siliquis surrectis cordiformibus angulatis. Tourn. Inst. R. H. 153.
5. CAPSICUM (*Cerasiforme*) caule herbaceo, fructu rotundo glabro. *Capsicum with an herbaceous stalk, and a round smooth fruit.* Capsicum siliquis surrectis Cerasi forma. Tourn. Inst. 153.
6. CAPSICUM (*Olivæforme*) caule herbaceo, fructu ovato. *Capsicum with an herbaceous stalk, and an oval-shaped fruit.* Capsicum siliqua olivæ forma. Tourn. Inst. 153.

7. Capsicum (*Pyramidale*) caule fruticoso foliis lineari-lanceolatis, fructu pyramidali erecto luteo. *Capsicum with a shrubby stalk, narrow spear-shaped leaves, and yellow pyramidal fruit growing upright.*
8. Capsicum (*Conoide*) caule fruticoso fructu conico erecto rubro. *Capsicum with a shrubby stalk, and a conical red fruit growing erect, commonly called Hen Pepper.*
9. Capsicum (*Frutescens*) caule fruticoso, fructu parvo pyramidali erecto. *Capsicum with a shrubby stalk, and a small pyramidal fruit growing erect.* Capsicum minus fructu parvo pyramidali erecto. Sloan. Hist. Jam. vol. i. p. 240. *Commonly called Barberry Pepper.*
10. Capsicum (*Minimum*) caule fruticoso, fructu parvo ovato erecto. *Capsicum with a shrubby stalk, and a small oval fruit growing erect, commonly called Bird Pepper.*

The first is the common long podded Capsicum, which is frequently cultivated in the gardens; of this there is one with red, and another with yellow fruit, which only differ in the colour of their fruit, which difference is permanent; for I have cultivated both sorts many years, and never have found them change from one to the other; but both will vary in the shape of their fruit and their manner of growing, so that the following varieties I have raised from the same seeds, viz.

1. Capsicum fructu surrecto oblongo. Tourn. *Capsicum with oblong fruit growing erect.*
2. Capsicum fructu bifido. Tourn. *Capsicum with a divided fruit.*
3. Capsicum siliquis surrectis & oblongis brevibus. Tourn. *Capsicum with oblong and short pods growing erect.*
4. Capsicum fructu tereti spithameo. Tourn. *Capsicum with a taper fruit a span long.*

Of these different forms I have had both the red and yellow, but neither of them have changed their colours, though they have frequently varied in their shape.

The second sort with heart-shaped fruit, is undoubtedly a different species from the first, and never alters toward it, though there are several varieties of this, which arise from the same seeds; of this there are red and yellow fruit, which do not alter in colour, though they produce the following varieties.

1. Capsicum siliqua propendente rotunda & cordiformi. Tourn. *Capsicum with round, heart-shaped, hanging pods.*
2. Capsicum siliqua latiore & rotundiore. Tourn. *Capsicum with a larger and rounder pod.*
3. Capsicum rotundo maximo. Tourn. *Capsicum with the largest round fruit.*
4. Capsicum siliquis surrectis cordiformibus. Tourn. *Capsicum with upright heart-shaped pods.*
5. Capsicum siliquis surrectis rotundis. Tourn. *Capsicum with round upright pods.*

The third sort I have cultivated many years, and have not found it alter, nor have I seen any other but the red fruit of this. It is the only sort which is proper for pickling, the skin of the fruit being fleshy and tender, whereas those of the other sorts are thin and tough. The pods of this sort are from one inch and a half, to two inches long, are very large, swelling, and wrinkled; flatted at the top, where they are angular, and sometimes stand erect, at others grow downward. When the fruit of this are designed for pickling, they should be gathered before they arrive to their full size, while their rind is tender; then they must be slit down on one side to get out the seeds, after which, they should be soaked two or three days in salt and water; when they are taken out of this and drained, boiling vinegar must be poured on them, in a sufficient quantity to cover them, and closely stopped down for two months; then they should be boiled in the vinegar to make them green; but they want no addition of any sort of spice, and are the wholesomest and best pickle in the world.

The fourth sort is also a distinct species from all the other: this hath broad wrinkled leaves; the fruit is also furrowed and wrinkled, generally growing upright, and of a beautiful scarlet colour: some of the fruit will have their tops compressed like a bonnet, from whence it had the name; others upon the same plants will be bell-shaped, but they never alter to any of the other sorts. This is much tenderer than either of the former, so will not ripen its fruit in the open air in England; but if the plants are kept under glasses, without any artificial heat, they will thrive better, and produce more fruit, than in hot-beds or stoves.

The fifth sort was sent me from the Spanish West-Indies: this doth not grow so tall as the other sorts, but spreads near the ground. The leaves come out in clusters, which are of a shining green, and stand on long foot-stalks. The fruit is round, smooth, of a beautiful red, and the size of a common Cherry. I have cultivated this several years, and have not found it change.

The sixth sort I received from Barbadoes: this is like the common in its stalk and leaves, but the fruit is oval, and about the size of a French Olive. I have cultivated this many years, and find it constantly the same.

These six sorts are annual with us, whatever they may be in their native countries, for their stalks decay soon after the fruit is ripe. They are propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants have six leaves, they should be transplanted on another hot-bed, at four or five inches distance, shading them in the day time from the sun, until they have taken root, after which, they must have a large share of air admitted to them in warm weather, to prevent their drawing up weak. Toward the end of May, the plants must be hardened by degrees to bear the open air; and in June they should be carefully taken up, preserving as much earth about their roots as possible, and planted into borders of rich earth, observing to water them well, as also to shade them until they have taken root; after which time, they will require no other management, but to keep them clean from weeds, and in very dry seasons to refresh them three or four times a week with water. They will flower the end of June and in July, and their fruit will ripen in autumn. These directions are for the culture of the common sorts of Capsicum, which are generally planted by way of ornament. But the plants of the third sort, which are propagated for pickling, should be planted in a rich spot of ground, in a warm situation, about a foot and a half asunder, and shaded till they have taken root, and afterward duly watered in dry weather; which will greatly promote their growth, and cause them to be more fruitful, as also enlarge the size of the fruit. By this management, there may be at least two crops of fruit for pickling obtained the same year, provided the season proves not too cold; but there should be one plant, whose pods are large and forward, chosen for to save seeds; so the first fruits on this should be suffered to remain, that they may have time to perfect their seeds before the frost comes in autumn, for the early frost generally destroys these plants. When the fruit is fully ripe, it should be cut off, and hung up in a dry room till the spring, when the seeds are wanted.

The fourth, fifth, and sixth sorts being tender, the plants should be put into pots, and placed in an old hot-bed under a deep frame, where they may have room to grow; or if they are planted in the full ground, the plants should be each covered with a bell-glass to screen them from cold. These glasses may be set off every day in warm weather, and placed over them in the evening again; and at such times as the weather is not favourable, the glasses should be raised on the contrary side to the wind, to admit the fresh air. With this care, the fruit of these sorts will ripen in England, which without it, rarely come to maturity, but in very warm seasons.

The beauty of these plants is in their ripe fruit, which being of different forms and colours, intermixed with the green leaves, and white flowers at the same time,

do make a pretty appearance in the latter part of summer, when they are properly disposed in the borders of the flower-garden; or if they are planted in pots, for the decoration of courts, &c. being intermixed with other annual plants, which are in beauty at the same season, they will make an agreeable variety; especially, if as many of the different shaped fruits, of both the red and yellow colours as can be procured, are propagated.

The four last sorts have perennial shrubby stalks, which rise four or five feet high; these are not so hardy as the other, therefore when the plants have been brought forward in the hot-bed, as was directed for the common sorts, they should be each planted in a pot filled with rich earth, and plunged into a very moderate hot-bed, under a deep frame, where they may have room to advance; and in warm weather, they should have a large share of air admitted to them, but must be covered with glasses every night, or in cold weather, and frequently watered. With this management, they will produce plenty of fruit in autumn, which ripen in winter; but they must be removed into the stove, on the first approach of frost, and placed where they may have a temperate warmth, in which they will thrive better than in a greater heat; and the fruit will continue in beauty most part of winter, making a pretty appearance in the stove during that season.

The seeds of the seventh sort I received from Egypt: the leaves of this are much narrower than those of any other sort I have yet seen; the pods always grow erect, and are produced in great plenty, so that the plants make a good appearance for three months in the winter, and they may be preserved two or three years; but as the young plants are the most fruitful, so few persons preserve the old longer, than till they have perfected their fruit, when they begin to lose their beauty. I have cultivated this sort several years, and have never found it vary, so conclude it is a distinct species.

The eighth sort I received from Antigua, by the title of Hen Pepper. This rises with a shrubby stalk three or four feet high, sending out many branches toward the top: the fruit is about half an inch long, shaped in form of an obtuse cone, and of a bright red, growing erect. This ripens its fruit in winter, when it makes a pretty appearance.

The ninth sort grows about the same height as the eighth, but differs from it in the shape and size of the fruit: those of this sort being about the bigness of a Barberry, and nearly of the same shape. This I have long cultivated, and have not observed it to alter.

The tenth sort is commonly known by the title of Bird Pepper in America. This rises with a shrubby stalk four or five feet high: the leaves are broad, and rounder at the ends than those of the other sorts, and of a lucid green: the fruit grows at the divisions of the branches, standing erect: these are small, oval, and of a bright red; they are much more sharp and biting than those of the other sorts. From the fruit of this sort is made the Cayan butter, or what the inhabitants of America call Pepper-pots, which they esteem as the best of all the spices. The following is a receipt for making a Pepper-pot: take of the ripe pods of this sort of Capsicum, and dry them well in the sun, then put them into an earthen or stone pot, mixing flour between every strata of pods, and put them into an oven after the baking of bread, that they may be thoroughly dried; after which, they must be well cleansed from the flour, and if any of the stalks remain to the pods, they should be taken off, and the pods beaten, or ground to fine powder; to every ounce of this, add a pound of Wheat flour, and as much leaven as is sufficient for the quantity intended; after this has been properly mixed and wrought, it should be made into small cakes, and baked in the same manner as common cakes of the same size; then cut them into small parts, and bake them again, that they may be as dry and hard as biscuit, which, beaten into fine powder and sifted, may be kept for use. This may be used as the common Pepper, to season meat or broth, or for any of the purposes that the ordinary Pepper is used: it gives a better relish to meat or sauce, and is found of excellent use to break and discuss the wind, both in the stomach and the guts; therefore is very proper sauce for such meats as are flatulent and windy, or that breed much moisture or crudity. A scruple of this powder put into chicken or veal broth, is greatly commended for comforting cold stomachs, or dispelling of phlegm or viscous humours, and helping digestion.

Most of the sorts of Capsicum are natives of both the Indies; but they have been brought to Europe from America, where they abound in all the Caribbee islands, and are by the inhabitants greatly used in all their sauces; but especially by the negroes, who are great devourers of them; from whence it had the appellation of Negro Pepper, and probably the title of Guinea Pepper may have been applied to it for the same reason. In Spain and Portugal these fruit are much cultivated, where they are used for the same purposes as in America; but in England, they are chiefly cultivated for ornament, being rarely used for sauce, or in medicine; though it is much used in both, in several other countries.

If the ripe pods of Capsicum are thrown into the fire, they will raise strong and noisome vapours, which occasion vehement sneezing and coughing, and often vomiting, in those who are near the place, or in the room where they are burnt. Some persons have mixed the powder of the pods with snuff, to give to others for diversion; but where it is in quantity, there may be danger in using it, for it will occasion such violent fits of sneezing, as to break the blood-vessels of the head, as I have observed in some to whom it has been given.

CAPSULATE pods [of capsula, *Lat.* a chest] are little, short, dry seed-vessels of plants.

CAPSULATED plants, are such as produce their seeds in short dry pods or husks.

CARACALLA. See PHASEOLUS.

CARAGANA. See OROBUS.

CARDAMINDUM. See TROPÆOLUM.

CARDAMINE. Lin. Gen. Plant. 727. [takes its name of Cardamum, which is called Nasturtium; hence it is a small species of Nasturtium,] in English, Ladies Smock.

The CHARACTERS are,

*The empalement is composed of four oval oblong leaves. The flower hath four oblong petals, placed in form of a cross, which at their base are erect, but spread open above, and are much larger than the empalement; it hath six stamina, four of which are the length of the empalement; the other two, which are opposite, are much longer: these are terminated by oblong, heart-shaped, erect summits. It hath a slender cylindrical germen, as long as the stamina, having no style, but is crowned by an obtuse stigma. The germen afterward turns to a long, compressed, cylindrical pod, with two cells, opening in two valves which twist spirally, and cast out the seeds when ripe, by their elasticity.*

This genus of plants is ranged in the second section of Linnæus's fifteenth class, intitled Tetradynamia Siliquosa; the flowers of this class have six stamina, four of which are short, and two are longer, standing opposite, and the seeds are included in long pods.

The SPECIES are,

1. CARDAMINE (*Pratensis*) foliis pinnatis, foliolis radicalibus subrotundis, caulinis lanceolatis. Lin. Sp. Plant. 656. *Ladies Smock with winged leaves, whose lobes at bottom are roundish, but those on the stalks are spear-shaped.* Cardamine pratensis magno flore purpurascente. Tourn. Inst. 224.
2. CARDAMINE (*Parviflora*) foliis pinnatis, foliolis incisis, floribus exiguis, caule erecto ramoso. *Ladies Smock with winged leaves, cut lobes, very small flowers, and an upright branching stalk.* Cardamina annua exiguo flore. Tourn. Inst. R. H. 224.

3. Cardamine (*Hirsuto*) foliis pinnatis, floribus tetrandis. Hort. Cliff. 336. *Ladies Smock, or impatient Cress with winged leaves, and flowers with four stamina.* Cardamine quarta. Dalechamp. Ludg.

4. Cardamine (*Impatiens*) foliis pinnatis incisis stipulatis, floribus apetalis. Lin. Sp. 914. *Impatient Cress with winged leaves, cut stipulæ, and fugacious flowers.* Cardamine pratensis parvo flore. Tourn. Inst. 224.

5. Cardamine (*Græca*) foliis pinnatis foliolis palmatis æqualibus petiolatis. Prod. Ley. 345. *Impatient Cress with winged leaves, whose lobes are handed, equal, and have foot-stalks.* Cardamine Sicula, foliis Fumariæ. Tourn. Inst. 225. *Sicilian impatient Cress with Fumitory leaves.*

6. Cardamine (*Amara*) foliis pinnatis, foliolis subrotundis angulosis. Hall. Helv. 558. *Impatient Cress with winged leaves, whose lobes are roundish and angular.* Nasturtium aquaticum majus & amarum. C. B. P. 104.

7. Cardamine (*Trifolia*) foliis ternatis obtusis, caule subnudo. Lin. Sp. Plant. 654. *Three-leaved impatient Cress with a naked stalk.* Nasturtium Alpinum trifolium. C. B. P. 104.

8. Cardamine (*Bellidifolia*) foliis simplicibus ovatis integerrimis petiolis longis, Flor. Lap. 206. *Impatient Cress with single, oval, entire leaves, having long foot-stalks.* Nasturtium Alpinum Bellidis folio minus. C. B. P. 105. *Smaller Alpine Cress with a Daisey leaf.*

9. Cardamine (*Petræa*) foliis simplicibus oblongis dentatis. Lin. Sp. Plant. 654. *Impatient Cress with single, oblong, indented leaves.* Nasturtium petræum. Pluk. Alm. 261. *Rock Cress.*

10. Cardamine (*Chelidonia*) foliis pinnatis foliolis quinis incisis. Lin. Sp. Plant. 655. *Impatient Cress with winged leaves, having five lobes which are cut.* Cardamine glabra Chelidonii folio. Tourn. Inst. 225.

The first sort grows naturally in the meadows in many parts of England; it is called Cuckow Flower, and Ladies Smock. Of this there are four varieties, viz. the single purple with white flowers, which are frequently intermixed in the meadows, and the double flower of both colours. The single sorts are seldom admitted into gardens; but as the first sort stands in the list of medicinal plants, I have enumerated it. The young leaves of this plant have been gathered in the spring, by some persons, and put into sallads instead of Cress: it is supposed to be an antiscorbutic. The two varieties with double flowers were accidentally found growing in the meadows, and were transplanted into gardens, where they have been propagated. These deserve a place in shady moist borders of the flower-garden, where they will thrive, and make a pretty appearance during their continuance in flower: they are propagated by parting their roots; the best time for this is in autumn, when they should be transplanted annually. They delight in a soft loamy soil, not too stiff, and must have a shady situation. This flowers in May, and in cool seasons will continue part of June.

The seventh, eighth, and tenth sorts, grow naturally on the Alps, and other mountainous places. I received these from Verona, in the neighbourhood of which place they grow naturally. These are low perennial plants, which may be propagated by parting their roots in the autumn, and require a strong soil and shady situation: they may also be propagated by seeds, which should be sown in the autumn, on a shady border, where they will come up soon after, and are never hurt by frost, so will flower the following season. These varieties are preserved in some gardens, but having little beauty, are seldom admitted into the flower-garden.

The ninth sort is a low biennial plant, which grows naturally in several parts of England and Wales, and is preserved in some gardens for the sake of variety. It may be propagated by seeds, which should be sown in the autumn, upon poor light ground in an open situation, and will require no other care but to keep the plants clear from weeds. It flowers in June, and the seeds ripen in July.

The sixth sort grows naturally by the sides of rivers and ditches in most parts of England, so is not admitted into gardens. There has been a variety of this found with double flowers, but it is not as yet much known. This flowers the latter end of April, and in May.

The other sorts are low annual plants, which grow naturally in several parts of England, so are seldom admitted into gardens. These have the title of Impatient Cress, from the elasticity of their pods, which, if touched when they are ripe, spring open, and cast out their seeds with violence, to a considerable distance. These sorts when young, are, by the country people, eaten in sallads, and have the flavour of the common Cress, but milder.

These plants, when once admitted into a garden, propagate in plenty; for they produce great quantities of seeds, which, if permitted to scatter, there will be a supply of plants, which only require to be thinned and kept clean from weeds, and will thrive best in the shade.

CARDIACA. See Leonurus.

CARDINALS FLOWER. See Rapuntium.

CARDIOSPERMUM. Lin. Gen. Plant. Heart Pea; by the inhabitants of America called Wild Parsley; by the French, *Pois de Merveille.*

The Characters are,

*It hath a permanent empalement composed of four concave leaves. The flower has four obtuse petals, which are alternately larger; it hath a small four-leaved nectarium encompassing the germen, and eight stamina, three and three standing opposite, the other two on each side; these are terminated by small summits. The germen is three-cornered, and supports three short styles, crowned by single stigma. The germen afterward becomes a roundish swollen capsule with three lobes, divided into three cells, opening at the top, each having one or two globular seeds, marked with a heart.*

This genus of plants is ranged in the third section of Linnæus's eighth class, intitled Octandria Trigynia, the flower having eight stamina and three styles.

The Species are,

1. Cardiospermum (*Corindum*) foliis subtus tomentosis. Lin. Sp. 526. *Heart Pea with woolly leaves.* Corindum folio & fructu minori. Tourn. Inst. 431.

2. Cardiospermum (*Halicacabum*) foliis lævibus. Hort. Cliff. 150. *Heart-seed with smooth leaves.* Corindum folio ampliori, fructu majore. Tourn. Inst. 431.

The first sort rises with a slender, channelled, climbing stalk, to the height of four of five feet, sending out many side branches, garnished with leaves, upon very long foot-stalks, coming out opposite at the lower part of the stalk; but upward the leaves come out on one side, and the foot-stalk of the flower at the opposite; the foot-stalks of the leaves are divided into three, each of which sustain small leaves, which are again divided into three parts, that are sharply cut on their edges, and end in sharp points. The foot-stalk of the flowers are long, naked, and toward the top, divided into three short ones, each sustaining a single flower. Immediately under these divisions, comes out tendrils or claspers, like those of the Vine, but smaller; these fasten themselves to whatever plants grow near them, and are thereby supported. The flowers are small, white, and composed of four small concave petals, two of which standing opposite, are larger than the other; when these fall away, the germen afterward becomes a large inflated bladder, having three lobes, in each of which is contained one, two, and sometimes three seeds, which are round, hard, and the size of small Peas, each being marked with a black spot in shape of a heart.

The second sort differs from the first in having taller stalks, the leaves being first divided into five, and again into three parts. The foot-stalks are shorter, and the seeds and bladders in which they are contained are much larger, and the whole plant is smoother, in other respects they agree.

These plants grow naturally in both Indies, where they climb upon whatever shrubs are near them, and rise

rise to the height of eight or ten feet, but in England they seldom are much above half so high; they send out many side branches, which spread to a considerable distance every way, and, if permitted, will fasten themselves to the plants which are near them by their small tendrils, and thereby spread over them.

They are annual, and perish soon after they have perfected their seeds, and being natives of hot countries, they will not thrive in England in the open air. They are propagated by seeds, which should be sown upon a hot-bed in the spring; and when the plants are two inches high, they should be each transplanted into a pot filled with light sandy earth, not too rich, then plunged into a very moderate hot-bed, where they must be carefully shaded until they have taken fresh root; after which they must have a large share of air admitted to them, to prevent their being drawn up tall and weak; and when their roots have filled the pots, they should be carefully shaken out, preserving all the earth to their roots (for if that should fall off, the plants will not survive it;) then put them into pots a little larger, filling them up with the same light earth, and place them either under a deep frame, or behind the plants in the stove, where they may be screened from the sun till they are well settled in the pots; after which they may be removed into a glass-case, where they may have room to grow and be screened from the cold of the nights, but in warm weather they will require a large share of air; with this management they will flower in July, and their seeds will ripen in autumn.

**CARDUUS.** Lin. Gen. Plant. 832. Thistle, in French, *Chardon.*

The CHARACTERS are,

*It hath a compound flower made up of many hermaphrodite florets, which are fruitful; these are included in one common scaly empalement, which is swollen in the middle, each scale ending in a sharp spine; the florets are funnel-shaped, of one leaf, having a slender tube, with an erect brim, cut into five narrow segments; each of these florets have five short hairy stamina, terminated by cylindrical summits, which are indented at the top. In the center is situated an oval germen, crowned with down, supporting a slender style, which is longer than the stamina, crowned with a single, naked, indented stigma. The germen afterward becomes an oblong four-cornered seed, crowned with down, and inclosed by the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia æqualis; the flowers of this class have their summits connected into a cylindrical tube, but the stamina are separate, and those of this section have only hermaphrodite fruitful flowers.

1. CARDUUS (*Ptarmicifolia*) foliis integris subtus tomensis, spinis ramosis lateralibus. Prod. Leyd. 133. *Thistle with entire leaves, woolly on their under side, and branching spines proceeding from the side of the stalks.* Carduus humilis aculeatus, Ptarmicæ Austriacæ foliis. Triumf. obs. 96.

2. CARDUUS (*Eriophorus*) foliis sessilibus bifariam pinnatifidis laciniis alternis erectis, calycibus globosis villosis. Hort. Upsal. 249. *Thistle with leaves growing close to the stalks, which are doubly pinnated, the segments alternately erect, and globular woolly heads.* Carduus eriocephalus. Dod. Pempt. 723. *Woolly-headed Thistle, called by some Friars Crown.*

3. CARDUUS (*Acarna*) foliis lanceolatis dentatis ciliatis decurrentibus, spinis marginalibus duplicibus. *Thistle with spear-shaped indented leaves running along the stalks, with hairy edges, and the spines double on their borders.* Acarna major caule folioso. C. B. P. 379. *Greater Fish Thistle.*

4. CARDUUS (*Marianus*) foliis amplexicaulibus hastato-pinnatifidis spinosis, calycibus aphyllis, spinis canaliculatis duplicato-spinosis. Gouan. Monsp. 422. *Thistle with prickly leaves embracing the stalks, empalements without leaves, and doubly armed with channelled spines.* Carduus Mariæ. Dalech. Hist. 1475. *Our Ladies Thistle, or Milk Thistle.*

5. CARDUUS (*Cirsium*) foliis lanceolatis decurrentibus denticulis inermibus, calyce spinoso. Hort. Cliff. 392. *Thistle with spear-shaped leaves running along the stalks, with smooth indentures, and a prickly empalement.* Cirsium Anglicum. Ger. Emac. 1183. *English soft or gentle Thistle.*

6. CARDUUS (*Casabonæ*) foliis sessilibus lanceolatis integerrimis subtus tomentosis, margine spinis ternatis. Hort. Cliff. 393. *Thistle with entire spear-shaped leaves growing close to the stalks, whose borders are set with triple spines.* Acarna Theophrasti anguillaræ. Lob. Icon. 486. *The supposed true Fish Thistle of Theophrastus.*

There are a great number of species more than are here enumerated, some of which are very troublesome weeds in the gardens and fields, therefore are better to be kept out of both; so I thought it needless to mention them here. The few sorts which I have here enumerated, being often preserved in the gardens of the curious for the sake of variety, or cultivated for use by some persons, therefore chose not to omit them.

The first sort grows naturally in Sicily. This is an annual plant, which rises with a channelled stem about a foot and a half high, sending out several side branches toward the top, garnished with long narrow leaves like those of the Austrian Ptarmica, which are of a deep green above, but white on their under side, placed alternate: just below the foot-stalk of the leaf come out several unequal yellow spines, and at the end of the branches the flowers are produced; these have very prickly empalements, under which are placed two long leaves; the flowers are purple, and shaped like those of the common Thistle, but are smaller; these are succeeded by oblong smooth seeds, which have a long woolly down sitting on their top. This sort flowers in July and August, and the seeds ripen in September. It is propagated by seeds, which should be sown on a bed of light earth in the spring where the plants are to remain, for they do not bear transplanting, unless it is performed when they are very young; for they send long slender roots deep into the ground, which, if broken, the plant seldom survives it. The only care they will require, is to keep them clean from weeds, and thin the plants where they are too close.

The second sort grows naturally in several of the midland counties of England. This is a biennial plant, which sends out many long leaves near the ground, having several long segments, placed alternate, which are joined to a winged border running on each side the mid-rib the whole length; these segments point upward; the under side of the leaves, and the margin of the midrib, are armed with long sharp spines, standing every way. The following spring, there arises from the center of the plant one strong channelled stalk, four or five feet high, branching every way toward the top: the stalk and branches are garnished with the same shaped leaves as below, and each branch is terminated by a single head of purple flowers, having a woolly empalement. This flowers in June and July, and the seeds ripen in the autumn. One or two of these plants may be allowed a place in some abject part of the garden, for its singularity. The seeds of this plant should be sown where the plants are to remain, and will require no other care but to keep them clean from weeds. The second year they will flower, and then the whole plant perishes.

The third sort grows naturally in Spain and Portugal. This rises six feet high; the leaves are long, narrow, and the edges are set closely with small hairs; at every indenture of the leaves there comes out two long yellowish spines; at the end of the branches the flowers are produced from the side of the stalk, which have woolly oval empalements, closely armed with slender spines. The flowers are yellow, but make no great appearance, as they advance very little above the empalement. It flowers in July and August, and the seeds ripen in autumn. This plant may be propagated by seeds in the same

 manner

manner as the former ſort. It is called Fiſh Thiſtle, from the reſemblance which the ſpines have to the bones of fiſh.

The fourth ſort grows very common on the ſide of banks, and in waſte land in many parts of England, and is by ſome perſons blanched and dreſſed as a curious diſh. This is a biennial plant, which ſhould be ſown very thin, and when the plants are come up ſo as to be well diſtinguiſhed, the ground ſhould be hoed, to cut down all the young weeds, and the plants left about a foot and a half diſtance; and the following ſummer the ground ſhould be kept clean from weeds. In the autumn the leaves of the plants ſhould be tied up, and the earth drawn up cloſe to blanch them; when they are properly whitened, they will be fit for uſe. This is a biennial plant, which periſhes ſoon after the ſeeds are ripe.

The fifth ſort is a biennial plant, which is by ſome cultivated for medicinal uſe, and has been ſuppoſed a remedy for ſome ſort of madneſs. This may be propagated by ſeeds in the ſame manner as the ſecond ſort. It grows naturally in the northern parts of England, and flowers in June.

The ſixth ſort is ſuppoſed to be the true Fiſh Thiſtle of Theophraſtus. This is a biennial plant, which riſes with an upright ſtalk ſix feet high, garniſhed with long ſpear-ſhaped leaves, armed with triple ſpines at every indenture on their edges; at the top of the ſtalks the flowers come out in cluſters, which are of a purple colour, and are ſucceeded by ſmooth, oval, black ſeeds. It grows naturally in Sicily and the Levant. It is propagated by ſeeds as the ſecond ſort, which ſhould be ſown on a warm border, otherwiſe the plants will not live through the winter. It flowers in June, and the ſeeds ripen in autumn.

CARDUUS BENEDICTUS. See Centaurea.

CARDUUS FULLONUM. See Dipsacus.

CARICA. Lin. Gen. Plant. 1000. Papaw, in French *Papaie*.

The Characters are,

*It is male and female in different plants; the flowers of the male have ſcarce any empalement; they are funnel-ſhaped, and of one leaf, having a long ſlender tube, which expands at the top, where it is divided into five narrow obtuſe parts, which turn backward; it hath ten ſtamina, five of which are alternately longer than the other, and are terminated by oblong ſummits. The female flowers have a ſmall permanent empalement indented in five parts; it hath five long ſpear-ſhaped petals, which are obtuſe, and turn backward at the top; the oval germen ſupports five oblong blunt ſtigma, which are broad at the top, and crenated. The germen afterward becomes a large oblong fleſhy fruit, having five longitudinal cells, which are full of ſmall oval furrowed ſeeds, incloſed in a glutinous pulp.*

This genus of plants is ranged in the ninth ſection of Linnæus's twenty-ſecond claſs, intitled Dioecia Decandria; the plants of this claſs have male and female flowers on different plants, and in this ſection the male flowers have ten ſtamina.

The Species are,

1. Carica (*Papaya*) foliorum lobis ſinuatis. Hort. Cliff. 461. *Papaw with the lobes of the leaves ſinuated.* Papaya fructu Melopeponis effigie. Plum. *Papaw with the fruit ſhaped like the Squaſh.*
2. Carica (*Poſopoſa*) foliorum lobis integris. Hort. Cliff. 461. *Papaw with the lobes of the leaves entire.* Papaya ramoſa fructu pyriformi. Feuil. Peruv. 2. p. 52. tab. 39. *Branching Papaw with a Pear-ſhaped fruit.*

There are ſeveral varieties of the firſt ſort, which differ in the ſize and ſhape of their fruit. Plumier mentions three of the female or fruitful Papaw, beſide the male, one of which he titles Melon-ſhaped, and the other ſhaped like the fruit of the Gourd; and I have ſeen another variety in England, with a large, ſmooth, pyramidal fruit: but theſe are ſuppoſed to be accidental varieties, which ariſe from the ſame ſeeds.

This ſort riſes with a thick, ſoft, herbaceous ſtem, to the height of eighteen or twenty feet, which is naked till within two or three feet of the top, and hath marks of the veſtiges of the fallen leaves great part of its length; the leaves come out on every ſide the ſtem upon very long foot-ſtalks; thoſe which are ſituated undermoſt are almoſt horizontal, but thoſe on the top are erect: theſe leaves (in full grown plants) are very large, and divided into many parts (or lobes) which are deeply ſinuated, or cut into irregular diviſions. The whole plant abounds with a milky acrid juice, which is eſteemed good for the ringworm: the ſtem of the plant, and alſo the foot-ſtalks of the leaves, are hollow in the middle. The flowers of the male plants are produced from between the leaves on the upper part of the plant, on every ſide, which have foot-ſtalks near two feet long, at the ends of which the flowers ſtand in looſe cluſters, each having a ſeparate ſhort foot-ſtalk; theſe are of a pure white, and have an agreeable odour. They are monopetalous, having pretty long tubes, but are cut at the top into five parts, which twiſt backward like a ſcrew; ſometimes theſe are ſucceeded by ſmall fruit, about the ſize and ſhape of a Catherine Pear, which has occaſioned ſome to ſuppoſe it was a diſtinct ſpecies; but I have frequently raiſed this, and the female or fruitful ſort, from the ſame ſeeds, and in general the male flowers fall away, without any fruit ſucceeding them. The flowers of the female Papaw alſo come out between the leaves, toward the upper part of the plant, upon very ſhort foot-ſtalks, ſingly ſitting cloſe to the ſtem; they are large and bell-ſhaped, compoſed of ſix petals, which are commonly yellow, but thoſe of the pyramidal ſort, which I before mentioned, were purple: when theſe fall away, the germen ſwells to a large fleſhy fruit, the ſize of a ſmall Melon, which are of different forms; ſome are angular, and compreſſed at both ends, others are oval and globular, and ſome pyramidal; the fruit alſo abounds with the ſame acrid milky juice as the plants. This fruit, when ripe, is by the inhabitants of the Caribbee Iſlands eaten with pepper and ſugar as Melons, but are much inferior to our moſt common Melon in flavour, in its native country; but thoſe which have ripened in England were deteſtable: the only uſe I have made known of this fruit, was, when they were about half grown, to ſoak them in ſalt water, to get out the milky juice, and pickle them for Mangos, for which they have been a good ſubſtitute. Theſe plants are ſuppoſed to be natives of America, from whence they were carried to the Philippine Iſlands, and to ſeveral parts of India, where they are now pretty common. Though theſe plants have been ſuppoſed to have male flowers only in ſome plants, and female on the other, yet I have often ſeen ſmall fruit on the male plants, and have frequently had fruit on the female, whoſe ſeeds have grown as well as any I ever ſowed, though no male plants were in the ſame ſtove with them.

The ſecond ſort was found growing in a garden at Lima, by father Feuillée, and it was the only plant he ſaw of that ſort in his travels. This differs from the other, in having a branching ſtalk, the lobes or diviſions of the leaves being entire, and the fruit being ſhaped like a Pear, which he ſays were of different ſizes; that which he deſigned was about eight inches long, and three and a half thick, yellow within and without, and of a ſweet flavour. The flower, he ſays, was of a Roſe colour, and divided but into five parts.

Theſe plants being natives of hot countries, will not thrive in England, unleſs they are preſerved in a warm ſtove; where there are ſuch conveniencies, of a proper height to contain the plants, they deſerve a place as well as almoſt any of the plants which are cultivated for ornament; for when they are grown to a large ſize, they make a noble appearance with their ſtrong upright ſtems, which are garniſhed on every ſide near the top with large ſhining leaves, ſpreading out near three feet all round the ſtem: the flowers

of the male sort come out in clusters on every side; and the fruit of the female growing round the stalks between the leaves, being so different from any thing of European production, may intitle them to the care of the curious.

They are easily propagated by seeds, which are annually brought in plenty from the West-Indies. These should be sown in a hot-bed early in the spring, that the plants may obtain strength before the autumn: when the plants are near two inches high, they should be each transplanted into a separate small pot filled with a light, gentle, loamy soil, and plunged into a hot-bed of tanners bark, carefully shading them from the sun till they have taken root; after which they must be treated in the same manner as other tender plants from the same country; but as these plants have soft herbaceous stalks, and abound with a milky juice, they must not have too much water, for they are frequently killed with moisture. There should also be great care taken when these plants are shifted from small pots into larger, to preserve the whole ball of earth to their roots; for whenever they are left bare, they rarely survive it. As the plants advance in their growth, they will require larger pots, and when they are too tall to remain under frames, they must be placed in the tan-bed of the bark-stove, where they should constantly remain, being careful not to give them much water, especially during the winter season; and in summer their waterings should be often repeated, but given in small quantities. With this management I have raised plants near twenty feet high in three years, which have produced their flowers and fruit in great perfection.

CARLINA. Lin. Gen. Plant. 836. The Carline Thistle.

The Characters are,

*It hath a compound flower, made up of many hermaphrodite florets, which are fruitful; these are included in a common, swollen, scaly empalement; the inner scales are long, and placed in a circular order. The flowers are funnel-shaped, having a narrow tube, but are bell-shaped above, and cut into five parts at the brim; these have each five short hairy stamina, terminated by cylindrical summits. In the center is situated a short germen crowned with down, supporting a slender style the length of the stamina, crowned with an oblong bifid stigma. The germen afterward becomes a single taper seed, crowned with a branching plumose down.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia æqualis, the flowers being composed of only hermaphrodite florets which are fruitful, whose summits are connected, and form a tube.

The Species are,

1. Carlina (*Vulgaris*) caule multifloro corymboso, floribus terminalibus calycibus radio albis. Hort. Cliff. 395. *Carline Thistle with many flowers in a corymbus, which terminate the stalk, having white rays to the empalement.* Carlina sylvestris vulgaris. Clus. Hist. 2. p. 155. *Common wild Carline Thistle.*
2. Carlina (*Racemosa*) floribus sessilibus, lateralibus paucissimis. Sauv. Meth. 293. *Carline Thistle with a few flowers growing close to the side of the stalk.* Carlina sylvestris minor Hispanica. Clus. Hist. 2. p. 157. *Small wild Spanish Carline Thistle.*
3. Carlina (*Acaulis*) caule unifloro flore breviore. Hort. Cliff. 395. *Carline Thistle with one shorter flower on each stalk.* Carlina acaulos magno flore albo. C. B. P. 380.
4. Carlina (*Lanata*) caule multifloro lanato, calycibus radio purpureis. Lin. Sp. 1160. *Carline Thistle with many downy flowers on a stalk, which have purple rays to their empalement.* Acarna flore purpureo rubente patulo. C. B. P. 372.
5. Carlina (*Corymbosa*) caule multifloro subdiviso, floribus sessilibus calycibus radio flavis. Prod. Leyd. 135. *Carline Thistle with many flowers on a stalk, which is subdivided, the flowers sit close on the stalks, and have yellow rays to their empalement.* Acarna apula umbellata. Colum. Ecphr. 27.

The first sort grows naturally upon sterile ground in most parts of England, so is rarely admitted into gardens. The others are often preserved in botanic gardens for the sake of variety. They grow naturally in the south of France, Spain, and Italy.

They may all be propagated by sowing their seeds in the spring on a bed of fresh undunged earth, where they are designed to remain; for, as they send forth tap roots, they will not bear transplanting so well as most other plants. When the plants appear above ground, they should be carefully weeded; and, as they grow in size, they should be thinned, where they are too close, leaving them about ten inches or a foot asunder. The second year most of these plants will flower; but, unless the summer proves dry, they rarely produce good seeds in England, and most of them decay soon after they have flowered, therefore it is pretty difficult to maintain these plants in this country.

CARNATION. See Dianthus.

CARPESIUM. Lin. Gen. 948. Nodding Starwort.

The Characters are,

*It hath an imbricated empalement, the outer leaves are larger, spreading, and reflexed, the inner are shorter and equal: the flower is equal and compounded; the hermaphrodite florets are funnel-shaped, opening at the top in five parts; these compose the disk. The female florets are tubulous, quinquefid, closing together, which compose the border. The hermaphrodite florets have five short stamina, crowned by cylindrical summits, and an oblong germen, with a single stalk, crowned by a bifid stigma; the female florets have the like, and both are succeeded by oval naked seeds inclosed in the empalement.*

This genus of plants is ranged in the second order of Linnæus's nineteenth class, intitled Syngenesia Polygamia superflua, the flowers being composed of female and hermaphrodite florets, which are both fruitful.

The Species are,

1. Carpesium (*Cernuum*) floribus terminalibus. Lin. Sp. 1203. *Nodding Starwort whose flowers terminate the stalks.* After Cernuus. Col. Ecphr. 1. p. 251.
2. Carpesium (*Abrotanoides*) floribus lateralibus. Osb. It. tab. 10. *Nodding Starwort whose flowers come from the side of the stalks.*

The first sort grows naturally in Italy. It is a biennial plant, whose lower leaves are obtuse, woolly, and soft to the touch. The flower-stalk rises from the center of the plant near a foot and a half high, branching toward the top, and garnished with leaves of the same form with those at bottom, but smaller: each of the branches are terminated by one pretty large flower of an herbaceous yellow colour, nodding on one side the stalk; these are composed of female florets which compose the border, and hermaphrodite florets which compose the disk, both which are succeeded by oval naked seeds. This flowers in July, and the seeds ripen in September.

The plant is easily propagated by seeds, which may be sown on a bed of light earth in the spring, and when the plants come up, if they are thinned and kept clean from weeds, they will require no other culture. The second year they will flower and produce seeds, soon after which the plants decay.

The second sort grows naturally in China, and at present is rare in England. This hath a hard branching stalk, garnished with broad spear-shaped leaves slightly crenated on the edges: the flowers are thinly scattered on the side of the stalks and branches, where they sit very close, nodding downward; their empalements are composed of many small leaves which spread open, and inclose a great number of florets.

This may be propagated by seeds, which should be sown on a hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a single pot; and when the weather becomes warm, they may be exposed, but in autumn they must be housed.

CARPINUS. Lin. Gen. Plant. 952. [ſo called of carpere, *Lat.* to crop; becauſe it may be eaſily cropped, or its wood is eaſily cleft.] The Hornbeam, or Hardbeam, in French *Charme*.

The Characters are,

*It hath male and female flowers, growing ſeparate on the ſame plant. The male flowers are diſpoſed in a cylindrical rope or katkin, which is looſe and ſcaly, each ſcale covering one flower, which hath no petals, but ten ſmall ſtamina, terminated by compreſſed hairy ſummits. The female flowers are diſpoſed in the ſame form, and are ſingle under each ſcale; theſe have one petal, which is ſhaped like a cup, cut into ſix parts, and two ſhort germen, each having two hairy ſtyles, crowned by a ſingle ſtigma. The katkin afterward grows large, and at the baſe of each ſcale is lodged an oval angular nut.*

This genus of plants is ranged in the eighth ſection of Linnæus's twenty-firſt claſs, intitled Monœcia Polyandria, the plants of this claſs having male and female flowers growing ſeparate on the ſame tree, and thoſe of this ſection have many ſtamina.

The Species are,

1. Carpinus (*Vulgaris*) ſquamis ſtrobilorum planis. Hort. Cliff. 447. *Hornbeam with flat ſcales to the cones.* Carpinus. Dod. Pempt. 841. *Common Hornbeam.*
2. Carpinus (*Oſtrya*) ſquamis ſtrobilorum inflatis. Hort. Cliff. 447. *Hornbeam with inflated ſcales to the cones.* Oſtrya ulmo ſimilis, fructu racemoſo lupulo ſimilis. C. B. P. 427. *The Hop Hornbeam.*
3. Carpinus (*Orientalis*) foliis ovato-lanceolatis ſerratis ſtrobilis brevibus. *Hornbeam with oval, ſpear-ſhaped, ſawed leaves, and the ſhorteſt cones.* Carpinus Orientalis folio minori, fructu brevi. T. Cor. 40. *Eaſtern Hornbeam, with a ſmaller leaf and ſhorter fruit.*
4. Carpinus (*Virginiana*) foliis lanceolatis acuminatis, ſtrobilis longiſſimis. *Hornbeam with pointed ſpear-ſhaped leaves, and the longeſt cones.* Carpinus Virginiana floreſcens. Pluk. *Virginia flowering Hornbeam.*

The firſt ſort is very common in many parts of England, but is rarely ſuffered to grow as a timber-tree, being generally reduced to pollards by the country people; yet where the young trees have been properly treated, they have grown to a large ſize. I have ſeen ſome of them in woods, upon a cold ſtiff clay, which have been near ſeventy feet high, with large, noble, fine ſtems, perfectly ſtrait and ſound. Of late years, this has been only conſidered as a ſhrub, and never cultivated but for under-wood in the country, and in the nurſeries to form hedges, after the French taſte; for in moſt of their great gardens, their cabinets, &c. are formed of theſe trees, as are their trelliſſes and hedges which ſurround their plantations. But ſince theſe ſort of ornaments have been almoſt baniſhed from the Engliſh gardens, there has been little demand for theſe trees in the nurſeries.

As this tree will thrive upon cold, barren, expoſed hills, and in ſuch ſituations where few other ſorts will grow, it may be cultivated to great advantage by the proprietors of ſuch lands. It will reſiſt the violence of winds better than moſt other trees, and is by no means ſlow in its growth. But where theſe are propagated for timber, they ſhould be raiſed from ſeeds, upon the ſame ſoil, and in the ſame ſituation, where they are deſigned to grow; and not brought from better land, and a warmer ſituation, as is too frequently practiſed. Nor ſhould they be propagated by layers, which is the common method where they are intended for hedges or under-wood; for which thoſe ſo raiſed will anſwer the purpoſe full as well as thoſe raiſed from ſeeds, but the latter muſt always be preferred for timber-trees.

The ſeeds of this tree ſhould be ſown in the autumn, ſoon after they are ripe; for if they are kept out of the ground till ſpring, the plants will not come up till the following year. When the plants appear, they muſt be kept very clean from weeds, and treated as other foreſt-trees; in two years time they will be fit to tranſplant, for the ſooner all trees which are deſigned for timber are planted where they are to remain, the larger they will grow, and the wood will be firmer and more durable. If theſe are not intermixed with other kind of trees, they ſhould be planted pretty cloſe; eſpecially on the outſide of the plantations, that they may protect and draw each other up: and if they are kept clean from weeds three or four years, it will greatly promote their growth, after which the plants will have obtained ſufficient ſtrength to keep down the weeds.

As the trees advance in their growth, they muſt be thinned, which ſhould be done with caution, cutting away the moſt unpromiſing plants gradually, ſo as not to let much cold air at once, to thoſe which are left, eſpecially on the borders of the plantation. For in all young plantations of timber, it is much the better method, to take away a few trees every year, where it is wanted, than, as is commonly practiſed, to let all grow till it is fit to cut as under-wood, and then cut all away, except thoſe intended for timber; whereby ſo much cold air is ſuddenly let in upon them, as to ſtop their progreſs for ſome years: but by this method a preſent advantage is gained, which is now more generally attended to, than the future profit.

The timber of this tree is very tough and flexible, and might be converted to many uſeful purpoſes, when ſuffered to grow to a proper ſize; but as they have been generally treated otherwiſe, the principal uſes it has been applied to, was for turnery ware, for which it is an excellent wood, and alſo for making mill-cogs, heads of beetles, &c. It is alſo excellent fuel.

The leaves of this tree remain upon them, till the young buds in the ſpring thruſt them off, ſo they afford much ſhelter to birds in winter; and this renders them very proper to plant round the borders of other plantations in expoſed ſituations, where they will defend the other trees in winter, and thereby greatly promote their growth.

The Hop Hornbeam ſheds its leaves in winter, with the Elm, and other deciduous trees. This tree, tho' but lately much known in England, is very common in Germany, growing promiſcuouſly with the common ſort. It is alſo ſaid to grow plentifully in many parts of North America, but it is doubtful whether that is not a different ſort from this. The Hop Hornbeam is of quicker growth than the common ſort, but what the wood of that will be I do not know; for there are but few of the trees in England growing upon their own roots, moſt of them having been grafted upon the common Hornbeam, which is the uſual method of propagating them in the nurſeries; but the trees ſo raiſed are of ſhort duration, for the graft generally grows much faſter than the ſtock, ſo that in a few years there is a great diſproportion in their ſize; and where they happen to ſtand expoſed to ſtrong winds, the graft is frequently broken from the ſtock, after many years growth; for which reaſon, I would caution every perſon not to purchaſe any of theſe trees which have been ſo propagated.

The Virginian flowering Hornbeam is ſtill leſs common than the laſt, and only to be ſeen in curious gardens; it is equally as hardy as the other, and may be increaſed by layers.

This ſort will grow to the height of thirty feet, or more, and is of quicker growth than either of the former ſorts: it ſheds its leaves in autumn, about the ſame time with the Elm; and, during the time of its verdure, this tree makes a good appearance, being well clothed with leaves, which are of a deep, ſtrong, green colour, reſembling more the long-leaved Elm than the Hornbeam.

The Eaſtern Hornbeam is a tree of humble growth, rarely riſing above ten or twelve feet high in this country, ſhooting out many horizontal irregular branches, ſo cannot eaſily be trained up to a ſtem. The leaves of this ſort are much ſmaller than thoſe of the common Hornbeam, and the branches grow cloſer together, therefore may be very proper for low hedges, where they are wanted in gardens; being a very tonſile plant, it may be kept in leſs compaſs than

than almost any deciduous tree. It is as hardy as any of the sorts, and may be propagated in the same manner; but at present it is rare in the English nurseries.

CARROTS. See DAUCUS.

CARTHAMUS. Lin. Gen. Plant. 838. [so called of καθαίρειν, *Gr.* to purge, because the seeds of it are purging,] Bastard Saffron, or Safflower in French; *Cartame, ou Saffran Batard.*

The CHARACTERS are,

*It hath a flower composed of several hermaphrodite florets, included in one common scaly empalement. The scales are composed of many flat leaves, broad at their base, ending in a spine, and spread open below. The florets are funnel-shaped, of one leaf, cut into five equal segments at the top; these have five short hairy stamina, terminated by cylindrical tubular summits; in the center is situated a short germen, supporting a slender style the length of the stamina, crowned by a single stigma. The germen afterward becomes a single, oblong, angular seed, inclosed in the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia Æqualis; the flowers of this section being composed of only fruitful florets, and their summits are connected in form of a cylindrical tube.

The SPECIES are,

1. CARTHAMUS (*Tinctorius*) foliis ovatis integris serrato-aculeatis. Hort. Cliff. 394. *Bastard Saffron with oval entire leaves, which have spiny serratures.* Carthamus officinarum, flore croceo. Tourn. Inst. 457. *Bastard Saffron of the shops, with a Saffron-coloured flower.*
2. CARTHAMUS (*Lanatus*) caule piloso supernè lanato, foliis inferioribus pinnatifidis, summis amplexicaulibus dentatis. Hort. Upsal. 251. *Carthamus with a hairy stalk, woolly above, the under leaves indented, and the upper embracing the stalk.* Atractylis lutea. C. B. P. *Yellow Distaff Thistle.*
3. CARTHAMUS (*Creticus*) caule læviusculo, calycibus sublanatis, flosculis subnovenis, foliis inferioribus lyratis, summis amplexicaulibus dentatis. Lin. Sp. 1163. *Carthamus with a smooth stalk, woolly empalements, generally nine florets, the under leaves lyre-shaped, and the upper embracing the stalk.* Cnicus Creticus Atractylidis folio & facie, flore leucophæo. Tourn. Cor. 33.
4. CARTHAMUS (*Tingitanus*) foliis radicalibus pinnatis, caulinis pinnatifidis, caule unifloro. Lin. Sp. 1163. *Carthamus whose radical leaves are winged, those on the stalks wing-pointed, and one flower on a stalk.* Cnicus perennis cæruleus Tingitanus. H. L. 162. *Blue perennial Cnicus of Tangier.*
5. CARTHAMUS (*Carduncellus*) foliis caulinis linearibus pinnatis longitudine plante. Lin. Sp. Plant. 831. *Carthamus with narrow winged leaves on the stalks, which are as long as the plant.* Cnicus cæruleus humilis Montis Lupi. H. L. *Dwarf Cnicus of Mount Lupus with a blue flower.*
6. CARTHAMUS (*Cæruleus*) foliis lanceolatis spinoso-dentatis, caule subunifloro. Hort. Cliff. 1163. *Carthamus with spear-shaped leaves prickly indented, and one flower on each stalk.* Cnicus cæruleus asperior. C. B. P. 378. *Rougher blue Cnicus.*
7. CARTHAMUS (*Arborescens*) foliis ensiformibus sinuato-dentatis. Prod. Leyd. 136. *Carthamus with sword-shaped leaves which are sinuated and indented.* Cnicus Hispanicus arborescens fœtidissimus. Tourn. Inst. 451. *Stinking shrubby Cnicus of Spain.*
8. CARTHAMUS (*Corymbosus*) floribus umbellatis numerosis. *Carthamus with many flowers in umbels.* Chamæleon niger umbellatus, flore cæruleo hyacinthino. C. B. P. 380. *Black umbellated Chamæleon with blue flowers.*

The first sort grows naturally in Egypt, and in some of the warm parts of Asia. I have frequently received the seeds of this from the British islands in America, but whether they were originally carried thither, or if it grows naturally there, I could never be rightly informed. It is at present cultivated in many parts of Europe, and also in the Levant, from whence great quantities of Safflower are annually imported to England, for dyeing and painting.

This is an annual plant, which rises with a stiff ligneous stalk two feet and a half, or three feet high, dividing upward into many branches, which are garnished with oval pointed leaves, sitting close to the branches: these are entire, and are slightly sawed on their edges, each tooth being terminated by a short spine. The flowers grow single at the extremity of each branch: the heads of flowers are large, inclosed in a scaly empalement; each scale is broad at the base, flat, and formed like a leaf of the plant, terminating in a sharp spine. The lower part of the empalement spreads open, but the scales above closely embrace the florets, which stand out near an inch above the empalement; these are of a fine Saffron colour, and this is the part which is gathered for the uses above-mentioned. When the florets decay, the germen which is situated in each, become single, oblong, angular seeds, of a white colour, and have a pretty strong shell or cover to them. It flowers in July and August, and the seeds ripen in autumn; but if the season proves cold and moist, when the plants are in flower, there will be no good seeds produced; so that there are few seasons, wherein the seeds of this plant do come to perfection in England.

The seeds of this plant are sometimes used in medicine, and are accounted a pretty strong cathartic, but at present they are seldom prescribed. It is propagated by seeds, which should be sown in April, upon a bed of light earth: the best way is to sow them in drills, drawn at two feet and a half distance from each other, in which the seeds should be scattered thinly, for the plants must not stand nearer each other than a foot in the rows; but as some of the seeds will fail, so a greater quantity should be sown, as it will be easy to thin the plants, at the time when the ground is hoed. If the seeds are good, the plants will appear in less than a month; and in a fortnight or three weeks after, it will be proper to hoe the ground to destroy the weeds, and at the same time the plants should be thinned where they are too close; but at this time they should not be separated to their full distance, lest some of them should afterward fail; so that if they are now left six inches asunder, there will be room enough for the plants to grow, till the next time of hoeing, when they must be thinned to the distance they are to remain for good: after this they should have a third hoeing, which, if carefully performed in dry weather, will destroy the weeds and make the ground clean, so that the plants will require no farther care, till they come to flower; when, if the Safflower is intended for use, the florets should be cut off from the flowers as they come to perfection; but this must be performed when they are perfectly dry, and then they should be dried in a kiln, with a moderate fire, in the same manner as the true Saffron, which will prepare the commodity for use.

But if the plants are designed for seed, the flowers must not be gathered; for if the florets are cut off, it will render the seeds abortive, though they may swell and grow to their usual size, as I have frequently experienced; yet when they are broken, there will be found nothing more than a shell without any kernel. And this frequently happens to be the case with these seeds, in wet cold seasons; though in very wet years the germen will rot, and never come so forward as to form a shell.

I have been informed, that this plant was formerly cultivated in the fields in several parts of England, for the dyers use; and particularly in Gloucestershire, where the common people frequently gathered the florets, and dried them, to put into their puddings and cheesecakes, to give them a colour; but some by putting it in too great quantity, gave their puddings a cathartic quality.

If this plant was ever cultivated here in great quantity, it is surprising how it came to be so totally neglected, as that at present, there are not the least traces to be met with, in any part of England, of its ever having been cultivated; nor is the commodity

scarce known, except to those who deal in it: the quantity of this which is annually consumed in England is so great, as to make a very considerable article in trade, so that it might be very well worthy of the public attention; for although the seeds seldom come to perfection in England, yet these might be annually procured from abroad, and the plants would constantly produce the flower, which is the only part useful. A few years past I sent a small parcel of the seeds of this plant to South Carolina, where I was afterward informed it grew amazingly, for in six weeks after the seeds were sown, the crop of Safflower was fit to cut, and the gentleman to whom the seeds were given, sent some of the commodity to his brother in London, who was so kind as to send me a specimen of it, with an account that the dyers complained of its want of colour; and upon examining it, I found the florets were drawn out of their empalements the whole length, so that their tails which had been included in their covers were white, and being mixed together gave the whole a pale appearance; upon this I wrote to the gentleman to desire he would cut off the upper part of the florets with sciffars, which would be easier performed, but have heard nothing from him since; however, a year or two after I received a letter from his excellency Governor Lyttleton, in which he wrote that the Safflower bid fair to prove one of their great branches of commerce, but how it has turned out I have not since heard.

This plant is cultivated in great plenty, in some parts of Germany, where the seeds constantly come to perfection; and as I have obtained a short account of their method of cultivation, from a curious gentleman of that country, so I shall insert it for the benefit of those who may be induced to engage in this undertaking.

The ground in which they propose to sow the Carthamus, has always a double fallow given to it, first to destroy the weeds, and afterward to make it fine. They make choice of their lightest land, and such as is clear from Couch Grass, and other troublesome weeds. After the land has been fallowed a summer and winter, in which time they give it four ploughings, and harrow it between each, to break the clods, and pulverize it: in the latter end of March they give it the last ploughing, when they lay it in narrow furrows of about five feet or a little more, leaving a space of two feet between each: then they harrow these lands to make them level, and after it is finished, they sow the seeds in the following manner. With a small plough, they draw four shallow furrows in each land, at near a foot and a half distance, into which they scatter the seeds thinly; then with a harrow, whose teeth are little more than one inch long, they draw the earth into the drills to cover the seeds; after this, they draw a roller over the ground, to smooth and settle it. When the plants are come up, so as to be distinguished, they hoe the ground to destroy the weeds; and at this first operation, where the plants happen to be close, they cut up the least promising, leaving them all single, at the distance of three or four inches; which they always suppose will be sufficient room for their growth, till the second time of hoeing, which must be performed in about five weeks after their first; in which they are guided by the growth of the weeds, for as this work is performed with a Dutch hoe, so they never suffer the weeds to grow to any size before they cut them; in which they judge right, for when the weeds are small, one man will hoe as much ground in a day, as can be performed by three, when they are permitted to grow large; and the weeds will be more effectually destroyed.

They give a third hoeing to the plants, about five or six weeks after the second; which generally makes the ground so clean, as to require no more cleaning, till the Carthamus is pulled up. When the plants begin to flower, and have thrust out their florets (or thrum) to a proper length, they go over the ground once a week to gather it; and as it is from time to time gathered, it is dried in a kiln for use. There is usually a succession of flowers for six or seven weeks. After the crop is gathered, the stalks are pulled, and tied in bundles for fuel; and when they have been set up a few days to dry, they are carried off, and the ground is ploughed for Wheat; which they say, always succeeds well after this plant.

The good quality of this commodity is chiefly in the colour, which should be of a bright Saffron colour, and herein that which is cultivated in England often fails; for if there happens much rain during the time the plants are in flower, it will cause the florets to change to a dark or dirty yellow, which will also befal that which is gathered when there is any moisture remaining upon it; therefore great care must be taken not to gather it till the dew is quite dried off, nor should it be pressed together till it has been dried on the kiln. The manner of doing this being the same as for the true Saffron, I shall not mention it here, but desire the reader to turn to the article CROCUS, where that is fully treated.

In Spain this plant is cultivated in their gardens, as Marigolds are in England, to put into their soups, olios, and other dishes, to give them a colour. The Jews also are very fond of this, and mix it in most of their viands; and it is very probable they were the persons who first carried the seeds of this plant to America, and taught the inhabitants the use of it, for it is now as commonly used by the English there, as in any part of Europe.

This plant may be admitted to have a place in the borders of large gardens, where it will add to the variety, during the time of its continuance in flower, which is commonly two months, or ten weeks; for if the seeds are sown in the beginning of April, the first flowers will appear in the middle of July at farthest; and there will be a succession of flowers on the side branches, till the end of September, or in mild warm seasons till the middle of October, during which time the plants will not be destitute of flowers; which being of a bright Saffron colour, make a pretty appearance; and if the plants are supported to prevent their being broken, or blown down by the wind, they will not interfere with the other flowers, because these have a regular upright growth.

When they are cultivated for this purpose, the seeds should be sown in the places where the plants are designed to remain, because they do not bear transplanting well; therefore three or four seeds should be sown in each patch, lest any of them should fail; and when the plants are grown so strong as to be out of danger, the most promising in each patch should be left, and the others pulled up, that they may not draw or injure those which are to stand.

The second sort grows naturally in the south of France, Spain, and Italy, where the women use the stalks of this plant for distaffs, from whence it had the title of Distaff Thistle. It is by some called Bastard wild Saffron. The leaves of this plant are sometimes ordered for medicine, and are supposed to have the same virtues as Carduus Benedictus.

This plant is annual, perishing soon after the seeds are ripe; the lower leaves spread flat upon the ground; these are five or six inches long, narrow, and deeply indented on both sides; they are hairy, and have a few soft spines on their edges; the stalk rises about two feet high, covered with hairs, and garnished with oblong hairy leaves, which embrace the stalk with their base, and are deeply sinuated, with sharp thorns growing on their edges. The upper part of the stalk divides into many branches, which are garnished with leaves of the same form, but smaller. The flowers are produced at the end of the branches, having a cluster of stiff, hard, prickly leaves below the scaly empalement, which contains many yellow hermaphrodite flowers, succeeded by oblong angular seeds. It flowers in June and July, and the seeds ripen in autumn. If the seeds of this sort are sown in autumn, the plants will flower early the following summer, so there will be a certainty of good seeds. They

may be sown upon a bed of earth in any situation, and will require no other culture, but to keep them clean from weeds, and thin the plants where they are too close; this being a medicinal plant, is kept in some gardens, but it hath little beauty.

There is a variety of this, which grows much taller, the heads are larger, and the leaves are placed closer upon the stalks. This was found by Dr. Tournefort in the Levant.

The third sort was also discovered by Tournefort in the island of Crete, from whence he sent the seeds to the royal garden at Paris. This differs from the former, in having a smooth stalk; the leaves are very stiff, deeply indented, smooth, and are armed with very strong spines; the heads of flowers are oval, the florets white, and the plant grows near four feet high. This is an annual plant, which may be sown and treated in the same way as the former, and flowers about the same time.

The fourth sort hath a perennial root, but an annual stalk. This grows naturally in Spain, and was first brought to England from Tangier; the seeds of this are never perfected in England, so it is propagated by parting of the roots. The best time for transplanting and parting them, is about the beginning of March; they should have a dry soil and a warm situation, otherwise they are liable to be destroyed in severe winters.

The stalks of this rise about a foot and a half high, seldom putting out any branches, garnished with narrow spear-shaped leaves the whole length of the stalk; these are deeply sawed on their edges, each of the serratures ending in a sharp point. The stalk is terminated by one large scaly head of blue flowers, shaped like those of the other species.

The fifth sort grows naturally in the south of France, Spain, and Italy. This hath a perennial root and an annual stalk, which rises about six inches high; it is channelled, hairy, and garnished with long narrow leaves, ending in several sharp spines; their edges are indented, each indenture ending in a spine. Each stalk is terminated by one large head of blue flowers, having a leafy empalement, composed of very broad scales, each ending in a sharp spine. It flowers in June.

This sort is difficult to propagate in England, for the roots do not put out offsets like the former, so is only to be raised from seeds; which do not come to perfection here, unless the season proves warm and dry. This plant should have a dry soil and a warm situation.

The sixth sort is supposed by some, to be the same with the fourth, which is a great mistake, for they are extremely different. This rises with a single stalk about two feet high, which is of a purplish colour, hairy, and channelled, closely garnished with broad spear-shaped leaves, which are sharply sawed on their edges, and covered with a short hairy down. The stalk is terminated by a single large head of blue flowers, having a scaly empalement, composed of two orders of leaves, the outer being broad, long, and armed with sharp spines on their edges; the inner are narrow, and terminate with a sharp thorn. It flowers in June and July, and the seeds ripen in autumn. This sort may be propagated by parting of their roots, which should be performed in autumn, when the leaves decay. It should have a light dry soil, in which it will endure the cold of our winters, and continue many years. It may also be propagated by seeds, which ripen well in dry seasons, but in wet summers the seeds are generally abortive; this requires no other care but to keep it clean from weeds. It grows naturally in Spain, France and Italy, on arable land.

The seventh sort I received from Andalusia, where it grows naturally in great plenty. This rises with a shrubby perennial stalk to the height of eight or ten feet, dividing into many branches, garnished with pretty long sword-shaped leaves, which are indented, armed with spines on their edges, and embrace the stalks with their base. The branches are terminated by large, scaly, prickly heads of yellow flowers, which come out in July, but are never succeeded by seeds in this country, so can only be propagated by side shoots, slipped from the branches in the spring, and planted in pots filled with light sandy earth, and plunged into a moderate hot-bed, observing to shade them till they have taken root; then they must be gradually hardened, and removed into the open air, and when they have obtained strength, they may be separated, and some of them planted in a warm dry border, where they will endure the cold of our ordinary winters; but, in severe frost, they are frequently destroyed, therefore a plant or two should be kept in pots, and sheltered in winter to preserve the species.

The seeds of the eighth sort were sent me from Spain, where it grows naturally. This hath a perennial root but an annual stalk, which is single, and never puts out any side branches; these are white, smooth, and channelled. The leaves are long, narrow, of a pale green, and closely armed on their edges with short stiff spines, which come out double. The stalks are terminated by single, oval, scaly heads of white flowers, each scale being terminated by a purplish spine. This squamous empalement is closely joined at the top, so as few of the hermaphrodite florets appear visible above it; and this is guarded by a border of long, narrow, prickly leaves, surrounding the head, which rise considerably above the flowers. This plant flowers in July and August, but seldom perfects its seeds in England. It should be planted in a light soil and a warm situation, where it will live abroad in our ordinary winters, but in severe frost it is sometimes destroyed. As the seeds of this sort rarely ripen in England, the only method to propagate the plant, is by parting the roots in the spring.

CARUM. Lin. Gen. Plant. 327. Carvi [so called of Κάρα, Gr. the head, as though good for the head; but others derive the name from Caria, where the antients found this plant.] Carui, or Carraway.

The CHARACTERS are,

*It hath an umbellated flower, composed of several small umbels, which are formed as rays to the general umbel, neither of which have any involucrum; the single flowers have very small empalements; each hath five heart-shaped obtuse petals, turned inward at their points; it hath five hairy stamina the length of the petals, terminated by roundish small summits. The germen is situated under the flower, supporting two small styles, crowned by a single stigma. The germen afterward becomes an oblong channelled fruit, dividing into two parts, each having an oblong furrowed seed.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Dygynia, the flowers having five stamina and two styles.

The SPECIES are,

1. CARUM (*Carvi*) foliis pinnatifidis planis, umbellatis inæqualibus confertis. *Carraway with plain leaves ending with many points, and unequal umbels, growing close.* Cuminum pratense, Carui officinarum. C. B. P. 159. *Meadow Cumin, or Carraway of the shops.*
2. CARUM (*Hispanicum*) foliis capillaribus multifidis, umbellis laxis. *Carraway with capillary multifid leaves, and loose umbels.* Carvi Hispanicum, semine majore, & latiore. Juss. *Spanish Carraway with a larger and broader seed.*

The first sort is the common Carraway, whose seeds are greatly used, not only in medicine, but also in the kitchen, &c. This grows naturally in some rich meadows in Lincolnshire and Yorkshire, and is sometimes found growing in the pastures near London. It is also cultivated for use in Essex, and some other counties.

This is a biennial plant, which rises from seeds one year, flowers the next, and perishes soon after the seeds are ripe. It hath a taper root like a Parsnep, but much smaller, which runs deep into the ground, and hath a strong aromatic taste, sending out many small fibres; from the root arises one or two smooth, solid,

solid, channelled stalks, about two feet high, garnished with winged leaves, having long naked footstalks, and many small wings placed opposite on the midrib, which are composed of many narrow, little, plain leaves, ending in several points. The stalks divide upward into several smaller branches, each of which is terminated by an umbel, composed of six or eight small separate umbels or rays, which divide into several small foot-stalks, each sustaining a single white flower, with five heart-shaped petals; the flowers of these small umbels are closely joined together. After the flowers are decayed, the germen becomes an oblong channelled fruit, composed of two oblong channelled seeds, plain on one side, but convex on the other. It flowers in June, and the seeds ripen in autumn.

The best season for sowing the seeds of this plant is in autumn, soon after they are ripe, when they will more certainly grow, than those sown in the spring; and the plants which rise in the autumn, generally flower the following season, so that a summer's growth is hereby saved. When the plants come up, the ground should be hoed to destroy the weeds; and where the plants are too close, they must be thinned in the same manner as is practised for Carrots, leaving them three or four inches apart. In the following spring they will require to be twice more hoed, which will keep the ground clean till the seeds are ripe; then the stalks must be pulled up, and tied in bundles, setting them upright to dry, when the seeds may be threshed out for use.

The second sort grows naturally in Spain: the seeds of this were sent me from the royal garden at Paris. This plant rises with a stronger stalk than the former, which seldom grows more than a foot and a half high, but is closely garnished with fine narrow leaves like those of Dill; the stalks divide upward into many branches, each being terminated by loose umbels of white flowers, which are succeeded by large broad seeds, having the same aromatic flavour as the common sort. This is a biennial plant, and may be treated in the same manner as the former.

CARYOPHYLLATA. See Geum.

CARYOPHYLLUS. Lin. Gen. 594. Caryophyllus aromaticus. Tourn. Inst. R. H. 661. tab. 432. *The Clove-tree, or All-spice.*

The Characters are,

*It hath a double empalement, that of the flower is of one leaf, cut into four obtuse parts, upon which the germen is situated; the fruit hath another empalement, which is small, and slightly divided into four parts, which are permanent. The flower hath four blunt petals, which are situated opposite to the incissures of the empalement. It hath many stamina, which rise from the sides of the empalement, terminated by roundish summits. The germen is situated under the flower, and is crowned by the small empalement, supporting a single upright style, crowned by an obtuse stigma. The germen afterward becomes a soft berry with two cells, each containing a single kidney-shaped seed.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, intitled Polyandria Monogynia, the flower having many stamina and but one style.

The Species are,

1. Caryophyllus (*Aromaticus*) foliis ovato-lanceolatis oppositis, floribus terminalibus, staminibus corollâ longioribus. *The Clove-tree with oval spear-shaped leaves growing opposite, and flowers terminating the stalks, whose stamina are longer than the petals.* Caryophyllus aromaticus fructu oblongo. C. B. P. 410. *Aromatic Clove with an oblong fruit.*
2. Caryophyllus (*Pimento*) foliis lanceolatis oppositis, floribus racemosis terminalibus, & axillaribus. *Clove-tree with spear-shaped leaves growing opposite, and flowers growing in bunches at the ends of the branches, and wings of the leaves.* Myrtus arborea aromatica foliis laurinis. Sloan. Cat. 161. *The Pimento, or All-spice.*
3. Caryophyllus (*Fruticosus*) foliis lanceolatis oppositis; floribus geminatis alaribus. Brown. Hist. Jam. 248. *Clove-tree with spear-shaped leaves placed opposite, and flowers growing by pairs from the sides of the stalks.*
4. Caryophyllus (*Cotinifolia*) foliis ovatis obtusis oppositis, floribus sparsis alaribus. *Clove-tree with oval blunt leaves placed opposite, and flowers growing thinly from the sides of the branches.* Myrtus cotini folio. Plum. Cat. 19. *Myrtle with a leaf of Venice Sumach.*
5. Caryophyllus (*Racemosus*) foliis oblongo-ovatis, emarginatis, ridigis, glabris, floribus racemosis terminalibus. *Clove-tree with oblong oval leaves, which are stiff, smooth, and indented at the edges, and flowers growing in branches terminating the stalk.*

The first sort grows naturally in the Moluccas, and the hottest parts of the world, where it rises to the height of a common Apple-tree; but the trunk generally divides at about four or five feet from the ground into three or four large limbs, which grow erect, and are covered with a thin smooth bark, which adheres closely to the wood. These limbs divide into many small branches, which form a sort of conical figure; the leaves are like those of the Bay-tree, and are placed opposite on the branches. The flowers are produced in loose bunches at the end of the branches, which are small, white, and have a great number of stamina, which are much longer than the petals. The flowers are succeeded by oval berries, which are crowned with the empalement, divided into four parts, which spread flat on the top of the fruit, in which form they are brought to Europe; for it is the young fruit beaten from the trees before they are half grown, which are the Cloves used all over Europe.

I have not heard of any plants of this kind being in the gardens, either in England or Holland, but I chose to mention it here, to introduce the other.

The second sort grows naturally in Jamaica, but particularly on the north side of that island, where it is found in great plenty, and is a considerable branch of their trade; the unripe fruit dried, being the All-spice so well known in Europe. It is now cultivated with care in many of the plantations, for the trees will thrive upon shallow rocky land, which is unfit for the Sugar-cane; so that a great advantage arises to the planters from those lands, which would otherwise be of small account to them.

This tree grows to the height of thirty feet or more, with a strait trunk, covered with a smooth brown bark, dividing upward into many branches which come out opposite, garnished with oblong leaves, resembling those of the Bay-tree in form, colour, and texture, but are longer, and are placed by pairs: when these are bruised or broken, they have a very fine aromatic odour like that of the fruit. The branches grow very regular, so that the trees make a fine appearance, and as they retain their leaves through the year, the trees are worthy of being propagated for ornament and shade about the habitations of the planters. The flowers are produced in large loose bunches from the side of the branches, towards their ends, each branch is also terminated by a larger bunch than the other; the flowers are small, and of an herbaceous colour; they are male and female upon distinct trees. I was favoured with fine samples of both, and also a particular account of the trees, by William Williams, Esq; of St. Anne's, on the north side of Jamaica, who has the greatest number of these trees on his plantation of any person in that island. The male flowers have very small petals, and a great number of stamina in each, which are of the same colour with the petals, terminated by oval bifid summits; the female flowers have no stamina, but an oval germen, situated below the flower, supporting a slender style, with a blunt stigma at the top. The germen afterward becomes a globular pulpy berry, including two kidney-shaped seeds. The usual season when these trees flower, is in June, July, and August.

When the fruit of theſe trees are deſigned for uſe, they are gathered, or beaten down from the trees a little before they arrive to their full ſize, and are ſeparated from leaves, ſtalks, or any rubbiſh which may have accidentally mixed with them; then the fruit is expoſed every day to the ſun, ſpread on cloths for ten or twelve days to dry, but removed under cover every evening to ſcreen it from the dews; when the fruit is perfectly dry, it is packed up for exportation. If the fruit is permitted to grow to maturity, the pulp, which ſurrounds the ſeeds, is ſo full of moiſture, and is ſo glutinous, as to ſtick to the fingers of thoſe who bruiſe them, therefore are unfit for thoſe uſes to which the dried fruit are applied.

It is called by ſome Jamaica Pepper, but the moſt general appellation is All-ſpice, from its reliſh and flavour, partaking of many other ſpices, and is deſervedly accounted one of the beſt; and if it was as ſcarce and difficult to procure as thoſe ſpices in the eaſt, would be much more ſought after and eſteemed: our neighbours the Dutch, who have engroſſed the ſpice trade to themſelves, have alſo been artful enough to deceive us with this of our production, by purchaſing the dried fruit of the All-ſpice in England at a low price, and grinding it to a powder, then ſelling it to us at an advanced price for powder of Cloves. This I have been credibly informed of, by an eminent merchant, through whoſe hands great quantities of this commodity have paſſed.

The Dutch have alſo drawn an oil from the fruit of this tree, which they vend for oil of Cloves. I had a ſmall phial of this oil ſent me from Jamaica, which was ſhewn to ſome of the beſt judges of drugs in London, who tried many experiments with it, and declared they thought it as good oil of Cloves as they had ſeen.

As there is ſo great an affinity between this tree and the true Clove, it might be worthy of trial, if the fruit when firſt formed, or the flowers were beaten down from the trees, and dried in the ſame manner as the eaſtern Cloves, might not anſwer the ſame purpoſe; or, at leaſt, it would be a good ſuccedaneum for that ſpice; and as it is the production of our own colonies, ſhould have proper encouragement.

This tree is propagated by ſeeds, which in the natural place of its growth is conveyed, and ſown by birds, to a great diſtance; and, it is very probable, the ſeeds paſſing through them, are rendered fitter for vegetation, than thoſe which are immediately gathered from the tree; for I have received great quantities of the berries from the gentleman before-mentioned, which were perfectly ripe and freſh, great part of which I ſowed in different ways, and communicated ſome of them to ſeveral other curious perſons, who did the ſame, but none of them have yet ſucceeded; and upon informing my friend Mr. Williams of this, he told me that a friend of his, whoſe plantation was on the ſouth ſide of Jamaica, deſired him to ſave a large quantity of the ripe berries for him to ſow on his plantation, which he accordingly did, but his friend forgot to ſend for them till near two years after; during which time, they had lain in a large heap, and had fermented, and, on ſowing thoſe berries, the plants came up with the firſt rains in great abundance; ſo that it may be of great ſervice to theſe ſeeds, either to paſs through animal bodies, or to be fermented before they are ſown.

The plants cannot be preſerved in England unleſs they are placed in a ſtove during the winter ſeaſon, but they will thrive in a moderate degree of warmth: they ſhould be planted in a ſoft light ſoil, and in winter muſt have but little water. In the ſummer they ſhould have a large ſhare of air, and in July, if the ſeaſon proves warm, they may be placed in the open air, in a warm ſheltered ſituation; but upon the approach of cold nights, they muſt be removed into the ſtove again. The expoſing of theſe plants to the open air for one month only, will be of great ſervice to clean their leaves from inſects or filth, which they are ſubject to contract, by remaining long in the ſtove; but if the ſeaſon ſhould prove very wet or cold, it will not be ſafe to truſt theſe plants long abroad; therefore their leaves ſhould be now and then waſhed with a ſponge to clean them, which will not only render them more ſightly, but alſo promote their growth. This tree is pretty difficult to propagate in England, where the ſeeds do not ripen; the only method in which this has been done, is by laying down the young branches, ſlitting them at a joint in the ſame manner as is practiſed in making layers of Carnations. If this is carefully performed, and the layers are regularly but gently watered, they will put out roots in one year; then they may be carefully ſeparated from the old plants, and each planted in a ſmall pot filled with light earth, and plunged into the tan-bed, either in the ſtove or under a frame, being careful to ſhade them until they have taken new root, after which they may be treated as the older plants. This plant, being an Evergreen, makes a fine appearance in the ſtove at all ſeaſons of the year; and their leaves having ſuch an agreeable fragrancy when rubbed, render them as worthy of a place in the ſtove, as any other tender exotic plant which is preſerved for ornament.

The third ſort grows naturally in Jamaica, from whence I received it ſome years paſt. This riſes with a divided trunk to the height of eight or ten feet, ſending out many branches, which are placed oppoſite, covered with a grey bark: the leaves come out oppoſite, which are ſhorter and rounder at their points than thoſe of the laſt ſpecies; they are alſo ſmoother, and of a firmer texture. The flowers come out from the ſide of the branches between the leaves, upon ſlender foot-ſtalks, about an inch in length, two generally ariſing from the ſame point: theſe are ſucceeded by round berries, of a brighter colour than thoſe of the former, having the empalement on their crowns. The leaves and fruit of this ſort have no aromatic flavour, ſo are not of uſe, but the characters of the flower and fruit are the ſame as in the other ſort.

This tree retains its leaves all the year, which being of a ſplendent green, make a very good appearance, when it is intermixed with other exotic plants in the ſtove; but the flowers being ſmall, and growing thinly upon the branches, do not make any great figure, ſo it is only preſerved for the beauty of its foliage. It is propagated by ſeeds, and requires the ſame treatment as the other ſort.

The fourth ſort was ſent me by the late Mr. Robert Millar, ſurgeon, from Carthagena in New Spain: this riſes with many irregular ſtems about twelve or fourteen feet high, covered with an Aſh-coloured bark, dividing into many branches upward: theſe are garniſhed with ſtiff oval leaves, placed oppoſite. The flowers are produced from the ſide of the branches, ſometimes four, five, or ſix foot-ſtalks ariſe from the ſame point; at other times, they come out ſingle, or perhaps by pairs: theſe are white, and of the ſame ſhape with thoſe of the ſecond ſort, and are ſucceeded by berries which are rounder, and, for the moſt part, contain but one kidney-ſhaped ſeed.

This ſort agrees with the ſecond in its general characters, but not in the virtues, for it hath none of the aromatic flavour, with which that abounds; but as it retains its leaves through the year, may merit a place in the ſtove, better than many other plants which are preſerved by the curious. This is propagated by ſeeds, in the ſame way as the ſecond ſort, and the plants muſt be treated in the ſame manner as thoſe.

The fifth ſort was ſent me from the iſland of Berbuda, where it riſes to the height of twenty feet; the trunk and branches are covered with a ſmooth brown bark. The branches come out by pairs; they grow erect, and are garniſhed with very ſtiff, ſmooth, lucid leaves, which are placed oppoſite, and have very ſhort foot-ſtalks. The leaves vary much in their form; ſome of them are oval, others oblong, and ſome are indented ſo deeply at their ends, as to

 be

be almoſt heart-ſhaped. Their conſiſtence is much thicker than thoſe of the common Laurel, and their colour is a ſplendent green, with one deep midrib running through their middle, and many ſmall veins going from thence tranſverſly to their border. The flowers are produced in ſmall looſe bunches at the extremity of the branches, which have ſeveral narrow leaves intermixed with the bunches. Theſe are ſucceeded by berries of the ſame ſhape with thoſe of the ſecond ſort, but larger.

This tree is propagated by ſeeds as the other ſpecies, and deſerves a place in the ſtove, for the beauty of its evergreen leaves, which being of a thick conſiſtence, and of a ſhining green colour, make a fine appearance in the ſtove at all ſeaſons of the year; but this hath no aromatic flavour to recommend it, as hath the ſecond ſort, for which reaſon it is ſeldom noticed. I take this to be the Bay-tree, mentioned by Hughes, in the Hiſtory of Barbadoes, which he deſcribes to have no flavour; for I have ſeen plants of this ſort which were brought from Barbadoes, ſo that I ſuppoſe it grows naturally there.

As the plants of theſe ſorts do not riſe ſo readily from ſeeds in England, the beſt way to obtain them, is to get ſome perſon of ſkill in America, to take up a number of young plants, and plant them cloſe in boxes of earth, ſetting them in the ſhade till they have taken new root; then remove them into an open ſituation, where they may have time to eſtabliſh their roots before they are ſhipped for England; and in their paſſage they muſt be guarded from the ſpray of the ſea, and ſalt water, and ſhould have very little water given them; for moſt of the plants which are ſent to England, are killed in their paſſage by having too much wet. If theſe directions are obſerved, the plants may be brought in good health to England, provided they come over any time in the ſummer, that they may have time to get freſh root before the cold ſeaſon begins; and when once they are well eſtabliſhed in their roots here, they may be preſerved many years in vigour; but I have not ſeen many of the plants in flower here as yet.

CASIA. See Osyris.

CASSIA. Lin. Gen. Plant. 461. Caſſia, or Wild Senna.

The Characters are,

*The empalement is compoſed of five concave coloured leaves; the flower hath five roundiſh concave petals, which ſpread open: it hath ten declining ſtamina, three of the lower are long, the three upper are ſhorter; the ſummits of the three lower are large, arched, beaked, and ſeparated at their points; the three upper ſtamina have very ſmall ſummits; the four ſide ſtamina have no beaks, but ſpread from the other. In the center is ſituated a long taper germen, having a ſhort ſtyle, terminated by an obtuſe ſtigma. The germen afterward becomes a long pod, divided by tranſverſe partitions, each containing one or two roundiſh ſeeds, faſtened to the margin of the upper valve.*

This genus of plants is ranged in the firſt ſection of Linnæus's tenth claſs, intitled Decandria Monogynia, the flowers having ten ſtamina and one ſtyle.

The Species are,

1. Cassia (*Occidentalis*) foliis quinquejugis, ovato-lanceolatis, margine ſcabris, exterioribus majoribus, glandulâ baſeos petiolorum. Lin. Sp. Plant. 337. *Caſſia with leaves compoſed of five pair of oval ſpear-ſhaped lobes with rough borders, the upper lobes being the largeſt, and a ſmall gland at the baſe of the foot-ſtalk.* Senna occidentalis, odore opii viroſo, orobi Pannonici foliis mucronatis glabris. Hort. Amſt. 1. p. 51. tab. 26.

2. Cassia (*Fruteſcens*) foliolis quinquejugatis ovatis glabris, exterioribus longioribus, caule fruticoſo. *Caſſia with leaves compoſed of five pair of ſmooth oval lobes, the upper being the longeſt, and a ſhrubby ſtalk.* Senna ſpuria Americana fruteſcens, foliis mucronatis minoribus, ſiliquis teretibus, duplici ſeminum ordine fœtus. Houſt. MSS.

3. Cassia (*Alata*) foliolis octojugatis, ovali-oblongis, interioribus minoribus, petiolis eglandulofis ſtipulis patulis. Hort. Cliff. 158. *Caſſia with eight pair of oblong oval lobes, the inner being the leaſt, foot-ſtalks without glands, and a ſpreading ſtipula.* Caſſia ſylveſtris fœtida, ſiliquis alatis. Plum. Cat. 18. *Wild ſtinking Caſſia with winged pods.*

4. Cassia (*Villoſa*) foliolis trijugatis, oblongo-ovatis æqualibus villoſis, ſiliquis articulatis, caule erecto arboreo. *Caſſia with three pair of oblong, oval, hairy leaves, which are equal, jointed pods, and an upright woody ſtem.* Senna ſpuria arborea, villoſa, foliis latis mucronatis, ſiliquis articulatis. Houſt. MSS.

5. Cassia (*Uniflora*) foliolis trijugatis, ovato-acuminatis, villoſis, floribus ſolitariis axillaribus, ſiliquis erectis. *Caſſia with three pair of lobes in each leaf, which are oval, pointed, hairy, and ſingle flowers proceeding from the ſides of the ſtalks, with upright pods.* Senna ſpuria herbacea orobi Pannonici foliis rotundioribus, flore parvo, ſiliquis erectis. Houſt. MSS.

6. Cassia (*Marylandica*) foliis octojugis ovato-oblongis, æqualibus, glandula baſeos petiolorum. Lin. Sp. 541. *Caſſia with ſmall leaves compoſed of eight pair of oblong, oval, equal lobes, having a gland at the baſe of the foot-ſtalk.* Caſſia Marylandica pinnis foliorum oblongis, calyce floris reflexo. Mart. Cent. 1. 21.

7. Cassia (*Bicapſulari*) foliolis trijugatis obovatis glabris, interioribus rotundioribus minoribus, glandulâ interjectâ globoſâ. Hort. Cliff. 159. *Caſſia with three pair of oval ſmooth leaves, the inner ones being rounder, ſmaller, and a globular gland placed between the leaves.* Caſſia hexaphylla, ſiliquâ bicapſulari. Plum. Cat. 18.

8. Cassia (*Fiſtula*) foliis quinquejugatis ovatis acuminatis, petiolis eglandulofis. Flor. Zeyl. 149. *Caſſia with five pair of oval, pointed, ſmooth lobes, and foot-ſtalks having no glands.* Caſſia fiſtula Alexandrina. C. B. P. 405. *The purging Caſſia of Alexandria, or Pudding Pipe-tree.*

9. Cassia (*Bahamenſis*) foliolis ſexjugatis, lanceolatis, glabris, interioribus minoribus, floribus terminatricibus. *Caſſia with ſix pair of ſmooth ſpear-ſhaped lobes, the inner ones being ſmaller, and flowers terminating the ſtalk.* Caſſia Bahamenſis, pinnis foliorum mucronatis anguſtis, calyce floris non reflexo. Martyn. Cent. 1. p. 21.

10. Cassia (*Fruticoſa*) foliolis bijugatis, ovato-lanceolatis, glabris, floribus terminalibus, ſiliquis longis teretibus, caule fruticoſo. *Caſſia with two pair of oval, ſpear-ſhaped, ſmooth lobes, flowers terminating the ſtalks, long taper pods, and a ſhrubby ſtalk.* Caſſia fruticoſa tetraphylla, ſiliquis erectis. Houſt. MSS.

11. Cassia (*Javanica*) foliolis duodecemjugatis, oblongis, obtuſis, glabris, glandula nulla. Lin. Sp. Plant. 379. *Caſſia with twelve pair of ſmooth lobes, which have no glands.* Caſſia fiſtula Braſilania. C. B. P. 403. *Purging Caſſia of Braſil, commonly called Horſe Caſſia in America.*

12. Cassia (*Liguſtrina*) foliolis ſeptemjugatis, oblongo-ovatis, floribus ſpicatis axillaribus, ſiliquis recurvis. *Caſſia with ſeven pair of oblong oval lobes, and ſhort ſpikes of flowers proceeding from the ſides of the ſtalks, and recurved pods.* Senna folio liguſtri. Plum. Cat. 18. *Senna with a Privet leaf.*

13. Cassia (*Emarginata*) foliolis trijugatis, obtuſis, emarginatis, caulibus piloſis, floribus ſolitariis axillaribus petiolis longioribus. *Caſſia with three pair of obtuſe leaves, indented at the top, hairy ſtalks, flowers growing ſingly from the ſides of the ſtalks upon a long foot-ſtalk.* Senna ſpuria fruteſcens, foliorum pinnis latioribus, caulibus piloſis, ſiliquis longiſſimis pediculis inſidentibus. Houſt. MSS.

14. Cassia (*Biflora*) foliolis quadrijugatis oblongo-ovatis, caulibus procumbentibus, floribus axillaribus pedunculis bifloris. *Caſſia with four pair of oval oblong leaves, trailing ſtalks, and flowers proceeding from the ſides of the ſtalks, two growing upon each foot-ſtalk.* Senna ſpuria minima, procumbens, foliorum pinnis ſubrotundis, caule pubeſcente. Houſt. MSS.

15. Cassia (*Arboreſcens*) foliolis bijugatis oblongo-ovatis, ſubtus villoſis, floribus corymboſis, caule erecto arboreo. *Caſſia with two pair of oblong oval leaves, hairy on their under ſide, flowers growing in round bunches, and an erect tree-like ſtem.* Senna ſpuria tetra-

tetraphylla arborea, siliquis compressis, angustis, longissimis, pendulis. Houst. MSS.

16. Cassia (*Flexuosa*) foliolis multijugatis linearibus, floribus solitariis axillaribus, pedunculis longissimis. *Cassia with many pair of narrow leaves, single flowers proceeding from the sides of the stalks, and very long foot-stalks.* Senna occidentalis, foliis herbæ mimosæ, siliquâ singulari, floribus pediculis longioribus insistentibus. Sloan. Hist. Jam. 2. 51.

17. Cassia (*Chamæcrista*) foliolis multijugatis linearibus, caulibus procumbentibus, frutescentibus, floribus maximis solitariis axillaribus, siliquis glabris. *Cassia with many pair of small leaves, which are narrow, shrubby trailing stalks, large flowers growing singly from the sides of the stalks, and smooth pods.* Senna spuria mimosæ foliis, frutescens & procumbens, flore maximo, siliquis glabris. Houst. MSS.

18. Cassia (*Pentagonia*) foliolis trijugatis ovatis, exterioribus majoribus glandulâ subulatâ inter inferiora. Prod. Leyd. 46. *Cassia with three pair of small oval leaves, the upper being the largest, and an awl-shaped glandule between the lower pair.* Senna spuria plerumque hexaphylla siliquâ pentagonâ alatâ. Houst. MSS.

19. Cassia (*Racemosa*) foliolis quinquejugatis, lanceolatis rigidis floribus racemosis axillaribus, siliquis planis, caule fruticoso. *Cassia with five pair of spear-shaped stiff leaves, flowers growing in bunches from the sides of the stalk, flat pods, and a shrubby stalk.*

20. Cassia (*Procumbens*) foliolis bijugatis ovatis, caulibus procumbentibus, floribus solitariis axillaribus, siliquis hirsutis. *Cassia with two pair of small oval leaves, trailing stalks, single flowers proceeding from the sides of the stalk, and hairy pods.* Senna spuria tetraphylla herbacea procumbens, siliquis hirsutis. Houst. MSS.

21. Cassia (*Glandulosa*) foliolis multijugatis, glandulâ petioli pedicellatâ, stipulis ensiformibus. Hort. Upsal. 101. *Cassia with many pair of leaves, and the gland on the foot-stalk resembling an insect, and sword-shaped stipulæ.* Chamæ christa pavonis Americana, siliquâ multiplici. Breyn. Cent. 64.

The first sort grows naturally in most of the islands in the West Indies, where it is called Stinking Weed, from its unsavoury odour. This rises with a channelled stalk three or four feet high, dividing into several branches, garnished with winged leaves placed alternately; each of these is composed of five pair of lobes which are oval, spear-shaped, sitting close to the midrib, having rough edges, the lower pair of lobes being the smallest, the others enlarge to the top, which are the biggest; at the base of the foot-stalk is produced a small protuberance, which is called a gland; this is differently situated in the several species of this genus. The flowers come out from the sides of the stalks, two growing upon each foot-stalk; but the branches are terminated by loose spikes of flowers, which are composed of five concave yellow petals, with ten declining stamina, situated round the germen and style, which becomes a sword-shaped flat pod, having a border on each side, and is indented between each seed.

This is a biennial plant, which is propagated by seed in plenty, in the countries where it grows naturally; but in England, the seeds must be sown on a hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a separate pot, filled with light earth, and plunged into a moderate hot-bed, where they should be shaded till they have taken fresh root; after which they should have fresh air admitted to them every day, in proportion to the warmth of the season, and should be frequently watered. When the plants have filled the pots with their roots, they should be shifted into larger; and if they are too tall to remain in the hot-bed, they must be placed either in the stove, or a glass-case, where they may be defended from cold, but in warm weather have plenty of air. With this management the plants will flower in August, and perfect their seeds in October, but may be preserved through the winter in a stove, where they will continue flowering a long time. In warm summers the plants may be placed in the open air toward the latter end of June, where they will flower very well; but these will not perfect their seeds, unless they are removed into the stove in autumn.

The second sort was sent me from Jamaica by the late Dr. Houstoun, who found it growing there naturally. This rises with a shrubby stalk five or six feet high, sending out many branches toward the top, garnished with winged leaves, composed of five pair of small oval leaves, the upper ones being longest. The flowers come out from the side of the stalks, and also terminate the branches in loose spikes; these are yellow, and shaped like those of the former, but are smaller; the pods are long, taper, and contain two rows of seeds.

This plant may be preserved three or four years in the stove, and will annually flower and perfect the seeds. It is propagated by seeds, which should be sown on a hot-bed in the spring; and the plants must be treated in the same manner as the former sort, with only this difference, that these, when they are too tall to remain longer under the frames on the hot-bed, must be removed into the stove, where they will often flower in autumn or winter, but they seldom perfect their seeds till the second year.

The third sort hath an herbaceous stalk, which rises five or six feet high, garnished with long winged leaves, composed of eight or ten pair of large oval lobes, each being more than three inches long, and one broad, rounded at the end, where they are slightly indented. The flowers are produced in loose spikes at the top of the stalk, which are large, yellow, and of the same shape with those of the other species; the pods are long, taper, and have four borders or wings running longitudinally; these contain a double row of angular seeds. The whole plant hath a strong fœtid odour.

This sort seldom continues more than two years; it must be raised from seeds as the former sorts, and placed in the tan-bed in the stove, being very tender, and should have but little water in winter. The second year the plants will flower, but they very rarely produce seeds in England.

The fourth sort was sent me from Campeachy by the late Dr. Houstoun, who found it growing there in great plenty. This rises with a woody stem to the height of fourteen or sixteen feet, sending out many lateral branches, garnished with winged leaves, composed of three pair of oblong, oval, hairy lobes, of equal size; the flowers come out in loose bunches at the end of the branches, which are of a pale straw colour, and small, but shaped like the others; the pods are long, narrow, and jointed, each seed being lodged in a sort of isthmus; the seeds are oval and brown.

This may be propagated by seeds, which must be sown upon a hot-bed, and the plants afterward treated as the former sorts, placing them in a warm stove, where they will continue several years producing their flowers in summer, and in warm seasons the seeds will ripen.

The fifth sort is a low herbaceous plant, seldom rising a foot high; the stalk is single, and garnished with winged leaves, composed of three pair of oval pointed lobes, which are hairy; the flowers come out single from the side of the stalks; they are of a pale yellow, and small; these are succeeded by narrow taper pods two inches long, which grow upright. This plant is annual; the seeds must be sown on a hot-bed, and the plants treated as the first sort: they will flower in July, and ripen their seeds in autumn. This was sent me from Campeachy by the late Dr. Houstoun.

The sixth sort grows naturally in Maryland, from whence I received the seeds. It hath a perennial root, composed of a great number of black fibres; this sends out several upright stalks in the spring, which rise four or five feet high, garnished with winged leaves, composed of nine pair of oblong smooth lobes, which are equal; toward the upper part of the stalks

the flowers come out from the wings of the leaves, two or three together; but the ſtalks are terminated by looſe ſpikes of pale yellow flowers, which are rarely ſucceeded by pods in England. The ſtalks decay in autumn, and riſe again in the ſpring. The roots of this ſort continue many years, and will live abroad in a warm border and a dry ſoil. The ſeeds will come up in the full ground, if ſown in April, and in autumn they may be planted into the borders where they are deſigned to remain.

The ſeventh ſort is an annual plant, which riſes a foot and a half high, with an erect herbaceous ſtalk, garniſhed with winged leaves, compoſed of three pair of oval lobes; the flowers come out ſingly from the wings of the leaves; theſe are ſmall, yellow, and of the ſame ſhape with thoſe of the other ſpecies, and are ſucceeded by taper pods, having cells containing two rows of ſeeds. It grows naturally in Jamaica, and the other ſugar iſlands.

This is propagated by ſeeds, which muſt be ſown on a hot-bed in the ſpring, and the plants afterward treated in the ſame manner as hath been directed for the firſt ſort. They flower in July, and the ſeeds ripen in October, and then the plants will decay.

The eighth ſort is the tree which produces the purging Caſſia which is uſed in medicine. It grows naturally in Alexandria, and in both Indies, where it riſes to the height of forty or fifty feet, with a large trunk, dividing into many branches, garniſhed with winged leaves, compoſed of five pair of ſpear-ſhaped lobes, which are ſmooth, having many tranſverſe nerves from the midrib to the borders; the midrib is very prominent on the under ſide; the flowers are produced in long ſpikes at the end of the branches, each ſtanding upon a pretty long foot-ſtalk; theſe are compoſed of five large concave petals, of a deep yellow colour, and are ſucceeded by cylindrical pods, which are from one to two feet long, with a dark brown woody ſhell, having a longitudinal ſeam on one ſide, divided into many cells by tranſverſe partitions, each containing one or two oval, ſmooth, compreſſed ſeeds, lodged in a ſweetiſh black pulp, which is the part uſed in medicine.

This tree is propagated by ſeeds, which may be eaſily procured from the druggiſts who import the pods for uſe; theſe muſt be ſown on a hot-bed in the ſpring, and when the plants come up, they muſt be treated in the ſame manner as the firſt ſort, during the firſt ſummer; and in autumn they muſt be removed into a ſtove, and plunged into the tan-bed: during the winter they ſhould have very little water; for as theſe trees grow naturally in dry ſandy land, moiſture is a great enemy to them, but eſpecially during that ſeaſon. In the ſummer they ſhould have a good ſhare of air admitted to them in warm weather, but they will not thrive in the open air in this country, at the warmeſt time of the year, ſo ſhould conſtantly remain in the ſtove. With proper care theſe plants will grow to the height of eight or ten feet, and produce their flowers, when they make a fine appearance.

The ninth ſort grows naturally in the Bahama Iſlands, from whence I received the ſeeds. This is an annual plant, which riſes with an upright ſtalk two feet and a half high, garniſhed with winged leaves, compoſed of ſix pair of lobes, which are ſmooth, narrow, and ſpear-ſhaped, ſtanding at wide diſtances; the flowers are collected into looſe bunches at the top of the ſtalks, which are of a pale yellow, and are ſucceeded by long compreſſed pods. It flowers in July, and the ſeeds ripen in autumn. This muſt be treated as the firſt ſort.

The tenth ſort was ſent me from La Vera Cruz, in New Spain, by the late Dr. Houſtoun. This grows upward of twenty feet high, with ſeveral trunks covered with brown bark; theſe divide into many branches upward, garniſhed with winged leaves, compoſed of two pair of lobes, which in the lower leaves are oval; but thoſe of the upper are five inches long, and two and a half broad in the middle, ſmooth, and of a light green. The flowers are produced in looſe ſpikes at the extremity of the branches, which are large, of a gold colour, and ſucceeded by taper brown pods about nine inches long, having many tranſverſe partitions, in which the ſeeds are lodged in a thin pulp.

This ſort is propagated by ſeeds, which muſt be ſown upon a hot-bed, and the plants afterward treated in the ſame manner as the eighth ſort, for the plants will not live abroad in this country in the warmeſt ſeaſon of the year; but if properly managed in the ſtove, will produce their beautiful flowers in three or four years from the ſeed.

The eleventh ſort grows in great plenty in moſt of the iſlands of the Weſt Indies. This riſes to a great magnitude, with a large trunk, dividing into many branches, garniſhed with very long winged leaves, compoſed of twelve or fourteen pair of oblong blunt lobes, which are ſmooth, of a light green, and placed near together. The flowers come out in looſe ſpikes at the end of the branches, which are of a pale Carnation colour, ſhaped like thoſe of the other ſpecies, and are ſucceeded by large cylindrical pods, divided by tranſverſe partitions into many cells, in which the ſeeds are lodged, ſurrounded with a black purging pulp. This is called Horſe Caſſia, becauſe it is generally given to horſes, and ſeldom taken by any perſons on account of its griping quality.

It is propagated by ſeeds, which ſhould be ſown, and the plants afterward treated in the ſame manner as the eighth ſort, with which management they will thrive and produce flowers in England.

The twelfth ſort was ſent me from the Havannah by the late Dr. Houſtoun. This hath an herbaceous ſtalk, which divides into many branches, riſing about three feet high, garniſhed with winged leaves, compoſed of ſeven pair of oblong oval lobes, which are rounded at the end. The flowers come out from the ſide of the branches, upon very long foot-ſtalks, diſpoſed in looſe ſpikes; theſe are of a pale yellow, and are ſucceeded by recurved pods, containing one row of compreſſed ſeeds.

This is a biennial plant, which, if brought forward early in the ſpring, will ſometimes perfect ſeeds the ſame year; but if they ſhould fail, the plants may be kept through the winter in a ſtove, as the firſt ſort, and good ſeeds may be obtained the following ſeaſon.

The thirteenth ſort riſes with ſeveral weak ſhrubby ſtalks about two feet high, cloſely garniſhed with winged leaves, compoſed of three pair of lobes, which are very narrow at their baſe, enlarging to the top, where they are blunt, and rounded with a little indenture at the point; theſe contract cloſely every evening, after the ſun has left them. The flowers come out ſingle from the ſide of the branches, ſtanding upon very long foot-ſtalks; they are of a bright yellow, and ſhaped like thoſe of the other ſpecies, and are ſucceeded by narrow flat pods, an inch and a half long. This grows plentifully in Jamaica. It is propagated by ſeeds, which muſt be ſown on a hot-bed, and managed as the other tender ſorts; it will continue two or three years, if placed in a warm ſtove.

The fourteenth ſort ſends out from the root two or three ſlender ſtalks, which trail on the ground, garniſhed with winged leaves, having four pair of ſmall roundiſh lobes, of a pale green; at the inſertion of the foot-ſtalks ariſe thoſe of the flower, which is jointed, dividing into two ſhorter at the top, ſuſtaining two ſmall yellow flowers. This grows naturally in Jamaica, from whence the ſeeds were ſent me. It is an annual plant, whoſe ſeeds muſt be ſown early in the ſpring on a hot-bed, and treated like the other kinds; but as the branches of this grow near the ground, ſo the plants may remain under a frame all the ſummer, and will flower in July; when, if the ſeaſon is warm, they muſt have have a large ſhare of air, otherwiſe the flowers will fall off, without being ſucceeded by pods; but if rightly managed, the ſeeds will ripen in autumn.

The

The fifteenth sort was sent me from La Vera Cruz, in New Spain, by the late Dr. Houstoun. This rises with a strong upright trunk, to the height of twenty-five, or thirty feet, dividing into many branches, which are covered with an Ash-coloured bark, garnished with winged leaves, having long foot-stalks; each being composed of two pair of oblong oval lobes, four inches long, and near two broad, which are smooth, of a dark green on their upper side, but paler underneath. The flowers are produced sometimes from the side of the stalks, where they are few and scattering, but the ends of the branches have large round bunches of flowers, which branch out from one center; they are of a deep yellow, inclining to an Orange colour. These are succeeded by compressed pods, near nine inches long, having a border on each side, and contain one row of oval, smooth, compressed seeds.

This sort may be propagated by seeds, which should be sown on a hot-bed in the spring, and when the plants come up, they will require the same treatment as the seventh sort; with which management the plants will thrive, and produce their flowers in a few years.

The sixteenth sort hath very slender trailing stalks, about two feet long, garnished with winged leaves, sitting close to the branches, composed of many narrow pinnæ, like those of the Sensitive Plant; the flowers come out single from the side of the stalk, upon long slender foot-stalks, which are small, of a bright yellow colour, shaped like those of the other species; they are succeeded by short flat pods, containing two or three seeds. This grows naturally in Jamaica. It is a biennial plant, and requires the same treatment as the first sort.

The seventeenth sort was sent me by the late Dr. Houstoun from La Vera Cruz, where he found it growing naturally. This rises with several shrubby trailing stalks, which are two feet long, sending out many side branches, closely garnished with winged leaves, composed of several pair of very narrow pinnæ, smaller than those of the sensitive Plant. The flowers are produced single from the side of the branches, on very short foot-stalks; they are large, of a deep Orange colour, and are succeeded by short, narrow, smooth pods. This plant differs much from the Chamæ crista pavonis major, of Breynius, in having a shrubby trailing stalk; the leaves are much shorter, having but half the number of pinnæ, which are also narrower and shorter, the flower is also larger.

This plant will continue two or three years, and produce flowers annually, but it must be treated in the same manner as the other tender sorts; for it will not thrive unless it is preserved in a warm stove, where it will perfect seeds the second year. It flowers in July and August, and the seeds ripen in autumn.

The eighteenth sort was sent me from Campeachy, by the late Dr. Houstoun. This rises with a shrubby slender stalk about two feet high, dividing upward into several branches, which are thinly garnished with winged leaves, composed of three pair of oval lobes, the upper being the largest; these stand upon long foot-stalks, from the base of which comes out the flower, standing single on a short foot-stalk, of a pale yellow colour, and is succeeded by a bending pod, near four inches long, having five longitudinal wings, ending in a point.

It is a biennial plant, which if brought forward in the spring, will flower the same summer, and sometimes perfect seeds in autumn; but if the plants are placed in a warm stove, they will live through the winter, and the following season will flower earlier, and good seeds may then be obtained.

The nineteenth sort rises with a shrubby stalk to the height of ten or twelve feet, dividing upward into many branches, garnished with winged leaves, composed of five pair of stiff spear-shaped lobes; the flowers come out from the side of the branches, on long branching foot-stalks, collected into large loose spikes; these are of a deep Orange colour, large, and shaped like those of the other species, and are succeeded by flat brown pods, about four inches long, containing one row of flat, smooth, oval seeds. This sort was sent me from Carthagena, by the late Mr. Robert Millar.

This sort is propagated by seeds in the same manner as the other species, and requires a warm stove to preserve it, where it will thrive and produce flowers annually.

The twentieth sort was sent me from La Vera Cruz, by the late Dr. Houstoun. This hath several trailing herbaceous stalks, about two feet long, garnished with winged leaves, having long foot-stalks, which are placed at a considerable distance from each other; they have two pair of oval smooth lobes. The flowers come out single from the side of the branches, which are of a pale yellow colour, and are succeeded by short, flat, hairy pods, containing one row of flat seeds.

This is an annual plant, which must be raised on a hot-bed early in the spring, and treated in the same manner as the other annual sorts before-mentioned. It flowers in July, and the seeds ripen in autumn.

The twenty-first sort grows common in all the islands of the West-Indies. This rises with a slender stalk about two feet high, sending out a few side branches upward, garnished with winged leaves, composed of many pairs of narrow pinnæ, like those of the Sensitive Plant. The flowers come out upon short foot-stalks from the side of the branches, each foot-stalk sustaining two or three yellow flowers, of the same form with the other species of this genus; these are succeeded by short flat pods, containing three or four flat seeds in each.

This is an annual plant, and requires the same treatment as the last; but as the stalks of this grow upright, they will be too tall to remain under a frame all the summer; therefore when the plants are advanced so high as to be near the glasses, they should be removed into the stove, or a glass case, where they may have room to grow, and be screened from the cold, but in warm weather should have a good share of air admitted to them; with this management they will flower in July, and perfect their seeds in autumn.

These plants are frequently preserved in the gardens of several curious persons, therefore I have enumerated them here, though several of them have not much beauty to recommend them, but are chiefly kept for the sake of variety. The most beautiful are the fourth, the eighth, tenth, eleventh, fifteenth, and nineteenth sorts; these all make a good appearance in the stove, especially when they are in flower; and as they retain their leaves all the year, they make an agreeable variety in the winter season, when intermixed with other plants from the same countries.

All the species of this genus contract their leaves every evening as the sun declines, and open them again with the rising sun in the morning; which is also common to many other plants, some of which turn their upper surface outward, but all those of this genus turn their under surface outward, the upper being very closely folded together. These are what Linnæus titles sleeping plants. It must also be observed that most of those plants, whose under surface is turned outward, are such as grow upon dry sandy land, where their roots do not find a supply of moisture, so that the lower surface of their leaves being generally covered with a short soft down, or hairs, detain the nightly dews, which are inhaled by the leaves, and furnish part of their nourishment; whereas the other, whose upper surface is turned outward, do not stand in need of this supply; being smooth, the moisture is cast off, and not imbibed by them.

CASSIDA [i. e. an helmet,] Scull-cap. See SCUTELLARIA.

CASSINE. Lin. Gen. Plant. 333. The Cassioberry Bush, and South-Sea Thea.

The CHARACTERS are,

*It hath a small permanent empalement, which is divided into five parts; the flower hath but one petal, which is cut into five obtuse segments, which spread open; it hath five stamina, which spread from each other, and are terminated by single summits; it hath a conical germen, without a style, supporting three reflexed stigma. The germen afterward becomes an umbilicated berry with three cells, each containing a single seed.*

This genus of plants is ranged in the third section of Linnæus's fifth class, intitled, Pentandria Trigynia, the flower having five stamina, and three stigma.

The SPECIES are,

1. CASSINE (*Corymbosa*) foliis ovato-lanceolatis, serratis, oppositis, floribus corymbosis axillaribus. Fig. Pl. plat. 83. f. 1. *Cassine with oval spear-shaped leaves placed opposite, and flowers growing in round bunches from the sides of the branches.* Cassine vera perquam similis, arbuscula, Phillyreæ foliis antagonistis, ex Provinciâ Caroliniensi. Pluk. Mant. 40. *The Cassioberry Bush.*
2. CASSINE (*Paragua*) foliis lanceolatis alternis sempervirentibus, floribus axillaribus. Fig. pl. Plat. 83. f. 2. *Cassine with evergreen spear-shaped leaves placed alternately, and flowers proceeding from the sides of the branches.* Cassine vera Floridanorum, arbusculâ bacciferâ, Alaterni ferme facie, foliis alternatim sitis tetrapyrene. Pluk. Mant. 40. *Evergreen Cassine, Yapon, or South-Sea Thea.*
3. CASSINE (*Oppositifolia*) foliis ovatis acutis glabris, floribus axillaribus sparsis. *Cassine with oval acute leaves placed opposite, and flowers coming from the wings of the stalks, commonly called Hysson Tea.*

The first sort rises with two or three stems, which send out many side branches their whole length, and become bushy; these seldom rise more than eight or nine feet high. The branches are garnished with oval spear-shaped leaves, sawed on their edges, which grow opposite. Toward the upper part of the branches the flowers come out from the sides, growing in roundish bunches; these are white, and are divided into five parts almost to the bottom; in their center is placed the germen, attended by five stamina, which spread open, near as much as the segments of the petal. After the flower is past, the germen swells to a round berry, having three cells, each containing a single seed. This is by Dr. Linnæus supposed to be the same plant as the Phillyrea Capensis folio celastri. Hort. Elth. But those who know both the plants, can have no doubt of their being different. The Cassine here mentioned drops its leaves in autumn; whereas that Phillyrea is evergreen; the former lives abroad in the open air, but the latter can scarce be kept through the winter in a green-house, without artificial heat; nor have the plants the same appearance, and withal differ essentially, according to his own system, in the number of stamina, which removes them to different classes.

The first sort has been pretty common in the nurseries near London some years, where it is propagated by laying down the branches, which afford shoots in plenty for that purpose from the root, and lower part of the stem, so as to become very bushy and thick, if they are not cut off; there are numbers of these shrubs which produce flowers in England every year, but none of them ripen their seeds.

The leaves of this plant are extremely bitter, so that if a single one is chewed, the bitterness cannot be gotten rid of in a long time. These leaves will continue green very late in autumn, if the season proves mild, and they come out early in the spring, but are frequently pinched by the frost in March, when they appear so soon. This shrub flowers in July and August. It grows naturally in Virginia and Carolina.

It loves a light soil, not too dry, and should have a warm situation; for, in exposed places, the young shoots are frequently killed in the winter, whereby the shrubs are rendered unsightly; but where they are near the shelter of trees, or walls, they are very rarely hurt.

The second sort grows naturally in Carolina, and also in some warm parts of Virginia, but chiefly near the sea; this, in the natural places of its growth, rises to the height of ten or twelve feet, sending out branches from the ground upward, which form themselves into a sort of pyramid, garnished with spear-shaped leaves, placed alternately; these are in texture and colour like those of Alaternus, and continue green through the year. The flowers are produced in close whorls round the branches, at the foot-stalks of the leaves; they are white, and of the same shape as the former; these are succeeded by red berries, like those of the former sort.

Dr. Linnæus has separated this from the class in which he has placed the other, and has joined it to the Dahoon Holly, supposing them to be the same plant; in which he is equally mistaken, for they not only differ in the shape of their leaves, but also in their essential characters; for the Dahoon Holly must, according to his system, be ranged in his twenty-second class, and the Cassine must be ranged in his fifth.

This plant was many years preserved in several curious gardens near London, till the severe winter in 1739, when most of them were destroyed, so that there was scarce any left; but of late years there have been many of the young plants raised from seeds, which came from Carolina, some of which have been growing in the full ground several years, and have resisted the cold of the winters, without covering; though they often suffer in very cold seasons, where they are not very well sheltered. If this plant can be brought to thrive well in England, and to endure the winter in the open air, it will be a fine plant, to make a variety in plantations of Evergreen-trees. The leaves of this sort are not so bitter as those of the first, especially when green, therefore are preferred to them for making the Thea; but an infusion of the leaves of the first, has been taken for a loss of appetite by some persons with good success; but it must not be too strong, lest it should prove emetic or cathartic.

The inhabitants of North Carolina and Virginia, where this shrub grows in plenty, give it the title of Yapon, which I suppose to be the Indian name; for, as it is a plant much esteemed by the Indians for its medicinal virtues, they certainly have a name for it; this grows to the height of ten or twelve feet; the leaves are about the size and shape of those of the small leaved Alaternus, but are somewhat shorter, and a little broader at their base; they are a little notched about their edges, and are of a thick substance, and deep green colour; the flowers of this sort are produced at the joints near the foot-stalk of the leaves, but the Cassioberry Bush produces its flowers in umbels at the extremity of the shoots; the berries of this Yapon continue upon the plants most part of the winter, and, being of a bright red colour, intermixed with the green leaves, make a fine appearance at that season. From these berries continuing so long untouched by the birds, we may reasonably conclude, they have some venomous quality, because few of the fruits, or berries, which are wholesome, escape the birds, in a country where there are such flocks of many kinds of them.

These shrubs are propagated by sowing their seeds (which are obtained from Carolina, where they grow in great plenty near the sea-coasts;) they should be sown in pots filled with light sandy earth, and plunged into a gentle hot-bed, observing to water them frequently, until you see the plants appear, which is sometimes in five or six weeks time, and at other times they will remain in the ground until the second year; therefore, if the plants should not come up in two months time, you should remove the pots into a shady situation, where they may remain till October, being careful to keep them clean from weeds, and now and then in dry weather giving them a little

water; then remove these pots into shelter during the winter season, and in the March following put them upon a fresh hot-bed, which will forward the seeds in their vegetation.

When the plants are come up, they should, by degrees, be exposed to the open air, in order to inure them to our climate; yet they should not be exposed to the open sun at first, but rather let them have the morning sun only, placing them for some time where they may be sheltered from cold winds; they should enjoy a shelter during the two or three first winters, after which the Cassioberry Bush may be planted abroad; but the South-Sea Thea should be kept in pots a year or two longer, being slower of growth, and will therefore not have strength enough to resist the cold when young.

The third sort has been but few years introduced to the English gardens; this rises eight or ten feet high, sending out branches from the root to the top, garnished with oval, smooth, entire leaves placed opposite, whose foot-stalks are drawn toward each other, whereby the leaves turn upward; the flowers come out from the wings of the leaves thinly, they are white, and of the same shape with those of the other sorts, but are not succeeded by berries in England.

This is propagated by seeds as the other sorts, or by laying down the branches in the spring, which if carefully performed will take root in one year; when they may be cut from the old plant, and put into small pots, and placed in the shade till they have taken new root; afterward they may be exposed in summer, but in autumn they must be removed into shelter.

The Paraguay, or South-Sea Thea, is accounted by the Indians very wholesome, and (as I have been informed by several worthy persons, who resided for several years in Carolina) is the only physic the Indians use; and for which, at certain times of the year, they come in droves, some hundred miles distant, for the leaves of this tree (it not being known to grow at any considerable distance from the sea;) where their usual custom is, to make a fire upon the ground, and, putting a great kettle of water thereon, they throw into it a large quantity of these leaves, and immediately set themselves round the fire, and, with a bowl that holds about a pint, they begin drinking large draughts, which in a very short time vomits them severely; thus they continue drinking and vomiting, for the space of two or three days, until they have sufficiently cleansed themselves; then they gather every one a bundle of the shrub to carry away with them, and retire to their habitations. But these gentlemen observed something very extraordinary in the operation of this plant, which was, that in vomiting it gave them no uneasiness, or pain, but came away in a full stream from their mouths, without so much as declining their heads, or the least reaching.

This plant is generally supposed to be the same as that which grows in Paraguay, where the jesuits of that country make a great revenue of the leaves, which they export to several other countries, where it is infused and drank like tea; indeed, there are some persons who doubt its being the same; which will be pretty difficult to determine, since there is so little converse between the inhabitants of Paraguay and those in Europe; and all the leaves of that tea, which have been brought to Europe, have been generally so broken and defaced, as to render it almost impossible to know their true figure; however, from some of the fairest leaves, which were picked out of the Paraguay Tea by a person of skill, who compared them with those of the Yapon, he had great reason to believe they were the same; and as the virtues attributed to the Yapon are nearly, if not absolutely, the same with those of the Paraguay, the Indians of these northern parts of America making the same use of it as the inhabitants of the south parts of America do, viz. to restore lost appetites, and they say it gives them courage and agility, for which purposes it has been in use time out of mind: we may also observe, that the place of its growth in the north, is the same latitude as Paraguay is south; so I shall beg leave to insert the account given of the Paraguay Tea by Monsf. Frezier, who travelled through great part of New Spain, by express order of the king of France.

In South Carolina the plant is called Cassena, or South-Sea Tea: the inhabitants of that country do not make so great use of this Tea, as those of Virginia and North Carolina; in the last of which, the white people have it in as great esteem as the Indians, and make as constant use of it.

Monsieur Frezier also says, that the Spaniards who live near the gold mines in Peru, are obliged frequently to drink of the herb Paraguay or Mate, to moisten their breasts, without which, they are liable to a sort of suffocation, from the strong exhalations which are continually coming from the mines.

The same author also adds, that the inhabitants of Lima, during the day-time, make much use of the herb Paraguay, which some call St. Bartholomew's Herb, who, they pretend, came into those provinces, where he made it wholesome and beneficial; whereas, before it was venomous; this, he says, is brought to Lima dry, and almost in powder.

Instead of drinking the tincture or infusion apart, as we drink tea, they put the herb into a cup or bowl made of a calabash tipped with silver, which they call mate; they add sugar, and pour the hot water upon it, which they drink immediately, without giving it time to infuse, because it turns black as ink. To avoid swallowing the herb, which swims at the top, they make use of a silver pipe, at the end whereof is a bowl full of little holes; so that the liquor sucked in at the other end, is clear from the herb. They drink round with the same pipe, pouring hot water on the same herb, as it is drunk off. Instead of a pipe, which they call bombilla, some part the herb with a silver separator, called apartador, full of little holes. The reluctancy which the French have shewn to drink after all sorts of people, in a country where many have the venereal disease, has occasioned the inventing the use of little glass pipes, which they begin to use at Lima. This liquor, he says, in his opinion, is better than tea; it has a flavour of the herb, which is agreeable enough: the people of the country are so used to it, that even the poorest drink it once a day, when they rise in the morning.

The trade for this herb, (he says,) is carried on at Santa Fé, whether it is brought up the river of Plate. There are two sorts of it; the one called Yerba de Palos; and the other, which is finer, and of more virtue, Yerba de Camini; the last is brought from the lands belonging to the jesuits. The great consumption of it is between La Paz and Cusco, where it is worth half as much more as the other, which is sent from Potosi to La Paz. There come yearly from Paraguay into Peru about fifty thousand arrovas, twelve thousand hundred weight of both sorts, whereof at least one third is of the Camini, without reckoning twenty-five thousand arrovas of that of Palos for Chili. They pay for each parcel, containing six or seven arrovas, four royals for the duty called alcavala (being a rate upon all goods sold;) which, with the charge of carriage, being above six hundred leagues, doubles the first prices, which is about two pieces of eight; so that at Potosi it comes to about five pieces of eight the arrova. The carriage is commonly by carts, which carry an hundred and fifty arrovas from Santa Fé to Jujuy, the last town of the province of Tucuman; and from thence to Potosi, which is an hundred leagues farther, it is carried on mules.

What this curious author has observed, on there being two sorts of this herb, may very well agree with the two last sorts mentioned, since both of them are generally supposed to agree in their qualities, though one is much preferable to the other; therefore I imagine the Yerba de Camini, is what we call Paraguay or South-Sea Thea; and Yerba de Palos to be our

our third sort. But as our author only saw the dried herb, he could no more distinguish their difference, than we can the Thea brought from China; I mean, as to the particular trees which produce it.

CASSYTHA. Lin. Gen. Plant. 505.

The Characters are,

*It hath a small three-leaved permanent empalement; the flower hath three petals which are concave and permanent, and three oblong, coloured, nectarious glands surrounding the germen, with nine erect compressed stamina, and two globular glands, inclosing each a single stamina, sitting on one side the base; these have summits under the top of the stamina; it has an oval germen within the coloured empalement, supporting a thick style the length of the stamina, crowned by an obtuse almost trifid stigma; the receptacle becomes a pulpy berry, globular but a little depressed, inclosed in the coloured empalement, having a perforated navel inclosing many oval seeds.*

This is ranged in Linnæus's first order of his eleventh class of plants, intitled Enneandria Monogynia, the flower having eleven stamina and one style.

We have at present but one Species of this genus.

Cassytha (*Filiformis*) Osb. It. Lin. 530. *Slender Cassytha.* Cuscuta baccifera Barbadensium. Pluk. Phyt. tab. 172. f. 2.

This plant grows naturally in both Indies. I have received it from Barbadoes, Jamaica, and the Spanish West Indies; and that it grows also in the East Indies, is plain from its figure in the Hortus Malabaricus. It rises with taper succulent stalks, which divide into many slender succulent branches; these come out frequently by threes or fours at the same joint, afterward they send out side branches singly without order, and become very bushy: the flowers come out on the side of the branches singly, sitting very close thereto, having no empalement; the corolla is oval, white, with a small tincture of red, opening like a navel at the top, including the germen, stamina, style, and nectarious glands so closely, as not to be discovered till the corolla is cut open; after the flower is past, the germen becomes many oblong, oval, dark seeds, surrounded with a mucilaginous substance.

This plant is easily propagated by planting cuttings of it during the summer months, but as these cuttings are succulent, it will be proper to cut them off a week before they are planted, laying them in the stove, that the part cut may have time to heal over before they are planted. These cuttings should be planted in small pots, which must be plunged into a moderate hot-bed, where, if they are not over watered, they will take root in six weeks; then they may be parted, planting each into a separate small pot, filled with light sandy earth, and may be plunged again into the hot-bed to forward their taking new root; after which they should be removed into a dry stove, where they should constantly remain, giving but little water in winter, and in summer admitting a large share of air in warm weather, for this plant is too tender to thrive in the open air in this climate.

CASTANEA. Tourn. Inst. R. H. 584. tab. 352. Fagus. Lin. Gen. Plant. 951. [It takes its name from Castana, a city of Thessaly, where this tree anciently grew in great plenty.] The Chesnut-tree, in French *Chateignier*, or *Maronnier*.

The Characters are,

*It hath male and female flowers on the same tree, sometimes at separate distances, and at other times near each other. The male flowers are fixed to a long string, forming a sort of katkin; these have each an empalement of one leaf, cut into five parts; they have no petals, but include about ten or twelve bristly stamina, terminated by oblong summits. The female flowers have also an empalement of one leaf, divided into four parts, having no petals, but a germen fixed to the empalement, supports three styles crowned by a reflexed stigma. The germen, which is situated at the base of the empalement, becomes a roundish fruit armed with soft spines, including one or more nuts.*

This genus of plants is ranged in the eighth section of Linnæus's twenty-first class, intitled Monœcia Polyandria, the plants of this section have male and female flowers, and the male flowers have many stamina; but he has joined this genus to the Fagus, making these of one genus, so that he has entirely abolished the title. However, as the male flowers of the Chesnut are formed into long katkins, and those of the Beech are globular, they may with propriety be kept separate; and this I choose to do, that it may be more intelligible to common readers.

The Species are,

1. Castanea (*Sativa*) foliis lanceolatis acuminato-serratis, subtus nudis. *Chesnut with spear-shaped leaves, which are sharply sawed, and naked on their under side.* Castanea sativa. C. B. P. 418. *The manured Chesnut.*
2. Castanea (*Pumila*) foliis lanceolato-ovatis acutè serratis, subtus tomentosis, amentis filiformibus nodosis. *Chesnut with oval spear-shaped leaves sharply sawed, which are woolly on their under side, and a slender knotted katkin.* Castanea pumila Virginiana, racemosa fructu parvo in singulis capsulis echinato unico. Pluk. Alm. 90. *The Chinquapin.*
3. Castanea (*Sloanea*) foliis oblongo-ovatis, serratis, fructu rotundo maximo echinato. *Chesnut with oblong, oval, sawed leaves, and a very large, round, prickly fruit.* Sloanea amplis Castanæ foliis. fructu echinato. Plum. Nov. Gen. 49.

The Chesnut is a tree which deserves our care, as much as any of the trees which are propagated in this country, either for use or beauty, being one of the best sort of timber, and affording a goodly shade. It will grow to a very great size, and spread its branches finely on every side where it has room. The leaves are large, of a lucid green, and continue late in the autumn; nor are they so liable to be eaten by insects, as are those of the Oak, which of late years have frequently happened to the latter, and has rendered them very unsightly great part of summer, which I have never observed to be the case with the Chesnut, which renders them more valuable for parks and plantations for ornament; and there is no better food for deer, and many other animals, than their nuts, which most of them prefer to acorns; but yet, there should not be many of these trees planted too near the habitation; because, when they are in flower, they emit a very disagreeable odour, which is very offensive to most people.

There are several varieties of this tree, which have accidentally arisen from seeds; some have been supposed distinct species, but the differences are only in the size of their fruit and leaves, which have been altered, and improved by culture; so that the wild and manured Chesnut, are undoubtedly the same; for I have frequently found, that the nuts taken from the same tree, and cultivated in the same soil, with equal care, have produced trees with very small fruit; and among them have been others, whose fruit have been as large as those of the parent tree; therefore they can be only esteemed as varieties. But in many countries, where the trees are cultivated for their fruit, the people graft the largest and fairest fruit, upon stocks of Chesnut raised from the nut; and these grafted trees are by the French called Maronnier, but they are unfit for timber.

There is also a Chesnut with variegated leaves, which is propagated in the nurseries by way of curiosity: this is maintained by budding, and inarching it upon common Chesnut stocks, in the same manner as other fruit-trees; but these variegated trees and plants are not so much regarded at present, as they were some years past.

The Dwarf branching Chesnut which is mentioned in most of the books, I take to be only a variety of the common; for Dr. Boerhaave shewed me some young trees in his garden near Leyden, which he had raised from nuts, which were sent him by Micheli from Florence, as the true fruit of the Dwarf Chesnut; but there appeared to be no difference between those, and some other which came from nuts of the large sort.

The third sort grows in South Carolina, from whence ſome of the fruit with their outer covers, were ſent to his grace the Duke of Bedford, a few years paſt: theſe were as large and round as a tennis-ball, and armed all over with ſtrong ſpines like a hedge-hog: theſe capſulæ were divided regularly in four cells, each containing one ſmall Cheſnut. At that time I compared theſe with father Plumier's deſcription and figure, which he exhibited under the title of Sloanea, and found them to agree exactly; and upon looking through the box in which theſe were ſent, I found ſome of the leaves of the tree, which alſo tallied with his deſcription, which confirmed my former opinion; therefore, as I could ſee no other difference between the fruit of this and the common Cheſnut, but its having four regular cells, divided by partitions, whereas thoſe of the Cheſnut have generally but three; therefore I have joined them together, being perſuaded, that farther obſervations will juſtify my ſo doing.

It does not appear where Plumier found this tree growing naturally, though it is probable, it might be in Louiſiana; for I think it could not be in either of the Weſt India iſlands, where the heat is too great for this tree to thrive; though this is tender while young, for two or three young plants which were raiſed in England, did not ſurvive the third winter.

The firſt of theſe trees was formerly in greater plenty amongſt us than at preſent, as may be proved by the old buildings in London, which were for the moſt part of this timber; and in a deſcription of London, written by Fitz-Stephens, in Henry the Second's time, he ſpeaks of a very noble foreſt, which grew on the north part of it: proxime (ſays he) patet foreſta ingens, ſaltus numeroſi ferarum, latebræ cervorum, damarum, aprorum, & taurorum ſylveſtrium, &c. And there are now ſome remains of old decayed Cheſnuts, in the woods and chaces not far diſtant from London, but particularly on Enfield Chace; which plainly proves, that this tree is not ſo great a ſtranger to our climate, as many people believe; and may be cultivated in England, to afford an equal profit with any of the other ſorts of larger timber-trees, ſince the wood of this tree is equal in value to the beſt Oak, and, for many purpoſes, far exceeding it; as particularly for making veſſels for all kinds of liquor, it having a property (when once thoroughly ſeaſoned) of maintaining its bulk conſtantly, and is not ſubject to ſhrink or ſwell, as other timber is too apt to do: and I am certainly informed, that all the large caſks, tuns, &c. for their wines in Italy, are made of this timber; and it is for that, and many more purpoſes, in greater eſteem among the Italians, than any other timber whatever. It is alſo very valuable for pipes to convey water under ground, as enduring longer than the Elm, or any other wood. In Italy it is planted for coppice-wood, and is very much cultivated in ſtools, to make ſtakes for their Vines; which, being ſtuck into the ground, will endure ſeven years, which is longer than any other ſtakes will do, by near half the time. The uſefulneſs of the timber, together with the beauty of the tree, renders it as well worth propagating as any tree whatever.

Theſe trees are propagated by planting the nuts in February, in beds of freſh undunged earth. The beſt nuts for ſowing, are ſuch as are brought from Portugal and Spain, and are commonly ſold in winter for eating, provided they are not kiln-dried, which is generally the caſe of moſt of thoſe brought from abroad, which is done to prevent their ſprouting or ſhooting in their paſſage; therefore, if they cannot be procured freſh from the tree, it will be much better to uſe thoſe of the growth of England, which are full as good to ſow for timber or beauty, as any of the foreign nuts, though their fruit is much ſmaller: theſe ſhould be preſerved, until the ſeaſon for ſowing, in ſand, where mice, or other vermin cannot come to them, otherwiſe they will ſoon deſtroy them: before you ſet them, it will be proper to put them into water, to try their goodneſs, which is known by their ponderoſity; thoſe of them that ſwim upon the ſurface of the water ſhould be rejected as good for nothing; but ſuch as ſink to the bottom, you may be ſure are good.

In ſetting theſe ſeeds or nuts, the beſt way is, to make a drill with a hoe (as is commonly practiſed in ſetting Kidney Beans) about four inches deep, in which you ſhould place the nuts, at about four inches diſtance, with their eye uppermoſt; then draw the earth over them with a rake, and make a ſecond drill at about a foot diſtance from the former, proceeding as before, allowing three or four rows in a bed, with an alley between, three feet broad, for a conveniency of clearing the beds, &c. When you have finiſhed your plantation, you muſt be careful that it is not deſtroyed by mice, or other vermin; which is very often the caſe, if they are not prevented by traps, or other means.

In April theſe nuts will appear above ground; you muſt therefore obſerve to keep them clear from weeds, eſpecially while young: in theſe beds they may remain for two years, when you ſhould remove them into a nurſery, at a wider diſtance. The beſt ſeaſon for tranſplanting theſe trees, is either in October or the latter end of February; but October is the beſt ſeaſon: the diſtance theſe ſhould have in the nurſery, is three feet row from row, and one foot in the rows: you muſt be careful in tranſplanting theſe trees, to take them up without injuring their roots, nor ſhould they remain long out of the ground; but if they have a downright tap-root, it ſhould be cut off, eſpecially if they are intended to be removed again; this will occaſion their putting out lateral roots, and render them leſs ſubject to miſcarry when they are removed for good.

The time generally allowed them in this nurſery, is three or four years, according to their growth; but the younger they are tranſplanted, if deſigned for timber, the better they will ſucceed; during which time you ſhould be careful to keep them clear from weeds, obſerving alſo to prune off lateral branches, which would retard their upright growth; and where you find any that are diſpoſed to grow crooked, either by their upper bud being hurt, or from any other accident, you may the year after planting, in March, cut them down to the lowermoſt eye next the ſurface of the ground, which will cauſe them to make one ſtrong upright ſhoot, and may be afterwards trained into good ſtrait trees: but this ſhould not be practiſed, unleſs the plants have abſolutely loſt their leading ſhoot; for although the ſtems of the trees ſhould be very crooked (as is generally the caſe with them when young) yet when they are tranſplanted out, and have room to grow, as they increaſe in bulk, they will grow more upright, and their ſtems will become ſtrait, as I have frequently obſerved where there have been great plantations made of them.

But in doing of this, you muſt be careful not to diſturb or break their roots, which, perhaps might deſtroy them. Theſe trees require no other manure than their own leaves, which ſhould be ſuffered to rot upon the ground; and in the ſpring of the year, the ground ſhould have a ſlight digging, when theſe ſhould be buried between their roots, but not too cloſe to the trees, which might be injurious to their young fibres.

After having remained three or four years in the nurſery, they will be fit for tranſplanting, either in rows to grow for timber, or in quarters for wilderneſs plantations; but if you intend them for timber, it is by much the better method to ſow them in furrows (as is practiſed for Oaks, &c.) and let them remain unremoved; for theſe trees are apt to have a downright tap-root, which, being hurt by tranſplanting, is often a check to their upright growth, and cauſes them to ſhoot out into lateral branches, as is the caſe with the Oak, Walnut, &c.

Therefore, wherever any of theſe trees are planted for timber, they ſhould remain unremoved: but where the fruit of them is more ſought after, then it is certainly the better way to tranſplant them; for as

transplanting is a check to the luxuriant growth of trees, so it is a promoter of their fructification, as may be evinced by observing low shrubby Oaks, Walnuts, &c. which generally have a greater plenty of fruit, than any of the larger and more vigorous trees; and the fruit of such trees is much superior in taste, though the seeds of vigorous trees are vastly preferable for plantations of timber; for it is a constant observation, that, by saving seeds from dwarf trees or plants, from time to time, they may be rendered much lower in their growth than is their natural size; but where the fruit is most desired, then they should be taken from such trees as produce the largest and sweetest nuts, which are commonly found upon such trees as spread the most, and have horizontal roots; for the weaker trees being less capable to furnish a supply of nourishment, and having a greater quantity of fruit upon them, to which this must be distributed, together with their roots lying near the surface of the ground (by which means the juices are better prepared by sun, air, &c. before it enters their vessels,) it is certain their juices are better digested, and their fruits better maturated, than those can possibly be, which grow upon strong vigorous trees, which have long tap-roots running several feet deep into the earth, and consequently take in vast quantities of crude unprepared juice, which is buoyed up to the extreme parts of the tree; and these seldom having many lateral branches, to digest and prepare their juice, by perspiring and throwing off the crude part before it enters the fruits.

And this, I dare say, universally holds good in all sorts of fruit trees, and is often the occasion of the good and bad qualities of the same sorts of fruits growing on the same soil.

What has been related about grafting this tree into the Walnut, to promote their bearing, or render their fruit fairer; or inoculating Cherries into the Chesnut, for later fruit, is very whimsical and silly, since neither the Chesnut nor Walnut will receive its own kind any other way than by inoculating or inarching; and it is the latter only, by which the Walnut can be propagated; nor was it ever known, that any two trees of a different genus would take upon each other, so as to produce either a good tree or fruit; therefore we may justly explode all those different graftings of various trees upon each other, so much talked of by the ancients; at least we may suppose those trees are not known by the same names now, that they are mentioned by in their writings; for I have made many trials upon them, which, although performed with great care, and in different seasons, yet scarcely one of them succeeded. But to return:

If you design a large plantation of these trees for timber, after having two or three times ploughed the ground, the better to destroy the roots of weeds, you should make your furrows about six feet distance from each other, in which you should lay the nuts about ten inches apart, covering them with earth about three inches deep; and, when they come up, you must carefully clear them from weeds: the distance allowed between each row, is for the use of the horse hoeing plough, which will dispatch a great deal of this work in a short time; but it should be performed with great care, so as not to injure the young plants; therefore the middle of the spaces only should be cleaned with this instrument, and a hand hoe must be used to clean between the plants in the rows, and also on each side, where it will be unsafe for the plough to be drawn: and in hand hoeing, there must be great care taken, not to cut the tender rind of the plants. If the following spring the spaces are carefully stirred with the plough, it will not only make the ground clean, but also loosen it, so as that the sun and moisture may more easily penetrate the same, which will greatly promote the growth of the plants; and the oftener these ploughings are repeated, the cleaner will be the ground, and the greater will be the progress of the plants, which cannot be kept too clean while they are young. When these have remained three or four years (if the nuts succeeded well,) you will have many of these trees to remove, which should be done at the seasons before directed, leaving the trees about three feet distance in the rows; at which distance they may remain for three or four years more, when you should remove every other tree to make room for the remaining, which will reduce the whole plantation to six feet square, which will be distance enough for them to remain in, until they are large enough for poles, when you may cut down every other of these trees (making choice of the least promising,) within a foot of the ground, in order to make stools for poles, which, in eight or ten years time, will be strong enough to lop for hoops, hop poles, &c. for which purposes they are preferable to most other trees; so that every tenth year, here will be a fresh crop, which will pay the rent of the ground, and all other incumbent charges, and, at the same time, a full crop of growing timber left upon the ground: but as the large trees increase in bulk, their distance of twelve feet square will be too small; therefore when they have grown to a size for small boards, you should fell every other tree, which will reduce them to twenty-four feet square, which is a proper distance for them to remain for good; this will give air to the under wood (which, by this time, would be too much overhung by the closeness of the large trees;) by which means that will be greatly encouraged, and the small timber felled, will pay sufficient interest for the money at first laid out in planting, &c. with the principal also: so that all the remaining trees are clear profit, for the under wood still continuing, will pay the rent of the ground, and all other expences; and what a fine estate here will be for a succeeding generation, in about fourscore years, I leave every one to judge.

The Chinquapin, or Dwarf Virginian Chesnut, is at present very rare in England: it is very common in the woods of America, where it seldom grows above twelve or fourteen feet high, and produces great plenty of nuts, which are, for the most part, single in each outer coat or capsule. This tree is very hardy, and will resist the severest of our winters in the open ground, but is very apt to decay in summer, especially if it is planted in very dry ground. The nuts of these trees, if brought from America, should be put up in sand as soon as they are ripe, and sent to England immediately, otherwise they lose their growing quality, which is the reason this tree is at present so scarce with us; for not one seed in five hundred sent over ever grew, which was owing to the neglect of putting them up in this manner: indeed, most of the nuts which have been brought over, have been kiln-dried, to preserve them from sprouting, which infallibly destroys the germen. When the nuts arrive, they should be put into the ground as soon as possible; and if the winter should prove severe, it will be proper to cover the ground with leaves, tan, or Pease-haulm, to prevent the frost from penetrating the ground, so as to destroy the nuts. This sort of Chesnut delights in a moist soil; but if the wet continues long upon the ground in winter, it is apt to kill the trees. This will take by inarching it upon the common sort, but the trees so propagated seldom succeed well.

I have seen a specimen, and some nuts of a Dwarf Chesnut, which were brought from North America, which differed from all the other sorts; and I have been informed, that the French have raised plants of this kind, from the nuts which were brought from Canada; but as I have not seen any of the plants raised in England, I can give no farther account of it, than that some of the late writers have supposed it might be the dwarf branching kind before-mentioned.

CASTANEA EQUINA. See Esculus.

CASTOREA. See Durantia.

CATANANCHE. Lin. Gen. Plant. 824. [Κατανάγκω, a violent allurement to love, of κατὰ and ἀνάγκη, necessity, or of καταναγκάζω, to compel; so called, because

because the opinion the ancients had of it, that it was a strong, and almost invincible inducement to love.] Candia Lions Foot.

The Characters are,

*The flower is composed of many hermaphrodite florets, those on the border being longer than those which are in the center; these are included in one common scaly empalement, which is permanent and elegant. The florets are of one leaf, tongue-shaped, indented in five parts, and are longer than the empalement; these have each five short hairy stamina, terminated by cylindrical summits. The germen is situated below the flower, supporting a slender style the length of the stamina, crowned with a bifid stigma which is reflexed. The germen afterward becomes a single oval seed, which is compressed and crowned with bristles, inclosed in the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia æqualis; the flowers of this class have their stamina separate, and their summits connected together in a cylinder, and those of this section have only hermaphrodite flowers.

The Species are,

1. Catananche (*Cærulea*) squamis calycinis inferioribus ovatis. Hort. Cliff. 390. *Catananche whose under scales of the empalement are oval.* Catanance quorundam. Lugd. Hist. 1190.
2. Catananche (*Lutea*) squamis calycinis inferioribus lanceolatis. Hort. Cliff. 390. *Catananche whose under scales of the empalement are spear-shaped.* Catanance flore luteo, latiore folio. Tourn. Inst. R. H. 478.

Tournefort mentions a third sort with a narrow leaf, in which it differs from the second; but if there is such a distinct species, I have not happened to meet with it; for although I have frequently received the seeds from several parts of Europe by this title, yet I could not find any difference between the plants, and those of the second sort; therefore I suppose Tournefort may have found the plants growing on a sterile soil, where the leaves were much narrower than those growing in a garden, or in better ground, which may have induced him to suppose they were distinct species. Both these plants grow naturally in the south of France, in Spain, Italy, and Candia, from whence it had the title of Candia Lions Foot.

The first sort sends out many long, narrow, hairy leaves, which are jagged on their edges like those of Buckshorn Plantain, but the leaves are broader, the jags deeper, and at greater distances; these lie flat on the ground, turning their points upwards, which are very narrow. Between the leaves come out the flower-stalks, which are in number proportionable to the size of the plant; for from an old thriving root, there is frequently eight or ten, and young plants do not send out more than two or three. These stalks rise near two feet high, dividing into many small branches upward, garnished with leaves like those below, but are smaller, and have few or no jags on their edges: each of the foot-stalks are terminated with single heads of flowers, having a dry, silvery, scaly empalement, in which are included three or four florets, whose petals are broad, flat, and indented at their ends; these are of a fine blue colour, having a dark spot at bottom, and in each the five stamina, with their yellow summits, standing a little above the petal, make a pretty appearance.

It has been by some authors titled Chondrilla cærulea, i. e. *Blue Gum Cicory*; and by others Sesamoides, or Catanances Sesamoides. Caspar Bauhin calls it Chondrilla cærulea cyani capitulo. Pin. 130. *Blue Gum Cicory with a Blue Bottle head.* There is a variety of this with double flowers, which is not very common in the English gardens.

The second sort hath broader leaves than the first, which are smoother, and less jagged on their edges: from each root arise two or three stalks, which grow a foot and a half high, sending out two or three slender foot-stalks, each sustaining a single head of yellow flowers, inclosed in a dry scaly empalement, of a darker colour than those of the first: as these flowers are small, they make but little appearance, therefore the plant is only kept for the sake of variety.

The first of these plants is a perennial, and may be propagated by heads taken off the mother plant, either in spring or autumn; but those plants which are raised from seeds, are much stronger than those from slips. These plants are commonly planted in pots filled with light sandy soil, in order to shelter them in the winter from severe frosts; but if they are planted in warm borders, either near walls, pales, or hedges, in a moderately dry soil, they will endure abroad very well. It begins flowering in May, and continues till August or September (especially if the summer is not too dry,) is a pretty ornament to a garden, and is easily kept within bounds. This may also be propagated by seeds, which should be sown in a border of good light earth in March; and in May, when the plants are come up, they may be either transplanted into pots or borders, where they are to remain for flowering. These plants should remain unremoved when they are planted in the full ground, which will cause them to flower better, and they will produce more seeds. The seeds ripen in August.

The other sort is an annual plant, and therefore only propagated by seeds, which ripen very well in this country. The time for sowing them is early in March, in beds or borders of light earth where they are to remain, which will come up in a month or five weeks time, and require no other care but to keep them clean from weeds, and thin the plants where they are too close. These flower in June, and perfect their seeds in August or September; but as they have little beauty, they are not often kept in gardens.

CATAPUTIA Major. See Ricinus.

CATAPUTIA Minor. See Euphorbia.

CATARIA. See Nepeta.

CATCH-FLY. See Lychnis.

CATERPILLARS.

There are several kinds of this insect, which are very pernicious to a garden; but there are two sorts which are the most common, and destructive to the young plants: one of them is that which the white butterfly breeds. It is of a yellowish colour, spotted and striped with black; this commonly infests the tender leaves of Cabbages, Cauliflowers, and the Indian Cress: they eat off all the tender parts of the leaves, leaving only the fibres entire; so that very often we see, in the autumn season, whole gardens of winter Cabbages and Savoys almost destroyed by them, especially in those which are crouded with trees, or are near buildings. They always increase most in very dry seasons; and when the plants have been stinted by the drought, they are constantly attacked; whereas, those which are in vigour, seldom suffer much by those insects. Nor is there any other method found out to destroy them that I know of, but to pick them off the plants before they are spread from the nests; by which means, though perhaps many may be overlooked, yet their numbers will be greatly diminished. But this work must be often repeated during the warm weather, when the butterflies are abroad, which are continually depositing their eggs, and in a few days time will be metamorphosed to perfect caterpillars. But as these, for the most part, feed upon the outer leaves of plants, so they are more easily taken than the other sort, which is much larger: the skin is very tough, and of a dark colour: this is called by the gardeners, a grub, and is exceeding hurtful. The eggs of this sort of caterpillar, are, for the most part, deposited in the very heart or center of the plant (especially in Cabbages;) where, after it hath obtained its form, it eats its way out through all the leaves thereof; and also their dung, being lodged between the inclosed leaves of the Cabbages, gives them an ill scent.

This insect also burrows just under the surface of the ground, and makes great havock on young plants, by eating them through their tender shanks, and drawing

ing them into their holes. The miſchief is chiefly done in the night: whenever you obſerve this, you ſhould every morning look over your plat of plants; and wherever you ſee any plants eaten off, ſtir the ground round about the place with your fingers an inch deep, and you will certainly find them out. This is the only method I know of deſtroying them.

CATKINS, or IULUS.
This is, by the botaniſts, called Flos Amentaceus: it is an aggregate of ſummits, which are joined together in form of a rope or cat's tail, and is the male flower of the trees which produce them; as the Firs, Pines, Cedars, Walnuts, Birch-trees, and Willows.

CATESBÆA. Lin. Gen. Plant. 121. Hiſt. Carolin. Vol. II. p. 100. The Lily Thorn.

The CHARACTERS are,

*It hath a ſmall permanent empalement of one leaf, with five ſharp indentures; the flower is of one leaf, funnel-ſhaped, having a very long tube, which gradually widens to the top, where it is four-cornerned and ſpread open; it hath four ſtamina riſing in the neck of the tube, terminated by oblong erect ſummits; the roundiſh germen is ſituated under the flower, ſupporting a ſlender ſtyle, crowned by a ſingle ſtigma. The germen afterward becomes an oval berry with one cell, filled with angular ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourth claſs, intitled Tetrandria Monogynia, the flower having four ſtamina and one ſtyle.

We have but one SPECIES of this plant, viz.

CATESBÆA. Lin. Sp. Plant. 109. The Lily Thorn. Frutex ſpinoſus Buxi foliis, plurimis ſimul naſcentibus, flore tetrapetaloide, pendulo, ſordidè flavo, tubo longiſſimo, fructu ovali croceo, ſemina parva continente. Cateſb. Hiſt. Carol. Vol. II. p. 100.

This ſhrub was diſcovered by Mr. Cateſby, near Naſſau town, in the iſland of Providence, where he ſaw two of them growing, which were all he ever ſaw; from theſe he gathered the ſeeds, and brought them to England in 1726, from which many plants were raiſed in the Engliſh gardens, ſome of which have ſince flowered here.

It riſes with a branching ſtem to the height of ten or twelve feet, which is covered with a pale ruſſet bark; the branches come out alternately from the bottom to the top, which are garniſhed with ſmall leaves, reſembling thoſe of the Box-tree, coming out in cluſters all round the branches, at certain diſtances; the flowers come out ſingle from the ſide of the branches, hanging downward; they are tubulous, and near ſix inches long, very narrow at their baſe, but widening upward toward the top, where it is divided into four parts which ſpread open, and are reflexed backward; theſe are of a dull yellow colour. After the flower decays, the germen ſwells to an oval fleſhy berry the ſize of a middling Plumb, hollow within, and filled with ſmall angular ſeeds.

This ſhrub is propagated by ſeeds, which muſt be procured from the country where it naturally grows. If the entire fruit are brought over in ſand, the ſeeds will be better preſerved: when they arrive in England, the ſeeds muſt be ſown in ſmall pots filled with light ſandy earth, and plunged into a moderate hot-bed of tanners bark, and now and then moderately watered. If the ſeeds are good, the plants will appear in about ſix weeks after ſowing; when, if the heat of the bed declines, the tan ſhould be turned over to the bottom, and, if neceſſary, ſome freſh added to renew the heat, for theſe plants make but little progreſs the firſt year. When the pots are again plunged into the tan-bed, they muſt have freſh air admitted to them every day in proportion to the warmth of the ſeaſon, and frequently refreſhed with water, in ſmall quantities, for much wet will certainly kill them; if the nights ſhould prove cold, the glaſſes ſhould be covered with mats every evening. As theſe plants grow ſlowly, they will not require to be removed out of the ſeed-pots the firſt year. In the autumn the pots ſhould be removed into the ſtove, and plunged into the tan-bed. During the winter, the plants ſhould be watered with great caution, and in ſpring they ſhould be carefully taken up, and each planted in a ſeparate ſmall pot filled with light ſandy earth, and plunged into a freſh hot-bed of tanners bark, being careful to ſhade them until they have taken freſh root, as alſo to refreſh them with water gently, as they may require it; and in ſummer, when the weather is warm, they ſhould have a good ſhare of air admitted to them; but in autumn muſt be removed into the ſtove, where they ſhould conſtantly remain, and muſt be treated afterward in the ſame manner as other tender exotic plants.

This plant may be propagated by planting cuttings in ſmall pots filled with light earth, during the months of June and July. The pots ſhould be plunged into a moderate hot-bed of tanners bark, and the cuttings cloſely covered with ſmall bell-glaſſes to exclude the external air. If this is properly performed, the cuttings will put out roots in about two or three months, when they may be carefully ſeparated, planting each into a ſmall pot filled with light earth, and plunged into the hot-bed again, and afterward muſt be treated as the ſeedling plants.

Moſt of thoſe plants which were raiſed from Mr. Cateſby's ſeeds, were killed by the ſevere winter in 1739; but ſeven years ago I received ſome freſh ſeeds, which ſucceeded ſo well, as to enable me to communicate plants to ſeveral curious perſons in England and Holland.

CACAULIS, Baſtard Parſley.
This is one of the umbelliferous plants with oblong ſeeds, which are a little furrowed and prickly: the petals of the flower are unequal and heart-ſhaped.

There are ſeveral ſpecies of this plant preſerved in the botanic gardens; but as there is no great beauty or uſe in any of them, I ſhall paſs them over with only obſerving, that if any perſon hath a mind to cultivate them, the beſt ſeaſon to ſow their ſeeds is in autumn, ſoon after they are ripe; for if the ſeeds are kept till ſpring, the plants ſeldom produce ripe ſeeds again. They are moſt of them biennial, and require to be ſown every year. We have four or five ſpecies of them, which grow wild in England.

CAULIFEROUS plants [of Caulis, *Lat.* a ſtalk, and *fero*, to bear;] ſuch plants as have a true ſtalk.

CAULIS, is that part of a plant which riſes ſingle above the earth, from whence the leaves or little branches put forth, as Jungius defines it; or it is the upper part of a plant ſtretched forth to an height, ſo that the fore parts differ not from the hind, nor the right from the left. In trees and ſhrubs it is called Caudix; in corn Culmus; the ſtalk of any herb; the ſtem, trunk, or body of a tree. *Lat.*

CEANOTHUS. Lin. Gen. Plant. 237. Euonymus. Com. Hort. New Jerſey Thea.

The CHARACTERS are,

*It hath a turbinated empalement of one leaf, which is permanent, cut into five acute ſegments which cloſe together; the flower hath five roundiſh equal petals which ſpread open, and are leſs than the empalement; it hath five erect ſtamina, placed oppoſite to the petals, and are of equal length, terminated by roundiſh ſummits, and a three-cornered germen, ſupporting a cylindrical ſtyle, crowned by an obtuſe ſtigma. The germen afterward becomes a dry capſule with three cells, in which are lodged three oval ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, intitled Pentandria Monogynia, the flower having five ſtamina and one ſtyle.

The SPECIES are,

1. CEANOTHUS (*Americanus*) foliis trinerviis. Lin. Sp. Plant. 195. *Ceanothus with leaves having three nerves.* Euonymus Nervi Belgii corni fœminæ foliis. Hort. Amſt. 1. 167. *New England Dogwood with female Cornel leaves, commonly called New Jerſey Thea.*
2. CEANOTHUS (*Africanus*) foliis lanceolatis enerviis, ſtipulis ſubrotundis. Lin. Sp. Plant. 196. *Ceanothus with ſpear-ſhaped leaves without nerves, and roundiſh ſtipulæ.* Alaternoides Africana lauri ſerratæ folio. Com. Præl. 61. tab. 11.



3. CEANOTHUS

3. CEANOTHUS (*Arborescens*) foliis ovatis sessilibus nervosis floribus alaribus. *Ceanothus with oval nervous leaves set close to the branches, flowers proceeding from the wings of the leaves, commonly called Red-wood.*

The first sort grows naturally in most parts of North America, from whence great plenty of the seeds have been of late years brought to Europe, by the title of New Jersey Thea, where I have been informed the inhabitants dry the leaves of this shrub to use as Thea. The people of Canada use the root in venereal cases. I have received the seeds of this sort from New England, Pensylvania, Virginia, and Carolina; and the French mention it as a common shrub in Canada, where they say the cattle browze upon it, and keep it very low.

In England this shrub seldom rises more than three or four feet high, sending out branches on every side from the ground upward. The branches are very slender, and as it is pretty late in the spring before they begin to shoot, they keep growing very late; therefore, unless the autumn proves dry and mild, the tender shoots are often killed down very low by the early frosts; but, in favourable seasons, the extreme parts of the shoots only are injured by the cold. These branches are garnished with oval pointed leaves, having three longitudinal veins running from the foot-stalk to the point, which diverge in the broad part of the leaves from each other: the leaves are placed opposite, and are of a light green colour. At the extremity of each shoot the flowers are produced in close thick spikes, which are composed of five small leaves, of a clear white. These appear in July, and make a pretty appearance during their continuance; for, as every shoot is terminated by one of these spikes, the whole shrub is covered over with flowers, the branches commonly growing very close to each other; and when the autumn proves mild, these shrubs often flower again in October. After the flowers are past, there succeeds to each flower a tricapsular seed-vessel, flatted at the top, opening into three cells, each having a single seed. In warm seasons the seeds ripen in England. This shrub is best propagated by seeds, which should be sown in the autumn in small pots, and plunged into an old hot-bed, where they may remain during the winter, exposing them in mild weather to the open air, but in frost they must be protected from cold. In March the pots should be plunged into a moderate hot-bed to bring up the plants, which should be inured to bear the open air by degrees; and as soon as they have obtained a little strength, they should be exposed in a sheltered situation till autumn, when they must be placed under a hot-bed frame, to screen them from severe frost in winter; but in mild weather they should be fully exposed to the open air, for while the plants are young, they will not endure the cold of the winter. In the following spring, before the plants begin to shoot, they should be transplanted; some of them may be put into separate pots, and the others into a nursery-bed, in a warm situation, where they may remain a year or two to get strength, after which time they may be removed to the places where they are designed to remain. They should have a moderately dry soil and a sheltered situation, where they will thrive and flower extremely well; but in stiff cold land, they are always very late in the spring before they come out, so that their young shoots are full of sap in the autumn, and the first frost commonly kills their tops, which frequently causes them to die great part of their length.

It may also be propagated by laying down the young branches, which, in a light soil, will put out roots in a year's time, but these layers should not be much watered; for as the shoots are tender, moisture will often occasion their rotting, when it is given in quantities, or too often repeated; therefore the best method is to cover the surface of the ground in dry weather, all round the layers, either with mulch or rotten tan, which will preserve a sufficient moisture in the ground, provided the season is not extremely dry; in which case they should have a little water once in eight or ten days, which will be sufficient.

The best time for laying down these branches is in autumn; and if after this is performed, the surface of the ground is covered over with some old tan, taken from a decayed hot-bed, it will prevent the frost from penetrating the ground, which will secure them from injury; and the same covering will prevent the winds from drying the ground in the spring, and thereby promote their putting out roots. These layers, when rooted, may be taken up the following spring, and treated in the same manner as those raised from seeds.

The second sort grows naturally at the Cape of Good Hope, from whence it was originally brought to Holland, and has been many years preserved there; and since has been communicated to most of the curious gardens in Europe, where it has been long known by the title of Alaternoides, &c. and by some authors it is titled Ricinoides Africana arborescens, &c. but Dr. Linnæus, having examined the characters more exactly, has joined it to this genus.

This rises to the height of ten or twelve feet, with a woody stem, covered with a rough dark-coloured bark, and sends out many weak branches, which hang downward; these while young are green, but afterward change to a purplish colour. They are garnished with oblong pointed leaves, of a lucid green, which are smooth, and slightly sawed on their edges. The flowers are small, of an herbaceous colour, coming out from the side of the branches; these sometimes appear in July, but are not succeeded by seeds in this country, nor do the plants often produce flowers; so that they are preserved only for the beauty of their shining evergreen leaves, which make a variety in the green-house during the winter season.

It may be propagated either by layers or cuttings; the latter being a very sure and expeditious method, is generally preferred. The cuttings should be planted in the spring into pots filled with good kitchen-garden earth, and plunged into a very moderate hot-bed, observing to shade them in the heat of the day, and now and then refresh them with water. In about two months or less, they will have taken root, when they must be gradually inured to the open air, placing them in a sheltered situation till they have obtained strength, when they may be separated, and each planted in a small pot filled with light earth, placing them in the shade till they have taken fresh root; then they may be removed, and intermixed with other exotic plants for the summer season. In autumn they must be housed with Myrtles, and other more hardy exotic plants, and treated in the same manner.

The third sort grows naturally in the Bahama Islands, from whence the late Mr. Catesby brought the seeds to England. It also grows naturally in Barbadoes, and some other islands in the West Indies, from whence I have received the seeds. This, in the countries of its natural growth, rises to the height of forty or fifty feet, with large trunks, which are by the inhabitants sawn into boards, and were at first esteemed for the beauty of their colour; but being exposed to the air, their colour vanished and they became pale, so have not since been much regarded.

In Europe, where the plants have been properly treated, they have grown to the height of twenty feet; and if the stoves in which they were placed had been lofty enough, would have grown much higher. The stem is strong, woody, and is covered with a light brown bark, which, when young, has several furrows; the branches come out irregularly from every side the stem, garnished with pretty large oval leaves, of a light green colour, having several longitudinal veins inclining to white. The flowers are small, of an herbaceous white, so make little appearance; they come out from the wings of the leaves, and, in their native soil, are succeeded by roundish fruit almost the size of small Pease, opening in three cells; in each is inclosed one shining black seed.

This is propagated by seeds, which should be sown in the spring, in small pots filled with light earth, and plunged into a hot-bed; these seeds lie generally two months in the ground before the plants make their appearance, during which time the pots should be duly watered, and air admitted when the weather is warm. When the plants come up and are fit to remove, they should be carefully separated, planting each in a small pot filled with light earth, watering the earth to settle it about their roots; then plunge them into the tan-bed again, shading the plants from the sun till they have taken new root; afterward they may be treated in the same manner as other tender plants from the same countries. When the plants have obtained strength, they may be preserved in winter in a dry stove, but these will not make such progress as those in the tan-stove.

CECROPIA. Yaruma Oviedi. Sloan. Hist. Jam. The Trumpet-tree, or Snakewood.

The Characters are,

*It hath male and female flowers in different plants. The male flower hath an oval acute spatha, which bursts and contains a tale composed of many katkins, which are taper and bundled together; these are imbricated, and have many turbinated scales, which are four-cornered, obtuse, and compressed. The flower hath no corolla, but a scaly nectarium, with two short hair-like stamina, crowned by four-cornered oblong summits. The female flowers have a spatha, with four taper imbricated germen; they have no corolla, but the compressed imbricated germen support one short style, crowned by a headed torn stigma. The empalement afterward turns to a berry with one cell, containing one oblong compressed seed.*

This tree is ranged in the second order of Linnæus's twenty-second class, intitled Diœcia Diandria, the male flowers growing upon separate plants from the female, and have each two stamina.

It grows naturally in most of the woody parts of the island of Jamaica, where it rises to the height of thirty-five or forty feet: the trunk and branches are hollow, and stopped at different spaces by membranaceous septæ, which have so many light annular marks in the surface; the leaves are large, divided into many lobes like those of Papaya, but the foot-stalk is placed more in the center, so as to resemble a target: they are downy on their under side. The flowers are inclosed in a conical spatha or sheath, the male growing upon separate plants from those which have the female; they are produced upon imbricated katkins, composed of several turbinated scales, having no corolla, each having a scaly nectarium, with two short hair-like stamina, crowned with four-cornered oblong summits. The female flowers are inclosed in a conical spatha or sheath; these have no corolla, but have four imbricated germen, supporting one short style, crowned by a headed torn stigma. The empalement afterward turns to an oblong cylindrical berry, composed of many small acini like the Strawberry, and much resemble it in flavour when ripe.

This tree is very rare at present in Europe; the fruit being small are generally devoured by birds, so are not much observed by the European inhabitants, but the negroes are fond of it; they also make use of the small branches of the tree to obtain fire, by rubbing them against each other; by this attrition they soon emit sparks of fire, so that it is a useful tree in that country.

I received specimens of this tree from the late Dr. Houstoun, who found it growing naturally at La Vera Cruz, in New Spain, but without flowers; nor had the Doctor leisure to examine the characters of it, so that at present we are not sufficiently acquainted with them.

It may be propagated by seeds (when procured from the places where it naturally grows.) These should be brought over in sand; for as the fruit are composed of several acini like those of Strawberries, so if they are put up moist in papers, they will be apt to grow mouldy, and thereby spoil the seeds: but when they are put up in light sand, it will prevent that inconveniency. The seeds should be sown in small pots filled with light earth, and plunged into a moderate hot-bed of tanners bark, observing to water the pots duly, and to admit fresh air whenever the weather is favourable. When the plants come up and are fit to transplant, they should be carefully taken up, and each planted in a separate small pot filled with the like light earth, and plunged into the hot-bed again, being careful to water them to settle the earth to their roots, and also to screen them from the sun till they have taken new root: after which they should be constantly kept plunged into the bark-bed in the stove, and treated in the same manner as other plants from the same country.

CEDRUS. The Cedar-tree of Barbadoes, and the Mahogany, &c.

The Characters are,

*It hath a tubulous bell-shaped empalement of one leaf, indented in five parts. The flower is of one leaf, divided at the top into five parts; it hath five short stamina, which adhere at bottom to the germen, and are terminated by roundish summits; in the center is situated the roundish germen, supporting a thick stigma; the germen afterward becomes an oval pod, having five cells, opening from the bottom upward with five valves, having a double cover; the outer being thick and woody, the inner very thin, which immediately surrounds the seeds. In the center is fixed a five-cornered column the length of the pod, whose angles are opposite to the fissures of the pod, to which the seeds adhere, placed over each other like the scales of fish; these are thick at their base, but upward are flat and thin, like the wings adhering to the seeds of Firs and Pines.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one germen.

As the Cedar of Libanus is by Tournefort very properly referred to the genus of Larix, and all the berry-bearing Cedars are joined to the Junipers, I have given the title of Cedrus to this genus, as they were mentioned by imperfect titles by most of the authors who have treated of them; and as the first sort has been generally known by the appellation of Cedar in the countries where it naturally grows, the applying the same name to those plants which agree in their essential characters with it, will join them properly together.

The Species are,

1. Cedrus (*Odorata*) foliis pinnatis, foliolis multijugatis obtusis, fructu ovali glabro. *Cedar-tree with winged leaves, composed of many pair of small leaves or lobes, which are obtuse, and an oval smooth fruit.* Cedrus Barbadensium, alatis fraxini foliis non crenatis, fructu singulari, quinis involucris crassis validis cochleato cavis, totidem semina membranis adaucta & columnæ canaliculatæ pentagonæ prægrandi adnata, occludentibus ornato. Pluk. Phyt. tab. 157. f. 1. *The Barbadoes Cedar-tree.*
2. Cedrus (*Mahogani*) foliis pinnatis, foliolis oppositis, glabris, floribus racemosis sparsis. *Cedar with winged leaves, whose lobes are smooth and stand opposite, and flowers growing in loose bunches.* Arbor foliis pinnatis, nullo impari alam claudente, nervo ad latus unum excurrente fructu anguloso magno, semine alato instar Pinûs. Catesb. Hist. Carol. Vol. II. p. 181. *The Mahogany-tree.*
3. Cedrus (*Alternifolius*) foliis alternis simplicibus, cordato-ovatis acutis, fructu pentagono mucronato. *Cedar with single leaves placed alternately, which are oval, heart-shaped, and acute, having a five-cornered pointed fruit.* Arbor excelsa Coryli folio ampliore. Houst. MSS.

The first sort is commonly known under the title of Cedar in the British islands of America, where this tree grows naturally, and is one of the largest trees of that country. The trunks of these trees are so large, that the inhabitants hollow them, and form them into the shape of boats, and periaguas, for which purpose they are extremely well adapted; the wood

wood being soft, it may be cut out with great facility, and being light, it will carry a great weight on the water. There are canoes in the West Indies, which have been formed out of these trunks, which are forty feet long and six broad; the wood is light, of a brown colour, and has a fragrant odour, from whence the title of Cedar has been given to it. This wood is frequently cut into shingles for covering of houses, and is found very durable; but as the worms are apt to eat this wood, it is not proper for building of ships, though it is often used for that purpose, as also for sheathing of ships. It is often used for wainscoting of rooms, and to make chests, because vermin do not so frequently breed in it, as in many other sorts of wood, this having a very bitter taste, which is communicated to whatever is put into the chests, especially when the wood is fresh; for which reason it is never made into casks, because spirituous liquors will dissolve part of the resin, and thereby acquire a very bitter taste.

This tree rises with a strait stem to the height of seventy or eighty feet, while young the bark is smooth, and of an Ash-colour; but as they advance, the bark becomes rough and of a darker colour. Toward the top it shoots out many side branches, garnished with winged leaves, composed of sixteen or eighteen pair of lobes (or small leaves) so that they are sometimes near three feet long; the lobes are broad at their base, and are near two inches long, blunt at their ends, and of a pale colour; these emit a very rank odour in the summer season, so as to be very offensive. As I have not seen any of these flowers upon the trees, I can give no description of them. The fruit is oval, about the size of a partridge's egg, smooth, of a very dark colour, and opens in five parts, having a five-cornered column standing in the middle, between the angles of which the winged seeds are closely placed, lapping over each other like the scales of fish.

There are some plants of this sort in England, which are preserved in the gardens of those who are curious in collecting exotic plants; these have been raised from the seeds which have been brought from Barbadoes, but they are too tender to live in the open air in England; therefore these plants should be treated in the same manner as the Mahogony next mentioned, but they are of much quicker growth; for in four years from the seed, I have had the plants upward of ten feet high.

I have received plants of this kind from Paris, by the title of Semiruba; but whether the root of this tree is what they use in medicine under that appellation, I cannot say. The seeds of this have also been sent me from the French islands in America, by the title of Acajou Cedre.

It is propagated by seeds, which may be easily procured from the American islands, which must be sown upon a hot-bed in the spring, and the plants treated in the same manner as the next.

The second sort is the Mahogony, whose wood is now well known in England.

This tree is a native of the warmest parts of America, growing plentifully in the islands of Cuba, Jamaica, and Hispaniola; there are also many of them on the Bahama Islands, but I have not heard of their being found in any of the Leeward Islands. In Cuba and Jamaica there are trees of a very large size, so as to cut into planks of six feet breadth; but those on the Bahama Islands are not so large, though they are frequently four feet diameter, and rise to a great height, notwithstanding they are generally found growing upon the solid rocks, where there is scarce any earth for their nourishment. The wood which has been brought from the Bahama Islands has usually passed under the appellation of Madeira wood, but there is no doubt of its being the same as the Mahogony. The Spaniards make great use of this wood for building of ships; for which purpose it is better adapted, than any other sort of wood yet known, being very durable, resisting gun shots, and burying the shot without splintering; nor is the worm so apt to eat this wood as that of the Oak, so that for the West Indies the ships built of Mahogony are preferable to any other.

The excellency of this wood for all domestic uses, is now sufficiently known in England; and it is matter of surprise, that the tree should not have been taken notice of by any historian or traveller to this time; the only author who has mentioned this tree, is Mr. Catesby, in his Natural History of Carolina, and the Bahama Islands, before whom I believe neither the tree or the wood was taken notice of by any writer on natural history, although the wood has been many years brought to England in great quantities.

In the West Indies these trees are of so quick growth, as to arrive to a large size in a few years; the manner of their propagation in the Bahama Islands, as it is described by Mr. Catesby, is as follows: when the fruit is ripe, the outer hard shell or covering separates at the bottom, next the foot-stalk, thereby exposing the seeds, which are fastened to a hard five-cornered column, standing in the middle; these seeds being broad and light, are dispersed on the surface of the ground, which is very rocky. Such of the seeds as happen to fall into the fissures of the rock, very soon send forth roots; and if these tender fibres meet with resistance from the hardness of the rock, they creep out on the surface of it, and seek another fissure, into which they creep, and swell to such a size and strength, as to break the rock, and thereby make way for the root's deeper penetration; and by this nourishment from the rock, the trees grow to a large size in a few years.

The leaves of this tree are winged like those of the Ash, having commonly six or eight pair of pinnæ (or lobes) which are shorter and broader at their base than those of the Ash, where they adhere to the midrib by very short foot-stalks; these lobes are very smooth, having but one vein running through each, which is always on one side, so as to divide them unequally. We have no perfect account of the flower of this tree; those which are exhibited in Mr. Catesby's Natural History, were drawn from a withered imperfect fragment, which were the only remains of the flowers which could be found at the time when he was there; but the fruit he has delineated very exactly, as I have had opportunity of comparing it with some which have been brought to England. The entire fruit, before it opens, is of a brown colour; these fruit grow erect, upon foot-stalks, which closely adhere to the five-cornered column, running through the middle of the fruit, and to which the seeds are fastened, lying imbricatim like slates on a house, over each other; so that when the fruit is ripe, the outer cover divides at the bottom into five equal parts, and when these fall off, and the seeds are dispersed, the foot-stalk and the column remain some months after on the tree.

It is propagated by seeds, which may be easily procured from the Bahama Islands, from whence most of the good seeds which have come to England were brought; for most of these which have been sent from Jamaica, although brought in their pods, have not succeeded; whereas, those from the Bahama Islands, have grown as well as if they were immediately taken from the trees. The seeds should be sown in small pots filled with light sandy earth, and plunged into a hot-bed of tanners bark, giving them a gentle watering once a week: if the seeds are good, the plants will appear in five or six weeks; and when they are two inches high, a sufficient number of small pots should be filled with light earth, and plunged into the tan-bed a day or two, that the earth may be warmed before the plants are put into the pots; then the young plants should be shaken out of the pots, and carefully separated, so as not to tear their roots, and each planted in a single pot, being careful to shade them till they have taken fresh root; after which they must be treated in the same manner as other tender plants from the

the same climate, being careful not to give them much water, especially in winter; as also when they are shifted, to preserve the earth about their roots, otherwise they are very subject to perish; for in the country where they grow naturally, they say it is not possible to remove these trees so as to live; if the plants are properly managed, they will make considerable progress. I have some plants now in the Chelsea garden, more than twelve feet high, which are but of eight years growth from seeds.

As the wood of this tree is now so generally used in England, so it might surely be worthy of the care of the planters in America, many of whom are possessed of barren rocky lands, which at present produce no profit; but if the seeds of this tree were sown there, might turn out greatly to the advantage of their successors, though the present possessors should not live to enjoy the profit; but I fear there are few of the gentlemen in those islands, who extend their thoughts so far, as to make provision for the rising generation.

The third sort was discovered by the late Dr. Houstoun at Campeachy, from whence he sent the seeds to England, which succeeded in several gardens; when the doctor first observed these trees, they were destitute of leaves, but were loaded with ripe fruit; and on his second visit to the place, he found the trees in full verdure, but no appearance of flowers, so he was at a loss to know what genus it belonged to; but as the fruit of the trees agree exactly with those of the two former species, so I have ventured to join it to them.

These trees usually rise to the height of eighty feet, or upward, and divide into many large branches toward the top; garnished with leaves, somewhat resembling those of the Witch Hazel, but are broader at their base, and cut angular at their top; these are of an Ash-colour underneath, and are set on the branches without any order; the fruit of this tree is much larger than that of the Barbadoes Cedar, being broad at the base, and diminishing gradually to the top, where it terminates in a point, being upwards of two inches long; this has also a column, or woody core, running lengthways through the fruit, to which the winged seeds adhere as in the two former; but as both their fruit are smooth on the outside, this differs from them, in having five angles running from the base upward; at each angle the fruit, when ripe, separates, and exposes the winged seeds, which are dispersed by the winds.

We have no account of the wood of this tree, whether it is ever used in buildings, or other purposes, as there have been few persons of any curiosity in that country, the cutters of Logwood being the chief people who inhabit there, from whom there can be little known of the produce. The plants which have been raised from the seeds in England, have made great progress for the two first years, but afterward were but slow of growth; for, in six years more, they did not shoot so much as in the first year from the seed, when they grew more than three feet high. I made several trials to propagate the trees by cuttings and layers, but without success; so that by seeds, seems to be the only method of having them; these may be raised and managed in the same manner as the two foregoing sorts, and with them constantly kept in the bark-stove.

CEDAR of BERMUDAS. } See JUNIPERUS.
CEDAR of CAROLINA. }

CEDAR of JAMAICA. See THEOBROMA.

CEDAR of LIBANUS. See LARIX.

CEDAR of LYCIA. }
CEDAR of PHŒNICIA. } See JUNIPERUS.
CEDAR of VIRGINIA. }

CEIBA. See BOMBAX.

CELASTRUS. Lin. Gen. Plant. 392. Euonymoides. Isnard. Ac. R. Sc. 1716. The Staff-tree.

The CHARACTERS are,

*The flower hath a small one leaved empalement, cut into five unequal blunt parts. The flower hath five oval petals, which are equal, and spread open. It hath five stamina as long as the petals, terminated by small summits, and a small germen with a large receptacle, marked with ten deep channels, supporting a short style crowned with an obtuse trifid stigma. The germen afterward becomes an oval, blunt, three-cornered capsule, opening in three cells, each containing an oval smooth seed.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, from the flower having five stamina and one style.

The SPECIES are,

1. CELASTRUS (*Bullatus*) inermis, foliis ovatis integerrimis. Lin. Sp. Plant. 196 *Smooth Staff-tree with oval entire leaves.* Euonymus Virginianus, rotundifolius capsulis Coccineis eleganter bullatis. Pluk. Alm. 139.
2. CELASTRUS (*Scandens*) inermis, caule volubili foliis serrulatis. Lin. Sp. Plant. 285. *Smooth Staff-tree with a twining stalk, whose leaves are slightly sawed.* Euonymoides Canadensis scandens foliis serratis. Isnard. Ac. Reg. 1716.
3. CELASTRUS (*Pyracanthus*) spinis nudis, ramis teretibus, foliis acutis. Hort. Cliff. 72. *Staff-tree with naked spines, taper branches, and pointed leaves.* Lycium Æthiopicum pyracanthæ foliis. Hort. Amst. 1. p. 163.
4. CELASTRUS (*Buxifolius*) spinis foliosis, ramis angulatis, foliis obtusis. Hort. Cliff. 73. *Staff-tree with leaves on the spines, angular branches, and obtuse leaves.* Lycium Portoricense, Buxi foliis angustioribus. Pluk. Alm. 234. tab. 202. f. 3.
5. CELASTRUS (*Myrtifolius*) inermis, foliis ovatis serrulatis, floribus racemosis caule erecto. Hort. Cliff. 72. *Staff-tree without spines, oval sawed leaves, flowers in long bunches, and an erect stalk.* Myrtifolia arbor, foliis latis subrotundis, flore albo. Sloan. Hist. Jam. 2. p. 79. tab. 193.

The first sort grows naturally in Virginia, and many other parts of North America, where it rises to the height of eight or ten feet; but in England there are few of them much more than half that height. It generally puts out two or three stems from the root, which divide upward into several branches, covered with a brown bark, garnished with leaves near three inches long, and two broad, which are placed alternately on the branches; the flowers come out in loose spikes at the end of the branches; these are white, made up of five oval petals, with a germen in the center, attended by five stamina: when the flowers fall off, the germen swells to a three-cornered capsule, of a scarlet colour, set full of small protuberances; this opens in three cells, each containing a hard oval seed, covered with a thin red pulp. This shrub flowers in July, but rarely produces good seeds in England.

It is propagated here by layers, which will take root in one year; the young branches only are proper for this purpose, so that where there is not any of these near the ground, the main stalks should be drawn down, and fastened with pegs to prevent their rising, and the young shoots from them should be laid. The best time for doing this is in autumn, when they begin to cast their leaves, and by that time twelvemonth they will be sufficiently rooted, when they should be cut from the old plant, and planted in a nursery for two or three years to get strength; after which they must be removed to the places where they are to remain. This shrub grows naturally in moist places, so will not thrive well in a dry soil. It is very hardy, and bears the cold of our winters very well. It is also propagated by seeds, which are frequently brought from America; but as these rarely arrive here time enough to sow before the spring, so the plants never come up the first year; therefore the seeds may be sown either in pots, or in a bed of loamy earth, keeping them clean from weeds during the summer; and those in the pots should be placed in the shade till the autumn, when the pots should be either plunged into the ground in a warm situation, or placed

placed under a common frame, to prevent the froſt from penetrating through the ſide of the pots; and if the ſurface of thoſe which are plunged in the ground, and alſo the bed where the ſeeds are ſown are lightly covered with ſome old tan from a decayed hot-bed, it will ſecure the ſeeds from being hurt by ſevere froſts. In the ſpring the plants will come up, which muſt be kept clean from weeds, and, if the ſeaſon proves dry, they ſhould have water now and then, which will greatly forward their growth. If the plants make good progreſs the firſt ſummer, they may be tranſplanted into a nurſery in autumn, otherwiſe they ſhould remain in the ſeed-bed till the ſecond year, when they may be treated in the ſame manner as the layers.

The ſecond ſort ſends out ſeveral ligneous ſtalks from the root, which are flexible, and twiſt themſelves about whatever trees and ſhrubs grow near them, or when they are at a diſtance from ſuch ſupport, they twine about each other, and riſe to the height of twelve or fourteen feet; but when they faſten themſelves about trees they will grow much taller, but wherever this happens, their branches girt the trees ſo cloſely, as in a few years will deſtroy them. Theſe are garniſhed with leaves about three inches long, and near two broad, which are ſawed on their edges, and placed alternately on the branches; they are of a lively green above, and paler on their under ſide, having ſeveral tranſverſe nerves from the middle to the ſide. The flowers are produced in ſmall bunches toward the end of the branches, which are of an herbaceous colour, compoſed of five roundiſh petals; theſe are ſucceeded by roundiſh three-cornered capſules, which are red when ripe, ſpread open in three cells, diſcloſing the ſeeds in the ſame manner as our common Spindle-tree. This flowers about the beginning of June, and the ſeeds ripen in autumn. The ſeeds of this ſort generally ripen well in England, and the plants may be propagated from the ſeeds, or by layers, in the ſame manner as the former ſort; it delights in a ſtrong loamy ſoil, rather moiſt than dry, and will grow in woods among other trees and ſhrubs, where, when the fruit is ripe, they make a pretty appearance. It grows naturally all over North America, and is extremely hardy.

The third ſort is a native of Ethiopia, from whence the ſeeds were firſt brought to the gardens in Holland, where the plants were propagated, and have been ſince communicated to moſt of the curious gardens in Europe. This riſes with an irregular ſtalk about three or four feet high, ſending out ſeveral ſide branches, covered with brown bark, garniſhed with leaves about two inches long, and more than half an inch broad, ſome of which are pointed, and others are obtuſe; they are ſtiff, of a lucid green, and come out irregular from the branches; theſe continue green through the year. The flowers are produced from the ſides of the branches in looſe tufts, many of them ariſing from one point, ſtanding upon long footſtalks; they are of an herbaceous white colour, compoſed of five petals, which ſpread open, and five ſpreading ſtamina, which ſurround a ſwelling germen, ſupporting a tapering ſtyle, crowned by an obtuſe trifid ſtigma; the germen afterward becomes an oval fruit, of a fine red colour, which opens in three cells, containing one oblong hard ſeed, the other two cells being generally empty.

This plant is commonly propagated by cuttings in Europe, which is more expeditious than raiſing them from ſeeds, becauſe the ſeeds rarely come up the firſt year. The cuttings may be planted any time in ſummer; but thoſe which are planted early, will have more time to get ſtrength before winter. They ſhould be planted in ſmall pots, which will contain four cuttings in each; the earth of a kitchen garden, which is well cultivated, is as good as any for this purpoſe. The pots ſhould be then plunged into a moderate hot-bed, and ſhaded from the ſun every day, and gently refreſhed with water now and then; when they have taken root they muſt be gradually expoſed to the open air, and then placed in a ſheltered ſituation till they have obtained ſtrength, when they ſhould be ſeparated, and planted each in a ſmall pot filled with the ſame earth, then placed in the ſhade till they have taken freſh root; after which they may be placed with other exotic plants in a ſheltered ſituation till autumn, when they muſt be houſed with Myrtles, and other hardy green-houſe plants, and will require the ſame treatment.

This plant has been titled African Barberry by ſome ignorant perſons, I ſuppoſe from the reſemblance of its fruit to that of the Barberry.

The fourth ſort grows naturally at the Cape of Good Hope, from whence I received the ſeeds. This riſes with a ſlender ligneous ſtalk to the height of ten or twelve feet, covered with a light Aſh-coloured bark, and full of joints, which are armed with long ſpines, upon which grow many ſmall leaves; the branches are ſlender, and armed with the ſame ſpines at every joint, but the whole plant is ſo weak, as to require ſome ſupport, without which they would fall to the ground. The leaves come out in cluſters without any order, which are ſhaped ſomewhat like thoſe of the narrow-leaved Box-tree, but are longer, and of a looſe texture; the branches are angular, and when young their bark is whitiſh. As I have not ſeen the flowers of this ſhrub, I can give no farther deſcription of it.

This riſes very eaſily from ſeeds, and the plants make great progreſs; for I have raiſed them four feet high in two years from ſeeds, without any artificial heat; and ſome of the plants have lived thro' two winters againſt a ſouth-eaſt wall, but theſe have ſhed their leaves in winter, whereas thoſe which were removed into the green-houſe have retained their verdure through the year.

It may be propagated by cuttings, which ſhould be planted in the ſpring, and treated in the ſame manner as hath been directed for the former ſort; or if the young ſhoots are laid, they will take root in one year, and may then be tranſplanted either into pots, or againſt a good aſpected wall, where I find they will endure our ordinary winters without any protection; and if they are covered in ſevere froſts, they may be brought, when old, to live abroad without protection. Thoſe in pots will require a little ſhelter in winter, but ſhould not be tenderly treated, for that will cauſe them to have weak branches, nor will the leaves have ſo much verdure, as when they are expoſed to the open air in mild weather.

The fifth ſort grows naturally in Jamaica, and alſo in ſome of the other iſlands in the Weſt Indies, where it riſes to the height of eighteen or twenty feet, ſending out many ſide branches, garniſhed with leaves ſomewhat like thoſe of the broad-leaved Myrtle, which are ſlightly ſawed on their edges; the flowers come out from the ſide of the branches in long bunches; they are white, and compoſed of five petals, having five ſtamina placed oppoſite to them, and a germen in the center which is channelled; this afterward becomes a fruit, having five cells, each incloſing an oblong ſeed.

This plant is at preſent rare in England, for the ſeeds ſeldom grow the firſt year; therefore when the ſeeds arrive here, they ſhould be ſown in ſmall pots filled with light earth, and plunged into a tan-bed, where they ſhould remain till the following ſpring, when they ſhould be plunged into a freſh hot-bed of tanners bark; and if the pots are duly watered, the plants will appear in about a month after; when theſe are fit to remove, they ſhould be planted into ſeparate ſmall pots, and plunged again into the tan-bed, being careful to water and ſhade them till they have taken new root, after which they ſhould be treated in the ſame manner as other tender plants from the ſame countries.

CELERY or SALARY. See APIUM.

CELLS of plants [of Cellæ, *Lat.*] are thoſe partitions or hollow places in the huſks or pods of plants, in which the ſeed is contained.

CELOSIA. Lin. Gen. Plant. 255. Amaranthus. Tourn. Inst. R. H. 234. tab. 118. Amaranth.

The CHARACTERS are,

*The empalement is permanent, and composed of three dry coloured leaves. The flower hath five erect sharp-pointed petals, which are permanent, stiff, and shaped like a flower-cup. It hath a small nectarium joined to the border of the germen, to which adhere the five stamina, which are terminated by turning summits. The globular germen supports an upright style, which is as long as the stamina, crowned with a single stigma. The empalement afterward becomes a globular capsule with one cell opening horizontally, containing roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. CELOSIA (*Margaritacea*) foliis ovatis stipulis falcatis, pedunculis angulatis, spicis scariosis. Lin. Sp. Plant. 297. *Celosia with oval leaves, a faulchion-shaped stipula, and a rough spike.* Amaranthus spicâ albescente habitiore. Martyn. Cent. 1. p. 7.
2. CELOSIA (*Cristata*) foliis lanceolato-ovatis recurvis subundatis pedunculis angulatis, spicis oblongis cristatis. Lin. Sp. 297. *Celosia with oval spear-shaped leaves, angular foot-stalks, and oblong crested spikes of flowers.* Amaranthus cristatus. Camer. Epit. 792. *Crested Amaranth, commonly called Cockscomb.*
3. CELOSIA (*Paniculata*) foliis lanceolato-ovatis, paniculâ diffusâ filiformi. Flor. Virg. 144. *Celosia with oval spear-shaped leaves, and a slender diffused panicle.* Amaranthus paniculâ flavicante gracili holosericeâ. Sloan. Hist. 1. p. 142. tab. 90.
4. CELOSIA (*Coccinea*) foliis ovatis strictis inauriculatis, caule sulcato, spicis multiplicibus cristatis. Lin. Sp. 297. *Celosia with oval leaves, a furrowed stalk, and many crested spikes of flowers.* Amaranthus panicula speciosa cristata. C. B. P. 121.
5. CELOSIA (*Castrensis*) foliis lanceolato-ovatis lineatis acuminatissimis, stipulis falcatis, spicis cristatis. Lin. Sp. 297. *Celosia with oval, linear, spear-shaped, acute-pointed leaves, and crested spikes of flowers.* Amaranthus vulgaris. Rumph. Amb. 5. p. 236.
6. CELOSIA (*Lanata*) foliis lanceolatis tomentosis obtusis, spicis confertis, staminibus lanatis. Flor. Zeyl. 102. *Celosia with spear-shaped, obtuse, woolly leaves, and many spikes of flowers having downy stamina.*

The first sort here mentioned, grows naturally in America, from whence I have frequently received the seeds. This rises with an upright stalk about two feet high, garnished with oval leaves ending in points, of a pale colour; those on the lower part being four or five inches long, and one and a half broad in the middle, but they diminish gradually in their size upward. Toward the upper part of the stalk, there are a few side branches sent out which stand erect; each of which is terminated by a slender spike of flowers, and the principal stalk is terminated by one which is much larger; this is two or three inches long, and about as thick as a man's middle finger, the whole spike being of a silvery colour. But there is a variety of this with slender pyramidal spikes, intermixed with red toward the top, the seeds of which I received from Dr. Linnæus, by the above title; but I am inclinable to think it is different from that which was figured by Dr. Martyn in his Decades of rare plants, which I have cultivated many years in the Chelsea garden, and have never found it to vary. The spike of this is much thicker than that of Linnæus's, and of equal size the whole length; whereas his diminishes almost to a point at the top, and the colours of both are very different. This sort is annual like the other Amaranths, and requires the same culture.

The second sort is well known by its common appellation of Cockscomb, which was given to it from the form of its crested head of flowers resembling a Cockscomb; of this there are many varieties, which differ in their form, magnitude, and colours; but as they vary from seeds, they are not enumerated as distinct species. I have raised great varieties of these from seeds which came from China, and other countries, but have generally found them alter in a few years, notwithstanding great care has been taken in the saving of their seeds: the principal colours of their heads are red, purple, yellow, and white; but I have had some, whose heads have been variegated with two or three colours. I also raised some from seeds which I received from Persia, whose heads were divided like a plume of feathers, which were of a beautiful scarlet colour, but these in a few years degenerated: therefore I shall include all the different varieties of Cockscomb, under this general title.

The seeds of the third sort were sent me from Jamaica by the late Dr. Houstoun. This grows naturally in most of the Sugar Islands. It rises with a weak stalk near four feet high, garnished with oblong pointed leaves, which stand opposite at each joint. The flowers come out in loose panicles from the side of the stalks, and also at the end of the branches: these are divided into a great number of very slender spikes, which are of a pale yellow, shining with a gloss like silk. The plants of this perished in the autumn, without perfecting their seeds.

The fourth sort I received from China; this hath a furrowed stalk, which rises three or four feet high, garnished with oval leaves which are not eared at their base; the stalk is terminated by several spikes of flowers which are variously formed, some being crested, others are plumed like feathers, of a bright scarlet colour, so make a good appearance; but the seeds of this when carefully saved, are apt to degenerate.

The fifth sort is of humbler growth, the leaves are oval, spear-shaped, ending in very acute points; the branches proceed from the wings of the leaves, almost the length of the stalk, and are terminated by slender spikes of flowers of no great beauty, therefore the plant is preserved as a variety in the botanic gardens.

The sixth sort grows naturally in Ceylon; it rises with a very white woolly stalk from two to three feet high, garnished with obtuse, spear-shaped, woolly leaves; from the upper part of the stalk come out two or three slender side branches, which (as also the principal stalk) are terminated by woolly spikes of flowers: these flowers are so closely wrapped up in their woolly empalements, as to be scarce visible to the naked eye, so they make no appearance; but the extreme whiteness of the stalk, leaves, and spikes, make a pretty variety among other tender plants during their continuance.

This plant is tender; the seeds should be sown in the spring upon a hot-bed, and the plants should be treated in the same way as is directed for the Cockscombs; but when the plants are fully grown, they should be removed into an airy glass-case, where they may be screened from cold and wet, but have free air admitted to them in warm weather, otherwise they will not perfect their seeds in this country.

In order to have large fine Amaranths, great care should be taken in the choice of the seeds; for if they are not carefully collected, the whole expence and trouble of raising them will be lost. When you are provided with good seeds, they must be sown on a hot-bed (which should have been prepared a few days before, that the violent heat may be abated) about the beginning of March; and in about a fortnight's time (if the bed is in good temper) the plants will rise; but as they are tender when they first appear, they require great care for a few days till they get strength; first, in giving them a due proportion of air, to prevent their drawing up weak; and next to keep them from too great moisture, for a small share of moisture will cause their tender stems to rot: in sowing the seeds, there should be care taken not to put them too close, for when the plants come up in clusters, they frequently spoil each other for want of room to grow: in a fortnight or three

 weeks

weeks time the plants will be fit to remove, when you must prepare another hot-bed, covered with good rich light earth, about four inches thick; which should be made a few days, that it may have a proper temperature of heat; then raise up the young plants with your finger, so as not to break off the tender roots, and prick them into the new hot-bed about four inches distance every way, giving them a gentle watering to settle the earth to their roots: but in doing this, be very cautious not to bear the young plants down to the ground by hasty watering, which rarely rise again, or at least so as to recover their former strength in a long time, but very often rot in the stems, and die quite away.

After the plants are thus planted, they must be screened from the sun till they have taken fresh root; but as there is generally a great steam rising from the fermentation of the dung, which condenses to wet against the glasses, and this dropping upon the plants, very frequently destroys them; so the glasses should be frequently turned in the day-time, whenever the weather will permit; but if the weather happens to prove bad, that you cannot turn your glasses, it will be of great service to your plants, to wipe off all the moisture two or three times a day with a woollen cloth, to prevent its dropping upon the plants. When your plants are firmly rooted, and begin to grow, you must observe to give them air every day (more or less, as the weather is cold or hot) to prevent their drawing up too fast, which greatly weakens their stems.

In about a month or five weeks these plants will have grown so as to meet; therefore should have another hot-bed, which should be of a moderate temper, and covered with the same rich earth about six inches thick, in which they should be planted (observing to take them up with as much earth about their roots as possible) at seven or eight inches distance every way, giving them some water to settle the earth about their roots; but be very careful not to water them heavily, so as to bear down the plants, (as was before directed) and keep them shaded in the heat of the day, until they have taken fresh root; and be sure to refresh them often (but gently) with water, and give them air in proportion to the heat of the weather, covering the glasses with mats every night, lest the cold chill your beds, and stop the growth of the plants.

In the middle of May you must provide another hot-bed, which should be covered with a deep frame, that your plants may have room to grow: upon this hot-bed, you must set as many three-penny pots as can stand within the compass of the frame; these pots must be filled with good rich earth, and the cavities between each pot filled up with any common earth, to prevent the heat of the bed from evaporating, and filling the frame with noxious steams; then, with a trowel, or some such instrument, take up your plants (from the former hot-bed) with as much earth as possible to the roots, and place each single plant in the middle of one of the pots, filling the pot up with the earth before described, and settle it close to the root of the plant with your hands; water them gently, as before, and shade them in the heat of the day from the violence of the sun, by covering the glasses with mats; refresh them often with water, and give them a good quantity of air in the day-time.

In about three weeks more, these plants will have grown to a considerable size and strength, so that you must now raise the glasses very much in the day-time; and when the air is soft and the sun is clouded, draw off the glasses, and expose them to the open air, and repeat this as often as the weather will permit; which will harden them by degrees, to be removed abroad into the places where they are to remain the whole season: but it is not advisable to set these plants out until a week in July, observing to do it when the air is perfectly soft, and if possible, in a gentle shower of rain.

Let them at first be set near the shelter of a hedge for two or three days, where they may be screened from the violence of the sun, and strong winds, to which they must be inured by degrees: these plants, when grown to a good stature, perspire very freely, and must be every day refreshed with water, if the weather proves hot and dry; otherwise they will stunt, and never produce their plumes so fine as they would do if taken care of.

This is the proper management, in order to have fine Amaranths; which, if rightly followed, and the kinds are good, in a favourable season, will produce wonderful large fine heads, and are the greatest ornament to a good garden for upwards of two months: by this method, I have had plants five or six feet high, with crests near a foot in breadth; and I am persuaded, if the kind is good, (and there is no want of dung, or conveniencies) in a kindly season, they will grow much larger.

By the middle or latter end of September, the Amaranths will have perfected their seeds, so that you must make choice of the largest, most beautiful, and least branching plants of each kind for seed; which you should remove under shelter, (especially if the weather proves wet, or the nights frosty) that the seeds may be perfectly ripened; in the choice thereof, be sure never to take any seeds from side branches, nor from the neck of the plume, but such only as are produced in the middle thereof, which in many plants, perhaps, may be but a small quantity; but I do assure you, it is those only you can depend upon, to have your kinds good the succeeding year.

CELSIA. Lin. Gen. Plant. 675. The name was given to this plant in honour of Dr. Olaus Celsius, professor of philosophy and theology in the university of Upsal, in Sweden, by Dr. Linnæus. We have no English name for it.

The CHARACTERS are,

*It hath an obtuse permanent empalement, which is as long as the petal, divided at the top into five parts. The flower is of one leaf, with a very short tube, spread open above, and cut into five unequal parts; the two upper being small, and the under larger. It hath four hairy stamina, which incline toward the upper segments of the petal, two of which are longer than the petal, and two are of the same length, terminated by small roundish summits. In the center is situated a roundish germen, supporting a slender style, crowned by an obtuse stigma. The germen afterward becomes a roundish capsule compressed at the top, sitting upon the empalement, having two cells which are filled with small angular seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, the flower having two long and two short stamina, and the seeds being included in a capsule.

There is but one SPECIES of this genus at present known, which is,

CELSIA (*Orientalis*) foliis duplicato-pinnatis. Hort. Cliff. 321. *Celsia with double winged leaves.* Verbascum orientale Sophiæ folio. Tourn. Cor. 8. *Eastern Mullein with a Flixweed leaf.*

This plant grows naturally in Armenia, from whence Dr. Tournefort sent the seeds to the royal garden at Paris, where they succeeded, and have been since communicated to most parts of Europe. In its natural place of growth, this is an annual; but in England it will rarely ripen its seeds, unless the plants come up in the autumn and live through the winter.

It sends out many oblong leaves, which are finely divided almost to the mid-rib on both sides; these lie flat on the surface of the ground, and from the center arises a roundish herbaceous stalk near two feet high, garnished the whole length with leaves of the same shape, but diminishing in their size gradually to the top: these are placed alternately, and at the foot-stalk of each come out the flowers, more than half the length of the stalk, which are of an iron colour on their outside, but pale yellow within, spread-

ing open like thofe of the common Mullein, but are not fo regular; the fhort tube being turned downward, and the lower fegments being larger than the upper, and the ftamina being unequal, have occafioned Linnæus to remove it to his ringent flowers. The feed-veffel is round, compreffed, and hath two cells filled with fmall feeds. It flowers in June, and the feeds ripen in September: if the feeds of this plant are fown upon a warm dry border as foon as they are ripe, the plants will often come up and live through the winter, provided the foil is poor; for in rich ground they are apt to grow rank, and then they are generally deftroyed by the early frofts, or will rot with much wet; but if the plants fhould not rife the fame autumn, there will be little hazard of their growing the following fpring. When the plants come up, they will require no other care but to keep them clean from weeds, and thin them if they are too clofe; for they do not bear removing well, fo fhould be fown where they are intended to remain.

I have fometimes, when the feafons have proved warm, had ripe feeds from plants fown in the fpring; but this cannot be depended on, therefore it is much better to fow the feeds in autumn.

CELTIS. Tourn. Inft. R. H. 612. tab. 383. Lin. Gen. Plant. 1012. The Lote or Nettle-tree, in French Micocoulier.

The CHARACTERS are,

*It hath male and hermaphrodite flowers on the fame tree: the hermaphrodite flowers are fingle, and fituated above the male. The empalement of the hermaphrodite flower is divided into five parts, in which there are no petals, but five fhort ftamina terminated by thick quadrangular fummits, which have four furrows. In the center is fituated an oval germen, fupporting two reflexed ftyles crowned by a fingle ftigma. The germen afterward becomes a round berry with one cell, inclofing a roundifh nut. The male flowers have their empalements divided into fix parts, and have no germen or ftyle, but in other parts like the hermaphrodite.*

This genus of plants is ranged in the firft fection of Linnæus's twenty-third clafs, intitled Polygamia Monœcia, from the fame tree having male and hermaphrodite flowers.

The SPECIES are,

1. CELTIS (*Auftralis*) foliis lanceolatis acuminatis, ferratis, nervofis. *Nettle-tree with fpear-fhaped pointed leaves, which are veined and fawed on their edges.* Celtis fructu nigricante. Tourn. Inft. 612. *Lote-tree with a black fruit.*
2. CELTIS (*Occidentalis*) foliis obliquè-ovatis, ferratis, acuminatis. Lin. Sp. Plant. 1044. *Nettle-tree with oblique, oval, pointed leaves, which are fawed on their edges.* Celtis fructu obfcurè purpurafcente. Inft. R. H. 612. *Lote-tree with a dark purple fruit.*
3. CELTIS (*Orientalis*) foliis ovato-cordatis, denticulatis, petiolis brevibus. *Nettle-tree with oval heart-fhaped leaves, flightly indented, and fhort foot-ftalks.* Celtis orientalis minor, foliis minoribus & craffioribus, fructu flavo. Inft. Cor. 42. *Smaller Eaftern Lote-tree with fmaller and thicker leaves, and a yellow fruit.*
4. CELTIS (*Americana*) foliis oblongo-ovatis, obtufis, nervofis, fupernè glabris, fubtus aureis. *Nettle-tree with oblong, obtufe, nervous leaves, which are fmooth on their upper furface, and of a gold colour beneath.* Celtis foliis citrii fubtus aureo, fructu rubro. Plum. Cat. 18. *Lote-tree with Citron leaves, of a gold colour on their under fide, and a red fruit.*

The firft fort grows naturally in the fouth of France, in Spain and Italy, where it is one of the largeft trees of thofe countries: yet this is not fo plenty in England as the fecond, nor do I remember to have feen but two large trees of this fort in the Englifh gardens; one of which was formerly growing in the Bifhop of London's garden at Fulham, but was cut down fome years paft, with many other curious exotic trees, which were there growing in great perfection: the other was in the garden of Dr. Uvedale at Enfield, which was there ftanding a few years ago, when I paid a vifit to that place, which had frequently produced fruit, but was never propagated in this country; nor were there any young plants of this kind in the garden, till about fourteen years ago, when I procured a good quantity of the fruit from Italy, which I communicated to feveral of my friends.

This tree rifes with an upright ftem to the height of forty or fifty feet, fending out many flender branches upward, which have a fmooth dark coloured bark, with fome fpots of gray; thefe are garnifhed with leaves placed alternately, which are near four inches long, and about two broad in the middle, ending in long fharp points, and deeply fawed on their edges, having feveral tranfverfe veins which are prominent on their under fide. The flowers come out from the wings of the leaves all along the branches; they have a male and an hermaphrodite flower generally at the fame place, the male flowers being fituated above the others: thefe have no petals but a green herbaceous empalement, fo make no figure; they come out in the fpring, at the fame time when the leaves make their firft appearance, and generally decay before the leaves have grown to half their magnitude. After the flowers are paft, the germen of the hermaphrodite flowers become a round berry about the fize of a large Pea, which, when ripe, is black.

The fecond fort grows naturally in North America; it delights in moift rich foil, in which it becomes a very large tree. This rifes with a ftrait ftem, which in young trees is fmooth and of a dark colour, but as they advance, it becomes rougher and of a lighter green. The branches are much diffufed on every fide, and are garnifhed with oblique oval leaves, ending in points, fawed on their edges; they are placed alternately on the branches, with pretty long foot-ftalks. The flowers come out oppofite to the leaves, upon pretty long foot-ftalks; the male flowers ftanding above the hermaphrodite as in the other fpecies; after thefe decay, the hermaphrodite flowers are fucceeded by roundifh berries, which are fmaller than thofe of the firft fort, and when ripe, are of a dark purple colour. This tree flowers in May, and the feeds ripen in October. Of this fort there are feveral pretty large trees in the Englifh gardens, fome of which produce great quantities of fruit annually, which in favourable feafons come to maturity, fo that from thefe feeds there have been plants raifed; and there are few years, in which there is not fruit of this fort fent from America, whereby it is now become pretty common in the Englifh nurferies.

This tree is late in coming out in the fpring, but in recompenfe for that, it continues as long in beauty in the autumn, for it is the lateft in fading of any of the deciduous trees; nor do the leaves alter their colour long before they fall, but continue in full verdure till within a few days of their dropping off; and, fo foon as they begin to fall, the trees will in a few days be quite deftitute of leaves, fo that the litter which their falling leaves occafion, may be fooner cleared away, than that of any other deciduous tree. There is little beauty in the flowers or fruit of this tree; but, as the branches are well clothed with leaves, which are of a fine green colour, the trees, when mixed with others in wilderneffes, make a pleafing variety during the fummer feafon. The wood of this tree being tough and pliable, is efteemed by coachmakers for the frames of their carriages.

The third fort was difcovered by Dr. Tournefort in Armenia, from whence he fent the fruit to the royal garden at Paris, where they fucceeded, and the trees, which were there raifed, have produced fruit for feveral years, fo that moft of the curious gardens in Europe have been furnifhed with it from thence.

It rifes with a ftem about ten or twelve feet high, dividing into many branches, which fpread horizontally on every fide, having a fmooth greenifh bark, garnifhed with leaves about an inch and a half long, and near an inch broad, inclining to a heart-fhape,

but are oblique, one of the ears of the base being smaller and lower than the other; they are of a thicker texture than those of the common sort, and of a paler green, placed alternate on the branches, and have short foot-stalks. The flowers come out from the foot-stalks of the leaves, in the same manner as the former, and are succeeded by oval yellow berries, which, when fully ripe, turn of a darker colour. The wood of this tree is very white.

These trees are all propagated by seeds, which should be sown soon after they are ripe, when they can be procured at that season, for these frequently come up the following spring; whereas, those which are sown in the spring, will not come up till a twelvemonth after: therefore it is the best way to sow them in pots or tubs, that they may be easily removed, for those which are sown in the spring should be placed in a shady situation in summer, and constantly kept clean from weeds; but in autumn they should be placed in a warm situation, plunging the pots into the ground; and if they are covered over with a little tan from a decayed hot-bed, it will prevent the frost from penetrating the earth to injure the seeds; and if these pots are placed on a gentle hot-bed in the spring, it will greatly forward the vegetation of the seeds, whereby the plants will have more time to get strength before the winter: but when the plants appear above ground they must have a large share of air admitted to them, otherwise they will draw up weak; and as soon as the weather is warm, they must be exposed to the open air, and in summer they must be constantly kept clean from weeds; if the season proves dry, they will require water two or three times a week. In autumn it will be proper to remove the pots, and place them under a hot-bed frame, to shelter them in winter from severe frost; or where there is not that conveniency, the pots should be plunged into the ground near a wall or hedge; and as the plants, when young, are full of sap, and tender, the early frosts in autumn frequently kill the upper part of the shoots; therefore the plants should be either covered with mats, or a little straw or Pease-haulm laid over them to protect them.

In the following spring the plants should be taken out of the seed-pots, and planted in the full ground: this should be done about the middle or latter end of March, when the danger of the frost is over; therefore a bed or two should be prepared (according to the number of plants raised) in a sheltered situation, and, if possible, in a gentle loamy soil. The ground must be well trenched, and cleared from the roots of bad weeds, and when levelled, should be marked out in lines at one foot distance; then the plants should be carefully turned out of the pots and separated, so as not to tear their roots, and planted in the lines at six inches asunder, pressing the earth down close to the roots. If the ground is very dry when they are planted, and there is no appearance of rain soon, it will be proper to water the beds, to settle the ground to the roots of the plants; and after this, if the surface of the ground is covered with some old tan or rotten dung, it will keep it moist, and prevent the drying winds from penetrating to the roots of the plants.

The following summer, the necessary care must be to keep them constantly clean from weeds; but after the plants are pretty well established in the ground, they will not require any water, especially toward the latter end of summer, for that will occasion their late growth, whereby they will be in great danger of suffering by the autumn frosts; for the more any of these young trees are stopped in their growth by drought towards autumn, the firmer will be their texture, so better able to bear the cold.

The plants may remain in these nursery-beds two years, by which time they will have obtained sufficient strength to be transplanted where they are designed to remain for good, because these plants extend their roots wide every way; so that if they stand long in the nursery, their roots will be cut in removing, which will be a great prejudice to their future growth.

These sorts are hardy enough to thrive in the open air in England, after they are become strong; but for the two first winters after they come up from seeds, they require a little protection, especially the third sort, which is tenderer than either of the former. The young plants of this sort frequently have variegated leaves, but those are more impatient of cold than the plain leaved.

The fourth sort was first discovered by father Plumier, in the French islands of America; and it was found growing in Jamaica, by Dr. Houstoun, who sent the seeds to England. This rises with a strait trunk near twenty feet high, covered with a gray bark, divided into many branches upward, garnished with leaves near four inches long, and two and a half broad, rounded at their extremity, of a thick texture, very smooth on their upper surface, and on their under side are of a lucid gold colour, placed alternately on the branches. The fruit is round and red, but the flowers I have not seen.

The seeds of this sort rarely come up the first year, so they may be sowed in pots, and plunged into the tan-bed in the stove, where they should remain till the plants come up. These plants must be constantly kept in the bark-stove, and treated in the same manner as other tender exotics.

CENTAUREA. Lin. Gen. Plant. 880. Centaurium majus. Tourn. Inst. R. H. 449. tab. 256. Jacea. Tourn. 443. Cyanus. Tourn. 445. Greater Centaury, Knapweed, Blue Blottle, &c.

The Characters are,

*It hath a compound flower, whose disk is composed of many hermaphrodite florets, and the borders or rays of female florets, which are larger and looser; these are included in a common, roundish, scaly empalement; the hermaphrodite florets have narrow tubes, swelling at the top, and cut into five parts; these have five short hairy stamina, terminated by cylindrical summits: the germen is situated under the petal, supporting a slender style, crowned with an obtuse stigma. The germen afterward becomes a single seed shut up in the empalement. The female florets have a slender tube, but expands above, where it is enlarged, and cut into five unequal parts; these are barren.*

This genus of plants is ranged in the third section of Linnæus's nineteenth class, intitled Syngenesia Polygamia Frustanea; the flowers of this section have their disk and middle composed of hermaphrodite florets, which are fruitful, and their borders of female abortive florets.

The Species are,

1. Centaurea (*Alpina*) calycibus inermibus, squamis ovatis obtusis, foliis pinnatis glabris integerrimis impari serrato. Hort. Cliff. 421. *Centaury with an empalement without spines, oval obtuse scales, and smooth winged leaves, which are entire.* Centaurium alpinum luteum. C. B. P. 117. *Yellow Alpine Centaury.*
2. Centaurea (*Centaurium*) calycibus inermibus, squamis ovatis, foliis pinnatis, foliolis serratis decurrentibus. Hort. Cliff. 421. *Centaury with an empalement without spines, oval scales, and winged leaves, whose lobes are sawed, and run along the midrib.* Centaurium majus, folio in lacinias plures diviso. C. B. P. 117. *Greater Centaury with a leaf divided into many parts.*
3. Centaurea (*Glastifolia*) calycibus scariosis foliis indivisis integerrimis decurrentibus. Hort. Cliff. 421. *Centaury with a scaly empalement, and undivided entire leaves running along the stalks.* Centaurium majus orientale erectum, glasti folio, flore luteo. Tourn. Cor. 32. Com. Rar. Plant. 39. *Upright, eastern, greater Centaury, with a Woad leaf and a yellow flower.*
4. Centaurea (*Stæbe*) calycibus ciliatis oblongis, foliis pinnatifidis linearibus integerrimis. Prod. Leyd. 140. *Centaury with oblong hairy empalements, and winged pointed leaves, which are very narrow and entire.* Stæbe incana, cyano similis tenuifolia. C. B. P. *Hoary Stæbe with the appearance of Blue Bottle, and a narrow leaf.*

5. Centaurea (*Conifera*) calycibus ſcarioſis, foliis tomentoſis, radicalibus lanceolatis, caulinis pinnatifidis caule ſimplici. Prod. Leyd. 142. *Centaury with a ſcaly empalement, woolly leaves, thoſe near the root being ſpear-ſhaped, thoſe on the ſtalk pointed, and a ſingle ſtalk.* Centaureum majus incanum, humile, capite pini. Tourn. Inſt. R. H. 469. *Dwarf, hoary, greater Centaury, with a head like a Pine cone.*

6. Centaurea (*Montana*) calycibus ſerratis, foliis lanceolatis decurrentibus, caule ſimpliciſſimo. Hort. Cliff. 422. *Centaury with ſawed empalements, ſpear-ſhaped running leaves, and a ſingle ſtalk.* Cyanus montanus latifolius. ſc. Verbaſculum Cyanoides. C. B. P. 273. *Greater Mountain Blue Bottle with broad leaves.*

7. Centaurea (*Anguſtifolia*) calycibus ſerratis, foliis lineari-lanceolatis decurrentibus, caule ſimplici. *Centaury with ſawed empalements, very narrow, ſpear-ſhaped, running leaves, and a ſingle foot-ſtalk.* Cyanus anguſtiore folio & longiore Belgicus. H. R. Par. *Narrower and longer leaved Belgick Blue Bottle.*

8. Centaurea (*Moſchata*) calycibus inermibus, ſubrotundis glabris, ſquamis ovatis, foliis lyrato-dentatis. Hort. Cliff. 421. *Centaury with unarmed, roundiſh, ſmooth empalements, oval ſcales, and ſinuated leaves.* Cyanus floridus odoratus, Turcicus ſive orientalis major. Park. Theat. 421. *Sweet oriental Cyanus, commonly called Sweet Sultan.*

9. Centaurea (*Amberboi*) calycibus inermibus, ſubrotundis, glabris, ſquamis ovatis obtuſis, foliis laciniatis ſerratis. *Centaury with roundiſh, ſmooth, unarmed empalements, oval obtuſe ſcales, and cut leaves, which are ſawed on their edges.* Cyanus orientalis flore luteo fiſtuloſo. Ac. R. Par. 75. *Eaſtern Cyanus with a yellow fiſtular flower, commonly called yellow Sweet Sultan.*

10. Centaurea (*Cyanus*) calycibus ſerratis, foliis linearibus integerrimis, infimis dentatis. Hort. Cliff. 422. *Centaury with ſawed empalements, very narrow entire leaves indented below.* Cyanus ſegetum. C. B. P. 273. *Corn Blue Bottle.*

11. Centaurea (*Lippii*) calycibus inermibus, ſquamis mucronatis, foliis pinnatifidis obtuſis decurrentibus. Lin. Sp. Plant. 910. *Centaury with unarmed empalements, having pointed ſcales, and winged pointed leaves, which are obtuſe, running along the ſtalk.* Cyanus Ægypticus flore parvo purpureo, caule alato. D. Lipp. *Egyptian Cyanus with a ſmall purple flower, and a winged ſtalk.*

12. Centaurea (*Cineraria*) calycibus ciliatis terminali-ſeſſilibus, foliis tomentoſis pinnatifidis, lobis acutis. Hort. Cliff. 422. *Centaury with hairy empalements cloſely terminating the ſtalks, woolly leaves with winged points, and the ſegments very narrow.* Jacea montana candidiſſima, Stæbes foliis. C. B. P. 273. *White Mountain Knapweed with a Stæbe leaf.*

13. Centaurea (*Raguſina*) calycibus ciliatis, foliis tomentoſis pinnatifidis, foliolis obtuſis ovatis integerrimis exterioribus majoribus. Hort. Cliff. 422. *Centaury with hairy empalements, woolly leaves with winged points, the ſmall leaves oval and obtuſe, the outer larger.* Jacea arborea argentea Raguſina. Zan. Hiſt. 107. *Silvery-tree Knapweed of Raguſa.*

14. Centaurea (*Napifolia*) calycibus palmato-ſpinoſis, foliis decurrentibus radicalibus lyratis. Prod. Leyd. 141. *Centaury with palmated ſpinous empalements, and ſinuated prickly leaves running along the ſtalks.* Jacea cyanoides altera, alato caule. Herm. Par. 189. *Another Knapweed like Cyanus, with a winged ſtalk.*

15. Centaurea (*Rhapontica*) calycibus ſcarioſis, foliis ovato-oblongis denticulatis integris petiolatis, ſubtus tomentoſis. Hort. Cliff. 421. *Centaury with ſcaly empalements, oval, oblong, indented, entire leaves, having foot-ſtalks, woolly underneath.* Centaurium majus, folio helenii incano. Tourn. Inſt. 449. *Greater Centaury with a white Elecampane leaf.*

16. Centaurea (*Peregrina*) calycibus ſetaceo-ſpinoſis, foliis lanceolatis petiolatis, infernè dentatis. Hort. Cliff. 423. *Centaury with briſtly prickly empalements, ſpear-ſhaped leaves, with foot-ſtalks indented beneath.* Centaurium majus folio molli acuto laciniato, flore aureo magno, calyce ſpinoſo. Boerh. Ind. alt. 1. p. 144. *Greater Centaury with a ſoft, pointed, cut leaf, and a large golden flower, with a prickly empalement.*

17. Centaurea (*Orientalis*) calycibus ſquamato-ciliatis, foliis pinnatifidis, pinnis lanceolatis. Lin. Sp. Plant. 913. *Centaury with hairy ſcales to the empalement, wing-pointed leaves, whoſe lobes are ſpear-ſhaped.* Cyanus foliis radicalibus partim integris, partim pinnatis, bracteâ calycis ovali, flore ſulphureo. Hall. Act. Phil. 1745.

18. Centaurea (*Argentea*) calycibus ſerratis, foliis tomentoſis, radicalibus pinnatis, foliolis uniauritis. Lin. Sp. 1290. *Centaury with ſawed empalements, woolly leaves, thoſe near the root winged, and the lobes eared.* Jacea Cretica laciniata argentea, flore parvo flaveſcente. Tourn. Cor. 31.

19. Centaurea (*Sempervirens*) calycibus ciliatis, foliis lanceolatis ſerratis, inferioribus haſtatis. Lin. Sp. 1291. *Centaury with a hairy empalement, ſpear-ſhaped ſawed leaves, and thoſe near the root halbert-ſhaped.* Jacea Luſitanica ſempervirens.

20. Centaurea (*Splendens*) calycibus ſcarioſis obtuſis, foliis radicalibus pinnatifidis, caulinis pinnatis dentibus lanceolatis. Prod. Leyd. 142. *Centaury with a rough obtuſe empalement, the radical leaves wing-pointed, and thoſe on the ſtalk winged, ſpear-ſhaped, and indented.* Jacea caliculis argenteis major. Inſt. R. H. 444.

21. Centaurea (*Romana*) calycibus palmato-ſpinoſis, foliis decurrentibus inermibus, radicalibus pinnatifidis, impari maximo. Hort. Cliff. 423. *Centaury with a palmated ſpiny empalement, ſmooth running leaves, thoſe near the root wing-pointed, and a large terminating lobe.* Jacea ſpinoſa Cretica. Zan. Hiſt. 141.

22. Centaurea (*Sphærocephala*) calycibus palmato-ſpinoſis, foliis ovato-lanceolatis petiolatis dentatis. Hort. Cliff. 423. *Centaury with a palmated prickly empalement, and oval, ſpear-ſhaped, indented leaves, having foot-ſtalks.* Jacea ſphærocephala ſpinoſa Tingitana. H. L. 332.

23. Centaurea (*Eriophora*) calycibus duplicato-ſpinoſis lanatis, foliis ſemidecurrentibus integris ſinuatiſque caule prolifero. Hort. Upſal. 272. *Centaury whoſe empalement is downy and doubly armed with ſpines, running leaves, ſome entire, others ſinuated, and a childing ſtalk.*

24. Centaurea (*Benedicta*) calycibus duplicato-ſpinoſis lanatis involucratis, foliis ſemidecurrentibus denticulato-ſpinoſis. Lin. Sp. 1296. *Centaury whoſe empalement is downy and doubly armed with ſpines, running leaves with indentures, terminating in ſpines.* Carduus Benedictus. Camer. Epit. 562. *Bleſſed Thiſtle.*

There are many other ſpecies of this genus, which are preſerved in botanic gardens for the ſake of variety; ſome of which grow naturally in England, and are often troubleſome weeds in the fields, ſo do not deſerve a place in gardens; therefore I choſe not to trouble the reader with mentioning their titles, but have here ſelected thoſe ſpecies which have ſome beauty to recommend them.

The firſt ſort grows naturally upon the Alps. This hath a perennial root, which ſtrikes deep into the ground, ſending out a great number of long, winged, ſmooth leaves, of a glaucous colour; the ſtalks riſe near four feet high, and divide upward into many branches, garniſhed with ſmall leaves of the ſame form as the lower; each of theſe ſtalks is terminated by a ſingle head of yellow flowers, compoſed of many florets; thoſe which occupy the diſk are hermaphrodite, but thoſe of the ray are female. This flowers in June and July, and, in dry ſeaſons, will perfect their ſeeds in autumn. It may be propagated either by ſeeds, or by parting their roots in the autumn, being careful not to divide the roots too ſmall. The ſeeds ſhould be ſown in the ſpring on a bed of light earth; and when the plants are fit to remove, they ſhould be tranſplanted into a bed of freſh earth ſix inches aſunder, in which place they ſhould remain till autumn, when they ſhould be planted where they are deſigned to remain.

The ſecond ſort ſtands in the liſt of medicinal plants of the college, but is very rarely uſed; the root is

reckoned to be binding, and good for all kinds of fluxes, and of great uſe to heal wounds. This grows naturally on the mountains of Italy and Spain; it hath a ſtrong perennial root like the former ſort, from which come out a great number of long winged leaves, which ſpread wide on every ſide, of a lucid green, and ſawed on their edges; the flower-ſtalks are ſlender, but very ſtiff, and divide upward into many ſmaller foot-ſtalks; theſe, together with the other ſtalks, riſe five or ſix feet high, having at each joint one ſmall winged leaf of the ſame form with the other: each of theſe foot-ſtalks is terminated by a ſingle head of purpliſh flowers, which are conſiderably longer than the empalement. This ſort flowers in July, and in very warm dry ſeaſons will produce ripe ſeeds in England. It may be propagated by parting of the roots in the ſame manner as the former ſort, and the plants muſt be treated in the ſame way, but ſhould have more room to grow, therefore it is not proper for ſmall gardens; but in large open borders, or to intermix in open quarters with other tall growing plants, this will make a variety.

The third ſort was diſcovered by Dr. Tournefort in the Levant, who ſent the ſeeds to the royal garden at Paris, and from thence it hath ſince been communicated to moſt of the curious gardens in Europe. This hath a perennial root, which ſtrikes deep into the ground, from which ſprings up a great tuft of long entire leaves, ſhaped like thoſe of Woad, growing upright, with many upright ſtalks, which grow near five feet high, garniſhed with leaves coming out ſingle at each joint, of the ſame ſhape as the under, but are leſs, and have a border or wing running along the ſtalk. The upper part of the ſtalk divides into two or three ſmaller, each of which is terminated by a ſingle head of yellow flowers, included in a ſilvery ſcaly empalement. This flowers in July, but rarely produces good ſeeds in England. It may be propagated by parting the roots in the ſame manner as the former, and the plants may be treated in the ſame way, being equally hardy; and as this doth not ſpread ſo much as the laſt, it may be allowed a place in ſmaller gardens.

The fourth ſort grows naturally in Auſtria. This hath a perennial root as the former, from which come out many winged leaves, which are hoary, the ſegments narrow and entire; the ſtalks riſe near three feet high, dividing into ſeveral branches, which have a ſingle winged leaf at each joint, of the ſame ſhape with the other; at the end of each ſtalk is one head of purple flowers, incloſed in an oblong ſcaly empalement, each ſcale being bordered with ſmall hairs like an eye-brow. The flowers appear in June, and the ſeeds ripen in Auguſt. This is propagated by ſeeds, which may be ſown in a bed of common earth, in a nurſery; and when the plants come up they muſt be thinned, and kept clean from weeds, and the following autumn the plants may be tranſplanted where they are deſigned to remain; after which they will require no further care. Two or three of theſe plants may be allowed a place in gardens where there is room, for the ſake of variety.

The fifth ſort grows naturally in the ſouth of France, and in Italy: I received the ſeeds of this from Verona. It hath a perennial root, which doth not divide and ſpread as the former, but grows ſingle, ſending out in the ſpring ſeveral entire ſpear-ſhaped leaves, and afterward a ſingle ſtalk, more than a foot high, garniſhed at each joint with one divided hoary leaf; and at the top comes out a ſingle, large, ſcaly head, ſhaped like a cone of the Pine-tree, very taper at the top, where it cloſely ſurrounds the florets, whoſe tops juſt peep out of the empalement: they are of a bright purple colour, and appear in June, but are not ſucceeded by ſeeds in England, ſo cannot be propagated unleſs the ſeeds are procured from abroad. Theſe ſeeds may be ſown, and the plants afterward treated in the ſame manner as the laſt.

The ſixth ſort is the common perennial Blue Bottle, which by ſome is titled Batchelors Button. This is ſo well known as to need no deſcription; the roots of this ſort creep under ground to a great diſtance, whereby the plant propagates too faſt, and often becomes troubleſome in gardens. It flowers in May and June, and will grow in any ſoil and ſituation.

The ſeventh ſort differs from the eighth, in having much longer and narrower leaves, which are not ſo white, the heads of flowers are alſo ſmaller; but whether this is only a variety from the other, I cannot determine, having never raiſed either from ſeeds; for theſe plants ſpread very much by their creeping roots, which renders them barren, as is frequently the caſe with many other creeping rooted plants, few of which produce ſeeds: however, this plant has always retained its difference from the year 1727, when I firſt brought it to England; and as it propagates ſo faſt, it is now become almoſt as plenty in the gardens, as the common broad leaved ſort. This is equally hardy, and may be planted in any ſoil or ſituation, where many other ſorts will not thrive, and during its continuance in flower will make a variety in the garden.

The eighth ſort is annual, ſo is only propagated by ſeeds. This has been many years propagated in the Engliſh gardens, under the title of Sultan Flower, or Sweet Sultan. It was brought from the Levant, where it grows naturally in arable land among the corn. This ſends up a round channelled ſtalk near three feet high, which divides into many branches, garniſhed with jagged leaves, of a pale green, ſmooth, and ſtand cloſe to the branches; from the ſide of the branches come out long naked foot-ſtalks, each ſuſtaining a ſingle head of flowers ſhaped like thoſe of the other ſpecies, which have a very ſtrong odour, ſo as to be offenſive to many people, but to others is very grateful. The empalement of theſe is ſcaly, round, and without ſpines; the flowers are in ſome purple, and others white, and likewiſe a fleſh colour between them hath come from the ſame ſeeds. There is alſo a variety of this with fiſtular flowers, and another with fringed flowers, commonly called Amberboi or Emberboi: but theſe have degenerated to the common ſort in a few years, although I have ſaved the ſeeds with great care, ſo I ſuppoſe they are only varieties. Theſe ſeeds are commonly ſown upon a hot-bed in the ſpring, to bring the plants forward, and in May they are tranſplanted into the borders of the flower-garden; but if the ſeeds are ſown in a warm border in autumn, they will live through the winter; and theſe plants may be removed in the ſpring into the flower-garden, which will be ſtronger, and come earlier to flower than thoſe which are raiſed in the ſpring. The ſeeds may alſo be ſown in the ſpring on a common warm border, where the plants will riſe very well, but theſe will be later in flowering than either of the other. The autumnal plants will begin to flower the middle of June, and will continue flowering till September; and the ſpring plants will flower a month later, and continue till the froſt ſtops them. Their ſeeds ripen in autumn.

The ninth ſort has been ſuppoſed to be only a variety of the former, which is a great miſtake; for although there is a great ſimilitude in their appearance, yet they are ſpecifically different, ſo never alter. I have cultivated this ſort upward of forty years, and have never obſerved the leaſt variation in it. This is much tenderer than the former, ſo the ſeeds muſt be ſown upon a hot-bed in the ſpring; and when the plants are fit to remove, they ſhould be tranſplanted on a freſh hot-bed to bring them forward: when they have taken root in this bed, they muſt have air admitted to them every day, to prevent their drawing up weak, and refreſhed with water ſparingly, becauſe they are very apt to rot with much wet. When the plants have obtained ſtrength, they muſt be carefully taken up, and planted in ſeparate pots filled with light earth, and ſome of them placed in the ſhade till they have taken root; then they may be placed with other annual plants in the pleaſure-garden, where they will continue long in beauty. But as theſe plants which

are placed in the open air rarely produce good seeds, there should be two or three plants kept in a moderate hot-bed under a deep frame, where they will come earlier to flower; and being protected from wet and cold, they will ripen their seeds every year, which is the surest method to preserve the sort.

This sort differs from the common, in its leaves being sawed on their edges; the flowers are fistular, of a bright colour, and have a very agreeable soft odour. It flowers in July and August, and the seeds ripen in October.

The tenth sort is the common Blue Bottle, which grows naturally amongst the corn in most parts of England: this stands in the list of medicinal plants. There is a distilled water of the flowers, which is esteemed good for the eyes. There are great varieties of colours in these flowers, some of which are finely variegated: the seeds of these are sold by seedsmen, by the title of Bottles of all Colours. These are annual plants, which will rise in any common border, and require no other care but to keep them clean from weeds, and thinned where they are too close, for they do not thrive well when they are transplanted. If the seeds are sown in autumn, they will succeed better, and the plants will flower stronger than those which are sown in the spring.

The seeds of the eleventh sort were sent me by Dr. Jussieu, from Paris, who received them from Dr. Lippi, at Grand Cairo. This is an annual plant, which rises near two feet high, sending out two or three branches toward the top; the leaves are divided into many obtuse segments, and have a border running along the stalk; the flowers are small, of a bright purple, and have a scaly empalement. If the seeds are sown in the spring upon a border of light earth, where the plants are to remain, they will require no farther care but to keep them clean from weeds. It flowers in July, and the seeds ripen in autumn.

The twelfth sort is a perennial plant, which retains its leaves through the year. This grows naturally in Italy, on the borders of the fields. The leaves are hoary, and divided into many narrow segments; the stalks rise near three feet high, branching upward into many divisions, each being terminated by a head of purple flowers; these come out in June, and in favourable seasons will perfect their seeds in autumn. This sort will live abroad in moderate winters, if it has a warm situation and a dry soil; but in severe winters the plants are commonly killed, so one or two of them may be sheltered under a common frame in winter to preserve the kind. It may be easily propagated by seeds in the same manner as the fourth sort; or if the young branches, which do not shoot up to flower, are cut off, and planted in a shady border any time in summer, they will take root, and in autumn may be removed to warm borders, or put into pots to be sheltered in winter.

The thirteenth sort grows naturally in Mauritania, and in several other places on the borders of the Mediterranean Sea. This seldom rises more than three feet high in this country; it hath a perennial stalk, which divides into many branches, garnished with very white woolly leaves, divided into many obtuse entire lobes, the small leaves or lobes on the exterior part of the leaf being the largest. The flowers are produced from the side branches upon short foot-stalks, which are of a bright yellow, and are included in a fine hairy empalement. These appear in June and July, but scarce ever are succeeded by seeds in England. It is propagated by planting of the young shoots in the same manner as the last, and the plants require protection from hard frost. But if they are planted in dry lime-rubbish, where they will not grow luxuriant, they will resist the cold of our ordinary winters in the open air. As this plant retains its leaves all the year, which are extremely white, it makes a pretty variety in a garden.

The fourteenth sort is annual. This grows naturally in the Archipelago. It rises with a branching stalk about three feet high; the lower leaves are not much unlike those of the Turnep, being rounded at their ends, and their base is cut into many segments; those upon the stalks and branches are nearly of the same form, but diminish gradually in their size to the top; these have a border or wing running along the stalks, which connect them together; the flowers are produced at the end of the branches, which have prickly empalements; the spines come out from the border of the scales, divided like the fingers of a hand. The flowers are of a bright purple, so make a pretty appearance. This sort may be treated in the same manner as the Corn Bottle, by sowing the seeds in autumn, and keeping the plants clean from weeds. The plants will flower in June, and the seeds will ripen in August. If some seeds are also sown in the spring, the plants will come to flower a month after the others, and will continue flowering till the frost stops them. But these plants do not always perfect seeds, so that from the autumnal plants the seeds will more certainly be procured.

The fifteenth sort grows naturally upon the Helvetian, and some of the Italian mountains. I received the seeds of this sort from Verona: it hath a perennial root and an annual stalk; the leaves are oblong, slightly indented on their edges, and woolly on their under side; these have much the resemblance of those of Elecampane, generally standing upright; the stalks rise little more than a foot high, and are terminated by large single heads of purple flowers, inclosed in scaly empalements; these appear in July, but unless the season proves very dry and warm they have no seeds succeed them in this country; so that this, like the fifth sort, is very difficult to propagate in England, unless good seeds can be procured from the countries where they naturally grow. This is very hardy, so may be treated in the same manner as any of the former perennial sorts, but will require a little more room than the fifth.

The sixteenth sort grows naturally in Austria and Hungary, from both which countries I have received the seeds. The lower leaves of this plant spread flat on the ground; they are soft, hairy, and end in sharp points, but toward their base are cut into several narrow segments; the stalks rise near three feet high, garnished at each joint by spear-shaped entire leaves, and are terminated by single large heads of flowers, of a gold colour, inclosed in a prickly scaly empalement. This flowers in July and August, but never produces seeds in this country. It hath a perennial root, which sends out offsets; these may be taken from the old plants in autumn, whereby it may be easily propagated. It is very hardy in respect to cold, but should have a dry soil, the roots being very apt to rot in winter with much wet.

The seventeenth sort grows naturally in Siberia. The seeds of this were sent me from Petersburgh. This sends out many long winged leaves from the root, which are divided into several spear-shaped lobes; the stalks rise near five feet high, and divide upward into many smaller branches, garnished with leaves of the same form as the lower, but much smaller, and the segments very narrow; each of the stalks is terminated by a head of yellow flowers, inclosed in a scaly empalement; the borders of the scales are set with fine hairs like an eye-brow. It flowers in June, July, and August, and the seeds ripen in autumn. This hath a perennial root and an annual stalk, which, with the leaves, decay in autumn, and arise new from the root in the spring. It may be propagated either by seeds or parting of the roots, in the same manner as the fifth sort, and the plants require a large share of room, so should not be planted too near other plants; therefore it is not proper furniture for small gardens.

The eighteenth sort grows naturally in Crete. This hath a perennial root; the lower leaves are winged and very woolly, those on the flower-stalks are single, wedge-shaped, and indented; the stalks are terminated by heads of yellow flowers, composed of as many

florets as the other ſorts. This flowers in July, but rarely produces ripe ſeeds in this country, ſo is propagated by ſlips as the fifth ſort; and as the plants which are expoſed to the open air in winter are frequently deſtroyed, it will be proper to place one or two of them under a common frame to preſerve the ſpecies.

The nineteenth ſort grows naturally in Portugal: the ſtalks of this are perennial; the leaves continue in verdure through the year, for which it is chiefly valued, for the flower has little more beauty than the common Knapweed. It flowers in June and July, and in warm ſeaſons the ſeeds ripen in September. It is propagated by ſeeds, which, if ſown in April in a bed of light earth, the plants will riſe eaſily. Theſe plants, in a dry ſoil and a ſheltered ſituation, will live in the open air in mild winters; but as they are frequently killed when the froſts are ſevere, it will be proper to ſhelter a plant or two under a common frame in winter to preſerve the ſpecies.

The twentieth ſort grows naturally in Spain, and upon the Helvetian mountains. This rarely continues longer than two or three years: the lower leaves are doubly wing-pointed, thoſe on the ſtalks are ſpear-ſhaped, winged, and indented; the ſtalks riſe three feet high, and are terminated by flowers like thoſe of the common Knapweed, having ſilvery empalements. It flowers in July, and the ſeeds ripen in September. If theſe are ſown in April on a bed of light earth, the plants will come up, and will live through the winter in the open air.

The twenty-firſt ſort grows naturally in the Campania of Rome. This is a biennial plant in England; thoſe plants which ariſe from ſeeds in the ſpring ſeldom flower till the following year, and when they perfect their ſeeds they die. The ſtalks of this ſort riſe three feet high; the lower leaves are wing-pointed, without ſpines; thoſe on the ſtalks run along the ſtalks like wings; the flowers are large, red, and their empalements are ſtrongly armed with ſpines. This flowers in July, and the ſeeds ripen in September. It may be propagated by ſeeds as the former.

The ſecond ſort grows naturally in Spain and Mauritania. This is an annual plant, which rarely ripens its ſeeds in England; the leaves of this are ſpear-ſhaped, indented, and woolly; the ſtalk riſes two feet high, dividing upward into three or four branches, which are terminated by pretty large heads of flowers, whoſe empalements are woolly, and ſtrongly armed with ſpines. This flowers in July, and in warm ſeaſons the ſeeds ripen in September. It is propagated by ſeeds as the two former ſorts.

The twenty-third ſort grows naturally in Portugal. The ſtalk of this riſes two feet high, garniſhed with woolly leaves; ſome of which are entire, others are ſinuated on their borders; the ſtalks are terminated by woolly heads of flowers, ſtrongly armed with double ſpines on the empalement, which almoſt incloſes the florets. It flowers in July, and in warm ſeaſons the ſeeds ripen in September. It is propagated by ſeeds as the former.

The twenty-fourth ſort is the Carduus Benedictus, or Bleſſed Thiſtle, which is frequently uſed as an emitic. It grows naturally in Spain and the Levant; in England it is propagated in gardens for medicinal uſe. It is an annual plant, which periſhes ſoon after the ſeeds are ripe. The ſureſt method of cultivating this plant, is to ſow the ſeeds in autumn; and when the plants come up, to hoe the ground, to cut up the weeds, and thin the plants; and in the following ſpring to hoe it a ſecond time, leaving the plants a foot aſunder, which will ripen their ſeeds in autumn, and ſoon after decay.

CENTAURIUM MINUS. See Gentiana.

CENTINODIUM, Knot Graſs. See Polygonum.

CEPA, the Onion.

The botanical characters of this genus are the ſame with thoſe of Allium, to which it is now joined by the late ſyſtem; but as this work is intended for the inſtruction of ſuch as are not well acquainted with the ſcience of botany, or who may have no inclination to ſtudy it, and yet may want information how to cultivate the plants which are uſeful in the kitchen, I have choſen to treat of theſe under their former appellation. Mr. Ray and Tournefort admit of the fiſtular leaves and ſwelling ſtalks, as characters to diſtinguiſh the plants of this genus from Porrum and Allium.

The Varieties of the common Onion are,

The Straſburgh. Cepa oblong. C. B. P. 71.

The Spaniſh Onion. Cepa vulgaris, floribus & tunicis purpuraſcentibus. C. B. P. 71.

The white Egyptian Onion. Cepa floribus & tunicis candidis. C. B. P. 71.

All theſe vary from ſeeds, ſo that there are ſeveral intermediate differences which are not worth enumerating.

Theſe three varieties are propagated by ſeeds, which ſhould be ſown at the latter end of February or the beginning of March, on good, rich, light ground, which ſhould be well dug and levelled, and cleared from the roots of all bad weeds; then the ſeeds ſhould be ſown in a dry time, when the ſurface of the ground is not moiſt; and where they are intended for a winter crop, they muſt not be ſown too thick. The common allowance of ſeed is ſix pounds to an acre of land; but the generality of gardeners ſow more, becauſe many of them allow for a crop to draw out, which they call cullings; theſe are all ſuch as want to be removed from others, ſo are thinned out when young, and tied in bunches for the market; but thoſe who have regard to their principal crop, never practiſe this; therefore ſow no more ſeeds than is ſufficient, which is the quantity before-mentioned, for when the plants come up too cloſe, they draw each other weak; and when this happens, their roots never grow ſo large as thoſe which are thin: beſides, there is a greater trouble in hoeing them; and when they are thinned for the market, the ground is trodden over, and the Onions which are to ſtand have their leaves bruiſed, whereby they are greatly injured; ſo that where young Onions are wanted, it is a much better way to ſow ſome ſeparate beds for this purpoſe, than to injure the future crop.

In about ſix or ſeven weeks after ſowing, the Onions will be up forward enough to hoe; at which time (chooſing dry weather) you ſhould, with a ſmall hoe about two inches and a half broad, cut up lightly all the weeds from amongſt the Onions; and alſo cut out the Onions where they grow too cloſe in bunches, leaving them at this firſt hoeing at leaſt two inches apart. This, if well performed, and in a dry ſeaſon, will preſerve the ground clear of weeds at leaſt a month or five weeks; when you muſt hoe them over a ſecond time, cutting up all the weeds as before, and alſo cut out the Onions to a larger diſtance, leaving them this time three or four inches aſunder. This alſo, if well performed, will preſerve the ground clean a month or ſix weeks longer, when you muſt hoe them over the third and laſt time.

Now you muſt carefully cut up all weeds, and ſingle out the Onions to near ſix inches ſquare; by which means they will grow much larger, than if left too cloſe. This time of hoeing, if the weather proves dry and it is well performed, will keep the ground clean until the Onions are fit to pull up; but if the weather ſhould prove moiſt, and any of the weeds ſhould take root again, you ſhould, about a fortnight or three weeks after, go over the ground and draw out all the large weeds with your hands; for the Onions having now begun to bulb, they ſhould not be diſturbed with a hoe.

Toward the middle of Auguſt your Onions will have arrived to their full growth, which may be known by their blades falling to the ground and ſhrinking; you ſhould therefore, before their necks or blades are withered off, draw them out of the ground, cropping off the extreme part of the blade, and lay them abroad upon a dry ſpot of ground to dry, obſerving to turn them over every other day at leaſt, to prevent their

 ſtriking

ſtriking freſh root into the ground; which they will ſuddenly do, eſpecially in moiſt weather.

In about a fortnight's time your Onions will be dry enough to houſe, which muſt be performed in perfect dry weather; in doing of this, you muſt carefully rub off all the earth from the roots, and be ſure to mix no faulty ones amongſt them, which will in a ſhort time decay, and ſpoil all thoſe that lie near them; nor ſhould you lay them too thick in the houſe, which would occaſion their ſweating, and thereby rot them; nor ſhould they be put in a lower room, or ground floor, but in a loft or garret; and the cloſer they are kept from the air, the better they will keep. You ſhould, at leaſt, once a month, look over them to ſee if any of them are decayed; which if you find, muſt be immediately taken away, otherwiſe they will infect all that lie near them.

But notwithſtanding all the care you can poſſibly take in the drying and houſing of your Onions, many of them will grow in the loft, eſpecially in mild winters, which are generally moiſt; therefore thoſe who would preſerve them late in the ſeaſon, ſhould ſelect a parcel of the firmeſt and moſt likely to keep from the others, and with a hot iron ſlightly ſinge their beards, or roots, which will effectually prevent their ſprouting; but in doing of this there muſt be great caution uſed not to ſcorch the pulp of the Onions, for that will cauſe them to periſh ſoon after.

The beſt Onions for keeping are the Straſburgh kind, which is an oval-ſhaped bulb; but this ſeldom grows ſo large as the Spaniſh, which is flatter; the white ſort is eſteemed the ſweeteſt; but theſe varieties are not laſting; for if you ſave ſeeds of white Onions only, you will have a mixture of the red ones amongſt them; nor will the Straſburgh Onion keep long to its kind, but will by degrees grow flatter, as do the large Portugal Onions, when planted in our climate, which in a year or two will be ſo far degenerated, as not to be known they were from that race.

But in order to ſave ſeeds, you muſt in the ſpring make choice of ſome of the firmeſt, largeſt, and beſt ſhaped Onions (in quantity proportionable to the ſeed you intend to ſave;) and having prepared a piece of good ground (which ſhould be well dug, and laid out in beds about three feet wide,) in the beginning or middle of March you muſt plant your Onions in the following manner. Having ſtrained a line about four inches within the ſide of the bed, you muſt, with a ſpade, throw out an opening about ſix inches deep, the length of the bed, into which you ſhould place the Onions, with their roots downward, at about nine inches diſtance from each other; then with a rake draw the earth into the opening again to cover the bulbs; then proceed to remove the line again about a foot farther back, where you muſt make an opening as before, and ſo again till the whole is finiſhed; ſo that you will have four rows in each bed, between which you muſt allow a ſpace of two feet for an alley to go among them to clear them from weeds, &c. In a month's time their leaves will appear above ground, and many of the roots will produce three or four ſtalks each; you muſt therefore keep them diligently cleared from weeds, and about the beginning of June, when the heads of the flowers begin to appear upon the tops of the ſtalks, you muſt provide a parcel of ſtakes about four feet long, which ſhould be driven into the ground, in the rows of Onions, at about ſix or eight feet apart; to which you ſhould faſten ſome packthread, rope yarn, or ſmall cord, which ſhould be run on each ſide the ſtems of the Onions, a little below their heads, to ſupport them from breaking down with the wind and rain; for when the ſeeds are formed, the heads will be heavy, and ſo are very often broken down by their own weight, where they are not well ſecured; and if the ſtalks are broken before the ſeeds have arrived to maturity, they will not be near ſo good, nor keep ſo long as thoſe which are perfectly ripened.

About the end of Auguſt the Onion ſeed will be ripe, which may be known by its changing brown, and the cells in which the ſeeds are contained opening; ſo that if it be not cut in a ſhort time, the ſeeds will fall to the ground: when you cut off the heads, they ſhould be ſpread abroad upon coarſe cloths in the ſun, obſerving to keep it under ſhelter in the night, as alſo in wet weather; and when the heads are quite dry, you muſt beat out the ſeeds, which are very eaſily diſcharged from their cells; then having cleared it from all the huſk, &c. after having expoſed it one day to the ſun to dry, you muſt put it up in bags to preſerve it for uſe.

The directions here given is for the general crop of winter Onions; but there are two other crops of this common ſort of Onion, cultivated in the gardens about London to ſupply the market, one of which is commonly called Michaelmas Onions. Theſe are ſown in beds pretty cloſe, the middle of Auguſt, and muſt be well weeded when they come up. In the ſpring of the year, after the winter Onions are over, they are tied up in bunches to ſupply the markets; but from the thinning of theſe they carry to market young green Onions in March, for ſallads, &c.

And in the ſpring they ſow more beds in the ſame manner, to draw up young for ſallads, after the Michaelmas Onions are grown too large for that purpoſe; and where a ſupply of theſe are required, there may be three different ſowings, at about three weeks diſtance from each other, which will be ſufficient for the ſeaſon.

There are alſo the following ſorts of Onions cultivated in the kitchen-gardens.

The Shallot, or Eſchalottes, which is the Cepa Aſcalonica. Matth. 556.

The Ciboule, or Cepa fiſſilis. Matth. Lugd. 1539.

The Cives, or Cepa ſectilis juncifolia perennis. Mor. Hiſt. 2. 383.

The Welch Onion I ſuppoſe to be the ſame with the Ciboule, although they paſs under different appellations; for I have ſeveral times received the Ciboule from abroad, which, when planted, prove to be what is generally known here by the title of Welch Onions. There is alſo a great affinity between the Eſchalottes and theſe, ſo that they are not well diſtinguiſhed yet; for although they are generally cultivated in the gardens, yet they are not well known to the botaniſts, ſome of whom have ſuppoſed a greater variety than is in nature; while others have joined them together, making but two ſpecies.

The Scallion, or Eſcallion, is a ſort of Onion which never forms any bulbs at the roots, and is chiefly uſed in the ſpring for green Onions, before the other ſorts, ſown in July, are big enough; but this ſort of Onion, how much ſoever in uſe formerly, is now ſo ſcarce as to be known to few people, and is rarely to be met with, except in curious botanic gardens: the gardeners near London ſubſtitute another ſort for this, which are thoſe Onions which decay and ſprout in the houſe: theſe they plant in a bed early in the ſpring, which in a ſhort time will grow large enough for uſe; when they draw them up, and after pulling off all the outer coat of the root, they tie them up in bunches, and ſell them in the market for Scallions.

The true Scallion is eaſily propagated by parting the roots, either in ſpring or autumn; but the latter ſeaſon is preferable, becauſe of their being rendered more fit for uſe in the ſpring: theſe roots ſhould be planted three or four in a hole, at about ſix inches diſtance every way, in beds or borders three feet wide, which in a ſhort time will multiply exceedingly, and will grow upon almoſt any ſoil and in any ſituation; and their being ſo hardy as to reſiſt the ſevereſt of our winters, and being green, and fit for uſe ſo early in the ſpring, renders them worthy of a place in all good kitchen-gardens.

The Cives are a very ſmall ſort of Onion, which never produce any bulbs, and ſeldom grow above ſix inches high in the blade, which is alſo very ſmall and ſlender, and are in round bunches like the former;

this was formerly in great request for sallads in the spring, as being milder than those Onions which had stood through the winter; these are propagated by parting their roots like the former, and are also very hardy, and will be fit for use early in the spring.

The Welch Onions are only propagated for spring use also; these never make any bulb, and are therefore only fit to be used green for sallads, &c. They are sown about the end of July, in beds of about three feet and a half wide, leaving alleys of two feet broad to go between the beds to clean them, and in a fortnight's time they will appear above ground, when they must be carefully cleared from weeds; towards the middle of October their blades will die away, so that the whole spot will seem to be naked, which hath led many people to dig up the ground again, supposing the crop totally lost; whereas, if they stand undisturbed, they will come up again very strong in January, and from that time grow very vigorously, resisting all weathers; and by March will be fit to draw for young Onions, and are, in the markets, more valued than any other sort at that season; for they are extremely green and fine, though they are much stronger than the common Onion in taste, approaching nearer to Garlick, which hath occasioned their being less esteemed for the table: but as no winter, however hard, will hurt them, it is proper to have a few of them to supply the table, in case the common sort should be destroyed by frosts.

The roots of these Onions, if planted out at six or eight inches distance, in March, will produce ripe seeds in autumn, but it will be in small quantities the first year; therefore the same roots should remain unremoved, which the second and third year will produce many stems, and afford a good supply of seeds; these roots will abide many years good, but should be transplanted and parted every second or third year, which will cause them to produce strong seeds.

CEPHALANTHUS. Lin. Gen. Plant. 105. Platanocephalus. Vaill. Acad. R. Scien. 1722. Button Wood.

The CHARACTERS are,

*It hath a number of small flowers, which are collected into a spherical head; these have no common empalement, but each particular flower hath a funnel-shaped empalement, divided into four parts at the top; the flower is funnel-shaped, of one petal, divided at the top into four parts, inclosing four stamina, which are inserted in the petal, and are shorter than the tube, being terminated by globular summits. The germen is situated under the flower, supporting a style which is longer than the petal, and is crowned by a globular stigma; the germen afterward becomes a globular hairy capsule, inclosing one or two oblong angular seeds; these are joined to an axis, and form a round head.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia, the flower having four stamina and but one style.

We have but one SPECIES of this plant, viz.

CEPHALANTHUS (*Occidentalis*) foliis oppositis ternisque. Flor. Virg. 15. *Button-tree with leaves growing opposite, and sometimes by threes.* Scabiosa dendroides Americana ternis foliis caulem ambientibus, floribus ochroleucis. Pluk. Alm. 336. tab. 77.

This shrub grows naturally in North America, from whence the seeds are annually sent to Europe, and of late years great numbers of the plants have been raised in the gardens of the curious; but there are no very large plants in the English gardens; the largest I have seen are in the curious gardens of his grace the Duke of Argyle, at Whitton, near Hounslow, where they thrive better than in almost any other place where they have been planted, so that in a moist soil they will do the best.

This seldom rises higher than six or seven feet in this country. The branches come out by pairs, opposite at each joint; the leaves also stand opposite, sometimes by pairs, and at other times there are three arising at the same joint, standing round the branch; these are near three inches long, and one and a quarter broad, having a strong vein running longitudinally through the middle, and some small transverse veins from that to the borders; they are of a light green, and their foot-stalks change to a reddish colour next the branches; the ends of the branches are terminated by loose spikes of spherical heads, about the size of a marble, each of which are composed of many small flowers, which are funnel-shaped, of a whitish yellow colour, fastened to an axis which stands in the middle; these appear in July, and, in warm seasons, are succeeded by seeds, which have sometimes ripened in England.

These plants are propagated chiefly by seeds (though there has been some raised from cuttings and layers;) these should be sown in pots, for the greater conveniency of removing them either into a shady situation, or where they may have shelter. If the seeds can be procured so early as to sow them before Christmas, the plants will come up the following summer; but if they are sown in the spring, they generally remain a year in the ground; therefore, in such case, the pots should be placed in the shade that summer, and in the autumn following removed under a common frame to shelter them from frost, and the spring following the plants will come up.

The first year, when the plants come up, it will be necessary to shade them in hot dry weather, while they are young, at which time they are often destroyed by being too much exposed; nor should the watering be neglected; for as these plants naturally grow on moist ground, so when they are not duly watered in dry weather, the young plants will languish and decay.

The next autumn, when the leaves begin to drop, the young plants may be transplanted into nursery-beds, which should be a little defended from the cold winds; and, if the soil is moist, they will succeed much better than in dry ground; but where it happens otherwise, it will be absolutely necessary to water them in dry weather, otherwise there will be great danger of the plants dying in the middle of summer, which has been the case in many gardens where these plants were raised.

In these nursery-beds the plants may remain a year or two (according to the progress they may have made, or the distance they were planted;) then they may be taken up in October, and transplanted where they are to remain for good. Although I have mentioned but one season for transplanting them, yet this may also be performed in the spring, especially if the ground is moist into which they are removed, or that the plants are duly watered, if the spring should prove dry, otherwise there will be more hazard of their growing when removed at this season.

These plants make a pretty variety among other hardy trees and shrubs, being extreme hardy in respect to cold; but they delight in a moist light soil, where they will grow very fast, and their leaves will be larger than in dry land.

CERASTIUM. Lin. Gen. Plant. 518. Mouse-ear, or Mouse-ear Chickweed; in French, *Oreille de Souris.*

The CHARACTERS are,

*It hath a permanent five-leaved empalement, which spreads open; the flower hath five obtuse bifid petals, which are as large as the empalement. It hath ten slender stamina shorter than the petals, terminated by roundish summits. In the center is situated an oval germen, from which arise five styles, which are hairy, erect, and crowned with obtuse stigma; the empalement afterward becomes an oval, cylindrical, or globular capsule with one cell, opening at the top, containing many roundish seeds.*

This genus of plants is ranged in the fourth section of Linnæus's tenth class, intitled Decandria Pentagynia, the flower having ten stamina and five styles.

The Species are,

1. Cerastium (*Repens*) foliis lancolatis, pedunculis ramosis, capsulis subrotundis. Lin. Sp. Plant. 439. *Cerastium with spear-shaped leaves, branching foot-stalks, and roundish capsules.* Myosotis incana repens. Tourn. Inst. R. H. 245. *Hoary creeping Mouse-ear, by some called Sea Pink.*
2. Cerastium (*Tomentosum*) foliis oblongis, tomentosis, pedunculis ramosis, capsulis globosis. Lin. Sp. Plant. 440. *Cerastium with oblong woolly leaves, branching foot-stalks, and globular capsules.* Myosotis tomentosa, linariæ folio angustiore. Tourn. Inst. R. H. 245. *Woolly Mouse-ear with a narrow Toad-flax leaf.*
3. Cerastium (*Dichotomum*) foliis lanceolatis, caule dichotomo ramosissimo, capsulis erectis. Prod. Leyd. 450. *Cerastium with spear-shaped leaves, a very branching stalk divided in forks, and upright capsules.* Myosotis Hispanica segetum. Tourn. Inst. R. H. 545. *Spanish Corn Mouse-ear, or Horned Chickweed.*
4. Cerastium (*Pentandrum*) floribus pentandriis, petalis integris. Lin. Sp. Plant. 438. *Cerastium with flowers having five stamina, and entire petals.*
5. Cerastium (*Perfoliatum*) foliis connatis. Hort. Cliff. 173. *Cerastium whose leaves are joined.* Myosotis Orientalis perfoliata folio lychnidis. Tourn. Cor. 18. *Eastern perfoliated Mouse-ear with a Lychnis leaf.*

The first sort grows naturally in France and Italy, and was formerly cultivated in the English gardens under the title of Sea Pink; one of the uses made of it was to plant it as an edging to keep up the earth of borders; but this was before the Dwarf Box was brought to England, since which all those plants which were formerly applied for this purpose have been neglected. This plant was by no means fit for this use, because its creeping branches would spread into the walks where they put out roots into the gravel; so that unless they are frequently cut off, they cannot be kept within compass.

This sends out many weak stalks which trail upon the ground, and put out roots at their joints, whereby it propagates very fast; the leaves are placed by pairs opposite, which are about two inches long, and little more than half an inch broad, very hoary; those next the root are much smaller than the upper; the flowers come out from the side of the stalks upon slender foot-stalks, which branch out into several smaller, each supporting a white flower, composed of five petals, which are split at the top. The whole flower has the appearance of Chickweed flowers, but are larger; it flowers in May.

It propagates too fast by its creeping roots and trailing branches, when it is admitted into gardens, so may be planted in any soil or situation; and is very proper to be planted between stones on the side of grottos, where it will spread, and thrive without care.

The seeds of the second sort I received from Istria, where it naturally grows; this is by Parkinson titled hoary narrow-leaved Pink. The leaves of this sort are narrower than those of the former, and are much whiter; the stalks grow more erect, and the seed-vessels are rounder, in which their chief difference consists. This is a trailing plant, and propagates by sending out roots at the joints, in the same manner as the former, and is equally hardy. It flowers in May and June, and the seeds ripen in August.

The third sort is annual; this grows naturally on arable land in Spain, from whence the seeds were sent to England, where it is allowed a place in botanic gardens for the sake of variety, but hath not much beauty; this hath branching stalks, which grow about six inches high, dividing by pairs in forks, the flowers coming out in the middle of the divisions, which are shaped like those of Chickweed; the whole plant has a clammy moisture, which sticks to the fingers of those who handle it. This flowers in May, and the seeds ripen in July. If the seeds are sown in autumn, they will succeed better than in the spring; or if they are permitted to fall, the plants will rise without care.

The fourth sort is very like the third in its whole appearance, and differs from it, in having but five stamina in the flower, whereas the other hath ten. This was discovered by Mr. Lœfling, a pupil of Dr. Linnæus's, in Spain, from whence he sent the seeds to Upsal, part of which were sent me by the Doctor.

The fifth sort was discovered by Dr. Tournefort in the Levant, from whence he sent the seeds to the royal garden at Paris, where they succeeded, and have been since communicated to most of the curious botanic gardens in Europe. This is an annual plant, which rises with an upright stalk a foot high; the lower leaves of this plant have much resemblance to those of the Lychnis, which is called Lobel's Catchfly, so that when the plants are young, it is not easy to distinguish them. The stalks are garnished with leaves of the same shape, but smaller, placed by pairs, and embrace the stalks at their base. The flowers come out at the top of the stalks, and also from the wings of the leaves, on the upper part of the stalks, which are white, and shaped like those of Chickweed. They appear in May and June, and are succeeded by beaked capsules, containing many roundish seeds.

If the seeds of this sort are sown in autumn, they will more certainly grow than those which are sown in the spring; or if the seeds are permitted to scatter, the plants will come up and live through the winter, and will require no other care but to keep them clean from weeds.

There are many other species of this genus than are here enumerated, which are weeds in many parts of England, so are never cultivated in gardens, therefore not worthy of notice here.

CERASUS [κέρασος, *Gr.* so called according to Servius, from Cerasus, a city of Pontus, which Lucullus having destroyed, he carried the Cherry-tree from thence to Rome, and called it Cerasus, after the name of the city; but others will have it that the city took its name from the abundance of those trees which grew there.] The Cherry-tree.

The botanical characters of this genus, according to the system of Linnæus, are the same with those of Prunus; therefore he has joined the Apricot Cherry, Laurel, and Bird Cherry together, making them only species of the same genus; but those who admit of the fruit, as a character to determine the genus, must separate the Cherry from the others, because they differ greatly in the shape of their stones; but there is a more essential difference in nature between them, which is, that the Cherry will not grow upon a Plumb-stock, by budding or grafting, nor will the Plumb take upon a Cherry-stock; and yet we know of no trees of the same genus which do not unite with each other, by budding or grafting.

However, as the joining so many genera into one, would occasion great confusion among gardeners, who cultivate these trees for sale, therefore if there were no other motive than that, it would be a sufficient excuse for not closely following that system in this work, which is designed for the instruction of those who have not made botany their study; so I shall refer the reader to the article Prunus, under which the botanical characters will be inserted, and proceed to the species.

I shall first enumerate the sorts which are specifically different from each other, and then mention the varieties of these fruits, which are cultivated in the English gardens; many of which seem to differ so essentially from each other, that they may be allowed as specific differences; but as I have not had an opportunity of trying the various sorts from seeds, to see if they alter, so I chose to insert them only as varieties, till further observation may better settle their boundaries.

The Species are,

1. Cerasus (*Vulgaris*) foliis ovato-lanceolatis, serratis. *The common, or Kentish Cherry.* Cerasus sativa rotunda rubra & acida. C. B. P. 449. *Manured Cherry with round, red, acid fruit.*

2. Cerasus (*Nigra*) foliis serratis lanceolatis. *Cherry-tree with spear-shaped sawed leaves.* Cerasus major ac sylvestris, fructu subdulci nigro colore inficiente. C. B. P. 450. *Greater wild Cherry-tree with a sweetish fruit, whose juice affords a black colour.*

3. Cerasus (*Hortensis*) foliis ovato-lanceolatis, floribus confertis. *Cherry-tree with oval spear-shaped leaves, and flowers growing in clusters.* Cerasus racemosa hortensis. C. B. P. 450. *Commonly called the Cluster Cherry.*

4. Cerasus (*Mahaleb*) floribus corymbosis, foliis ovatis. Lin. Sp. Plant. 474. *Cherry-tree with flowers growing in round bunches, and oval leaves.* Cerasus sylvestris amara, mahaleb putata. J. B. *The Mahaleb or perfumed Cherry.*

5. Cerasus (*Canadensis*) foliis lanceolatis, glabris, integerrimis, subtus, cæsiis, ramis patulis. *Cherry-tree with smooth, spear-shaped, entire leaves, of a bluish green on their under side, and spreading branches.* Cerasus pumila Canadensis, oblongo angusto folio fructu parvo. Du Hamel. *Dwarf Canada Cherry, with oblong narrow leaves, and a small fruit, called Ragouminier, Nega, or Minel in Canada.*

The first sort is the common or Kentish Cherry, which is so well known in England as to need no description. From this sort it hath been supposed many of the varieties which are cultivated in the English gardens, have been raised; but as there are very great differences in the size and shape of their leaves, as also in the shoots of the trees from those of this sort, I think it is very doubtful, where the boundaries of their specific differences terminate: however, I shall comply with the generality of modern botanists, in supposing the following sorts to have been produced from the seeds of this, as we have not sufficient experiments to determine otherwise.

| | |
|---|---|
| The Early May Cherry. | The Ox Heart. |
| The May Duke Cherry. | The Lukeward. |
| The Archduke Cherry. | The Carnation. |
| The Flemish Cherry. | The Hertfordshire Heart. |
| The Red Heart. | The Morello. |
| The White Heart. | The Bleeding Heart. |
| The Black Heart. | Yellow Spanish Cherry. |
| The Amber Heart. | |

Two sorts with double flowers, one larger and fuller than the other. These are propagated for ornament.

The second sort above-mentioned is the Black Cherry, which is supposed to be a native of England. This grows to be a large tree, fit for timber, and is frequently found growing as such in the woods. From this, the only varieties which I have ever known raised by seeds, are the Black Coroun, and the small Wild Cherry; of which there are two or three varieties, which differ in the size and colour of their fruit.

These Wild Cherries are very proper to plant in parks, because they grow to a large size, and make beautiful trees; and in the spring, when they are in flower, will be very ornamental. The fruit of them will be good food for birds, and when the trees are cut down, the wood is very useful for turners. These trees will thrive in poor land better than most other sorts, so there is an advantage in propagating them in those places. The French often plant them for avenues to their houses, upon such land where they cannot get any other trees to thrive; they also cultivate them in their woods to cut for hoops, and greatly esteem them for this purpose.

The stones of this sort are generally sown for raising stocks to graft or bud the other sorts of Cherries upon, being of quicker growth, and of longer duration than either of the other, so are very justly esteemed and preferred to them.

The wood of the fourth sort, is by the French greatly esteemed for making of cabinets, because it hath an agreeable odour. This, and the wood of the Bird Cherry, are often blended together, and pass under the appellation of Bois de Sainte Lucie; but the Bird Cherry is the true sort.

The fifth sort was brought from Canada, where it grows naturally, to the gardens in France, where it is cultivated as a flowering shrub for ornament. The stones of this were sent me by Dr. Bernard de Jussieu, professor of botany at Paris, which succeeded very well in the Chelsea garden; but by comparing this with a specimen of the old Chamæcerasus, or Cerasus humilis of Gerard, and other old writers, I find it to be the same plant, for it also agrees exactly with their descriptions of it.

This is a low shrub, which seldom grows more than three or four feet high, sending out many horizontal branches, which spread near the ground on every side; and the lower branches are very subject to lie in the ground, where they will put out roots, and thereby multiply. The young branches have a very smooth bark, inclining toward red; the leaves are long, narrow, very smooth, and entire, having the appearance of some sorts of Willow leaves, of a light green on their upper side, but of a bluish or sea-green on their under: the flowers come out from the side of the branches, two, three, or four arising at the same joint most part of the length of the young shoots; these are shaped like those of the common Cherry, but are smaller, standing upon long slender foot-stalks. The fruit is like those of the small wild Cherry, but hath a bitterish flavour. It flowers about the same time as the other sorts of Cherries, and the fruit ripens in July; these fruit are good food for birds, and the French plant them among their other shrubs, to entice the birds to harbour there.

It is easily propagated by laying down the branches early in the spring, which will take root by the following autumn, when they may be taken off, and either planted in a nursery to get strength, or to the places where they are designed to remain. It may also be propagated by sowing the stones, in the same manner as other Cherries.

All the sorts of Cherries which are usually cultivated in fruit-gardens, are propagated by budding or grafting the several kinds into stocks of the Black or wild Red Cherries, which are strong shooters, and of longer duration than any of the garden kinds. The stones of these two kinds are sown in a bed of light sandy earth in autumn (or are preserved in sand till spring, and then sowed.) When these stocks arise they must be carefully weeded, and if in dry weather you refresh them with water, it will greatly promote their growth. These stocks should remain in the nursery-beds till the second autumn after sowing; at which time you should prepare an open spot of good fresh earth, which should be well worked; but if the soil is fresh, it will be the better. In this ground, in October, you should plant out the young stocks at three feet distance row from row, and about a foot asunder in the rows, being careful in taking them up from their seed-beds to loosen their roots well with a spade, to prevent their breaking, as also to prune their roots; and if they are inclinable to root downwards, you should shorten the tap-root to cause it to put out lateral roots; but do not prune their tops, for this is what by no means they will endure.

The second year after planting out, if they take to growing well, they will be fit to bud, if they are intended for dwarfs: but if they are for standards, they will not be tall enough until the fourth year; for they should be budded or grafted near six feet from the ground, otherwise the graft will not advance much in height; so that it will be impossible to make a good tree from such as are grafted low, unless the graft is trained upward.

The usual way with the nursery gardeners is to bud their stocks in summer, and such of them as miscarry they graft the succeeding spring (the manner of these operations will be described under their proper heads.) Those trees where the buds have taken, must be headed off in the beginning of March about six inches above the bud; and when the bud hath shot in summer, if you fear its being blown out by the winds, you may fasten it up with some bass, or any other soft binding, to that part of the stock which was left above

 the

the bud. The autumn following these trees will be fit to remove; but if your ground is not ready to receive them, they may remain two years before they are transplanted; in doing which, you must observe not to head them, as is by many practised, for this very often is immediate death to them; but if they survive it, they seldom recover this amputation in five or six years.

If these trees are intended for a wall, I would advise the planting dwarfs between the standards; so that while the dwarfs are filling the bottom of the walls, the standards will cover the tops, and will produce a great deal of fruit: but these, as the dwarfs arise to fill the walls, must be cut away to make room for them; and when the dwarf trees cover the walls, the standards should be entirely taken away. But I would advise, never to plant standard Cherries over other fruits, for there is no other sort of fruit that will prosper well under the drip of Cherries.

When these trees are taken up from the nursery, their roots must be shortened, and all the bruised parts cut off; and also all the small fibres, which would dry, grow mouldy, and be a great prejudice to the new fibres in their coming forth; you must also cut off the dead part of the stock which was left above the bud, close down to the back part of it, that the stock may be covered by the bud. If these trees are designed for a wall, observe to place the bud directly from the wall, that the back part of the stock that was cut may be hid from sight. The soil that Cherries thrive best in, is a fresh hazel loam; but if the soil is a dry gravel, they will not live many years, and will be perpetually blighted in the spring.

The sorts commonly planted against walls, are the Early May, and May Duke, which should have a south aspected wall. The Hearts and common Duke will thrive on a west wall; and in order to continue this sort later in the season, they are frequently planted against north and north-west aspected walls, where they succeed very well; and the Morello on a north wall, which last is chiefly planted for preserving. The Hearts are all of them ill bearers, for which reason they are seldom planted against walls: but I am apt to believe, if they were grafted upon the Bird Cherry, and managed properly, that defect might be remedied; for this stock (as I am informed) will render Cherries very fruitful; and having the same effect on Cherries, as the Paradise stock hath on Apples, they may be kept in less compass, which is an experiment well worth the trial.

Your trees, if planted against a wall, should be placed at least twenty or twenty-four feet asunder, with a standard tree between each dwarf: this will be found a reasonable distance, when we consider, that Cherry-trees will extend themselves full as far as Apricots, and many other sorts of fruit.

In pruning these sorts of fruit, you should never shorten their shoots; for the most part of them produce their fruit buds at the extremities, which, when shortened, are cut off, and this often occasions the death of the shoot, at least a good part of its length: their branches should be therefore trained in at full length horizontally, observing in May, where there is a vacancy in the wall, to stop some strong adjoining branches, which will occasion their putting out two or more shoots; by which means, at that season of the year, you may always get a supply of wood for covering the wall; and at the same time, should all foreright shoots be displaced by the hand; for if they are suffered to grow till winter, they will not only deprive the bearing branches of their proper supply of nourishment, but when they are cut out, it occasions the tree to gum in that part (for Cherries bear the knife the worst of any sort of fruit trees;) but be careful not to rub off the sides or spurs, which are produced upon the two and three years old wood; for it is upon these that the greatest part of the fruit are produced, which sides will continue fruitful for several years. And it is for want of duly observing this caution, that Cherry-trees are often seen so unfruitful, especially the Morello, which the more it is cut the weaker it shoots; and, at last, by frequent pruning, I have known a whole wall of them destroyed; which, if they had been suffered to grow without any pruning, might probably have lived many years, and produced large quantities of fruit.

Cherry-trees are also planted for orchards in many parts of England, particularly in Kent, where there are large plantations of these trees. The usual distance allowed for their standing is forty feet square, at which space they are less subject to blight than when they are closer planted; and the ground may be tilled between them almost as well as if it were entirely clear, especially while the trees are young; and often stirring the ground, provided you do not disturb their roots, will greatly help the trees; but when they are grown so big as to over-shadow the ground, the drip of their leaves will suffer very few things to thrive under them. These standard trees should be planted in a situation defended as much as possible from the strong westerly winds, which are very apt to break their tender branches; this occasions their gumming, and is very prejudicial to them.

The sorts best approved for an orchard, are the common Red, or Kentish Cherry, the Duke, and Luke-ward; all which are plentiful bearers. But orchards of these trees are now scarcely worth planting, except where land is very cheap; for the uncertainty of their bearing, with the trouble in gathering the fruit, together with the small price it commonly yields, hath occasioned the destroying many orchards of this fruit in Kent within a few years past.

This fruit was brought out of Pontus, at the time of the Mithridatic victory, by Lucullus, in the year of the city 680, and were brought into Britain about 120 years afterward, which was An. Dom. 55; and were soon after spread through most parts of Europe, it being generally esteemed for its earliness, as being one of the first of the tree fruit that appears to welcome in the approaching fruit season.

This sort of fruit hath been by many people grafted upon the Laurel, to which it is a congener; but the effect it hath in the growth of the tree, as also in its fruit, will not recommend it to practice, the trees being of short duration, and seldom produce much fruit; though this practice is as old as Pliny, who says it gives the fruit a pleasant bitterness: but there is little to be depended upon in the writings of the ancients, with respect to the several sorts of trees being grafted upon each other; very few of those which we find mentioned by them to have been frequently practised, will not succeed with us. Nor is it owing to the difference of climate, as some have supposed, who are inclinable to believe whatever they find related in those books, especially in the business of husbandry and gardening; whereas many of the rules for the practical part of husbandry, are not founded on experiments, but are mere theory; for from many repeated trials which have been made with the utmost care, by persons of the best skill, it appears, that no two sorts of trees, which are of different classes, will take upon each other. However, the Laurel and the Cherry being of the same genus, or so near of kin to be ranked together by most botanists, will take upon each other by grafting. But I have not yet seen any of the trees so grafted, which have lived to be of any considerable size; though I have seen many trees so grafted, which have lived a few years, but have made very poor progress; nor do I remember to have seen any fruit upon the Cherry-trees which were grafted on the Laurels, therefore cannot determine what effect this has on the flavour of the fruit.

There are some persons who graft the Duke, and other sorts of Cherries, upon the Morello Cherry, which is but a weak shooter, in order to check the luxuriant growth of their trees, which will succeed for three or four years: but they are not of long duration, nor have I ever seen one tree so grafted, which had made shoots above six or eight inches long, but they were closely covered with blossoms, so may produce

duce some fruit in a small compass; but these are experiments unfit to be carried into general use, and only proper to satisfy curiosity; for is it not much better to allow the trees a greater share of room against the walls, when one tree so planted and properly managed, will produce more fruit than twenty of these trees, or twice that number, when they are planted too close, though they are grafted upon the Black Cherry or any other free stock.

The Early or May Cherry is the first ripe, so one or two trees of this sort may be allowed a place in a garden, where there is room for variety. The next ripe is the May Duke, which is a larger fruit than the other, and is more valuable. After this comes the Archduke, which, if permitted to hang upon the tree till the fruit is quite ripe, is an excellent Cherry; but few persons have patience to let them hang their full time, so rarely have them in perfection, for these should not be gathered before July; and if they hang a fortnight longer they will be better. This is to be understood of the situation near London, where they ripen a fortnight earlier than in places forty miles distant, unless they have a very warm sheltered situation. When this sort is planted against north walls, the fruit may be continued till the middle of August; but these must be protected from the birds, otherwise they will destroy them.

The Hertfordshire Cherry, which is a sort of Heart Cherry, but a firmer and better flavoured fruit, will not ripen earlier than the end of July, or the beginning of August, which makes it the more valuable for its coming when the other sorts of Cherries are gone. This is now pretty common in the nurseries; but as it is one of the best kind of Cherries, it is well worthy of being propagated in the nurseries.

The Morello Cherry, which is generally planted against walls to a north aspect, and the fruit commonly used for preserving; yet where they are planted to a better aspect, and suffered to hang upon the trees until they are thoroughly ripe, is a very good fruit for the table; therefore some of the trees of this sort should have place where there is plenty of walling, upon a south-west wall, where they will ripen perfectly by the middle or end of August, at which time they will be an acceptable fruit.

The Carnation Cherry is also valuable for coming late in the season; this has a very firm fleshy fruit, but is not the best bearer. This sort will some seasons ripen very well on espaliers, and by this means the fruit may be continued longer in the season.

The large Spanish Cherry is nearly allied to the Duke Cherry, from which it seems to be only a variety accidentally obtained; this ripens soon after the common Duke Cherry, and very often passes for it.

The yellow Spanish Cherry is of an oval shape and of an amber colour; this ripens late, and is a sweet Cherry, but not of a rich flavour; and being but a middling bearer, is not often admitted into curious gardens, unless where variety is chiefly considered.

The Corone, or Coroun Cherry, is somewhat like the Black Heart, but a little rounder; this is a very good bearer and an excellent fruit, so should have a place in every good fruit-garden. This ripens the middle of July.

The Lukeward ripens soon after the Corone Cherry; this is a good bearer, and a very good fruit; it is of a dark colour, not so black as the Corone; this will do well in standards.

The Black Cherry is seldom grafted or budded, but is generally sown for stocks to graft the other kinds of Cherries upon; but where persons are curious to have the best flavoured of this sort of fruit, they should be propagated by grafting from such trees as produce the best fruit. This sort of Cherry is frequently planted in wildernesses, where it will grow to a large size, and, at the time of its flowering, will make a variety, and the fruit will be food for the birds.

The double-flowering Cherry is also propagated for the beauty of the flowers, which are extremely fine, the flowers being as double and large as a Cinnamon Rose; and these being produced in large bunches on every part of the tree, render it one of the most beautiful trees of the spring. Some of the flowers which are less double, will often produce some fruit, which the very double flowers will not; but this defect is sufficiently recompensed in the beauty of its flowers. This is propagated by budding or grafting on the Black or Wild Cherry stock, and the trees are very proper to intermix with the second growth of flowering trees.

CERASUS RACEMOSA. See Padus.

CERATONIA. Lin. Gen. Plant. 983. Siliqua. Tourn. Inst. R. H. 578. tab. 344. The Carob, or St. John's Bread, in French *Carouge*.

The Characters are,

*It is male and female in distinct trees. The male flowers have large empalements, divided into five parts; they have no petals, but have five long stamina, terminated by large summits. The female flowers have empalements of one leaf, divided by five tubercles; they have no petals, but a fleshy germen situated within the receptacle, supporting a slender style, crowned by a stigma in form of a head. The germen afterward becomes a long, fleshy, compressed pod, divided by transverse partitions, each having one large, roundish, compressed seed.*

This genus of plants is ranged in the third section of Linnaeus's twenty-third class, intitled Polygamia Triœcia. The plants of this class have male, female, and hermaphrodite flowers on distinct plants.

We have but one Species of this genus, viz.

Ceratonia (*Siliqua.*) H. L. The Carob-tree, or St. John's Bread. Siliqua edulis of Caspar Bauhin, and the Caroba of Dale.

This tree is very common in Spain, and in some parts of Italy, as also in the Levant, where it grows in the hedges, and produces a great quantity of long, flat, brown-coloured pods, which are thick, meally, and of a sweetish taste. These pods are many times eaten by the poorer sort of inhabitants when they have a scarcity of other food, but they are apt to loosen the belly, and cause gripings of the bowels. The pods are directed by the College of Physicians to enter some medicinal preparations, for which purpose they are often brought from abroad.

In England the tree is preserved by such as delight in exotic plants, as a curiosity; the leaves always continue green, and being different in shape from most other plants, afford an agreeable variety when intermixed with Oranges, Myrtles, &c. in the green-house.

These plants are propagated from seeds, which, when brought over fresh in the pods, will grow very well, if they are sown in the spring upon a moderate hot-bed; and when the plants are come up they should be carefully transplanted each into a separate small pot filled with light rich earth, and plunged into another moderate hot-bed, observing to water and shade them until they have taken root; after which you must let them have air, in proportion to the heat of the weather. In June you must inure them to the open air by degrees; and in July they should be removed out of the hot-bed, and placed in a warm situation, where they may remain until the beginning of October, when they should be removed into the green-house, placing them where they may have free air in mild weather; for they are pretty hardy, and require only to be sheltered from hard frosts. When the plants have remained in the pots three or four years, and have gotten strength, some of them may be turned out of the pots in the spring, and planted into the full ground, in a warm situation, near a south wall, where they will endure the cold of our ordinary winters very well, but must have some shelter in very hard weather.

I have not as yet seen any of these trees produce flowers, though from some which have been planted some time against walls, it is probable there may be flowers and fruit in a few years; though it cannot be expected that the fruit will ever ripen in this country.

CERBERA. Lin. Gen. Plant. 260. Thevetia. Lin. Hort. Cliff. 76. Prod. Leyd. 413. Ahouai. Tourn. Inst. R. H. 657. tab. 434.

The Characters are,

*The empalement is composed of five sharp-pointed leaves, which spread open and fall away. The flower is of one leaf, funnel-shaped, having a long tube spread open at the top, where it is divided into five large obtuse segments, standing oblique to the mouth of the tube; it hath five stamina situated in the middle of the tube, which are terminated by erect summits; these stand close together. In the center is situated a roundish germen, supporting a short style, crowned by a stigma in form of a head. The germen afterward becomes a large, fleshy, roundish berry, with a longitudinal furrow on the side, dividing it into two cells, each containing a single, large, compressed nut.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The Species are,

1. Cerbera (*Ahouai*) foliis ovatis. Lin. Sp. Plant. 208. *Cerbera with oval leaves.* Ahouai. Thevet. Antarct. 66. Tourn. Inst. 658. *The Ahouai.*
2. Cerbera (*Thevetia*) foliis linearibus, longissimis, confertis. Lin. Sp. Plant. 209. *Cerbera with very long narrow leaves growing in clusters.* Ahouai Nerii folio, flore luteo. Plum. Cat. 20. *Ahouai with a Rose-bay leaf, and a yellow flower.*
3. Cerbera (*Manghas*) foliis lanceolatis, nervis transversalibus. Flor. Zeyl. 106. *Cerbera with spear-shaped leaves and transverse nerves.* Manghas lactescens, foliis Nerii crassis venosis, Jasmini flore, fructu Persici simili venenato. Burm. Zeyl. 150. tab. 70.

The first sort grows naturally in the Brazils, and also in the Spanish West Indies in plenty; and there are some of the trees growing in the British islands of America; this rises with an irregular stem to the height of eight or ten feet, sending out many crooked diffused branches, which toward their tops are garnished with thick succulent leaves about three inches long, and near two broad, of a lucid green, smooth, and very full of a milky juice, as is every part of the shrubs. The flowers come out in loose bunches at the end of the branches, of a cream colour, having long narrow tubes at the top cut into five obtuse segments, which seem twisted, so as to stand oblique to the tube; these spread open, and have the appearance of the flowers of Oleander. It flowers in July and August, but never produces fruit in England. The wood of this tree stinks most abominably, and the kernels of the nuts are a most deadly poison; so that the Indians always caution their children against eating them, for they know of no antidote to expel this poison; nor will any of them use the wood of this tree for fuel, but they take the kernels out of the shells, into which they put small stones, then bore a hole through each shell, and string them; these they tie about their legs to dance with, as the morris-dancers use bells.

The second sort grows naturally in the Spanish West Indies, and also in some of the French islands in America, and hath lately been introduced into the British islands, from whence I received the seeds by the title of French Physic Nut; but how it came by that appellation, I cannot imagine, because there is another plant which grows common there, and has passed under that title many years.

This rises with a round stalk about the same height as the former, dividing upward into many branches. These, when young, are covered with a green smooth bark, but as they grow older, the bark becomes rough, but changes to a gray or Ash-colour. The leaves are four or five inches long, and half an inch broad in the middle, ending in sharp points, of a lucid green, and come out in clusters without order, and are full of a milky juice, which flows out when they are broken. The flowers come out from the side of the branches upon long foot-stalks, each supporting two or three yellow flowers with long tubes, spreading open in the same manner as the former. It flowers about the same time as the former, but never produces fruit in England.

The third sort grows naturally in India, and also in some parts of the Spanish West Indies, from whence I received the seeds; this rises with a woody stem to the height of twenty feet, sending out many branches toward the top, garnished with long spear-shaped leaves, which are rounded at their ends; they are thick, succulent, and, on their upper side, of a lucid green, having several transverse nerves from the midrib to the side; on their under side they are of a paler green. The flowers are produced at the end of the branches, standing on long foot-stalks, each sustaining two or three flowers shaped like those of the other species.

These plants may be propagated from their nuts, which must be procured from the countries where they grow naturally; these should be put into small pots filled with light earth, and plunged into a hot-bed of tanners bark in the spring, and treated in the same manner as other tender exotic seeds, giving them now and then a little water to promote their vegetation. When the plants are come up about two inches high, they should be transplanted each into a separate pot, filled with light sandy earth, and plunged again into a hot-bed of tanners bark, observing to shade the glasses in the heat of the day, until the plants have taken new root; they must also be frequently refreshed with water, but it must not be given in too large quantities. As the summer advances, these plants should have air admitted to them in proportion to the warmth of the season; and when they have filled these small pots with their roots, they should be turned out and transplanted into other pots of a larger size, but they must not be too large; for the roots of these plants should be confined, nor should the earth in which they are planted be rich, but a light sandy soil is best for them; after they are new potted they should be plunged into the hot-bed again, observing to water them now and then, as also to admit air under the glasses every day in proportion to the warmth of the season. When the plants are grown about a foot high, they should have a larger share of air, in order to harden them before the winter, but they should not be wholly exposed to the open air. In the winter these plants should be placed in a warm stove, and during that season they should have very little water given to them, especially in cold weather, lest it should rot their roots. In the following spring these plants should be shifted again into other pots, at which time you should take away as much as you conveniently can of the old earth from their roots, and afterwards cut off the decayed fibres; then put them into pots filled with the same light sandy earth, and plunge them into the bark-bed again, for these plants will not thrive well unless they are constantly kept in tan: and as they abound with milky juice, they should be sparingly watered, for they are impatient of moisture, especially during the winter season.

When by any accident the tops of these plants are injured, they frequently put out shoots from their roots, which, if carefully taken up and potted, will make good plants, so that they may be this way propagated.

CERCIS. Lin. Gen. Plant. 458. Siliquastrum. Tourn. Inst. R. H. 646. tab. 414. The Judas-tree, in French *Guainier*.

The Characters are,

*It hath a short bell-shaped empalement of one leaf, which is convex at the bottom, and full of honey liquor; at the top it is indented in five parts. The flower hath five petals, which are inserted in the empalement, and greatly resembles a papilionaceous flower. The two wings rise above the standard, and are reflexed; the standard is of one roundish petal, and the keel is composed of two petals, in form of a heart, which inclose the parts of generation. It hath ten distinct stamina, which decline, four of which are longer than the rest, and are terminated by oblong incumbent summits. It hath a long slender germen,*

*men, sitting upon a slender style, crowned by an obtuse stigma; the germen afterward becomes an oblong pod with an oblique point, having one cell, inclosing several roundish compressed seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, the flower having ten stamina and one style. This genus is by all the writers placed with the papilionaceous flowers, before Linnæus's System, which separates it from them, because the stamina in these flowers are all distinct; whereas the papilionaceous flowers have nine stamina joined together, and one separate.

The Species are,

1. Cercis (*Siliquastrum*) foliis cordato-orbiculatis glabris. Hort. Cliff. 156. *Cercis with round, heart-shaped, smooth leaves.* Siliquastrum. Cast. Duran. 415. and the Arbor Judæ. Dod. Pemp. 786. *The common Judas-tree.*

2. Cercis (*Canadensis*) foliis cordatis pubescentibus. Hort. Cliff. 156. *Cercis with downy heart-shaped leaves.* Siliquastrum Canadense. Tourn. Inst. R. H. 647. *Canada Arbor Judæ, or Red Bud-tree.*

The first sort grows naturally in the south of France, Spain, and Italy, and is by the Spaniards and Portuguese, titled the Tree of Love: this rises with an upright trunk to the height of twenty feet, covered with a dark brown bark, dividing upward into many irregular branches, garnished with round, heart-shaped, smooth leaves, placed irregularly on the branches, having long foot-stalks; they are of a pale green on their upper, and of a grayish colour on their under side, and fall off in autumn. The flowers come out on every side the branches, and many times from the stem of the tree in large clusters, arising from the same point, having short foot-stalks; they are of a very bright purple colour, so make a fine appearance, especially when the branches are covered pretty thick with them: for they come out in the spring with the leaves, so are in full beauty before the leaves have obtained to half their size. The shape of the flower is the same as other papilionaceous (or butterfly) flowers; these have an agreeable poignancy, so are frequently eaten in sallads. When the flowers fall off, the germen becomes a long flat pod with one cell, containing one row of roundish seeds, a little compressed; but these do not often succeed the flowers in this country upon standard trees, for the birds pick off the flowers when fully open; but where they have been planted against good aspected walls, I have seen great plenty of the pods, which, in warm seasons, have ripened very well.

These trees are usually planted with other flowering trees and shrubs for ornaments to pleasure-gardens, and for their singular beauty, deserve a place as well as most other sorts; for when they are arrived to a good size, they are productive of flowers, so as that the branches are often closely covered with them; and the singular shape of their leaves make a very pretty variety in the summer, and are seldom damaged by insects, so that they are often entire, when many other trees have their leaves almost eaten up. This tree flowers in May, when planted in the full air, but against warm walls it is a fortnight or three weeks earlier.

The wood of this tree is very beautifully veined with black and green, and takes a fine polish, so may be converted to many uses.

There are two other varieties of this tree, one with a white, and the other hath a flesh-coloured flower, but these have not half the beauty of the first. Tournefort also mentions one with broader pods and pointed leaves, which I believe is only a variety of this.

The second sort grows naturally in most parts of North America, where it is called Red Bud, I suppose from the red flower-buds appearing in the spring before the leaves come out; this grows to a middling stature in the places where it is a native, but in England rarely rises with a stem more than twelve feet high, but branches out near the root. The branches of this are weaker than those of the first sort; the leaves are downy, and terminate in points; whereas those of the first are smooth, and round at the end where they are indented. The flowers of this are also smaller, so do not make so fine appearance as those of the first; but the trees are equally hardy, and will thrive in the open air very well.

The flowers of this sort are frequently put into sallads by the inhabitants of America; and the French in Canada pickle the flowers, but these have little flavour. The wood of this tree is of the same colour and texture as that of the first.

These plants may be propagated by sowing their seeds upon a bed of light earth, towards the latter end of March, or the beginning of April (and if you put a little hot dung under the bed, it will greatly facilitate the growth of the seeds;) when the seeds are sown, sift the earth over them about half an inch thick; and, if the season prove wet, it will be proper to cover the bed with mats, to preserve it from great rains, which will sometimes burst the seeds, and cause them to rot; the seeds will often remain till the spring following before they come up, so the ground must not be disturbed till you are convinced that the plants are all come up; for some few may rise the first year, and a greater number the second.

When the plants are come up they should be carefully cleared from weeds, and in very dry weather must be now and then refreshed with water, which will greatly promote their growth. The winter following, if the weather is very cold, it will be proper to shelter the plants, by covering them either with mats or dry straw in hard frosts, but they should constantly be opened in mild weather, otherwise they will grow mouldy and decay.

About the beginning of April, you should prepare a spot of good fresh ground, to transplant these out (for the best season to remove them is just before they begin to shoot;) then you should carefully take up the plants, being careful not to break their roots, and plant them as soon as possible, because if their roots are dried by the air, it will greatly prejudice them.

The distance these should be planted, must be proportionable to the time they are to remain before they are again transplanted; but commonly they are planted two feet row from row, and a foot asunder in the rows, which is full room enough for them to grow two or three years, by which time they should be transplanted where they are designed to remain; for if they are too old when removed, they seldom succeed so well as younger plants.

The ground between the plants should be carefully kept clean from weeds in summer, and in the spring should be well dug to loosen the earth, that their roots may extend themselves every way; at that season prune off all strong side branches (especially if you intend to train them up for standard trees,) that their top branches may not be checked by their side shoots, which often attract the greatest part of the nourishment from the roots; and if their stems are crooked, you must place a strong stake down by the side of each plant, and fasten the stem to it in several places, so as to bring it strait, which direction it will soon take as it grows larger, and thereby the plants will be rendered beautiful.

When they have remained in this nursery two or three years, they should be transplanted in the spring where they are designed to remain, which may be in wilderness quarters among other flowering trees, observing to place them with trees of the same growth, so as they may not be overhung, which is a great prejudice to most plants.

CEREFOLIUM. See Chærefolium.

CEREUS. Par. Bat. 122. Boerh. Ind. alt. 1. 292. Juss. Act. R. Par. 1716. Cactus. Lin. Gen. Plant. 539. The Torch Thistle.

The Characters are,

*It hath an oblong scaly empalement, which is covered with spines, and sits upon the germen. The flower is composed*

*of a great number of narrow pointed petals, which spread open like the sun's rays. It hath a great number of declining stamina, which are inserted to the base of the petals, and are terminated by oblong summits. The germen, which is situated under the empalement, supports a long cylindrical style, crowned with a multifid stigma, in form of a head. The germen afterward becomes an oblong succulent fruit, with a prickly skin, full of small seeds inclosed in the pulp.*

Dr. Linnæus has joined the plants of this genus, and also those of Opuntia to the Cactus, making them only species of the same genus; but as the flowers of these plants differ greatly in their form from those of the Cactus, they should be separated; and by preserving the title to this genus, by which it has been long known, it will prevent confusion; and by increasing the number of genera, the specific differences may be better ascertained. Linnæus places the genus of Cactus in his twelfth class, intitled Icosandria, in which he includes those plants, whose flowers have from nineteen to thirty stamina, which are fastened to the petals.

The Species are,

1. Cereus (*Hexagonus*) erectis, sexangularis, longus, angulis distantibus. *Upright long Cereus with six angles, which are far distant.* Cereus erectus altissimis Surinamensis. Par. Bat. 116. *Tallest upright Torch Thistle of Surinam.*
2. Cereus (*Tetragonus*) erectis quadrangularis, angulis compressis. *Upright Cereus with four compressed angles.* Cereus erectus quadrangularis, costis alarum instar assurgentibus. Boerh. Ind. alt. 293. *Four-cornered upright Torch Thistle.*
3. Cereus (*Lanuginosus*) erectus octangularis, angulis obtusis, superne inermibus. *Upright Cereus with eight obtuse angles, having no spines on the upper part.* Cereus erectus, fructu rubro non spinoso. Par. Bat. 114. *Upright Torch Thistle with a red fruit, having no spines.*
4. Cereus (*Peruvianus*) erectus octangularis, angulis obtusis, spinis robustioribus patulis. *Upright Cereus with eight angles which are obtuse, and strong spreading spines.* Cereus erectus maximus fructu spinoso rubro. Dadus. Par. Bat. 113. *Greatest upright Torch Thistle with a red prickly fruit.*
5. Cereus (*Repandus*) erectus novemangularis, obsoletis angulis, spinis lanâ brevioribus. *Upright Cereus with nine angles, and spines shorter than the down.* Cereus Curassavicus, erectus, maximus, fructu rubro non spinoso, lanugine flavescente. Par. Bat. 115. *Greatest upright Torch Thistle with a red fruit, having no spines, and a yellowish down.*
6. Cereus (*Heptagonus*) erectus octangularis, spinis lanâ longioribus. *Upright Cereus with seven or eight angles, and spines longer than the down.* Cereus erectus crassissimus maximè angulosus, spinis albis pluribus longissimis, lanugine flavâ. Boerh. Ind. alt. 293. *Upright thickest Torch Thistle, having many angles, several very long white spines, and a yellow down.*
7. Cereus (*Royeni*) erectus novemangularis, spinis lanâ æqualibus. *Upright Torch Thistle with nine angles, and spines of equal length with the down.* Cereus erectus, gracilis, spinosissimis, spinis flavis, polygonus, lanugine albâ pallescente. Boerh. Ind. alt. 293. *Upright slender Torch Thistle, very full of yellowish spines, many angles, and a pale white down.*
8. Cereus (*Gracilis*) erectus gracilior novemangularis spinis brevibus, angulis obtusis. *Slenderer upright Torch Thistle having nine obtuse angles, and short spines.* Cereus altissimis, gracilior, fructu extus luteo intus niveo, seminibus nigris pleno. *Tallest slender Torch Thistle with a fruit yellow without, white within, and full of black seeds.*
9. Cereus (*Triangularis*) repens triangularis, fructu maximo rotundo, rubro, esculento. *Creeping triangular Torch Thistle, with very large, round, red, eatable fruit.* Cereus scandens minor trigonus articulatis fructu suavissimo. Par. Bat. Prod. 118. *Lesser, creeping, three-cornered, jointed Torch Thistle, with a very sweet fruit, commonly called in the West Indies, the true prickly Pear, and by the Spaniards Pithatiaya.*
10. Cereus (*Compressus*) repens triangularis, angulis compressis. *Creeping triangular Torch Thistle, with compressed angles.* Ficoides Americanum, s. Cereus erectus, cristatus, foliis triangularibus profundè canaliculatis. Pluk. Phyt. tab. 29. f. 3. *Crested American Torch Thistle, with three angles deeply channelled.*
11. Cereus (*Grandiflorus*) repens subquinquangularibus. *Creeping Torch Thistle with five angles.* Cereus scandens minor polygonus articulatis. Par. Bat. 120. *Lesser jointed climbing Torch Thistle with many angles.*
12. Cereus (*Flagelliformis*) repens decemangularis. *Creeping Cereus with ten angles.* Cereus minor scandens, polygonus, spinosissimis, flore purpureo. Ed. Prior. *Lesser climbing Torch Thistle, with many spinous angles and a purple flower.*

The first sort has been the most common in the English gardens. This grows naturally in Surinam, from whence it was brought to the gardens in Holland, where it produced flowers in the year 1681, and from the Dutch gardens, most parts of Europe have been supplied with this plant.

This rises with an upright stalk, having six large angles, which are far asunder, armed with sharp spines, which come out in clusters at certain distances, arising from a point, but spread open every way like a star; the outer substance of the plant is soft, herbaceous, and full of juice, but in the center there is a strong fibrous circle running the whole length, which secures the stem from being broke by winds. These will rise to the height of thirty or forty feet, provided their tops are not injured, if they have room to grow; but some of them have grown too tall to be kept in the stoves, so have either been cut off, or the plants laid down at length in winter; but whenever the stems are cut, or otherwise injured, they put out one, two, or sometimes three shoots, from the angles, immediately under the wounded part, and frequently one or two lower down. These shoots, if they are not cut off, form so many distinct stems, and grow upright; but these seldom are so large as the principal stem, especially if more than one is left on the same plant. The flowers come out from the angles on the side of the stem; these have a thick, fleshy, scaly foot-stalk, round, channelled, and hairy, supporting a swelling germen, upon the top of which sits the scaly prickly empalement, closely surrounding the petals of the flowers, till a little time before they expand, which in most of the sorts is in the evening, and their duration is very short, for before the next morning they wither and decay. The flower of this sort is composed of many concave petals, which, when fully expanded, are as large as those of the Hollyhock; the inner petals are white, and crenated at their extremity. The empalement is green, with some purple stripes; the middle of the flower is occupied by a great number of stamina, which decline, and rise at their extremities, having roundish summits. The flowers of this kind are never succeeded by fruit in this country, nor do the plants often produce their flowers here; but when they do, there are generally several on the same plant. I have some years had more than a dozen upon a single plant, which have all flowered within a few days of each other. The usual time of its flowering is in July.

This sort is not so tender as the others, so may be preserved in a warm green-house, without any artificial heat; but the plants should have no water given them in winter, when they are thus situated; for unless they are placed in a stove, where the moisture is soon evaporated, the wet will occasion them to rot.

These plants naturally grow upon very dry rocky places, where their roots are confined, so they must not be planted in large pots, nor should they be planted in rich soil; the best compost for them is one third light earth from a common, a third of sea sand, and the other part sifted lime-rubbish; if these are well mixed together, and often turned over before the plants are put into it, they will thrive the better. The farther directions for their management, will be hereafter exhibited.

The second sort rises with an upright stem like the first, but it hath only four angles, which are compressed, and stand far asunder. This is very subject to put out many shoots from the sides, which stops its upright growth, so that the plants rarely rise more than four or five feet high. This hath not flowerd in England, so far as I have been able to learn. The third, fourth, fifth, sixth, seventh and eighth sorts grow naturally in the British islands of America, from whence I received them in the year 1728. These have the same form as the first, but differ in the size of their stems, the number of angles, and the length of their spines, as is before expressed in their titles; but, except the eighth sort, not any of them have flowered in England as yet, though there are many of the plants which are more than twelve or fourteen feet high: the eighth sort hath the smallest stem of any of the upright sorts which I have yet seen; this hath generally nine obtuse angles, which are armed with short spines, placed at farther distances than those of the other sorts, nor are the channels between the angles near so deep. The flowers of this are produced from the angels, in the same manner as the first, but they are smaller, and the empalement is of a light green, without any mixture of colour. The fruit is about the size and shape of a middling Bergamot Pear, having many soft spines on the skin; the outside is a pale yellow, the inside very white, full of pulp, having a great number of small black seeds lodged in it. This sort frequently flowers in July, and in warm seasons will perfect its fruit, which hath very little flavour in this country.

These sorts are more impatient of cold than the first, so require a stove to preserve them in winter; nor should they be exposed abroad in summer, but kept constantly in the house, giving them a large share of air in warm weather.

The twelfth sort grows naturally in Peru, from whence it was sent to the royal garden at Paris; and in the year 1734, I was favoured with some cuttings of it by Dr. Bernard de Jussieu, demonstrator of the plants in that garden. These succeeded in the Chelsea garden, and have since been communicated to most of the curious gardens in England. This is not so tender as the other sorts, so may be preserved in a good green-house, or placed under a hot-bed frame in winter, and in summer should be exposed to the open air, which will prevent the shoots from drawing weak, and thereby a greater number of flowers will be produced; but during the time they remain in the open air, they should have little water; and if the season should prove wet, the plants should be screened from it, otherwise it will cause them to rot the following winter. This sort produces its flowers in May, and sometimes earlier, when the season is warm.

The ninth sort is, by the inhabitants of Barbadoes, trained up against their houses for the sake of its fruit, which is about the bigness of a Bergamot Pear, and of a most delicious flavour. This, and also the tenth, eleventh, and twelfth sorts, are tender, so require a warm stove to preserve them. These should be placed against the walls of the stove, into which they will insinuate their roots, and extend themselves to a great length; and with a little help, in fastening them to the wall in a few places, may be led up about the cieling of the house, where they will appear very handsome. And the eleventh sort, when arrived to a sufficient strength, will produce many exceeding large, beautiful, sweet-scented flowers; but they are (like most of the flowers of these kinds) of very short duration, scarcely continuing full blown six hours; nor do the same flowers ever open again, when once closed: they begin to open in the evening between seven and eight of the clock, are fully blown by eleven, and by three or four the next morning fade, and hang down quite decayed; but, during their continuance, there is scarce any flower of greater beauty, or that makes a more magnificent appearance; for the calyx of the flower, when open, is near a foot diameter; the inside of which, being of a splendid yellow colour, appears like the rays of a bright star, the outside of a dark brown; and the petals of the flowers being of a pure white, adds to the lustre; and the vast number of recurved stamina, surrounding the style in the center of the flower, make a fine appearance; and add to this the fine scent of the flower, which perfumes the air to a considerable distance: there is scarce any plant which deserves a place in the hot-house so much as this, especially as it is to be trained against the wall, where it will not take up room. The usual season of its flowering is in July, and when the plants are large, they will produce a great number of flowers, so that there will be a succession of them for several nights, and many of them will open the same night. I have frequently had six, eight, or ten flowers open at the same time upon one plant, which have made a most magnificent appearance by candle-light, but none of them have been succeeded by any appearance of fruit.

The tenth sort produces a flower little inferior to the former, as I have been informed by persons who have seen them; but I never had the good fortune to have any of these plants which have been under my care flower; nor have I heard of more than two gardens where they have as yet flowered in England; the first of them was many years since in the royal gardens at Hampton Court, when there was a curious collection of exotic plants kept in good order in those gardens, which have since been greatly neglected; the other was produced in the gardens of the right honourable the Marquis of Rockingham, at Wentworth-Hall, in Yorkshire. These are the only gardens in this country where I have heard of this sort having produced flowers; although there are many of these plants in several gardens, which are of a considerable age, and extend their branches to a very great distance.

The ninth sort has never produced any flowers as yet in England, nor have we any good figure of the flower in any of the botanic books; but I have been informed by some curious persons who have resided in America, that the flowers are not near so beautiful as those of the tenth and eleventh, but the fruit is greatly esteemed by all the inhabitants.

The twelfth sort produces a greater number of flowers than either of the other; these are of a fine Pink colour, both within and without; the petals are not so numerous, and the tube of the flower is longer than those of the other species; and, contrary to all the other sorts, keep open three or four days, provided the weather is not too hot, or the place where they stand kept too warm. During the continuance of these flowers, they make a fine appearance. This sort has very slender trailing branches, which require to be supported; but these do not extend so far as those of the other sort, nor are their branches jointed as those are, so they cannot be trained so far against the walls of the house; but as it produces such beautiful flowers, and in so great plenty, it may be placed among the first class of exotic plants. This plant has produced fruit in the garden at Chelsea, but it hath not as yet ripened.

These plants are all propagated by cuttings, so that if you intend to increase the number of them, you must cut off the stems of the upright sorts at what length you please; these should be laid in a dry place to heal the part cut, at least a fortnight or three weeks before they are planted; but if they lie a month it is much the better, and they will be in less danger of rotting, especially those sorts which are the most succulent.

These cuttings should be planted in pots filled with the mixture of earth before directed, laying some stones in the bottom of the pots to drain off the moisture; then place the pots into a gentle hot-bed of tanners bark, to facilitate their rooting, giving them once a week a gentle watering.



The

The best season for this work is in June, or the beginning of July, that they may have time to root before winter; towards the middle of August you must begin to give them air by degrees, to harden them against winter, but they should not be wholly exposed to the open air or sun; at the end of September they must be removed into the stove, or green-house, where they are to abide the winter, during which season you must be very careful not to let them have much water; and always observe to place the young plants, for the first winter, in a little warmer situation than the older plants, as being somewhat tenderer.

These plants should always have a dry situation in winter, for as they imbibe the greatest part of their nourishment from the circumambient air, so if this be too replete with moist particles, it will occasion their rotting; therefore they should not be exposed abroad, not even in the midst of summer, unless they are under shelter; for great rains, which often happen at that season, are very injurious to them; the first eight sorts should be therefore placed so as to enjoy a free air in the summer, but, at the same time, screened from rains and great dews; it will therefore be much the better method to set them in an open glass stove, where the windows may be set open in good weather, and shut in cold or wet. The other four sorts must not be exposed too much to the open air, even in the hottest season, especially if you design to have them flower; and in winter they should be kept very warm, and have no water given them.

When you have once cut off the tops of any of these plants, in order to increase them, the lower parts will put forth fresh shoots from their angles, which, when grown to be eight or nine inches long, may also be taken off to make fresh plants; and, by this means, the old plants will continually afford a supply, so that you never need cut off above one plant of a sort, which you should preserve for a breeder.

These plants being succulent, they will bear to be a long time out of the ground; therefore whoever hath a mind to get any of them from the West Indies, need give no other instructions to their friends, but to cut them off, and let them lie two or three days to dry; then put them up in a box with dry hay, or straw, to keep them from wounding each other with their spines, and if they are two or three months on their passage, they will keep very well, provided no wet get to them.

CERINTHE. Lin. Gen. Plant. 171. Tourn. Inst. R. H. 79. tab. 16. Honeywort; in French, *Melinet*.

The CHARACTERS are,

*It hath an oblong permanent empalement, cut into five equal parts. The flower hath one petal, having a thick short tube, which swells upward much thicker, and at the brim is quinquefid; the chaps are naked and pervious; it hath five short stamina, terminated by pointed upright summits. In the bottom are situated four germen, supporting a slender style the length of the stamina, crowned by an obtuse stigma; two of the germen afterward becomes so many seeds, which are hard, smooth, plain on one side, but convex on the other, and are inclosed in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. CERINTHE (*Major*) foliis ovato-oblongis, asperis, amplexicaulibus, corollis obtusiusculis, patulis. *Honeywort with oval, oblong, rough leaves, embracing the stalk, and spreading blunt petals.* Cerinthe quorundam major, spinoso folio, flavo flore. J. B. 3. 602. *Greater Honeywort with a prickly leaf, and a yellow flower.*
2. CERINTHE (*Glabris*) foliis oblongo-ovatis, glabris, amplexicaulibus, corollis obtusiusculis, patulis. *Honeywort with oblong, oval, smooth leaves, embracing the stalks, and a spreading blunt petal.* Cerinthe flore rubro purpurascente. C. B. P. 258. *Honeywort with a purplish red flower.*
3. CERINTHE (*Minor*) foliis amplexicaulibus, integris, fructibus geminis, corollis acutis, clausis. Lin. Sp. Plant. 137. *Honeywort with entire leaves, embracing the stalk, a double fruit, and a pointed closed petal.* Cerinthe minor. C. B. P. 258. *Smaller Honeywort.*

The first sort grows naturally in Germany and Italy. This is an annual plant, which rises with smooth branching stalks a foot and a half high, garnished with oval, oblong, prickly leaves, which are of a sea-green, spotted with white, and embrace the stalks with their base; the flowers are produced at the end of the branches, standing between the small leaves, which embrace the stalks; these are long, tubulous, and blunt at the top, where the tube is greatly enlarged; they are yellow, and have a mellous liquor in their tubes, with which the bees are much delighted; and an herbaceous empalement, cut into five parts, which afterward incloses the seeds; these flowers have each four embryos, or germen, but only two of them are fruitful The top of the stalks are reflexed backward, somewhat like those of Turnsole. It flowers in June and July, and the seeds ripen in August and September. If the seeds are not taken as soon as they change black, they drop out of the empalement in a short time; so unless they are carefully gathered up, they will vegetate with the first moist weather.

The second sort is like the first, but the leaves are larger, and smooth, having no prickles on them. The flowers of this are of a purplish red colour, and the plants grow larger. This grows in Italy, and the south of France; it is also an annual plant.

The third sort grows naturally on the Alps, and other mountainous places; this hath slenderer stalks than either of the former, which rise two feet high, and closer garnished with leaves than either of the others; these embrace the stalks with their base, and are of a bluer green colour. The flowers are small, their upper part is deeply cut into five segments, but the mouth of the tube is closely shut up; the empalement is large, and closely surrounds the flower. The flowers are yellow, and appear at the same time with the other sorts. If the seeds of this are permitted to scatter, the plants will come up in autumn, and these will grow much taller, and flower earlier than those which are sown in the spring; this hath been supposed a perennial plant by many, but from many years observation, I could never find these plants continue after they had flowered and perfected their seeds.

The species of this plant are propagated by seeds, which should be sown soon after they are ripe; for, if they are kept till spring, the growing quality of them is often lost; or at least they lie some months in the ground before they grow; the plants are hardy, and if the seeds are sown in a warm situation, they will endure the winter's cold very well without shelter; these autumnal plants are also much surer to produce ripe seeds than those which are sown in the spring, which are generally late in the season before they flower; and consequently if the autumn should not prove very warm, their seeds would not be perfected.

The plants make a pretty variety for large borders in gardens, where, if they are suffered to drop their seeds, the plants will arise without any farther care; so that when a person is once furnished with the several varieties, he need be at no more trouble than to allow each of them a respective place where it may remain, and sow itself; and with this culture, there is a greater certainty of preserving the sorts than in any other management; nor will they perhaps be entirely lost in this way, if it should happen that the season should prevent their ripening seed (as it sometimes proves;) for when great quantities of the seeds have scattered upon the ground, some of them will be buried so deep, in stirring the earth, as not to grow the first year; which, upon being turned up to

to the air the succeeding year, will come up as well as new seeds.

CESTRUM. Lin. Gen. Plant. 231. Jasminoides. Dill. Nov. Gen. 170. Bastard Jasmine.

The CHARACTERS are,

*It hath a short tubular empalement of one leaf, which is indented at the top into five parts, which are erect. The flower is funnel-shaped, of one petal, having a long cylindrical tube, which spreads open at the top, where it is cut into five equal segments; it hath five slender stamina the length of the tube, to which they adhere, and are terminated by roundish four-cornered summits. The oval cylindrical germen is situated in the empalement, supporting a slender style the length of the stamina, crowned by an obtuse thick stigma. The germen afterward becomes an oval oblong berry with one cell, inclosing several roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. CESTRUM (*Nocturnum*) floribus pedunculatis. Hort. Cliff. 490. *Cestrum with flowers standing upon foot-stalks.* Jasminoides foliis Pishaminis, flore virescente noctu odoratissimo. Hort. Elth. 183. tab. 153. *Bastard Jasmine with leaves of Pishamin, and a greenish flower, smelling very sweetly in the night.*
2. CESTRUM (*Diurnum*) floribus sessilibus. Hort. Cliff. 491. *Cestrum with flowers growing to the branches.* Jasminoides laureolæ folio, flore candido interdiu odorato. Hort. Elth. 186. tab. 154. *Bastard Jasmine with a Spurge Laurel leaf, and a white flower, smelling in the day.*
3. CESTRUM (*Nervosum*) foliis lanceolatis oppositis nervis transversalibus, pedunculis ramosis. *Cestrum with spear-shaped leaves growing opposite, having transverse veins, and branching foot-stalks to the flowers.* Jasminoides Americanum, lauri folio, flore albo odorato. Houst. MSS. *Bastard Jasmine of America with a Bay leaf, and a white, sweet, smelling flower.*
4. CESTRUM (*Spicatum*) foliis ovato-lanceolatis, floribus spicatis, alaribus & terminalibus. *Cestrum with oval spear-shaped leaves, and flowers growing in spikes from the sides and tops of the branches.*
5. CESTRUM (*Confertum*) foliis oblongo-ovatis, obliquis, floribus alaribus confertis, tubo longissimo & tenuissimo. *Cestrum with oblong oval leaves which are oblique, and flowers growing in clusters from the sides of the branches, with a very long slender tube.*
6. CESTRUM (*Venenatum*) foliis lanceolatis obliquis, floribus alaribus, pedunculis foliosis. *Cestrum with oblique spear-shaped leaves, flowers proceeding from the sides of the branches, and leafy foot-stalks.* Jasminum lauri-nis foliis, flore pallidè luteo, fructu atrocæruleo polypyreno venenato. Sloan. Hist. Jam. 2. p. 196. *Jasmine with Bay leaves, a pale yellow flower, and a dark blue fruit with many seeds, which are poisonous.*

The first sort was many years past raised in the curious gardens of the Duchess of Beaufort, at Badmington, in Gloucestershire, and was from thence communicated to several gardens in England and Holland, where in the latter it passes under the title of Badmington Jasmine to this time. This grows naturally in the island of Cuba, from whence I received the seeds by the title of Dama de Noche, i. e. Lady of the Night; which appellation I suppose was given it, from the flowers sending out a strong odour after the sun is set.

It rises with an upright stalk about six or seven feet high, covered with a grayish bark, and divides upward into many slender branches, which generally incline to one side; and are garnished with leaves placed alternate, which are near four inches long, and one and a half broad, smooth on their upper side, of a pale green, and on their under side they have several transverse veins, and are of a sea-green colour, having short foot-stalks. The flowers are produced at the wings of the leaves, in small clusters, standing upon short foot-stalks, each sustaining four or five flowers, which have very short empalements, with long slender tubes, which are enlarged at the top, where they are cut into five parts which are reflexed; these are of an herbaceous colour; they appear in August, but are not succeeded by berries in this country; but those which I received from America were small, and of a dark brown colour, inclosing several seeds.

The seeds of the second sort were sent me from the Havannah, by the title of Dama de Dio, or Lady of the Day; this rises with an upright stalk to the height of ten or twelve feet, covered with a smooth light green bark, dividing upward into many smaller branches, garnished with smooth leaves near three inches long, and one and a half broad, of a lively green colour, and the consistence of those of the Spurge Laurel; these are ranged alternately on the branches. Toward the upper part of the shoots come out the flowers from the wings of the leaves, standing in clusters close to the branches; they are very white, shaped like those of the former sort, and smell sweet in the day time, from whence it had the appellation of Lady of the Day. The berries of this are smaller than those of the first sort. This flowers in September, October and November.

The third sort was sent me from Carthagena in New Spain, near which place it grows naturally; this rises with a shrubby stalk five or six feet high, covered with a brown bark, and divides upward into many small branches, garnished with spear-shaped leaves, about four inches long, and little more than one broad; they are smooth, of a light green, and have many horizontal veins running from the midrib to the sides, and are placed opposite. From the wings of the leaves, toward the upper part of the branches, are produced the flowers, standing upon branching foot-stalks, each sustaining four or five flowers, whose tubes are swelling at their base, just above the empalement, but contract upward to the mouth, where the petal is cut into five broad segments which spread flat; they are white, but without scent.

The fourth sort was sent me from Carthagena with the former. This rises with a shrubby stalk ten or twelve feet high, covered with a light gray bark, and sends out many branches the whole length, garnished with oval spear-shaped leaves, standing without order; they are two inches and a half long, and one and a half broad, of a light green, with slender foot-stalks. The flowers come out in loose spikes from the side, and also the end of the branches, which are shaped like those of the first sort, and are of a whitish green colour, without scent. These are succeeded by roundish purple berries, the size of large Pease, which have a soft juicy pulp, filled with flat seeds.

The fifth sort rises with several shrubby stalks eight or ten feet high, covered with a white smooth bark, sending out many irregular branches, garnished with oblong oval leaves, which at their base are longer on one side, so that the foot-stalk is oblique; they are placed on the branches without order, and are of a pale green. The flowers come out in clusters from the side of the branches, many of them arising from the same point; these have very slender long tubes, which are cut at the top into five acute segments which are erect. They are of a pale yellow, and without scent.

The sixth sort grows naturally in Jamaica, from whence it was sent me by the late Dr. Houstoun. This rises with a woody stem eight or nine feet high, covered with a smooth brown bark, and sends out many branches on the side which grow erect, garnished with oval spear-shaped leaves, whose foot-stalks are short; they are five inches long, and two broad, smooth, of the consistence with Bay leaves, and are placed alternate on the branches. From the wings of the leaves the flowers are produced, most part of the length of the branches; the foot-stalks of the flowers are garnished with small leaves, standing between each flower in a singular manner, the flowers

rising one above the other; and between, or opposite to each, is one, and sometimes two leaves, of the same form with those on the branches. The flowers are of a pale yellow, and emit a disagreeable odour. These are succeeded by oval berries of a Violet colour, full of juice, each containing several flat seeds; they are reckoned very poisonous, so have the appellation of Poison Berries in Jamaica.

This has been, by many of the writers on botany, supposed to be the same with the first; but any person who has seen both sorts growing, cannot doubt of their being distinct species; the shape and size of the leaves are very different, as are also their flowers and berries. Some have also supposed that the Parqui of Pere Feuillé, is the same with this, but that is a great mistake; for the flowers of this plant are produced in loose bunches at the extremity of the branches, whereas those of this sort come out from the side, at the foot-stalks of the leaves; so that this plant is certainly different from either of these, but approaches nearest to the third.

The fifth sort I take to be the same as Pere Plumier's Jasminum aliud arborescens, foliis solani, minus; for by an imperfect specimen of his plant which was shewn me, the leaves appear the same, but as the specimen was without flower or fruit, so I could not determine it.

The first and second sorts produce their flowers every year in England, but the others do but seldom flower here; but as they retain their leaves all the year, so they make a pretty variety in the stove, during the winter season; and when they flower, the branches are commonly well garnished at their joints with bunches of flowers, so they make a fine appearance at that time.

All these plants grow naturally in very hot countries, so cannot be preserved in England without artificial heat; therefore require to be placed in a warm stove, especially in the winter. The two first are hardier than the others; these I have kept several years in a dry stove, with a moderate share of heat in winter, and in the middle of summer have set them in the open air, in a warm situation. With this management I have found them thrive, and produce flowers much better than when they have been placed in a greater heat; but I have often endeavoured to keep these plants through the winter, in a green-house, or a glass case, without fire, but could never succeed; for by the end of January, they commonly decayed.

The other sorts require a larger share of heat, especially when the plants are young; therefore they should be plunged in the tan-bed of the bark-stove, otherwise they will lose their leaves in winter, if they are not quite destroyed; but after three or four years growth, they will bear to be treated more hardily, provided they are inured to it gradually.

These plants may be propagated from seeds, or by cuttings. Those which come from seeds are always the most vigorous, and straitest plants; but as they do not produce seeds in England, so the other method is generally practised, because their seeds are rarely brought hither.

The best time to plant these cuttings is about the end of May, by which time the shoots will have had time to recover their strength, after their confinement during the winter season. The shoots which come out from the lower part of the stalks, should always be chosen for this purpose. These should be cut about four inches long, and five or six of them may be planted in each halfpenny pot; for the cuttings of most sorts of exotic plants, will succeed better when they are planted in these small pots, than they do in larger, as I have many years experienced. The earth in which these are planted, should be fresh and light, but not full of dung: when the cuttings are planted, the earth must be pressed pretty close to them, and then gently watered; after which the pots must be plunged into a moderate hot-bed of tanners bark, and every day shaded from the sun. They must also have fresh air admitted to them in warm weather, and two or three times a week refreshed with water. With this management the cuttings will put out roots in five or six weeks, when they should be gradually exposed to the sun; and when they begin to put out shoots, they must have a greater share of fresh air admitted to them, to prevent their drawing up weak; and their waterings should be oftener repeated, but given in small quantities, for their young tender fibres will not endure much wet. When they have made good roots, they should be carefully shaken out of the pots, and each put into a separate small pot, filled with the same sort of earth as before; then give them some water, to settle the earth to their roots, and plunge them again into the tan-bed; observing if any of their leaves hang down, to shade them from the sun in the middle of the day, until they have taken fresh root; after which they should have a large share of air in warm weather, to strengthen them before winter. Their waterings in the summer should be frequent; and if they are sprinkled all over their leaves, it will wash and cleanse them from filth, which will greatly promote their growth; but their roots must not be kept too moist.

In the autumn the plants of the three last sorts must be removed into the bark-stove, and plunged into the tan-bed, where they must be treated in the same manner as other tender exotic plants; but the two first sorts may be treated otherwise, especially when they have obtained strength, yet the first winter they may be managed in the same way as the others. There must be great care had in watering of these plants in winter, for they are all (except the second sort) very impatient of moisture; so that they are soon killed by being over-watered.

If the seeds of these are procured from the countries where they grow naturally, they should be sowed in small pots filled with the earth before directed, and plunged into a moderate hot-bed of tanners bark, giving them now and then a little water. Sometimes the seeds will come up the same year, but they very often lie in the ground till the spring following; so that if the plants do not appear in six or seven weeks after the seeds are sown, they will not come up that season; in which case the pots may be plunged in the tan-bed of the stove, between the other plants, where they will be shaded from the sun, and but little water given them; in this situation they may remain till the following spring, when they should be removed, and plunged into a fresh hot-bed, which will bring up the plants in a short time, provided the seeds were good.

When the young plants are fit to remove, they should be carefully shaken out of the pots, and each planted into a separate pot filled with the before-mentioned earth, and plunged into the hot-bed again, and afterward treated in the same way as hath been directed for the plants raised from cuttings.

CETERACH. See Asplenium.

CHÆROPHYLLUM. Lin. Gen. Plant. 320. Tourn. Inst. R. H. 314. tab. 166. [χαιρέφυλλον, of χαίρω, to rejoice, and φύλλον, *Gr.* a leaf, because the leaves, steeped in wine, and drank, will exhilarate and chear melancholy persons.] Chervil.

The Characters are,

*It is an umbelliferous plant; the principal umbel is spreading and hath no involucrum, composed of several small ones, called rays; the small ones have a five-leaved involucrum, which is reflexed; the flowers have five heart-shaped inflexed petals, and five stamina, which are terminated by roundish summits: the germen is situated below the flower, supporting two reflexed styles, crowned with obtuse stigmas. The germen afterward becomes an oblong pointed fruit, dividing in two parts, each having one seed, which is convex on one side and plain on the other.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flowers having five stamina and two styles.

The

The Species are,

1. Chærophyllum (*Sylvestre*) caule striato geniculis tumidiusculis. Flor. Suec. 2. N. 257. *Wild Chervil with striated stalks, whose joints are swelling.* Myrrhis sylvestris seminibus lævibus. C. B. P. 160. *Wild Myrrh with smooth seeds.*
2. Chærophyllum (*Bulbosum*) caule lævi, geniculis tumidis. Lin. Sp. Plant. 258. *Chervil with a smooth stalk, and swelling joints.* Myrrhis tuberosa & nodosa conyophillon. Mor. Umb. 67. *Tuberous and knotted Myrrh with a Hemlock leaf.*
3. Chærophyllum (*Temulum*) caule scabro, geniculis tumidis. Lin. Sp. Plant. 258. *Chervil with a rough stalk, and swelling joints.* Chærophyllum sylvestre. C. B. P. 152. *Wild Chervil.*
4. Chærophyllum (*Aureum*) caule æquali, foliolis incisis acutis. Lin. Sp. Plant. 258. *Chervil with an equal stalk, and leaves cut into acute segments.* Myrrhis perennis alba minor, foliis hirsutis, semine aureo. Mor. Umb. 282.
5. Chærophyllum (*Hirsutum*) caule æquali, foliolis incisis acutis, seminibus subulatis. Lin. Sp. Plant. 371. *Wild Chervil with an equal stalk, whose small leaves are cut acutely, and awl-shaped seeds.* Myrrhis palustris, latifolia rubra. C. B. P. 161.

The first sort grows naturally on the side of highways, and the borders of the fields in most parts of England, so is never cultivated in gardens. It is frequently called Cow Parsley, but for what reason I cannot say, because there are few animals who care to eat it, except the ass; for it is reckoned to have something of the quality of Hemlock, but in a less degree. It is a weed which should be rooted out from all pastures in the spring, for it is one of the most early plants in shooting; so that by the beginning of April the leaves are near two feet high. The seeds of this plant spread greatly over the ground, and as the roots are perennial, they are often very troublesome weeds to destroy.

The second sort grows naturally in Hungary and Istria. This plant hath a thick tuberous root, from which come forth several leaves resembling those of Wild Chervil, which spread horizontally near the ground. The stalks rise six or seven feet high, which are spotted with purple, and garnished with leaves of the same form as those below. The knots at the joints of the stalks swell out on every side, at which is placed one of these divided leaves; the stalks are terminated by small umbels of white flowers, which are succeeded by long narrow seeds. It flowers in June, and the seeds ripen in August. If the seeds of this plant are permitted to scatter, the plants will come up without any farther care, and only require to be kept clean from weeds.

The third sort grows naturally on the sides of footwalks, and on the borders of woods in many parts of England, so is not cultivated in gardens.

The fourth sort grows naturally in the pastures about Geneva, and in Switzerland; this hath a perennial root, from which come out in the spring many leaves, shaped like those of the first, but narrower, hairy, and more divided. The stalks are channelled, and rise three feet high, garnished with the like leaves; these are terminated by large umbels, formed of many small ones, which are composed of flowers, having five heart-shaped petals, which turn inward; these are succeeded by long pointed seeds. The whole plant has an aromatic smell and taste.

The fifth sort grows naturally on the Alps, and the Helvetian mountains. It is a perennial plant, somewhat resembling the first sort, but their leaves are hairy, and their segments are broader; the stalk rises four feet high, terminated by large umbels of flowers, which in some plants are red, and in others white; these are succeeded by long pointed seeds, two being joined in the same cover.

These plants are preserved in botanic gardens for variety; but as their use either in medicine or the kitchen are not known, they are rarely admitted into other gardens.

CHAMÆCERASUS. See Cerasus and Lonicera.

CHAMÆCISTUS. See Cistus.

CHAMÆCLEMA. See Glechoma.

CHAMÆCYPARISSUS. See Santolina.

CHAMÆDAPHNE. See Ruscus.

CHAMÆDRYS. See Teucrium.

CHAMÆLÆA. See Cneorum.

CHAMÆMELUM. See Anthemis.

CHAMÆMESPILUS. See Mespilus.

CHAMÆMORUS. See Rubus.

CHAMÆNERION. See Epilobium.

CHAMÆPITYS. See Teucrium.

CHAMÆRHODODENDRON. See Azalea and Kalmia.

CHAMÆRIPHES. See Chamærops.

CHAMÆROPS. Lin. Gen. Plant. 1084. Chamæriphes. Pont. 10. Dod. Pempt. 820. Dwarf Palm, or Palmetto.

The Characters are,

*It hath male and hermaphrodite flowers in distinct plants; the hermaphrodite flowers are all included in one common spatha or hood, which is compressed and bifid, and the spadix or club is branching; each flower hath a small three-pointed empalement; they have one thick upright petal, which is cut into three parts, and turns inward at the top, and five compressed stamina which join at their base, terminated by narrow twin summits, joined to the interior part of the stamina. They have three roundish germen, each having a distinct style, which is permanent, terminated by pointed stigma. The three germen afterward become so many round berries, having one cell, each containing a single seed. The male flowers are like the hermaphrodite, but the stamina are not distinct, nor have they any germen.*

This genus of plants is joined with the other kinds of Palms by Dr. Linnæus, and placed in the appendix to his Genera Plantarum; but should be ranged in his twenty-third class, or rather made a distinct class by themselves, because their manner of fructification is very different from most other plants.

The Species are,

1. Chamærops (*Humilia*) frondibus palmatis, plicatis, stipitibus spinosis. Hort. Cliff. 482. *Dwarf Palm with folding palmated leaves, and prickly foot-stalks.* Palma humilis, sc. Chamæriphes. J. B. Hist. 1. 368. *Dwarf Palm, or Palmetto.*
2. Chamærops (*Glabra*) foliis flabelliformibus, maximis, stipitibus glabris. *Dwarf Palm with very large fan-shaped leaves, and smooth foot-stalks.* Palma non spinosa humilima. *Dwarf Palm without spines, commonly called small Palmetto Royal.*

The first sort grows naturally in Spain, particularly in Andalusia, where, in the sandy land, the roots spread and propagate so fast, as to cover the ground in the same manner as the Fern in England. The leaves of these plants are tied together to make besoms for sweeping.

This never rises with an upright stem, but the foot-stalks of the leaves rise immediately from the head of the root, and are armed on each side with strong spines; they are flat on their upper surface, and convex on their under side. The center of the leaves are fastened to the foot-stalk, which spread open like a fan, having many foldings, and at the top are deeply divided like the fingers of a hand; when they first come out, they are closed together like a fan when shut, and are fastened together by strong fibres which run along the borders of the leaves; and when the leaves spread open, these fibres or strings hang from the sides and ends; the borders of the leaves are finely sawed, and have white narrow edgings; they are from nine to eighteen inches long, and near a foot broad in their widest part: as the lower leaves of the plants decay, their vestiges remain, and form a short stump above ground, in the same manner as our common male Fern does; from between the leaves comes out the spadix or club, which sustains the flowers; this is covered with a thin spatha or hood, which falls off when the bunches open and divide.

vide. As all the plants of this sort which I have seen flower were male, I cannot give any particular description of their fructification.

This plant is commonly propagated here by heads, which sometimes separate from the main root; if these are carefully taken off with fibres and planted, they will grow; but the plants so raised are not so good as those which are produced from seeds; so that if good seeds can be procured, that is by much the better way to propagate them. The seeds should be sown in small pots filled with light sandy earth, and plunged into a moderate hot-bed of tanners bark; these must be refreshed now and then with water. If the seeds are fresh, the plants will come up in two months; these rise with a single long-pointed leaf. When they appear they must be now and then refreshed with water, but they must not have it in too great plenty. If the plants are not too close to each other in the pots, they will not require to be transplanted the first year; therefore they should remain in the tan-bed all the summer, but in warm weather they must have plenty of air admitted to them. In autumn the pots should be removed into the stove, and, if they are plunged into the bark-bed the first winter, it will greatly forward the growth of the plants. The following spring the plants should be carefully turned out of the pots, so as to preserve their roots entire; for all the sorts of Palms have tender roots, which, if they are cut off or broken, frequently kill the plants: then they should be each planted into a separate small pot filled with light, sandy, undunged earth, and plunged into a fresh hot-bed to encourage their taking root; the following summer they should be gradually hardened, by raising the glasses pretty high, so as to admit a large share of air to them, but they should not yet be wholly exposed to the open air. The autumn following the plants may be placed in a dry stove; but as the plants advance and get strength, they may be treated more hardily, and in summer placed in the open air in a warm situation, and in winter may be preserved in a warm green-house without artificial heat

As the plants advance in growth, they should be put into larger pots; but when this is done, there must be great care taken, that their roots are not cut or broken, nor should they have pots too large. In winter they must have but little water, and if they are exposed to the open air in summer, they will not require much, unless the season proves very warm and dry, in which case they may be sparingly watered two or three times a week.

The second sort grows naturally in the West Indies, where it never rises with a stem; the foot-stalks of the leaves are rounder than those of the former, and have no spines on their sides. When the plants are old their leaves are three or four feet long, and upward of two broad; these are folded in the same manner as those of the first, but the folds are broader, and the leaves are of a darker green; some of these plants have put out slender bunches of male flowers in England, which were too imperfect to form a description.

This sort rises freely from seeds, which may be easily procured from the islands in America; these must be sown in the same manner as the former, and the plants treated in the same way; but as they are natives of a warmer climate, they should be constantly kept in the bark-stove, where, if they are carefully managed, they will make good progress.

I have received seeds from Carolina of a Dwarf Palm, which is very like this, if not the same; but the plants do not make so good progress here, as those which came from Jamaica; the berries were so like, that I could not distinguish them; but as the plants advance, if they are different, it will appear.

CHAMÆRUBUS. See Rubus.

CHAMÆSYCE. See Euphorbia.

CHEIRANTHUS. Lin. Gen. Plant. 730. Leucojum. Tourn. Inst. R. H. 220. tab. 107. Stock Gilliflower and Wall-flower, in French *Giroffier ou Violier*.

The Characters are,

*It hath a four-leaved compressed empalement; the two outer leaves are swelling at their base. The flower hath four petals placed in form of a cross; these are longer than the empalement. It hath six parallel stamina, which are the length of the empalement, two of which are between the swelling leaves of the empalement, the other are a little shorter, and are terminated by erect bifid summits, which are reflexed at the top. It hath a four-cornered prismatic germen as long as the stamina, supporting a very short compressed style, crowned with an oblong divided stigma, which is reflexed and permanent. The germen afterward becomes a long compressed pod with two cells, opening with two valves, filled with compressed seeds.*

This genus of plants is ranged in the second section of Linnæus's fifteenth class, intitled Tetrandynamia siliquosa, the flowers having two long and four shorter stamina, and the seeds are lodged in long pods.

The Species are,

1. Cheiranthus (*Erysimoides*) foliis lineari-lanceolatis dentatis caule recto, siliquis tetragonis. *Cheiranthus with narrow, indented, spear-shaped leaves, an upright stalk, and four-cornered pods.* Hesperis leucoii folio serrato, siliquâ quadrangulâ. Tourn. Inst. R. H. 223. *Dames Violet with a sawed Wall-flower leaf, and a quadrangular pod.*
2. Cheiranthus (*Integerrimis*) foliis lanceolatis integerrimis, caule erecto, siliquis tetragonis. *Cheiranthus with spear-shaped entire leaves, an upright stalk, and quadrangular pods.* Hesperis leucoii folio non serrato, siliquâ quadrangulâ. Tourn. Inst. R. H. 223. *Dames Violet with a Wall-flower leaf not sawed, and a quadrangular pod.*
3. Cheiranthus (*Cheiri*) foliis lanceolatis, acutis, glabris ramis angulatis. Hort. Cliff. 334. *Cheiranthus with spear-shaped, pointed, smooth leaves.* Leucojum luteum vulgare. C. B. P. *Common yellow Leucojum, or Wall-flower.*
4. Cheiranthus (*Angustifolium*) foliis linearibus, unguibus petalorum calyce longioribus. *Cheiranthus with narrow leaves, and the necks of the petals longer than the empalement.* Leucojum angustifolium Alpinum flore sulphureo. H. R. Par. *Narrow-leaved Wall-flower of the Alps, with a sulphur-coloured flower.*
5. Cheiranthus (*Annuus*) foliis lanceolatis, subdentatis, obtusis, incanis, siliquis cylindricis apice acutis, caule herbaceo. Lin. Sp. Plant. 662. *Cheiranthus with spear-shaped leaves somewhat indented, obtuse, and hoary cylindrical pods, with acute points and an herbaceous stalk.* Leucojum incanum minus. C. B. P. 200. *Lesser hoary Stock Gilliflower, commonly called the Ten Weeks Stock.*
6. Cheiranthus (*Incanus*) foliis lanceolatis, integerrimis, obtusis, incanis, siliquis apice truncatis, compressis, caule suffruticoso. Hort. Upsal. 187. *Cheiranthus with very entire spear-shaped leaves, which are obtuse and hoary, compressed pods with truncated points, and a shrubby stalk.* Leucojum incanum majus. C. B. P. 200. *Greater hoary Stock Gilliflower, commonly called the Queen's Stock Gilliflower.*
7. Cheiranthus (*Coccineus*) foliis lanceolatis undatis, caule erecto indiviso. *Cheiranthus with waved spear-shaped leaves, and an upright undivided stalk.* Leucojum incanum majus Coccineum. Mor. Hist. 2. 240. *Greater hoary Stock Gilliflower with a scarlet flower, commonly called the Brompton Stock Gilliflower.*
8. Cheiranthus (*Albus*) foliis lanceolatis, integerrimis, obtusis, incanis, ramis floriferis axillaribus, caule suffruticoso. *Cheiranthus with hoary, entire, spear-shaped, obtuse leaves, flower branches proceeding from the sides, and a shrubby stalk.* Leucojum album sive purpureum sive violaceum. Ger. *The white, purple, or Violet Stock Gilliflower.*
9. Cheiranthus (*Glabrus*) foliis lanceolatis, acutis, petiolatis, viridibus, caule suffruticoso. *Cheiranthus with spear-shaped acute leaves, which are green, having foot-stalks, and a shrubby stalk.* Leucojum album odoratissimum, folio viridi. C. B. P. 2. 102. *Sweetest white Stock Gilliflower with a green leaf, commonly called white Wall-flower.*

10. CHEIRANTHUS (*Sexiſtalis*) foliis conferto-capitatis, recurvatis, undatis. Lin. Sp. Plant. App. 1198. *Cheiranthus with leaves growing cloſe together in heads, which turn backward, and are waved.*

11. CHEIRANTHUS (*Littoreus*) foliis lanceolatis, ſubdentatis ſubtomentoſis ſubcarnoſis, petalis emarginatis, ſiliquis tomentoſis. Lin. Sp. 925. *Cheiranthus with ſpear-ſhaped, indented, woolly leaves, emarginated petals, and woolly pods.* Leucojum maritimum anguſtifolium. C. B. P. 221. *Narrow-leaved Sea Stock Gilliflower.*

12. CHEIRANTHUS (*Maritimus*) foliis lanceolatis acutiuſculis, caule diffuſo, antheris eminentibus. Amœn. Acad. 4. p. 280. *Cheiranthus with acute ſpear-ſhaped leaves, a diffuſed ſtalk, and eminent antheræ.* Heſperis maritima, ſupina, exigua. Tourn. Inſt. 223. *Small, low, maritime Dames Violet, commonly called Dwarf, or Virginia Stock Gilliflower.*

13. CHEIRANTHUS (*Chius*) foliis obovatis aveniis emarginatis, ſiliquis apice ſubulatis. Hort. Upſal. 187. *Cheiranthus with oval emarginated leaves and pods, whoſe ſummits are awl-ſhaped.* Heſperis ſiliquis hirſutis flore parvo rubello. Hort. Elth. 180. tab. 147. *Dames Violet with hairy pods, and a ſmall reddiſh flower.*

14. CHEIRANTHUS (*Tricuſpidatus*) ſiliquarum apicibus tridentatis foliis lyratis. Hort. Cliff. 335. *Cheiranthus with pods indented in three parts at the point, and lyre-ſhaped leaves.* Heſperis maritima latifolia ſiliquâ tricuſpide. Tourn. Inſt. R. H. 223. *Broad-leaved maritime Dames Violet, with a three-pointed pod.*

15. CHEIRANTHUS (*Sinuatis*) foliis tomentoſis obtuſis ſubſinuatis, ramis integris, ſiliquis muricatis. Lin. Sp. 926. *Cheiranthus with woolly, obtuſe, ſinuated leaves, intire branches, and rough pods.* Leucojum maritimum ſinuato folio. C. B. P. 200.

16. CHEIRANTHUS (*Triſtis*) foliis linearibus ſubſinuatis, floribus ſeſſilibus petalis undatis, caule ſuffruticoſo. Lœfl. *Cheiranthus with linear indented leaves, flowers cloſe to the ſtalk, waved petals, and a ſhrubby ſtalk.* Leucojum minus breviore folio, obſolete flore. Barrel. It. 999.

17. CHEIRANTHUS (*Lacerus*) foliis lacero-dentatis acuminatis, calycibus piloſis, ſiliquis nodoſis mucronatis. Lin. Sp. 926. *Cheiranthus with torn, indented, pointed leaves, hairy empalements, and knobbed, acute-pointed pods.* Leucojum Luſitanicum purpureum, foliis eleganter dentatis. Parad. Bat. 193.

The firſt ſort grows naturally in the ſouth of France, in Spain and Italy; this is an annual plant, which riſes a foot high, with an angular channelled ſtalk, which branches upward on every ſide; theſe are garniſhed with long, narrow, green leaves, reſembling thoſe of the common Wall-flower, but are ſharply indented on their edges, ſitting cloſe to the ſtalks; at the extremity of the branches the flowers are produced in looſe ſpikes; theſe are yellow, having four petals ſituated in form of a croſs, greatly reſembling thoſe of the common yellow Wall-flower, but have no ſcent; theſe are ſucceeded by long four-cornered pods, filled with brown ſeeds. It flowers in June, and the ſeeds are ripe in autumn.

The ſecond ſort grows naturally in Hungary and Iſtria; this is alſo an annual plant, riſing with an upright ſtalk nearly the ſame height as the other, but doth not branch out as that doth. The leaves are broader, ſmoother, and not pointed as thoſe of the other; they ſtand alternately on the ſtalk without any viſible foot-ſtalk, and are of a deep green. The flowers come out in looſe ſpikes at the top of the ſtalks; theſe are ſmall, and of a pale yellow without ſcent, and are ſucceeded by four-cornered pods like thoſe of the former. It flowers, and the ſeeds are ripe at the ſame time with the former.

Theſe two plants have by ſome perſons been ſuppoſed the ſame, but I have cultivated them thirty years, and have never found them alter. If their ſeeds are permitted to ſcatter, the plants will come up without care, and will thrive on any ſoil or ſituation, and upon walls, or in rubbiſh, in the ſame manner as the common Wall-flower.

The ſecond ſort grows naturally upon old walls and buildings in many parts of England; it is alſo cultivated in gardens for the fragrancy of its flowers. When theſe plants grow upon walls or buildings, they ſeldom riſe more than ſix or eight inches high, having very tough roots and firm ſtalks; the leaves are ſhort, and ſharp-pointed, and the flowers are ſmall, but in gardens the plants will grow two feet high, and branch out wide on every ſide; the leaves are broader, and the flowers much larger; but in ſevere winters, when theſe plants are frequently killed in the gardens, thoſe upon the walls will receive no injury, though they are much more expoſed to the winds and froſts; for as theſe plants are ſtunted, and of a firmer texture, having but little juice, the cold never affects them.

There is a variety of this with very double flowers, which is propagated in the gardens from ſlips planted in the ſpring, which readily take root. There is one ſort of this with variegated leaves, which is preſerved in the gardens, but this is not quite ſo hardy as the plain.

The large, yellow, bloody Wall-flower, is alſo ſuppoſed to be a variety of this, which has been improved by culture; and this I am inclinable to believe, becauſe I have frequently obſerved many of them degenerate to the common ſort; but although I have many years ſowed the ſeeds of the common ſort from the walls, yet I could never find them alter, except in being larger, but not any of them approached toward the other varieties. The large bloody Wall-flower will frequently riſe with double flowers from ſeeds, if they are carefully ſaved from ſuch plants as have five petals; and theſe double flowers may be propagated by ſlips as the common ſort, but the plants ſo raiſed will not produce ſuch large ſpikes of flowers as thoſe which are propagated by ſeeds.

There is alſo another variety with double blood-coloured flowers, whoſe petals are ſhorter and more numerous, approaching nearer to the common double Wall-flower, but much larger. This is called the Old Bloody Wall-flower. It is propagated from ſlips, in the ſame manner as the other double ſorts. There are ſome intermediate varieties of theſe flowers, differing in the ſize and colour of their petals, which the floriſts diſtinguiſh as different; but as they conſtantly vary from ſeeds, they do not deſerve notice.

The fourth ſort grows naturally upon the Alps, and the mountains in Italy, where it rarely riſes above ſix inches high; the leaves are very narrow, and the flowers grow in cloſe ſpikes at the end of the branches; they are of a pale yellow, or brimſtone colour, and the necks of the petals are much longer than the empalement; theſe have but little ſcent. When this ſort is cultivated in gardens, it grows as large as the common Wall-flower, and makes a finer appearance, for the ſpikes of flowers are longer, and they grow much cloſer together; but they have little ſcent, which occaſioned their being firſt neglected, and at preſent there are few, if any, of the plants remaining in the Engliſh gardens. It was titled the Straw-coloured Wall-flower by the gardeners.

The ſorts with ſingle flowers produce ſeeds in plenty, from which the plants are raiſed; but the largeſt and deepeſt coloured flowers ſhould always be ſelected for ſeeds, becauſe from ſeeds carefully ſaved, there will be fewer of the plants degenerate. The ſeeds ſhould be ſown in April, upon poor or undunged ſoil, and when the plants are fit to remove, they ſhould be tranſplanted into nurſery-beds, at about ſix inches diſtance each way, obſerving to water and ſhade them until they have taken freſh root; after which they will require no farther care, but to keep them clean from weeds all the ſummer; and at Michaelmas they may be tranſplanted into the borders of the flower-garden where they are deſigned to remain, that the plants may get good roots before the froſt comes on. This is the method which is commonly practiſed with theſe flowers; but if the ſeeds are ſown upon poor land,

where they are designed to remain, and not transplanted, they will thrive, and endure the frost in winter much better than those which are removed; so that upon ruins or rubbish the seeds of these plants may be sown, where they will thrive and continue much longer than in good land; and in such places, if they are properly disposed, they will be very ornamental, and their flowers having a strong odour, will perfume the air to a considerable distance.

The Stock Gilliflowers are distinguished from the Wall-flowers by their hoary leaves. These agree with each other in their botanical characters, so are generally included in the same genus; but the gardeners remove them to a considerable distance, and treat them very differently; yet there is so great affinity between them, as that they may be treated in the same manner, and both will grow equally upon old walls or ruins; but as they have been separated by most of the writers on gardening, I have, in compliance with that custom, ranged them accordingly.

The fifth sort is now generally known by the appellation of ten Weeks Stock, but it is what was formerly titled Annual Stock Gilliflower, which of late has been applied to another species, which is biennial. This rises with a round smooth stalk about two feet high, dividing into several branches upward, garnished with spear-shaped hoary leaves, which are rounded at their ends, and placed without order, sometimes being almost opposite, and others alternate, and frequently three or four together of unequal sizes; at the ends of the branches the flowers are produced in loose spikes, which are placed alternate; the empalement of the flower is large, erect, and slightly cut into several acute parts at the top; the petals are large and heart-shaped, spreading open in form of a cross; the pods are long, cylindrical, and have a longitudinal furrow on one side, which opens in two cells, which are filled with flat roundish seeds, having a thin border. It flowers in July and August, and the seeds ripen in October.

Of this sort there are the red, the purple, the white, and striped, with single flowers, and the same colours with double flowers; these are very great ornaments in the borders of the flower-garden in the autumn, when there is a scarcity of other flowers; and if the seeds are sown at two or three different times, the flowers may be continued in succession near three months.

The first sowing should be about the middle of February, upon a very slender hot-bed, just to bring up the plants, which must be guarded against frost; and when they are fit to remove, they should be transplanted into the nursery beds, at about three or four inches distance, observing to water and shade them till they have taken root, and afterward to keep them clean from weeds; in these beds they may remain five or six weeks to get strength, and may then be planted into the borders of the flower-garden, where they are to remain: if these are transplanted when there is rain, they will soon take root, after which they will require no farther care. From these early plants good seeds may be expected, therefore some of the finest plants of each colour should be preserved, and marked for seeds, which, when ripe, should be carefully cut before the frost pinches it, and the stalks tied up in small bundles, and hung up in a dry room till the pods are well dried, when the seeds may be rubbed out and preserved for use.

The sixth sort is a biennial plant, though when the seeds are sown early in the spring, the plants often flower the following autumn; but these plants which are so forward, are often killed in winter; therefore it is much better to sow them in May, that the plants may not grow too rank the first season; they will live through the winter, and produce large spikes of flowers the second year.

This is commonly called the Queen's Stock Gilliflower by the gardeners, and differs greatly from the other sorts, though many of the late botanists have supposed they were only seminal variations; but from near forty years experience in the culture of these plants, I can affirm, that the species here enumerated, do not alter from one to the other, though they frequently vary in the colour of their flowers.

It rises with a strong stalk, which is almost shrubby, a foot high or more, having oblong, spear-shaped, hoary leaves, which are frequently waved on their edges, and turn downward at the extremity; from the stalk is sent out many lateral branches, which are garnished with the same shaped leaves, but smaller; these side branches are each terminated by a loose spike of flowers, each having an oblong woolly empalement, and consist of four large roundish petals, which are indented at the end. These usually appear in May and June, but the same plants frequently continue flowering most part of the summer. The seeds ripen in autumn, and the plants generally perish soon after; but when any of them grow in dry rubbish, they will last two or three years and become shrubby; but those with single flowers, are not worth preserving after they have perfected their seeds. The flowers of this sort vary in their colour; some are of a pale red, others are of a bright red, and some are curiously variegated, but those of the bright red are generally most esteemed. There is always a great number of double flowers produced, if the seeds are well chosen, frequently three parts in four of the plants will be double; and as the plants divide into many branches, they make a fine appearance during their continuance in flower.

The seventh sort is known by the title of Brompton Stock Gilliflower, I suppose from its having been there first cultivated in England. This rises with an upright, strong, undivided stalk, to the height of two feet or more, garnished with long hoary leaves, which are reflexed, and waved on their edges, and at the top form a large head; out of the center of these arises the flower-stalk, which, when the plants are strong, is frequently a foot and a half long, putting out two or three short branches toward the bottom; the flowers of this kind have longer petals than any of the other sorts, and are formed into a pyramidal spike; but those with single flowers are loosely disposed, because the flowers having but few petals, do not fill the spike, as those do which are double; for these often have so many petals, as to render each flower as large and full as small Roses; and when they are of a bright red, make a pretty appearance, being excelled by none of the flowery tribe; but the plants of this sort produce but one spike, in which it differs from all the other kinds, and being constant in this particular, I think is sufficient to establish a distinct species. This sort is generally biennial, though many times the plants are preserved longer; but they are always stronger the first year of their flowering, than they will be after; so that the seeds are sown every spring, to continue a succession of flowering plants.

The eighth sort is the White Stock Gilliflower, which is of longer duration than either of the other sorts. I have frequently had these plants live three or four years, which have become shrubby; their stalks have been three feet high, and branched out on every side, so as to appear like shrubs; these seldom send out flower-stalks from the center of the plant, but it is the side branches which produce the flowers, and these side branches divide into several other, which is not common to the other sorts. There are always many double flowers rise from seeds of this sort, when they are well chosen; some years I have scarce had enough single flowers to preserve the kind. The varieties of this are few, sometimes a few of the plants will produce pale flesh-coloured flowers, and now and then some have been purple; and as that sort of Stock Gilliflower, which is titled the Twickenham Purple, will sometimes come with flowers variegated with white, I have been inclinable to think these two may be varieties of each other; and the rather, because the plants agree with each other in their external habit; for neither of these put out their flower-stems from the center of the plants, but always on their

their ſide, ſo that theſe are undoubtedly a diſtinct ſpecies from the former.

The ninth ſort is known by the title of White Wall-flower, among the gardeners and floriſts. This riſes with a greeniſh ſtalk a foot high, dividing into many branches, garniſhed with narrow, ſmooth, ſpear-ſhaped leaves, of a lucid green, and of thicker conſiſtence than thoſe of any of the other ſorts; they come out without any order, are near three inches long, and about half an inch broad in the middle; the flowers are produced in looſe ſpikes at the end of the branches, which are of a pure white, and have a great fragrancy, eſpecially in an evening or in cloudy weather; the flowers are ſucceeded by oblong compreſſed pods like thoſe of the other ſpecies. There is a variety of this with double flowers, which is propagated by cuttings or ſlips, in the ſame manner as the double Wall-flowers; but theſe plants require protection from great rains, and froſt in winter; ſo if they are planted in pots, and placed under a common frame in winter, where in mild weather they may enjoy the open free air, and be covered from hard rains and froſt, they may be preſerved ſeveral years.

Sometimes many of the plants with double flowers will come up from ſeeds, but not ſo frequent as ſome of the other ſorts. I have for ſeveral years raiſed more than one hundred plants in a ſeaſon, without obtaining one double flower; and from the ſeeds of theſe, have the following year had more than half the plants with double flowers: but this is not to be expected often.

The ſeeds of the tenth ſort were ſent me by Dr. Linnæus, from Upſal in Sweden. This plant riſes about ſix inches high, with an herbaceous ſwelling ſtalk; the leaves are produced in cluſters at the top, which are very hoary, waved on their edges, have obtuſe points, and ſet very cloſe to the ſtalk; the flowers are produced in ſlender ſpikes from the ſide of ſtalk; theſe are purple, but not ſo fragrant as many of the other ſorts; the pods are woolly, and recurve backward at the end.

All theſe ſorts flower in May and June, at which time they are the greateſt ornament to the flower-garden, therefore deſerve our care to cultivate them as much as any of the flowery tribe; but in order to have many double flowers, there muſt be great care taken in the choice of plants for ſeeds, without which there can be little hopes of having theſe flowers in perfection. The only ſure way of getting many double flowers, is to make choice of thoſe ſingle flowers which grow near many double ones; for I have always found thoſe ſeeds which have been ſaved from plants growing in beds cloſe to each other, where there happened to be many double flowers among them, have produced a much greater number of plants with double flowers, than thoſe which have been ſaved from plants of the ſame kinds, which grew ſingle in the borders of the flower-garden; ſo that there ſhould be a ſmall bed of each kind planted on purpoſe to ſave ſeeds in the flower-nurſery; or if they are ſown there, and the plants thinned properly when they are young, they need not be tranſplanted; for I have always obſerved the plants which have come up from ſcattered ſeeds, which have not been tranſplanted, endure the froſt much better than thoſe which have been removed; for as theſe plants ſend out horizontal roots from the bottom of their ſtems, which ſpread near the ſurface of the ground, ſo when they are tranſplanted, the roots are forced downward out of their natural direction; and if their ſtalks were grown tall before removal, they are generally planted low in the ground, whereby they are apt to rot, if the ground is moiſt, or the winter ſhould prove wet; therefore where they can be left unremoved, there will be a better chance of their living through the winter; and as theſe beds need not be of great extent, ſo when the winter proves very ſevere, it will not be much trouble or expence to arch the beds over with hoops, and cover them with mats in froſty weather, by which method they may be always preſerved.

The ground where theſe ſeeds are ſown, muſt not have any dung, for in rich land the plants will grow very vigorous in ſummer, but when the froſt comes on, or the heavy rains in autumn, either of which will ſoon deſtroy them; for theſe plants will thrive upon rocks or old walls, as was before obſerved; and in ſuch ſituations they will live, when all thoſe which are planted in gardens are deſtroyed. The beſt time to ſow the ſeeds is about the beginning of May; and if the ſeaſon ſhould prove dry, it will be proper to ſhade the beds with mats every day, to prevent the earth from drying too faſt; but the covering muſt be taken off every evening, to admit the dews of night, and they ſhould be gently watered in the evening two or three times a week. When the plants firſt appear, with their two ſeed-leaves, they are often attacked by flies, eſpecially in dry hot ſeaſons; therefore to prevent their deſtroying of the plants, the covering ſhould be continued over them during the heat of the day, and the plants frequently refreſhed with water, which will keep them in a growing ſtate, ſo the flies will not infeſt them; for I have always obſerved, they never attack any plants unleſs they have been ſtunted in their growth: when the plants have got ſtrength, they will be ſecure from this danger, and the coverings may be removed; after this the plants will require no farther care but to keep them clean from weeds, and to be thinned to the diſtance of nine inches or a foot aſunder, that they may have proper room to grow, and not draw each other up tall and weak. The plants which are drawn out of theſe beds to thin them, may be planted in the borders of the flower-garden, where they are deſigned to remain, and the ſooner they are removed, when the plants have got ſix or eight leaves, the more likely they will be to live through the winter; becauſe their roots will not have extended themſelves ſo far, ſo cannot be planted deep in the ground, and may take their natural direction; therefore whenever theſe plants are removed, it is always the beſt way to do it when they are young.

The farther care of the plants which are left in the beds, will be to cover them in winter with mats; and when they come to flower, all thoſe which are not of good colours, or whoſe flowers are ſmall, ſhould be drawn out as ſoon as they appear, that they may not impregnate thoſe which are deſigned for ſeeds with their farina; but thoſe with double flowers ſhould by no means be removed, nor ſhould their flowers be cut off, but ſuffered to fade among the ſingle ones, by which the ſeeds will be improved; it will alſo be a ſure method of preſerving each ſort in perfection, to have them ſeparate from each other, in diſtinct beds; though I think there is no danger of any of the ſpecies altering, by the mixture of their farina, but their colours are liable to be changed by it; ſo that in order to continue thoſe pure, they ſhould not ſtand too near each other.

The time for ſowing the ſeeds before-mentioned, muſt be underſtood to be for the ſorts which are biennial; for the annual, or ten Weeks Stock Gilliflower ſhould be for the firſt ſeaſon ſown in February, as was before directed; and to ſucceed theſe, there ſhould be another parcel ſown in March; and thoſe who are curious to continue theſe flowers late in the autumn, ſhould ſow a parcel of the ſeed the latter end of May; and if theſe laſt ſown plants are upon a warm border, where they may be covered, by placing glaſſes before them in winter, or covering them with mats, they may be continued in flower till Chriſtmas; and if ſome of the plants are potted, and put under a hot-bed frame in autumn, where they may enjoy the open air in mild weather, and be ſcreened from hard rains and froſt; by which method I have known theſe plants kept flowering all the winter, when the winters have not been very ſevere.

There are ſome who propagate the double Stock Gilliflowers by ſlips and cuttings, which will take root when properly managed; but the plants ſo raiſed are never ſo ſtrong as thoſe which come from ſeeds, and their

their spikes of flowers are always very short, and have not half the beauty; therefore it is not worth while to practise this method, unless for those sorts which cannot be obtained with any certainty from seed.

The eleventh sort grows naturally in the south of France, Spain, and Italy, near the sea coast. This rises near a foot high, with a ligneous stalk, dividing into many small branches, garnished with narrow hoary leaves, which are entire, and rounded at their extremity; the flowers are produced in loose spikes at the end of the branches, which are smaller than those of either sort before-mentioned, of a bright red at their first appearing, but fade to a purple before they fall off. The stalks, leaves, and the whole plant is very white, and by its woody stalks hath the appearance of a perennial plant, but it generally perishes in autumn. The seeds of this sort should be sown in autumn, upon a warm border, where the plants are designed to remain; when the plants come up, they will require no farther care but to keep them clean from weeds, and thin them where they come up too close. These autumnal plants will flower early in June, so will produce good seeds; but those which are sown in the spring will flower in July and August, so that from these there cannot be any certainty of having ripe seeds: however, by sowing the seeds at two or three different seasons, there may be a succession of flowers continued for three or four months.

The twelfth sort is commonly sown in gardens, sometimes as an edging for borders, but more generally in patches between taller growing flowers: it is titled sometimes Dwarf annual Stock Gilliflower, and by others it hath the appellation of Virginia Stock Gilliflower. This seldom rises more than six inches high, sending out many branches from the root, which intermix and grow irregular; these are garnished with spear-shaped leaves, rounded at their ends, and sit close to the branches; the flowers come out in loose spikes at the end of the branches, which are of a purple colour, composed of four petals in form of a cross, and are succeeded by slender pods like those of the other sorts. If the seeds of this sort are sown in patches, at two or three different times, the first in autumn, the second the latter end of March, and the third the end of April, or the beginning of May, in the borders of the flower-garden, they will make a variety, when intermixed with other low growing annual flowers, for three months.

The thirteenth sort rises near two feet high, sending out many upright branches from the bottom, which are thinly garnished with spear-shaped leaves, the lower ones being a little indented; the flowers come out single, at great distances from each other, toward the upper part of the branches; these are small, of a purplish red colour, and soon fall away, being succeeded by long taper pods, with awl-shaped points. This is an annual plant, which may be treated in the same manner as the last mentioned sort; but as it hath little beauty, it is not often cultivated in gardens.

The fourteenth sort grows naturally on the sea coasts in Italy, Spain, and Portugal. This is also an annual plant, which branches out from the root into many declining stalks; the lower leaves are about two inches long, and three quarters of an inch broad, very deeply sinuated on their edges, and hoary; those upon the stalks are of the same form, but much smaller; the flowers are produced from the sides of the stalks singly, and at the top in loose spikes; the empalements of the flowers are covered with a white down, as are also the end of the branches; the flowers are purple, composed of four leaves placed in form of a cross; the pods are about three inches long, taper, woolly, and at their ends are divided into three parts, which spread into a triangle. It flowers in July, and when the season is favourable, the seeds will ripen in autumn; but if the seeds are sown in autumn on a warm border, the plants will live through the winter, and these will flower early in June, so from these good seeds may be obtained from them.

The fifteenth sort grows naturally on the sea coasts in the south of France and Spain, where it continues three or four years; the stalk is erect, and the whole plant is covered with a white down; the lower leaves are broad, spear-shaped, obtuse, and alternately indented; the flowers are flesh-coloured, composed of four petals like the other species, and are succeeded by long woolly pods.

This may be propagated by seeds in the same manner as the other sorts; and if the plants grow in rubbish, they will live through the winter better than in rich earth.

The sixteenth sort is of humble growth, seldom rising above eight or nine inches high; the leaves are very narrow, and indented on their edges; the stalk becomes shrubby, to which the flowers grow very close; these are of a worn out purple colour, so make but little appearance. It grows naturally in Spain and Italy, and is not so hardy as the other sorts, therefore requires some protection in winter.

The seventeenth sort grows naturally in Portugal. This is a low annual plant with pointed leaves, whose borders are indented as if torn; the empalement of the flower is hoary; the flowers have four purple petals placed in form of a cross, which are succeeded by knobbed-pointed pods inclosing flat seeds.

If the seeds of this kind are sown in the spring upon sheltered borders, where the plants are to remain, and they are thinned and kept clean from weeds, the plants will flower in July, and produce ripe seeds in autumn.

CHELIDONIUM. Tourn. Inst. R. H. 231. tab. 116. Lin. Gen. Plant. 572. Chelidonium majus. Raii Meth. Plant. 100. Glaucium. Tourn. Inst. R. H. tab. 130. Celandine, or Greater Celandine, in French *Cheliodine* or *Eclair*.

The Characters are,

*The flower hath a roundish empalement, composed of two concave obtuse leaves, which fall off; it hath four large roundish petals, which spread open and are narrow at their base; in the center is situated a cylindrical germen, attended by a great number of stamina, which are broad at the top, and are terminated by oblong, compressed, twin summits. Upon the germen is situated a bifid stigma in form of a head. The germen afterward becomes a cylindrical pod, with one or two cells, opening with two valves, and filled with many small seeds.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, intitled Polyandria Monogynia, the flower having many stamina and one style. To this genus he has joined the Glaucium of Tournefort, whose characters very well agree with those of Celandine, so are very properly brought together.

The Species are,

1. Chelidonium (*Majus*) pedunculis umbellatis. Lin. Gen. Plant. 505. *Celandine with an umbellated foot-stalk.* Chelidonium majus vulgare. C. B. P. 144. *Greater common Celandine.*
2. Chelidonium (*Laciniatum*) foliis quinque lobatis, lobis angustis acute laciniatis. *Celandine whose leaves are composed of five narrow lobes, which are cut into many acute segments.* Chelidonium majus laciniato flore. Clus. Hist. 203. *Greater Celandine with a jagged flower.*
3. Chelidonium (*Glaucium*) pedunculis unifloris, foliis amplexicaulibus sinuatis, caule glabro. Lin. Sp. Plant. 506. *Celandine with single flowers on the foot-stalks, sinuated leaves which embrace the stalks, and a smooth stalk.* Glaucium flore luteo. Tourn. Inst. R. H. 351. *Glaucium with a yellow flower*; and the Papaver corniculatum luteum. C. B. P. 171. *Yellow horned Poppy.*
4. Chelidonium (*Corniculatum*) pedunculis unifloris, foliis sessilibus pinnatifidis, caule hispido. Lin. Sp. Plant. 506. *Celandine with single flowers upon the foot-stalks, leaves set close to the stalks which have winged points, and a rough stalk.* Glaucium hirsutum flore Phœnicio. Tourn. Inst. R. H. 253. *Hairy Glaucium, or horned Poppy, with a scarlet flower.*
5. Chelidonium (*Glabrum*) pedunculis unifloris, foliis semiamplexicaulibus, dentatis, glabris. *Celandine with*

*foot-*

*foot-stalks having a single flower, and smooth indented leaves, which half embrace the stalks.* Glaucium glabrum flore Phœnicio. Tourn. Inst. 254. *Smooth horned Poppy with a scarlet flower.*

6. Chelidonium (*Hybridum*) pedunculis unifloris, foliis pinnatifidis, linearibus, caule lævi siliquis trivalvibus. Lin. Sp. Plant. 724. *Celandine with single flowers upon the foot-stalk, many pointed narrow leaves, and a smooth stalk.* Glaucium flore violaceo. Tourn. Inst. 254. *Horned Poppy with a Violet-coloured flower.*

The first sort is the common Celandine which is used in medicine, and is esteemed aperitive and cleansing, opening obstructions of the spleen and liver, and is of great use in curing the jaundice and scurvy. This grows naturally on the side of banks, and in shady lanes in many parts of England, so is seldom cultivated in gardens; for if the seeds are permitted to scatter, the ground will be plentifully stored with plants to a considerable distance. It flowers in May, at which time the herb is in the greatest perfection for use.

The second sort is found growing in a few particular places, where the seeds have been formerly sown, or the plants cast out of gardens. This is by some supposed to be only a variety of the first, but I have propagated this by seeds above forty years, and have constantly found the plants produced to be the same as those from which the seeds were saved, and never vary, nor have I ever observed the first alter to this. The leaves of this are divided into narrow long segments, which are deeply jagged on their edges, and the petals of the flower are cut into many parts, in which it differs from the first. If the seeds of this sort are permitted to scatter, they will fill the ground with plants. They both delight in shade. There is a variety of this with double flowers, which generally rises the same from seeds, which is not usual in many other plants; however, this variety may always be preserved by parting the roots.

The third sort is known by the title of Horned Poppy; it was so called from the resemblance which the flower bears to the Poppy, and the long seed-vessel, which is like a horn. It grows naturally upon the sandy and gravelly shores by the sea, in many parts of England, from whence the seeds have been brought into gardens, where it is sometimes allowed to have place for the sake of variety. This plant abounds with a yellow juice which flows out from every part, when broken. It sends out many thick gray leaves, which are deeply jagged; the stalks are strong, smooth, and jointed, which rise near two feet high, and divide into many branches. These are garnished with leaves at each joint; those on the lower part of the stalks are long, broad, and deeply jagged, but the upper leaves are entire and almost heart-shaped: they closely embrace the stalks with their base; from the bosom of the leaves come out the short foot-stalks of the flowers, each supporting one large yellow flower, composed of four broad petals, which spread open like the garden Poppy, in the center of which are a great number of yellow stamina, surrounding a long cylindrical germen, crowned by an arrow-pointed stigma, which is permanent, remaining upon the top of the horned seed-vessel, which grows nine or ten inches long, having a longitudinal furrow on one side, where it opens when ripe, and lets out the seeds. This is a biennial plant, which flowers the second year, and perishes soon after the seeds are ripe.

If the seeds of this plant are permitted to scatter, they will fill the ground near them with plants, so that it is not a proper plant for a flower-garden; but if a few of the seeds are scattered about in rock work, the plants will rise without trouble, and in such places will have a pretty effect. And if the seeds are permitted to scatter, there will always be a supply of young plants; so the only care they will require, is to pull them up when they multiply too fast. It flowers in June and July, and the seeds ripen in autumn.

The fourth sort grows naturally in Spain, Italy, and some parts of Germany, from whence the seeds have been brought to England. The leaves of it are deeply jagged and hairy, of a pale green, and grow close to the stalks: those at the bottom lie on the ground, and are broader than those above. The stalks are a foot and a half high, having a single jagged leaf placed at each joint; these have many divisions, from their origin to the point, which is extended longer than the lower leaves. The flowers come out from the bosom of the leaves; these are composed of five broad obtuse petals, which are of a dark scarlet colour, and soon fall off. In the center of each is situated an oblong germen, having no style, but supports a bifid stigma; this is attended by a great number of short stamina, terminated by obtuse summits. The germen afterward becomes a long taper pod, on the apex of which the bifid stigma remains, sitting on the middle partition, which divides the pod into two cells, which are filled with small seeds. The flower hath an empalement composed of two hollow leaves, which are closely set with short prickles; this falls away when the flower is expanded. It flowers in June and July, and the seeds ripen in autumn. As the flowers of this plant are but of short duration, they do not make any considerable figure; but the foliage of the plant is very elegant, and might be introduced by way of ornament to furniture with great advantage, being very picturesque: it may also be wrought into patterns for silks, and painted upon porcelain, where it would have a very good effect. If the seeds of this plant are sown in the autumn, they will more certainly grow than those which are sown in the spring; which frequently, in dry seasons, do not come up the same year, or at least not before autumn; whereas those sown in autumn, frequently come up soon after, or if not at that season, do not fail coming up in the spring; and these plants come early to flower, so that good seeds may always be obtained from them. They should be sown where the plants are to remain, and they will require no other care but to thin them where they are too close, and keep them clean from weeds.

The fifth sort differs from the fourth, in having broader leaves, which are not so deeply divided; the whole plant is smooth, and the flowers are larger, but are of the same colour: this is also an annual plant, and requires the same treatment as the last.

The sixth sort grows naturally among the Corn, in some parts of England. This is also an annual plant, whose seeds should be sown in autumn, for those which are sown in the spring seldom succeed. The leaves of this sort are finely jagged, and divided into narrow segments, somewhat like those of Buckshorn Plantain; they are smooth, of a lucid green, and are commonly opposite. The stalks rise little more than a foot high, dividing into two or three branches upward, garnished with small leaves of the same form as those below. The flowers are sustained by slender foot-stalks, which come out from the wings of the leaves; these are composed of four obtuse petals, of a Violet colour, in the center of which is situated a cylindrical germen, attended by a great number of stamina; the germen afterward becomes a long cylindrical pod, like those of the other species. The flowers of this plant are very fugacious, seldom lasting above three or four hours before the petals drop off, especially in clear weather. It flowers in May, and the seeds ripen in July, and the plants soon after perish. If the seeds are permitted to scatter, the plants will come up without care as the others.

CHELONE [χελώνη, *Gr.* a tortoise.] Tourn. Act. R. S. 1706. tab. 7. fol. 2. Lin. Gen. Plant. 666.

The Characters are,

*The empalement of the flower is of one leaf, cut into five parts, and is permanent; the flower is of the ringent kind, having a short cylindrical tube, which is swollen at the chaps, where it is oblong, convex above, and plain below; the mouth is almost closed; the upper lip is obtuse and indented,*

*dented, the lower lip is lightly cut into three parts. It hath four stamina, which are inclosed in the backside of the petal; the two side ones being a little longer than the other, which are terminated by oval hairy summits. It hath an oval germen supporting a slender style, crowned by an obtuse stigma; the germen afterward becomes an oval capsule having two cells, which are filled with flat roundish seeds having a border.*

This genus of plants is ranged in the second section of Linnæus's thirteenth class, intitled Didynamia Angiospermia, from the flower having two long and two short stamina, and the seeds being included in a capsule.

The SPECIES are,

1. CHELONE (*Glabra*) foliis lanceolatis, acuminatis, sessilibus, obsoletè serratis, radice reptatrice. *Chelone with pointed spear-shaped leaves, set close to the stalks, with small serratures on their edges, and a creeping root.* Chelone Acadiensis flore albo. Tourn. Act. R. Par. 1706. *Chelone of Acadia, with a white flower.*
2. CHELONE (*Purpurea*) foliis lanceolatis, obliquis, petiolatis, oppositis, marginibus acutè serratis. *Chelone with oblique spear-shaped leaves, growing opposite on foot-stalks, and their borders sharply sawed.* Chelone floribus speciosis pulcherrimis, colore rosæ damascenæ. Clayt. Flor. Virg. 71. *Chelone with a very beautiful looking flower, the colour of the Damask Rose.*
3. CHELONE (*Hirsuta*) caule foliisque hirsutis. Lin. Sp. Plant. 611. *Chelone with hairy stalks and leaves.* Digitatis Virginiana, panacis coloni foliis, flore amplo, pallascente. Pluk. Mant. 64. *Virginia Foxglove with Clowns all-heal leaves, and a large pale flower.*

The first sort grows naturally in most parts of North America. This is called by Joscelin, in his New England Rarities, the Humming Bird-tree. It hath a pretty thick jointed root, which creeps under ground to a considerable distance, sending up smooth channelled stalks, which rise about two feet high, garnished with two leaves at each joint, standing opposite without foot-stalks; these are three inches and a half long, and about three quarters of an inch broad at their base, where they are broadest, and diminish gradually to a sharp point; they have small serratures on their edges, which scarcely appear. The flowers grow in a close spike at the end of the stalks; they are white, and have but one petal, which is tubular, and narrow at the bottom, but swells upward, almost like the Foxglove flower; the upper side is bent over and convex, but the under is flat, and slightly indented in three parts at the end. When the flowers fall off, the germen turns to an oval capsule sitting in the empalement, filled with roundish compressed seeds, which have a thin border. It flowers in August, and when the autumn proves favourable, the seeds will sometimes ripen in England; but as the plants propagate so fast by their creeping roots, the seeds are seldom regarded. The best time to transplant the roots is in autumn, that they may be well established in the ground before the spring, otherwise they will not flower so strong, especially if the season proves dry; but when they are removed in the spring, it should not be later than the middle of March, by which time their roots will begin to push out new fibres. They will thrive in almost any soil or situation, but their roots are apt to creep too far, if they are not confined, and sometimes intermix with those of other plants; and then their stalks stand so far distant from each other, as to make but little appearance; therefore they should be planted in pots, which will confine their roots, so that in each pot there will be eight or ten stalks growing near each other, when they will make a tolerable good appearance. This plant is very hardy, so is not injured by cold, but it must have plenty of water in hot weather.

The second sort was discovered in Virginia by Mr. Clayton, who sent it to England; the roots of this do not creep so far as those of the first, the stalks are stronger, and the leaves much broader, and are oblique; they are deeply sawed on their edges, and stand upon short foot-stalks: the flowers are of a bright purple colour, so make a finer appearance. This flowers at the same time with the first, and is propagated by parting of the roots in the same manner.

The third sort I received from New England, where it grows naturally: this is near to the first sort, but the stalks and leaves are very hairy, and the flower is of a purer white. It flowers at the same time with the former, and requires the same treatment.

As these plants flower in the autumn, when there is a scarcity of other flowers, it renders them the more valuable, especially the second sort, whose flowers make a very pretty appearance, when they are strong; and if some of them have a shady situation in the summer, they will flower later in the autumn.

CHENOPODIA-MORUS. See BLITUM.

CHENOPODIUM [χηνοπόδιον, Gr.] Tourn. Inst. R. H. 506. tab. 288. Lin. Gen. Plant. 272. Goosefoot, or Wild Orach.

The CHARACTERS are,

*It hath a permanent empalement, composed of five oval concave leaves: the flower hath no petal, but in the center it hath five stamina placed opposite to the leaves of the empalement, and of the same length, terminated by roundish twin summits; it hath a round germen supporting a short double style, crowned by an obtuse stigma. The germen afterward becomes a five-cornered fruit inclosed in the empalement, containing one roundish depressed seed.*

Linnæus places this genus in the second section of his fifth class, intitled Pentandria Digynia, the flower having five stamina and two styles.

The SPECIES are,

1. CHENOPODIUM (*Bonus Henricus*) foliis triangulari-sagittatis, integerrimis spicis compositis aphyllis. Hort. Cliff. 84. *Goosefoot with arrow-shaped triangular leaves which are entire.* Chenopodium folio triangulo. Tourn. Inst. 506. *Goosefoot with a triangular leaf, called English Mercury, All Good, or Good Henry.*
2. CHENOPODIUM (*Vulvaria*) foliis integerrimis rhombeo-ovatis, floribus conglomeratis axillaribus. Flor. Suec. 216. *Goosefoot with entire, oval, rhomboidal leaves, and flowers growing in clusters on the side of the stalks.* Chenopodium fœtidum. Tourn. Inst. 506. *Stinking Orach.*
3. CHENOPODIUM (*Scoparia*) foliis lineari-lanceolatis, planis, integerrimis. Hort. Cliff. 86. *Goosefoot with narrow spear-shaped leaves, which are plain and entire.* Chenopodium lini folio villoso. Tourn. Inst. R. H. *Goosefoot with a hairy Flax leaf, commonly called Belvedere, or Summer Cypress.*
4. CHENOPODIUM (*Botrys*) foliis oblongis, sinuatis, racemis nudis multifidis. Hort. Cliff. 84. *Goosefoot with oblong sinuated leaves, and naked multifid spikes of flowers.* Chenopodium ambrosioides folio sinuato. Tourn. Inst. 506. *Goosefoot, like Ambrosia, with sinuated leaves, commonly called Oak of Jerusalem.*
5. CHENOPODIUM (*Ambrosioides*) foliis lanceolatis, dentatis, racemis foliatis simplicibus. Hort. Cliff. 84. *Goosefoot with spear-shaped indented leaves, and single leafy spikes of flowers.* Chenopodium ambrosioides Mexicanum. Tourn. Inst. 506. *Mexican Goosefoot, like Ambrosia, commonly called Oak of Cappadocia.*
6. CHENOPODIUM (*Fruticosum*) foliis lanceolatis, dentatis, caule fruticoso. *Goosefoot with spear-shaped indented leaves, and a shrubby stalk.* Chenopodium ambrosioides Mexicanum fruticosum. Boerh. Ind. alt. 2. p. 90. *Shrubby Mexican Orach.*
7. CHENOPODIUM (*Multifidum*) foliis multifidis, segmentis linearibus, floribus axillaribus sessilibus. Lin. Sp. 320. *Goosefoot with multifid leaves, linear segments, and flowers set close to the stalk.* Chenopodium sempervirens, foliis tenuiter laciniatis. Hort. Elth. 78.

There are many other species of this genus, some of which grow naturally on dunghills and the side of ditches, in most parts of England, where they often become very troublesome weeds; for which reason, I have not enumerated them here.

The first sort is found growing naturally in shady lanes in many parts of England, but it is very doubtful if the seeds have not been cast out of gardens originally,

originally, becauſe this plant was formerly cultivated in kitchen-gardens for uſe; and in ſome of the northern counties, the people ſtill preſerve it in their gardens as an eſculent herb; which in the ſpring ſeaſon, they dreſs in the ſame manner as Spinach, for which it is a ſubſtitute. But, as the latter is a much better herb, it has obtained the preference very juſtly, in all the countries where the culture of the kitchen-garden is underſtood.

The ſecond ſort is very common upon dunghills, and in gardens, in moſt parts of England: it is ſeldom cultivated, except in ſome phyſic-gardens; for the markets in London are ſupplied with it by the herb-women, who gather it in the places where it grows wild.

The third ſort is ſometimes cultivated in gardens; it is a beautiful plant, which is naturally diſpoſed to grow very cloſe and thick, and in as regular a pyramid as if cut by art. The leaves are of a pleaſant green; and were it not for that, it hath ſo much of the appearance of a Cyprus-tree, that at ſome diſtance it might be taken for the ſame, by good judges: the ſeeds ſhould be ſown in autumn; and in the ſpring, when the plants are come up, they may be planted into pots of good earth, and kept ſupplied with water in dry weather: theſe pots may be intermixed with other plants to adorn court-yards, &c. where they will appear very handſome, until their ſeeds begin to ſwell and grow heavy, which weigh down and diſplace the branches; at which time the pots ſhould be removed to ſome abject part of the garden, to perfect their ſeeds; which, if permitted to fall upon the ground, will come up the next ſpring; ſo that you need be at no more trouble in propagating theſe plants, but only to tranſplant them where you intend they ſhould grow.

The fifth ſort was formerly uſed in medicine; but although it ſtill continues in the catalogue of ſimples annexed to the London Diſpenſatory, yet is very ſeldom uſed at preſent. This plant may be propagated by ſowing the ſeeds in an open border of good earth in the ſpring, where it will perfect its ſeeds in autumn; which, if permitted to ſhed upon the ground, will ariſe as the former.

The fourth ſort was brought from America, where the ſeeds are called Worm Seed, I ſuppoſe from ſome quality contained in it, which deſtroys worms in the body.

This is propagated by ſowing the ſeeds in the ſpring, as the before-mentioned ſort, and will perfect its ſeed in autumn; after which, the plant decays to the ground: but if the root be preſerved in ſhelter under a common frame in winter, the ſtalks will riſe again the following ſpring.

The leaves of this plant emit a very ſtrong odour when bruiſed, ſomewhat like thoſe of the Ambroſia, for which the plants are preſerved in gardens, for the flower hath no beauty. This plant grows naturally in moſt parts of North America, where it is generally called Worm Seed. It ſends up ſeveral ſtalks from the root, which riſe about two feet high, garniſhed with oblong leaves a little indented on their edges, of a light green, and placed alternately on the ſtalks; the flowers come out from the wings of the leaves on the upper part of the branches, in looſe ſpikes: theſe appear in July, and the ſeeds ripen in September; which, if permitted to ſcatter, the plants will come up the following ſpring, when a few of them may be tranſplanted into pots filled with kitchen-garden earth, to be preſerved through the winter; and the others may be planted in the common borders, where they will flower and perfect their ſeeds; but unleſs the winter is very favourable, the roots will be deſtroyed.

The ſeeds of all the ſpecies of this genus will ſucceed beſt, if they are ſown in autumn; for when they are ſown in the ſpring, they frequently lie a whole year before the plants come up: therefore where the ſeeds of any of them ſcatter, the plants will come up much better than thoſe which are ſown by hand.

The fifth ſort is annual: this alſo grows naturally in North America, from whence I have frequently received the ſeeds. It is alſo a native of many of the warm countries in Europe. This hath many oblong leaves at the bottom, which are deeply ſinuated on both ſides, ſomewhat like thoſe of the Oak-tree, from whence it received the title of Oak of Jeruſalem. Theſe are purple on their under ſide, and when bruiſed, emit a ſtrong odour. The ſtalks riſe about eight or nine inches high, dividing into ſeveral ſmaller branches. The lower part of theſe is garniſhed with leaves of the ſame ſhape with thoſe below, but are ſmaller. The flowers grow in naked looſe ſpikes, divided into many parts: they are ſmall, herbaceous, and are ſucceeded by ſmall round ſeeds. This ſort flowers in June and July, and the ſeeds ripen in autumn.

The ſixth ſort hath leaves very like thoſe of the fourth, and have the ſame ſcent: but this hath a ſhrubby ſtalk, which riſes five or ſix feet high, and divides into many branches. It is a native of America, and muſt be houſed in the winter, for it will not live through the winter in England in the open air. It is eaſily propagated by cuttings during any of the ſummer months, which, if planted in a ſhady border, and duly watered, will ſoon take root; and then may be planted in pots filled with light earth, and placed in the ſhade till they have taken new root, after which they may be placed with other hardy exotic plants in a ſheltered ſituation during ſummer; and when the froſt comes on, they muſt be removed into the green-houſe; but they only require protection from hard froſts, and ſhould have plenty of air in mild weather. This grows naturally in the Braſils.

The ſeventh ſort grows naturally at Buenos Ayres: this riſes with a ſhrubby ſtalk three or four feet high, garniſhed with oblong leaves, which are cut into many linear ſegments; the flowers ſit cloſe to the ſtalks, which, like the other ſpecies of this genus, have no petals, but the empalement incloſes five ſlender ſtamina: the germen ſupports two ſtyles, crowned by obtuſe ſtigma.

This is a perennial plant, which retains its leaves through the year, ſo will add to the variety in a green-houſe in winter, but has little other beauty to recommend it. This may be propagated by cuttings, which, if planted in a bed of light earth during any of the ſummer months, and duly ſhaded and watered, will put out roots; then they may be tranſplanted into pots, and may be placed with other hardy exotic plants in ſummer, but muſt be ſheltered from froſt in winter.

CHERRY-LAUREL. See PADUS.

CHERRY-TREE. See CERASUS.

CHERVIL. See SCANDIX.

CHESNUT. See CASTANEA.

CHESNUT, the Horſe. See ESCULUS.

CHIONANTHUS. Lin. Gen. Plant. 21. The Fringe, or Snowdrop-tree. This title was given to this plant by Dr. Van Royen, from the whiteneſs of its flowers: the inhabitants of America, where this tree is a native, call it Snowdrop-tree, for the ſame reaſon: and the Dutch call it Sneebaum, i. e. Snow-tree, on the ſame account.

The CHARACTERS are,

*It hath a permanent empalement of one leaf, which is erect, and cut into four acute parts; the flower is of one petal, having a ſhort ſpreading tube the length of the empalement, and the upper part is cut into four very long narrow ſegments, which are erect. It hath two ſhort ſtamina inſerted in the tube of the petal, which are terminated by upright heart-ſhaped ſummits. In the center is placed the oval germen, ſupporting a ſingle ſtyle, crowned by an obtuſe trifid ſtigma. The germen afterward becomes a round berry with one cell, incloſing one hard ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's ſecond claſs, intitled Diandria Monogynia, the flower having two ſtamina and one ſtyle.

We have but one SPECIES of this plant in the English gardens, viz.

CHIONANTHUS pedunculis trifidis trifloris. Lin. Sp. Plant. 8. *Snowdrop-tree, or Fringe-tree, with trifid foot-stalks supporting three flowers.* Amelanchier Virginiana laurocerasi folio. Pet. Hor. Sicc. 241. *Virginia Amelanchier with a Laurel leaf.*

This shrub is common in South Carolina, where it grows by the side of rivulets, and seldom is more than ten feet high: the leaves are as large as those of the Laurel, but are of a much thinner substance; the flowers come out in May, hanging in long bunches, and are of a pure white, from whence the inhabitants call it Snowdrop-tree; and, from the flowers being cut into narrow segments, they give it the name of Fringe-tree. After the flowers have fallen away, the fruit appears, which becomes a black berry, about the size of Sloes, having one hard seed in each.

This tree is now more common in the curious gardens in England, than it was a few years since; there having been many young plants raised from the seeds, which have been brought from America lately: there have also been some plants propagated by layers, though there is great uncertainty of their taking root, which they seldom do in less than two years; nor will they ever take root, unless they are well supplied with water in dry weather.

The best way to obtain good plants, is from the seeds, which must be procured from America, for they never have produced any fruit in this country. The seeds should be sown in small pots filled with fresh loamy earth soon after they arrive, and should be placed under a hot-bed frame, where they may remain till the beginning of May, when they must be removed to a situation exposed to the morning sun, and screened from the sun in the middle of the day. In dry weather the pots must be watered, and kept clean from weeds; for as these seeds lie in the ground a whole year before the plants will come up, they should not be exposed to the sun the first summer, but the following autumn they should be removed, and placed under a frame, to protect the seeds from being injured by the frost; and if the pots are plunged into a moderate hot-bed the beginning of March, it will bring up the plants much sooner than they will otherwise rise; by which means they will get more strength the first summer, and be better able to resist the cold of the next winter. While these plants are very young, they will be in danger of suffering by severe frost; but when they have obtained strength, they will resist the greatest cold of our climate in the open air; therefore for the two or three first winters, it will be proper to keep them under shelter; so that the young plants may remain in the seed-pots all the first summer, and the following winter; and in the spring before they begin to shoot, they should be shaken out of the pots, and carefully separated so as not to break off their roots, and each planted in a small pot filled with light loamy soil, and plunged into a very moderate hot-bed, just to forward their taking fresh root; then they should be gradually inured to the open air, and during the following summer, the pots should be plunged into the ground, to prevent the earth from drying, in a situation where they may enjoy the morning sun, but screened from the great heat at noon. During the summer season, they will require to be frequently watered, and kept clean from weeds. The autumn following, they should be again placed under a hot-bed frame to screen them from frost; but they should enjoy the free air at all times, when the weather is mild. The April following, the plants may be shaken out of the pots, with the ball of earth to their roots, and planted where they are designed to remain.

This shrub delights in a moist, soft, loamy soil, and if it is planted in a sheltered situation, will endure the cold of our winters very well in the open air; but in dry land it is very subject to decay in warm seasons.

In the places where this shrub grows naturally, it produces great quantities of flowers, so that they seem covered with snow, which gave occasion to the inhabitants for titling it Snowdrop-tree; but in England the flowers are seldom so numerous, so do not make so good an appearance.

CHIRONIA. Lin. Gen. Plant. 227.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, cut into five oblong segments: it hath one petal, with a roundish tube the size of the empalement, divided into five equal parts above, which spread open: it hath five short broad stamina, which are fastened to the top of the tube, and are terminated by large oblong summits, which join together, and after the flowers drop are spirally twisted. It hath an oval germen, situated in the center, supporting a slender declining style, crowned by a rising stigma in form of a head. The germen afterward becomes an oval capsule with two cells, filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. CHIRONIA frutescens, capsulifera. Lin. Sp. Plant. 190. *Shrubby Chironia bearing capsules.* Centaurium minus Africanum, arborescens, latifolium, flore ruberrimo. Com. Rar. Pl. 8. tab. 8. *Lesser Tree-like African Centaury, with a broad leaf, and a very red flower.*
2. CHIRONIA frutescens baccifera. Lin. Sp. Plant. 190. *Shrubby berry-bearing Chironia.* Centaurium minus arborescens pulpiferum. Com. Rar. Pl. 9. tab. 9. *Lesser Tree-like Centaury with seeds surrounded with pulp.*

These plants grow naturally at the Cape of Good Hope, from whence their seeds were brought to Holland many years past, and the plants were raised in some of the curious gardens there, and have since been communicated to the curious in many parts of Europe. The seeds of the first sort were sent me from Paris, by Mr. Richard, gardener to the king at Versailles, from which I raised several plants, which have flowered in the Chelsea garden several years, but have not as yet perfected any seeds.

It hath a fibrous root, which spreads near the surface of the ground. The stalks are round, and inclining to be ligneous, but are of a very soft texture; these grow from two to three feet high, having several branches on every side, which grow erect, garnished with succulent leaves, which are an inch or more in length, and an eighth part of an inch broad, ending in an obtuse point. At the ends of each shoot the flowers are produced, which are tubulous, and spread open at the top like those of Periwinkle; these are of a bright red colour, and when there are a large number of the flowers open on the same plant, they make a very fine appearance. In the center of the flower is placed an oval germen, upon which there is fixed a recurved style, having a blunt stigma at the top, surrounded by five incurved stamina, each supporting a large summit. When the flowers fall away, the germen becomes an inflated capsule, which is filled with small seeds. The flowers are produced from June to autumn, and the seeds ripen in October. This plant should be placed in an airy glass-case in winter, where it may enjoy a dry air and much sun, but will not thrive in a warm stove; nor can it be well preserved in a common green-house, because a damp moist air will soon cause it to rot.

The seeds of this plant should be sown in small pots filled with light sandy earth, soon after they are ripe, and plunged into a moderate hot-bed, and must be frequently but gently watered; sometimes the seeds will lie a long time in the ground, so that if the plants do not appear the same season, the pots should not be disturbed, but preserved in shelter till the following spring, and then plunged into a fresh hot-bed, which will bring up the plants in a short time, if the seeds are good. When the plants are fit to remove, they should be transplanted into small

ſmall pots, four or five in each pot; then plunge the pots into a moderate hot-bed, and ſprinkle them with water, and ſhade them every day from the ſun till they have taken new root; after which they muſt have a large ſhare of air in warm weather, to prevent their drawing up weak: when the plants have obtained ſome ſtrength, they muſt be gradually inured to bear the open air; but when they are expoſed abroad, if there ſhould happen much rain, the plants muſt be ſcreened from it, otherwiſe it will cauſe them to rot: when the plants have filled the pots with their roots, they ſhould be parted, and each put into a ſeparate pot filled with light ſandy earth, not rich with dung, placing them in the ſhade till they have taken freſh root; then they may be removed to a warm ſheltered ſituation, and mixed with ſuch other plants as require but little water; in which ſituation they may remain till autumn, when they muſt be placed in a dry airy glaſs-caſe; and in the winter ſhould have very little wet, but muſt enjoy the ſun as much as poſſible; and in mild weather ſhould have freſh air admitted to them, but muſt be protected from froſt: with this management, the plants will thrive and produce flowers the ſecond year from ſeed.

The ſecond ſort riſes with a firmer ſtalk than the firſt, which is round, jointed, and divides upward into a greater number of branches, garniſhed with ſhort narrow leaves, which are pretty thick and ſucculent. The flowers are produced at the end of the branches, in the ſame manner as thoſe of the firſt, which are of a fine red colour, but not half ſo large as the flowers of the firſt; when theſe fall away, they are ſucceeded by oval pulpy berries, in which are included many ſmall ſeeds. This ſort continues flowering great part of ſummer and autumn, and in warm ſeaſons the ſeeds will ripen in England.

It is propagated by ſeeds in the ſame manner as the former ſort, and the plants require the ſame treatment.

CHIVES, as they are by ſome titled, are the ſtamina, which ſupport the ſummits in the center of flowers.

CHIVETS, in French, are the ſmall parts, or little offſets from the roots of bulbous plants, by which they are propagated.

CHONDRILLA. Lin. Gen. Plant. 815. Tourn. Inſt. R. H. 475. tab. 268. [of Χόνδρος, *Gr.* a cartilage.] Gum Succory.

The CHARACTERS are,

*The common empalement is compoſed of many narrow cylindrical ſcales, which are equal. The flower is compoſed of many hermaphrodite florets, which are uniform, and lie imbricatim, like tiles on a houſe; theſe have one petal, which is ſtretched out on one ſide like a tongue, and are indented at the top in four or five ſegments; they have each five ſhort hairy ſtamina, terminated by cylindrical ſummits. The germen is ſituated under the floret, having a ſtyle the length of the ſtamina, crowned by two reflexed ſtigmas; the germen afterward becomes a ſingle, oval, compreſſed ſeed, crowned with a ſingle down, and incloſed in the empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's nineteenth claſs, intitled Syngeneſia Polygamia æqualis. The flowers of this ſection are compoſed of only hermaphrodite florets, which are fruitful.

We have but one SPECIES of this genus, viz.

CHONDRILLA (*Juncea.*) Lin. Hort. Cliff. 383. *Gum Succory.* Chondrilla juncea viſcoſa arvenſis. C. B. P. 30. *Viſcous Field Gum Succory with ruſhy ſtalks.*

This plant grows naturally in Germany, Helvetia, and France, on the borders of the fields, and is ſeldom preſerved in gardens, becauſe the roots are very apt to ſpread, and become troubleſome weeds; and the ſeeds having down on their tops, are carried by the wind to a great diſtance, ſo that the neighbouring ground is filled with the plants; the roots of this ſtrike deep into the ground, and ſpread out with thick fibres on every ſide, each of which, when cut, or broken into many parts, will ſhoot up a plant; ſo that when this plant hath obtained poſſeſſion of the ground, it is very difficult to root out. The root ſends out a great number of ſlender ſtalks, which at their bottom are garniſhed with oblong ſinuated leaves, but thoſe above are very narrow and entire. The flowers are produced from the ſide and top of the branches, which are like thoſe of Lettuce, and are ſucceeded by ſeeds of the ſame form, crowned with down. It flowers in July, and the ſeeds ripen in September.

The other ſpecies of this genus which were enumerated in the former edition, are referred to the Lactuca and Crepis.

CHRISTMAS FLOWER, or Black Hellebore. See HELLEBORUS.

CHRISTOPHORIANA. See ACTEA.

CHRISANTHEMOIDES OSTEOSPERMON. See OSTEOSPERMUM.

CHRYSANTHEMUM. Tourn. Inſt. R. H. 491. tab. 280. Lin. Gen. Plant. 866. Leucanthemum. Tourn. Inſt. R. H. 492. [χρυσάνθεμον, *Gr.* from χρυσὸς, gold, ἄνθεμος, a flower; that is to ſay, Golden Flower.] Corn Marigold.

The CHARACTERS are,

*It hath a compound flower, the rays being compoſed of female florets, which are extended on one ſide like a tongue, and are indented in three ſegments at the end; theſe have an oval germen, ſupporting a ſlender ſtyle, crowned by two obtuſe ſtigmas. The hermaphrodite florets which compoſe the diſk, are funnel-ſhaped the length of the empalement, but are divided into five ſegments at the top, which are ſpread open; theſe have five ſhort hairy ſtamina, terminated by tubular cylindrical ſummits, and have an oval germen, with ſtyle and ſtigma like the female; the germen afterward becomes a ſingle, oblong, naked ſeed.*

This genus of plants is ranged in the ſecond ſection of Linnæus's nineteenth claſs, intitled Syngeneſia Polygamia ſuperflua. In this ſection all the central florets which compoſe the diſk, are hermaphrodite and fruitful, and the rays are compoſed of female florets.

The SPECIES are,

1. CHRYSANTHEMUM (*Segetum*) foliis amplexicaulibus, ſupernè laciniatis, infernè dentato-ſerratis. Hort. Cliff. 416. *Corn Marigold with leaves embracing the ſtalks, the upper being jagged, and the lower indented like a ſaw.* Chryſanthemum ſegetum. Cluſ. Hiſt. 1. p. 334. *Corn Marigold.*
2. CHRYSANTHEMUM (*Leucanthemum*) foliis amplexicaulibus, oblongis, ſupernè ſerratis, infernè dentatis. Hort. Cliff. 416. *Corn Marigold with oblong leaves embracing the ſtalks, the upper ones being ſawed, and the lower indented.* Bellis ſylveſtris caule folioſo major. C. B. P. 261. *Greater wild Daiſy with a leafy ſtalk.*
3. CHRYSANTHEMUM (*Serotinum*) foliis lanceolatis, ſupernè ſerratis, utrinque acuminatis. Hort. Cliff. 416. *Corn Marigold with ſpear-ſhaped leaves, thoſe above being ſawed, and pointed on all ſides.* Bellis major, radice repente, foliis latioribus, ſerratis. Mor. Hiſt. 3. p. 29. *Greater Daiſy with a creeping root, and broad ſawed leaves.*
4. CHRYSANTHEMUM (*Montanum*) foliis imis ſpathulato-lanceolatis, ſerratis, ſummis linearibus. Sauv. Monſp. 87. *Corn Marigold with lower leaves pointed like a ſpear-ſhaped ſpatula, and ſawed, and the upper ones linear.* Leucanthemum montanum minus. Tourn. Inſt. 492. *Leſſer Mountain Ox-eye.*
5. CHRYSANTHEMUM (*Graminifolium*) foliis linearibus, ſubintegerrimis. Sauv. Monſp. 87. *Corn Marigold with narrow leaves, which are entire.* Leucanthemum gramineo folio. Tourn. Inſt. 493. *Ox-eye with a Graſs leaf.*
6. CHRYSANTHEMUM (*Alpinum*) foliis pinnatifidis, laciniis parallelis, integris, caule unifloris. Lin. Sp. Plant. 889. *Corn Marigold with many pointed leaves, whoſe ſegments are parallel and entire, and one flower on each foot-ſtalk.* Leucanthemum Alpinum, foliis Coronopi. Tourn. Inſt. R. H. 493. *Alpine Ox-eye with a Hartſhorn leaf.*

7. Chrysanthemum (*Corymbiferum*) foliis pinnatis, inciso-ferratis, caule multifloro. Prod. Leyd. 174. *Corn Marigold with winged leaves, sawed segments, and many flowers upon a stalk.* Tanacetum montanum inodorum, minore flore. C. B. P. 132. *Unsavoury Mountain Tansy with a lesser flower.*

8. Chrysanthemum (*Coronarium*) foliis pinnatifidis, incisis, extrorsum latioribus. Hort. Cliff. 416. *Corn Marigold with wing-pointed cut leaves, whose exterior parts are broadest.* Chrysanthemum Creticum. Clus. Hist. 1. p. 334. *Corn Marigold of Crete.*

9. Chrysanthemum (*Monspeliensium*) foliis imis palmatis, foliolis linearibus, pinnatifidis. Sauv. Monsp. 304. *Corn Marigold, whose lower leaves are palmated, and the smaller linear, ending in many points.* Leucanthemum montanum foliis Chrysanthemi. Tourn. Inst. 492. *Mountain Ox-eye with Corn Marigold leaves.*

10. Chrysanthemum (*Frutescens*) fruticosum, foliis linearibus dentato-trifidis. Hort. Cliff. 417. *Shrubby Corn Marigold with narrow leaves, having three indented points.* Leucanthemum Canariense, foliis Chrysanthemi, Pyrethri sapore. Tourn. Inst. 493. *Canary Ox-eye with Corn Marigold leaves, and the taste of Pelitory.*

11. Chrysanthemum (*Flosculosum*) flosculis omnibus uniformibus, hermaphroditis. Hort. Cliff. 417. *Corn Marigold, whose florets are all uniform and hermaphrodite.* Bellis spinosa, foliis Agerati. C. B. P. 262. *Prickly Daisy with Maudlin leaves.*

12. Chrysanthemum (*Pallidum*) foliis linearibus, infernè apice dentatis, supernè integerrimis, pedunculis nudis unifloris. *Corn Marigold with narrow leaves, those on the lower part being indented at their points, the upper entire, and naked foot-stalks with one flower.* Chrysanthemum pallidum minimis, imisque, foliis incisis superioribus integris, capillaribus. Barrel. Icon. 421. *Least Corn Marigold, with the under and lesser leaves divided, the upper entire.*

The first sort is the common Corn Marigold, which grows naturally amongst the corn, and the borders of the corn-fields in divers parts of England, so is rarely admitted into gardens; but we have inserted this and the next to introduce the other species.

The second sort is the greater Daisy, which stands in the list of medicinal plants in the College Dispensatory: this grows naturally in moist pastures, almost every where in this country. It rises with stalks near two feet high, garnished with oblong indented leaves, which embrace the stalks with their base. The foot-stalks are each terminated by one white flower, shaped like those of the Daisy, but four times as large. It flowers in June.

The third sort grows naturally in North America, but hath been long preserved in the English gardens. The roots of this plant creep far under the surface, and send up strong stalks three or four feet high, garnished with long sawed leaves, ending in points; the stalks divide upward into many smaller, each being terminated by a large, white, radiated flower; these appear in September. It multiplies very fast by its creeping roots, and will thrive in any soil or situation.

The fourth sort grows naturally upon the Alps, and other mountainous places. I received this from Verona, near which place it grows in plenty: this sends up a single stalk a foot high, garnished with entire leaves above, but the under leaves are sawed on the edges. The stalk is terminated by one large white flower, shaped like those of the third sort. It flowers in June, and the seeds ripen in August. This sort may be propagated by seeds, which, if sown in a shady border, will come up in about six weeks; and the plants, when fit to remove, may be transplanted into a shady border, where they are to remain, and will require no other care but to keep them clean from weeds.

The fifth sort grows naturally about Montpelier; this hath a perennial root, from which springs up many narrow Grass-like leaves, and, between them, stalks which rise a foot and a half high, garnished with leaves of the same form as those below. The stalks are each terminated by one large white flower, with a yellow disk or middle. This flowers in June, but rarely perfects seeds in England, so is propagated only by parting the roots: the best time for this is in autumn, that the plants may get good root before winter.

The seventh sort grows naturally on the Alps, and other mountainous places in Germany: this sends out upright stalks, garnished with leaves cut into many parallel segments, somewhat like those of Buckshorn Plantain. The stalks rise a foot and a half high, and are each terminated by a single flower of the same form with those of the last: it hath a perennial root, and may be propagated in the same manner as the other.

The eighth sort has been many years cultivated in the gardens for the beauty of its flowers. Of this there are single and double with white, and the same with yellow flowers; and as these do not differ from each other in any thing except in the colour of their flowers, therefore they are generally esteemed but one species; but this difference is constant, for I have never found the seeds saved from the white, produce plants with yellow flowers, nor those of the yellow produce white.

There is also a variety of these colours with fistular florets, which has accidentally risen from seeds of the other; these are generally titled Quill-leaved Chrysanthemum; but as the seeds saved from these degenerate to the common sorts, so they do not merit a particular denomination.

These plants are always esteemed as annual, so the seeds are usually sown upon a slender hot-bed in the spring, and the plants treated in the same manner as the African Marigold, for the culture of which we shall refer the reader to that article; but as the plants which rise from seeds, do many of them produce single flowers, although the seeds are saved from the best double flowers, therefore many persons now propagate these plants from cuttings, whereby they continue the double sorts only; these cuttings, taken from the plants the beginning of September, and planted in pots, will readily take root; and if they are placed under a hot-bed frame to screen them from the frost in winter, letting them have free air in mild weather, they will live through the winter; and in the spring these plants may be transplanted into the borders of the flower-garden, where they will flower in June, and continue in succession till the frost puts a stop to them; by this method all the varieties may be continued without variation, but the plants which are propagated this way by cuttings will become barren soon, so will not produce seeds.

The ninth sort is a perennial plant, sending out many stalks from the root, which divide into branches, garnished with pretty thick leaves, deeply cut into many segments, like those of the last sort; these are of a pale green; the flowers are produced at the end of the branches, standing upon pretty long naked foot-stalks; they are very like those of the common Greater Daisy, in size and colour. It flowers in June, and continues till the end of September. This sort ripens seeds every year in England, by which the plant is easily propagated; for if the seeds are sown in the spring on a common border, the plants will come up in six weeks; when these are fit to remove, they may be transplanted into a nursery-bed at about a foot distance every way, and kept clean from weeds till autumn, when they may be removed to the places where they are designed to remain. As these plants extend their branches pretty far on every side, they should be allowed at least two feet room; therefore they are not very proper furniture for small gardens, where there is not room for these large growing plants; but in large gardens, these may have a place for the sake of variety.

If these plants are planted in poor dry land, or upon lime-rubbish, they will not grow so vigorous as in good ground, so they will endure the cold better,

and continue longer; for when their leaves and branches are replete with moiſture, they are very apt to rot in the winter, ſo are ſeldom of long duration; but where the plants have grown from the joints of old walls, I have known them continue in vigour ſeveral years.

The tenth ſort grows naturally in the Canary Iſlands, from whence it was firſt brought to England, where it has been long an inhabitant in ſome curious gardens. It has been frequently called by the gardeners Pellitory of Spain, from the very warm taſte which it hath, much reſembling the taſte of that plant.

This riſes with a ſhrubby ſtalk near two feet high, dividing into many branches, garniſhed with pretty thick ſucculent leaves, of a grayiſh colour, cut into many narrow ſegments, which are divided into three parts at their extremity. The flowers come out from the wings of the leaves, ſtanding upon naked footſtalks ſingly, which greatly reſemble thoſe of the common Chamomile; there is a ſucceſſion of flowers upon the ſame plants great part of the year, for which it is chiefly eſteemed. This plant will perfect ſeeds in England, when the ſeaſons are favourable; but as the cuttings of it take root ſo eaſily, if planted during any of the ſummer months, the ſeeds are rarely ſown.

As this plant is a native of warm countries, it will not live in the open air in England during the winter ſeaſon; therefore when the cuttings have made good roots, they ſhould be each planted into a ſeparate pot, and placed in the ſhade till they have taken freſh root; then they may be removed to a ſheltered ſituation, where they may remain till autumn, at which time they muſt be removed into the green-houſe to protect them from froſt; but in mild weather they ſhould have plenty of free air, and, during the winter, they ſhould be frequently refreſhed with water, but it muſt not be given them in too great plenty. In ſummer they will require more moiſture, and ſhould be treated in the ſame manner as other hardier kinds of exotic plants.

The eleventh ſort grows naturally at the Cape of Good Hope, from whence the ſeeds were brought many years paſt to Holland, where the plants were firſt raiſed, and from thence all the other parts of Europe have been ſupplied with this plant. It riſes with a ſhrubby ſtalk about two feet high, which divides into many ſlender branches upward, garniſhed with oblong leaves, much indented on their edges, each indenture terminating in a ſoft ſpine; theſe are of a pale green, ſet cloſe to the branches. The flowers are produced on ſhort foot-ſtalks from the wings of the leaves, toward the upper part of the branches; theſe are globular, and formed of a great number of hermaphrodite florets, which are tubular and even, having no rays, ſo are naked, and of a deep yellow colour. The flowers appear in June, and continue in ſucceſſion till the froſt ſtops them. This may be propagated by cuttings in the ſame manner as the laſt, and the plants ſhould be treated in the ſame way.

The twelfth ſort grows naturally about Madrid: this hath a low ſhrubby ſtalk, which ſeldom riſes a foot high, putting out ſeveral ſlender ligneous branches, garniſhed with narrow, pale, green leaves; thoſe on the lower part of the branches are indented at their extremity in ſeveral parts, but the upper leaves are entire; from the end of each branch is produced a naked foot-ſtalk ſix inches long, ſuſtaining one radiated flower, of a ſulphur colour. The flowers come out in June and July, but there is ſeldom any ſeeds ripened in England; this ſort muſt be ſheltered under a common frame in winter, for unleſs the winter proves very favourable, the plants will not live in the open air here. It may be propagated by cuttings in ſummer, as the two laſt ſorts, but theſe cuttings do not ſo readily take root as thoſe do.

CHRYSOBALANUS. Lin. Gen. Plant. 585. Icaco. Plum. Nov. Gen. 44. Cocoa Plumb.

The Characters are,

*The empalement of the flower is of one leaf, divided into five parts, almoſt to the middle. The flower hath five petals, which ſpread open, and ten ſtamina, five of which are longer than the petals; the other are ſhorter, and are terminated by heart-ſhaped ſummits. In the center is ſituated an oval germen, ſupporting a trifid ſhort ſtyle, crowned by obtuſe ſtigmas. The germen afterward becomes an oval fleſhy berry, incloſing a nut with five longitudinal furrows.*

This genus of plants is ranged in the firſt ſection of Linnæus's thirteenth claſs, intitled Polyandria Monogynia; but it would be more properly placed in the third ſection of his tenth claſs, for the flowers have ten ſtamina and three ſtyles.

The Species are,

1. Chrysobalanus (*Icaco*) foliis ovatis, emarginatis, floribus racemoſis, caule fruticoſo. *Chryſobalanus with oval indented leaves, flowers growing in bunches, and a ſhrubby ſtalk.* Frutex Cotini ferè folio craſſo, in ſummitate deliquium patiente, fructu ovali cæruleo oſſiculum anguloſum continente. Cateſb. Car. *The Cocoa Plumb.*
2. Chrysobalanus (*Purpurea*) foliis decompoſitis, foliolis ovatis integerrimis. *Chryſobalanus with decompounded leaves, whoſe lobes are oval and entire.* Icaco fructu purpureo. Plum. Nov. Gen. 44. *Icaco with purple fruit.*

The firſt ſort grows naturally in the Bahama Iſlands, and in many other parts of America, but commonly near the ſea. It riſes with a ſhrubby ſtalk about eight or ten feet high, ſending out ſeveral ſide branches, covered with a dark brown bark, ſpotted with white; theſe are garniſhed with oval ſtiff leaves, which are indented at the end, in form of a heart, placed alternately on the branches. From the wings of the leaves, and alſo at the diviſion of the branches, the flowers are produced, which grow in looſe bunches; theſe are ſmall and white, having many ſtamina in each, which are joined to the petals of the flowers, terminated by yellow ſummits. The flowers are ſucceeded by oval Plumbs about the ſize of Damſons; ſome of theſe are blue, ſome red, and others yellow; they have a ſweet luſcious taſte. The Spaniards in the iſland of Cuba, make a conſerve of theſe fruits. The ſtone of the Plumb is ſhaped like a Pear, and hath five longitudinal ridges on it. This grows naturally on moiſt land.

The ſeeds of the ſecond ſort were ſent me from Jamaica, with Plumier's title; the ſtones were exactly the ſame ſhape of thoſe of the former, but the plants have leaves compounded of ſeveral winged lobes, which are branched out oppoſite, each having ſix or ſeven pair of pinnæ (or lobes.) This ſort hath not flowered in England, ſo I can give no farther account of it.

As theſe trees are natives of the warm parts of America, ſo they will not thrive in England, unleſs they are kept in a warm ſtove. They are propagated by ſeeds, which muſt be obtained from the countries where the plants naturally grow; theſe muſt be ſown in the ſpring in ſmall pots filled with light earth, and plunged into a hot bed of tanners bark, obſerving frequently to water the pots; but not let them have much at each time. In ſix weeks the plants will come up, and, if properly managed, will be fit to remove in a month's time after, when they ſhould be carefully ſeparated, and each planted into a ſeparate ſmall pot filled with light kitchen-garden earth, and then plunged into the hot-bed again, obſerving to ſhade them from the ſun till they have taken freſh root; after which they muſt have air every day in proportion to the warmth of the ſeaſon, and their waterings during the ſummer ſhould be frequent, but ſparing. In the autumn the plants muſt be removed into the bark-ſtove, and plunged into the tan-bed; and in winter the plants muſt not have too much water, leſt it occaſions their throwing off their leaves. In ſummer they muſt have a good ſhare of air, and the plants in the ſtove ſhould be conſtantly treated in the ſame manner as other tender plants from the ſame countries.

CHRYSOCOMA. Lin. Gen. Plant. 845. Dillen. Gen. 14. Coma aurea. Boerh. 1. p. 121. Goldylocks.

The Characters are,

*The common empalement is imbricated, the scales are narrow, the outer being convex and pointed; the flower is composed of many hermaphrodite florets, which are tubular, equal, and funnel-shaped, cut into five segments at the brim, which turn back; these have each five short slender stamina, terminated by cylindrical summits; they have an oblong germen, supporting a slender style, crowned by two oblong depressed stigmas. The germen afterward becomes a single, oblong, compressed seed, crowned with hairy down.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia Æqualis; the plants of this section have only hermaphrodite florets, which are fruitful.

The Species are,

1. Chrysocoma (*Linosyris*) herbacea, foliis linearibus, glabris, calycibus laxis. Lin. Sp. Plant. 841. *Herbaceous Goldylocks with narrow smooth leaves, and loose empalements.* Coma aurea Germanica linariæ folio. Park. Theat. 688. *German Goldylocks.*
2. Chrysocoma (*Biflora*) herbacea paniculata, foliis lanceolatis trinerviis, punctatis, nudis. Lin. Sp. Plant. 841. *Herbaceous Goldylocks with flowers growing in panicles, and spear-shaped leaves, having three nerves, and yellow flowers growing in umbels.*
3. Chrysocoma (*Coma Aurea*) fruticosa foliis linearibus dorso decurrentibus. Hort. Cliff. 397. *Shrubby Goldylocks with very narrow leaves, whose back parts run along the stalks.* Coma aurea Africana fruticans, foliis linariæ augustis, major. Com. Hort. Amst. 2. p. 89. *Greater shrubby African Goldylocks, with narrow Toad-flax leaves.*
4. Chrysocoma (*Cernua*) subfruticosa, foliis linearibus subtus pilosis, floribus ante florescentiam cernuis. Hort. Cliff. 397. *Shrubby Goldylocks with very narrow hairy leaves, and flowers nodding before they are blown.* Coma aurea foliis linariæ augustioribus minor. Hort. Amst. 2. p. 89. *Lesser Goldylocks with narrower Toad-flax leaves.*
5. Chrysocoma (*Ciliata*) suffruticosa, foliis linearibus rectis, ciliatis ramis pubescentibus. Lin. Sp. Plant. 481. *Shrubby Goldylocks with narrow leaves and downy branches.* Conyza Africana, tenuifolia, subfrutescens, flore aureo. Hort. Elth. 104. tab. 68. *Narrow-leaved, African, shrubby Fleabane, with a golden flower.*

The first sort grows naturally in Germany, and also in France and Italy; this hath a perennial root; the stalks rise two feet and a half high, are round, stiff, and closely garnished with long, narrow, smooth leaves, which come out without any order, of a pale green colour; the upper part of the stalk divides into many slender foot-stalks, each sustaining a single head of flowers, which are composed of many hermaphrodite florets, contained in one common empalement, having very narrow scales. The flowers are of a bright yellow, and stand disposed on the top of the stalk, in form of an umbel. These appear in July; and in favourable seasons are succeeded by seeds, which ripen in September, soon after which the stalks decay to the root, and new ones arise the following spring.

This plant is generally propagated by parting of the roots, that being the most expeditious method; for the seedling plants do not flower till the second or third year. The best time to remove the plants and part their roots, is soon after the stalks decay in autumn, that the plants may get fresh roots before winter. It delights in a dry loose soil, in which it will live in the open air, and propagate by its roots very fast; but in strong wet land, the roots often rot in winter.

The second sort grows naturally in Siberia, from whence the seeds were sent to Petersburgh, part of which I received from the late Dr. Amman, who was professor of botany in that university. This plant hath a perennial creeping root, which spreads on every side to a considerable distance, sending up many erect stalks, garnished with flat spear-shaped leaves, ending in points; these are rough, and have three longitudinal veins; the upper part of the stalks branch out, and form loose panicles of yellow flowers, which are larger than those of the former sort. This flowers in June and July, and the seeds ripen in autumn.

It propagates too fast by its creeping roots to be admitted into the flower-garden, for the roots will often extend two or three feet every way in the compass of one year, so that they will interfere with the neighbouring flowers; but as the plants will grow in any soil or situation, so a few roots may be planted on the side of extensive rural walks round the borders of fields, where they will require no care, and their flowers will make a good appearance, and continue long in beauty.

The third sort grows naturally at the Cape of Good Hope. This rises with a ligneous stalk about a foot high, dividing into many small branches, which are garnished with narrow leaves, of a deep green, coming out on every side without order; the back part of each leaf hath a small short appendix, which runs along the stalks. The flowers are produced at the end of the branches, on slender naked foot-stalks; these are of a pale yellow, and shaped like those of the former sorts, but are larger. This plant flowers great part of the year, for which it is chiefly esteemed; the seeds ripen very well in autumn, which if sown on a common border of light earth in the spring, the plants will come up, and may be transplanted into pots, to be removed into shelter in winter, for these plants will not live through the winter in the open air in England.

The most expeditious method of propagating this plant is by cuttings, which, if planted in a common border in any of the summer months, and covered with hand-glasses, will easily take root, provided they are shaded from the sun and duly watered: when these have gotten good roots they should be carefully taken up, and each planted in a separate pot, filled with light earth, placing them in the shade till they have taken new root; then they may be exposed with other hardy exotic plants till autumn, when they must be removed into the green-house during the winter season; they should enjoy a large share of free air in mild weather, for they only require protection from frost, so must not be too tenderly treated.

The fourth sort is a native of the Cape of Good Hope, from whence I received the seeds; this is a less plant than the former, it hath a shrubby stalk, branching out in the same manner; the leaves are shorter, and a little hairy; the flowers are not half so large, of a pale sulphur colour, and nod on one side before they are blown. This also flowers great part of the year, and ripens seeds very well; but this is generally propagated in the same manner as the former, and the plants require the same treatment.

The fifth sort is also a native of the same country as the two former; this hath a low shrubby stalk, which branches out on every side, very narrow, short, rough, and reflexed; the flowers stand single on the top of naked foot-stalks, which arise from the upper part of the branches; these flowers are larger than those of the last, and stand erect. This plant requires the same treatment as the two former, and is propagated by cuttings in the same manner.

CHRYSOPHYLLUM. Lin. Gen. Plant. 233. Cainito. Plum. Nov. Gen. 9. tab. 9. The Star Apple.

The Characters are,

*The empalement is permanent, and consists of five small, roundish, concave petals; the flower is composed of five petals, which spread open, and are cut in the middle into two parts; it hath five stamina placed alternate to the segments of the petals, terminated by heart-shaped summits: the oval germen is situated in the center, supporting*

*ing a short style, crowned by an obtuse stigma. The germen afterward becomes a large, oval, fleshy fruit, inclosing three or four flat seeds, having hard shells.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The Species are,

1. Chrysophyllum (*Cainito*) foliis ovatis, parallele striatis subtus, tomentoso-nitidis. Jacq. Amer. 15. *Chrysophyllum with oval leaves, with parallel veins and neat woolly leaves on their under side.* Cainito folio subtus aureo, fructu olivæ formi. Plum. Nov. Gen. 10. *The Damson-tree.*
2. Chrysophyllum (*Glabrum*) foliis utrinque glaberrimis. Jacq. Amer. 15. *Chrysophyllum with very smooth leaves.* Cainito folio subtus aureo, fructu maliformi. Plum. Nov. Gen. 10. *The Star Apple.*

These trees grow naturally in the West-Indies, where the first sort rises from twenty to thirty feet high, dividing into many branches, garnished with oval leaves, smooth above, and of a gold colour on their under side; the flowers come out from the side of the branches, at the setting on of the leaves, in round clusters, which are succeeded by oval, smooth, pulpy fruit, inclosing three or four hard flat seeds.

The second sort rises with an upright trunk to the height of thirty or forty feet, dividing into many slender branches, garnished with spear-shaped leaves, coming out without order; from the wings of the leaves, and also at the extremity of the branches, the flowers are produced in bunches, which are succeeded by round pulpy fruit the size of a Golden Pippin, containing many flat hard seeds.

The fruit of both these trees is very rough and astringent at first, but by lying some time after they are gathered, they become mellow, like the Medlar. The timber of both these trees is used in buildings, and for shingles to cover houses.

These plants are preserved in several curious gardens for the beauty of their leaves, especially the first sort, whose under sides shine like sattin, the upper sides are of a deep green. The leaves continue all the year, so make a very pretty appearance in the stove at all seasons.

These trees, being natives of the warmest parts of the world, cannot be preserved in this country, without being kept in the warmest stoves; and should always remain in a hot-bed of tanners bark, otherwise they will make but little progress. They are propagated by seeds, which must be procured from the places of their growth, for they do not produce fruit in Europe. These seeds must be fresh, otherwise they will not grow; and if they are sent over in sand, it will preserve them from drying too much; when the seeds arrive, they must be sown as soon as possible in small pots filled with light fresh earth, and plunged into a good hot-bed of tanners bark. If the seeds are good, and the bed in a proper temperature of warmth, the plants will appear in five or six weeks; and in about two months after, will be strong enough to transplant; in doing of which, the plants, with all the earth, should be shaken out of the pots very carefully, and separated with their roots entire, and each planted into a single small pot filled with fresh rich earth, and plunged again into a hot-bed of tanners bark, watering and shading them until they have taken fresh root. If the hot-bed in which these plants are plunged, is from time to time stirred, and a little fresh tan added to it, to renew the heat when it declines, the plants will make good progress, and in three or four months will be near a foot high, and may then be shifted into pots a small size larger than those they before were in. If these plants are constantly kept in a warm bed in the stove, and shifted twice a year, to renew the earth to their roots, they will thrive very fast, and put out their side branches, so as to make a handsome appearance in the stove, with other curious plants of the same country; for though they do not produce either flowers or fruit, yet as they keep their leaves through the year, which are so very beautiful, they deserve a place in the stove, better than most other plants. The chief care they require, is to keep them constantly in a proper degree of heat, and never to put them into too large pots; and in winter they should not have too much water, about twice a week will be often enough to water them; and in the depth of winter, they should not have much at each time.

These trees are frequently propagated in the West-Indies, by planting of their branches (as I have been informed by persons of credit;) but I have not heard of their being propagated in England by that method.

CHRYSOSPLENIUM. Lin. Gen. Plant. 493. [χρυσοσπλήνιον, of χρυσὸς, Gold, and σπλὴν, the spleen; q. d. a plant, the flowers of which are of a golden colour, and good against diseases of the spleen.] Golden Saxifrage.

The Characters are,

*The empalement is divided into four or five parts, which spread open, are coloured, and permanent. The flower hath no petals, but eight or ten stamina, which are short, erect, and stand opposite to the angles of the empalement, terminated by single summits: the germen is immersed in the empalement, supporting two short styles, crowned by obtuse stigma. The germen afterward becomes a capsule with two beaks, opening with two valves, and filled with small seeds.*

This genus of plants is ranged in the second section of Linnæus's tenth class, intitled Decandria Digynia, the flowers having ten stamina and two styles.

The Species are,

1. Chrysosplenium (*Alternifolium*) foliis alternis. Flor. Suec. 317. *Golden Saxifrage with alternate leaves.* Saxifraga aurea foliis pediculis oblongis insidentibus. Raii Syn. Hist. 206. *Golden Saxifrage with leaves growing upon long foot-stalks.*
2. Chrysosplenium (*Oppositifolium*) foliis oppositis. Sauv. Monsp. 128. *Golden Saxifrage with opposite leaves.* Chrysosplenium foliis amplioribus auriculatis. Tourn. Inst. 146. *Golden Saxifrage with larger eared leaves.*

These two plants are found growing wild in many parts of England, upon marshy soils and bogs, as also in moist shady woods, and are seldom propagated in gardens; where, if any person has curiosity to cultivate them, they must be planted in very moist shady places, otherwise they will not thrive. They flower in March and April.

CIBOULS, or CHIBOULS. See Cepa.

CICER. Lin. Gen. Plant. 783. Tourn. Inst. R. H. tab. 210. [This plant is called Cicer, of Κίκυς, strength, because it is said to strengthen: it is also called Arietaria, because the seeds of it resemble the head of a ram.] Cicer, or Chich Pease.

The Characters are,

*The empalement of the flower is cut into five segments, four of which lie upon the standard; the two middle, which are the longest, are joined, the other is under the keel. The flower is of the butterfly kind; the standard is large, roundish, and plain; the wings are much shorter and obtuse, the keel is shorter than the wings, and is sharp-pointed. It hath ten stamina, nine of them are joined, and the tenth is separate, terminated by single summits. It hath an oval germen supporting a single style, crowned by an obtuse stigma. The germen afterward becomes a turgid swelling pod of a rhomboidal figure, inclosing two roundish seeds, with a protuberance on their side.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, from the flower having ten stamina joined in two bodies.

There is but one Species of this genus, viz.

Cicer (*Arietinum*) foliolis serratis. Hort. Cliff. 370. *Chich Pease with sawed leaves.* Cicer sativum. C. B. P. 347. *Garden Chich Pease.*

There is a variety of this with a red seed, which differs from it in nothing but the colour.

It is much cultivated in Spain, being one of the ingredients in their olios, and is there called Garavance; it is alſo cultivated in France, but in England it is rarely ſown.

This plant is annual, ſhooting out ſeveral hairy ſtalks from the root, which are about two feet long; garniſhed with long winged leaves of a grayiſh colour, compoſed of ſeven or nine pair of ſmall roundiſh leaves (or lobes) terminated by an odd one, which are ſawed on their edges. From the ſide of the branches come out the flowers, ſometimes one, at other times two together. They are ſhaped like thoſe of Peaſe, but are much ſmaller and white, ſtanding on long foot-ſtalks; theſe are ſucceeded by ſhort hairy pods, including two ſeeds in each, which are the ſize of common Peaſe, but have a little knob or protuberance on one ſide.

The ſeeds of this plant may be ſown in the ſpring, in the ſame manner as Peaſe, making drills with a hoe, about an inch and a half deep, in which the ſeeds ſhould be ſown at about two inches aſunder, then with a rake draw the earth into the drill to cover the ſeeds. The drills ſhould be made at three feet diſtance from each other, that there may be room for their branches to ſpread, when the plants are fully grown, as alſo to hoe the ground between them, to keep it clean from weeds, which is all the culture theſe plants require.

This plant flowers in June, and the ſeeds ripen in Auguſt; but unleſs the ſeaſon proves warm and dry, the plants decay in this country before the ſeeds are ripe.

CICHORIUM. Lin. Gen. Plant. 825. Tourn. Inſt. R. H. tab. 272. [κιχώριον, or κιχόρειον, of κιχέω, to find, becauſe found every where in walking.] Succory.

The CHARACTERS are,

*The flower hath a common ſcaly empalement, which at firſt is cylindrical, but is afterward expanded; the ſcales are narrow, ſpear-ſhaped, and equal. The flower is compoſed of many hermaphrodite florets, which are plain, uniform, and ſtand circularly, each having one petal, which is tongue-ſhaped, and cut into five ſegments. They have five ſhort hairy ſtamina, terminated by five-cornered cylindrical ſummits. The germen is ſituated under the petal, ſupporting a ſlender ſtyle, crowned by two turning ſtigmas: the germen afterward becomes a ſingle ſeed, incloſed with a down, and ſhut up in the empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's nineteenth claſs, intitled Syngeneſia Polygamia æqualis. The plants of this ſection have only hermaphrodite fruitful florets.

The SPECIES are,

1. CICHORIUM (*Intybus*) floribus geminis ſeſſilibus, foliis runcinatis. Flor. Suec. 650. *Succory with two flowers ſitting cloſe to the ſtalk.* Cichorium ſylveſtre ſive officinarum. C. B. P. 126. *Wild Succory.*
2. CICHORIUM (*Spinoſum*) caule dichotomo ſpinoſo floribus axillaribus ſeſſilibus. Hort. Cliff. 388. *Succory with a prickly forked ſtalk.* Cichorium ſpinoſum. C. B. P. 126. *Prickly Succory.*
3. CICHORIUM (*Endivia*) floribus ſolitariis pedunculatis, foliis integris, crenatis. Hort. Cliff. 389. *Succory with ſingle flowers on foot-ſtalks, and entire crenated leaves.* Cichorium latifolium, ſive endivia vulgaris. C. B. P. 125. *Broad-leaved Succory, or common Endive.*
4. CICHORIUM (*Criſpum*) floribus ſolitariis pedunculatis, foliis fimbriatis, criſpis. *Succory with ſingle flowers on foot-ſtalks, and fringed curled leaves.* Endivia criſpa. C. B. P. 125. *Curled Endive.*

The firſt ſort grows naturally by the ſides of roads and in ſhady lanes, in many parts of England: this has been ſuppoſed to be no other way differing from the garden Succory, but by the latter being cultivated in gardens; indeed, moſt of the writers on botany, have confounded the two ſorts together; for the Garden Succory which is deſcribed in moſt of the old books, I take to be the broad-leaved Endive, which is the third ſort here enumerated, for I have many years cultivated both ſorts in the garden, without finding either of them alter. There is an eſſential difference between theſe, for the wild Succory hath a perennial creeping root, whereas the other is at moſt but a biennial plant; and if the ſeeds of the latter are ſown in the ſpring, the plants will flower and produce ſeeds the ſame year, and periſh in autumn, ſo that it may rather be called annual. The wild Succory ſends out from the roots long leaves, which are jagged to the midrib, each ſegment ending in a point; from between theſe ariſe the ſtalks, which grow from three to four feet high, garniſhed with leaves, ſhaped like thoſe at the bottom, but are ſmaller, and embrace the ſtalks at their baſe. Theſe branch out above into ſeveral ſmaller ſtalks, which have the ſame leaves, but ſmaller and leſs jagged; the flowers are produced from the ſide of the ſtalks, which are of a fine blue colour; theſe are ſucceeded by oblong ſeeds, incloſed in a down. It flowers in June and July, and the ſeeds ripen in September.

The ſecond ſort grows naturally on the ſea-coaſts in Sicily and the iſlands of the Archipelago. This ſends out from the root many long leaves, which are indented on their edges, ſpreading flat on the ground; from between theſe ariſe the ſtalks, which have very few leaves, and thoſe ſmall and entire: the ſtalks are divided in forks upward, from between theſe come out the flowers, which are of a pale blue, and are ſucceeded by ſeeds ſhaped like thoſe of the common ſort; the ends of the ſmaller branches are terminated by ſtar-like ſpines, which are very ſharp. The plant is biennial with us in England, and in cold winters is frequently killed. It flowers and ſeeds about the ſame time with the former ſort, and may be treated in the ſame way as the Endive.

The broad leaved Succory or Endive, differs from the wild ſorts in its duration, the root always periſhing after it has ripened ſeeds: the leaves are broader, rounder at the top, and not laciniated on the ſides as the leaves of the wild; the branches are more horizontal, and the ſtalks never riſe ſo high.

This ſort is not much cultivated in the Engliſh gardens at preſent, for the curled Endive being tenderer, and not ſo bitter, is generally preferred to it. The broad-leaved and curled Endive has been ſuppoſed to be only varieties from each other, which hath accidentally been produced by culture; but from having cultivated both near forty years, I could never find that they ever altered, otherwiſe than by the curled ſort coming more or leſs curled; the leaves of this ſort have only a few ſlight indentures on their edges, and the ſtalks grow more erect, having but few leaves upon them. This, when blanched, has a bitter taſte, which has occaſioned its being generally neglected in England, but in Italy it is ſtill cultivated in their gardens.

All the ſorts of Succory are eſteemed aperitive and diuretic, opening obſtructions of the liver, and good for the jaundice; it provokes urine, and cleanſes the urinary paſſages of ſlimy humours, which may ſtop their paſſage.

The curled Endive is now much cultivated in the Engliſh gardens, being one of the principal ingredients in the ſallads of autumn and winter, for which purpoſe it is continued as long as the ſeaſons will permit. I ſhall therefore give directions for the managing of this plant, ſo as to have it in perfection during the autumn and winter months.

The firſt ſeaſon for ſowing of theſe ſeeds is in May, for thoſe which are ſown earlier in the year, generally run up to feed, before they have arrived to a proper ſize for blanching; and it frequently happens, that the ſeeds ſown in May in the rich ground near London, will run to ſeeds the ſame autumn; but in ſituations which are colder, they are not ſo apt to run up, therefore there ſhould be ſome ſeeds ſown about the middle or latter end of that month. The ſecond ſowing ſhould be about the middle of June, and the laſt time in the middle of July. From theſe three different crops, there will be a ſupply for the table during the whole ſeaſon; for there will be plants of each ſowing, very different in their growth, ſo that there

there will be three different crops from the same beds.

When the plants come up they must be kept clean from weeds, and in dry weather duly watered, to keep them growing till they are fit to transplant, when there should be an open spot of rich ground prepared to receive the plants, in size proportionable to the quantity intended. When the ground is well dug and levelled, if it should be very dry, it must be well watered to prepare it to receive the plants; then the plants should be drawn up from the seed-bed carefully, so as not to break their roots, drawing out all the largest plants, leaving the small ones to get more strength; which, when they have room to grow, by taking away the large ones, they will soon do. As the plants are drawn up, they should be placed with their roots even, all the same way, and every handful as they are drawn, should have the tops of their leaves shortened, to make them of equal length: this will render the planting of them much easier, than when the plants are promiscuously mixed, heads and tails: then the ground should be marked out in rows at one foot asunder, and the plants set ten inches distant in the rows, closing the earth well to their roots, and let them be well watered; and repeat this every other evening, till the plants have taken good root, after which they must be kept clean from weeds.

When the plants of the seed-bed have been thus thinned, they should be well cleaned from weeds and watered, which will encourage the growth of the remaining plants, so that in ten days or a fortnight after, there may be another thinning made of the plants, which should be transplanted in the same manner. And at about the same distance of time, the third and last drawing of plants may be transplanted.

Those plants which were the first transplanted, will be fit to blanch by the latter end of July at farthest; and if they are properly managed, in three weeks or a month, they will be sufficiently blanched for use, which will be as soon as these sallads are commonly required; for during the continuance of good Cos Lettuce, few persons care for Endive in their sallads; nor, indeed, is it so proper for warm weather. If any of the plants should put out flower-stems, they should be immediately pulled up and carried away, being good for nothing, so should not be left to incommode the neighbouring plants. As the quantity of roots necessary for the supply of a middling family is not very great, so there should not be too many plants tied up to blanch at the same time, therefore the largest should be first tied, and in a week after those of the next size; so that there may be three different times of blanching the plants, on the same spot of ground. But as in some large families there is a great consumption of this herb for soups, so the quantities of plants should be proportionably greater, at each time of planting and blanching. The manner of blanching is the next thing to be treated of, therefore in order to this you should provide a parcel of small Osier twigs (or bass mat) to tie up some of the largest heads to blanch; which should be done in a dry afternoon, when there is neither dew nor rain to moisten the leaves in the middle of the plants, which would occasion their rotting soon after their being tied up. The manner of doing it is as follows, viz. You must first gather up all the inner leaves of the plant in a regular order, into one hand, and then take up those on the outside that are sound, pulling off and throwing away, all the rotten and decayed leaves which lie next the ground; observing to place the outside leaves all round the middle ones, as near as possible to the natural order of their growth, so as not to cross each other: then having got the whole plant close up in your hand, tie it up with the twig, bass, &c. at about two inches below the top, very close; and about a week after go over the plants again, and give them another tie about the middle of the plant, to prevent the heart leaves from bursting out on one side; which they are subject to do, as the plants grow, if not prevented this way.

In doing of this you need only tie up the largest plants first, and so go over the piece once a week, as the plants increase in their growth; by which means you will continue the crop longer, than if they were all tied up at one time: for when they are quite blanched, which will be in three weeks or a month after tying, they will not hold sound and good above ten days or a fortnight, especially if the season proves wet: therefore it is that I would advise to sow at three or four different seasons, that you may have a supply as long as the weather will permit. But in order to this, you must transplant all the plants of the last sowing under warm walls, pales, or hedges, to screen the plants from frost; and if the winter should prove very sharp, you should cover them with some Pease haulm, or such other light covering, which should be constantly taken off in mild weather: these borders should also be as dry as possible, for these plants are very subject to rot, if planted in a moist soil in winter.

Although I before directed the tying up of the plants to blanch them, yet this is only to be understood for the two first sowings; for after October, when the nights begin to be frosty, those plants which are so far above ground will be liable to be much prejudiced thereby, especially if they are not covered in frosty weather; therefore the best method is, to take up your plants of the latter sowings in a very dry day, and with a large flat-pointed dibble, plant them into the sides of trenches of earth, which should be laid very upright, planting them sideways, on the south side of the trenches, towards the sun, with the tops of the plants only out of the ground, so that the hasty rains may run off, and the plants be kept dry, and secured from frosts.

The plants thus planted, will be blanched fit for use in about a month or five weeks time, after which it will not keep good more than three weeks, before it will decay; you should therefore continue planting some fresh ones into trenches every fortnight or three weeks, that you may have a supply for the table; and those which were last transplanted out of the seed beds, should be preserved till February, before they are planted to blanch; so that from this you may be supplied until the beginning of April, or later: for at this last planting into the trenches, it will keep longer than in winter, the days growing longer; and the sun, advancing with more strength, dries up the moisture much sooner than in winter, which will prevent the rotting of these plants; but if the weather should prove frosty, these latter plantations of Endive should be covered with mats and straw to preserve it, otherwise the frost will destroy it, but the coverings must always be taken off when the weather is favourable.

When your Endive is blanched enough for use, you must dig it up with a spade; and after having cleared it from all the outside green and decayed leaves, you should wash it well in two or three different waters to clear it the better from slugs, and other vermin, which commonly shelter themselves amongst the leaves thereof, and then you may serve it up to the table with other sallading.

But in order to have a supply of good seeds for the next season, you must look over those borders where the last crop was transplanted, before you put them into the trenches to blanch; and make choice of some of the largest, soundest, and most curled plants, in number according to the quantity of seeds required: for a small family, a dozen of good plants will produce seeds enough; and for a large, two dozen or thirty plants.

These should be taken up and transplanted under a hedge or pale, at about eighteen inches distance, in one row about ten inches from the hedge, &c. This work should be done in the beginning of March, if the season is mild, otherwise it may be deferred a fortnight

fortnight longer. When the flower-stems begin to advance, they should be supported with a packthread, which should be fastened to nails driven into the pale, or to the stakes of the hedge, and run along before the stems, to draw them upright close to the hedge or pale, otherwise they will be liable to break with the strong winds. Observe also to keep them clear from weeds, and about the beginning of July your seeds will begin to ripen; therefore, as soon as you find the seeds are quite ripe, you must cut off the stalks, and expose them to the sun upon a coarse cloth to dry; and then beat out the seeds, which must be dried, and put up in bags of paper, and preserved for use in some dry place. But I would here caution you, not to wait for all the seeds ripening upon the same plant; for if so, all the first ripe and best of the seeds will scatter and be lost before the other are near ripe; so great a difference is there in the seeds of the same plant being ripe.

The wild Succory (of which there are some varieties in the colour of the flowers) is seldom propagated in gardens; it growing wild in unfrequented lanes and dunghills in divers parts of England, where the herb women gather it, and supply the markets for medicinal use.

CICUTA properly signifies an hollow intercepted between two knots, of the stalks or reeds of which the shepherds used to make their pipes, as Virgil sings;

*Est mihi disparibus septem compacta Cicutis*
*Fistula*——

CICUTA. Lin. Gen. Plant. 316. Sium. Raii Syn. 212. Water Hemlock.

The Characters are,

*It is a plant with an umbellated flower; the principal umbel is composed of several smaller (called rays;) these are equal, roundish, and bristly: the great umbel hath no involucrum, but the smaller have, which are composed of many short leaves. The flowers have each five oval petals nearly equal, which turn inward; they have five hairy stamina, which are longer than the petals, terminated by single summits. The germen is situated below the flower, supporting two slender styles, which are permanent and longer than the petals, crowned by stigmas in form of a head. The germen afterward becomes a roundish channelled fruit dividing into two parts, containing two oval seeds, plain on one side and convex on the other.*

This genus of plants is ranged in the second section of Linnæus's fifth class of plants, intitled Pentandria Digynia, the flower having five stamina and two styles. The title of this genus has been generally applied to the common Hemlock, which grows naturally on the banks by highways, in most parts of England. But to that plant Dr. Linnæus has applied the old title of Conium, and added this title to the poisonous Water Hemlock described by Webfer.

The Species are,

1. Cicuta (*Virosa*) umbellis oppositis foliis, petiolis marginatis. Lin. Sp. Plant. 255. *Hemlock with umbels opposite to the leaves, and obtuse marginated foot-stalks.* Sium erucæ folio. C. B. P. 154. *Sium with a Rocket leaf.* Cicuta aquatica Gesneri. J. B. 111. 2. p. 175. *Water Hemlock of Gesner.*
2. Cicuta (*Maculata*) foliorum serraturis mucronatis, petiolis membranaceis, apice bilobis. Lin. Sp. Plant. 256. *Hemlock with pointed serratures to the leaves, and membranaceous foot-stalks ending in two lobes.* Angelica Virginiana foliis acutioribus, semine striato minore, cumini sapore & odore. Mor. Hist. 3. p. 281. *Virginia Angelica with pointed leaves, and a small channelled seed, having the taste and smell of Cumin.*
3. Cicuta (*Bulbifera*) ramis bulbiferis. Lin. Sp. 367. *Hemlock, whose branches bear bulbs.* Ammi foliorum lacinulis capillaribus, caule angulato. Flor. Virg. 31.

The first sort grows naturally in standing waters in many parts of England, so is never propagated in gardens; for unless there is a considerable depth of standing water for the plants to root in, they will not grow. I have several times transplanted these plants into ponds, where they have grown one summer, but have not continued through the winter.

It grows near four feet high, with a branching hollow stalk, garnished with winged leaves. The stalks are terminated by umbels of yellowish flowers, which are succeeded by small channelled seeds like those of Parsley. It flowers in June and July, and the seeds ripen in autumn.

The second sort grows naturally in North America, from whence the seeds have been brought to England, where the plants are preserved in botanic gardens for the sake of variety. This is propagated by seeds, which should be sown in autumn in a shady border, where the plants will come up in the spring, and require no other care but to keep them clean.

The third sort is a native of North America. This is sometimes preserved in botanic gardens for variety, but being a plant of no great beauty or use, is seldom allowed a place in other gardens. It is propagated by seeds, which should be sown in autumn, and the plants afterward treated as those of the second sort.

CICUTARIA. See Ligusticum.

CINARA. See Cynara.

CINERARIA, Sea Ragwort.

The Characters are,

*It has a simple empalement, composed of many small equal leaves. The flower is radiated. The disk is composed of many hermaphrodite florets, which are funnel-shaped, cut into five segments at the top; these have five slender stamina, crowned by cylindrical summits, and an oblong germen, supporting a very slender style, crowned by two erect stigmas. The germen afterward becomes a narrow four-cornered seed, covered with downy hairs. The female florets which compose the rays are tongue-shaped, indented at their points; these have an oblong germen with two styles, and have seeds like the hermaphrodite florets, which are included in the empalement.*

This genus of plants is ranged in the second order of Linnæus's nineteenth class, intitled Syngenesia Polygamia superflua, the flowers being composed of hermaphrodite and female florets, which are both fruitful.

The Species are,

1. Cineraria (*Geifolia*) pedunculis ramosis, foliis reniformibus suborbiculatis sublobatis dentatis petiolatis. Lin. Sp. 1242. *Ragwort with branching foot-stalks, kidney-shaped, orbicular, indented leaves upon foot-stalks.* Jacobæa Africana, hederæ terrestris folio, repens. Hort. Amst. 2. p. 145.
2. Cineraria (*Maritima*) floribus paniculatis, foliis pinnatifidis tomentosis, laciniis sinuatis, caule frutescente. Lin. Sp. 1244. *Sea Ragwort with a shrubby stalk, woolly wing-pointed leaves, and flowers growing in panicles.* Jacobæa maritima. C. B. P. 131. *Sea Ragwort.*
3. Cineraria (*Amelloides*) pedunculis unifloris, foliis ovatis oppositis, caule suffruticoso. Lin. Sp. 1245. *Ragwort with an under shrub stalk, oval leaves placed opposite, and foot-stalks with one flower.* After caule ramoso scabro perenne, foliis ovatis sessilibus, pedunculis nudis unifloris. Fig. pl.
4. Cineraria (*Othonnites*) pedunculis unifloris, foliis oblongis indivisis subdentatis petiolatis alternis nudis. Lin. Sp. 1244. *Ragwort with oblong undivided leaves slightly indented, and foot-stalks with one flower.* Jacobæa Africana frutescens, crassis & succulentis foliis. Hort. Amst. 2. p. 147.
5. Cineraria (*Tomentosa*) foliis pinnato-sinuatis dentatis subtus tomentosis, floribus paniculatis, caule frutescente. *Ragwort with sinuated, wing-shaped, indented leaves, downy on their under side, flowers in panicles, and a shrubby stalk.* Jacobæa maritima latifolia. C. B. P. 69.

There are several other species of this genus than are here enumerated, but being plants of little use or beauty are omitted, as they are rarely cultivated in gardens.



The

The first sort grows naturally at the Cape of Good Hope. The root of this is composed of many small fibres; the stalks are weak, so trail on the ground, if they are not supported; but if they are will rise four feet high, dividing into many branches, garnished with roundish kidney-shaped leaves, crenated on their edges; the flowers are produced at the extremity of the branches in small clusters; they are yellow, and in shape like those of the common Ragwort, which are succeeded by seeds, crowned with down.

This sort is easily propagated by cuttings, which, if planted in a shady border during the summer months, and duly watered, will put out roots in a month or five weeks; soon after which it will be proper to transplant them into pots, because their roots are very apt to spread in the full ground; so when the plants are taken up, many of their roots are torn off, whereby the plants are endangered. This is also often the case of the plants in pots. When they are not often removed, their roots will shoot through the holes in the bottom of the pots into the ground, and the plants will grow luxuriantly; but when the pots are removed, and those roots torn off, the plants are often killed thereby. As this plant grows naturally at the Cape of Good Hope, it is too tender to live through the winters in England in the open air; yet if it is nursed tenderly, it is very apt to draw up weak, and thereby is destroyed; therefore the surest method to preserve it, is to make young plants annually from cuttings, and to place them in a common hot-bed frame in winter, where they may enjoy the full air in mild weather, but be screened from the frost, and in summer place them abroad with other of the hardier sorts of exotic plants.

The second sort grows naturally on the sea-coasts in some parts of England and Wales, in particular warm spots, but in the south of France and Italy, it is very common. This hath many ligneous stalks, which rise two or three feet high, dividing into many branches, which have a white downy bark, and are garnished with very woolly leaves six or eight inches long, deeply sinuated, and jagged on their borders into many winged points; they are downy on both sides. The stalks which support the flowers are a foot or more in length, having two or three small leaves on each, shaped like those below, and are terminated by many yellow flowers growing in panicles, shaped like those of common Ragwort; these appear in June, July, and August, and are succeeded by seeds, which ripen the beginning of October.

This sort is also easily propagated by planting cuttings or slips of it on a shady border during the summer months, observing to water them duly. When these are well rooted, they should be planted in a dry rubbishing soil, where they will resist the cold of our ordinary winters very well, and continue many years; but in rich moist ground, the plants are often so very luxuriant in summer, as to be killed in winter when there is much frost.

The third sort grows naturally at the Cape of Good Hope. This hath branching stalks, which are shrubby, and rise from two to three feet high, garnished with oval leaves placed opposite: the foot-stalks of the flowers are long, naked, and support one blue flower at the top, whose rays are reflexed; these appear great part of the year, and those which blow in summer are succeeded by compressed seeds crowned with down.

This may be propagated by sowing the seeds on a bed of light earth the beginning of April, and when the plants are fit to remove, they should be part of them planted in pots, that they may be sheltered in winter under a hot-bed frame; the remainder may be planted close to a warm wall in poor ground, where, if the winter proves favourable, they will live; but if these fail, those in the frame will be secured. It may also be propagated by cuttings, in the same manner as the last mentioned.

The fourth sort hath shrubby branching stalks, which rise three or four feet high, garnished with oblong, thick, undivided leaves, of a glaucous colour. The flowers are produced on branching foot-stalks, arising toward the end of the branches; they are yellow, shaped like those of the other sorts, but are rarely succeeded by seeds in England. This is easily propagated by cuttings any time in summer: the plants, when rooted, must be planted in pots, that they may be removed into shelter in winter, for they will not live abroad in England. It grows naturally at the Cape of Good Hope.

The fifth sort grows naturally on the sea coasts of Italy and Sicily. This has great resemblance to the second sort, but the stalks are more woody, rise higher, and do not branch so much. The leaves are broader, not so much sinuated, and are of a black green colour on their upper side. The flowers are produced in smaller bunches on the top of the foot-stalks, and are like those of the second sort, but are rarely succeeded by seeds in England, nor are the plants so hardy, therefore should be sheltered in winter. It is easily propagated by cuttings during the summer months, in the same way as the second sort.

CIRCEA. Lin. Gen. Plant. 24. Tourn. Inst. R. H. 301. tab. 155. [It is said to be so called from Circe, the famous enchantress, said to have enchanted Ulysses and his companions. Boerhaave supposes it to be so called, because the fruit of this plant takes hold of peoples cloaths, and by this means draws them to it, as the enchantress Circe was wont to do by her enchantments.] Enchanter's Nightshade.

The CHARACTERS are,

*The empalement of the flower is composed of two oval concave leaves: the flower hath two heart-shaped petals, which are equal and spread open; it hath two erect hairy stamina, terminated by roundish summits. The germen is situated under the flower, supporting a slender style, crowned by an obtuse bordered stigma. The empalement afterward becomes a rough oval capsule with two cells opening lengthways, each containing a single oblong seed.*

This genus of plants is ranged in the first section of Linnæus's second class, intitled Diandria Monogynia, the flower having two stamina and one style.

The SPECIES are,

1. CIRCEA (*Lutetiana*) caule erecto, racemis pluribus. Lin. Sp. Plant. 9. *Enchanter's Nightshade, with an upright stalk and many spikes of flowers.* Circea lutetiana. Lob. Icon. 266. *Common Enchanter's Nightshade.*
2. CIRCEA (*Alpina*) caule adscendente, racemo unico. Lin. Sp. Plant. 9. *Enchanter's Nightshade, with an ascending stalk and a single spike.* Circea minima. Col. p. 2. 80. *Least Enchanter's Nightshade.*

The first sort grows naturally in shady woods, and under hedges, in many parts of England. This plant hath a creeping root, by which it multiplies greatly. The stalks are upright, and rise a foot and a half high, garnished with heart-shaped leaves placed opposite, upon very long foot-stalks: these are of a dark green on their upper side, but are pale on their under side. The stalks are terminated by loose spikes of flowers, which are branched out into three or four small spikes. The flowers are small and white, having but two petals, opposite to which are situated the two stamina. After the flowers fall away, the empalement of the flower becomes a rough capsule, inclosing two oblong seeds.

The second sort grows at the foot of mountains in many parts of Germany. It also grows naturally in a wood near the Hague, from whence I brought it to England. This sort seldom rises more than six or eight inches high, with a slender stalk, garnished with leaves shaped like those of the former sort, but smaller, and are indented on their edges. The flowers are produced on single loose spikes at the top of the stalks, which are smaller than those of the former sort, but of the same form and colour. These plants flower in June, and their seeds ripen in August; but they both multiply exceedingly by their creeping

roots, so are seldom kept in gardens, unless for the sake of variety.

If the roots are planted in any shady moist part of a garden, they will increase fast enough without any care.

CIRCULATION of the sap. See SAP.

CIRRI are those fine strings or fibres put out from the stalks of plants, by which some plants fasten themselves to walls, pales, or trees, in order to their support, as Ivy, &c.

CIRSIUM. See CARDUUS.

CISSAMPELOS. Lin. Gen. Plant. 993. Caapeba. Plum. Nov. Gen. 33. tab. 29.

The CHARACTERS are,

*It is male and female in different plants; the male flowers have no empalement; they have four oval plain petals, and a wheel-shaped nectarium in the disk, with four small stamina joined together, crowned by plain summits. The female flowers have neither empalement or corolla; instead of petals, there is a large nectarium, whose membranes stand round the hairy oval germen, which afterward becomes a succulent berry, inclosing a single seed.*

This genus of plants is ranged in the twelfth section of Linnæus's twenty-second class, intitled Diœcia Monodelphia, the male and female flowers being on different plants, and the male flowers have four stamina, which are joined in one body.

The SPECIES are,

1. CISSAMPELOS (*Pariera*) foliis peltatis cordatis emarginatis. Lin. Sp. 1473. *Cissampelos with target heart-shaped leaves which are indented at their top.* Caapeba folio orbiculari, & umbilicato lævi. Plum. Nov. 33. *Caapeba with a round, smooth, umbilicated leaf.*
2. CISSAMPELOS (*Caapeba*) foliis basi petiolatis integris. Lin. Sp. 1473. *Cissampelos with leaves having foot-stalks, and entire at their base.* Caapeba folio orbiculari non umbilicato. Plum. Nov. Gen. 33. *Caapeba with a round leaf not umbilicated, called Velvet Leaf in America.*

These plants grow naturally in the warmest parts of America, where they twist themselves about the neighbouring shrubs, and rise to the height of five or six feet. The first sort hath round heart-shaped leaves, whose foot-stalks are set within the base of the leaf, resembling an ancient target; these are hairy on their under side, and have pretty long slender foot-stalks. Toward the upper part of the stalks the flowers come out from the wings of the leaves; those of the male plants grow in short spikes or clusters, and are of a pale herbaceous colour; but the female flowers are produced in long loose racemi from the side of the stalks, and are succeeded by a single pulpy berry inclosing a single seed.

The second sort hath round heart-shaped leaves, which are extremely woolly and soft to the touch; these have their foot-stalks placed at the base between the two ears; the flowers of this come out in bunches from the side of the stalks, in the same manner as the first. The stalks and every part of the plant is covered with a soft woolly down.

The seeds of both these plants were sent me from Jamaica, by the late Dr. Houstoun, which succeeded in the Chelsea garden, where the plants produced their flowers for several years; and the fruit of the first sort were produced, but these would not grow, though they seemed to be perfectly ripened; but the plants grew at some distance from the male, so were probably not impregnated.

These plants are propagated by seeds, which should be sown upon a hot-bed in the spring; and the plants must afterward be treated in the same way as other tender exotics, keeping them constantly in the bark-stove, otherwise they will not live in this country.

The first sort is supposed to be the Pareira, whose root has been so much esteemed as a diuretic. But by a specimen which I received from the late Dr. Houstoun, under the title of Pariera, it should rather be ranged under the genus of Smilax.

CISSUS, Wild Grape.

The CHARACTERS are,

*It hath a small many-leaved empalement, and four concave petals to the flower, with a large nectarium at the border of the germen, and four stamina the length of the corolla inserted in the nectarium, crowned by roundish summits. The germen is four-cornered, supporting a slender style the length of the stamina, crowned by an acute stigma. The cover of the flower afterward becomes a berry inclosing one roundish seed.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia, the flowers having four stamina and one style.

The SPECIES are,

1. CISSUS (*Cordifolia*) foliis cordatis integerrimis. Lin. Sp. 170. *Wild Grape with entire heart-shaped leaves.* Vitis folio subrotundo, uva corymbosa cæruleo. Plum. Gen. 18.
2. CISSUS (*Sicyoides*) foliis ovatis nudis setaceo serratis. Lin. Sp. 170. *Wild Grape with oval leaves which are sawed.* Bryonia alba geniculato, violæ foliis, baccis e viridi-purpurascentibus. Sloan. Hist. Jam. 1. p. 106.
3. CISSUS (*Acida*) foliis ternatis oblongis carnosis incisis. Lin. Sp. 170. *Wild Grape with trifoliate leaves, which are oblong, fleshy, and cut on their edges.* Vitis trifolia minor corymbosa, acinis nigrioribus turbinatis. Plum. Sp. 18.
4. CISSUS (*Trifoliata*) foliis ternatis subrotundis subdentatis. Lin. Sp. 170. *Wild Grape with roundish trifoliate leaves, which are slightly indented.* Bryonia alba triphylla maxima. Sloan. Hist. Jam. 1. p. 106.

These plants all of them grow naturally in the island of Jamaica, and in some of the other islands in the warm parts of America, where they send out slender branches, having tendrils at their joints, by which they fasten to the neighbouring trees, bushes, and any other support, mounting to a considerable height. The first sort produces bunches of fruit, which are frequently eaten by the negroes, but are chiefly food for birds and wild fowl, as indeed are most of the fruit of the other sorts, as they all grow in the uncultivated parts.

The plants are preserved in some of the European gardens, more for the sake of variety, than for use or beauty, as they rarely produce either fruit or flowers in moderate climates. They are propagated either by laying their flexible branches down in pots of earth, where they will put out roots in four or five months, or by planting cuttings in pots filled with light earth, which should be plunged into a moderate hot-bed of tanners bark, covering the pots closely with hand-glasses to exclude the outer air: the cuttings must be frequently refreshed with water, but not too much given at each time. When these or the layers are well rooted, they should be carefully taken up, and each planted in a small pot filled with light earth, and plunged into the hot-bed of tan, where they should constantly remain, being too tender to thrive in England, but with this care. Therefore they should be shifted into larger pots when it is necessary, and their branches must be supported with stakes, to prevent them from trailing over the neighbouring plants; and in warm weather the plants should have free air admitted to them daily. With this treatment they will thrive very well.

CISTUS. Lin. Gen. Plant. 598. Tourn. Inst. R. H. 259. tab. 136. [It is so called from Κίστος, or Κισσός, *Gr.* Ivy, because its small seminal vessel is inclosed in a cista, or little chest.] Rock-rose.

The CHARACTERS are,

*The flower hath a five-leaved empalement which is permanent, two of the middle alternate leaves being smaller than the other. The flower hath five large roundish petals which spread open; it hath a great number of hairy stamina, which are shorter than the petals, and are terminated by small roundish summits. In the center is situated a roundish germen, supporting a single style the length of the stamina, crowned by a plain orbicular stigma. The germen afterward becomes an oval close capsule, having in some five, and others ten cells, filled with small roundish seeds.*

This

This genus of plants is ranged in the first section of Linnæus's thirteenth class, intitled Polyandria Monogynia, the flowers having many stamina and but one style.

The Species are,

1. Cistus (*Pilosus*) arborescens exstipulatis foliis ovatis, petiolatis hirsutis. Lin. Sp. 736. *Tree Rock-rose with oval leaves, whose foot-stalks are hairy.* Cistus mas major, folio rotundiore. J. B. 2. 2. *Greater male Cistus, or Rock-rose, with a rounder leaf.*

2. Cistus (*Incanus*) arborescens exstipulatis foliis spatulatis tomentosis rugosis, inferioribus basi vaginantibus connatis. Hort. Cliff. 205. *Tree Rock-rose with spatule-shaped, woolly, rough leaves, which are joined at their base.* Cistus mas 2 folio longiore incano. J. B. 2. 2.

3. Cistus (*Breviorifolius*) arborescens, foliis ovato-lanceolatis, basi connatis, hirsutis, rugosis, pedunculis florum longioribus. *Tree Rock-rose with oval spear-shaped leaves, joined at their base, which are hairy and rough, and longer foot-stalks to the flowers.* Cistus mas folio breviore. C. B. P. 464.

4. Cistus (*Lusitanicus*) arborescens, foliis ovatis, obtusis, villosis, subtus nervosis rugosis, floribus amplioribus. *Tree Rock-rose, with oval, obtuse, hairy leaves, which are nervous and rough on their under side, and larger flowers.* Cistus mas Lusitanicus, folio amplissimo incano. Tourn. Inst. 259.

5. Cistus (*Hispanicus*) arborescens villosus, foliis lanceolatis, viridibus, basi connatis, floribus sessilibus, calycibus acutis. *Hairy-tree Rock-rose with green spear-shaped leaves joined at their base, flowers sittin close, and sharp-pointed empalements.*

6. Cistus (*Ladaniferus*) arborescens exstipulatus, foliis lanceolatis, suprà lævibus, petiolis basi coalitis vaginantibus. Hort. Cliff. 205. *Tree Rock-rose with spear-shaped leaves, smooth on their upper side, and their foot-stalks joining like sheaths.* Cistus ladanifera Hispanica incana. C. B. P. 467.

7. Cistus (*Albidus*) arborescens exstipulatus foliis ovato-lanceolatis tomentosis incanis, sessilibus subtrinerviis. Sauv. Monsp. 150. *Tree Rock-rose with oval, spear-shaped, woolly leaves, sitting close to the stalks.* Cistus mas folio oblongo incano. C. B. P. 464.

8. Cistus (*Salvifolius*) arborescens exstipulatus, foliis ovatis petiolatis utrinque hirsutis. Hort. Cliff. 205. *Rock-rose with oval hairy leaves, having foot-stalks.* Cistus fœmina, folio salviæ, supina humisparsa. C. B. P. 466.

9. Cistus (*Creticus*) arborescens exstipulatus, foliis spatulato-ovatis petiolatis enerviis scabris, calycinis lanceolatis. Lin. Sp. 738. *Tree Rock-rose with oval spatule-shaped rough leaves without veins, having foot-stalks.* Cistus ladanifera Cretica flore purpureo. Tourn. Cor. 19. *Gum-bearing Cistus of Crete with a purple flower.*

10. Cistus (*Oleæfolius*) fruticosus, foliis lineari-lanceolatis, hirsutis, sessilibus, floribus terminalibus. *Shrubby Rock-rose with narrow, spear-shaped, hairy leaves, sitting close to the branches, and flowers terminating the stalks.* Cistus ledon foliis oleæ sed angustioribus. C. B. P. 167.

11. Cistus (*Laurifolius*) arborescens exstipulatus foliis oblongo-ovatis petiolatis, trinerviis supra glabris. *Tree Rock-rose with oblong oval leaves, having foot-stalks, smooth above, and the foot-stalks joined at their base.* Cistus ledon foliis laurinus. C. B. P. 476.

12. Cistus (*Cordifolius*) foliis oblongo-cordatis, glabris, petiolis longioribus, caule fruticoso. *Rock-rose with oblong, heart-shaped, smooth leaves, longer foot-stalks, and a shrubby stalk.*

13. Cistus (*Monspeliensis*) arborescens exstipulatus, foliis lineari-lanceolatis, sessilibus, utrinque villosis, trinerviis. Hort. Cliff. 205. *Tree Rock-rose with linear spear-shaped leaves sitting close to the branches, hairy on both sides, having three nerves.* Cistus ladanifera Monspeliensium. C. B. P. 467.

14. Cistus (*Salicifolius*) arborescens, foliis lineari-lanceolatis, subtus incanis, trinerviis, petalis subrotundis. *Tree Rock-rose with narrow spear-shaped leaves, hoary on their under side, having three nerves with roundish petals.* Cistus ladanifera Hispanica, salicis folio, flore albo, maculâ punicante insignito. Tourn. Inst. R. H. 260. *Spanish Gum-bearing Cistus with white flowers spotted with purple.*

15. Cistus (*Populifolius*) arborescens exstipulatus, foliis cordatis lævibus acuminatis petiolatis. Hort. Cliff. 205. *Tree Rock-rose with heart-shaped smooth leaves, having foot-stalks.* Cistus ledon foliis populi nigræ major. C. B. P. 467.

16. Cistus (*Crispus*) arborescens exstipulatus, foliis lanceolatis pubescentibus trinerviis undulatis. Hort. Cliff. 206. *Rock-rose with spear-shaped, hairy, waved leaves, having three veins.* Cistus mas, foliis chamædryos. C. B. P. 464.

17. Cistus (*Halimifolius*) foliis ovatis, incanis, infernè petiolatis, supernè coalitis, caule fruticoso. *Rock-rose with oval hoary leaves, those beneath having foot-stalks, and the upper ones joined at their base, and a shrubby stalk.* Cistus Halimi, folio 1. Clus. Hist. 1. p. 71. *Cistus with Sea Purslane leaves.*

18. Cistus (*Longifolius*) foliis lineari-lanceolatis, incanis petiolatis, floribus racemosis caule fruticoso. *Rock-rose with narrow spear-shaped leaves, having foot-stalks which are hoary, flowers growing in clusters, and a shrubby stalk.* Cistus folio halimi longiore incano. J. B. 2. 5.

These plants all grow naturally in the south of France, in Spain, and Portugal, from whence their seeds have been brought to England, where most of the sorts are now cultivated in the nurseries for sale. The first sort hath a strong woody stem, covered with a rough bark, which rises three or four feet high, dividing into many branches, so as to form a large bushy head; garnished with oval hairy leaves, placed opposite, and sit close to the branches, having several smaller leaves of the same form, rising from the same joint. The flowers are produced at the end of the branches, four or five standing together, almost in form of an umbel, but rarely more than one is open at the same time; these are composed of five large roundish petals of a purple colour, which spread open like a Rose, having a great number of stamina, surrounding the oval germen in the center, terminated by small, roundish, yellow summits; these flowers are but of short duration, generally falling off the same day they expand; but there is a succession of fresh flowers every day for a considerable time. After the flowers are past, the germen swells to an oval seed-vessel, sitting in the empalement, which is hairy; these capsules have ten cells, which are full of small roundish seeds. This sort flowers in May and June, and the seeds ripen in autumn; and there is generally more flowers produced in September and October, if the autumn proves favourable, and where the plants are protected from frost, they frequently produce some flowers all the winter season.

The second sort differs from the first in the shape of the leaves, which are longer and whiter; those on the lower part of the branches are oval, and join at their base, surrounding the stalks, but the upper leaves are spear-shaped and distinct; the flowers are larger, and of a paler purple colour. This flowers and ripens seeds at the same time with the first.

The third sort differs from both the former, in having shorter and greener leaves, which are joined at their base, and are hairy. The foot-stalks of the flowers are much longer, and the flowers are smaller, but of a deeper purple. This flowers and seeds at the same time with the two former, and the shrubs grow as large as the first sort.

The fourth sort hath much larger and rounder leaves than either of the former, which are hairy, and smooth on their upper side, but rough, and full of veins on their under; the branches are white, hairy, and the flowers are very large, and of a light purple colour. This flowers at the same time with the former.

The fifth sort doth not rise so high as either of the former, but sends out branches near the root, which are hairy and erect, garnished with spear-shaped leaves, of a dark green colour, which join at their base,

base, surrounding the stalk. At each joint comes out a very slender branch, having three pair of small leaves of the same shape with the other, terminated by a single flower; the ends of the branches have three or four flowers sitting close without foot-stalks. The flowers are of a deep purple colour, and like those of the first. This flowers at the same time with the other sorts.

The sixth sort rises to the height of five or six feet, with a strong woody stalk, sending out many hairy branches, garnished with spear-shaped leaves, smooth on their upper side, but veined on their under, having short foot-stalks, which join at their base, where they form a sort of sheath to the branch. The flowers come out at the end of the branches, which are large, of a light purple colour, and resembling those of the fourth sort.

The seventh sort hath erect branches, which come out from the lower part of the stalk, and are woolly; garnished with oblong hoary leaves, covered with a white down, which are smooth above, but veined on their under side, joining at their base where they surround the stalk; the flowers are produced at the end of the branches, which are of a bright purple colour, and large. This flowers at the same time with the other sorts.

The eighth sort hath a slender smooth stalk, covered with a brown bark, which never rises more than three feet high, sending out many horizontal weak branches, which spread wide, garnished with small oval leaves, which are hairy, standing upon short foot-stalks. The flowers come out at the wings of the leaves, upon long naked foot-stalks; these are white, and somewhat smaller than those of the other sorts. This flowers in June, July, and August.

The ninth sort grows naturally in the islands of the Archipelago; this is the plant which produces the labdanum, as is hereafter mentioned; it rises three or four feet high, with a woody stalk, sending out many lateral branches, covered with a brown bark, garnished with oval, spear-shaped, hairy leaves, with waved borders; these in warm seasons sweat a glutinous liquid, which spreads on the surface of the leaves, is very clammy and sweet scented. The flowers come out at the end of the branches, on short hairy foot-stalks; they are of a deep purple colour, and about the size of a single Rose; these appear in June and July.

The tenth sort rises with a shrubby stalk about four feet high, the branches are very hairy, glutinous, grow erect, and are garnished with long, narrow, hairy leaves, ending in points, of a deep green on both sides, having a deep longitudinal furrow on their upper side, made by the midrib, which is prominent, the flowers stand upon long foot-stalks at the end of the branches, which are of a pale sulphur colour, having a bordered empalement, which is cut into five acute parts at the top. This flowers in June, July, and August, and the seeds ripen in autumn.

The eleventh sort rises with a strong woody stem to the height of five or six feet, sending out many erect branches, garnished with spear-shaped leaves ending in points; these are thick, white on their under side, of a dark green above, and very glutinous in warm weather. The flowers are produced at the end of the branches, upon long naked foot-stalks, which branch on their sides into small foot-stalks, each sustaining one large white flower, having a hairy empalement. This sort flowers in June and July.

The twelfth sort rises with a smooth shrubby stalk four or five feet high, sending out many slender ligneous branches, covered with a smooth brown bark; garnished with oblong heart-shaped leaves, which are smooth, and have long foot-stalks. The flowers are produced at the end of the branches, standing upon pretty long foot-stalks; they are white, and appear in June, July, and August, but rarely produce any seeds in England.

The thirteenth sort rises with a slender shrubby stalk, from three to four feet high, sending out many branches from the bottom upward, which are hairy, garnished with spear-shaped leaves, of a very dark green colour, having three longitudinal veins in each, and in warm weather are covered with a glutinous sweet-scented substance, which exsudes from their pores. The flower-stalks which come out at the end of the branches, are long, naked, and sustain many white flowers, rising above each other; their empalements are bordered, and end in sharp points. This flowers at the same time with the last mentioned.

The fourteenth sort rises with a woody stem to the height of five or six feet, sending out many side branches from the bottom, the whole length; these are smooth, covered with a reddish brown bark, garnished with narrow spear-shaped leaves, whitish on their under side, of a dark green above, having three longitudinal veins. The flowers are produced at the end of the branches, on short foot-stalks, and are composed of five very large, roundish, white petals, each having a large purple spot at their base. The whole plant exsudes a sweet glutinous substance in warm weather, which hath a very strong balsamic scent, so as to perfume the circumambient air to a great distance. This flowers in June, July, and August.

There is a variety of this with white flowers, having no purple spots, which is in all other respects the same with this.

The fifteenth sort hath a stiff, slender, woody stalk, which sends out many branches the whole length, and rises to the height of six or seven feet; the leaves are large, heart-shaped, and of a light green colour; these sit close to the branches, having many nerves; the flowers are produced at the end of the branches, upon naked foot-stalks; they are white, and soon drop off. This flowers in June and July, and is at present pretty rare in the English gardens.

The sixteenth sort hath weak, slender, woody branches, which spread horizontally, so seldom rise more than two or three feet high, garnished with spear-shaped hairy leaves, which are indented on their edges, and have three longitudinal veins running through them; the flowers are white, coming out upon naked foot-stalks from the wings of the leaves; these are succeeded by roundish blunt seed-vessels, having several cells, filled with angular seeds. This flowers in June and July, and the seeds ripen in August and September.

The seventeenth sort hath an upright shrubby stalk, which rises four or five feet high, sending out many branches from the ground upward, so as to form a large bush. The branches are channelled and hoary. The leaves are oval, standing opposite; those on the lower part of the branches have foot-stalks, but upward they coalesce at their base, and surround the stalk; they are very white. The foot-stalks of the flowers which rise at the end of the branches, are a foot in length, naked, hairy, and put out two or four shorter foot-stalks on the side, each supporting three or four flowers. The flowers are large, of a bright yellow colour, but of short duration; their empalements are hairy, and sharp-pointed. This flowers in June and July, and at present is but in few English gardens.

The eighteenth sort hath been long preserved in the English gardens; this rises with a slender woody stalk three or four feet high, sending out many slender branches, garnished with narrow, spear-shaped, hoary, waved leaves; from the wings of the leaves come out slender branches, which have two or three pair of small leaves, terminated by loose bunches of flowers, each standing on a slender foot-stalk. The flowers are of a dirty sulphur colour, and appear in June and July, but are never succeeded by seeds in this country.

This sort will not live abroad in the winter, so is always placed in a green-house, where, by its hoary leaves, which continue all the year, it makes a variety.

All the various kinds of Ciſtus are very great ornaments to a garden; their flowers are produced in great plenty, which though but of a ſhort duration, yet are ſucceeded by freſh ones almoſt every day for above two months ſucceſſively; theſe flowers are many of them about the bigneſs of a middling Roſe, but ſingle, and of different colours; the plants continue their leaves all the year.

Theſe plants are all of them, except the laſt, hardy enough to live in the open air in England, unleſs in very ſevere winters, which often deſtroys many of them, ſo that a plant or two of each ſort may be kept in pots, and ſheltered in winter, to preſerve the kinds; the reſt may be intermixed with other ſhrubs, where they will make a pretty diverſity; and in ſuch places where they are ſheltered by other plants, they will endure the cold much better than where they are ſcattered ſingly in the borders. Many of theſe plants will grow to the height of five or ſix feet, and will have large ſpreading heads, provided they are permitted to grow uncut; but if they are ever trimmed, it ſhould be only ſo much as to prevent their heads from growing too large for their ſtems; for whenever this happens, they are apt to fall on the ground, and appear unſightly.

Theſe ſhrubs are propagated by ſeeds, and alſo from cuttings; but the latter method is ſeldom practiſed, unleſs for thoſe ſorts which do not produce ſeeds in England; theſe are the twelfth, ſeventeenth, and eighteenth ſorts; all the others generally produce plenty of ſeeds, eſpecially thoſe plants which came from ſeeds; for thoſe which are propagated by cuttings, are very ſubject to become barren, which is alſo common to many other plants.

The ſeeds of theſe plants may be ſown in the ſpring upon a common border of light earth, where the plants will come up in ſix or ſeven weeks, and, if they are kept clear from weeds, and thinned where they are too cloſe, they will grow eight or ten inches high the ſame year; but as theſe plants, when young, are liable to injury from hard froſt, therefore they ſhould be tranſplanted when they are about an inch high, ſome into ſmall pots filled with light earth, that they may be removed into ſhelter in winter, and the others into a warm border, at about ſix inches diſtance each way; thoſe which are potted, muſt be ſet in a ſhady ſituation till they have taken new root; and thoſe planted in the border muſt be ſhaded every day with mats till they are rooted, after which the latter will require no other care but to keep them clean from weeds till autumn, when they ſhould have hoops placed over them, that they may be covered in froſty weather; thoſe in the pots may be removed into an open ſituation, ſo ſoon as they have taken new root, where they may remain till the end of October, but during the ſummer they muſt be ſhifted into larger pots, and be frequently watered; the end of October they ſhould be placed under a hot-bed frame to ſcreen them from the cold in winter, but, at all times, when the weather is mild, they ſhould be fully expoſed to the open air, and only covered in froſts: with this management, the plants will thrive much better than when they are more tenderly treated.

The above method is what the gardeners generally practiſe; but thoſe who are deſirous to have their plants come forward, ſhould ſow the ſeeds on a moderate hot-bed in the ſpring, which will bring up the plants very ſoon; but theſe muſt have plenty of air when they appear, otherwiſe they will draw up very weak; when the plants are fit to remove, they ſhould be each planted into a ſeparate ſmall pot, and plunged into a very moderate hot-bed, obſerving to ſhade them till they have taken freſh root; then they muſt have plenty of air admitted to them every day in good weather, to prevent their drawing up weak; and by degrees they muſt be hardened, ſo as to be removed into the open air the beginning of June, and then they may be treated in the ſame manner as is before directed for the other ſeedling plants. By the bringing of the plants forward in the ſpring in this method, they will grow to the height of two feet, or more, the firſt ſummer, and have many lateral branches, ſo will be ſtrong enough to plant abroad the following ſpring, and moſt of them will flower the ſame ſummer; whereas thoſe which are ſown in the full ground, rarely flower till the year after; nor will they be ſo ſtrong, or capable to reſiſt the cold of the ſecond winter, as thoſe which have been brought forward.

In the ſpring following, theſe plants may be turned out of the pots, with all the earth preſerved to their roots, and planted in the places where they are to remain (for they are bad plants to remove when grown old,) obſerving to give them now and then a little water, until they have taken freſh root; after which time, they will require no farther care than to train them upright in the manner you would have them grow; but thoſe plants which were at firſt planted into a border in the open ground, ſhould be arched over, and covered with mats in froſty weather, during the firſt winter, but may be tranſplanted abroad the ſucceeding ſpring. In removing of theſe plants, you ſhould be careful to preſerve as much earth about the roots as you can; and if the ſeaſon ſhould prove hot and dry, you muſt water and ſhade them until they have taken freſh root, after which they will require no other culture than was before directed.

Theſe plants may alſo be propagated by cuttings, which ſhould be planted in May or June, upon a bed of light earth, keeping them ſhaded with mats, and frequently refreſhed with water, until they have taken root; which will be in about two months time, when you may tranſplant them into pots filled with good freſh light earth, and they ſhould be ſet in a ſhady place until they have taken root, then they may be expoſed to the open ſun until October, when you ſhould remove them into ſhelter the firſt winter; but the ſucceeding ſpring you may plant them abroad, as was before directed for the ſeedling plants.

The fourteenth and fifteenth ſorts are by much the moſt beautiful of all theſe Ciſtus's; the flowers, which are as big as a large Roſe, are of a fine white, with a deep purple ſpot on the bottom of each leaf. Theſe plants alſo abound with a ſweet glutinous liquor, which exſudes through the pores of the leaves in ſo plentiful a manner in hot weather, that the ſurfaces of the leaves are covered therewith; from this plant Cluſius thinks might be gathered great quantities of the ladanum which is uſed in medicine, in the woods in Spain, where he ſaw vaſt quantities of this ſhrub growing.

But it is from the ninth ſort, which Monſ. Tournefort ſays, the Greeks, in the Archipelago, gather this ſweet gum; in the doing of which (Bellonius ſays) they make uſe of an inſtrument like a rake without teeth, which they call ergaſtiri; to this are tied many thongs of raw and untanned leather, which they rub gently on the buſhes that produce ladanum, ſo that the liquid moiſture may ſtick upon the thongs, after which they ſcrape it off with knives; this is done in the hotteſt time of the day, for which reaſon the labour of gathering this ladanum is exceſſive, and almoſt intolerable, ſince they are obliged to remain on the mountains for whole days together, in the very heat of ſummer, or the dog days; nor is there any perſon almoſt that will undertake this labour, except the Greek monks.

Monſ. Tournefort alſo relates the ſame in his travels, where he ſays, that the ſhrubs which produce the ladanum grow upon dry ſandy hillocks; and that he obſerved ſeveral country fellows in their ſhirts and drawers, that were bruſhing the ſhrubs with their whips; the ſtraps whereof, by being drawn over the leaves of the plant, licked up a ſort of odoriferous balſam ſticking upon the leaves, which he ſuppoſes to be part of the nutritious juice of the plant, which exſudes through the pores of the leaves, where it remains like a fattiſh dew, in ſhining drops as clear as turpentine.

When the whips are sufficiently laden with this grease, they take a knife, and scrape it clean off the straps, and make it up into a mass of cakes of different sizes; this is what comes to us under the name of ladanum, or labdanum. A man that is diligent, will gather three pounds two ounces per day, or more, which they sell for a crown on the spot; this work is rather unpleasant than laborious, because it must be done in the hottest time of the day, and in the greatest calm; and yet the purest ladanum is not free from filth, because the winds of the preceding days have blown dust upon these shrubs, which, by the glewy substance upon the surfaces of the leaves, is thereby detained and mixed therewith. But to add weight to this drug, they knead it up with a very fine blackish sand, which is found in those parts, as if nature herself was minded to teach them how to adulterate this commodity. It is no easy thing to discover this cheat, when the sand has been well blended with the ladanum; in order to which you must chew it for some time, to find whether it crackles between the teeth, and if it doth, you must first dissolve it, and then strain it, in order to purify away what has been added to it.

CITHAREXYLUM. Lin. Gen. Plant. 678. Fiddle-wood.

The CHARACTERS are,

*The empalement of the flower is bell-shaped, of one leaf, indented in five parts. The flower is of one leaf, funnel-shaped, divided at the top into five equal parts, which spread open. It hath four stamina which adhere to the tube, two of them being longer than the other, terminated by oblong summits with two lobes. In the center is situated the roundish germen, supporting a slender style, crowned by an obtuse double-headed stigma. The germen afterward becomes a capsule with two cells, each having a single seed.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia; the plants of this section have two long, and two short stamina, and the seeds are included in a capsule.

The SPECIES are,

1. CITHAREXYLUM (*Cinereum*) ramis angulatis, foliis ovato-lanceolatis venis candicantibus. *Fiddle-wood with angular branches, and oval spear-shaped leaves, having white veins.* Citharexylum arbor laurifolia Americana, foliorum venis latis candicantibus. Pluk. Almag. 108. *Fiddle-wood with oval spear-shaped leaves, which are veined, indented, and placed by threes, angular branches, and flowers growing in loose bunches. This is the common Fiddle-wood of America.*
2. CITHAREXYLUM (*Album*) foliis oblongo-ovatis, integris, oppositis, ramis angulatis, floribus spicatis. *Fiddle-wood with oblong, oval, entire leaves growing opposite, angular branches, and flowers growing in spikes.* Berberis fructu arbor maxima baccifera, racemosa, foliis integris obtusis, flore albo pentapetalo odoratissimo, fructu nigro monopyreno. Sloan. Cat. Jam. 170. *Fiddle-wood, or Fidelle-wood.*

The first sort grows common in most of the islands in the West-Indies, where it rises to a great height, and becomes a very large timber-tree; the wood of which is greatly esteemed for buildings, being very durable.

This hath an upright trunk fifty or sixty feet high, sending out branches on every side, which have several angles, or ribs, running longitudinally, garnished by three oval spear-shaped leaves at every joint, standing in a triangle, upon short foot-stalks. The leaves are about four inches long, and one or two broad, of a lively green colour, pretty much notched on their edges, having several deep veins running from the midrib to the edges, which are of a white colour on their upper side, and very prominent on their under. The flowers come out from the sides, and also at the end of the branches, in loose bunches, which are succeeded by small pulpy berries, inclosing two seeds in each.

The second sort is a native of the same islands with the first. This is also a very large tree, whose timber is greatly valued in America, for buildings, being very durable; and from thence I have been informed the French gave it the title of Fidelle-wood, which the English have rendered Fiddle-wood; and some have supposed that the wood was used for making those musical instruments, which is a great mistake. This tree rises with a strong upright trunk to the height of sixty feet or more, sending out many angular branches, standing opposite, which are covered with a loose whitish bark, (from whence the inhabitants give it the name of white Fiddle-wood,) garnished with oval oblong leaves, standing opposite, on short foot-stalks; these are of a lucid green, and are rounded at their ends. The flowers come out in long loose spikes, toward the end of the branches, which are white, and smell very sweet; these are followed by small, roundish, pulpy berries, each inclosing a single seed.

The first sort hath been long preserved in some of the curious gardens in England, for the sake of variety. The leaves continuing through the year, and being of a fine green colour, make a pretty variety in the stove during the winter season: this may be propagated either by seeds, or cuttings; the latter is the usual method in England, where the seeds are not produced; but when seeds can be obtained from abroad, the plants which rise from them are much better than those raised from cuttings.

The seeds of this sort should be sown in small pots early in the spring, and plunged into a fresh hot-bed of tanners bark, and treated in the same manner as other exotic seeds, which are brought from hot countries. If the seeds are fresh, the plants will appear in six or seven weeks, and in about one month more will be fit to transplant; when this is done, the plants should be carefully separated, so as not to tear, or break off their roots, and each planted in a small pot filled with light fresh earth, and plunged into the hot-bed again, observing to shade them till they have taken fresh root; after which they should have a large share of air admitted to them in warm weather, and must be frequently watered; in autumn the plants should be removed into the bark-stove, where it will be proper to keep them the first winter, till they have obtained strength; then they may be afterward kept in a dry stove in winter, and in the middle of summer they may be exposed in the open air for two or three months, in a warm situation, with which management the plants will make better progress than when they are more tenderly treated.

If the cuttings of these plants are planted in small pots during the summer months, and plunged into a moderate hot-bed, they will take root, and may afterward be treated in the same manner as the seedling plants.

The seeds of the second sort were sent me by William Williams, Esq; from Jamaica, which have succeeded in the physic garden at Chelsea; but as the plants have not yet flowered, I can give no other account of them, than what is before-mentioned; however, they seem to be full as hardy as those of the first sort, and make full as great progress. The leaves of this sort continue all the year, and having a glossy green colour, make a pretty appearance in the winter season.

CITRUS. Lin. Gen. Plant. 807. Citreum. Tourn. Inst. R. H. 620. tab. 395, 396. The Citron-tree.

The CHARACTERS are,

*The empalement of the flower is of one leaf, indented in five parts. The flower hath five oblong, thick petals, which spread open, and are a little concave; it hath ten stamina, which are not equal, and join in three bodies at their base, terminated by oblong summits. The oval germen in the center supports a cylindrical style, crowned by a globular stigma; the germen afterward becomes an oblong fruit, with a thick fleshy skin filled with a succulent pulp, having many cells, each containing two oval hard seeds.*

Dr. Linnæus has joined the Aurantium and Limon to this genus, making them only different species of the same genus; but all the varieties of Citron which

I have

I have examined, have but ten ſtamina in their flowers, whereas thoſe of the Orange have more, ſo that theſe may be ſeparated on that difference; but Tournefort adds, as a diſtinguiſhing character to this genus, the appendix which grows to the foot-ſtalk of the leaf. However, I ſhall not ſo cloſely follow Linnæus, in joining thoſe things together, which have by all the writers on botany and gardening been kept ſeparate, leſt I ſhould render this work unintelligible to thoſe who have not made botany their ſtudy.

The Species are,

1. Citrus (*Medica*) fructu oblongo, majori, mucronato, cortice craſſo rugoſo. *Citron with a larger, oblong, pointed fruit, having a thick rough rind.* Malum Citreum dulci medulla. Fer. Heſp. 72. *The Sweet Citron.*
2. Citrus (*Tuberoſa*) fructu oblongo, cortice tuberoſa rugoſo. *Citron with an oblong fruit, having a rough knobbed rind.* Malum Citreum vulgare. Fer. Heſp. 57. *The common Citron.*

There are ſeveral varieties of this fruit, with which the Engliſh gardens have been ſupplied from Genoa, where is the great nurſery for the ſeveral parts of Europe for this ſort, as alſo Orange and Lemon-trees; and the gardeners who cultivate them there, are as fond of introducing a new variety to their collection, as the nurſery-men in England are of a new Pear, Apple, Peach, &c. ſo that the varieties being annually increaſed, as are many of our fruits from ſeeds, there is like to be no end of the vatiety of theſe, nor of the Orange and Lemon-trees.

The fruit of the Citron is ſeldom eaten raw, as thoſe of the Orange, but they are generally preſerved, and made into ſweetmeats, which are by ſome perſons greatly eſteemed; and as theſe are kept till winter and ſpring, when there is a ſcarcity of fruit for furniſhing out the deſert, they are the more valuable; but unleſs the ſeaſons are warm, and the trees are well managed, the fruit rarely ripens in England. Some of the faireſt fruit which I have ſeen growing in England, were in the gardens of his late grace the Duke of Argyle, at Whitton, where the trees were trained againſt a ſouth wall, through which there are flues contrived for warming the air in winter, and glaſs-covers to put over them when the weather begins to be cold. In this place the fruit were as large, and perfectly ripe, as they are in Italy or Spain.

The ſeveral ſorts of Citrons are cultivated much in the ſame manner as the Orange-tree, to which I ſhall refer the reader, to avoid repetition; but ſhall only remark, that theſe are ſomewhat tenderer than the Orange, and ſhould therefore have a warmer ſituation in winter, otherwiſe they are very ſubject to caſt their fruit. They ſhould alſo continue a little longer in the houſe in the ſpring, and be carried in again ſooner in the autumn; as alſo have a warmer and better defended ſituation in the ſummer, though not too much expoſed to the ſun in the heat of the day.

And as their leaves are larger, and their ſhoots ſtronger, than thoſe of the Orange, they require a little more water in the ſummer; but in winter they ſhould have but little water at each time, which muſt be the oftener repeated. The ſoil ought to be much the ſame as for the Orange-tree, but not quite ſo ſtrong.

The common Citron is much the beſt ſtock to bud any of the Orange or Lemon kinds upon, it being the ſtraiteſt and freeſt growing tree. The rind is ſmoother, and the wood leſs knotty, than either the Orange or Lemon; and will take either ſort full as well as its own kind, which is what none of the other ſorts will do: and theſe ſtocks, if rightly managed, will be very ſtrong the ſecond year after ſowing, capable to receive any buds, and will have ſtrength to force them out vigorouſly; whereas it often happens, when theſe buds are inoculated into weak ſtocks, they frequently die, or remain till the ſecond year before they put out; and thoſe that ſhoot the next ſpring after budding, are oftentimes ſo weak as hardly to be fit to remain, being incapable to make a ſtrait handſome ſtem, which is the great beauty of theſe trees.

CITRUL. See Pepo.

CLARY. See Sclarea.

CLAYTONIA. Gron. Flor. Virg. Lin. Gen. Plant. 253.

The Characters are,

*The flower hath a two-leaved oval empalement, with a tranſverſe baſe: it hath five oblong oval petals, which are indented at the top, and five awl-ſhaped recurved ſtamina, which are ſhorter than the petals, terminated by oblong ſummits. In the center is ſituated an oval germen, ſupporting a ſingle ſtyle, crowned by a trifid ſtigma. The germen afterward becomes a roundiſh capſule, having three cells, opening with three elaſtic valves, and filled with round ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, intitled Pentandria Monogynia, the flower having five ſtamina and but one ſtyle.

The Species are,

1. Claytonia (*Virginica*) foliis linearibus. Lin. Sp. Plant. 294. *Claytonia with very narrow leaves.* Ornithogalo affinis Virginiana, flore purpureo pentapetaloide. Pluk. Alm. 272.
2. Claytonia (*Siberica*) foliis ovatis. Lin. Sp. Plant. 294. *Claytonia with oval leaves.* Limnia. Act. Stockh. 1746.

The firſt ſort grows naturally in Virginia, from whence it was ſent by Mr. Clayton to England, and received its title from him.

It hath a ſmall tuberous root, which ſends out low ſlender ſtalks in the ſpring, about three inches high, which have each two or three ſucculent narrow leaves about two inches long, of a deep green colour. At the top of the ſtalk are four or five flowers produced, ſtanding in a looſe bunch; theſe are compoſed of five white petals which ſpread open, and are ſpotted with red on their inſide; after theſe fall away, the germen becomes a roundiſh capſule divided into three cells, which are filled with roundiſh ſeeds. The flowers appear in April, and the ſeeds ripen in June, ſoon after which the plant decays to the root.

The ſecond ſort grows naturally in Siberia. This is a low plant, ſeldom riſing more than two or three inches high; the root is tuberous, ſending out three or four oval leaves; the foot-ſtalk of the flower ariſes immediately from the root, ſuſtaining two or three ſmall white flowers of the ſame ſhape with thoſe of the firſt ſort, ſo make but little figure in a garden.

The plants are both propagated by ſeeds, and alſo from offſets ſent out from the roots: the ſeeds ſhould be ſown upon a ſhady border of light earth, or in pots filled with the like mould, ſoon after they are ripe; for if they are kept out of the ground till ſpring, the plants will not come up till the next year; whereas thoſe which are ſown early in the autumn, will grow the following ſpring, ſo that a whole year is gained. When the plants come up, they will require no other care but to keep them clean from weeds; and in the autumn, if ſome old tanners bark is ſpread over the ſurface of the ground, it will ſecure the roots from being injured by froſt; which, if it ſhould prove very ſevere, might injure the young plants, but in mild winters they will not require protection.

The beſt time to tranſplant the roots is about Michaelmas, when they are inactive; but as they are ſmall, if great care is not taken in opening the ground, the roots may be buried and loſt; for they are of a dark colour, ſo are not eaſily diſtinguiſhed from the ground.

CLAVICLE [Claviculus, *Lat.*] a claſper or tendril.

CLEMATIS. Lin. Gen. Plant. 616. Clematitis. C. B. P. 300. [Κληματὶς, of Κλῆμα, a twig or claſper, &c. becauſe it climbs up trees with claſpers, like thoſe of Vines. Hence it is called Virgultum ductile, Ranunculus obſequioſus; and alſo Antrogenomene, and Flammula, as though producing a carbuncle; for the leaves being bruiſed, and applied to the ſkin, burn it into carbuncles, as it is in the peſti-

lence;

lence; and Flammula, because if one leaf be cropped in a hot day in the summer season, and bruised, and presently put to the nostrils, it will cause a smell and pain like a flame.] Virgin's Bower.

The Characters are,

*The flowers have no empalement; they have each four loose oblong petals, with a great number of stamina, which are shorter than the petals, and the summits adhere to their side. They have many germen, which are roundish and compressed; the awl-shaped style, which is longer than the stamina, is crowned by a single stigma. The germina afterward become so many roundish compressed seeds, with the style sitting on their top, and are collected into a head, the styles of the several species being of various forms.*

This genus of plants is ranged in the seventh section of Linnæus's thirteenth class, intitled Polyandria Polygynia, the flowers of this section having many stamina and several styles.

The Species are,

1. Clematis (*Recta*) foliis pinnatis, foliolis ovato-lanceolatis, integerrimis, caule erecto. Hort. Cliff. 225. *Clematis with winged leaves, whose lobes are oval, spear-shaped, entire, and an upright stalk.* Clematitis sive flammula surrecta alba. J. B. 2. 127. *Upright white Climber.*
2. Clematis (*Integrifolia*) foliis simplicibus, ovato-lanceolatis. Hort. Cliff. 225. *Clematis with single leaves, which are oval and spear-shaped.* Clematitis cærulea erecta. C. B. P. 300. *Upright blue Climber.*
3. Clematis (*Hispanica*) foliis pinnatis, foliolis lanceolatis, acutis, integerrimis, caule erecto. *Clematis with winged leaves, whose lobes are spear-shaped, pointed, and entire, and an upright stalk.* Clematitis Hispanica surrecta altera & humilior flore albicante. H. R. Par.
4. Clematis (*Vitalba*) foliis pinnatis, foliolis cordatis, scandentibus. Hort. Cliff. 225. *Clematis with winged leaves, whose lobes are heart-shaped and climbing.* Clematitis latifolia integra. J. B. 2. p. 125. *Climber with broad entire leaves, commonly called Viorna, or Traveller's Joy.*
5. Clematis (*Canadensis*) foliis ternatis, foliolis cordatis, acutis, dentatis, scandentibus. *Clematis with trifoliate, heart-shaped, pointed leaves, which are indented, and climbing.* Clematitis Canadensis latifolia & triphylla. Sar. *Broad-leaved Canada Climber.*
6. Clematis (*Flammula*) foliis inferioribus, pinnatis, laciniatis, summis simplicibus, integerrimis, lanceolatis. Hort. Cliff. 225. *Clematis whose lower leaves are winged and jagged, and the upper ones single, spear-shaped, and entire.* Clematitis sive flammula repens. C. B. P. 300. *Creeping Climber.*
7. Clematis (*Cirrhosa*) cirrhis scandens foliis simplicibus. Hort. Cliff. 226. *Clematis with climbing tendrils, and simple leaves.* Clematitis peregrina, foliis pyri incisis. C. B. P. 300. *Foreign Climber with cut Pear-shaped leaves.*
8. Clematis (*Viticella*) foliis compositis decompositisque, foliolis ovatis, integerrimis. Hort. Cliff. 225. *Clematis with compound and decompounded leaves, whose small leaves are oval and entire.* Clematitis cærulea vel purpurea repens. C. B. P. 300. *Single blue Virgin's Bower.*
9. Clematis (*Alpina*) foliis compositis ternatis ternatisque, foliolis acutis serratis. *Clematis with compound leaves, whose lobes are sharply sawed.* Clematitis Alpina geranii folio. C. B. P. 300. *Alpine Climber with a Crane's-bill leaf.*
10. Clematis (*Viorna*) foliis compositis decompositisque, foliolis quibusdam trifidis. Flor. Virg. 62. *Clematis with compound and decompounded leaves, some of whose lobes are trifid.* Clematis purpurea repens, petalis florum coriaceis. Raii Hist. 1928. *Creeping purple Climber, with coriaceous petals to the flower.*
11. Clematis (*Orientalis*) foliis compositis, foliolis incisis angulatis lobatis cuneiformibus, petalis interne villosis. Lin. Sp. 765. *Clematis with compound leaves, whose small leaves are cut into angular wedge-shaped lobes, and the inside of the petals are hairy.* Clematitis Orientalis folio apii, flore ex viridi flavescente, posterius reflexo. Tourn. Cor. 20. *Eastern Climber with a Smallage leaf, and a reflexed, greenish, yellow flower.*
12. Clematis (*Sibirica*) foliis compositis & decompositis, foliolis ternatis, serratis. Gmel. *Climber with compound and decompounded leaves, whose small leaves are sawed and trifoliate.*
13. Clematis (*Dioica*) foliis ternatis, integerrimis, floribus diocis. *Three-leaved Climber, with entire leaves, having three lobes, and male and female flowers on the same plant.* Clematis foliis ternis. Sloan. Cat. 84. *Three-leaved Climber.*
14. Clematis (*Americana*) foliis ternatis, foliolis cordato-acuminatis, integerrimis, floribus corymbosis. *Three-leaved Climber with heart-shaped pointed lobes, which are entire, and flowers collected in round bunches.* Clematitis Americana triphylla, foliis non dentatis. Houst. MSS.
15. Clematis (*Crispa*) foliis simplicibus, ternatisque, foliolis integris trilobisve. Lin. Sp. Plant. 543. *Climber with single and trifoliate leaves, whose small leaves are either entire, or have three lobes.* Clematis flore crispo. Hort. Elth. 86. *Climber with a curled flower.*

The first sort grows naturally in the south of France, Italy, Austria, and several parts of Germany, but hath been long cultivated in the English gardens for ornament. This hath a perennial root. The stalks are upright, about three or four feet high, garnished with winged leaves standing opposite, which are composed of three or four pair of lobes, terminated by an odd one; they are oval, spear-shaped, and entire: the flowers are produced in large loose panicles at the top of the stalks; these are composed of four white petals, which spread open; and the middle is occupied by a great number of stamina, surrounding five or six germen, which afterward become so many compressed seeds, each having a long tail or beard sitting on the top. It flowers in June, and the seeds ripen in September.

The second sort grows naturally in Hungary and Tartary, but hath been long an inhabitant in the English gardens. The root of this is perennial, sending up many slender upright stalks, from three to four feet high, garnished with opposite single leaves at each joint, having short foot-stalks; the leaves are near four inches long, and an inch and an half broad in the middle, of a bright green, smooth, and entire, ending in a point: the flowers come out from the upper part of the stalks, standing upon very long naked foot-stalks, each supporting a single blue flower, composed of four narrow thick petals which spread open, and many hairy stamina surrounding the germina in the center. After the flowers are past, the germen become so many compressed seeds, each having a tail or beard. It flowers and seeds at the same time with the former sort.

The third sort is very like the first, from which it differs in having but two or three pair of lobes in each leaf, which are narrower and stand farther asunder: the stalks are shorter, and the flowers larger.

The fourth sort grows naturally in the hedges, in most parts of England. This hath a tough climbing stalk, sending out claspers, by which it fastens to the neighbouring bushes and trees, and sometimes rises more than twenty feet high, sending out many side branches, so as often to cover all the trees and bushes of the hedge. This puts out many bunches of white flowers in June, which are succeeded by several flat seeds joined in a head, each having a long twisted tail sitting on the top, which is covered with long white hairs; and in autumn, when the seeds are near ripe, they appear like beards, from whence the country people call it Old Man's Beard. The branches of this being very tough and flexible, are used for tying up faggots; from whence, in some countries, it is called Bindwith.

There are two varieties of this, one with indented leaves, which is the most common, and the other hath entire leaves; but as these are supposed to arise accidentally from seeds, they are not distinguished by later botanists.



The

The fifth sort grows naturally in most parts of North America, from whence the seeds have been brought to Europe. This is in its first appearance very like the last sort, but the leaves are broader, and grow by threes on the same foot-stalk, whereas those of the former have five or seven lobes in each leaf. The flowers appear at the same time with the former, but the seeds do not ripen in England, unless the season is very warm. There is little beauty in this sort.

The sixth sort hath a climbing stalk like the fourth; the lower leaves of this are winged, and deeply cut on their edges, but the upper leaves are single, spear-shaped, and entire. The flowers of this sort are white, and appear in June or July. This grows naturally in the south of France, and in Italy.

The seventh sort grows naturally in Spain and Portugal. This hath a climbing stalk, which will rise to the height of eight or ten feet, sending out branches from every joint, whereby it becomes a very thick bushy plant; the leaves are sometimes single, at other times double, and frequently trifoliate, being indented on their edges. These keep their verdure all the year: opposite to the leaves come out claspers, which fasten themselves to the neighbouring shrubs, by which the branches are supported, otherwise they would fall to the ground. The flowers are produced from the side of the branches; these are large, of an herbaceous colour, and appear always about the end of December, or beginning of January, which being a season when few persons visit gardens for information, these flowers have escaped their notice, so that many have supposed this sort doth not produce flowers in England; and the flowers being nearly the same colour of the leaves, those who have been more constant visitors of gardens, have passed by this plant, without noticing the flowers; but for many years together, it hath produced plenty of flowers in the garden at Chelsea, and always at the same season.

The seventh sort is cultivated in the nursery-gardens for sale, and is known by the title of Virgin's Bower. There are four varieties of it which are preserved in the gardens of the curious, and have been by some treated as so many distinct species; but as their only differences consist either in the colour of their flowers, or the multiplicity of their petals, they are now only esteemed as seminal variations; but as they are distinguished by the nursery-gardeners, I shall just mention them.

1. Single blue Virgin's Bower.
2. Single purple Virgin's Bower.
3. Single red Virgin's Bower.
4. Double purple Virgin's Bower.

These have no difference in their stalks or leaves, so that the same description will fit them all, excepting the colours or multiplicity of petals in their flowers.

The stalks of these plants are very slender and weak, having many joints, from whence come out side branches, which are again divided into smaller. If these are supported, they will rise to the height of eight or ten feet, and are garnished with compound winged leaves, placed opposite at the joints. These branch out into many divisions, each of which hath a slender foot-stalk, with three small leaves, which are oval and entire: from the same joint, generally four foot-stalks arise, two on each side; the two lower have three of these divisions, so that they are each composed of nine small leaves or lobes; but the two upper have only two opposite leaves on each, and between these arise three slender foot-stalks, each supporting one flower. The flowers have each four petals, which are narrow at their base, but are broad at the top and rounded: in one they are of a dark worn-out purple, in another blue, and the third of a bright purple or red colour. The double sort, which is common in the English gardens, is of the worn-out purple colour: but the foreign catalogues mention double flowers of both the other colours, which may probably be found in some of their gardens; but as I have not seen them myself, I have not noticed them. The double flowers have no stamina or germen, but in lieu of them, there is a multiplicity of petals, which are narrow, and turn inward at the top.

These plants grow naturally in the woods in Spain and Portugal, but have been long cultivated in the English gardens for ornament. They flower in June and July, but they seldom ripen seeds in England, and the double sort continues to the end of August.

The ninth sort grows naturally on the Alps, and other mountains in Italy. I received it from mount Baldus, where it grows in plenty. This hath a slender climbing stalk, which rises three or four feet high, supporting itself by fastening to the neighbouring plants or shrubs. The leaves of this are composed of nine lobes or small leaves, three standing upon each foot-stalk, so that it is what the former writers stile a nine-leaved plant. The flowers come out at the joints of the stalk, in the same manner as the common Travellers Joy, which are white, so make no great appearance. This sort flowers in May.

The tenth sort grows naturally in Virginia and Carolina, from both of these countries I have received the seeds. This hath many slender stalks, garnished with compound winged leaves at each joint; and are generally composed of nine leaves, standing by threes, like those of the eighth sort, but the small leaves or lobes of this are nearly of a heart-shape. The flowers of this stand upon short foot-stalks, which come out from the wings of theleaves, one on each side thestalk. The flowers are composed of four thick petals, which are purple on their outside, and blue within. They appear in July, and if the autumn proves warm, the seeds will ripen in September.

The eleventh sort was discovered by Dr. Tournefort in the Levant, from whence he sent the seeds to the royal garden at Paris, where they succeeded and perfected seeds, so that most of the gardens in Europe have been furnished with the seeds from thence: this hath weak climbing stalks, which fasten themselves by their claspers, to any plants or shrubs which stand near them, and thereby rise to the height of seven or eight feet, garnished with compound winged leaves, consisting of nine small leaves (or lobes) which are angular and sharp-pointed. The flowers come out from the wings of the leaves, which are of a yellowish green, and the petals are reflexed backward; they come out in April and May, and in warm seasons the seeds will ripen very well, if the plants have a good situation.

The twelfth sort grows naturally in Siberia, from whence the seeds were sent to the imperial garden at Petersburgh, where they succeeded and produced seeds, part of which were sent me in the year 1753. These grew, and the plants have flowered several years in the Chelsea garden. It hath weak climbing stalks which require support, that rise from four to six or eight feet high; the joints are far asunder; at each of these come out two compound winged leaves, whose small leaves or lobes are placed by threes; these are deeply sawed on their edges, and terminate in sharp points. The flowers come out from the wings of the leaves single, standing upon long naked foot-stalks, and are composed of four broad obtuse petals, which spread open in form of a cross, of a whitish yellow colour. In the center is placed several germen, surrounded by a great number of stamina, with flat compressed summits, of the same colour with the petals of the flower; after these are past, the germen become so many compressed seeds, each having a bearded tail. It flowers in February March and April, and the seeds ripen in July or August.

The thirteenth sort was sent me from Jamaica by the late Dr. Houstoun. This hath slender climbing stalks, which fasten themselves to the trees and shrubs which stand near them, and thereby rise to the height of ten or twelve feet, garnished with trifoliate leaves, coming out on each side the stalk; the lobes are large, oval, and entire, having three longitudinal veins. The foot-stalks of the flowers arise at the

ſame joints, cloſe to thoſe of the leaves, one on each ſide the ſtalks: theſe are long, naked, and grow horizontally, extending beyond the leaves before they divide and branch; then there comes out three or four pair of ſmall foot-ſtalks from the large one, each of which divides again into three ſmaller, each ſupporting a ſingle flower: the lower pair of theſe are extended four or five inches, the other gradually diminiſh to the top, ſo that they form a pyramidal thyrſe of flowers; theſe are white, and are compoſed of four narrow petals which are reflexed back, but the ſtamina all ſtand erect.

This hath been by ſome perſons ſuppoſed to be the ſame with the common Travellers Joy, but thoſe who have ſeen the two plants, cannot doubt of their being diſtinct ſpecies.

The fourteenth ſort was ſent me from Campeachy by the late Dr. Houſtoun. This hath ſtrong climbing ſtalks, which faſten themſelves by their claſpers to the neighbouring trees, whereby they are ſupported, and riſe to the height of twenty feet or more, garniſhed at each joint by trifoliate leaves, which are heart-ſhaped, pointed, and entire. The flowers come out on long, naked, branching foot-ſtalks, which riſe from the wings of the leaves; they are white, and collected into roundiſh bunches; theſe are ſucceeded by ſeeds ſhaped like thoſe of the common ſort, but have long curling beards to each, which are finely feathered.

The fifteenth ſort grows naturally in Carolina, from whence I received the ſeeds in the year 1726. This hath weak ſtalks which riſe near four feet high, and by their claſpers faſten themſelves to the neighbouring plants, whereby they are ſupported. The leaves come out oppoſite at the joints; theſe are ſometimes ſingle, at others trifoliate, and ſome of the leaves are divided into three lobes. The flowers come out ſingly from the ſide of the branches upon ſhort foot-ſtalks, which have one or two pair of leaves below the flower, which are oblong and ſharp-pointed. The flowers have four thick petals, like thoſe of the tenth ſort; theſe are of a purple colour, and their inner ſurface is curled, and hath many longitudinal furrows. This flowers in July, and the ſeeds ripen in September.

The three firſt ſorts have perennial roots, which multiply pretty faſt, but their ſtalks die down every autumn, and new ones ariſe in the ſpring, in which particular they differ from all the other ſpecies, therefore require different management, and are propagated in a different manner; therefore I ſhall firſt give directions for their culture.

Theſe plants are propagated either by ſeeds, or parting their roots; but the former being a tedious method (the plants ſeldom riſing until the ſecond year after ſowing, unleſs the ſeeds are ſown in the autumn ſoon after they are ripe, and are often two years more before they flower,) the latter is generally practiſed. The beſt ſeaſon for parting theſe roots is in October or February; either juſt before their branches decay, or before they riſe again in the ſpring.

They will grow almoſt in any ſoil or ſituation; but if the ſoil is very dry, they ſhould always be new planted in the autumn, otherwiſe their flowers will not be ſo ſtrong; but if the ſoil be wet, it is better to defer it until the ſpring. The roots may be cut through their crowns with a ſharp knife, obſerving to preſerve to every offſet ſome good buds or eyes; and then it matters not how ſmall you divide them, for their roots increaſe very faſt: but if you part them very ſmall, you ſhould let them remain three or four years before they are again removed, that their flowers may be ſtrong, and their roots multiplied in eyes, which in leſs time cannot be obtained.

Theſe plants are extreme hardy, enduring the cold of our ſevereſt winters in the open air, and are very proper ornaments for large gardens, either to be planted in large borders, or intermixed with other hardy flowers in quarters of flowering ſhrubs; where, by being placed promiſcuouſly in little open places, they fill up thoſe ſmall vacancies, and are agreeable enough. They begin to flower about the beginning of June, and often continue to produce freſh flowers until Auguſt, which renders them valuable, eſpecially ſince they require very little care in their culture; for their roots may be ſuffered to remain ſeveral years undiſturbed, where there is no want to part them, which will not in the leaſt prejudice them.

The fourth ſort is found wild in moſt parts of England, growing upon the ſides of banks under hedges, and extends its trailing branches over the trees and ſhrubs that are near it. This plant in the autumn is generally covered with ſeeds, which are collected into little heads, each of which having, as it were, a rough plume faſtened to it, hath occaſioned the country people to give it the name of Old Man's Beard. It is titled by Lobel and Gerard, Viorna; and by Dodonæus, Vitis alba: in Engliſh it is moſt commonly called Travellers Joy. This ſort is rarely cultivated in gardens, being too rambling, and having but little beauty.

The fifth and ſixth ſorts have no more beauty than the fourth, ſo are ſeldom preſerved in gardens, unleſs for the ſake of variety. They are both as hardy as the common ſort, and may be propagated either by ſeeds or laying down their branches.

The ſeventh ſort retains its leaves all the year, which renders it valuable. This was formerly preſerved in green-houſes in the winter, ſuppoſing it too tender to live in the open air in England; but now it is generally planted in the full ground, where the plants thrive much better than in pots, and produce plenty of flowers, which they never did when they were more tenderly treated; nor have I found that the plants have ſuffered from ſevere froſts; for thoſe which have been growing in the open air at Chelſea, more than fifty years, have reſiſted the greateſt cold without covering.

This ſort doth not produce ſeeds in England, ſo it is propagated by layers, and alſo from cuttings. If they are propagated by layers, it muſt be done in the beginning of October, when the ſhoots of the ſame year only ſhould be choſen for this purpoſe; for the older branches do not put out roots in leſs than two years, whereas the tender ſhoots will make good roots in one year: theſe muſt be pegged down into the ground, in the ſame manner as is uſually practiſed for other layers, to prevent their riſing. If the ſhoots have two inches of earth over them, it will be better than a greater depth; but then, a little old tanners bark ſhould be ſpread over the ſurface of the ground, to keep out the froſt; for as the plants generally begin flowering about Chriſtmas, ſo at the ſame time they are putting out roots, which being but juſt formed, may be injured by ſevere froſts: theſe layers will have ſtrong roots by the following autumn, when they may be taken from the old plant, and tranſplanted where they are deſigned to remain.

When they are propagated by cuttings, they ſhould be planted in March, in pots filled with good kitchen-garden earth, and plunged into a very moderate hot-bed, obſerving to ſhade them from the ſun in the day-time, and gently water them two or three times a week, and in leſs than two months they will have taken root, when they ſhould be gradually inured to the open air. The following ſummer they may be placed in any part of the garden till Michaelmas, and then they ſhould be turned out of the pots and planted in the full ground, either where they are deſigned to remain, or into a nurſery-bed, to grow a year longer to get ſtrength, before they are placed out for good.

All the varieties of Virgin's Bower are propagated by laying down their branches; for although the ſingle flowers ſometimes produce ſeeds in England, yet as theſe ſeeds, when ſown, generally remain a whole year in the ground before they vegetate, ſo the other being the more expeditious method of increaſing theſe plants, is generally practiſed: but in order to ſucceed, theſe layers ſhould be laid down at a different

ſeaſon

ſeaſon from the former ſort; for when they are laid in the autumn, their ſhoots are become tough, ſo rarely put out roots under two years; and after lying ſo long in the ground, not one in three of them will have made good roots; ſo that many have ſuppoſed theſe plants were difficult to propagate, but ſince they have altered their ſeaſon of doing it, they have found theſe layers have ſucceeded as well as thoſe of other plants.

The beſt time for laying down the branches is in the beginning of July, ſoon after they have made their firſt ſhoots, for it is theſe young branches of the ſame year, which freely take root; but as theſe are very tender, there ſhould be great care taken not to break them in the operation: therefore thoſe branches from which theſe ſhoots were produced, ſhould be brought down to the ground, and faſtened to prevent their riſing; then the young ſhoots ſhould be laid into the earth, with their tops raiſed upright, three or four inches above ground; and after the layers are placed down, if the ſurface of the ground be covered with moſs, rotten tanners bark, or other decayed mulch, it will prevent the ground from drying, ſo that the layers will not require watering above three or four times, which ſhould not be at leſs than five or ſix days interval; for when theſe layers have too much wet, the tender ſhoots frequently rot; or when the young fibres are newly put out, they are ſo tender, as to periſh by having much wet: therefore where the method here directed is practiſed, the layers will more certainly take root, than by any other yet practiſed.

As moſt of theſe plants have climbing branches, they ſhould be always planted where they may be ſupported, otherwiſe the branches will fall to the ground and appear unſightly; ſo that unleſs they are properly diſpoſed, inſtead of being ornaments to a garden, they will become the reverſe. Where there are arbours or ſeats, with trellis work round them, theſe plants are very proper to train up againſt it; or where any walls or other fences require to be covered from the ſight, theſe plants are very proper for the purpoſe; but they are by no means proper for open borders, nor do they anſwer the expectation, when they are intermixed with ſhrubs; for unleſs their branches have room to extend, they will not be productive of many flowers.

The ſort with double flowers is the moſt beautiful, ſo that ſhould be preferred to thoſe with ſingle flowers, of which a few only ſhould be planted for variety. They are all equally hardy, ſo are ſeldom injured by froſt, excepting in very ſevere winters, when ſometimes the very tender ſhoots are killed; but if theſe are cut off in the ſpring, the ſtems will put out new ſhoots.

The tenth, eleventh, and fifteenth ſorts are alſo very hardy plants, and have climbing branches, ſo may be diſpoſed in the ſame manner as the other: they are alſo propagated by layers, which will ſucceed, if performed at the ſame time, and in the ſame manner as is directed for them.

The other ſorts are natives of the warmeſt parts of America, ſo will not thrive in this country, unleſs they are preſerved in ſtoves; but as theſe are great ramblers and plants of no great beauty, they are ſeldom preſerved in Europe, but in botanic gardens for the ſake of variety. Theſe may be propagated by layers, in the ſame manner as the other ſorts; or may be raiſed from ſeeds, obtained from the countries where they naturally grow; but theſe muſt be treated in the ſame manner as other exotic plants from the ſame country.

**CLEOME.** Lin. Gen. Plant. 740. Sinapiſtrum. Tourn. Inſt. R. H. 231. tab. 116.

The Characters are,

*The flower hath a four-leaved empalement which ſpreads open: it hath four petals which are inclined upward and ſpread open, the two lower being leſs than the other; in the bottom there are three mellous glands which are roundiſh, and are ſeparated by the empalement. It hath ſix or more ſtamina which are incurved, having riſing ſummits fixed to their ſide: it hath a ſingle ſtyle, ſupporting an oblong germen, which is of the ſame length as the ſtamina, and crowned by a thick ſtigma. The germen afterward becomes a long cylindrical pod, ſitting upon the ſtyle, having one cell, opening with two valves, and filled with roundiſh ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifteenth claſs, intitled Tetradynamia Siliquoſa; the plants of this ſection have in the flowers four long and two ſhort ſtamina, and their ſeeds are included in long pods.

The Species are,

1. Cleome (*Pentaphylla*) floribus gynandris, foliis quinatis caule inermi. Lin. Sp. 938. *Cleome with flowers having male and female parts, five leaves, and ſmooth ſtalks.* Sinapiſtrum Indicum, pentaphyllum flore carneo, minus, non ſpinoſum. H. L.
2. Cleome (*Ornithopodoides*) floribus hexandris, foliis ternatis, foliolis ovati-lanceolatis. Lin. Sp. Plant. 940. *Cleome with flowers having ſix ſtamina, trifoliate leaves, and ſpear-ſhaped lobes.* Sinapiſtrum Orientale, triphyllum, ornithopodii ſiliquis. Tourn. Cor. 17.
3. Cleome (*Luſitanica*) floribus hexandris, foliis ternatis, foliolis lineari-lanceolatis, ſiliquis bivalvibus. *Cleome with flowers having ſix ſtamina, trifoliate leaves, narrow ſpear-ſhaped lobes, and pods having two valves.* Sinapiſtrum Luſitanicum triphyllum, flore rubro. Tourn. Inſt. R. H. 231.
4. Cleome (*Viſcoſa*) floribus dodecandris, foliis quinatis ternatiſque. Flor. Zeyl. 241. *Cleome with flowers having twelve ſtamina, trifoliate and quinquefoliate leaves.* Sinapiſtrum Zeylanicum, triphyllon & pentaphyllon viſcoſum, flavo flore. Mart. Dec. 3.
5. Cleome (*Triphylla*) floribus hexandris, foliis ternatis, foliolo intermedio majori. *Cleome with flowers having ſix ſtamina, and trifoliate leaves, whoſe middle lobe is the largeſt.* Sinapiſtrum Indicum triphyllum, flore carneo non ſpinoſum. H. L.
6. Cleome (*Erucago*) floribus hexandris, foliis ſeptenis, caule ſpinoſo, ſiliquis pendulis. *Cleome with flowers having ſix ſtamina, leaves with ſeven lobes, a prickly ſtalk, and hanging pods.* Sinapiſtrum Ægyptiacum heptaphyllum, flore carneo, majus ſpinoſum. H. L.
7. Cleome (*Spinoſa*) floribus hexandris, foliis quinatis ternatiſque, caule ſpinoſo. *Cleome with flowers having ſix ſtamina, leaves compoſed of five and three lobes, and a prickly ſtalk.* Sinapiſtrum Indicum ſpinoſum, flore carneo, folio trifido vel quinquefido. Houſt. MSS.
8. Cleome (*Monophylla*) floribus hexandris, foliis ſimplicibus, petiolatis ovato-lanceolatis. Flor. Zeyl. 243. *Cleome with ſix ſtamina to the flowers, and ſix leaves, which are ovally ſpear-ſhaped.* Sinapiſtrum Zeylanicum viſcoſum, folio ſolitario, flore flavo, ſiliquâ tenui. Burm. Theſ. 217.

The firſt ſort grows naturally in Aſia, Africa, and America; I have received the ſeeds of it from Aleppo, and the coaſt of Guinea, and in the earth which came from the Weſt-Indies with other plants; this hath come up as a weed. It riſes with an herbaceous ſtalk about a foot high, garniſhed with ſmooth leaves, compoſed of five ſmall leaves or lobes, joining at their baſe to one center, and ſpread out like the fingers of a hand. The leaves on the lower part of the ſtalk ſtand upon long foot-ſtalks, which are gradually ſhortened to the top of the ſtalk, where they almoſt join it: the flowers are produced in looſe ſpikes at the end of the ſtalks and branches; theſe have four petals of a fleſh colour, which ſtand erect, ſpreading from each other; and below theſe are placed the ſtamina and ſtyle, which coaleſce at the bottom, and are ſtretched out beyond the petals, where they ſpread open; after the flower is paſt, the germen which ſits upon the ſtyle, becomes a taper pod, about two inches long, filled with round ſeeds. This is an annual plant, which dies ſoon after the ſeeds are ripe.

The ſecond ſort grows naturally in the Levant, from whence Dr. Tournefort ſent the ſeeds to the royal garden at Paris, and from thence moſt of the botanic gardens in Europe have been furniſhed with it: this

rises with an upright ſtalk about the ſame height as the firſt, garniſhed with leaves compoſed of three ſpear-ſhaped lobes, ſtanding upon ſhort foot-ſtalks; the flowers come out ſingly from the ſide of the ſtalks, and have four red petals, which ſtand in the ſame form as thoſe of the former ſort: theſe are ſucceeded by ſlender pods two inches long, which ſwell in every diviſion, where each ſeed is lodged, ſo as to appear like joints, as thoſe do of the Bird's-foot Trefoil; when the ſeeds are ripe, the whole plant decays. If the ſeeds of this are ſown in autumn the plants will flower in June, and their ſeeds will ripen in Auguſt, but thoſe which are ſown in the ſpring do not flower till July; ſo that unleſs the ſeaſon proves favourable, the ſeeds will not ripen: if the ſeeds of this ſort are permitted to ſcatter, the plants will come up without care, and require only to be thinned and kept clean from weeds, for they will not bear tranſplanting.

The third ſort grows naturally in Portugal and Spain, from whence I have received the ſeeds. This riſes with an herbaceous ſtalk about a foot and half high, ſending out a few ſhort ſide branches, which are garniſhed with leaves compoſed of three narrow lobes, ſtanding upon ſhort foot-ſtalks. The flowers come out ſingly from the ſide of the ſtalks, are of a deep red colour, and are ſucceeded by thick taper pods, filled with round ſeeds. This is an annual plant, which will thrive in the open air, and requires the ſame treatment as the former.

The fourth ſort grows naturally in the iſland of Ceylon, from whence the ſeeds were brought to Holland, where they ſucceeded, and the ſeeds were ſent me by the late Dr. Boerhaave; this riſes near two feet high, ſending out ſeveral ſide branches, garniſhed with leaves, ſome of which have five, and others three roundiſh lobes ſtanding upon ſhort hairy foot-ſtalks. The flowers come out ſingly at the foot-ſtalks of the leaves, they are of a pale yellow, and are ſucceeded by taper pods between two and three inches long, ending in a point, which are full of round ſeeds. The whole plant ſweats out a viſcous clammy juice. This is alſo an annual plant.

The fifth ſort was ſent me from Jamaica by the late Dr. Houſtoun, in the year 1730. This is an annual plant which riſes two feet high, ſending out many ſide branches, garniſhed with leaves, with one large ſpear-ſhaped lobe in the middle, and two very ſmall ones on the ſide; theſe ſit cloſe to the branches. The flowers come out ſingly from the ſide of the branches, upon long foot-ſtalks: theſe have four large fleſh-coloured petals, and ſix long ſtamina, which ſtand out beyond the petals; when the flowers fade, the germen which ſits upon the ſtyle becomes a taper pod four inches long, filled with round ſeeds.

The ſixth ſort was ſent me from Jamaica by the late Dr. Houſtoun, who found it growing naturally there in great plenty. It alſo grows naturally in Egypt. This riſes with a ſtrong thick herbaceous ſtalk two feet and a half high, dividing into many branches, which are garniſhed with leaves compoſed of ſeven long ſpear-ſhaped lobes, joining in a center at their baſe, where they ſit upon a long ſlender foot-ſtalk: juſt below the foot-ſtalk comes out one or two ſhort, thick, yellow ſpines, which are very ſharp. The flowers come out ſingly from the ſide of the branches, forming a long looſe ſpike at their extremities; this ſpike hath ſingle broad leaves, which half ſurround the ſtalks at their baſe, from the boſom of which, come out the foot-ſtalks of the flowers, which are two inches long, each ſuſtaining a large fleſh-coloured flower, whoſe ſtyle and ſtamina are extended two inches beyond the petals. After the flower is paſt, the germen, which ſits upon the ſtyle, becomes a thick taper pod five inches long, which hangs downward, and is filled with round ſeeds. This is alſo an annual plant, which periſhes ſoon after the ſeeds are ripe.

The ſeventh ſort was ſent me from the Havannah in the year 1731, by the late Dr. Houſtoun. This is alſo an annual plant, which riſes near two feet high, branching out on every ſide: the lower leaves are compoſed of five oblong lobes ſtanding upon long foot-ſtalks, but thoſe on the ſtalks and branches have but three lobes, and have ſhort foot-ſtalks: the main ſtalk and alſo the branches, are terminated by looſe ſpikes of purple flowers, each ſitting upon a ſlender foot-ſtalk, at the baſe of which is placed a ſingle oval leaf. The ſtalks are armed with ſlender ſtiff ſpines, which are ſituated juſt under the foot-ſtalks of the leaves; when the flowers fade, the germen becomes a taper pod, two inches long, filled with round ſeeds.

The eighth ſort grows naturally in Ceylon; this is an annual plant, which riſes with an herbaceous ſtalk a foot and half high, garniſhed with long, narrow, ſingle leaves, ſtanding alternately on the ſtalks; from the wings of the leaves come out the foot-ſtalks of the flower, each ſuſtaining a ſingle yellow flower, which is ſucceeded by a very ſlender taper pod.

All theſe plants except the ſecond and third ſorts, are natives of very warm countries, ſo will not thrive in England without artificial heat; therefore their ſeeds muſt be ſown upon a good hot-bed in the ſpring, and when the plants are fit to remove, they ſhould be planted in ſeparate ſmall pots, filled with freſh light earth, and plunged into a freſh hot-bed, obſerving to ſhade them until they have taken freſh root; after which they ſhould have air admitted to them every day in proportion to the warmth of the ſeaſon, and their waterings ſhould be frequently repeated, but not given in too great plenty; when the plants have filled theſe ſmall pots with their roots, they ſhould be put into larger, and plunged again into a hot-bed to bring them forward; and in July, when they are too tall to remain longer in the hot-bed, they ſhould be removed into an airy glaſs caſe, where they may be ſcreened from cold and wet, but in warm weather may enjoy the free air. With this management the plants will flower ſoon after, and perfect their ſeeds in autumn. The ſecond and third ſorts may be ſown in the open borders of the garden, where they are deſigned to remain, for they do not require any artificial warmth.

CLEONIA, Portugal Self-heal.

The Characters are,

*It hath a bilabiated empalement of one leaf, which is tubulous and angular; the upper lip is broad, plain, and indented in three parts; the under is ſhort and divided into two. The flower is of the grinning kind, with one petal; the upper lip is erect and divided into two parts, the lower is trifid, the middle ſegment having two lobes, the two lateral ſpread aſunder; it hath four ſtamina, the two lower being the longeſt, whoſe outer top of their ſummits form a croſs. It hath four germen, ſupporting a ſlender ſtyle with four ſtigma, having four equal briſtles; the germen afterward become four ſeeds, incloſed in the hairy empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourteenth claſs, intitled Didynamia Gymnoſpermia, the flower having two long and two ſhort ſtamina, and are ſucceeded by naked ſeeds filling in the empalement.

This plant grows naturally in Spain and Portugal; it is annual, periſhing ſoon after it has ripened its ſeeds. It was formerly ranged under the genus of Bugula, Tournefort afterward titled it Clinopodium, and father Barrelier placed it with the Prunella, to which genus it is nearly related.

It is propagated by ſeeds, which, when ſown in the autumn the plants will come up the following ſpring: but the ſeeds which are ſown in the ſpring, frequently lie in the ground till the following autumn, and ſometimes till the next ſpring before they vegetate. When the plants come up and are fit to tranſplant, a few of them may be planted into a border where they may remain to produce their flowers and ſeeds, as they require but little culture; ſo a few plants may be allowed to have place in ſmall gardens, where they will not take much room.

CLETHRA. Gron. Fl. Virg. 43. Lin. Gen. Plant. 489.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, which is cut into five parts; it hath five oblong petals, which are longer than the empalement; it hath ten stamina which are as long as the petals, and are terminated by oblong erect summits; in the center is situated a roundish germen supporting a permanent erect style, crowned by a trifid stigma. The germen afterward becomes a roundish capsule inclosed by the empalement, having three cells, which are full of angular seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, the flowers having ten stamina, and one style.

We know but one SPECIES of this genus at present, viz.

CLETHRA (*Alnifolia*) Gron. Virg. 47. *There is no English title to this plant*, it is the Alnifolia Americana serrata, floribus pentapetalis albis in spicam dispositis. Pluk. Alm. 18. *American Shrub with an Alder sawed leaf, and white five-leaved flowers, disposed in a spike.*

This shrub is a native of Virginia and Carolina, where it grows in moist places, and near the sides of rivulets, rising to the height of eight or ten feet, but in this country it rarely rises to half that height: the leaves are in shape like those of the Alder-tree, but are longer; these are placed alternately upon the branches: the flowers are produced at the extremity of the branches, in close spikes: they are composed of five leaves, are white, and have ten stamina in each, which are nearly of the same length with the petals, this plant flowers in July, and when the autumn proves favourable, there are often some spikes of flowers again in October.

This is hardy enough to bear the open air in England, and is one of the most beautiful shrubs at the season of its flowering; which is very little later than in its native country, being commonly in flower here by the beginning of July; and if the season is not very hot, there will be part of the spikes in beauty till the beginning of August; and as most of the branches are terminated with these spikes of flowers, so when the shrubs are strong, they make a fine appearance at that season.

This will thrive much better in moist land than in dry ground, and requires a sheltered situation, where it may be defended from strong winds, which frequently break off the branches, where they are too much exposed to its violence. It is propagated by layers, but they are generally two years before they get root, so that at present it is rare in England. The finest shrubs of this kind, which I have yet seen, are in the curious garden of his grace the late duke of Argyle, at Whitton near Hounslow, where they thrive as well as in their native country. They may also be propagated by suckers, which are sent out from their roots; if these are carefully taken off with fibres in the autumn, and planted into a nursery-bed, they will be strong enough in two years to transplant where they are to remain.

It may also be propagated by seeds, which must be procured from the countries where it grows naturally, for the seeds are not perfected in England. But as these seldom arrive here till spring, so when they are sown at that season, the plants will not come up till the following spring. Therefore the seeds should be sown in pots, and placed in a shady situation till autumn, then placed under a frame in winter; the plants will come up the next spring, and in autumn may be transplanted into a nursery-bed, to get strength before they are placed to remain for good.

CLIFFORTIA. Lin. Gen. Plant. 1004.

The name was given to this genus of plants by Dr. Linnæus, in honour of Mr. George Clifford of Amsterdam; a great collector of plants, and a patron of botanists, who has printed a folio book of the plants in his garden, with several copper-plates, exhibiting the figures of many of the most curious plants. We have no English name for it.

The CHARACTERS are,

*It hath male and female flowers in different plants: the male flowers have a spreading empalement, composed of three small, oval, concave leaves. It hath no petals, but a great number of hairy upright stamina, which are the length of the empalement, terminated by compressed, oblong, twin summits. The female flowers have a permanent empalement, composed of three leaves which are equal, sitting upon the germen; these have no petals, but the oblong germen which is situated below the empalement, supports two long, slender, feathered styles, terminated by a single stigma; the germen afterward becomes an oblong taper capsule, with two cells crowned by the empalement, including one narrow taper seed.*

This genus of plants is ranged in the tenth section of Linnæus's twenty-second class, intitled Diœcia Polyandria; the plants of this section and class have male and female flowers on different plants, and the male flowers have a great number of stamina.

The SPECIES are,

1. CLIFFORTIA (*Ilicifolio*) foliis subcordatis, dentatis. Lin. Sp. Plant. 1308. *Cliffortia with heart-shaped indented leaves.* Arbuscula Afr. folio acuto ilicis caulem amplexo rigido. Boerh. Ind. alt. 2.
2. CLIFFORTIA (*Trifoliata*) foliis ternatis, intermedio tridentato. Prod. Leyd. 253. *Three-leaved Cliffortia, whose middle leaf is cut in three parts.* Myrica foliis ternatis, intermediis cuneiformibus tridentatis. Hort. Cliff. 456.
3. CLIFFORTIA (*Ruscifolia*) foliis lanceolatis, integerrimis. Hort. Cliff. 463. *Cliffortia with spear-shaped leaves which are entire.* Frutex Æthiopicus conifer, fructu parvo, sparsim intra folia rusci, seminibus cylindraceis.

The first sort grows naturally at the Cape of Good Hope, but hath been long cultivated in many of the English gardens; however it was not reduced to any genus, till Dr. Linnæus established this, and gave it the title. By some former writers it was called Camphorata, to which genus it had no relation.

It rises with a weak shrubby stalk four or five feet high, sending out many diffused branches, which spread out on every side, requiring some support: these are garnished with leaves, which are heart-shaped at their base, but broad at their ends, where they are sharply indented. They are very stiff, of a grayish colour, and closely embrace the stalks with their base, and are placed alternate on the branches; from the bosom of these arise a single flower, sitting close to the branch, having no foot-stalk. Before the empalement is spread open, it forms a bud, in shape and size of those of the Caper; this empalement is composed of three green leaves, which afterwards spread open, and then the numerous stamina appear standing erect; these, as also the inner surface of the empalement, are of a yellowish green colour. The flowers appear in June, July, and August, but the leaves continue in verdure through the year.

All the plants which I have seen of this sort, either in the English or Dutch gardens, were male, nor have I heard of any female plants being in any of the European gardens.

This plant is easily propagated by cuttings, which may be planted in any of the summer months; if these are planted in small pots filled with light earth, and plunged into a very moderate hot-bed they will soon take root, provided they are screened from the sun and duly watered; when they have taken root, they must be gradually inured to bear the open air, to which they should be exposed, to prevent their drawing up weak: therefore they should be placed abroad till they have obtained some strength, then they may be each transplanted into a separate small pot, and placed in the shade until they have taken fresh root; after which they may be placed with other of the hardy kinds of exotic plants in a sheltered situation till October, when they should be removed into the greenhouse, or placed under a common hot-bed frame, where they may be screened from the hard frost, but

enjoy the free air at all times when the weather is mild.

When the plants advance in height, their stems and branches must be supported, otherwise they will trail upon the ground. In summer they must be placed in the open air, with Myrtles and other hardy green-house plants; and in winter the plants may be treated in the same manner as those, but must have little water in winter. This plant has endured the cold of our ordinary winters, when planted near a south-west wall without covering, but in severe winters they are always destroyed.

The second sort is a native of the same country as the first; this hath very slender ligneous stalks, which must be supported, otherwise they will fall to the ground. These send out slender branches on every side, which are closely garnished with trifoliate leaves standing close to the branches; the middle lobes of these are much larger than the two side, and are indented in three parts. The flowers of this come out from the bosom of the leaves, having very short foot-stalks, and are shaped like those of the first, but are smaller; these appear in July and August. Of this sort we have only male plants in the English gardens, which can only be propagated by layers; and as these are two years before they take root, the plants are at present very rare in England. This sort requires the same management as the first, and is equally hardy, but must not be over watered in winter. The leaves of this sort continue green all the year, and being singularly shaped, they make a variety in the green-house during the winter season.

The third sort rises with a weak shrubby stalk about four feet high, sending out lateral branches, which are covered with a whitish bark, and are garnished with leaves, placed in clusters without order; these are stiff, of the consistence and colour of the Butchers Broom, but are narrower, and run out to a longer point. Between these clusters of leaves the flowers come out in loose bunches, these have a great number of yellowish stamina, included in a three-leaved empalement. We have only the male plant of this sort, which is very difficult to propagate, so is very rare in Europe at present.

This plant is tenderer than either of the former sorts, so should be placed in a warm green-house in winter, and during that season, they must have but little water. In the summer they may be exposed to the open air in a sheltered situation, but they should not remain abroad too late in the autumn; for if there should be much rain at that season, it would endanger these plants if they are exposed to it.

CLIMATE [of Κλίμα, *Gr.* an inclination,] is a part of the surface of the earth bounded by two circles parallel to the equator; so that the longest day in that parallel, nearest to the pole, exceeds the longest day in that parallel nearest to the equator by some certain space of time, viz. half an hour, till you come to places situate nearly under the arctic circle; and a whole hour, or even several days when you go beyond it.

The antient Greek geographers reckoned only seven climates from the equator towards the north pole, and denominated them from some noted place, through which the middle parallel of the climate passed; but the moderns reckon up twenty-four.

The beginning of the climate is the parallel circle, wherein the day is the shortest.

The end of the climate is that wherein the day is the longest.

The climates therefore are reckoned from the equator to the pole; and are so many bands or zones, terminated by lines parallel to the equator; though in strictness there are several climates in the breadth of one zone.

Each climate only differs from its contiguous ones, in that the longest day in summer is longer or shorter by half an hour in one place than the other.

As the climates commence from the equator, the first climate at its beginning has its longest day precisely twelve hours long; at its end twelve hours and a half: the second, which begins where the first ends, viz. at twelve hours and a half, ends at thirteen hours: and so of the rest, as far as the polar circles.

Here what geographers call hour-climates terminate, and month-climates commence.

As an hour-climate is a space comprised between two parallels of the equator, in the first of which the longest day exceeds that in the latter by half an hour; so the month-climate is a space between two circles parallel to the polar circles, whose longest day is longer or shorter than that of its contiguous one by a month, or thirty days.

The antients, who confined the climates to what they imagined the habitable part of the earth, only allowed of seven, as had been said: the first they made to pass through Meroe, the second through Sienna, the third through Alexandria, the fourth through Rhodes, the fifth through Rome, the sixth through Pontus, and the seventh through the mouth of the Borysthenes.

The moderns, who have sailed farther towards the poles, make thirty climates on each side; and because the obliquity of the sphere makes a little difference in the length of the longest day, some of them make the difference of the climate but a quarter of an hour instead of half an hour.

The term climate is vulgarly bestowed on any country or region differing from another, either in respect of the seasons, the quality of the soil, or even the manners of the inhabitants, without any regard to the length of the longest day.

CLINOPODIUM. Lin. Gen. Plant. 644. Tourn. Inst. R. H. 194. tab. 92. Field Basil.

The CHARACTERS are,

*It hath an involucrum cut into many parts, is the length of the empalement, upon which the whorls sit. The empalement is of one leaf, with a cylindrical tube, which is divided into two lips; the upper lip is broad, trifid, acute, and reflexed; the under lip is cut into two narrow segments, which turn inward. The flower is of the lip kind, with a short tube enlarging to the mouth; the upper lip is erect, concave, and indented at the top, which is obtuse; the under lip is trifid and obtuse, the middle segment being broad and indented. It hath four stamina under the upper lip, two of which are shorter than the other, terminated by roundish summits; in the center is situated the quadripartite germen, supporting a slender style the length of the stamina, crowned by a single compressed stigma. The germen afterward become four oval seeds shut up in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, intitled Didynamia Gymnospermia. The flowers of this class and section, have two long, and two short stamina, which are succeeded by four naked seeds.

The SPECIES are,

1. CLINOPODIUM (*Vulgare*) capitulis subrotundis, hispidis, bracteis setaceis. Lin. Sp. Plant. 587. *Field Basil with roundish prickly heads, and bristly bractea.* Clinopodium Origano simile, elatius, majore flore. C. B. P. 225. *Common English Field Basil.*
2. CLINOPODIUM (*Incanum*) foliis subtus tomentosis, verticillis explanatis, bracteis lanceolatis. Lin. Sp. Plant. 588. *Field Basil with leaves which are woolly on the under side, broad plain whorls, and spear-shaped bractea.* Clinopodium menthæ folio incanum, & odoratum. Hort. Elth. 87.
3. CLINOPODIUM (*Rugosum*) foliis rugosis, capitulis axillaribus, pedunculatis, explanatis, radiatis. Lin. Sp. Plant. 588. *Field Basil with rough leaves, plain heads growing on the sides of the stalks, which have foot-stalks, and are radiated.* Clinopodium rugosum, capitulis scabiosæ. Hort. Elth. 88.
4. CLINOPODIUM (*Humile*) humile ramosum, foliis rugosioribus, capitulis explanatis. *Low branching Field Basil with rougher leaves, and plain heads.* Clinopodium Americanum humile, foliis rugosioribus. Dale.

5. Clinopodium (*Carolinianum*) caule erecto, non ramoso, foliis subtus villosis, verticillis paucioribus, bracteis calyce longioribus. *Field Basil with an upright unbranching stalk, leaves hairy on their under side, fewer whorls, and bractea longer than the empalement.* Clinopodium Americanum, erectum, non ramosum foliis longioribus, internodiis longissimis. Dale.

6. Clinopodium (*Ægyptiacum*) foliis ovatis rugosis, verticillis omnibus distantibus, i. e. *Field Basil with oval rough leaves, and the whorls of flowers standing at a great distance.* Clinopodium Ægyptiacum, vulgari simile. Dill. *Ægyptian Field Basil like the common.*

The first sort grows naturally by the side of hedges and in thickets, in many parts of England; this hath a perennial fibrous root, which sends up several stiff square stalks a foot and a half high, from which come out a few lateral branches toward the top, garnished with oval hairy leaves, placed opposite; at the top of the stalks the flowers come out in round whorls, or heads; one of these terminate the stalk, and there is generally another which surrounds the stalk at the joint immediately below it. The flowers are sometimes purple, at others white, for they vary from one colour to the other, when they are propagated by seeds, so that both colours are found naturally in the fields. The whorls (or heads) grow very close, and each foot-stalk sustains several flowers; each flower hath a tubular empalement, ending in five sharp points, which stand erect; at the base of the empalement stand two bristly spines, which Linnæus terms the bractea; these stand almost horizontal under the empalement. The flower is of the labiated, or lip kind, according to Tournefort, Ray, &c. which is now styled ringent, or grinning, from the appearance which the upper part has to the mouth, or chaps of animals. The upper lip is broad and trifid, but the under is cut into two narrow segments; each flower is succeeded by four naked seeds, sitting at the bottom of the empalement. This flowers in June.

The second sort grows naturally in Pensylvania and Carolina, from both of these countries I have frequently received the seeds; this hath a perennial root, which sends up many square stalks about two feet high, which put out a few short side branches toward the upper part, garnished with oblong oval leaves, about the size of those of Water Mint, standing opposite, close to the stalk; they are hoary, and soft to the touch, and have a strong odour, between that of Marjoram and Basil. The upper surface of the leaves is of a pale green, but their under side is hoary and woolly, they are slightly indented on their edges. The flowers grow in flat smooth whorls round the stalks; each stalk hath generally three of these whorls, the upper which terminates the stalk being smaller, the other two increasing, so that the lower is the greatest. The flowers are of a pale purple colour, and shaped like those of the first sort, but the stamina of this stands out beyond the petal, and the bractea at the base of the empalement are large, spear-shaped, and indented on their sides. This plant is called Snake-weed in some parts of America, supposing it a remedy for the bite of rattle snakes. This flowers in July in England.

The third sort grows naturally in Carolina, from whence the seeds were sent me by the late Dr. Dale: this hath a perennial root, which sends up several square stalks, which are closely covered with brownish hairs; these rise between two and three feet high, garnished with leaves which are very unequal in their size, those at the bottom, and also toward the top, being above three inches long, and one inch and a quarter broad, whereas those in other parts of the stalk are not half so large; they are rough on their upper side, hairy below, and sawed on their edges, standing opposite: all the lower part of the stalk, but immediately below the foot-stalks of the flower-heads, there are three large leaves standing round the stalks; between these arise two slender hairy foot-stalks, about three inches long, one on each side the stalk; these sustain small heads of flowers, shaped like those of the scabious; they are white, shaped like those of the other, but smaller; the bractea immediately under the empalement, spread out like rays. This plant flowers in September in this country, but never ripens its seeds here.

The seeds of the fourth sort were sent me from Carolina, by the late Dr. Dale; this hath some appearance of our common sort, but the stalks do not grow more than half so high, and divide into many long side branches; the leaves are smaller and rougher, and the whorls of flowers are produced half the length of the branches, whereas the common sort hath rarely more than two; the bractea at the base of the empalement is also much longer. This flowers in June and July, and hath a perennial root.

The fifth sort was sent me by the late Dr. Dale, from Carolina; this hath a perennial root, which sends up strait hairy stalks, almost round; the joints of these are four or five inches asunder, at each of these come out two oblong leaves, hairy on their under side, standing upon short foot-stalks; at the bottom of these come out on each side a slender branch, half an inch long, having two or four small leaves, shaped like the other. The flowers are produced in small whorls, standing thinly; these are white, and the bractea are longer than the empalement. This flowers in August.

The sixth sort is a native of Egypt, from whence the seeds were sent to Europe, and the plants have for some years past grown in many curious gardens. It hath a perennial root; the stalks rise a foot and an half high, garnished with oval leaves, having many transverse deep furrows, of a dark green colour, placed opposite, at about five or six inches asunder. There are commonly two or four side branches from the main stem, produced toward the bottom; and the whorls of flowers are produced at every joint toward the upper part of the stalks: these are pretty large and hairy. The flowers are somewhat larger than those of the common Field Basil, and are of a deeper colour, stretching a little more out of the empalement. The leaves of this have at first sight much the same appearance; but when they are observed with attention, the difference is soon observed between the two sorts: but the greatest difference is in the leaves and whorls of flowers being placed at a greater distance, and the stalks growing sparsedly in this species; nor do the plants continue so long as those of the common sort.

This sort flowers in June, commonly a fortnight or three weeks before the common Field Basil, and the seeds ripen in September; which, if permitted to scatter, the plants will come up in autumn; and if the winter proves favourable, they will live in the open air, provided they grow on a dry soil; but in moist ground they are frequently destroyed, especially when the plants are young.

This plant approaches near to the Clinopodium Orientale Origani folio, flore minimo. Tour. Corol. 12. But by comparing this with a specimen of that sort from the Paris garden, I find the leaves of that are smoother, and placed much nearer together on the stalks than those of this sort; the flowers are smaller, so that it may be deemed a distinct species, as these differences are permanent, and do not alter in any of the plants which arise from the seeds.

These plants may be propagated by seeds, and also by parting their roots; the latter is generally practised in England, because few of the sorts perfect their seeds here. The best time to transplant and part their roots is in autumn, that they may take root before winter. If these are planted in a dry soil, they are all, except the third sort, hardy enough to thrive in the open air in England, and require no other care but to keep them clean from weeds, and every other year they may be transplanted and parted. The third sort must be planted in pots, and in winter sheltered under a frame, where the plants may enjoy the free air in mild weather, but screened from frost, otherwise they will not live in this country.



CLITORIA.

CLITORIA. Lin. Gen. Plant. 796. Ternatea. Tourn. Act. Reg. 1706. Clitorius. Dill. Hort. Elth. 76. We have no English title for this plant.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, which is tubular, erect, and indented in five parts at the top. The flower is of the butterfly kind, having a large spreading standard, which is erect, and indented at the top; the two wings are oblong, obtuse, and shorter than the standard, which is closed. The keel is shorter than the wings; it is roundish and hooked; it hath ten stamina, nine of which are joined, and one stands separate, which are terminated by single summits. In the center is situated an oblong germen, supporting a rising style, crowned by an obtuse stigma. The germen afterward becomes a long, narrow, compressed pod, with one cell, opening with two valves, inclosing several kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria; the flowers of this section have ten stamina, which compose two bodies.

The SPECIES are,

1. CLITORIA (*Ternatea*) foliis pinnatis. Hort. Cliff. 360. *Clitorea with winged leaves.* Ternatea flore simplici cæruleo. Tourn. Acad. Reg. Sc. 1706.
2. CLITOREA (*Brasiliana*) foliis ternatis, calycibus campanulatis solitariis. Hort. Upsal. 215. *Clitoria with trifoliate leaves, and a single flower with a bell-shaped empalement.* Planta leguminosa Brasiliana, Phaseoli flore, flore purpureo maximo. Breyn. Cent. 78. tab. 32.
3. CLITORIA (*Virginiana*) foliis ternatis, calycibus campanulatis subgeminis. Flor. Virg. 83. *Three-leaved Clitoria with two flowers joined, whose empalements are bell-shaped.* Clitorius trifolius flore minore cæruleo. Hort. Elth. 90. tab. 76.
4. CLITORIA (*Mariana*) foliis ternatis, calycibus cylindricis. Lin. Sp. Plant. 753. *Clitoria with trifoliate leaves, and cylindrical empalements to the flowers.* Clitorius Marianus trifolius subtus glaucis. Pet. Hort. Sicc. 243.

The first sort grows naturally in India; the seeds of this were first brought to Europe from Ternate, one of the Molucca Islands, and this induced Dr. Tournefort to give the title of Ternatea to this genus. There is a variety of this with white flowers, and another with large blue flowers, which make a fine appearance. The seeds which I received of the latter, produced all the plants with very double flowers, without the least variation; but in cold seasons the plants do not produce any pods here.

This rises with a twining herbaceous stalk to the height of four or five feet, in the same manner as the Kidney-bean, and requires the like support; for in the places where it grows naturally, it twists itself about the neighbouring plants; the stalks are garnished with winged leaves, composed of two or three pair of lobes, terminated by an odd one; these are of a beautiful green, and are placed alternate on the stalks; from the appendages of the leaves, come out the foot-stalks of the flower; each of these is encompassed by two very fine leaves about the middle, where they are bent, sustaining a very large, gaping, beautiful flower, whose bottom part seems as if growing to the top.

The flowers have a green membranaceous empalement, which is cut into five parts. The standard of the flowers is large, and is spread open very wide; and the flowers are of so deep a blue colour, as to stain paper, after having been many years dried, almost as blue as indigo; these flowers are succeeded by long slender pods, containing several kidney-shaped seeds.

The second sort grows naturally in the Brasils, from whence these seeds were brought to Europe. This hath a twining stalk like the former, which rises five or six feet high, garnished at each joint with one trifoliate leaf, standing upon a long foot-stalk. The flowers come out singly from the foot-stalk of the leaves, standing upon pretty long foot-stalks, which are encompassed about the middle with two small oval leaves; the flowers are very large, the standard being much broader than that of the first sort, and the two wings are larger; the flowers are of a fine blue colour, so make a fine appearance. The flowers appear in July, and in warm seasons the seeds will ripen in autumn, soon after which the plants decay.

There is one with a double flower of this sort, which I raised in the Chelsea garden some years past, from seeds sent me from India; but the plants did not produce seeds here, and being annual, the sort was lost. The flowers of this were very beautiful.

The seeds of the third sort were sent me from the Bahama Islands; this sends out from the root two or three slender twining stalks, which rise to the height of six or seven feet, garnished at each joint with one trifoliate leaf, whose lobes are oblong and pointed. At the opposite side of the stalk, the foot-stalk of the flower arises, which is little more than an inch long, naked, and sustains a single flower, which is of a purple colour within, but of a greenish white on the outside, not half so large as either of the former: these flowers are each succeeded by long, slender, compressed pods, ending in a point, which contain one row of roundish kidney-shaped seeds. This sort flowers in July and August, and the seeds ripen in autumn.

The seeds of the fourth sort were sent me from Carolina, where the plants grow naturally. This rises with a twining weak stalk about five feet high, garnished with trifoliate leaves like the former, whose lobes are narrower, and of a grayish colour on their under side; the flowers come out by pairs on the foot-stalks; their empalements are cylindrical. The flowers are small, and of a pale blue colour within, but of a dirty white on the outside. This flowers in August, but rarely ripens any seeds in England.

All these sorts are annual with us in England, so that unless the seeds ripen, the species are lost; and as the two sorts with double flowers have not formed any pods in this country, so far as I have been able to learn, therefore the seeds of these must be procured from the countries where they naturally grow. Indeed these are supposed to be only varieties, which accidentally arise from the single. If this be true, I cannot account for the success of those plants which grew at Chelsea, for they were all of the same double kind, without the least variation; and this was not from a single experiment, but in three different years when I received the seeds, the plants did all of them produce double flowers.

The seeds of these plants must be sown upon a good hot-bed early in the spring; and when the plants are two inches high, they should be carefully taken up, and each planted in a small pot filled with light fresh earth, and plunged into a hot-bed of tanners bark, observing to shade them till they have taken fresh root, and refresh them with water as they may require it. After they are well rooted in the pots, they must have air every day in proportion to the warmth of the season, to prevent their drawing up weak; their waterings should be repeated two or three times a week, but they should not have too much at each time. As these plants have climbing stalks, they will soon grow too tall to remain under common frames, therefore they must then be removed into the stove, and plunged into the bark-bed; but if their roots have filled the pots, they should be removed into larger, and afterward they must be treated in the same manner as other plants from the same countries.

CLUSIA. Lin. Gen. Plant. 577. Plum. Nov. Gen. 20. tab. 20. The Balsam-tree.

The CHARACTERS are,

*It hath an imbricated empalement, composed of roundish concave leaves which spread open; it hath five or six large, roundish, concave, spreading petals. In the bottom is situated a globular nectarium, including the germen, which is pervious at the top, from which place the stigma arises.*

It

*It hath a great number of stamina, which are shorter than the petals, terminated by single summits. The oblong oval germen is terminated by a plain star-like stigma, with six obtuse indentures. The germen afterward becomes an oval capsule, with six furrows, and six cells, opening with six valves, which spread in form of a star, including many angular seeds fixed to a column, surrounded with pulp.*

This genus of plants is ranged in the first section of Linnæus's twenty-third class, intitled Polygamia Monœcia, having male, female, and hermaphrodite flowers on the same plant.

The Species are,

1. Clusia (*Flava*) foliis aveniis corollis tetrapetalis. Jacq. Amer. 34. *Clusia whose leaves have no veins, and the flower has four petals.* Terebinthus folio singulari, non alato, rotundo, succulento flore pallidè luteo. Sloan. Hist. Jam. 2. p. 97. *Commonly called Balsam-tree in America.*
2. Clusia (*Venosa*) foliis venosis. Lin. Sp. Plant. 510. *Clusia with veined leaves.* Clusia flore roseo minor, fructu flavescente. Plum. Nov. Gen. 2.

There are three varieties of the first sort, which differ in the size and colour of their flowers and fruit; one hath a white flower and scarlet fruit, another hath a Rose flower and a greenish fruit, and a third hath a yellow fruit: but these are supposed to be only seminal variations, though Plumier has enumerated them as distinct species; but as the plants have not flowered in England, I can give no particular account of their difference: the singular beauty of the leaves of this plant, renders it worthy of a place in every collection of rare plants.

The first sort is pretty common in the British Islands of America, where the trees grow to the height of twenty feet, and shoot out many branches on every side, garnished with thick, round, succulent leaves, placed opposite. The flowers are produced at the ends of the branches, each having a thick succulent cover: these are of different colours in different plants, some being red, others yellow, some white, and some green. After the flowers are past, they are succeeded by oval fruit, which are also of different colours in different plants: from every part of these trees there exsudes a sort of turpentine, which is called in the West Indies Hog-gum; because they say, that, when any of the wild hogs are wounded they repair to these trees, and rub their wounded parts against the stems of them, till they have anointed themselves with this turpentine, which heals their wounds. The turpentine of these trees is also greatly recommended for the cure of sciaticas, by spreading it on a cloth, and applying it as a plaster to the part affected.

The plants are at present very rare in Europe: there were some years ago some fine plants in the garden of Mr. Parker, near Croyden in Surry; these were brought over, growing in tubs of earth from Barbadoes, which is the best method of procuring them; for the seeds seldom succeed, and the young plants grow so slowly, as not to make any figure in some years; but in the bringing over the plants, great care should be had, that they do not receive much wet; for as these plants have very succulent stems, moisture will cause them to rot.

The plants are tender, so they must be constantly kept in the stove, otherwise they will not live through the winter in England; they must also be watered very sparingly, especially in winter, for they naturally grow in those parts of the islands, where it seldom rains, therefore they cannot bear much moisture.

They may be propagated by cuttings, which must be laid to dry when they are cut off from the plants for a fortnight or three weeks, that the wounded part may be healed over, otherwise they will rot. When the cuttings are planted, the pots should be plunged into a hot-bed of tanners bark, and now and then gently refreshed with water: the best time for planting these cuttings is in June or July, that they may be well rooted before the cold weather comes on in autumn. In winter these plants may be placed upon stands in the dry stove; but if in summer they are plunged into the tan-bed, they will make great progress, and their leaves will be large, in which consists the great beauty of these plants.

The second sort was discovered by the late Dr. Houstoun, growing naturally at Campeachy, from whence he sent me some dried samples and seeds: this hath very large oval spear-shaped leaves, ending in points, which are placed alternate on the branches, and have several ribs, which go off from the midrib alternate, rising upward to the side of the leaves; and also a great number of small veins, running horizontally between these ribs. The borders of the leaves are sawed, and their under sides are of a shining brown colour. The branches are covered with a woolly down, and the flowers are produced in loose spikes at the end of the shoots; these are smaller than those of the former sort, and are of a Rose colour. This tree rises to the height of twenty feet; it is propagated by seeds, which must be obtained from the countries where the trees naturally grow, for there can be little hopes of obtaining any of the seeds in Europe. The plants are tender, so must be placed in the tan-bed of the bark-stove, otherwise they will not thrive in this country; and they must be treated in the same manner as is directed for other tender plants from the same countries.

CLUTIA. This genus of plants was constituted by the learned Dr. Boerhaave, professor of botany in the university of Leyden, in honour of Augerius Clute, a curious botanist.

The Characters are,

*It is male and female in different plants. The male flowers have a large spreading empalement, composed of five oval concave leaves; they have five heart-shaped petals, which are shorter than the empalement, and spread open. They have five exterior nectariums, which are situated in a circle at the bottom of the petals; and five interior, which are situated within the other, having small apices with a mellous liquor, and five stamina situated in the middle of the style, which spread horizontally, terminated by roundish summits: these have no germen, but a long truncated style in the middle of the stamina. The female flowers have permanent empalements, and petals like those of the male; these have five double exterior nectariums, but no interior; they have a roundish germen, supporting three bifid reflexed styles the length of the petals, crowned by obtuse stigma: the germen afterward becomes a globular capsule, with six furrows, and three cells, each containing a single seed.*

This genus of plants is ranged in the thirteenth section of Linnæus's twenty-second class, intitled Diœcia Gynandria. This section and class include those plants which have the different sexes on separate plants, and the male flowers have their stamina adhering to the style.

The Species are,

1. Clutia (*Alaternoides*) foliis sessilibus lineari-lanceolatis floribus solitariis erectis. Hort. Cliff. 500. *Clutia with linear spear-shaped leaves sitting close to the stalks, and solitary erect flowers.* Alaternoides Africana telephii legitimi imperati foliis. Hort. Amst. 2.
2. Clutia (*Pulchella*) foliis ovatis integerrimis, floribus lateralibus. Lin. Sp. Plant. 1042. *Clutia with oval entire leaves, and flowers growing from the sides of the branches.* Frutex Æthiopicus, portulace folio, flore ex albo virescente. Hort. Amst. 1. p. 177.
3. Clutia (*Eleutheria*) foliis cordato lanceolatis. Flor. Zeyl. *Clutia with heart spear-shaped leaves.* Ricinus dulcis arborescens Americanus, populneâ fronde argenteâ. Pluk. Alm. 321.

The two first sorts are natives of Africa, from whence they were brought to some curious gardens in Holland, and have since been communicated to most of the botanic gardens in Europe. The first sort with male flowers has been long an inhabitant of some curious gardens in England; the other with female flowers has been lately introduced.

The second sort has also been some years in the English gardens, where we had not that sort with male flowers till lately, when I was favoured with one by my learned friend Dr. Job Baster, of Zirkzee in Holland.

The first sort rises with a shrubby stalk to the height of six or eight feet, putting out many side branches which grow erect; these are garnished with small, linear, spear-shaped leaves, placed alternate, sitting close to the branches: they are of a grayish colour and entire. The flowers come out from the joints, at the setting on of the leaves: toward the upper part of the branches these are small and of a greenish white; they appear in June, July, and August, but being small make no great appearance.

The second sort rises about the same height with the first, but hath a stronger stem; the branches are garnished with oval leaves, which are much larger than those of the first sort, standing upon foot-stalks which are an inch long; they are of a sea green, and entire; the flowers are like those of the first sort in shape and colour, but those on the male plants are smaller, and grow closer together than those of the female, but both are sustained upon short foot-stalks. These flowers appear at the same time as those of the first sort, and the seeds ripen in autumn. I have raised several of these plants from seeds, which have all proved female, the same as the parent plant.

These plants are easily propagated by cuttings during any of the summer months: if the cuttings are planted in small pots, and plunged into a very moderate hot-bed, and shaded from the heat of the sun in the middle of the day, they will soon take root, and should then be inured to the open air, otherwise they will draw up very weak: afterward these plants may be each put into a separate small pot, and placed in a sheltered situation, where they may remain until the middle of October, or later, if the weather continues mild, when they should be removed into the green-house, and placed where they may have the free air in mild weather, for they only require to be protected from frost, therefore require no warmth in winter; but if the green-house is shut up too close, or the plants are much shaded by others, the tender shoots are subject to grow mouldy, which destroys more of these plants than the cold. In summer they must be placed abroad in a sheltered situation, with other hardy exotic plants.

As these plants are always green, they look well in the green-house during the winter season; and in summer, when they are placed in the open air with other exotic plants, they make a pretty variety.

The third sort grows naturally in India, from whence the seeds were brought. This rises with an upright shrubby stalk, not more than three or four feet high in England; but in the places where it grows naturally, it rises upward of twenty feet high, and sends out many branches at the top, so as to form a large spreading head: the branches are garnished with leaves, shaped like those of the black Poplar, which are of a lucid green, and are placed alternate standing upon slender foot-stalks. As these plants have not yet flowered in England, I can give no account of them, but the seed-vessels are very like those of the second sort.

This plant will live through the winter in an airy glass-case, without artificial heat; but in that situation they should have very little water, for the plants abound with a milky juice like the Euphorbia, so must at no season of the year have too much wet. If these plants, when young, are placed in a very moderate warmth in winter, it will greatly forward their growth, but they must not have too much heat, for that will force them too much; and when the plants have obtained strength, they may be treated more hardily. This sort may be propagated by cuttings during the summer season; but the cuttings should be laid in a dry place for a few days, when they are taken from the old plants, that their wounded parts may dry and be healed over before they are planted. These must be planted in small pots filled with light sandy earth, and plunged into a moderate hot-bed of tanners bark; and if the season is very warm, the glasses should be shaded in the heat of the day, and raised up to admit fresh air to the cuttings every day; these must be sparingly watered. When they have taken root, and begin to shoot, they must have a greater share of air, and by degrees be inured to the open air; and when their roots have filled the pots, they should be carefully parted, and each planted in a separate pot of the same light sandy earth; then they should be placed on the back part of the stove, behind the other plants, where they may be screened from the sun till they have taken fresh root, after which they may be brought forward, and exposed gradually to the open air. In the summer they should have free air constantly in warm weather, but they must be screened from heavy rain; and in winter placed in an airy glass-case, where they may enjoy the sun, and during that season have very little wet.

CLYPEOLA. Lin. Gen. Plant. 723. Jonthlaspi. Tourn. Inst. R. H. tab. 99. Treacle Mustard.

The Characters are,

*The flower hath a permanent empalement, composed of four oblong oval leaves. It hath four oblong entire petals, placed in form of a cross, and six stamina which are shorter than the petals, two of which standing opposite are shorter than the other, terminated by single summits. In the center is situated a roundish compressed germen, supporting a single style, crowned by an obtuse stigma. The germen afterward becomes an orbicular pod, which is compressed, erect, and indented at the top, with a longitudinal fissure, opening in two cells, containing round compressed seeds.*

This genus of plants is ranged in the first section of Linnæus's fifteenth class, intitled Tetradynamia siliculosa, the flower having four long and two shorter stamina, and the seeds growing in short pods.

The Species are,

1. Clypeola (*Jonthlaspi*) siliculis unilocularibus monospermis. Hort. Cliff. 329. *Clypeola with pods, having but one cell and a single seed.* Jonthlaspi minimum spicatum lunatum. Col. Ecp. 1. *Least Buckler Mustard with spiked flowers.*
2. Clypeola (*Maritima*) siliculis bilocularibus ovatis dispermis. Sauv. Monsp. 71. *Clypeola with oval pods having two cells and two seeds.* Thlaspi Alysson dictum maritimum. C. B. P. 107.

This genus of plants was named Jonthlaspi by Fabius Columna, and the same title was continued by Dr. Tournefort, and other late writers on botany before Dr. Linnæus, who has altered the name to this of Clypeola.

The first sort is a low annual plant, which seldom rises more than four inches high; the slender branches commonly lie prostrate on the ground; these are garnished with small leaves, narrow at their base, but are broader at their ends, where they are obtuse. The flowers are produced in short close spikes at the extremity of the branches, which are small, yellow, and composed of four petals, placed in form of a cross; these are succeeded by orbicular compressed seed-vessels, each having one cell, containing a single seed. It flowers in June and July, and the seeds ripen in autumn.

The second sort is perennial. This sends out from the root several slender branches, which divide again into many smaller, that lie prostrate, garnished with very narrow hoary leaves, sitting close to the branches. The flowers are produced in spikes at the end of the branches; these are small, yellow, and shaped like those of the other sort, but the spikes terminate in a roundish bunch. It flowers in June, and the seeds ripen in autumn.

These two sorts are low plants, which grow naturally in the south of France, Spain, and Italy, and are preserved in botanic gardens for the sake of variety, but have little beauty; their leaves and stalks are of a hoary white, which is much lighter in the warm

countries than in England; these are propagated by seeds, which should be sown upon a border of light earth where they are to remain, and will require no other culture, but to thin them if they come up too close, and keep them clean from weeds. The seeds may be sown either in the spring or autumn; those which are sown in autumn will grow much larger, and flower earlier than those which are sown in the spring, and from them there will be a greater certainty of having ripe seeds. If the seeds scatter, the plants will come up, and, if kept clean from weeds, they will thrive without farther care.

The second sort is a perennial plant, so should be sown upon a warm border and on a dry soil. This grows naturally on the borders of the sea, in the south of France and Italy; but when it is cultivated in a garden, if the soil is rich and moist, the plants generally grow luxuriant in summer, and are thereby too replete with moisture, so that they are frequently killed by the frost in winter; but when they grow on a poor, dry, gravelly soil, their stalks will be short, ligneous, and tough, so will endure the cold of this climate, and continue several years. This is propagated by seeds, which should be sown where the plants are designed to remain; or if any of them are removed, it should be done when the plants are young, for they do not bear transplanting well, when they are grown pretty large.

CNEORUM. Lin. Gen. Plant. 47. Chamelæa. Tourn. Inst. R. H. 651. tab. 421. Widow-wail.

The Characters are,

*The flower hath a small permanent empalement, indented in three parts. It hath three narrow oblong petals, which are erect, and three stamina which are shorter than the petals, terminated by small summits. In the center is situated an obtuse three-cornered germen, supporting a firm erect style, crowned by a trifid spreading stigma. The germen afterward becomes a globular dry berry, with three lobes, having three cells, each containing one round seed.*

This genus of plants is ranged in the first section of Linnæus's third class, intitled Triandria Monogynia, the flower having three stamina and one style.

We have but one Species of this genus, viz.

Cneorum (*Tricoccum*). Hort. Cliff. 18. Widow-wail. Chamelæa Tricoccos of Dodonæus and Caspar Bauhin.

This is an humble shrub, which seldom rises more than two feet and a half high in this country, but spreads out on every side with many lateral branches, so as to form a thick bush. The stems are ligneous, and almost as hard as those of the Box-tree, and the wood is of a pale yellow colour under the bark: the branches are garnished with thick stiff leaves, of an oblong oval shape, about an inch and a half long, and a quarter of an inch broad, of a dark green colour, having a strong vein or rib through the middle. The flowers are produced single from the wings of the leaves, toward the extremity of the branches, which are of a pale yellow colour, composed of three petals, which spread open, and a round germen at the bottom, having a single style, which doth not rise above half the length of the stamina, which are three in number, standing erect, and are situated between the petals. After the flowers are fallen, the germen becomes a fruit, composed of three seeds joined together after the same manner as those of Tithymalus or Spurge; these are first green, afterwards turn of a brown colour, and when ripe are black. The flowers begin to appear in May, and are succeeded by others during the summer months; and, when the autumn proves favourable, these shrubs will continue in flower till the end of October.

As this is a low evergreen shrub, it may be very ornamental, if placed in the front of plantations of evergreen trees and shrubs; for as the branches grow pretty compact, and are well garnished with leaves, it will hide the ground between the taller shrubs better than most other plants; and, being a durable shrub, will not want to be removed: it rises better from scattered seeds, than if sown with care.

This was formerly preserved in green-houses, and thought too tender to live in the open air in England; but of late years people have planted it in the full ground, where it resists the cold of our ordinary winters very well, and is seldom injured but by extreme hard frosts; nor do these kill the plants which grow upon dry, rocky, or rubbishing soils, where their shoots are generally short and firm; but in moist rich ground, where the shoots are more luxuriant, they are sometimes injured.

It is propagated by seeds, which should be sown in autumn soon after they are ripe, and then the plants will come up the following spring; whereas those which are not sown till the spring, will remain a year in the ground, and often miscarry: these seeds may be sown in a bed of common earth, covering them half an inch deep, and will require no other care but to keep the plants clear from weeds the following summer; and in the autumn following, the plants may be transplanted where they are to remain.

CNICUS. Lin. Gen. Plant. 833. Tourn. Inst. R. H. 450. tab. 257. Blessed Thistle.

The Characters are,

*The empalement of the flower is composed of many oval scales, placed over each other; those toward the top are terminated by branching spines. The flower is composed of several hermaphrodite florets, which are uniform; these are funnel-shaped, and cut at the top into five equal segments, standing erect, each having five short hairy stamina, terminated by cylindrical summits. In the center is situated a short germen, crowned with down, supporting a slender style, terminated by an oblong stigma. The germen afterward becomes a single seed, crowned with down, and shut up in the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia Æqualis. The plants of this section have only hermaphrodite flowers, which are fruitful.

The Species are,

1. Cnicus (*Erisithales*) caule erecto, foliis inferioribus laciniatis, superioribus integris concavis. Hort. Cliff. 394. *Cnicus with an upright stalk, whose lower leaves are laciniated, the upper entire and concave.* Cnicus pratensis, Acanthi folio, flore flavescente. Tourn. Inst. 450.
2. Cnicus (*Spinosissimus*) foliis amplexicaulibus, sinuato-pinnatis, spinosis, caule simplici, floribus sessilibus. Lin. Sp. Plant. 826. *Cnicus with winged, sinuated, prickly leaves embracing the stalk, and flowers sitting close on the top.* Cirsium Alpinum spinosissimum, floribus ochro-leucis inter flavescentia folia congestis. Haller. tab. 20.
3. Cnicus (*Cernuus*) foliis cordatis, petiolis crispis spinosis amplexicaulibus, floribus cernuis. Hort. Upsal. 251. *Cnicus with heart-shaped leaves, having curled prickly foot-stalks which embrace the stalks, and a nodding flower.* Carduus foliis ex cordato-lanceolatis, margine serratis & spinosis, squamis calycum membranaceis, laceris spinosis, capitulis nutantibus. Flor. Sib. 2. p. 47.

The first sort grows naturally in the northern parts of Europe. Mr. Ray found it growing on the Rhine near Basil. This hath a perennial root, which sends out many long jagged leaves, spreading on every side near the ground, so as to form a thick tuft; these are jagged almost to the midrib, in form of a winged leaf. The stalks are striated, smooth, and rise above four feet high, dividing at the top into smaller branches: the leaves which grow upon the stalks are entire, heart-shaped, concave, and embrace the stalks, and are sawed on their edges, each indenture ending in a weak spine: the stalks are terminated by large heads of flowers, growing in clusters; they are of a whitish yellow colour, and inclosed in a scaly empalement, and are succeeded by small oblong seeds, crowned with a bristly down. It flowers in June, and the seeds ripen in autumn.

 This

This sort may be propagated by seeds, or parting the roots; the latter is commonly practised where there are any of the plants, but the seeds are more easily conveyed to a distant place. The best time to part the roots is in autumn; it delights in shade, and requires no farther care but to keep it clean from weeds.

The second sort grows naturally on the Alps, and on the mountains of Austria. This rises with an upright single stalk near four feet high, garnished with sinuated leaves, which are very prickly, and embrace the stalks with their base. The flowers are produced at the top of the stalk, surrounded by a cluster of broad prickly leaves, sitting close to the stalk; they are of a whitish yellow, and appear at the same time with the former sort. It is a perennial plant, which may be propagated in the same manner as the former, and requires a moist soil and a shady situation.

The third sort grows naturally in Siberia, from whence the seeds were sent to the imperial garden at Petersburgh, where they succeeded, and produced seeds, part of which were sent me by the professor of botany; this hath a perennial root, composed of thick fleshy fibres. The leaves which rise immediately from the root are near a foot long, and near six inches broad in the middle, diminishing toward each end, and at a little distance from the base are much contracted, but are wider at the end; these have scarce any foot-stalks; they are of a deep green on their upper side, but white on their under, and sharply sawed on their edges. The stalks rise more than six feet high, sending out on each side small branches above a foot long; the stalks are striated, and of a reddish colour; they are garnished with heart-shaped leaves, which almost embrace the stalks with their base, and are of the same colour with those below; each branch is terminated by one large globular head of yellowish flowers, included in a scaly empalement, each scale ending with a sharp spine. This flowers in June, and the seeds ripen in autumn. It may be propagated in the same manner as the two former sorts, but requires a moist soil and shady situation; and if the weeds are kept down, there will be no farther care required. The inhabitants of Siberia eat the tender stalks of this plant, when boiled, instead of other vegetables.

This is a perennial plant, which may be propagated by parting the roots: the best time for doing of this is in autumn, that the plants may get good root in winter; for those which are transplanted in the spring, do not flower well the first year, unless they are planted in a moist soil. As these plants grow very large, they are not proper furniture for small gardens, where they will take up too much room; for they should not be planted nearer than four feet from each other, for if they are too near any other plants, they will rob them of their nourishment; for the roots of these extend to a great distance, so that two or three of these plants, for variety, are sufficient for any garden, which may be planted at a distance from choicer plants.

It is also propagated by seeds, which may be sown in the spring on a bed of common ground, in the same manner as the other sorts; and will only require to be thinned, and kept clean from weeds till autumn, when they may be transplanted where they are designed to remain.

COA. See Hippocratea.

COAST-MARY. See Tanacetum.

COCCIGRIA. See Rhus.

COCHLEARIA. Lin. Gen. Plant. 720. Tourn. Inst. R. H. 215. tab. 101. [so called of Cochleare, *Lat.* a spoon, because the leaves of this plant are hollowed like a spoon.] Spoonwort, or Scurvy Grass.

The Characters are,

*The empalement of the flower is composed of four oval concave leaves. The flower hath four petals, placed in form of a cross, which spread open, and are twice as large as the leaves of the empalement; it hath six stamina, four of which are longer than the other two; these are terminated by obtuse compressed summits. The germen is heart-shaped, supporting a short single style, crowned by an obtuse stigma: this afterward becomes a gibbous, heart-shaped, compressed pod, fastened to the style, having two cells, in each of which are lodged four roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's fifteenth class, intitled Tetradynamia Siliculosa. The flowers of this class have four long and two short stamina, and those of this section have very short pods.

The Species are,

1. Cochlearia (*Officinalis*) foliis radicalibus subrotundis, caulinis oblongis subsinuatis. Flor. Lapp. 256. *Scurvy Grass whose lower leaves are roundish, and those on the stalks oblong and sinuated.* Cochlearia folio subrotundo. C. B. P. 110. *Round-leaved Scurvy Grass.*
2. Cochlearia (*Anglica*) foliis ovato-lanceolatis, sinuatis. Flor. Ang. 248. *Scurvy Grass with oval spear-shaped leaves, which are sinuated.* Cochlearia folio sinuato. C. B. P. 110. *Sea Scurvy Grass.*
3. Cochlearia (*Grœnlandica*) foliis reniformibus, carnosis integerrimis. Hort. Cliff. 498. *Scurvy Grass with kidney-shaped leaves, which are fleshy and entire.* Cochlearia minima ex montibus Walliæ. Sher. Boerh. Ind. alt. 2. p. 10.
4. Cochlearia (*Danica*) foliis hastatis, angulatis. Flor. Suec. 196. *Scurvy Grass with angular spear-shaped leaves.* Cochlearia Armorica. H. R. Par. *Danish, or Ivy-leaved Scurvy Grass.*
5. Cochleria (*Armoracia*) foliis radicalibus lanceolatis, crenatis, caulinis incisis. Hort. Cliff. 332. *Scurvy Grass whose lower leaves are spear-shaped and crenated, and those on the stalks jagged.* Raphanus Rusticanus. C. B. P. 96. *Horse Radish.*
6. Cochlearia (*Glastifolia*) foliis caulinis cordato-sagittatis, amplexicaulibus. Hort. Cliff. 332. *Scurvy Grass whose upper leaves are arrow-pointed, heart-shaped, and embrace the stalks.* Cochlearia altissima glasti folio. Inst. R. H. 216.

The first sort grows naturally on the sea-shore in the north of England, and in Holland, but is cultivated for use in the gardens near London. This is an annual plant, for the seeds are sown, and the plants decay within the compass of one year, but the seeds should be sown early in autumn; this hath a fibrous root, from which arise many round succulent leaves, which are hollowed like a spoon; the stalks rise from six inches to a foot high; these are brittle, and garnished with leaves, which are oblong and sinuated. The flowers are produced in clusters at the end of the branches, consisting of four small white petals, which are placed in form of a cross, and are succeeded by short, roundish, swelling seed-vessels, having two cells, divided by a thin partition; in each of these is lodged four or five roundish seeds. It flowers in April, and the seeds ripen in June, soon after which it decays.

This sort is propagated in gardens for medicinal uses, which is done by sowing the seeds in July, soon after they are ripe, in a moist shady spot of ground; and when the plants are come up, they should be thinned, so as to be left at about four inches distance each way. The plants that are taken out may be transplanted into other shady borders, if there is occasion for them, otherwise they may be hoed out (as is practised for Onions, Carrots, &c.) and at the same time all the weeds may be hoed down, so as to clear the plants entirely from them, that they may have room to grow strong. In the spring these plants will be fit for use; and those that are suffered to remain will run up to seed in May, and perfect their seeds in June. If this plant is sown in the spring, the seeds seldom grow well, therefore the best time is soon after they are ripe. The plants rarely live after producing seeds, so that it should be sown every year, to have it for use.

The Sea Scurvy Grass is also used in medicine; but this grows in the salt marshes in Kent and Essex, where

where the salt water overflows it almost every tide, and can rarely be made to grow in a garden, or at least to last longer there than one year; but it being easily gathered in the places before-mentioned, the markets are supplied from thence by the herb-women, who make it their business to gather herbs.

This sort differs from the first in the shape of its leaves, these being longer, and sinuated on their edges. It flowers a little later in the season; both these sorts are used in medicine.

The little Welch Scurvy Grass is a biennial plant, and may be preserved in a garden, if planted in a strong soil and a shady situation. This is preserved in curious gardens of plants, but is not of any use in medicine, though it is by far the warmest and most pungent of all the sorts. This grows plentifully in Muscovy, as also in Davis's Streights.

The fourth sort is a low trailing plant, whose stalks grow six inches long, and lie prostrate on the ground; the leaves are angular, and in shape like those of Ivy. This is found growing naturally in some parts of England, and is annual. It flowers and seeds about the same time as the first sort.

The sixth sort is a biennial plant, which usually grows about a foot and a half high, with upright stalks, garnished with angular heart-shaped leaves, embracing the stalks with their base; the flowers are produced in loose spikes at the end of the branches; they are very small, white, and are succeeded by short swelling pods filled with round seeds. It flowers in May, and the seeds ripen in July and August. This may be propagated by seeds as the common sort; and if sown in autumn, will more certainly succeed than in the spring.

The Horse Radish is propagated by cuttings or buds from the sides of the old roots. The best season for this work is in October or February; the former for dry lands, the latter for moist; the ground should be trenched at least two spits deep, or more if it will allow of it. The manner of planting it is as follows: provide yourself with a good quantity of offsets, which should have a bud upon their crowns, but it matters not how short they are; therefore the upper part of the roots which are taken up for use, may be cut off about two inches long with the bud to it, which is esteemed the best for planting. Then make a trench ten inches deep, in which you should place the offsets at about four or five inches distance each way, with the bud upward, covering them up with the mould that was taken out of the trench: then proceed to a second trench in like manner, and continue the same till the whole spot of ground is planted. After this, level the surface of the ground even, observing to keep it clear from weeds, until the plants are so far advanced, as to be strong enough to overbear and keep them down. With this management the roots of the Horse Radish will be long and strait, and free from small lateral roots, and the second year after planting will be fit for use. 'Tis true, they may be taken up the first year, but then the roots will be but slender; therefore it is the better way to let them remain until the second year. The ground in which this is planted ought to be very rich, otherwise the roots will make but a small progress.

COCOS. Lin. Gen. Plant. 1223. The Cocoa Nut.

The CHARACTERS are,

*There are male and female flowers on the same tree. The universal spatha has one valve. The empalement consists of three small-coloured concave leaves; the flower has three oval spreading petals, and six stamina the length of the corolla, terminated by triangular summits. The germen is scarce discernible, supporting three short styles, crowned by obsolete stigma; these are barren. The female flowers are included in the like spatha. The empalement is three-leaved, which is coloured and permanent; they have three petals to the flowers, which are larger than the empalement, and an oval germen without a style, with a three-lobed stigma. The nut is large, triangular, and is perforated by three holes at the end.*

This genus is placed by Linnæus in his appendix under the title of Monoica Hexandria, the same plants having hermaphrodite and female flowers, the hermaphrodite having six stamina.

We know but one SPECIES of this genus, viz.

COCOS (*Nucifera*) frondibus pinnatis, foliolis ensiformibus replicatis. Jacq. Hist. 168. *Cocoa Nut with winged branches, whose small leaves are sword-shaped and folded.* Palma Indica coccifera angulosa. C. B. P. 502.

This tree is cultivated in both Indies, but is generally supposed to grow naturally in the Maldives, and other desart islands of the East-Indies. The trees grow to a great height in their native places, but their stems are composed of strong fibres like net-work, which lie in several lamina over each other, out of which come the branches (or rather leaves,) which grow twelve or fourteen feet long. The midrib is garnished with sword-shaped small leaves, whose borders fold backward: the first leaves which push out from the nut when planted, are very different from those which are afterward produced; for they are very broad, and have many folds in each: whereas, the after leaves have a strong midrib, of great length, on which the smaller lobes are placed alternately; these lobes are from six to eight or nine inches long, and are almost triangular, having very sharp points, and are very stiff. The flowers come out round the top of the trunk of the tree in large clusters; they are inclosed in a large spatha or sheath, and the nuts afterward are formed in large clusters; these are included in large net-work covers, which adhere closely about them; the nut has a hard shell, with three holes at the upper end. The kernel is large, sweet, and the lower part of the shell, when first taken from the tree, is filled with a pale liquor, which the inhabitants of the countries where the trees grow, call milk, and they are very fond of it. From this milk I have been informed by persons of credit, there has been exceeding good arrack distilled in Jamaica.

The plants are propagated by planting the nuts in such places where they are designed to remain; for the plants will not bear transplanting, unless it is performed while they are very young, for their roots shoot deep and wide; so that if these are cut or broken, the plants seldom survive it, which is generally the case with most of the kind of Palms.

Where any persons are desirous of having a plant or two of this sort, they should procure some fresh nuts from the nearest place of their growth, which, on their arrival in England, should be buried in a warm bed of tanners bark, laying them on one side, that the young shoot which comes out from one of the three holes may not be injured by wet, covering them about six inches deep with the tan. In this situation, if the nuts are good, they will put out shoots in six weeks or two months, so should be then carefully taken up, and each planted in a separate pot filled with kitchen-garden earth, and plunged into the tan-bed in the stove, where the plants should always remain, for they are too tender to thrive in any other situation; but as the plants advance in their growth, they should be shifted into larger pots or tubs, being careful not to cut or tear their roots in the operation.

This is one of the most useful trees to the inhabitants of America, who make many necessary utensils from the several parts of it. The outer cover of the nuts is made into cordage; the shells are converted into drinking bowls; the kernel of the nuts affords them a wholesome food, and the milk a cooling liquor. The leaves of the tree are used for thatching of their houses, and are also wrought into baskets, and many other things which are made of Osiers in Europe.

COCCOLOBA, Sea-side Grape.

The CHARACTERS are,

*The empalement is of one leaf, cut into five parts, which spread open and are permanent. The flower has no corolla, but hath eight awl-shaped spreading stamina, terminated by roundish twin summits. It has an oval three-cornered germen, supporting three short spreading styles, crowned by simple stigmas. The empalement afterward becomes a thick berry, inclosing an oval-*

 *pointed*

*pointed nut, with one cell, having a single seed of the same form.*

This genus of plants is ranged in the third section of Linnæus's eighth genera, intitled Octandria Trigynia, the flowers having eight stamina and three styles.

The Species are,

1. Coccoloba (*Uvifera*) foliis cordato-subrotundis nitidis. Lin. Sp. 523. *Sea-side Grape with neat, roundish, heart-shaped leaves.* Guajabara racemosa, foliis coriaceis subrotundis. Plum. Nov. Gen.
2. Coccoloba (*Rubescens*) foliis orbiculatis pubescentibus. Lin. Sp. 523. *Sea-side Grape with orbicular hairy leaves.* Scortea arbor Americana, amplissimis foliis aversa parte nervis extantibus. Pluk. Phyt. 222. f. 8.
3. Coccoloba (*Punctata*) foliis lanceolato-ovatis. Lin. Sp. 523. *Sea-side Grape with oval spear-shaped leaves.* Uvifera arbor Americana, fructu aromatico punctato. Pluk. Alm. 394.
4. Coccoloba (*Excoriato*) foliis ovatis, ramis quasi excorticatis. Lin. Sp. 524. *Sea-side Grape with oval leaves, and the branches casting their bark.* Guajabara alia racemosa, foliis oblongis. Plum. Icon. 146. f. 1. *Called Mountain Grape.*
5. Coccoloba (*Tenuifolia*) foliis ovatis membranaceis. Amœn. Acad. 5. p. 397. *Sea-side Grape with oval membranaceous leaves.*

The first sort rises with many ligneous stems to the height of ten or twelve feet, having several knots or joints, covered with a gray bark: at each joint is set on one large, roundish, smooth leaf, a little indented at the top. The flowers come out from the foot-stalks of the leaves, in long bunches like those of Currants; they have no petals, but the empalement is cut into five segments, including eight awl-shaped stamina, terminated by twin summits. The germen afterward becomes a succulent berry, including an oval-pointed nut, having one seed of the same form.

The second sort seldom rises so high as the first, but divides into several lateral branches, garnished with large roundish leaves, having several deep veins; the flowers and fruit come out from the side of the branches in like manner as those of the first, but are larger.

The third sort is a lower shrub than either of the former; the leaves are oval and spear-shaped; the fruit is smaller, somewhat aromatic, and spotted; these proceed from the side of the branches in like manner as the former sorts.

The fourth sort grows to a much larger size than any of the other; the leaves of this are much larger, of an oblong oval form, very smooth, and of a lucid green: from the wings of the leaves, the flowers and fruit are produced, which are in form like those of the other sorts, but are larger.

The fifth sort is of humbler growth than either of the former; the leaves are membranaceous, of an oval form; the flowers and fruit are smaller than those of the other sorts. These plants all grow naturally in the warm islands of America; some of them on the sea-shores, where they form very close, almost impenetrable thickets; the fruit of the first sort are frequently eaten by the inhabitants of the islands, but especially by the negroes. Those of the other sorts are food for birds.

The plants of all the sorts are easily propagated by seeds, when they can be obtained fresh from the places of their natural growth (for none of the sorts have as yet produced either fruit or flowers in England.) The seeds should be sown in small pots filled with earth from the kitchen-garden, and plunged into a hot-bed. If the seeds are good, and the bed of a proper temperature of warmth, the plants will appear in five or six weeks after, which will be fit to transplant in about a month after; when they should be shaken out of the pots, separating their roots carefully, and each planted in a separate small pot filled with the like earth, plunging them into a hot-bed of tanners bark, being careful to shade them in the day-time, until they have taken new root; after which they should be treated in the same way as other tender exotic plants, which require to be kept constantly in the bark-stove.

CODLIN-TREE. See Malus.

COFFEA. Lin. Gen. Plant. 209. Juss. Act. Reg. Scien. 1713. Jasminum. Com. Cat. The Coffee-tree.

The Characters are,

*The flower hath a small empalement divided into four parts, sitting upon the germen. It hath one petal which is funnel-shaped, having a narrow cylindrical tube, which is much longer than the empalement, but is plain at the top, where it is indented in five parts. It hath five stamina which are fastened to the tube, and are terminated by long slender summits. The roundish germen supports a single style, crowned by two thick reflexed stigmas. The germen afterward becomes an oval berry, containing two hemispherical seeds, plain on one side, and convex on the other.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style; it hath been generally included in the genus of Jasmines; but as the flowers of Jasmine have but two stamina, so by Linnæus's system, this is separated and ranged in another class.

We have but one Species of this genus, viz.

Coffea (*Arabica.*) Hort. Cliff. 59. The Coffee-tree. Jasminum Arabicum Castaneæ folio, flore albo odoratissimo, cujus fructus Coffea in officinis dicuntur nobis. Juss. Act. Par. 1713.

This tree is supposed to be a native of Arabia Felix, where it was first cultivated for use, and to this day, is the country from whence the best Coffee is brought to Europe, though the plant is now propagated in many parts of India and America; but the produce of those countries being greatly inferior to that of Arabia, hath occasioned its present disrepute in England, so that it is scarce worth importing; but this might be remedied, if the Coffee planters in the West Indies could be prevailed on to try a few experiments, which I shall hereafter propose, being founded on those which have been made in England, upon the berries produced here. But I shall first treat of the plant, with its culture in England.

This is a low tree in the native country of its growth, where it seldom rises more than sixteen or eighteen feet high, but in England I have not seen any above ten or twelve. The main stem grows upright, and is covered with a light brown bark; the branches are produced horizontally and opposite, which cross each other at every joint, so that every side of the tree is fully garnished with them: the lower branches being the longest, the others gradually decreasing to the top, form a sort of pyramid; the leaves are also produced opposite; these when fully grown, are about four or five inches long, and one inch and a half broad in the middle, decreasing toward each end; the borders are waved, and the surface is of a lucid green. The flowers are produced in clusters at the base of the leaves, sitting close to the branches; these are tubulous, spread open at the top, where they are divided into five parts, and are of a pure white, with a very grateful odour, but of short duration: they are succeeded by oval berries, which are first green, when fully grown, they turn red, and afterward change to black when fully ripe; these have a thin pulpy skin, under which are two seeds joined, which are flat on the joined sides, with a longitudinal furrow, and convex on their outer side.

As the Coffee-tree is an Evergreen, it makes a beautiful appearance at every season in the stove, but particularly when it is in flower; and also when the berries are red, which is generally in the winter; so that they continue a long time in that state, therefore there is scarce any plant that more deserves a place in the stove than this.

It is propagated by the berries, which must be sown soon after they are gathered from the trees, for if they are kept out of the ground a short time they will not grow. I have frequently sent the berries abroad

by the poſt, but when they have been a fortnight in their journey they have all failed; and this has conſtantly happened every where, for the berries which were ſent from Holland to Paris did not grow, nor did thoſe which were ſent from Paris to England grow; ſo that wherever theſe trees are deſired, the young plants muſt be ſent, if it be at any diſtance from the place where they grow.

The berries ſhould be planted in ſmall pots, filled with light kitchen-garden earth, and plunged into a hot-bed of tanners-bark; the pots muſt be watered gently once or twice a week, but the earth muſt not be too moiſt, leſt it rot the berries. If the bed be of a proper temperature of warmth, the plants will appear in a month or five weeks time, and in about two months more will be fit to tranſplant. For as many of the berries will produce two plants, ſo the ſooner they are parted, the better their roots will be formed; for when they grow double till they have made large roots, they will be ſo intermixed and entangled, as to render it difficult to ſeparate them without tearing off their fibres, which will greatly prejudice the plants. When theſe are tranſplanted, they muſt be each put into a ſeparate ſmall pot, filled with the ſame earth as before, and plunged into the tan-bed again; which ſhould be ſtirred up to the bottom, and if required, ſome new tan ſhould be mixed with it, to renew the heat. Then the plants ſhould be gently watered, and the glaſſes of the hot-bed muſt be ſhaded every day till they have taken new root; after which the plants ſhould have free air admitted to them every day, in proportion to the warmth of the ſeaſon: during the ſummer they will require frequently to be refreſhed with water, but they muſt not have it in too great plenty: for if their roots are kept too moiſt, they are very ſubject to rot, then the leaves will ſoon decay and drop off, and the plants become naked; when this happens, they are ſeldom recovered again. The firſt ſign of theſe plants being diſordered, is, their leaves ſweating out a clammy juice, which attracts the ſmall inſects, that too frequently infeſt the plants in ſtoves; when they are not in health, theſe inſects cannot be deſtroyed, till the plants are recovered to vigour: for although the plants are ever ſo carefully waſhed and cleaned from them, yet they will be ſoon attacked by them again, if they are not recovered to health, for theſe inſects are never ſeen upon any of the plants while they are in perfect vigour; but when they are diſordered, they ſoon ſpread over all the leaves and tender parts of the plants, and multiply exceedingly; ſo that upon the firſt attack, the plants ſhould be ſhifted into freſh earth, and all poſſible care taken to recover them, without which all the waſhing and cleaning of the plants will be to little purpoſe. The diſorders attending the Coffee-trees, generally proceed from either being put into pots too large for them, nothing being of worſe conſequence than over potting them; or from the earth being too ſtiff, or over-hung by other plants, or being over watered. If theſe are properly taken care of, and the ſtove kept always in a proper temperature of heat, the plants will thrive, and produce plenty of fruit.

I have made trial of ſeveral compoſitions of earth for theſe plants, but have found none of them equal to that of a kitchen-garden, where the ſoil is naturally looſe, and not ſubject to bind; and if it has conſtantly been well wrought and properly dunged, this without any mixture is preferable to any other.

The plants ſhould not be too often tranſplanted, for that will greatly retard their growth. If they are new potted twice a year at moſt, it will be ſufficient; though unleſs the plants make great progreſs, they will not require to be removed oftener than once in a year, which ſhould be in ſummer, that they may have time to get good roots again before winter. During the warm weather in ſummer, theſe plants ſhould have a large ſhare of air, but they muſt not be wholly expoſed abroad at any ſeaſon: for although they may have the appearance of thriving in the open air during the heat of ſummer, yet when they are removed into the ſtove again, their leaves will fall off, and the plants will make but an indifferent appearance the following winter, if they ſhould ſurvive it: therefore it is the better method to keep them conſtantly in the ſtove, and admit a proportionable ſhare of air to them every day, according to the heat of the ſeaſon; they will require water two or three times a week in warm weather, but in the winter they muſt have it more ſparingly; and the ſtove in which they are placed, ſhould be kept to the heat aſſigned for the Ananas upon the botanical thermometors.

There has been ſome of theſe plants propagated by cuttings, and alſo from layers; but theſe are long before they make roots, and the plants ſo raiſed, are never ſo ſtrong and thriving as thoſe which ariſe from berries; therefore where the berries can be procured, it is much the beſt method to propagate the plants by ſeeds.

When the plants are tranſplanted, their roots ſhould not be too much cut or trimmed; the decayed or rotten fibres ſhould be pruned off, and thoſe which are cloſely matted to the ſide of the pots ſhould be trimmed, but not cut too near to the ſtem; for the old fibres do not put out new roots very kindly, eſpecially thoſe which are become tough, ſo that there ſhould always be a ſufficient number of young fibres left to ſupport the plants, till new ones are produced.

The Coffee plants were firſt carried from Arabia to Batavia by the Dutch, and from thence they were afterward brought to Holland, where great numbers of the plants were raiſed from the berries which thoſe plants produced, and from theſe moſt of the gardens in Europe have been furniſhed. A great number of theſe young plants, which were raiſed at Amſterdam, were ſent to Surinam by the proprietors of that iſland, where the trees were ſoon propagated in great plenty, and from thence the plants have been diſperſed to moſt of the iſlands in the Weſt Indies: for as the plants raiſed from the berries, produce fruit in two years from planting, and in the warm countries ſooner, ſo plantations of theſe trees may be ſoon made in any of thoſe countries, where the temperature of the air is proper for their production, but the trees will not grow in the open air any where if there is a winter: ſo that in all countries without the tropics, they cannot be expected to grow abroad.

The French have made great plantations of theſe trees in their ſettlements in the Weſt Indies, and alſo in the iſle of Bourbon, from whence they import great quantities of Coffee annually to France; which although greatly inferior in quality to the Arabian, yet it is conſumed, otherwiſe they would not continue that branch of commerce. In the Britiſh colonies of America, there have been ſome large plantations made of Coffee-trees: and it was propoſed to the parliament, ſome years paſt, to give a proper encouragement for cultivating this commodity in America, ſo as to enable the planters to underſell the importers of Coffee from Arabia. Accordingly there was an abatement of the duty payable on all the Coffee which ſhould be of the growth of our colonies in America, which at that time was ſuppoſed would be a ſufficient encouragement for the planters to improve this branch of commerce: but the productions of thoſe countries, being greatly inferior in quality to that of Arabia, hath almoſt ruined the project; and unleſs the planters can be prevailed on to try ſome experiments to improve its quality, there can be little hope of its becoming a valuable branch of trade; therefore I ſhall beg leave to offer my ſentiments on this article, and ſincerely wiſh what I have to propoſe may be found uſeful for the inſtruction of the Coffee planters; for as my opinion is founded upon experiments, ſo it is not mere theory or ſuppoſition.

The great fault of the Coffee which grows in America, and alſo in the iſle of Bourbon, is the want of flavour, or having a diſagreeable one. The berries are

are much larger than those which are imported from Arabia, and consequently have not so much spirit or flavour. This may be owing to several causes, the first is that of its growing in a soil too moist; which is always known to increase the size of fruit and vegetables, but their quality is greatly diminished thereby. The second is from the gathering of the berries too soon; for I have been credibly informed, that it is the constant practice of the planters, to gather the fruit when it is red: at which time the berries are much larger, and of greater weight, than those which are permitted to ripen perfectly on the trees, which is not till they are turned black, and their outer pulp becomes dry, and the skins shrink: then the berries are much smaller than before, and the outer cover will easily separate from the berry; which I have always been informed, has been the complaint of the planters, that this was with great difficulty and trouble effected. A third cause I imgine may be in the drying of the berries when gathered; which must be constantly attended to, for they cannot be too much exposed to the sun and air in the day time, but they must be every evening removed under cover, and carefully screened from dews and rain; nor should they be placed near any sort of liquid or moisture, for these berries are very subject to imbibe moisture, and thereby acquire the flavour of the liquid; or if it be pure water, the berries will be enlarged, and the flavour diminished by it, as from many experiments I can affirm: for a bottle of rum being placed in a closet, in which a canister of Coffee berries closely stopped, was standing on a shelf at a considerable distance, in a few days had so impregnated the berries, as to render them very disagreeable; the same also has happened by a bottle of spirits of wine standing in the same closet with Coffee and Tea, both which were in a few days spoiled by it. Therefore from many experiments of this nature, which I have made with Coffee, it appears to me that it should never be brought over in ships freighted with rum, nor should the berries be laid to dry in the houses where the sugars are boiled, or the rum distilled. I have also been informed by a gentleman who has a very good estate in Jamaica, and who has lived many years in that island, that the planters frequently boil the Coffee berries before they are dried. As this information comes from a gentleman of great skill and veracity, so I cannot doubt of the fact; and if so, this alone is sufficient to spoil the best Coffee in the world; so that I am at a loss to guess the reason for this practice, which, as it appears to me, can only be intended to increase the weight, therefore must be imputed to avarice, the bane of every public good.

There was some time past an imperfect account printed in the papers, of the cause why the American Coffee was not so good as that which comes from Arabia; in which it is supposed, that the goodness of the latter proceeded from the length of time which the berries had been kept: therefore the author proposes that the American Coffee berries should be many years kept, which he says will render them equally good. This is contrary to all the experience I have had, or can learn, from those who have seen the whole progress of Coffee in Arabia, with their manner of drying and packing it to send abroad; for two gentlemen who had lived there some years assured me, that the berries, when first gathered, were much better than those which are kept any time. And a curious gentleman who resided in Barbadoes two years, also told me, that he never drank better Coffee in any part of the world, than what he made from the fresh berries which he gathered himself, and roasted as he had occasion for them; which is also confirmed by the trials which have been made with the berries which grow in the stoves in England, which make a better flavoured liquor, than the best Arabian Coffee berries which can be procured in England; therefore I wish those who are inclinable to cultivate these trees in America, would make choice of a soil rather dry than moist, in which the trees will not make so great progress as those which grow in a wet soil, nor will the produce be so great; but as the quality of the produce will be so much improved, it will certainly be of greater advantage to them.

The next thing is, to permit the berries to remain so long upon the trees, till their skins are shrivelled and turned very black; which it is true will greatly diminish their weight, but then the commodity will be more than double the value of that which is gathered sooner.

When the berries are fully ripe, they should be gathered, or rather shaken from the trees, when they are perfectly dry, and spread abroad upon cloths in the sun to dry, carrying them every evening under cover, to prevent the dews from falling on them, or the rain if any should happen: and when they are perfectly dry, they should be carefully packed up in cloths or bags, three or four times double, and consequently kept in a dry situation: and when they are shipped for England, it should be on board those vessels which have no rum, lest the Coffee should imbibe the flavour, which cannot be prevented when stowed in the same place. For some years past, a Coffee ship from India had a few bags of pepper put on board, the flavour of which was imbibed by the Coffee, and the whole cargo spoiled thereby.

As the quantity of Coffee now consumed in Britain is very much increased of late years, so it will certainly be worthy of public consideration, how far it may be necessary to encourage the growth of it in the British colonies: and certainly it deserves the attention of the inhabitants of those colonies, to improve this commodity to the utmost of their power; and not to have so much regard to the quantity, as to the quality of it; for although the former may appear to have the advantage of the latter in point of profit, yet the goodness of every commodity must always claim the preference, and thereby will be found of more lasting advantage to the cultivator.

COIX. Lin. Gen. Plant. 927. Lachryma Jobi. Tourn. Inst. R. H. 531. tab. 306. Job's Tears.

The Characters are,

*It hath male and female flowers on the same plant; the male flowers are disposed in a loose spike; the chaff of these have two valves, inclosing two flowers, the valves are oblong and bearded; the petal has two oval valves, the length of the chaff, with narrow beards: these have each three hairy stamina, terminated by oblong four-cornered summits. There are a few female flowers situated at the base of the male spike in the same plant, these have bivalvular chaff; the valves are roundish, thick, and smooth; the petal hath two oval valves, the outer being larger and bearded at both ends. They have a small oval germen, supporting a short style divided into two parts, crowned by two horned stigmas which are longer than the flower, and covered with fine hairs; the germen afterward becomes a hard, roundish, smooth seed.*

This genus of plants is ranged in the third section of Linnæus's twenty-first class, intitled Monœcia Triandria. The plants of this class have male and female flowers on the same plant, and the flowers of this section have three stamina.

The Species are,

1. Coix (*Lachryma Jobi*) seminibus ovatis. Hort. Cliff. 434. *Coix with oval seeds.* Lachryma Jobi. Clus. Hist. p. 2. *Job's Tears.*
2. Coix (*Angulatis*) seminibus angulatis. Hort. Cliff. 438. *Coix with angular seeds.* Lachryma Jobi Americana altissima, Arundinis folio & facie. Plum. Cat.

The first sort grows naturally in the islands of the Archipelago, and is frequently cultivated in Spain and Portugal, where the poor inhabitants grind the grain to flour in a scarcity of corn, and make a coarse sort of bread of it.

This is an annual plant, which seldom ripen its seeds in England, unless the season proves very warm; from a thick fibrous root is sent out two or three jointed stalks, which rise near three feet high, garnished

nished with single, long, narrow leaves at each joint, resembling those of the Reed; at the base of the leaves come out the spikes of flowers, standing on short foot-stalks; these spikes are composed of male flowers only, and below them is situated one or two female flowers; the male flowers decay soon after they have shed their farina; but the germen of the female flowers swell to a large oval seed, which is hard, smooth, and of a gray colour, greatly resembling the seeds of Gromwel, from whence this plant has been by several writers titled Lithospermum.

Those who are desirous to cultivate this plant in England, may procure the seeds from Portugal, these should be sown on a moderate hot-bed in the spring, to bring the plants forward, and afterward transplant them on a warm border, allowing each two feet room at least, and when the plants have taken root, they will require no farther care, but to keep them clean from weeds. These will flower about Midsummer, and in warm seasons, the seeds will ripen at Michaelmas. There is a variety of this with much broader leaves, which I received from Smyrna some years past, which did not perfect seeds here, so I cannot say whether it is only a variety, or a different sort from this.

The second sort will grow to the height of seven or eight feet, and the stems become hard, like the Reed, or Indian Corn: these branch out, and produce several spikes of flowers; but this sort will not live in the open air in England, therefore should be plunged into the bark-stove, where it will live through the winter, and produce ripe seeds the second year; and may be continued longer, if desired.

COLCHICUM. Lin. Gen. Plant. 415. Tourn. Inst. R. H. 348. tab. 181, 182. [So called from Colchos, a province of the Levant (now called Mingrelia, because this plant was formerly very common in that place.] Meadow Saffron.

The Characters are,

*The flower hath neither empalement or spatha; it hath one petal, rising with an angular tube from the root, which is divided at the top into six oval, concave, erect segments; it hath six stamina which are shorter than the petal, terminated by oblong summits having four valves. The germen is situated in the root, supporting three slender styles the length of the stamina, crowned by reflexed channelled stigmas; the germen afterward becomes a capsule with three lobes, having a seam on the inside, dividing it into three cells, which contain several roundish rough seeds.*

This genus of plants is ranged in the third section of Linnæus's sixth class, intitled Hexandria Trigynia, the flower having six stamina and three styles.

The Species are,

1. Colchicum (*Autumnale*) foliis planis lanceolatis, erectis. Hort. Cliff. 140. *Colchicum with plain, erect, spear-shaped leaves.* Colchicum commune. C. B. P. 67. *Common Meadow Saffron.*
2. Colchicum (*Montanum*) foliis linearibus, patentissimis. Lin. Sp. Plant. 342. *Meadow Saffron with very narrow spreading leaves.* Colchicum Montanum angustifolium. C. B. P. 68. *Narrow-leaved Mountain Meadow Saffron.*
3. Colchicum (*Variegatum*) foliis undulatis patentibus. Hort. Cliff. 140. *Meadow Saffron with waved spreading leaves.* Colchicum Chionense, floribus fritillariæ instar tessulatis, foliis undulatis. Mor. Hist. 2. p. 341. *Meadow Saffron of Chios, with chequered flowers like Fritillary, and waved leaves.*
4. Colchicum (*Tessulatum*) foliis planis patentibus. *Colchicum with plain spreading leaves.* Colchicum floribus fritillariæ instar tessulatis, foliis planis. Mor. Hist. 2. p. 341. *Meadow Saffron, with chequered flowers like Fritillary, and plain leaves.*

There is a greater variety of these flowers than any here enumerated, which differ in the colour of their flowers, and other little accidents, which are not lasting, so must not be ranged as distinct species. But as many of them are cultivated in flower-gardens, I shall beg leave to mention those varieties, which are frequently propagated by florists. These are most of them seminal variations from the first sort.

The most common Meadow Saffron hath a purplish flower.
The Meadow Saffron with white flowers.
Meadow Saffron with striped flowers.
Broad-leaved Meadow Saffron.
Striped-leaved Meadow Saffron.
Many flowered Meadow Saffron.
Meadow Saffron with double purplish flowers.
Meadow Saffron with double white flowers.
Meadow Saffron with many white flowers.

The first sort grows naturally both in the west and north of England. I have observed it in great plenty in the meadows near Castle Bromwich, in Warwickshire, in the beginning of September. The country people call the flowers Naked Ladies, because they come up naked, without any leaves or cover. This hath a bulbous root, about the size and shape of those of the Tulip, but not so sharp-pointed at the top, the skins or cover is also of a darker colour. These bulbs are renewed every year, for those which produce the flowers decay, and new roots are formed above. The flowers come out in autumn; these arise with long slender tubes from the root, about four inches high, shaped like those of the Saffron, but larger; they are of a pale purple colour, and divided into six parts at the top, which stand erect; the number of flowers is generally in proportion to the size of the roots, from two to seven or eight: in March the green leaves appear, these are commonly four to a full grown root; they are folded over each other below, but spread open above ground, standing cross-ways: they are of a deep green, and when fully grown, are five or six inches long, and one and a half broad. The seed-vessel comes out from between the leaves in April, and the seeds ripen in May, soon after which the leaves decay.

The other varieties of this, are supposed to have accidentally risen from the seeds of this; so that those who are desirous to obtain a variety of these flowers, should propagate them from seeds, by which method there may be a greater variety raised.

The second sort grows naturally on the mountains in Spain and Portugal. This hath a smaller root than the first, and a darker coat; the flowers appear in August or September; these are cut into six long narrow segments, of a reddish purple colour, having six yellow stamina. The leaves of this sort come up soon after the flowers decay, and continue green all the winter, like the Saffron; these are long, narrow, and spread on the ground; in June these decay like the first sort.

The third and fourth sorts grow naturally in the Levant, but are commonly cultivated in the English gardens. These flower at the same time as the first sort, and the green leaves come up in the spring. The root of one of these species, is supposed to be the Hermodactyl of the shops.

These are all very pretty varieties for a flower-garden, producing their flowers in autumn, when few other plants are in beauty; and are therefore, by some, called Naked Ladies. The green leaves come up in the spring, which are extended to a great length in May, then the green leaves begin to decay; soon after which time, is the proper season to transplant their roots; for if they are suffered to remain in the ground till August, they will send forth fresh fibres; after which time it will be too late to remove them. The roots may be kept above ground until the beginning of August; at which time, if they are not planted, they will produce their flowers as they lie out of the ground, but this will greatly weaken their roots. The manner of planting their roots being the same as Tulips, &c. I shall forbear mentioning it here, referring the reader to that article: and also for sowing the seeds, by which means new varieties may be obtained, I shall refer to the article Xiphion; where will be proper directions for this work.

COLD signifies something devoid of heat, or which does not contain in it any particles of fire; according to which definition, cold is a mere negative term. And this is agreeable to the sentiments of most of our modern philosophers, who suppose cold to consist in a mere privation or diminution of heat.

Others much on the same principle, define cold, to be that state of the minute parts of a body, wherein they are agitated more slowly and faintly than those of the organs of feeling. And in this sense, cold is a mere term of relation: and hence the same body becomes liable to be perceived hot or cold, as the particles of it are in greater or lesser degree of motion than those of the sensible organ.

Heat is supposed to consist in a particular motion of the parts of the body; and hence the nature of cold, which is its opposite, is easily deducible; for we find that cold extinguishes, or rather abates heat. Whence it seems to follow, that those bodies are cold, which check and restrain the motion of the particles, wherein heat consists.

There are three kinds of bodies that can do this; viz. either those whose particles are perfectly at rest; or those whose particles are indeed agitated, but with less violence than those of the hot body to which they are applied; or, lastly, such whose particles have a motion proper for exciting the sensation of heat, but move with a different determination, so as to retard and change the motion of the particles of the organ.

Hence three different kinds of cold, or cold bodies, do proceed.

The 1st, That cold is common to all hard bodies; which consists in the rest of their parts.

The 2d is, That which rises from plunging any part of the body in water; which consists in this, that the parts of our præcordia, being more briskly agitated than those of the fluid, communicate part of their motion to it.

The 3d, The cold felt on the collection of warm air with a pan, or in blowing hot breath out of our mouth with the lips close shut; which consists in this, that the direct motion of the particles of air does, in some measure, change and rebate the motion and determination of the parts of the body: and hence it is, that a cold body cannot cool another without heating itself.

Hence also it proceeds, that the more the parts of a frigid body are at rest, the more the particles of a warm body that is applied to heat them, must lose of their motion, and consequently of their heat.

Thus, there being more quiescent parts in marble than in wood, which is full of pores and interstices, the marble is felt colder than the wood: and hence also we may understand why air near marble, and other dense bodies, feels somewhat colder than in other places.

On this principle the two latter kinds of cold appear somewhat more than privations: the particles inducing the cold may be esteemed real frigorific corpuscles; and coldness may be deemed a real quality, as well as hotness. These particles do not only check the agitation of those continually diffused from the inner parts of an animal to the outer; but having an elastic power, they bend, and hang about the filaments of the body, pinch and squeeze them; and hence is that acute pungent sensation called cold.

That cold is more than a mere relation or comparison, is evident from its having real and positive effects; such as freezing, congelation, condensation, rarefaction, bursting, &c.

Dr. Clarke takes cold to be owing to certain nitrous and other saline particles, endued with particular figures proper to produce such effects. Hence sal-armoniac, salt petre, salt of urine, and many other volatile and alkalizate salts, mixed with water, increase its degree of cold very sensibly.

Hence also comes that popular observation, that cold prevents corruption; which, however, must not be admitted without an exception; since if an hard porous body have its interstices filled with water, and this be too much dilated by freezing, the including body will be burst. And thus it is that cold proves destructive to the parts of some plants: as it happened in the winters, anno 1728, and 1739-40, in several trees, whose trunks were much exposed to the south-west, the sap being thereby rarefied by the warmth of the sun, which, for several days, at the beginning of the severe frost, shone with an uncommon heat, and the nights coming on to extreme cold, whereby the rarefied sap was so suddenly condensed, that the sap-vessels could not contain it, and thereby burst off the bark of many trees almost from top to bottom; and this chiefly on the south-west side of the trees; as it did of several large trees in the physic-garden at Chelsea; and several Pear, and other fruit-trees, in the nurseries of Mr. Francis Hunt at Putney, &c. And thus it is that great quantities of trees are rendered shaken, and the timber, when cut, of little value; which is generally the case in very severe winters. In the hard frost of the year 1739-40, there was great damage done to the Oak-timber in most parts of England, by the frost penetrating to the sap-vessels of the trees; and by freezing the sap, the vessels could not contain it, but burst with great noise; so that the woods resounded with a noise somewhat like the breaking down of the branches of trees, when they are lopping.

Dr. Boerhaave says, That there is no such thing in all nature as absolute cold; that the most severe he had ever known, was in the year 1728, that then the water would freeze while it ran down his hand; and yet even then the cold was not so complete, but that he could make an artificial cold greater by twelve degrees.

Though much might be said as to the effects of cold on plants, I shall only conclude with an observation of the Reverend Dr. Hales, who, in the conclusion of his excellent treatise of Vegetable Statics, says;

The considerable quantity of moisture, which is perspired from the branches of trees during the cold winter season, plainly shews the reason why, in a long season of cold north-easterly winds, the blossoms, and tender young-set fruit and leaves, are, in the early spring, so frequently blasted, viz. by having the moisture exhaled faster than can be supplied from the trees; for, doubtless, moisture rises slower from the root, the colder the season is, though it rises, in some degree, all the winter; as is evident, as he says, from his sixteenth experiment in the said book.

And from the same cause it is, that the leafy spires of Corn are by these cold drying winds often faded, and turned yellow; which makes the husbandman, on these occasions, wish for snow: which, though it be very cold, yet it not only defends the root from being frozen, but also screens the Corn from these drying winds, and keeps it in a moist, florid, supple state.

It seems therefore to be a reasonable direction, which some authors, who write on agriculture and gardening give, viz. During these cold drying winds, when little dew falls, to water the trees in dry soils, in the blossoming season, and while the young-set fruit is tender; and provided there is no immediate danger of a frost, or in case of continued frost, to take care to cover the trees well, and at the same time to sprinkle them with water; which is imitating nature's method of watering every part.

As to sloping shelters over wall-trees he says; I have often found, that when they are so broad, as to prevent any rain or dew coming at the trees, they do more harm than good in these long easterly drying winds, because they prevent the rain and dews falling on them; which would not only refresh and supple them, but also nourish them: but in case of sharp frost after a shower of rain, these shelters and other fences must needs be of excellent use to prevent the almost total destruction occasioned by the freezing of the tender parts of vegetables, when they are saturated with moisture.



COLDENIA.

COLDENIA. Lin. Gen. Plant. 159. This plant was so titled by Dr. Linnæus, in honour of Dr. Colden, of North America, who is a very curious botanist, and has discovered several new plants which were not known before.

The Characters are,

*The empalement of the flower is composed of four erect leaves, which are as long as the petal. It hath a funnel-shaped flower of one petal, spreading at the top, and obtuse; it hath four stamina, which are inserted in the tube of the petal, terminated by roundish summits. In the center is situated four oval germen, each supporting a hairy style the length of the stamina, crowned by permanent stigmas. The germen afterward become an oval, compressed, rough fruit, with four cells, terminated by four beaks, inclosed by the empalement, each of the cells containing a single seed, convex on one side, and angular on the other.*

This genus of plants is ranged in the third section of Linnæus's fourth class, intitled Tetrandria Tetragynia, the flower having four stamina and four styles.

There is but one Species of this genus, viz.

Coldenia (*Procumbens*). Flor. Zeyl. 79. This is by Dr. Pluknet titled, Teucrii facie bisnagarica tetracoccos rostrata. Alm. 363.

This is a native of India, from whence the seeds have been brought to some of the curious botanic gardens. It was sent me by Dr. Linnæus, professor of botany at Upsal in Sweden. It is an annual plant, whose branches trail on the ground; they extend near a foot from the root, and divide into many smaller branches, garnished with short leaves, sitting close to them; these are deeply crenated on their edges, and have several longitudinal veins; they are of a glaucous colour, and come out without order. The flowers are produced at the wings of the leaves, growing in small clusters; these have one funnel-shaped petal cut into four segments at the top; they are of a pale blue colour, and very small; they have four stamina and four styles, having hairy stigmas. When the flower decays, the germen becomes a fruit, composed of four cells, wrapped up in the empalement, each containing a single seed.

This plant is propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be each put into a separate small pot, plunged into a hot-bed of tanners bark, observing to shade them till they have taken fresh root; after which they should have air admitted to them every day in proportion to the warmth of the season, and gently watered two or three times a week in warm weather, but they must not have too much moisture. These plants must remain in the hot-bed, where they will flower in June, and the seeds will ripen in September.

COLEWORTS. See Brassica.

COLLINSONIA. Lin. Gen. Plant. 38. The title of this plant was given to it by Dr. Linnæus, in honour of Mr. Peter Collinson, F. R. S. a most distinguished promoter of botanical studies, and the first who introduced this plant, among many others, to the English gardens.

The Characters are,

*The flower hath a permanent empalement of one leaf, cut into five equal segments at the top, the three upper being reflected, and the two under erect. The flower is funnel-shaped, of one petal which is unequal, and much longer than the empalement, cut into five parts at the top, the upper being short and obtuse, two of them being reflexed; the lower lip or beard is longer, ending in many points. It hath two long bristly stamina which are erect, terminated by incumbent summits. It hath a quadrifid obtuse germen, with a large gland, supporting a bristly style the length of the stamina, crowned by a pointed bifid stigma. The germen afterward becomes a single roundish seed, situated in the bottom of the empalement.*

This genus of plants is ranged in the first section of Linnæus's second class, intitled Diandria Monogynia, the flower having two stamina and one style.

We have but one Species of this plant, viz.

Collinsonia (*Canadensis*) foliis cordatis oppositis. *Collinsonia with heart-shaped leaves growing opposite.*

This plant was brought from Maryland, where it grows wild, as it also does in many other parts of North America, by the sides of ditches, and in low moist ground, where it usually rises to the height of four or five feet; but in England it seldom grows above three feet high, and unless it be planted in a moist warm situation, or in dry weather is duly watered, it rarely flowers well; therefore many people keep the plants in large pots, for the more convenient watering them, but these plants seldom produce good seeds; whereas those which are planted in the full ground, and are constantly watered, will ripen seeds very well in good seasons.

This hath a perennial root. The stalks decay in the autumn, and fresh shoots come out in the spring. The stalks are square, garnished with heart-shaped leaves, placed opposite, which are sawed on their edges. The flowers are produced at the extremity of the stalks in loose spikes; these have long tubes, and are divided into five parts at the top; they are of a purplish yellow, and the lower segment is terminated by long hairs. The flowers appear in July, and the seeds ripen in autumn.

This plant may be easily propagated by parting the roots in October. These roots should be planted at three feet distance, for they require much nourishment, otherwise they will not thrive. This plant will live in the open ground, if it is planted in a sheltered situation.

COLOCASIA. See Arum.

COLOCYNTHIS. See Cucurbita.

COLUMBINE. See Aquilegia.

COLUMNEA. Plum. Nov. Gen. 28. tab. 33. Lin. Gen. Plant. 710. The title of this genus was given to it by Plumier, in honour of Fabius Columna, a nobleman of Rome, who has published two curious books of botany.

The Characters are,

*The flower hath a permanent empalement of one leaf, cut into five parts at the top; it hath one petal, of the (ringent) or grinning kind, having a long swelling tube, divided above into two lips, the upper being erect, concave, and entire; the lower is divided into three parts which spread open: it hath four stamina, two being longer than the other; these are inclosed in the upper lip, and are terminated by single summits. In the center is situated the roundish germen, supporting a slender style, crowned by a bifid acute stigma. The germen afterward becomes a globular berry with two cells, sitting on the empalement, and is of the same magnitude, containing several oblong seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia. The flowers of this class have two long and two short stamina, and those of this section have their seeds inclosed in a capsule.

We have but one Species of this plant in the English gardens, viz.

Columnea (*Scandens*). Lin. Sp. Plant. 638. Columnea scandens, Phœniceo flore, fructu albo. Plum. Nov. Gen. 28. *Climbing Columnea with a scarlet flower and a white fruit.* Plumier mentions a variety of this, with a yellowish flower and a white fruit. But this is only a seminal variation supposed to have accidentally risen from the seeds of the first.

I received seeds of the scarlet sort from Carthagena in New Spain, where the plants grew naturally. This hath a climbing stalk, which fastens itself to the neighbouring plants, whereby it is supported. The leaves are oval, sawed on their edges, and stand upon short foot-stalks; these, and also the stalks, are very hairy; but the plants decayed the following year, before they produced any flowers, so that I can give no description of them.

These plants are natives of the warmest parts of America, so are too tender to live in England, unless they are preserved in the stove; they are propagated

by

by feeds, which must be sown in a good hot-bed; and when the plants come up, they must be treated in the same way as other tender exotic plants which are kept in the bark-stove.

COLUTEA. Tourn. Inst. R. H. 649. tab. 417. Lin. Gen. Plant. 776. Bladder-Sena.

The CHARACTERS are,

*It hath a bell-shaped permanent empalement of one leaf, indented in five parts. The flower is of the butterfly kind. The standard, wings, and keel, vary in their figure in different species. It hath ten stamina, nine of which are joined, the other stands separate, which are terminated by single summits. In the center is situated an oblong germen, which is compressed, supporting a rising style, crowned by a bearded line, extended from the middle of the upper part of the style. The germen afterward becomes a broad swollen pod with one cell, including several kidney-shaped seeds.*

This genus of plants is ranged in Linnæus's third section of his seventeenth class, intitled Diadelphia Decandria. The flowers of this class have ten stamina, nine of which are joined, and the tenth stands separate.

The SPECIES are,

1. COLUTEA (*Arborescens*) arborea, foliolis obcordatis. Hort. Cliff. 365. *Tree Bladder Sena with heart-shaped lobes.* Colutea vesicaria. C. B. P. 396. *Common Bladder Sena.*
2. COLUTEA (*Istria*) foliolis ovatis, integerrimis, caule fruticoso. *Shrubby Bladder Sena with oval leaves which are entire.*
3. COLUTEA (*Orientalis*) foliolis cordatis minoribus, caule fruticoso. *Bladder Sena with smaller heart-shaped leaves, and a shrubby stalk.* Colutea Orientalis flore sanguineâ coloris, luteâ maculâ notato. Tourn. Cor. 44.
4. COLUTEA (*Frutescens*) fruticosa foliolis ovato-oblongis. Hort. Cliff. 366. *Shrubby Bladder Sena with oblong oval leaves.* Colutea Æthiopica flore Phœniceo, folio Barbæ Jovis. Breyn. Cent. 1. 73. *Æthiopian Bladder Sena with a scarlet flower.*
5. COLUTEA (*Americana*) foliolis ovatis, emarginatis, leguminibus oblongis compressis acuminatis, caule arboreo. *Bladder Sena with oval leaves indented at the top, oblong, compressed, pointed pods, and a tree-like stalk.* Colutea Americana, vesiculis oblongis compressis, Houst. MSS. *American Bladder Sena with oblong compressed pods.* Dr. Pluknet titles it Colutea Veræ Crucis vesicaria. Alm. 111. pl. 165. f. 3. *Bladder Sena of Vera Cruz.*
6. COLUTEA (*Herbacea*) herbacea foliolis linearibus. Hort. Upsal. 266. *Herbaceous Bladder Sena with narrow leaves.* Colutea Africana annua, foliolis parvis, mucronatis, vesiculis compressis. Hort. Amst. 2. p. 87. tab. 44.
7. COLUTEA (*Procumbens*) caulibus procumbentibus, foliolis ovato-linearibus, tomentosis, floribus alaribus pedunculis longissimis. *Bladder Sena with trailing stalks, oval narrow leaves which are woolly, and flowers growing from the sides of the stalks, with very long foot-stalks.*

The first sort is commonly cultivated in the nursery-gardens, as a flowering shrub, to adorn plantations. This grows naturally in Austria, in the south of France and Italy, from whence the seeds were originally brought to England; this hath several woody stems, which grow to the height of twelve or fourteen feet, sending out many woody branches, garnished with winged leaves, composed of four or five pair of oval lobes, placed opposite, terminated by an odd one; these are indented at the top in form of a heart, and are of a grayish colour. The flowers come out from the wings of the leaves upon slender foot-stalks, about two inches long, each sustaining two or three flowers of the butterfly kind, whose standard is reflexed and large. The flowers are yellow, with a dark-coloured mark on the petal; these are succeeded by inflated pods an inch and a half long, having a seam on the upper side, containing a single row of kidney-shaped seeds, fastened to a placenta. This flowers in June and July, and the seeds ripen in autumn. There is a variety of this with reddish pods, which is equally common in the gardens, and is supposed to be only an accidental variety, for the plants do not differ in any other part.

The seeds of the second sort were brought from the Levant by the Reverend Dr. Pocock, which succeeded in the garden at Chelsea; and since Dr. Russel, who resided many years at Aleppo, brought over dried samples of this sort, which he assures me grow common near that city. This sort seldom grows more than six or seven feet high; the branches are very slender, and spread out on every side, garnished with winged leaves, composed of nine pair of small, oval, entire lobes, terminated by an odd one; the flowers stand upon slender foot-stalks, about the same length of the former. The flowers are also like those, but are of a brighter yellow. This sort begins to flower early in May, and continues flowering till the middle of October.

The third sort was discovered by Dr. Tournefort in the Levant, from whence he sent the seeds to the royal garden at Paris, where they succeeded, and since have been communicated to most of the curious gardens in Europe. This hath a woody stem, which sends out many branches on every side, which do not rise above seven or eight feet high; these are not so strong as those of the first sort, and are garnished with winged leaves, composed of five or six pair of small heart-shaped lobes, terminated by an odd one. The flowers proceed from the side of the branches, standing upon foot-stalks, each sustaining two or three flowers, shaped like those of the first sort, but smaller; they are of a dark red colour, marked with yellow: these appear in June, and the seeds ripen in autumn.

The fourth sort grows naturally in Æthiopia, from whence the seeds were brought to Europe. This hath a weak shrubby stalk, which sends out side branches, growing erect, garnished with equal winged leaves, composed of ten or twelve pair of small, oval, oblong, hoary lobes. The flowers are produced at the upper part of the branches from the wings of the leaves, each foot-stalk sustaining three or four scarlet flowers, which are longer than those of the other sorts, and are not reflexed; these are succeeded by inflated pods, containing one row of kidney-shaped seeds. The usual time of this plant producing its flowers is in June; but when the seeds are sown early in the spring, the plants frequently flower the following autumn.

The fifth sort was sent me from La Vera Cruz, in New Spain, in the year 1730, by the late Dr. Houstoun. This hath a shrubby stalk, which rises to the height of twelve or fourteen feet, sending out many branches, garnished with winged leaves, composed of three pair of oval lobes, terminated by an odd one; these are indented at the top, and are of a light green. The flowers are of a bright yellow, and stand two or three upon each foot-stalk, and are succeeded by compressed winged pods near four inches long, which end in long points.

The sixth sort grows naturally at the Cape of Good Hope. This is an annual plant of little beauty, so is rarely cultivated but in botanic gardens for the sake of variety. It rises with a slender herbaceous stalk about a foot and a half high, dividing upward into three or four branches, garnished with winged leaves, composed of five or six pair of very narrow lobes an inch long, which are a little hoary. The flowers are small, of a purplish colour, standing three together on slender foot-stalks, which are succeeded by flat oval pods, each containing two or three kidney-shaped seeds. It flowers in July, and the seeds ripen in autumn, and the plant decays soon after.

The seeds of the seventh sort were sent me from the Cape of Good Hope, in 1753, which have succeeded in the garden at Chelsea. This plant hath many slender ligneous stalks, which trail on the ground, and are

are divided into many ſmaller branches, garniſhed with winged leaves, compoſed of twelve or fourteen pair of ſmall, narrow, oval lobes, terminated by an odd one; theſe, and alſo the ſtalks, are covered with a whitiſh down. The flowers are very ſmall, of a purple colour, and ſtand upon very long ſlender foot-ſtalks, each ſuſtaining three or four flowers; theſe are ſucceeded by compreſſed pods little more than half an inch long, which are a little bent like a ſickle, each containing a ſingle row of ſmall kidney-ſhaped ſeeds. It flowers in June and July, and the ſeeds ripen in autumn. This is a perennial plant, which, if ſheltered in the winter, will continue ſeveral years; but the branches do not extend more than a foot in length, and unleſs they are ſupported, always trail upon the ground.

The three firſt mentioned ſorts are very hardy ſhrubs, which thrive in the open air extremely well, ſo are generally propagated for ſale in the nurſery-gardens; but the firſt ſort hath been longer in England, ſo is more generally known and propagated than either of the other, which have been but few years in the Engliſh gardens, nor has the third ſort been long known in this country. This is not mentioned in any of the botanic books; but as the ſeeds ripen here very well, in a few years it may be in as great plenty as the firſt ſort.

The three firſt ſorts are propagated by ſowing their ſeeds any time in the ſpring, in a bed of common earth; and when the plants are come up, they muſt be kept clear from weeds; and the Michaelmas following they ſhould be tranſplanted either into nurſery rows, or in the places where they are deſigned to remain; for if they are let grow in the ſeed-bed too long, they are very ſubject to have downright tap-roots, which renders them unfit for tranſplantation; nor ſhould theſe trees be ſuffered to remain too long in the nurſery before they are tranſplanted, where they are to remain for the ſame reaſon.

The firſt ſort will grow to the height of twelve or fifteen feet, ſo is very proper to intermix with trees of a middling growth in wilderneſs quarters; or in clumps of flowering trees, where the oddneſs of their flowers and pods will make a pretty variety, eſpecially as theſe trees continue a long time in flower; for they uſually begin flowering by the end of May, and from that time to September they are ſeldom deſtitute of flowers, but eſpecially the ſecond ſort.

Theſe ſhrubs make great ſhoots annually, which are frequently broken down by ſtrong winds in the ſummer; ſo that if they are not ſheltered by other trees, their branches ſhould be ſupported, otherwiſe they will be broken and ſplit off, whereby the trees will be rendered unſightly.

The third ſort does not grow ſo tall as the common, but makes a more regular ſhrub and is leſs liable to ſplit. The flowers of this ſort are of a duſky red colour, ſpotted with yellow, ſo it makes a very pretty variety, and is as hardy as the common ſort, therefore may be propagated by ſeeds in the ſame manner.

The fourth ſort is tender, ſo will not live through the winters (when they are ſevere) in the open air in England; but in mild winters, if they are planted in a dry ſoil and a warm ſituation, they will thrive very well; and thoſe plants which live abroad will flower much ſtronger, and make a finer appearance, than thoſe which are preſerved in the green-houſe; for theſe plants require a large ſhare of air, otherwiſe they are apt to draw up weak, ſo ſeldom produce their flowers in plenty; therefore when any of the plants are ſheltered in winter, they muſt be placed as near the window as poſſible, that they may have all the advantages of air; and in the ſpring they muſt be hardened, to bear the open air as ſoon as poſſible.

This ſort is propagated by ſeeds as the former. If the ſeeds are ſown early in the ſpring upon a warm border of light earth, the plants will flower in Auguſt; and, if the autumn proves favourable, they will ſometimes ripen their ſeeds very well; but there are ſome perſons who ſow the ſeeds upon a moderate hot-bed in the ſpring, whereby they bring their plants ſo forward as to flower in July, whereby the ſeeds are generally perfected from theſe plants. When the plants are tranſplanted, it ſhould always be done while they are young, for they do not bear removing when they are large. This ſort will ſometimes live in the open air for three or four years, when they ſtand in a well ſheltered ſituation; and theſe will grow to have large heads, and make a very fine appearance when they are in flower; they will alſo continue much longer in beauty than thoſe plants which are treated more tenderly.

The fifth ſort grows naturally in warm countries, ſo is too tender to thrive in the open air in England. It is propagated by ſeeds, which muſt be ſown on a hot-bed in the ſpring; and when the plants are two inches high, they ſhould be each tranſplanted into a ſeparate ſmall pot filled with light earth, and plunged into a hot-bed of tanners bark, obſerving to ſhade them till they have taken freſh root; after which they muſt be treated in the ſame way as other plants from the ſame climate, always keeping them in a ſtove, which ſhould be of a moderate temperature of heat.

The ſixth ſort is a low annual plant, which ſeldom grows more than a foot and a half in height; the flowers being ſmall, and having little beauty, it is ſeldom preſerved but in botanic gardens. The ſeeds of this ſort muſt be ſown upon a moderate hot-bed in the ſpring, and the plants muſt be planted into ſmall pots, and brought forward in another hot-bed. In July they will flower, when they may be expoſed in the open air, in a warm ſituation, where the ſeeds will ripen in September, and the plants will ſoon after decay.

The ſeventh ſort may be raiſed on a moderate hot-bed in the ſpring, and afterward expoſed to the open air in ſummer; but in winter they muſt be ſheltered under a frame, otherwiſe the froſt will deſtroy them.

COLLIFLOWER. See Brassica.

COLUTEA SCORPIOIDES. See Emerus.

COMA AUREA. See Chrysocoma.

COMARUM. Lin. Gen. Plant. 563. Pentaphylloides. Tourn. Inſt. R. H. 298. Marſh Cinquefoil.

The Characters are,

*The flower hath a large ſpreading empalement of one leaf, divided into ten parts at the top, which is coloured. It hath five oblong petals, which are inſerted in the empalement, but are much ſmaller. It hath twenty or more permanent ſtamina, which are inſerted into the empalement, terminated by moon-ſhaped ſummits. It hath a great number of ſmall roundiſh germen collected into a head, having ſhort ſingle ſtyles ariſing from their ſides, which are crowned by ſingle ſtigmas. The common receptacle afterward becomes a large fleſhy fruit, having many pointed ſeeds adhering to it.*

This genus of plants is ranged in the fifth ſection of Linnæus's twelfth claſs, intitled Icoſandria Polygynia, the flower having many ſtamina and a great number of ſtyles.

We know but one Species of this genus, viz.

Comarum (*Paluſtre*). Fl. Lapp. 214. Pentaphylloides paluſtre rubrum. Inſt. R. H. 298. *Red Marſh Baſtard Cinquefoil*; and the Quinquefolium paluſtre rubrum. C. B. P. 326. *Red Marſh Cinquefoil.*

There is another variety of this, which grows plentifully in Ireland, and alſo in ſeveral places in the north of England, from whence I have procured many of the plants, which after one year's growth in the garden, have been ſo like the common ſort, as not to be diſtinguiſhed from it; ſo that the different appearance which it has in the places where it grows noturally, may be ſuppoſed to ariſe from the ſoil and ſituation. This is by Dr. Plukenet titled Pentaphyllum paluſtre rubrum, craſſis & villoſis foliis Suecicum & Hibernicum. Alm. 284. *Red Marſh Cinquefoil of Sweden and Ireland, with thick and hairy leaves.*

This plant hath creeping woody roots, which ſend out many black fibres, penetrating deep into the ground, from which ariſe many herbaceous ſtalks about

two feet high, which generally incline to the ground; these are garnished at each joint with one winged leaf, composed of five, six, or seven lobes, which rise above each other, the middle being the largest; the lower diminishing, and with their base embrace the stalks; these are deeply sawed on their edges, smooth above, of a light green, and hoary on their under side. The flowers are produced at the top of the stalks, three or four together on short foot-stalks; these have a large spreading empalement, which is red on the upper side, and divided at the top into ten parts; in the center sits the five petals, which are red, and not more than a third part the size of the empalement; within these are situated many germen, attended by twenty or more stamina, terminated by dark summits. After the flower is past, the receptacle which sits in the bottom of the empalement, becomes a fleshy fruit, somewhat like a Strawberry, but flatter, including a great number of pointed seeds. It flowers in July, and the seeds ripen in autumn.

As these plants are natives of bogs, they are with difficulty preserved in gardens, for they must be planted in a soil as near to that of their natural growth as possible; they are very apt to spread much at the root, when in a proper situation: so whoever is inclinable to preserve these plants, may remove them from the places of their growth in October; and if they are planted on a bog, there will be no danger of the plants succeeding. There are a few of these plants now growing upon a bog at Hampstead, which were planted there some years ago; but the nearest place to London, where they grow wild in plenty, is in the meadows near Guilford in Surry.

COMMELINA. Lin. Gen. Plant. 58. Plum. Nov. Gen. 48. tab. 38. Zanonia. Plum. Nov. Gen. 38. tab. 38. This plant was so called by father Plumier, from Dr. Commeline, a famous professor of botany at Amsterdam.

The Characters are,

*It hath a permanent spatha, which is large, heart-shaped, compressed, and shut together. The flower hath six concave petals, three or four of which are small and oval, (these are frequently taken for the empalement) the other are large, roundish, and coloured. It hath three nectariums, (which have been supposed to be stamina;) these have proper stamina, which sit horizontal, and are shaped like a cross. There are three awl-shaped stamina, which recline, and sit about those of the nectarium, which are terminated by oval summits. In the center is situated a roundish germen, supporting a twining style, crowned by a single stigma. The germen afterward becomes a naked globular capsule, with three furrows, having three cells, each containing two angular seeds.*

This genus of plants is ranged in the first section of Linnæus's third class, intitled Triandria Monogynia, the flower having three stamina and one style; to this genus he has joined the Zanonia of Plumier, which was separated by that author from Commelina, because the flower has three petals, and his Commelina but two; whereas the several species of this genus most of them differ in the number of their petals, some having two green, and four coloured petals, others are equal, and some have four green, and but two coloured petals.

The Species are,

1. Commelina (*Communis*) corollis inæqualibus, foliis ovato-lanceolatis, acutis, caule procumbente, glabro. Hort. Upsal. 18. *Commelina with unequal petals, oval, spear-shaped, pointed leaves, and a smooth trailing stalk.* Commelina procumbens annua, saponariæ folio. Hort. Elth. 93. tab. 78.
2. Commelina (*Erecta*) corollis inæqualibus, foliis ovato-lanceolatis, caule erecto, scabro, simplicissimo. Hort. Upsal. 18. *Commelina with unequal petals, oval spear-shaped leaves, and a single, upright, rough stalk.* Commelina erecta, ampliore subcæruleo flore. Hort. Elth. 94. tab. 78.
3. Commelina (*Africana*) corollis inæqualibus, foliis lanceolatis, glabris, obtusis, caule repente. Lin. Sp. Plant. 41. *Commelina with unequal petals, smooth, spear-shaped, obtuse leaves, and a creeping stalk.* Commelina procumbens, flore luteo. Prod. Leyd. 538.
4. Commelina (*Tuberosa*) corollis æqualibus foliis ovato-lanceolatis, subcilliatis. Hort. Upsal. 18. *Commelina with equal petals, and oval spear-shaped leaves, which are hairy on their under side.* Commelina radice anacampserotidis. Hort. Elth. 94. tab. 79.
5. Commelina (*Zanonia*) corollis æqualibus, pedunculis incrassatis, foliis lanceolatis, vaginis laxis margine hirsutis bracteis geminis. Lin. Sp. Plant. 61. *Commelina with equal petals, thick foot-stalks to the flower, spear-shaped leaves, a loose hood, and double bractea.* Zanonia graminea perfoliata. Plum. Nov. Gen. 38.

There are some other species of this genus, but those which are here enumerated, are all that I have seen growing in the English gardens.

The first sort grows naturally in the islands in the West-Indies, and also in Africa; this is an annual plant, which hath several trailing stalks, that put out roots at the joints, which strike into the ground; at each joint is placed one oval spear-shaped leaf, ending in a point, embracing the stalk with its base, and hath several longitudinal veins: they are of a deep green, and smooth. The flowers come out from the bosom of the leaves, included in a spatha, which is compressed and shut up, each having two or three flowers, standing upon short foot-stalks, composed of two large blue petals, and four small green ones, which have generally been termed the empalement of the flower; within these are situated three nectariums, each having a slender stamina fixed on the side; these surround the germen, which afterward becomes a roundish capsule having three cells, in each of these is lodged two angular seeds. It flowers in June and July, and the seeds ripen in autumn. This plant was titled Ephemeron flore dipetalo, by some of the older writers on botany.

The second sort grows naturally in Pensylvania, from whence I received the seed; this hath a perennial root, composed of many white fibres; the stalks rise a foot and a half high, are upright, rough, herbaceous, and about the size of quills; these have a single leaf at each joint, shaped like those of the first sort, and embrace the stalks with their base; the flowers come out from the bosom of the leaves at the upper part of the stalk, sitting upon short foot-stalks; they are of a pale bluish colour, and are succeeded by seeds as the first sort. This flowers about the same time with the first, but the seeds do not often ripen in England.

The third sort grows naturally in Africa; this hath a fibrous root, which sends out many trailing stalks three feet long, which send out roots at every joint, and from them many more shoots are produced; so that where the plants are in a proper degree of warmth, and have room to spread, they will cover a large surface of ground. The leaves of this sort are very like those of the first, but the flowers are larger and of a deep yellow colour; the petals of this are heart-shaped, and the seed-vessels are larger. This flowers in July, and the seeds ripen in autumn.

The fourth sort grows naturally near Old Vera Cruz in New Spain, from whence the seeds were sent me by the late Dr. Houstoun. This hath a thick fleshy root composed of several tubers, somewhat like those of Ranunculus, several joining together at the top, where they form a head, and diminish gradually downward; from this arise one or two inclining stalks, which send out side branches from their lower parts; these are garnished with oval spear-shaped leaves, part of which have long foot-stalks, the others embrace the stalks with their base; they have short hairs on their under side, and toward the stalk, but are smooth above, of a deep green colour, and close every evening, or in cold weather. The flowers are produced toward the upper part of the stalks, from the bosom of the leaves, standing upon slender foot-stalks; these are composed of three blue petals which are pretty

pretty large and roundiſh, and three ſmaller which are green; the ſeeds are like thoſe of the other ſorts. It flowers in June, July, and Auguſt, and the ſeeds ripen in autumn, ſoon after which the ſtalks decay, but the roots may be preſerved two or three years, if they are planted in a ſtove in winter.

The fifth ſort grows naturally in the Weſt-Indies; the ſeeds of this were ſent me from the iſland of Barbuda. This hath trailing ſtalks like the firſt, which are garniſhed with narrow graſſy leaves, embracing the ſtalks with their baſe; the flowers are produced at the end of the ſtalks, upon thick foot-ſtalks, three flowers generally ſitting on each. The flowers have three equal large petals of a ſky blue, and three ſmaller which are green. Theſe flower in July and Auguſt, but have not perfected ſeeds in England.

All the ſorts are propagated by ſeeds; the firſt will grow if ſown in the full ground; but if the ſeeds are ſown upon a warm border of light earth in autumn, the plants will riſe early in the ſpring; ſo from theſe goods ſeeds may be expected, if the ſeaſon proves favourable; whereas thoſe which are ſown in the ſpring, often lie long in the ground, ſo rarely ripen their ſeed. Theſe plants have but little beauty, ſo that two or three of each ſort, is as many as moſt people chooſe to have; therefore if the ſeeds are ſown in autumn where the plants are deſigned to remain, or the ſeeds permitted to ſcatter, the plants will require no farther care, but to keep them clear from weeds. The ſecond ſort hath a perennial root; this ſeldom ripens ſeeds in England, but the roots ſend out offſets, by which the plant is eaſily propagated. But it is too tender to live in the full ground in winter, unleſs it has a warm ſheltered ſituation; therefore ſhould be planted in pots, and ſheltered under a common frame in winter, and expoſed abroad in ſummer; the beſt time to tranſplant and part theſe roots is about the end of March.

The other ſorts are tender, ſo their ſeeds muſt be ſown on a moderate hot-bed in the ſpring, and when the plants are two inches high, they ſhould be tranſplanted to a freſh hot-bed to bring the plants forward; when they have taken freſh root, they ſhould have a large ſhare of freſh air admitted to them every day in warm weather, to prevent their growing weak; and in June theſe may be carefully taken up, and tranſplanted on a warm border of light earth, obſerving to ſhade them till they have taken freſh root; after which they will require no other care, but to keep them clean from weeds. With this management the plants will flower and produce good ſeeds.

The third and fourth ſorts may be continued, if they are planted in pots, and in autumn placed in the bark-ſtove; or if the roots of the fourth ſort are taken out of the ground in autumn, and kept in a warm place in winter, they may be planted again in the ſpring, placing them on a hot-bed to forward their ſhooting, and theſe will produce ſtronger plants than thoſe which riſe from ſeeds.

COMMONS and COMMON-FIELDS. See Land.

COMPARTMENTS are beds, plats, borders, and walks, laid out according to the form of the ground, and ingenuity of the artiſt, and depend more on a good fancy than any rules. Theſe are diverſified in knots, flower-gardens, or parterres, of which there are great variety, and may be diverſified infinitely, according to the fancy of the deſigners.

Plain compartments are pieces of ground divided into equal ſquares and flower-beds, marked out by the line, of equal length and breadth.

Some perſons allow to theſe ſquares, borders of two feet in breadth, and not more, if the plat of ground be ſmall; but if they be reaſonably large, three feet; and they edge the borders with Box, or upright hardy Thyme, or ſome other aromatic herbs or flowers, for the ſake of the greater neatneſs.

And in order to preſerve the paths and alleys of compartments firm, even, and durable, they lay them with a coat of ſand or gravel, two or three inches thick, keeping them hoed and weeded as often as there ſhould be occaſion.

Theſe compartments were much eſteemed by the French, whoſe gardens were all laid out into ſeveral compartments, ſalons, boſquets, &c. after the manner of architects in buildings; but theſe ſtiff, unnatural gardens are now juſtly exploded, and a much better taſte has of late prevailed in the Engliſh gardens.

COMPOSTS are ſo called of compoſta, or compoſita, *Lat.* compounds, or componere, *Lat.* to compound or mix: and in huſbandry and gardening they ſignify ſeveral ſorts of ſoils or earthy matter mixed together, in order to make a manure for aſſiſting the natural earth in the work of vegetation, by way of amendment or improvement.

Compoſts are various, and ought to be different, according to the different nature or quality of the ſoils which they are deſigned to meliorate: and according as the land is either light, ſandy, looſe, heavy, clayey, or cloddy. A light looſe land requires a compoſt of a heavy nature, as the ſcouring of deep ditches, ponds, &c.

So on the other hand, a land that is heavy, clayey, or cloddy, requires a compoſt of a more ſprightly and fiery nature, that will inſinuate itſelf into the lumpiſh clods; which if they were not thus managed, would very much obſtruct the work of vegetation.

The great uſe of compoſts is for ſuch plants as are preſerved in pots or tubs; or in ſmall beds or borders of flower-gardens; which is what I ſhall here mention, and ſhall treat of thoſe compoſts or dreſſings, which are uſed in gardens and fields, under the articles of Dung and Manure.

As ſome plants delight in a rich light ſoil, others in a poor ſandy ſoil, and ſome in a loamy ſoil; ſo there ſhould be different compoſts prepared, in all thoſe gardens, where a great variety of plants are cultivated: and this is much more neceſſary in countries at a great diſtance from London, than in the neighbourhood of it, becauſe there is ſo great variety of lands, within ten miles round London, which have been ſo long dreſſed and cultivated, that a ſupply of earth fit for all ſorts of plants, may be eaſily procured; but in ſome places which are at a diſtance from large towns, it is very difficult to procure a quantity of earth proper for the choicer ſorts of flowers and plants; therefore the compoſts will require more care, and ſhould be mixed a conſiderable time longer before they are uſed; that they may have the advantage of heat and cold, to meliorate and improve them; and ſhould be frequently turned over, that the parts may be well mixed and incorporated, and the clods well broken and divided.

Almoſt every one who hath written on this ſubject, hath directed the procuring of the upper ſurface of earth from a paſture ground, as one of the principal ingredients, in moſt compoſts for plants, which is certainly a very good one, provided it has time to meliorate before it is uſed; for if this is mixed up haſtily, and put into pots or tubs, before it has had a winter's froſt, and ſummer's heat, to looſen the parts effectually; it will unite and cake together, ſo hard, as to ſtarve the plants that are put into it. For all earth when put into pots or tubs, is much more apt to bind, than when it is in beds; therefore ſhould be in proportion made looſer, according to the nature of the plants for which it is deſigned, than when it is intended for beds or borders. So that if this earth from a paſture, cannot be prepared and mixed at leaſt one year before it is uſed, it will be much better to take the earth of a kitchen-garden which has been well wrought and dunged; but this ſhould be clear from all roots of trees and bad weeds. If this earth is well mixed with the other compoſts ſix months, and often turned over, it will be fitter for pots and tubs, than the other will in twice that time, as I have frequently experienced, ſo can write from knowledge, not from theory. This earth being the principal ingredient in thoſe compoſts deſigned for ſuch plants as require a rich ſoil; the next is to have a quantity of very

rotten dung, from old hot-beds; or for those plants which delight in a cool soil, a quantity of rotten neats dung is preferable. The proportion of this must be according to the quality of the earth; for if that is poor, there should be one third part of dung, but if it be rich, a fourth part or less will be sufficient. These, when well incorporated and the parts divided, will require no other mixture, unless the earth is inclinable to bind, in which case it will be proper to add some sand or sea-coal ashes to it; if sea-sand can be easily procured, that is the best, the next to that is drift-sand; but that from pits is by no means proper. The proportion of this must be according to the nature of the earth, for if that is stiff, there must be a greater proportion used, but this should not exceed a fifth part, unless it is very strong, in which case it will require more, and a longer time to lie, and must be often turned over before it is used.

The next compost, which is designed for plants which do not require so good earth, and naturally grow on loose soils, should be half of the before-mentioned earth from a pasture, or that from a kitchen-garden; and if these are inclinable to bind, there should be a third part sand, and the other part rotten tan, which will be of great use to keep the parts divided, and let the moisture pass off.

The composition for most of the succulent plants, is prepared with the following materials; the earth from a common, where it is light, taken on the surface, one half, the other half sea or drift-sand, and old lime-rubbish screened of equal parts; these, well mixed and often turned over, I have found to answer better than any other compost, for most of the very succulent plants.

The other sort of compost, which is designed for plants that delight in a very loose, light, rich earth; should be made of light earth taken from a kitchen-garden, which has been well dunged, and thoroughly wrought, like those near London, one half; of rotten tanners bark one third, and the other part mud from the scouring of ditches, or from the bottoms of ponds, where the soil is fat: but this mud should lie exposed in small heaps a whole year, and often turned over before it is mixed with the other, and afterward frequently turned and mixed, for eight months or a year before it is used.

In all mixtures, where rotten wood may be required, if the rotten tanners bark, which is taken from old hot-beds is used, that will answer every purpose of the other; and wherever sand is necessary in any compost, the sea-sand should always be preferred to all other, as it abounds with more salts; but this should not be used fresh, because the salts should be exposed to the air, which will loosen the particles, and thereby render them better adapted for the nutriment of vegetables.

There are some who have directed the use of rotten leaves of vegetables, as an excellent ingredient in most composts; but from many years experience, I can affirm, they are of little use, and contain the least quantity of vegetable pasture, of any dressing which is used. Others, who never have had any experience in the culture of plants, have directed different composts for almost every plant; and these composts consist of such a variety of ingredients, as greatly to resemble the prescriptions of a quack doctor; for no person who has been conversant in the business of gardening, could be guilty of such gross absurdities: for it is well known, that a few different composts will be sufficient for all the known plants in the world. But those who pretend to give direction for the culture of plants from theory only, begin at the wrong end, for the true knowledge of gardening or agriculture, must be from experience, and is not to be obtained in a garret.

The several sorts of dressing for land, will be particularly treated under their respective titles, and in general they will be mentioned under the article of Dung and Manure.

In making of any compost, great care should be had, that the several parts are properly mixed together, and not to have too much of any one sort thrown together; therefore, when three or four several sorts are to be mixed together, there should be a man or two placed to each sort, in proportion to the quantity of each; for if two parts of any one sort are requisite to be added, there should be two men put to that, and but one to each of the other: and these men must be careful to spread each sort in such a manner over each other, as that they may be exactly mixed together. Another thing which should be observed is, never to lay these composts in too large heaps, but rather continue them in length, laying them up in a ridge, so that the sun and air may more easily penetrate through it: and, as these composts should (if possible) be made a year before they are used, that they may enjoy a summer's sun, and winter's frost, they should be frequently turned over, which will prevent the growth of weeds, and expose every part of the heaps equally to the sun and air, which is of great advantage to all sorts of composts; for the more they are exposed to the influences of these, the better will the earth be prepared for vegetation, which is evinced by the fallowing of land, which, when rightly managed, is equivalent to a dressing.

COMPOUND FLOWERS are such as consist of many florets, or semiflorets, or both together, which are included in one common empalement, so make up what is commonly called one whole flower.

CONE. A cone is a hard, dry, seed-vessel of a conical figure, consisting of several woody parts; and is, for the most part scaly, adhering closely together, and separating when ripe.

CONIFEROUS-TREES are such as bear cones; as, the Cedar of Lebanon, Fir, Pine, &c.

CONIUM. Lin. Gen. Plant. 299. Cicuta. Tourn. Inst. R. H. 306. tab. 160. Hemlock.

The Characters are,

*It is an umbelliferous plant; the general umbel is composed of several small ones termed rays, which spread open, the rays or small umbels are also spread in the like manner. Both these have involucrums, composed of many short leaves. The petals of the greater umbel are uniform; each flower is composed of five unequal heart-shaped petals, which turn inward; they have five stamina, which are terminated by roundish summits. The germen, which is situated under the flower, supports two reflexed styles, crowned by obtuse stigmas. The germen afterward becomes a roundish channelled fruit, divided into two parts, containing two seeds, which are convex and furrowed on one side, and plain on the other.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flowers having five stamina and two styles.

The Species are,

1. Conium (*Maculatum*) seminibus striatis. Hort. Cliff. 92. *Conium with striated seeds.* Cicuta major. C. B. P. 160. *Greater Hemlock.*
2. Conium (*Tenuifolium*) seminibus striatis, foliolis tenuioribus. *Conium with striated seeds and narrower leaves.* Cicuta major, foliis tenuioribus. C. B. P. 160. *Greater Hemlock with narrower leaves.*
3. Conium (*Africanum*) seminibus aculeatis. Hort. Cliff. 92. *Hemlock with prickly seeds.* Caucalis Africana, folio minore, Rutæ. Boerh. Ind. alt. Sp. 63.

The first sort grows naturally on the side of banks and roads in many parts of England; this is a biennial plant, which perishes after it hath ripened seeds. It hath a long taper root like a Parsnep, but much smaller. The stalk is smooth, spotted with purple, and rises from four, to upwards of six feet high, branching out toward the top into several smaller stalks, garnished with decompounded leaves, whose lobes are cut at the top into three parts; these are of a lucid green, and have a disagreeable smell. The stalks are terminated by umbels of white flowers, each being composed of about ten rays (or small umbels) and have a great number of flowers, which spread open, each sitting upon a distinct foot-stalk; the seeds are small and channelled, and like those of

Aniseed. It flowers in June, and the seeds ripen in autumn.

The second sort differs from the first, in having taller stalks, which are not so much spotted. The leaves are much narrower, and of a paler green; and this difference is constant, for I have cultivated it near twenty years in the Chelsea garden, where it has not varied. The seeds were sent me from Germany, where it grows naturally. This is biennial as the former.

The third sort grows naturally near the Cape of Good Hope, in Africa, from whence the seeds were brought to Holland, where the plants have been preserved in some of their curious gardens of plants. The seeds of this plant were sent me by the late Dr. Boerhaave, professor of Botany at Leyden. This plant rarely grows more than nine inches high; the lower leaves are divided somewhat like those of the small wild Rue, and are of a grayish colour; those upon the stalk are much narrower, but of the same colour; these are terminated by umbels of white flowers, each of the larger umbels being composed of three small ones; the involucrum hath three narrow leaves, situated under the umbel. This flowers in July, and ripens seed in autumn, soon after which the plants decay.

The first sort grows wild in most parts of England, so is seldom allowed room in gardens, because it is supposed to have a poisonous quality; some physicians have affirmed that it is so to all animals, while others have assured us, that it is eaten by the inhabitants of some parts of Italy when it is young, and is by them esteemed a great dainty. Mr. Ray mentions that he has found the gizzard of a thrush, full of Hemlock seeds, with four or five grains of Corn, intermixed with it, which, in the time of harvest, that bird had neglected for Hemlock, so very fond was it of that seed which we reckon pernicious. However, it is very certain, that scarce any animal will eat the green herb; for it is very common to see the grass, and most other weeds eat close where cattle are allowed to feed, and all the plants of Hemlock, which were growing left untouched.

This plant is esteemed by many physicians, as an excellent remedy to dissolve schirrous tumors; and some have greatly recommended it for cancers, and most of them agree, that it may be prescribed as a good narcotic.

The second sort is preserved in some botanic gardens for the sake of variety. If the seeds of this are permitted to scatter, the plants will come up in plenty, so if they are not rooted out, will become as troublesome weeds as the first sort.

The third sort is an humble plant, and being tender, will never become troublesome; for unless the winters are very favourable, this plant will not live in the open air in England. The seeds of this sort should be sown in pots in autumn soon after they are ripe, and placed under a common frame in winter, where they may be exposed to the open air at all times when the weather is mild, and only covered in bad weather. The plants will come up very early in the spring, and must then be exposed to the open air constantly when the weather will permit, otherwise they will draw up very weak. As these plants do not bear transplanting well, they should be thinned, and not more than four or five left in each pot; and as the plants have no great beauty, a few of them will be sufficient to continue the sort, where a variety of plants are preserved. The other culture is only to keep them clean from weeds, and in very dry weather to water them.

There is another species of this genus according to most of the botanists, which is now separated from it, and placed singly, under the title of Æthusa. This was titled, Cicuta minor petroselino similis, by Caspar Bauhin, i. e. *Smaller Hemlock with the appearance of Parsley.* This is a weed which frequently is found in gardens, especially in rich ground, and is generally supposed to be very poisonous: some persons who have ignorantly gathered this herb, and used it for Parsley, having been poisoned by it. Therefore it was formerly called Fools Parsley. This may be distinguished from Parsley, by the narrowness of the small leaves, which are also more pointed, and of a darker green. But those who are afraid of being deceived in this, should always use the curled Parsley, which is so different from this, that it cannot be mistaken for it.

CONNARUS. Zeylon Sumach.

The CHARACTERS are,

*It hath a woolly erect empalement of one leaf, cut into five segments, which is permanent, and five spear-shaped erect petals which are equal; it has ten awl-shaped stamina, which are joined at their base, and are alternately long and short, terminated by roundish summits, and a round germen supporting a cylindrical style, crowned by an obtuse stigma; the empalement afterward becomes an oblong gibbous capsule opening with two valves, having one cell, inclosing one large oval seed.*

This genus of plants is ranged in the second order of Linnæus's sixteenth class, intitled Monodelphia Decandria, the flower having ten stamina, which are joined in one house.

We know but one SPECIES of this genus, viz.

CONNARUS (*Monocarpos*). Flor. Zeyl. 248. *One seeded Connarus.* Rhus Zeylanicus trifoliatus, phaseoli facie, floribus copiosis spicatis. Burn. Zeyl. 199. tab. 89.

This plant grows naturally in India; it rises with a ligneous stalk eight or ten feet high, which is hard, rigid, and covered with a black bark, and divides upward into two or three branches, garnished with trifoliate leaves, having long foot-stalks placed alternate; the lobes are oval, smooth, and entire, each having a short petiolus fastened to the foot-stalk; these remain green the whole year: the flowers are produced in large panicles at the extremity of the branches, they are small, hairy, and of a greenish yellow colour, but are rarely succeeded by seeds in Europe.

This plant is usually propagated in the gardens by laying down the young branches, which, if tongued, (in the manner practised for Carnations) and duly watered, will put out roots in twelve months, when they may be cut off from the old plants, and each planted in a separate small pot, filled with fresh light earth, plunging them into a moderate hot-bed, to forward their taking new root, observing to shade them from the sun every day, and to water them as they may require it: after this the plants should be treated in the same way as other exotic plants which are not too tender, placing them in a dry stove in winter, and for about three months in the summer they may be removed into the open air, in a warm sheltered situation.

The cuttings of this plant will sometimes take root, if they are planted in pots, plunged into a moderate hot-bed of tanners bark, and closely covered with hand-glasses, or small bell-glasses; but unless they are carefully managed they seldom succeed.

If fresh seeds can be procured from abroad, they should be sown in small pots, plunged into a moderate hot-bed, and when the plants are fit to remove they should be separated, planting each into a separate pot, and plunged into a moderate hot-bed, treating them in the manner as the layers.

CONOCARPODENDRON. See PROTEA.

CONOCARPUS. Lin. Gen. Plant. 236. Rudbeckia. Houst. Nov. Gen. 21. Button-tree, vulgò.

The CHARACTERS are,

*The flowers are collected in a globular head, each standing in a scaly empalement. At the bottom is situated a large compressed germen, crowned by the empalement of the flower, which is small, sharp-pointed, and divided into five parts at the top. The flower hath five petals; it hath five, or sometimes ten slender stamina, which extend beyond the petals, terminated by globular summits. The germen is large, compressed, and obtuse, supporting a single style which is longer than the stamina, and is crowned by an obtuse stigma. The germen afterward becomes a single seed, inclosed in the scale of the fruit, which is shaped like the cone of Alder.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, from the flower having five stamina and one style.

The Species are,

1. Conocarpus (*Erecta*) foliis lanceolatis erecta. Lin. Sp. 250. *Upright Conocarpus with spear-shaped leaves.* Rudbeckia erecta longifolia. Houst. MSS. *Commonly called Button-tree in the West-Indies.*
2. Conocarpus (*Procumbens*) frutescens, procumbens, foliis ovatis, crassis, floribus alaribus & terminalibus. *Shrubby trailing Conocarpus with oval thick leaves, and flowers growing on the sides, at the ends of the branches.* Rudbeckia maritima procumbens rotundifolia. Houst. MSS. *Maritime trailing Rudbeckia, with a round leaf.*

The first sort grows plentifully in most of the sandy bays, in all the islands of the West-Indies. It rises with a woody upright stem about sixteen feet high, sending out many side branches, which also grow erect; these are garnished with spear-shaped leaves, having broad short foot-stalks, and are placed alternate on every side the branches. The flowers grow upon short branches, which arise from the wings of the leaves; these have three or four small leaves on their lower part, under the flowers; each of these branches are terminated by six or eight conical heads of flowers, which have some resemblance to those of Acacia, but each of these come out of a scaly covering; the flowers are small, of a reddish colour, having five slender stamina, and one style, which stand out farther than the petal. The flowers are succeeded by single seeds, which are included in the scales of the conical fruit.

The second sort hath short crooked branches, which divide and spread out on every side upon the ground; these are covered with a grayish bark, and their upper parts are garnished with oval thick leaves, a little larger than those of the Dwarf Box; they have very short foot-stalks, and are placed on every side the branches without order. The flowers are collected in small round heads, which come out single from the side of the branches, and in loose spikes at the end; these are small, and of an herbaceous colour; the scales are rough, and the cones are of a looser texture than those of the former sort.

This was discovered by the late Dr. William Houstoun, growing plentifully in the marshy grounds near the sea, at the Havannah, from whence he sent the seeds to England, in 1730.

Both these sorts are preserved in some curious gardens for the sake of variety, but they are plants of no great beauty: they are propagated from seeds, which must be obtained from the places of their natural growth, for they never produce any good seeds in Europe: these seeds, if they are fresh, will come up very soon, if they are sown upon a good hot-bed; and if the plants are potted, and preserved in the bark-stove, they will make great progress; but they are too tender to live in this country, unless they are constantly kept in the stove, and treated in the same manner with other exotic plants; observing, as they are natives of swamps, to supply them often with water; but in winter they must have it very sparingly. The plants are Evergreen, casting off their old leaves when the new come out.

CONSOLIDA MAJOR. See Symphytum.

CONSOLIDA MEDIA. See Bugula.

CONSOLIDA MINIMA. See Bellis.

CONSOLIDA REGALIS. See Delphinium.

CONVALLARIA. Lin. Gen. Plant. 383. Lilium Convallium. Tourn. Inst. R. H. 77. tab. 14. *Lily of the valley.* To this genus Dr. Linnæus has joined the Polygonatum of Tournefort, or Solomon's Seal.

The Characters are,

*The flower hath one petal, which is bell-shaped, and divided at the brim into six obtuse segments which spread open and are reflexed. It hath no empalement. It hath six stamina, which are inserted into the petal, but are shorter, terminated by oblong summits, which are erect. In the center is situated a globular germen, supporting a slender style, which is longer than the stamina, crowned by a three cornered obtuse stigma. The germen afterward becomes a globular berry, with three cells, containing one roundish seed.*

This genus of plants is ranged in the first section of Linnæus's sixth class, intitled Hexandria Monogynia, the flower having six stamina and one style.

The Species are,

1. Convallaria (*Majalis*) scapo nudo. Flor. Lapp. 113. *Convallaria with a naked stalk.* Lilium convallium album. C. B. P. 304. *White Lily of the Valley.* There is a variety of this with reddish flowers, which is preserved in gardens, titled by Caspar Bauhin Lilium Convallium flore rubente. Pin. 304.
2. Convallaria (*Latifolia*) scapo nudo, foliis latioribus. *Convallaria with a naked stalk and broader leaves.* Lilium Convallium latifolium. C. B. P. 136. *Broad-leaved Lily of the Valley.* There is also a variety of this with double variegated flowers which is preserved in gardens. This Tournefort titles Lilium Convallium latifolium, flore pleno variegato. Inst. R. H. 77. *Broad-leaved Lily of the Valley, with a large variegated flower.*
3. Convallaria (*Multiflora*) foliis alternis, amplexicaulibus caule tereti axillaribus pedunculis multifloris. *Convallaria with leaves placed alternate, embracing the taper stalk, whose foot-stalks have many flowers.* Polygonatum latifolium vulgare. C. B. P. 305. *Common broad-leaved Solomon's Seal.*
4. Convallaria (*Odorato*) foliis alternis, semiamplexicaulibus, floribus majoribus axillaribus. *Convallaria with alternate leaves which half embrace the stalks, and larger sweet-scented flowers.* Polygonatum latifolium, flore majore odoro. C. B. P. 303.
5. Convallaria (*Polygonatum*) foliis alternis amplexicaulibus, caule ancipti, pedunculis axillaribus subunifloris. Lin. Mat. Med. 168. *Convallaria with alternate leaves embracing the stalks, and foot-stalks having one flower.* Polygonatum floribus ex singula tribus pedunculis. C. B. 3. p. 530. *Common Solomon's Seal.*
6. Convallaria (*Stellata*) foliis amplexicaulibus plurimis. Lin. Sp. 452. *Convallaria with many leaves embracing the stalks.* Polygonatum Canadense spicatum fertile. Cornut. Canad. 33.
7. Convallaria (*Verticillata*) foliis verticillatis. Flor. Lapp. 114. *Convallaria with leaves growing in whorls.* Polygonatum angustifolium, non ramosum. C. B. P. 303.
8. Convallaria (*Racemosa*) foliis sessilibus, racemo terminali composito. Lin. Sp. Plant. 452. *Convallaria with leaves sitting close to the stalks, which are terminated by compound spikes of flowers.* Polygonatum Virginianum erectum, spicatum, flore stellato sterili. Mor. Hist. 3. 537.
9. Convallaria (*Bifolia*) foliis cordatis. Flor. Lapp. 113. *Convallaria with heart-shaped leaves.* This is the Smilax unifolio humillima. Tourn. Inst. App. 564. *Lowest Smilax with a single leaf; and the* Lilium Convallium minus. C. B. P. 304. *The least Lily of the Valley.*

The first sort grows naturally in great plenty in the woods near Woburn, in Bedfordshire, from whence the markets in London are generally supplied with the flowers. It is also cultivated in gardens for the sweetness of the flowers, and formerly it grew in great plenty on Hampstead-heath, but of late years it has been seldom found there; for since all the trees have been destroyed, the plants have not flowered there as formerly, nor have the roots increased.

This hath a slender fibrous root, which creeps under the surface of the ground, and thereby propagates in great plenty. The leaves come up by pairs; their foot-stalks, which are about three inches long, are wrapped together in one cover, and at the top divide into two parts, each sustaining a single leaf, one of which rises a little above the other; these leaves are from four to five inches long, and near an inch and a half broad in the middle, lessening gradually to both ends; they have many longitudinal veins, running parallel

parallel to the midrib, which is not situated exactly in the middle, but diverges to one side; the foot-stalks of the flowers arise immediately from the root, on one side the leaves; these are naked, about five inches long, adorned toward their upper parts with pendulous white flowers, ranged on one side the stalk, which decline to one side; each flower stands upon a short separate foot-stalk, which are bending and crooked. The flowers are of the short bell-shaped kind, their brims being reflexed, which are slightly cut into six parts; they have six stamina, which are inserted in the petal of the flower, and are shorter than the tube, and a single style arising from the germen, which is triangular, crowned by a three-cornered stigma; the germen afterward becomes a globular berry, of a red colour when ripe, inclosing three roundish seeds. It flowers in May, from whence it has been titled May Lily. The seeds ripen in autumn. The flowers of this sort are used in medicine; they are esteemed cephalic and cordial, so are recommended for palsies, epilepsies, and spasms; there is prepared a conserve, and a compound distilled water of the flowers. This compound water is by the Germans titled aqua aurea, or *golden water*, because of its excellent virtues.

There is another variety of this mentioned with narrow leaves, which I suppose may arise from the soil, or situation, for the roots which I have taken up in places where they have naturally narrow leaves, when planted in the garden, have produced leaves as broad as the common sort; but the sort with red flowers has constantly continued the same above forty years, without any variation. The flowers of this are smaller, the stalks are redder, and the leaves of a darker green than those of the common sort; but as I have not propagated this sort by seeds, I cannot be sure if it is a distinct species, or only a seminal variety.

The second sort I received from the Alps, where it naturally grows; this has retained its difference in the garden, where it grew in the same soil and situation with the common sort, so I make no doubt of its being a distinct species. The other with a double variegated flower is supposed to be only a variety of this, therefore I have not enumerated it as a different sort, but the flowers are much larger, and beautifully variegated with purple and white. I received a plant of this sort from the royal garden at Paris, which has flowered several years in the Chelsea garden, but the roots do not increase so much as the common sort.

These plants require a loose sandy soil, and a shady situation; they are propagated by parting of their roots, which multiply in great plenty. The best time to transplant and part the roots, is in autumn. They should be planted near a foot asunder, that their roots may have room to spread, for if they agree with the soil and situation, they will meet and fill the ground in one year. If these roots are planted in a rich soil, they will spread and multiply greatly, but will not be so productive of flowers.

The only culture which these plants require, is to keep them clean from weeds, and to transplant and separate the roots every third or fourth year, otherwise they will be so greatly matted together, as not to have proper nourishment, so the flowers will be small, and few in number.

The third sort is a native of the Alps and Appennines; the stalks of this (when growing in good ground) generally rise three feet high; they are taper, and garnished with oblong oval leaves placed alternate, embracing the stalks with their base; they have several longitudinal veins, resembling the leaves of white Hellebore: the foot-stalks of the flowers are produced from the wings of the leaves, which support four or five flowers on each; these flowers are larger than those of the common sort, but their tubes are more contracted, and are succeeded by pretty large berries, which when ripe turn of a bluish colour; it flowers in May and June, and the seeds ripen in autumn.

The fourth sort is the broad-leaved Solomon's Seal, which is said to grow naturally in England, but I doubt ours is different from that mentioned by Caspar Bauhin under that title; for in two places where I have found it growing, the stalks were much shorter, the leaves were broader, and their borders turned inward, and this difference continues in the garden where it grows in the same soil and situation with the common sort.

The fifth sort is the common Solomon's Seal; this hath a fleshy white root, as large as a man's finger, which multiplies in the ground, and is full of knots, from whence it had the name of Polygonatum, or many knees. In the spring arise several taper stalks, which grow near two feet high, adorned with oblong oval leaves, placed alternate, having many longitudinal veins running parallel to the middle, and embrace the stalk with their base; these are ranged on one side of the stalk, and on the opposite side come out the foot-stalks of the flowers, which are about an inch long, dividing at the top into three or four smaller, each sustaining a single tubulous flower, cut into six parts at the brim, where it is green, the lower part of the tube being white; they have each six slender stamina, surrounding a single style, which arises from the germen, and is crowned by a blunt stigma; the germen afterward becomes a round berry, about the size of Ivy berries, each inclosing three seeds. This flowers in May, and the seeds ripen in autumn, and then the stalks decay.

The sixth sort rises with an upright stalk about two feet high, garnished with long narrow leaves, which stand in whorls round the stalk; there are generally five of these placed at each joint, which are four inches long, and half an inch broad, smooth, and of a light green. The flowers come out from the same joints, standing upon short foot-stalks, each supporting five or six flowers, which are smaller, and have much shorter tubes than either of the former sorts; they are of a dirty white, tipped with green, and slightly cut into six parts at the top. It grows naturally in the northern parts of Europe.

The seventh sort grows naturally in most parts of North America; I have received plants of this from New England, Philadelphia, and several other places. This rises with an upright stalk near two feet high, garnished with oblong leaves, ending in sharp points; they are near five inches long, and two and a half broad, having three large longitudinal veins, with several smaller between, which join at both ends. The leaves are alternate, standing close to the stalks, and are of a light green on their upper side, but are paler on their under. The flowers are produced in branching spikes at the extremity of the stalks, each being composed of several small loose spikes of star-like flowers, of a pale yellow, which fall away without producing any seed. This flowers the latter end of May, or the beginning of June, and the stalks decay in autumn; but the root is perennial, and propagates by offsets.

The eighth sort is a native of the same countries as the last mentioned; this sends up stalks two feet high, garnished with many oblong leaves embracing the stalks with their base. The flowers are produced in single spikes at the top of the stalks, which are in shape and colour like those of the seventh; but these are succeeded by small red berries, about the size of those of the Lily of the Valley. This sort flowers the beginning of June, and the berries ripen in autumn.

All the sorts of Solomon's Seal are very hardy plants; they delight in a light soil and a shady situation, so are very proper to plant in wilderness quarters under tall trees, where if they are not crowded by lower shrubs, they will thrive and multiply exceedingly, and during the summer season will make an agreeable variety, the whole appearance of the plants being very singular.

They all multiply very fast by their creeping roots, especially when they are planted in a proper soil and situation. The best time to transplant and part the

roots

roots is in autumn, soon after their stalks decay; those which are removed at that season, will grow much stronger than those which are planted in the spring, which is the reason of my preferring that season; but they may be safely transplanted any time after the stalks decay, till the roots begin to shoot in the spring. As these roots greatly increase, they should be planted at a wide distance from each other, that they may have room to spread; for they should not be removed oftener than every third or fourth year, where they are expected to grow strong, and produce a good number of stalks, in which their beauty consists. The only culture these plants require, is to dig the ground between them every spring, and keep them clean from weeds.

The roots of the fifth sort are used in medicine, and are greatly recommended for their efficacy in all manner of contusions. The distilled water of the plant clears the face and beautifies the complexion: a decoction of it cures the itch, and such like cutaneous distempers.

CONVOLVULUS. Lin. Gen. Plant. 198. Tourn. Inst. R. H. 82. tab. 77. Bindweed. It is so titled from convolvendo, *Lat.* rolling round, or twining about.

The CHARACTERS are,

*It hath a permanent empalement of one leaf, which is divided into five parts at the top; the flower hath one large bell-shaped petal, which spreads open. It hath five short stamina, terminated by oval compressed summits, and a roundish germen, supporting a slender style, crowned by two broad oblong stigmas. The empalement afterward becomes a roundish capsule, with one, two, or three valves, containing several seeds which are convex on their outside, but on the inside angular.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. CONVOLVULUS (*Arvensis*) foliis sagittatis utrinque acutis, pedunculis unifloris. Flor. Suec. 173. *Bindweed with arrow-shaped leaves pointed on both sides, and a single flower on each foot-stalk.* Convolvulus minor arvensis. C. B. P. 294. *Smaller Field Bindweed, commonly called Gravel Bindweed.*
2. CONVOLVULUS (*Sepium*) foliis sagittatis posticè truncatis, pedunculis tetragonis unifloris. Prod. Leyd. 427. *Bindweed with arrow-shaped leaves, which are torn behind, and a single flower on each foot-stalk.* Convolvulus major albus. C. B. P. *Larger white Bindweed, called Bearbind.*
3. CONVOLVULUS (*Scammonia*) foliis sagittatis posticè truncatis, pedunculis teretibus subtrifloris. Prod. Leyd. 427. *Bindweed with arrow-shaped leaves torn behind, and two flowers on each foot-stalk.* Convolvulus Syriacus & Scammonia Syriaca. Mor. Hist. 2. p. 12. *Syrian Bindweed and Syrian Scammony.*
4. CONVOLVULUS (*Purpureus*) foliis cordatis indivisis fructibus cernuis pedicellis incrassatis. Lin. Sp. 219. *Bindweed with heart-shaped undivided leaves, nodding fruit, and swelling foot-stalks.* Convolvulus purpureus, folio subrotundo. C. B. P. 295. *Purple Bindweed with a roundish leaf, commonly called* Convolvulus major, or *Greater Bindweed.*
5. CONVOLVULUS (*Indicus*) foliis cordatis, acuminatis, pedunculis trifloris. *Bindweed with heart-shaped pointed leaves, and three flowers on each foot-stalk.* Convolvulus major, folio subrotundo, flore amplo purpureo. Sloan. Cat. Jam. 55. *Greater Bindweed with a roundish leaf, and a large purple flower.*
6. CONVOLVULUS (*Nil*) foliis cordatis trilobis villosis, calycibus lævibus, capsulis hirsutis, pedunculis bifloris. *Bindweed with heart-shaped leaves, having three lobes, which are hairy, smooth flower-cups, hairy seed-vessels, and two flowers on each foot-stalk.* Convolvulus cæruleus hederaceo angulosо folio. C. B. P. 295. *Blue Bindweed with an angular Ivy leaf.*
7. CONVOLVULUS (*Batatas*) foliis cordatis hastatis quinquenerviis, caule repente hispido tubifero. Lin. Sp. Plant. 154. *Bindweed with spear heart-shaped leaves, five nerves, and a creeping stinging stalk bearing tubers.* Convolvulus radice tuberosâ esculensâ minore purpurea. Sloan. Cat. Jam. 54. *Bindweed with a small, purple, tuberous, esculent root, commonly called Spanish Potatoes.*
8. CONVOLVULUS (*Palmatis*) foliis palmatis, lobis septem-sinuatis acutis, pedunculis unifloris, calycibus maximis patentibus. *Bindweed with palmated leaves, with seven sinuated pointed lobes, a single flower on each foot-stalk, and a large spreading empalement.* Convolvulus pentaphyllos, folio glabro dentato, viticulis hirsutis. Plum. Cat.
9. CONVOLVULUS (*Aristolochiofolius*) folio hastato lanceotis, auriculis rotundatis, pedunculis multifloris. *Bindweed with spear-pointed leaves, having rounded ears, and many flowers on each foot-stalk.* Convolvulus Americanus, Aristolochiæ folio longiore, floribus plurimis ex uno pediculo insidentibus. Houst. MSS.
10. CONVOLVULUS (*Hirtus*) foliis cordatis subhastatisque villosis, caule petiolisque pilosis, pedunculis multifloris. Lin. Sp. Plant. 159. *Bindweed with heart-shaped leaves, somewhat spear-pointed and downy, with hairy stalks and foot-stalks, having many flowers.* Convolvulus Americanus Polyanthos, Althææ folio villoso. Houst. MSS.
11. CONVOLVULUS (*Glabrus*) foliis ovato oblongis, glabris pedunculis unifloris, calycibus decempartitis. *Bindweed with oval, oblong, smooth leaves, and foot-stalks having a single flower, whose empalement is cut into ten parts.* Convolvulus foliis oblongis, glabris floribus amplis purpureis. Houst. MSS.
12. CONVOLVULUS (*Pentaphyllos*) hirsutissimus, foliis quinquelobatis, pedunculis longissimis bifloris. *Very hairy Bindweed, with leaves having five lobes, and very long foot-stalks, with two flowers.* Convolvulus pentaphyllos hirsutis. Plum. Cat.
13. CONVOLVULUS (*Frutescens*) caule fruticoso, glabro, foliis quinque lobis, pedunculis geniculatis unifloris, capsulis maximis. *Bindweed with a shrubby smooth stalk, leaves having five lobes, many jointed foot-stalks with one flower, and very large seed-vessels.* Convolvulus pentaphyllos, flore & fructu purpureis maximis. Plum. Cat.
14. CONVOLVULUS (*Brasiliensis*) foliis emarginatis, basi biglandulosis, pedunculis trifloris. Lin. Sp. Plant. 159. *Bindweed with indented leaves, having two glands and foot-stalks, with three flowers.* Convolvulus marinus Catharticus, folio rotundo, flore purpureo. Plum. Pl. Amer. 89. tab. 104.
15. CONVOLVULUS (*Multiflorus*) foliis cordatis, glabris, pedunculis multifloris, semine villoso ferrugineo. *Bindweed with smooth heart-shaped leaves, foot-stalks having many flowers, and seeds covered with an iron-coloured down.* Convolvulus Americanus vulgaris folio, capsulis triquetris numerosis, ex uno puncto, longis petiolis propendentibus, semine lanugine ferrugineâ villosa. Pluk. Phyt. tab. 167. f. 1.
16. CONVOLVULUS (*Canariensis*) foliis cordatis pubescentibus, caule perenni, villoso, pedunculis multifloris. Lin. Sp. Plant. 155. *Bindweed with soft, woolly, heart-shaped leaves, a hairy perennial stalk, and foot-stalks having many flowers.* Convolvulus Canariensis sempervirens, foliis mollibus & incanis. Hort. Amst. 2. p. 101.
17. CONVOLVULUS (*Hederaceus*) foliis triangularibus acutis, floribus plurimis sessilibus patulis, calycibus acutis multifidis. *Bindweed with sharp-pointed triangular leaves, many spreading flowers set close to the stalk, and acute empalements ending in many points.* Convolvulus folio hederaceo, angulosо, lanuginoso, flore magno, cæruleo, patulo. Sloan. Cat. Jam. 56.
18. CONVOLVULUS (*Roseus*) foliis cordatis, acuminatis pedunculis bifloris. *Bindweed with heart-shaped pointed leaves, and foot-stalks having two flowers.* Convolvulus Americanus hirsutus, folio acuminato, flore amplo roseo. Houst. MSS.
19. CONVOLVULUS (*Repens*) foliis sagittatis posticè obtusis, caule repente, pedunculis unifloris. Lin. Sp. Plant. 158. *Bindweed with narrow-pointed leaves, which are obtuse at the foot-stalk, a creeping stalk, and one flower*

*flower on each foot-ſtalk.* Convolvulus marinus catharticus, foliis Acetoſæ, flore niveo. Plum. Pl. Am. 89. tab. 105.

20. Convolvulus (*Betonicifolius*) foliis cordato ſagitatis, pedunculis unifloris. *Bindweed with heart-ſhaped arrow-pointed leaves, and foot-ſtalks having a ſingle flower.* Convolvulus exoticus, Betonicæ folio, flore magno albo fundo purpureo. Cat. Hort. R. Par.

21. Convolvulus (*Siculus*) foliis cordato ovatis, pedunculis unifloris, bracteis lanceolatis, flore ſeſſile. Hort. Cliff. 68. *Bindweed with oval heart-ſhaped leaves, foot-ſtalks having one flower, ſpear-ſhaped bracteæ, and the flower ſitting cloſe to the ſtalk.* Convolvulus ſiculus minor, flore parvo auriculato. Bocc. Pl. Sic. 89.

22. Convolvulus (*Elegantiſſimus*) foliis palmatis ſericeis, pedunculis bifloris, calycibus acutis. *Bindweed with ſilky palmated leaves, foot-ſtalks having two flowers, and ſharp-pointed empalements.* Convolvulus argentibus, elegantiſſimus, foliis tenuiter inciſis. Tourn. Inſt. R. H. 85.

23. Convolvulus (*Altheoides*) foliis cordatis inciſis & incanis, pedunculis bifloris, calycibus obtuſis. *Bindweed with hoary heart-ſhaped leaves, which are jagged, foot-ſtalks having two flowers, and obtuſe empalements.* Convolvulus argenteus folio althææ. C. B. P. 295.

24. Convolvulus (*Tricolor*) foliis lanceolato-ovatis glabris, caule declinato, floribus ſolitariis. Vir. Cliff. 68. *Bindweed with oval ſpear-ſhaped leaves, a declining ſtalk, with one flower on each foot-ſtalk.* Convolvulus Luſitanicus flore Cyaneo Broſs; *commonly called Convolvulus minor.*

25. Convolvulus (*Cantabrica*) foliis linearibus acutis caule ramoſo ſubdichotomo, calycibus piloſis. Lin. Sp. 225. *Bindweed with narrow ſpear-ſhaped leaves, a branching ſtalk, and hairy empalements.* Convolvulus linariæ folio aſſurgens. Tourn. Inſt. R. H. 83.

26. Convolvulus (*Lineatus*) foliis lanceolatis, ſericeis, lineatis petiolatis pedunculis bifloris, calycibus ſereceis ſubfoliaceis. Lin. Sp. 224. *Bindweed with ſilky ſpear-ſhaped leaves, having foot-ſtalks, with two flowers on each foot-ſtalk, having ſilky empalements.* Convolvulus minor, argenteus, repens, acaulis ferme. H. R. Par.

27. Convolvulus (*Cneorum*) foliis lanceolatis tomentoſis, floribus capitatis, calycibus hirſutis caule erectiuſculo. Lin. Sp. 224. *Bindweed with ſpear-ſhaped woolly leaves, foot-ſtalks and flowers growing in heads, terminating the ſtalks, which are erect.* Convolvulus argenteus umbellatus, erectis. Tourn. Inſt. R. H. 84.

28. Convolvulus (*Linarifolius*) foliis lineari lanceolatis, acutis caule ramoſo, recto, pedunculis unifloris. Hort. Cliff. 68. *Bindweed with narrow ſpear-ſhaped leaves, which are pointed, upright branching ſtalks, and foot-ſtalks with one flower.* Convolvulus ramoſus incanus, foliis piloſellæ. C. B. P. 295.

29. Convolvulus (*Soldanella*) foliis reniformibus, pedunculis unifloris. Hort. Cliff. 67. *Bindweed with kidney-ſhaped leaves, and one flower on each foot-ſtalk.* Soldanella maritima minor. C. B. P. 295. *Leſſer Sea Bindweed.*

30. Convolvulus (*Turpethum*) foliis cordatis, angulatis, caule membranaceo, quadrangulari, pedunculis multifloris. Flor. Zeyl. 72. *Bindweed with angular heart-ſhaped leaves, a quadrangular membranaceous ſtalk, and foot-ſtalks having many flowers.* Convolvulus Zeylanicus, alatus, maximis, foliis Ibiſci nonnihil ſimilibus anguloſis. Herm. Lud. 177. tab. 178. *Turbith of the ſhops.*

31. Convolvulus (*Jalapa*) foliis variis, pedunculis unifloris, radice tuberoſâ. *Bindweed with variable leaves, foot-ſtalks with ſingle flowers, and a tuberous root.* Convolvulus radice tuberoſâ Catharticâ. Houſt. MSS. *The true Jalap.*

The firſt ſort is very common upon dry banks, and in gravelly grounds, in moſt parts of England, and is generally a ſign of gravel lying under the ſurface. The roots of this ſhoot very deep into the ground, from whence ſome country people call it Devils Guts.

From the root ariſes many weak ſtalks, which trail on the ground, and faſten themſelves about the neighbouring plants; theſe are garniſhed with triangular arrow-pointed leaves. The flowers are produced from the ſide of the branches, having long foot-ſtalks, each ſuſtaining a ſingle flower, which is ſometimes white, at other times red, and frequently is variegated. This is a troubleſome weed in gardens, ſo ſhould be conſtantly rooted out.

The ſecond ſort is alſo a troubleſome weed in gardens, when the roots are intermixed with thoſe of trees and ſhrubs, or under hedges, where the plants cannot be eaſily deſtroyed; but in an open clear ſpot of ground, where the plants are carefully hoed down for three or four months, they may be effectually deſtroyed; for when the ſtalks are broken or cut, a milky juice flows out, and thereby the roots are ſoon exhauſted and decay. The roots of this ſort are pretty thick, extend far on every ſide, and are white. The ſtalks riſe ten or twelve feet high, twining themſelves about trees or hedges, and are garniſhed with large arrow-pointed leaves, which are torn at their baſe. The flowers come out from the ſide of the branches upon long foot-ſtalks, each ſuſtaining one large white flower, which are ſucceeded by roundiſh ſeed-veſſels, having three cells filled with ſeeds, which are convex on one ſide and plain on the other. It flowers in June, and the ſeeds ripen in autumn, ſoon after which the ſtalks decay to the root; but as every ſmall piece of the root will grow, it renders this a troubleſome weed to deſtroy.

The third ſort grows naturally in Syria, where the roots of the plants are wounded, and ſhells placed under the wounds to receive the milky juice which flows out, which is inſpiſſated, and afterward put up and exported: this is what is called Scammony in the ſhops; it is a very hardy plant, and will thrive very well in the open air in England, provided it is on a dry ſoil. The roots of this are thick, run deep into the ground, and are covered with a dark bark. The branches extend themſelves on every ſide to the diſtance of four or five feet; theſe are ſlender, and trail on the ground, if they are not ſupported, and are garniſhed with narrow arrow-pointed leaves. The flowers are of a pale yellow, and come out from the ſide of the branches, two ſitting upon each long foot-ſtalk; theſe are ſucceeded by roundiſh ſeed-veſſels, having three cells, filled with ſeeds ſhaped like thoſe of the former ſort, but ſmaller. It flowers in June and July, and the ſeeds ripen in autumn. If the ſeeds of this ſort are ſown in the ſpring, on a border of light earth, the plants will come up, and require no other culture but to keep them clean from weeds, and thin the plants where they grow too cloſe; for as the branches extend pretty far, the plants ſhould not be nearer than three feet aſunder. The ſtalks decay in autumn, but the roots will abide many years.

The fourth ſort is an annual plant, which grows naturally in Aſia and America, but has been long cultivated for ornament in the Engliſh gardens, and is generally known by the title of Convolvulus major. Of this there are three or four laſting varieties; the moſt common hath a purple flower; but there is one with a white, another with a red, and one with a whitiſh blue flower, which hath white ſeeds. All theſe varieties I have cultivated many years, without obſerving either of them change. If the ſeeds of theſe ſorts are ſown in the ſpring, upon a warm border where the plants are deſigned to remain, they will require no other culture but to keep them clean from weeds; and place ſome tall ſtakes down by them, for their ſtalks to twine about, otherwiſe they will ſpread on the ground, and make a bad appearance. Theſe plants, if they are properly ſupported, will riſe ten or twelve feet high; they flower in June, July, and Auguſt, and will continue till the froſt kills them. Their ſeeds ripen in autumn.

The fifth ſort grows naturally in Jamaica, from whence the late Dr. Houſtoun ſent me the ſeeds; this ſends out long branches, which twiſt about the trees,

trees, and riſe to a great height; the leaves are ſmooth, heart-ſhaped, ending in long points, and the ears at the baſe are large and rounded, ſtanding upon long ſlender foot-ſtalks. The flowers come out on the oppoſite ſide of the ſtalks, upon long foot-ſtalks, each ſuſtaining three flowers, with longer tubes than thoſe of the former, and are of a deeper purple colour; this flowers from the latter end of June till the froſt deſtroys it. As this is not ſo hardy as the former, the ſeeds ſhould be ſown upon a hot-bed in the ſpring, to bring the plants forward; and toward the end of May, they ſhould be planted out in warm borders, and treated in the ſame manner as the former ſort.

The ſixth ſort grows naturally in Africa and America; this is an annual plant, which riſes with a twining ſtalk eight or ten feet high, garniſhed with heart-ſhaped leaves, divided into three lobes, which end in ſharp points; theſe are woolly, and ſtand upon long foot-ſtalks; the flowers come out on long foot-ſtalks, each ſuſtaining two flowers of a very deep blue colour, from whence it has been titled Anil or Indigo. This is one of the moſt beautiful flowers of this genus, and is undoubtedly a diſtinct ſpecies; though ſome have ſuppoſed it to be only a variety of the fourth ſort, for I have cultivated it many years, and have never found it alter; the leaves of this having three deeply divided lobes, and thoſe of the fourth ſort being entire, is ſufficient to determine the ſpecific difference; this ſort is annual, and muſt be propagated in the ſame manner as the fifth. It flowers all the latter part of ſummer, and, in good ſeaſons, the ſeeds ripen well in the open air.

The ſeventh ſort is that whoſe roots are eaten, and is generally titled Spaniſh Potatoe; theſe roots are annually imported from Spain and Portugal, where they are greatly cultivated for the table, but they are too tender to thrive well in the open air in England; they are cultivated by the roots in the ſame way as the common Potatoe, but require much more room; for theſe ſend out many trailing ſtalks, which extend four or five feet every way, and at their joints ſend out roots, which, in warm countries, grow to be large tubers, ſo that from a ſingle root planted, forty or fifty large roots are produced. This plant is ſometimes propagated by way of curioſity in England, but the roots ſhould be planted on a hot-bed in the ſpring; and if the plants are kept covered in bad weather with glaſſes, they will produce flowers, and many ſmall roots will be produced from the joints; but if they are expoſed to the open air, they ſeldom make much progreſs.

The eighth ſort grows naturally at La Vera Cruz in New Spain, from whence the ſeeds were ſent me by the late Dr. Houſtoun. This riſes with a ſtrong winding ſtalk to the height of twenty feet, dividing into ſeveral ſmaller, which faſten themſelves about any of the neighbouring trees and ſhrubs; theſe are garniſhed with leaves in ſhape of a hand, having ſeven lobes, which are ſpear-ſhaped, and deeply cut on their borders, ending in ſharp points. The flowers are ſingle on each foot-ſtalk, which are very long. The empalement of the flower is large, ſpreading open, and is divided deeply into five parts. The flowers are large, of a purple colour, and are ſucceeded by large roundiſh ſeed-veſſels, having three cells, in each of theſe is lodged a ſingle ſeed.

This plant is tender, ſo the ſeeds ſhould be ſown on a hot-bed in the ſpring; and when the plants are fit to remove, they muſt be tranſplanted each into a ſeparate pot filled with light earth, and plunged into a moderate hot-bed, obſerving to ſhade them from the ſun till they have taken new root; then they ſhould have a large ſhare of air admitted to them every day, to prevent their drawing weak, and alſo ſhould have moderate waterings three or four times a week. When the plants are grown too tall to remain in the hot-bed, they muſt be ſhifted into larger pots, and placed in the bark-ſtove, where, if they are allowed room, they will riſe to a great height, and produce flowers, but it rarely produces ſeeds in England.

The ninth ſort is an annual plant. The ſeeds of this were ſent me from Carthagena in New Spain, where the plant grows naturally. This riſes with a twining ſlender ſtalk ten feet high, which is garniſhed with arrow-pointed leaves, whoſe ears at the baſe are rounded. The flowers are produced in ſmall cluſters, ſtanding on long foot-ſtalks; theſe are yellow, and are ſucceeded by three-cornered ſeed-veſſels, having three cells, in each of theſe are lodged two ſeeds.

This plant is annual, and too tender to thrive in the open air in England; ſo the ſeeds ſhould be ſown on a hot-bed in the ſpring, and the plants may be afterward treated in the ſame way as the eighth ſort, with which management they will flower and produce ripe ſeeds.

The ſeeds of the tenth ſort were ſent me from Jamaica by the late Dr. Houſtoun, who found the plants growing naturally there in great plenty. This is an annual plant, riſing with ſlender, ſtiff, twining ſtalks, eight or nine feet high, garniſhed with heart-ſhaped leaves, which are downy. The flowers ſtand many together at the end of ſtrong foot-ſtalks; theſe are purple, and are ſucceeded by roundiſh ſeed-veſſels, with three cells, containing ſeveral ſmall ſeeds.

This ſort requires the ſame treatment as the eighth, being too tender to thrive in this country in the open air.

The eleventh ſort was ſent me from the iſland of Barbuda. This is an annual plant, which riſes with twining ſtalks ſeven or eight feet high, garniſhed with oblong, oval, ſmooth leaves. The flowers come out at every joint on ſlender long foot-ſtalks, each ſupporting a large purple flower, whoſe empalement is cut almoſt to the bottom, in ten parts. The ſeeds and capſule are like thoſe of the other ſpecies. This is a tender plant, ſo muſt be treated in the ſame manner as the eighth ſort.

The twelfth ſort grows naturally at Carthagena in New Spain, from whence I received the ſeeds. This is a perennial plant, which riſes with ſtrong winding ſtalks to the height of twelve or fourteen feet, and are garniſhed with leaves, divided into five lobes, ſtanding upon ſhort foot-ſtalks; the flowers ſtand upon long foot-ſtalks, each ſuſtaining two purple flowers. The ſtalks, leaves, and every part of the plant, is cloſely covered with pungent ſtinging hairs, of a light brown colour. This ſort is tender, ſo muſt be treated in the ſame way as the eighth.

The thirteenth ſort grows naturally about Tolu in New Spain, from whence the ſeeds were ſent me by the late Mr. Robert Millar. This hath a ligneous ſtalk covered with a purple bark, which twines about the trees, and riſes to the height of thirty feet or more, and is garniſhed with leaves, which are deeply divided into five ſharp-pointed lobes. The flowers ſtand upon long thick foot-ſtalks, which have a knee in the middle; they are very large, and of a purple colour; theſe are ſucceeded by round ſeed-veſſels, as large as a middling Apple, divided into three cells, each containing two very large ſmooth ſeeds.

This plant is too tender to thrive in the open air in England, ſo muſt be treated in the ſame manner as the eighth ſort, but it grows too tall for the ſtoves here. I have had theſe plants upward of twenty feet high, which have ſent out many ſide branches, extending ſo wide on every ſide, as to cover moſt of the neighbouring plants, ſo that I was obliged to remove them into a cooler ſituation, where they would not thrive.

The fourteenth ſort grows naturally on the ſea ſhores in moſt of the iſlands in the Weſt-Indies, where the ſtalks trail on the ground, which are garniſhed with oval leaves, indented at the top. The flowers are large, of a purple colour, and are produced by threes, on very long foot-ſtalks; theſe are ſucceeded by large oval ſeed-veſſels, with three cells, each containing a ſingle ſeed. This hath a perennial ſtalk, which trails on the ground, and ſpreads to a great diſtance, but is too tender to thrive in the open air in England, ſo muſt be treated in the ſame manner as the eighth ſort,

and

and may be continued two or three years in a warm ſtove; but it is apt to ſpread too far for a ſmall ſtove, ſo that where there is not great room, it is not worthy of culture.

The fifteenth ſort grows naturally in Jamaica; this riſes with ſlender twining ſtalks eight or ten feet high; the leaves of theſe are ſhaped a little like thoſe of the common great white Convolvulus, but the foot-ſtalks, which are pretty long, do each ſuſtain many purple flowers, growing in bunches. The ſeed-veſſels of this ſort are three-cornered, and have three cells, each containing a ſingle ſeed. This is an annual plant, which requires a hot-bed to raiſe it, and muſt be kept in a glaſs-caſe or a ſtove, otherwiſe the ſeeds will not ripen here.

The ſixteenth ſort has been long preſerved in ſeveral curious gardens in England. It grows naturally in the Canary Iſlands; this hath a ſtrong fibrous root, from which ariſe ſeveral twining woody ſtalks, dividing into many ſmaller; theſe, where they have ſupport, will grow more than twenty feet high, and are garniſhed with oblong heart-ſhaped leaves, which are ſoft and hairy. The flowers are produced from the wings of the leaves, ſeveral ſtanding upon one foot-ſtalk; theſe are for the moſt part of a pale blue, but there is a variety of it with white flowers. This plant flowers in June, July, and Auguſt, and ſometimes ripens ſeeds here; but as the plants are eaſily propagated by layers, and alſo from cuttings, the ſeeds are not ſo much regarded; nor indeed will thoſe plants which are raiſed by layers or cuttings produce ſeeds, though thoſe which come from ſeeds ſeldom fail. As the leaves of this plant continue green all the year, the plants make a pretty variety in winter in the green-houſe; for it will not live abroad in winter in this country, though it only requires the ſame protection as Myrtles, and other hardy green-houſe plants. It may be propagated by laying down the young ſhoots in the ſpring, which generally put out roots in three or four months; then they may be taken from the old plants, and each planted in a ſeparate pot filled with light earth, and placed in the ſhade till they have taken new root; after which they may be placed with other hardy green-houſe plants till autumn, when they ſhould be removed into the green-houſe, and afterward treated in the ſame way as Myrtles, and other green-houſe plants. If the tender cuttings of this are planted during any of the ſummer months, in pots filled with light earth, and plunged into a moderate hot-bed, ſhading them from the ſun, they will take root, and afterward ſhould be treated as the layers.

The ſeventeenth ſort is an annual plant; the ſeeds of it were ſent me from Jamaica, where it grows naturally. This riſes with a very ſlender twining ſtalk four or five feet high, garniſhed with triangular leaves, which are pointed. The flowers grow in cluſters, ſitting cloſe to the ſtalks, which are blue, and are ſucceeded by ſeeds like thoſe of the fourth ſort. This ſort will not ripen ſeeds in England, unleſs the plants are brought forward on a hot-bed in the ſpring, and afterward placed in a glaſs-caſe, where they may be defended from cold.

The eighteenth ſort grows naturally in Jamaica, from whence the ſeeds were ſent me by the late Dr. Houſtoun. This is one of the moſt beautiful kinds, the flowers being very large, and of a fine Roſe colour. It riſes with a winding ſtalk ſeven or eight feet high, which is garniſhed with heart-ſhaped leaves, ending in long ſharp points, ſitting upon very long foot-ſtalks. The flowers alſo have long foot-ſtalks, each ſupporting two flowers, whoſe empalement is divided deeply into five parts; the ſeeds of this are large, and covered with a fine down. This is an annual plant, which is too tender to thrive in the open air in this country, ſo the ſeeds ſhould be ſown on a hot-bed in the ſpring, and the plants afterward treated in the ſame manner as is directed for the eighth ſort.

The nineteenth ſort grows naturally near the ſea at Campeachy, from whence I received the ſeeds. This hath ſtrong, ſmooth, winding ſtalks, which ſend out roots at their joints, and are garniſhed with arrow-pointed leaves, whoſe ears or lobes are obtuſe; the flowers are large, of a ſulphur colour, and ſit upon very long foot-ſtalks, which proceed from the ſide of the ſtalks, each ſupporting one flower, with a large ſwelling empalement; theſe are ſucceeded by large, ſmooth, oval capſules, having three cells, each including one large ſmooth ſeed. This is a perennial plant, whoſe ſtalks extend to a great diſtance, and put out roots at the joints, whereby it propagates in plenty; but it is too tender to thrive in England, unleſs it is preſerved in a warm ſtove, where it requires more room than can well be allowed to one plant. It muſt be treated in the ſame manner as the eighth ſort.

The twentieth ſort grows naturally in Africa, from whence the ſeeds were ſent to the royal garden at Paris, and from thence I received it in 1730. This riſes with a ſlender winding ſtalk five or ſix feet high, garniſhed with heart-ſhaped arrow-pointed leaves; the flowers ſtand on long ſlender foot-ſtalks; theſe are white, with purple bottoms. This ſort may be treated in the ſame manner as the common great Convolvulus.

The twenty-firſt ſort grows naturally in Spain and Italy. This is an annual plant, which riſes about two feet high, with ſlender twining ſtalks, garniſhed with oval leaves. The flowers are ſmall, and of a bluiſh colour, each foot-ſtalk ſupporting one flower of little beauty, ſo is not often cultivated in gardens. If the ſeeds of this ſort are permitted to ſcatter, the plants will riſe in the ſpring, and require no other culture but to keep them clean from weeds; or if the ſeeds are ſown in the ſpring, where the plants are to remain, they will flower in June, and the ſeeds will ripen in Auguſt.

The twenty-ſecond ſort grows naturally in Sicily, and alſo in the iſlands of the Archipelago. This hath a perennial root, which ſends out many ſlender ſtiff ſtalks, twiſting themſelves round the neighbouring plants, and riſe five or ſix feet high; theſe are garniſhed with leaves, which are divided into five or ſeven narrow lobes, and are of a ſoft texture, like ſattin, ſtanding on ſhort foot-ſtalks. The flowers are produced from the ſide of the ſtalks upon long foot-ſtalks, which ſuſtain two flowers of a pale Roſe colour, with five ſtripes of a deeper red. This ſort creeps at the root, ſo ſeldom produces ſeeds in England, but is propagated by ſhoots taken from the old plants. The beſt time for parting and tranſplanting theſe plants, is about the beginning of May, when they may be taken out of the green-houſe, and expoſed in the open air; but the young plants which are ſeparated from the old ones, ſhould be placed under a frame, and ſhaded from the ſun till they have taken new root; after which they muſt be gradually hardened to bear the open air, to which they muſt be expoſed all the ſummer; but in autumn they muſt be placed in the green-houſe, and may be treated in the ſame way as the Canary Convolvulus beforementioned.

The twenty-third ſort hath ſome appearance of the twenty-ſecond, and hath been ſuppoſed to be the ſame ſpecies by ſome writers; but I have cultivated both many years, and never have found either of them alter, ſo that I make no doubt of their being diſtinct plants. This ſort hath a perennial root like the former, which ſends out many weak twining ſtalks, riſing about three feet high, twiſting about the plants which ſtand near it, or about each other, and if they have no other ſupport, fall to the ground; theſe are garniſhed with leaves of different forms, ſome are ſhaped almoſt like thoſe of Betony, being ſlightly cut on their edges, others are almoſt heart-ſhaped, and are deeply cut on the ſides, and ſome are cut to the midrib; they have a ſhining appearance like ſattin, and are ſoft to the touch, ſtanding on ſhort foot-ſtalks. The flowers are produced on the oppoſite ſide from the leaves, having very long foot-ſtalks, each ſuſtaining two flowers of a pale Roſe colour, very like thoſe of

of the former ſpecies. It flowers in June, July, and Auguſt, but rarely ripens ſeeds in England. It hath a perennial root, which ſends out offsets, by which it is propagated in England, in the ſame manner as the laſt mentioned, and the plants muſt be treated in the ſame way.

The twenty-fourth ſort grows naturally in Portugal, but hath been long cultivated in the flower-gardens in England for ornament; this is uſually titled Convolvulus Minor, by the ſeedſmen and gardeners. It is an annual plant, which hath ſeveral thick herbaceous ſtalks, growing about two feet long, which do not twine like the other ſorts, but decline toward the ground, upon which many of the lower branches lie proſtrate; theſe are garniſhed with ſpear-ſhaped leaves, which ſit cloſe to the branches; the foot-ſtalks of the flowers come out juſt above the leaves at the ſame joint, and on the ſame ſide of the ſtalks; theſe are about two inches long, each ſuſtaining one large open bell-ſhaped flower, which in ſome is of a fine blue colour, with a white bottom; in others they are pure white, and ſome are beautifully variegated with both colours. The white flowers are ſucceeded by white ſeeds, and the blue by dark-coloured ſeeds, and this difference is pretty conſtant in both; but thoſe plants with variegated flowers, have frequently plain flowers of both colours intermixed with the ſtriped; therefore the only method to continue the variegated ſort, is to pull off all the plain flowers when they appear, never ſuffering any of them to remain for ſeed.

This ſort is propagated by ſeeds, which ſhould be ſown on the borders of the flower-garden where they are deſigned to remain. The uſual method is to put two or three ſeeds in each place where they are intended to flower, covering them half an inch with earth; and when the plants come up, if the ſeeds all grow, there ſhould be but two left in each place, which will be ſufficient; the others ſhould be drawn out carefully, ſo as not to diſturb the roots of thoſe which are left; after which they will require no other culture but to keep them clean from weeds. If the ſeeds are ſown in autumn, the plants will flower in May; but thoſe which are ſown in the ſpring, will not flower till about the middle of June, and will continue flowering till the froſt ſtops them. The ſeeds ripen in Auguſt and September.

The twenty-fifth ſort grows naturally in Italy and Sicily. This hath a perennial root, which runs deep in the ground, from which ariſe two or three upright branching ſtalks near two or three feet high, garniſhed with narrow leaves about two inches long, which ſit cloſe to the ſtalks; the foot-ſtalks of the flower proceed from the ſame place; theſe are four or five inches long, each ſuſtaining four or five flowers, of a pale Roſe colour, which ſpread open almoſt flat. This flowers in June and July, but ſeldom produces good ſeeds in England. It is propagated by ſeeds, which muſt be obtained from the countries where it naturally grows; theſe ſhould be ſown upon a warm dry border, where they are deſigned to remain; for as the plants run down with long tap-roots, they will not bear tranſplanting, for I have often made trial of this without any ſucceſs. When the plants come up, they ſhould be thinned where they grow too cloſe, and afterward conſtantly kept clean from weeds, which is all the culture it will require. It flowers in July and Auguſt, and the ſtalks decay in autumn; but the roots will laſt ſeveral years, and if they are in a dry ſoil and warm ſituation, will abide through the winters very well without covering. I have received a variety of this from Nice, where it grows naturally, with broader leaves, which are hairy. The flowers are placed all toward the top of the ſtalk upon long foot-ſtalks, growing many together very cloſely joined: but I cannot be ſure if it is not a ſeminal variation, for it was ſent me by the ſame title.

The twenty-ſixth ſort grows naturally in France; this hath a perennial creeping root, from which ariſe ſeveral ſhort branching ſtalks about four inches high, garniſhed with ſpear-ſhaped ſilky leaves; the flowers are produced on the ſide, and at the top of the ſtalks, in ſmall cluſters, ſitting cloſe together; theſe are much ſmaller than thoſe of the former ſort, but are of a deeper Roſe colour: this ſeldom produces ſeeds in England, but the roots propagate in plenty. It delights in a light dry ſoil, and requires no other care but to keep the plants clean from weeds; it may be tranſplanted either in the ſpring or autumn. This is by ſome ſuppoſed to be the ſame as the laſt mentioned ſort, but whoever has cultivated them, can have no doubt of their being different ſpecies.

The twenty-ſeventh ſort grows naturally in Italy, Sicily, and the iſlands in the Archipelago. It riſes with upright ſhrubby ſtalks about three feet high, cloſely garniſhed with blunt, ſpear-ſhaped, ſilky leaves, which are placed on every ſide the ſtalks; they are near two inches long, and a quarter broad, rounding at their ends. The flowers are produced in cluſters at the top of the ſtalks, ſitting very cloſe; they are of a pale Roſe colour, and come out in June and July, but do not perfect ſeeds in England. This plant will live in the open air in mild winters, if it is planted in a light ſoil and a warm ſituation, but in hard winters it is deſtroyed; therefore ſome of the plants ſhould be kept in pots, and ſheltered under a common frame in winter, where it may enjoy the free air in mild weather, and be protected from the froſt, and in ſummer placed abroad with other hardy exotic plants, where its fine ſilky leaves will make a pretty appearance. It may be propagated by laying down the branches, and alſo by cuttings, but both very ſeldom put out roots the ſame year, and many of them will fail; ſo that the beſt way is to procure the ſeeds from Italy, for thoſe plants which come from ſeeds, grow much larger than thoſe which are propagated the other way.

The twenty-eighth ſort grows naturally in Candia, and ſeveral of the iſlands in the Archipelago. This hath a perennial root, which ſends up ſeveral erect branching ſtalks about two feet high, which are garniſhed with very narrow-pointed leaves, ſitting cloſe to the ſtalks, which are hoary. The flowers come out ſingly on the ſide of the ſtalks, ſitting very cloſe to them, having ſcarce any foot-ſtalks; theſe are of a very pale bluiſh colour, and ſpread open almoſt to the bottom. It flowers in June and July, but rarely produces any ſeeds in England.

This ſort is propagated in the ſame manner as the twenty-fifth, and the plants require the ſame treatment. This plant muſt have a dry ſoil and a warm ſituation, otherwiſe it will not live through the winter in the open air in England. As the ſtalks of this ſort decay in autumn, ſo if the ſurface of the ground about their roots is covered with ſome old tanners bark, it will preſerve them in the hardeſt froſts.

The twenty-ninth ſort is uſed in medicine. This is ſtiled Soldanella, and Braſſica marina; it grows naturally on the ſea beaches in many parts of England, but cannot be long preſerved in a garden. This hath many ſmall, white, ſtringy roots, which ſpread wide, and ſend out ſeveral weak trailing branches, which twine about the neighbouring plants like the common Bindweed, and are garniſhed with kidney-ſhaped leaves about the ſize of thoſe of the leſſer Celandine, ſtanding upon long foot-ſtalks, and are placed alternate. The flowers are produced on the ſide of the branches at each joint. Theſe are ſhaped like thoſe of the firſt ſort, and are of a reddiſh purple colour; they appear in July, and are ſucceeded by round capſules, having three cells, each containing one black ſeed; every part of the plant abounds with a milky juice. This is eſteemed a good medicine to purge off watery humours, and is preſcribed in dropſies.

The thirtieth ſort grows naturally in the iſland of Ceylon. This is a perennial plant, having thick fleſhy roots, which ſpread far in the ground, and abound with a milky juice, which flows out when the roots are broken or wounded, and ſoon hardens into a reſinous ſubſtance, when expoſed to the ſun and air. From the root ſhoots forth many twining branches,

which twiſt about each other, or the neighbouring plants, like the common Bindweed. Theſe are garniſhed with heart-ſhaped leaves, which are ſoft to the touch, like thoſe of the Marſh Mallow. The flowers are produced at the joints on the ſide of the ſtalks, ſeveral ſtanding together on the ſame foot-ſtalk; they are white, and ſhaped like thoſe of the common great Bindweed. Theſe are ſucceeded by round capſules, having three cells, which contain two ſeeds in each.

The roots of this plant, which is the only part uſed in medicine, are brought to us from India. It is titled Turpethum, or Turbith in the ſhops.

This plant is tender, ſo will not live in the open air in England; it is propagated by ſeeds, which muſt be ſown on a hot-bed; and when the plants are fit to remove, they ſhould be each planted in a ſeparate pot, and plunged into a hot-bed of tanners bark, and ſcreened from the ſun till they have taken freſh root, and afterward muſt be treated in the ſame manner as hath been directed for the eighth ſort.

The thirty-firſt ſort is the Jalap which is uſed in medicine. This grows naturally at Haleppo, in the Spaniſh Weſt-Indies, ſituated between La Vera Cruz and Mexico. The root of this plant hath been long uſed in medicine, but it was not certainly known, what plant it was produced from. The old title of this was Mechoacana nigra, but father Plumier aſſerted that it was the root of one ſpecies of Marvel of Peru; from whence Tournefort was induced to conſtitute a genus from that plant, under the title of Jalapa. But Mr. Ray, from better information, put it among the Convolvuli, and titled it Convolvulus Americanus, Jalapium dictus. This was by the late Dr. Houſtoun certainly aſcertained, who brought ſome of the roots of this plant from the Spaniſh Weſt-Indies to Jamaica, where he planted them, with a deſign of cultivating the plants in that iſland, where he obſerved them to thrive, during his abode there: but ſoon after he left the country, the perſon to whoſe care he committed them, was ſo careleſs as to ſuffer hogs to root them out of the ground, and deſtroy them; ſo that there was no remains of them left, when he returned there; nor have I heard of this plant being introduced into any of the Britiſh iſlands ſince.

A few years paſt I received a few of the ſeeds of this plant, which ſucceeded in the Chelſea garden, where the plants throve very well, but did not produce any flowers. This hath a large root of an oval form, which is full of a milky juice; from which come out many herbaceous triangular twining ſtalks, riſing eight or ten feet, garniſhed with variable leaves, ſome of them being heart-ſhaped, others angular, and ſome oblong and pointed. They are ſmooth, and ſtand upon long foot-ſtalks; and from a drawing of the plant, made by a Spaniard in the country, where it grows naturally, who gave it to Dr. Houſton, and is now in my poſſeſſion, the flowers are ſhaped like thoſe of the common Great Bindweed, each foot-ſtalk ſupporting one flower. But as it is only a pencil drawing, ſo the colour is not expreſſed, therefore I can give no farther account of it. The ſeeds of this are covered with very white down like cotton.

As this plant is a native of a warm country, ſo it will not thrive in England, unleſs it is preſerved in a warm ſtove; therefore the ſeeds muſt be ſown on a hot-bed, and the plants put into pots, and plunged into a hot-bed of tanners bark, and treated in the ſame manner as the eighth ſort; with this difference only, that as this hath large, fleſhy, ſucculent roots, ſo they ſhould have but little water given them, eſpecially in winter, leſt it cauſe them to rot. They ſhould be planted in light ſandy earth not too rich, for the ſame reaſon, and the plants ſhould always remain in the bark-ſtove.

The root of Jalap is eſteemed an excellent cathartic medicine, purging ſerous watery humours eſpecially, and is of ſingular ſervice in dropſies, and for rheumatic diſorders. But the quantity of the root which is uſed in medicine, is not ſufficient to render the introduction of this plant into the Britiſh colonies, a matter of great concern. But ſince the diſtillers and brewers have found out its uſe for exciting a fermentation, the conſumption of it is now ſo great, as that it would become a national benefit, if it were produced in the Britiſh iſlands; which might be ſoon effected, were the inhabitants of thoſe iſlands a little more attentive to their own, and the public benefit.

CONYZA. Lin. Gen. Plant. 854. Tourn Inſt. R. H. 454. tab. 259. [of Κώνωψ, *Gr.* becauſe the leaves, being hung up, drive away gnats and fleas, as Dioſcorides ſays:] Flea-bane.

The CHARACTERS are,

*It hath a compound flower, made up of many hermaphrodite florets, which compoſe the diſk; and female half florets, which are ranged round the border, and form the rays; the hermaphrodite florets are funnel-ſhaped, and cut into five parts at the brim, which ſpread open; theſe have each five ſhort hairy ſtamina, terminated by cylindrical ſummits; in the bottom of each floret is ſituated a germen ſupporting a ſlender ſtyle, crowned by a bifid ſtigma. The female half florets or rays, are funnel-ſhaped, and cut into three parts at the top; theſe have a germen, with a ſlender ſtyle, terminated by two ſlender ſtigmas, but have no ſtamina. All theſe are included in a common ſcaly empalement, which is oblong and ſquare; the ſcales are pointed, and the outer ones ſpread open. The hermaphrodite and female florets, are each ſucceeded by one oblong ſeed, crowned with down, ſitting upon a plain receptacle, and are included in the empalement.*

This genus of plants is ranged in the ſecond ſection of Linnæus's nineteenth claſs, intitled Syngeneſia Polygamia ſuperflua. The plants of this ſection have hermaphrodite and female florets, which are both fruitful.

The SPECIES are,

1. CONYZA (*Squarroſa*) foliis lanceolatis acutis, caule annuo corymboſo. Hort. Cliff. 405. *Flea-bane with pointed ſpear-ſhaped leaves, an annual ſtalk, and flowers growing in roundiſh bunches.* Conyza major vulgaris. C. B. P. 265. *Common greater Flea-bane.*
2. CONYZA (*Bifrons*) foliis ovato oblongis, amplexicaulibus. Hort. Cliff. 405. *Flea-bane with oblong oval leaves embracing the ſtalks.* Eupatoria Conyzoides maxima Canadenſis, foliis caulem amplexantibus. Pluk. Alm. 141.
3. CONYZA (*Candidis*) foliis ovatis tomentoſis, floribus confertis, pedunculis lateralibus terminalibuſque. Hort. Cliff. 405. *Flea-bane with oval woolly leaves, flowers growing in cluſters, and foot-ſtalks proceeding from the ſides and terminating the ſtalks.* Conyza Cretica fruticoſa, folio molli candidiſſimo & tomentoſo. Tourn. Cor. 33.
4. CONYZA (*Lobata*) foliis inferioribus trifidis, ſuperioribus ovato lanceolatis obſolete ſerratis floribus corymboſis. Hort. Cliff. 405. *Flea bane whoſe under leaves are trifid, thoſe above oval and ſpear-ſhaped, and flowers growing in round bunches.* Conyza arboreſcens lutea, folio trifido. Plum. Cat. 9.
5. CONYZA (*Tomentoſis*) arboreſcens, foliis oblongo ovatis, tomentoſis, ſubtus cinereis, floribus terminalibus pedunculis racemoſis. *Tree Flea-bane with oblong woolly leaves, of an Aſh colour on their under ſide, and flowers terminating the branches, ſtanding upon branching foot-ſtalks.* Conyza arboreſcens, tomentoſa, foliis oblongis, floribus in ſummitatibus racemorum, ramoſis ſparſis albicantibus. Houſt. MSS.
6. CONYZA (*Salicifolius*) foliis linearibus decurrentibus ſerratis, floribus corymboſis terminalibus. *Flea-bane with narrow running leaves, and flowers in round bunches terminating the ſtalks.* Conyza herbacea, caule alato, Salicis folio, floribus umbellatis purpureis minoribus. Houſt. MSS.
7. CONYZA (*Corymboſa*) arboreſcens, foliis lanceolatis, floribus corymboſis, terminalibus pedunculis racemoſis. *Tree Flea-bane with ſpear-ſhaped leaves, and flowers growing in round bunches at the end of the ſhoots, having branching foot-ſtalks.* Conyza arboreſcens, foliis oblongis floribus ſingulis tribus floſculis conſtantibus. Houſt. MSS.

8. Conyza (*Viscosa*) caule herbaceo, foliis ovatis serratis, villosis, floribus alaribus & terminalibus. *Flea-bane with an herbaceous stalk, oval, sawed, hairy leaves, and flowers proceeding from the sides, and at the ends of the branches.* Conyza odorata, Bellidis folio villosa & viscosa. Houst. MSS.

9. Conyza (*Arborescens*) foliis ovatis integerrimis acutis subtus tomentosis, spicis recurvatis secundis, bracteis reflexis. Lin. Sp. 1209. *Flea-bane with entire oval-pointed leaves, woolly on their under side, recurved abounding spikes of flowers, and reflexed bractea.* Conyza fruticosa, flore pallide purpureo, capitulis & lateribus ramulorum spicatum exeuntibus. Sloan. Cat. Jam. 124.

10. Conyza (*Symphytifolia*) foliis oblongo ovatis scabris, floribus racemosis terminalibus, caule herbaceo. *Flea-bane with oblong, oval, rough leaves, flowers growing in bunches at the ends of the branches, and an herbaceous stalk.* Conyza Symphyti facie, flore luteo. Houst. MSS.

11. Conyza (*Scandens*) foliis lanceolatis scabris, nervosis sessilibus, racemis recurvatis, floribus adscendentibus, pedunculis lateralibus caule fruticoso scandente. *Flea-bane with rough, nervous, spear-shaped leaves sitting close to the branches, recurved spikes, with flowers standing upward, foot-stalks proceeding from the side of the branches, and climbing shrubby stalks.* Conyza Americana scandens, Lauri folio aspero, floribus spicatis albis. Houst. MSS.

12. Conyza (*Trinerviis*) foliis ovatis glabris, trinerviis integerrimis, floribus spicatis terminalibus, caule fruticoso. *Flea-bane with oval smooth leaves, which have three veins and are entire, flowers growing in spikes at the ends of the branches, and a shrubby stalk.* Conyza Americana frutescens, foliis ovatis trinerviis & integris, floribus spicatis albis. Houst. MSS.

13. Conyza (*Uniflora*) foliis lanceolatis acutis sessilibus, floribus singulis lateralibus, calycibus coloratis, caule fruticoso ramoso. *Flea-bane with pointed spear-shaped leaves sitting close to the branches, single flowers on the side of the branches, which have coloured empalements, and a shrubby branching stalk.* Conyza Americana frutescens foliis oblongis acutis, capitulis & ramulorum exeuntibus, calycibus purpurascentibus. Houst. MSS.

14. Conyza (*Spicata*) fruticosa foliis ovatis trinerviis, floribus spicatis alaribus. *Shrubby Flea-bane with oval leaves having three nerves, and flowers growing in spikes from the side of the branches.*

15. Conyza (*Pedunculata*) foliis ovato lanceolatis trinerviis, pedunculis longissimis terminalibus floribus corymbosis. *Flea-bane with oval spear-shaped leaves having three veins, foot-stalks which are very long terminating the branches, and flowers growing in round bunches.*

16. Conyza (*Baccharis*) foliis ovato oblongis, obtusis serratis, semiamplexicaulibus, floribus corymbosis terminalibus. *Flea-bane with oblong oval leaves which are obtuse and sawed, half embracing the stalks with their base, and flowers in round bunches terminating the stalks.* Eupatorium Conyzoides Sinica Baccharidis folio rarius crenato, summo caule ramoso, floribus parvis coronato. Pluk. Amath. 80.

17. Conyza (*Odorato*) foliis lanceolatis serratis, petiolatis, caule fruticoso ramoso, floribus corymbosis terminalibus. *Flea-bane with spear-shaped sawed leaves having foot-stalks, and flowers growing in round bunches at the end of the branches.* Conyza major odorato sive Baccharis floribus purpureis nudis. Sloan. Cat. Jam. 121.

18. Conyza (*Hirsuta*) foliis ovalibus integerrimis scabris subtus hirsutis. Lin. Sp. 1209. *Flea-bane with oval, entire, rough leaves, hairy on their under side.*

The first sort grows naturally upon dry places in several parts of England, so is seldom allowed a place in gardens. This is a biennial plant, which decays soon after the seeds are ripe; it hath several large, oblong, pointed leaves, growing near the ground, which are hairy; between these the stalks come out, which rise two feet and a half high, dividing upward into several branches, garnished with smaller oblong leaves, standing alternate; at the ends of the stalks the flowers are produced in round bunches, which are of a dirty yellow colour; these are succeeded by oblong seeds, crowned with down. It flowers in July, and the seeds ripen in autumn. If the seeds are permitted to scatter, the plants will come up the following spring, and require no other care but to keep them clean from weeds.

The second sort grows naturally on the mountains in Italy, and is preserved in botanic gardens for the sake of variety. This hath a biennial root but an annual stalk. From a thick fibrous root arise many upright stalks, garnished with oblong oval leaves, which are rough, and embrace the stalks with their base; these have appendages running along the stalk, from one to the other, whereby the stalk is winged. The upper part of the stalks divide into many smaller branches, garnished with leaves of the same form as the other, but smaller, standing alternate; the branches and main stalks, are terminated by yellow flowers growing in round bunches; these are succeeded by oblong seeds, crowned with down. It flowers in July, and the seeds ripen in autumn. This is propagated by seeds, which may be sown on a bed of light earth in the spring, and when the plants come up, they should be thinned where they are too near, and kept clean from weeds; the following autumn they may be transplanted where they are designed to remain, and require no other care but to keep them clean from weeds. The second year they will flower and produce ripe seeds, and will continue two years if the soil is not too good, for these plants often rot, when they are planted in a rich soil.

The third sort grows naturally in Crete. This hath a short shrubby stalk, which in this country seldom rises more than six inches high, dividing into several short branches, which are closely garnished with oval, woolly, very white leaves; from these branches arise the flower-stalks, which are woolly, about nine inches high, garnished with small, oval, white leaves, placed alternate. The flowers are produced at the sides, and end of the stalk, sometimes but one, at other times two, and sometimes three flowers standing on the same foot-stalk. They are of a dirty yellow colour, and appear in July, but rarely are succeeded by seeds in this country; so the plant is propagated here by slips, which, if taken from the old plants in June, and planted on an east-aspected border, and covered with hand-glasses, will take root in six or eight weeks. But these slips must be frequently, but gently refreshed with water, and the glasses should be shaded in hot weather; and after they have been planted a fortnight, the glasses should be raised on one side to admit air to the cuttings; and when they have taken root, they should be gradually exposed to the open air. In autumn these should be carefully taken up, preserving the earth to their roots; some of them may be planted in pots, that they may be sheltered under a frame in the winter; and the others should be planted in a warm border of dry poor earth, where they will endure the cold of our ordinary winters very well, and continue many years. This is preserved in gardens, more for the beauty of its silvery leaves than its flowers, which have not much to recommend them.

The fourth sort grows naturally in Jamaica, from whence it was sent me by the late Dr. Houstoun. This is titled by Sir Hans Sloane Virga aurea major, sc. Herba Doria folio sinuato hirsuto. Cat. Jam. 125. It rises with a shrubby stalk seven or eight feet high, dividing into several branches, garnished with rough leaves four inches long, shaped like the point of a halbert. The flowers are produced in roundish bunches, at the extremity of the branches; they are yellow, and stand close together. These are succeeded by oblong seeds crowned with down.

This plant is too tender to thrive in the open air in this country, therefore the seeds must be sown upon a hot-bed; and when the plants are fit to remove, they must be each transplanted into a separate small

pot filled with light sandy earth, and plunged into a hot-bed, observing to screen them from the sun till they have taken new root; then they must have free air admitted to them every day, in proportion to the warmth of the season; they must also be frequently watered in warm weather, but they should not have it in too great plenty. As the plants advance in strength, so they must have a greater share of air; and if the season is warm, they may be exposed to the open air for a few weeks in the heat of summer, provided they are placed in a warm situation; but if the nights prove cold, or much wet should fall, they must be removed into shelter: if these plants are placed in a moderate stove in winter, they will thrive better than in greater heat, and in summer they should have a large share of air. With this management I have had the plants flower well in July, though they have not perfected seeds here.

The fifth sort rises with a woody stalk ten or twelve feet high, dividing into many branches, whose bark is covered with a brown down; these are garnished with oblong oval leaves, which are green on their upper side, but of an Ash colour on their under, placed alternate, on short foot-stalks. The flowers are produced at the end of the branches, upon long branching foot-stalks, in loose spikes ranged on one side; they are white, and are succeeded by long flat seeds crowned with down. This plant grows naturally at La Vera Cruz in New Spain, from whence Dr Houstoun sent me the seeds. It is a tender plant, so must be treated in the same manner as hath been directed for the former sort.

The sixth sort grows naturally at La Vera Cruz in New Spain. This hath a perennial root, from which arise several upright stalks three feet high, garnished with long narrow leaves, sawed on their edges, placed alternate, and have appendages which run along the stalk from one to the other, forming a border or wing to the stalks. The flowers are produced at the end of the stalks in round bunches, they are small, and of a purple colour, and are succeeded by oblong flat seeds, crowned with down. This is propagated by seeds, which must be sown upon a hot-bed in the spring, and the plants must afterward be transplanted into pots, and plunged into a fresh hot-bed, observing to screen them from the sun till they have taken fresh root; after which they must have a large share of air, and about Midsummer they may be placed in the open air in a sheltered situation, where they may remain till the end of September, when they should be removed into the stove, and during the winter kept in a temperate degree of warmth. The second year these plants will flower, but they do not perfect seeds in England.

The seventh sort was sent me from La Vera Cruz by the late Dr. Houstoun, who found it growing there naturally. This hath a strong woody stem, which rises to the height of fourteen or sixteen feet, covered with an Ash-coloured bark, and is divided upward into many ligneous branches, garnished with spear-shaped leaves standing alternate, on short foot-stalks. These branches are terminated by roundish bunches of white flowers, sitting upon long foot-stalks, several of them being joined on the same foot-stalk. These are not succeeded by seeds in England, so that the seeds must be procured from abroad, and these must be sown on a hot-bed, and the plants afterward treated in the same manner as the fourth sort.

The eighth sort grows naturally at La Vera Cruz, from whence it was sent me by the late Dr. Houstoun; this is an annual plant, which grows in low moist places, where the water stands in winter; it hath an herbaceous branching stalk, which rises about one foot high, garnished at each joint with one oval leaf, sitting close to the branches; these are sawed on their edges, and covered with a white hairy down. The flowers are produced from the side of the branches on slender foot-stalks, each for the most part sustaining three flowers, which are white, and are succeeded by chaffy seeds, crowned with down; the whole plant is viscous, and will stick to the fingers of those who handle it.

The seeds of this plant must be sown on a hot-bed in the spring, and when the plants are fit to remove, they should be each transplanted into a separate pot, and plunged into a fresh hot-bed, and treated in the same manner as the other tender sorts, but must have a large share of air in warm weather, and frequently refreshed with water. In July these plants will flower, and if the autumn proves favourable, they will ripen their seeds; a plant or two of this sort may be preserved for the sake of variety, but there is little beauty in it.

The ninth sort grows naturally in Jamaica, from whence the seeds were sent me by the late Dr. Houstoun; this rises with a shrubby stalk six or seven feet high, dividing into many ligneous branches, which have a mealy bark, and garnished with spear-shaped leaves, sitting close to the branches; they are hairy, and of a silver colour on their under side, and are placed alternate. The flowers come out from the side of the branches, generally in loose spikes, which grow horizontal, and stand on the upper side erect; but sometimes they come out single, sitting close between the leaf and branch; these are of a pale purple colour, and are succeeded by chaffy seeds, crowned with a down.

This sort is propagated by seeds, which must be obtained from the country where it grows naturally, for it doth not produce seeds in England, though it has flowered several years in the Chelsea garden; the seeds must be sown, and the plants afterward treated in the same manner as hath been before directed for the fourth sort.

The tenth sort grows naturally at La Vera Cruz, from whence it was sent me by the late Dr. William Houstoun; this hath a perennial root, and an annual stalk. It grows about three feet high; the leaves are from four to five inches long, and one and a half broad in the middle, and are rough like those of Comfrey. The stalks are terminated by branching flower-stalks, each foot-stalk sustaining several yellow flowers, not much unlike those of the common sort. This is propagated by seeds in the same manner as the sixth sort, and the plants must be treated in the same way. It will flower the second year, but it doth not ripen seeds in England.

The eleventh sort was sent me from La Vera Cruz by the late Dr. Houstoun; this hath a climbing shrubby stalk, which rises fourteen or sixteen feet high, and divides into many branches, garnished with leaves about the size of those of the Bay-tree, and full as thick in their texture, having many deep transverse nerves, running from the midrib to the sides; they are of a pale green colour. The flowers are produced in long spikes, ranged on the upper side of the spike only, which come out from the side of the branches, pointed upward; these are large and white, and are succeeded by flat dark-coloured seeds, crowned with down.

This plant makes a fine appearance in the stove when it flowers, and as it retains its leaves all the year, so in the winter season it affords an agreeable variety among other tender plants. The culture of this plant is the same as hath been directed for the fourth sort, so need not be repeated.

The twelfth sort was sent me from Carthagena in New Spain, where it grows naturally, by the late Mr. Robert Millar, surgeon; this rises with a shrubby stalk six or seven feet high, dividing into several ligneous branches, garnished with oval, smooth, entire leaves, having three longitudinal veins, placed alternate, close to the branches. The flowers are produced in short close spikes at the end of the branches; these are white, and are succeeded by oblong flat seeds, crowned with down; this sort is tender, so must be treated in the same manner as the fourth, and will abide several years with this management.

The thirteenth ſort grows naturally in the ſame country as the laſt mentioned, and was ſent me by the ſame gentleman; this riſes with a ſhrubby ſtalk eight or ten feet high, dividing into many long ſlender branches, garniſhed with ſpear-ſhaped leaves, three inches long, and three quarters of an inch broad in the middle, ending in acute points; the ſmaller branches are ſet with very narrow, oblong, pointed leaves, which grow cloſe to the ſtalks; and at each joint is produced one pretty large white flower, with a purple empalement; theſe flowers come out the whole length of the ſmall branches, ſitting cloſe to the baſe of the leaves, ſo that the plants make a pretty appearance in flower. This may be propagated in the ſame way as the fourth, and with that management it hath flowered very well, but it doth not produce ſeeds in England.

The fourteenth ſort was ſent me from Carthagena by the before-mentioned gentleman, who found it growing there in great plenty. This hath a ſtrong woody ſtem, riſing ten or twelve feet high, divided upward into many ſhort ligneous branches, whoſe joints are very cloſe to each other. The leaves come out alternate on every ſide the branches, to which they ſit very cloſe; they are ſmooth, one inch long, and half an inch broad, ending in acute points, having three longitudinal veins. The flowers are white, and produced in ſhort cloſe ſpikes, which come out from the ſide of the branches, and are ſucceeded by oblong flat ſeeds, crowned with down.

This is a tender plant, ſo requires the ſame treatment as the fourth ſort, with which it hath flowered very well, but hath not produced ſeeds in England.

The fifteenth ſort riſes with a ſhrubby ſtem to the height of ſix or ſeven feet, dividing into ſeveral branches, which have a dark brown bark, and are cloſely garniſhed with oval, ſpear-ſhaped, ſmooth leaves, having three longitudinal veins, ſtanding on ſhort foot-ſtalks, placed alternate on every ſide the branches. The flowers are produced on long naked foot-ſtalks, which extend five or ſix inches beyond the end of the branches; theſe are purple, and form a kind of round bunch: the empalement of the flower is compoſed of ſhort chaffy ſcales.

This grows naturally at Campeachy, from whence the ſeeds were ſent me by Mr. Robert Millar. It is a tender plant, ſo muſt be treated in the ſame way as is directed for the fourth ſort, with which it hath flowered, but hath not produced ſeeds in this country.

The ſixteenth ſort grows naturally at Campeachy, from whence I received the ſeeds; this riſes with a ſhrubby ſtalk to the height of ten or twelve feet, ſending out many ſtrong ligneous branches, covered with a dark-coloured bark, garniſhed with oblong, oval, blunt leaves, ſawed on their edges, and half embrace the ſtalks with their baſe: the flowers are purple, growing in round bunches at the end of the branches, and are ſucceeded by flat ſeeds, crowned with down.

This is alſo a tender plant, and requires the ſame treatment as the fourth ſort, with which it hath flowered, but doth not produce ſeeds in England.

If the ſeeds of theſe plants are ſown in autumn ſoon after they are ripe, there is no danger of their miſcarrying; but as theſe are moſt of them brought from abroad, they do not arrive here in good time, ſo the plants rarely come up the firſt year; therefore the ſeeds ſhould be ſown in pots, that they may be preſerved through the winter, and the following ſpring the plants will come up.

The ſeventeenth ſort grows naturally in Jamaica; this riſes with a ſhrubby branching ſtalk about four or five feet high. The lower branches and ſtalk are garniſhed with ſpear-ſhaped leaves about four inches long, and one broad in the middle; they are ſawed on their edges, and have ſhort foot-ſtalks; the leaves on the upper branches are much narrower, and end in acute points. The flowers are purple, and are produced in round bunches at the end of the branches, and are ſucceeded by downy ſeeds like the other ſpecies. This is tender, and requires the ſame culture as the fourth ſort.

The ſeventeenth ſort grows naturally in China: this is a biennial plant, which periſhes ſoon after the ſeeds are ripe. The ſtalks are hairy, riſing about two feet high, garniſhed with oblong oval leaves, which are entire, rough on their upper ſide, but have many ſtrong pale hairs on their under, placed alternately on the branches. The flowers are purple, coming out from the ſide of the branches in oblong ſpikes.

This ſort is propagated by ſeeds, which ſhould be ſown in pots in the autumn, if they can be procured at that ſeaſon; but the pots ſhould be placed in a garden-frame in winter, to prevent the ſeeds ſuffering by cold and wet. If the ſeeds are ſown in the ſpring, the plants rarely come up the ſame year, therefore it will be proper to ſcreen this in winter; when this is obſerved, the plants will riſe the following ſpring. When the plants are fit to remove, they ſhould be each planted in a ſeparate pot, and placed into a very moderate hot-bed, where they muſt be ſcreened from the ſun until they have taken root; after which they ſhould be gradually hardened to bear the open air, into which they ſhould be removed the beginning of June, placing them in a ſheltered ſituation, where the ſecond ſeaſon they will flower, and if the ſummer is good, they will ripen their ſeeds.

CONSERVATORY. See Green-House.

CONVAL LILY. See Convallaria.

COPAIFERA, the balſam of Capevi.

The Characters are,

*It hath no empalement; the flower conſiſts of five leaves, which expands in form of a Roſe; it hath ten ſhort ſtamina, crowned by long ſummits. The pointal is fixed in the center of the flower, which afterward becomes a pod, in which are contained one or two ſeeds, which are ſurrounded with a pulp of a yellow colour.*

We know but one ſort of this tree, which is,

Copaifera (*Officinalis*) foliis pinnatis. *The balſam of Capevi.*

This tree grows near a village called Ayapel, in the province of Antiochi, in the Spaniſh Weſt-Indies; this is about ten days journey from Carthagena. There are great numbers of theſe trees in the woods about this village, which grow to the height of fifty or ſixty feet. Some of theſe trees do not yield any of the balſam, thoſe which do are diſtinguiſhed by a ridge which runs along their trunks; the trees are wounded in their center, and they place calabaſh ſhells, or ſome other veſſels to the wounded part to receive the balſam, which will all flow out in a ſhort time. One of theſe trees will yield five or ſix gallons of the balſam; but though theſe trees will thrive well after being tapped, yet they never afford any more balſam.

As this balſam is uſed in medicine, it deſerves our application to procure the trees, and cultivate them in ſome of the Engliſh colonies of America; for as the Engliſh are poſſeſſed of lands in ſo many different latitudes, they might cultivate moſt kinds of trees and plants from the different parts of the world, which are uſeful in medicine, dyeing, or for any other purpoſe of life.

The ſeeds of this tree were brought from the country of their growth by Mr. Robert Millar, ſurgeon, who ſowed a part of them in Jamaica, which he informed me had ſucceeded very well; ſo that we may hope to have theſe trees propagated in great plenty in a few years, in ſome of the Engliſh colonies, if the ſlothfulneſs of the inhabitants doth not ſuffer them to periſh, as they have the Cinnamon-tree, and ſome other uſeful plants, which have been carried thither by curious perſons.

There are not at preſent any of theſe trees in Europe, that I can learn; for thoſe ſeeds which Mr. Millar ſent over to England, were all deſtroyed by inſects in their paſſage, ſo that not one ſucceeded in the ſeveral places where they were ſown; but could freſh ſeeds be procured, the plants might be raiſed in England, and preſerved in the bark-ſtoves very well; for the country of their growth is much more temperate than many others, from whence we have been fur-

furnished with a great variety of plants, which succeed very well in the stoves, and some of them arrive to a great degree of perfection.

CORALLODENDRON. See ERYTHRINA.

CORCHORUS. Lin. Gen. Plant. 675. Tourn. Inst. 259. tab. 135. Jews Mallow.

The CHARACTERS are,

*The empalement of the flower is composed of five narrow spear-shaped leaves, which are erect. The flower hath five oblong blunt petals, which are no longer than the empalement. It hath many hairy stamina, which are shorter than the petals, terminated by small summits. In the center is situated an oblong furrowed germen, supporting a short thick style, crowned by a bifid stigma. The germen afterward becomes a cylindrical pod having five cells, which are filled with angular-pointed seeds.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, intitled Polyandria Monogynia, the flowers having many stamina and but one style.

The SPECIES are,

1. CORCHORUS (*Olitorius*) capsulis oblongis, ventricosis, foliorum infimis serraturis setaceis. Lin. Flor. Zeyl. 213. *Jews Mallow with oblong swelling pods, and the saws on the under side of the leaves terminating with bristles.* Corchorus sive Melochia. J. B. 2. 982. *Common Jews Mallow.*
2. CORCHORUS (*Æstuans*) capsulis oblongis, sexsulcatis sexcuspidatis, foliis cordatis infimis serraturis setaceis. Lin. Sp. 746. *Jews Mallow with oblong furrowed pods, heart-shaped leaves, whose saws terminate with bristles.* Corchorus Americana, carpini foliis, sextuplici capsula prælonga. Pluk.
3. CORCHORUS (*Capsularis*) capsulis subrotundis, depressis, rugosis. Flor. Zeyl. 214. *Jews Mallow with roundish depressed capsules which are rough.* Corchorus Americana, prælongis foliis, capsula striata subrotunda brevi. Pluk.
4. CORCHORUS (*Tetragonis*) foliis ovato-cordatis crenatis, capsulis tetragonis, apicibus reflexis. *Jews Mallow with oval heart-shaped leaves which are crenated, and four-cornered capsules, whose points are reflexed.* Corchorus flore flavo, fructu carophylloide. Pluk.
5. CORCHORUS (*Linearibus*) foliis lanceolatis, serrato dentatis, capsulis linearibus, compressis, bivalvibus. *Jew Mallow with spear-shaped leaves, which are indented like the teeth of a saw, and narrow, compressed, bivalvular pods.*
6. CORCHORUS (*Bifurcatis*) foliis cordatis, serratis, capsulis linearibus, compressis, apicibus bifurcatis. *Jews Mallow with heart-shaped sawed leaves, and narrow compressed pods, whose points have two horns.*
7. CORCHORUS (*Siliquosus*) capsulis linearibus compressis, foliis lanceolatis æqualiter serratis. Lin. Sp. 746. *Jews Mallow with compressed capsules, and spear-shaped leaves equally sawed on their edges.* Corchorus Americana, foliis & fructu augustioribus. Tourn. Inst. R. H. 259.
8. CORCHORUS (*Hirsuta*) capsulis subrotundis lanatis, foliis ovatis obtusis tomentosis æqualiter serratis. Lin. Sp. 747. *Jews Mallow with roundish downy pods, and obtuse, oval, woolly leaves, which are equally sawed on their edges.* Corchoro affinis Chamædryos folio, flore stamineo, seminioribus atris quadrangulis duplici serie dispositis. Sloan. Cat. 50.

The first species, Rauwolf says, is sown in great plenty about Aleppo, as a pot-herb, the Jews boiling the leaves of this plant to eat with their meat; this he supposes to be the Olus Judaicum of Avicenna, and the Corchorum of Pliny.

This plant grows in the East and West-Indies, from both which places I have several times received the seeds. In the East-Indies the herb is used in the same manner as in the Levant, as I have been informed; but I do not hear that it is used by the inhabitants of America.

It is an annual plant, which rises about two feet high, dividing into several branches, garnished with leaves of different sizes and forms; some are spear-shaped, others are oval, and some almost heart-shaped; they are of a deep green, and slightly indented on their edges, having near their base two bristly segments, which are reflexed. They have very long slender foot-stalks, especially those which grow on the lower part of the branches. The flowers sit close on the opposite side of the branches to the leaves, coming out singly; they are composed of five small yellow petals, and a great number of stamina surrounding the oblong germen, which is situated in the center of the flower, and afterward turns to a rough swelling capsule, two inches long, ending in a point, opening in four cells, which are filled with angular greenish seeds. This plant flowers in July and August, and the seeds ripen in autumn.

The second sort grows naturally in several islands of the West-Indies, from whence the seeds have been sent me; this is also an annual plant, which rises with a strong herbaceous stalk two feet high, divided upward into two or three branches, garnished with heart-shaped leaves, sawed on their edges, standing upon long foot-stalks; and between these are several smaller leaves nearly of the same form, sitting close to the branches. The flowers come out singly on the side of the branches, as the other, which are shaped like them, and are succeeded by longer swelling pods, which are rough, and have four longitudinal furrows; these open into four parts at the top, and contain four rows of angular seeds. It flowers and seeds at the same time with the former sort.

The third sort grows naturally in both Indies; I have received the seeds of this from several parts of India and America; this is also an annual plant, which rises with a slender herbaceous stalk about three feet high, sending out several weak branches, which are garnished at each joint by one leaf of an oblong heart-shape, ending in a long acute point, and are sawed on their edges, standing upon short foot-stalks. The flowers come out singly on the side of the branches, to which they sit very close; they are smaller than those of the former sorts, and are succeeded by short roundish seed-vessels, which are rough, and flatted at the top, having six cells filled with small angular seeds. This flowers and seeds at the same time as the former.

The fourth sort is also a native of both Indies, from whence I have received the seeds; this is an annual plant, which rises about two feet high, dividing into small branches, garnished with oval heart-shaped leaves, sawed on their edges. The flowers of this are very small, of a pale yellow, and are succeeded by swelling, rough, four-cornered seed-vessels, about an inch long, flatted at the top, where there are four horns, which are reflexed, so that these have some resemblance in shape to the Clove. This flowers and seeds about the same time as the former sorts.

The seeds of the fifth sort were sent me from Carthagena in New Spain, where the plants grow naturally; this is an annual plant, which rises about three feet high, sending out several weak side branches, garnished with leaves about three inches long, and one broad in the middle, lessening gradually to both ends, and are indented on the edges like the teeth of a saw, sitting close to the branches. The flowers come out singly, opposite to the leaves; they are very small, of a pale yellow, and are succeeded by seed-vessels near two inches long, which are flat, and have two cells filled with small angular seeds. This flowers and ripens its seeds about the same time as the former.

The seeds of the sixth sort were sent me from Jamaica by the late Dr. Houstoun; this is an annual plant, which rises with a strong herbaceous stalk between three and four feet high, sending out several side branches, which grow erect, garnished with heart-shaped leaves sawed on their edges, standing upon long slender foot-stalks; between these grow many smaller leaves nearly of the same form, sitting close to the branches. The flowers come out from the side of the branches, on short foot-stalks; they are very small, of a pale yellow, and are succeeded


by

by flat seed-vessels near three inches long, ending in two horns; these open in two cells, which are filled with small angular seeds.

The seeds of the seventh sort were sent me from Barbadoes, where the plant grows naturally, for I have also had it rise in the earth which came over from thence in tubs with growing plants: this rises about the same height as the sixth, sending out several weak side branches, garnished with long narrow leaves, which are rough, and sawed on their edges, sitting close to the branches; between the larger leaves come out several small ones, which are placed irregularly on the branches. The flowers are small, of a pale yellow, and come out on the side of the branches opposite to the leaves; these are succeeded by very narrow compressed pods two inches long, opening with two valves, and filled with small angular seeds. It flowers and seeds at the same time with the former.

The eighth sort grows naturally in Jamaica; this rises with a shrubby stalk four feet high, dividing into a great number of small branches, which are closely garnished with small, oval, sawed leaves, sitting close to the branches; between these are many very small leaves, placed without order: the flowers are produced on the side of the branches on very short foot-stalks; these are small, and the petals soon fall off, so that it has been supposed to have no petals. The flowers are succeeded by compressed seed-vessels three inches long, which are rounded at their points, and open with two valves at the top, containing a great number of small angular seeds. This plant hath a perennial stalk, so may be preserved through the winter in a moderate stove, and the second year will flower in June, and produce ripe seeds in autumn; but when the plants are brought forward so as to flower the first year, they seldom perfect their seeds, and these plants cannot be so well preserved as those which are treated hardily in the summer.

All these sorts are too tender to thrive in England in the open air, therefore their seeds must be sown on a hot-bed in the spring; and when the plants are come up fit to remove, they should be transplanted on a fresh hot-bed to bring the plants forward, otherwise they will not ripen seeds. After the plants are rooted in the new hot-bed, they must have free air admitted to them every day, in proportion to the warmth of the season, for they must not be drawn up weak; when the plants have obtained strength, they should be transplanted each into a separate pot, and plunged into a hot-bed, observing to shade them from the sun till they have taken root; then they must have a large share of air every day, and should be frequently refreshed with water; and in June they should be gradually inured to the open air, and part of them may be shaken out of the pots, and planted in a warm border, where, if the season proves warm, they will flower and perfect their seeds; but as these will sometimes fail, it will be proper to put one or two plants of each sort into pots, which should be placed in a glass-case, where they may be screened from bad weather, and from these good seeds may always be obtained. The last sort may also be treated in the same manner during the summer season, but in autumn they must be removed into the stove, and plunged into the bark-bed, and these will flower early the second year, and ripen seeds.

CORDIA. Plum. Nov. Gen. 13. tab. 14. Sebestena. Dillen. Hort. Elth. 225. Sebesten.

The Characters are,

*The flower hath a permanent empalement of one leaf, indented in three parts. It hath one funnel-shaped petal, whose tube is the length of the empalement, and the top is divided into four, five, or six parts, which are obtuse and erect. It hath five awl-shaped stamina, terminated by long summits, and in the center a roundish pointed germen, supporting a bifid style, crowned by two obtuse stigmas. The germen afterward becomes a dry berry, which is globular and pointed, fastened to the empalement, and incloses a furrowed nut with four cells.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The Species are,

1. Cordia (*Sebestina*) foliis oblongo-ovatis, repandis, scabris. Lin. Sp. Plant. 190. *Cordia with oblong, oval, rough leaves, turning backward.* Caryophyllus spurius inodorus, folio subrotundo, scabro, flore racemoso, hexapetaloide, coccineo. Sloan. Cat. 136. *Commonly called Lignum Aloes.*
2. Cordia (*Myxa*) foliis tomentosis, corymbis lateralibus, calycibus decemstriatis. Lin. Sp. 273. *Cordia with oval woolly leaves, flowers growing in a corymbus from the side of the branches, and empalements with ten stripes.* Sebestina domestica sive Myxa. Com. Hort. Amst. 1. 139. *The cultivated Sebesten.*
3. Cordia (*Macrophylla*) foliis ovatis, villosis sesquipedalibus. Lin. Sp. Plant. 274. *Cordia with oval woolly leaves half a foot long.* Prunus racemosa, foliis oblongis hirsutis maximis, fructu rubro. Sloan. Cat. Jam. 184.

The first sort grows naturally in several islands in the West-Indies: this rises with several shrubby stalks eight or nine feet high, which are garnished toward the top with oblong, oval, rough leaves, standing alternate on short foot-stalks; they are of a deep green on their upper side. The flowers terminate the branches, growing in large clusters upon branching foot-stalks, some sustaining one, others two, and some have three flowers, which are large, funnel-shaped, having long tubes, which spread open at the top, where it is divided into five obtuse segments; they are of a beautiful scarlet, so make a fine appearance.

The second sort is by most botanists believed to be the Myxa of Cæsalpinus, which is the best Sebesten of the shops; the fruit of which was formerly used in medicine, but of late years has been seldom brought to England, therefore is rarely ordered. This is called Assyrian Plum, from the country where it naturally grows. It rises to the height of our common Plum-trees, but was very rare in this country till the year 1762, when there was some of the fruit sent from Egypt, by those persons who were sent to travel at the king of Denmark's expence, from which fruit some plants have been raised in the Chelsea garden.

The third sort was discovered by father Plumier, in some of the French islands of America; and since was found in the bay of Campeachy, by Mr. Robert Millar, who sent the seeds to England: this sort grows to the height of eighteen or twenty feet in the natural places where it is found wild; it hath winged leaves, which are large, entire, and smooth; but it hath not as yet flowered in England, so I can give no farther account of it.

These plants, being natives of warm countries, are too tender to live through the winter in this country, unless they are preserved in a stove: they are all propagated by seeds, which must be procured from the countries of their natural growth; these seeds must be sown in small pots, which must be plunged into a good hot-bed of tanners bark in the spring; and if the seeds are fresh and good, the plants will begin to appear in six or eight weeks after. These must be brought forward in the hot-bed, by being treated as other tender exotic plants, observing frequently to water them in summer; and in July, if the plants have made much advance, they should be gradually hardened, otherwise they will grow so weak as not to be easily preserved through the winter. As these plants obtain strength, they will become more hardy; but during the two first winters, it will be proper to plunge them into the tan-bed in the stove; but when they begin to have woody stems, they may be placed on shelves, in a dry stove; where, if they are kept in a moderate degree of heat, they may be preserved very well (especially the first sort) which is somewhat hardier than the others. This may also be placed abroad in a warm situation, in the beginning of July, where the

the plants may remain till the middle of September, provided the ſeaſon continues warm, otherwiſe they muſt be removed into the ſtove ſooner.

The firſt ſort produces very fine flowers, of a ſcarlet colour, in large bunches, at the extremity of the branches, after the ſame manner as the Oleander or Roſe-bay; but theſe flowers are much larger, and of a much finer colour.

A ſmall piece of the wood of this tree being put on a pan of lighted coals, will ſend forth a moſt agreeable odour, and will perfume a whole houſe.

COREOPSIS. Lin. Gen. Pl. 879. Tickſeed.

The CHARACTERS are,

*The common empalement of the flower is double, the outer being compoſed of eight leaves, placed circularly; the inner is in every part larger, membranaceous, and coloured. The diſk of the flower is compoſed of many hermaphrodite florets, which are tubular, and divided into five parts at the top; theſe have each five hairy ſtamina, terminated by cylindrical ſummits. In their center is ſituated a compreſſed germen with two horns, ſupporting a ſlender ſtyle, crowned by an acute bifid ſtigma. The germen afterward becomes a ſingle orbicular ſeed, convex on one ſide, and hollow on the other, having a membranaceous border, and two horns on the top. The border or rays of the flower is compoſed of eight female florets which are large, and tongue-ſhaped, indented in five parts; theſe have no ſtamina, but a germen like the other, without any ſtyle or ſtigma, and are abortive.*

This genus of plants is ranged in the third ſection of Linnæus's nineteenth claſs, intitled Syngeneſia Polygamia Fruſtranea; the flowers of this claſs and ſection are compoſed of hermaphrodite florets which are fruitful, and female half florets which are barren.

The SPECIES are,

1. COREOPSIS (*Alternifolia*) foliis lanceolatis, ſerratis, alternis, petiolatis decurrentibus. Hort. Upſal. 270. *Tickſeed with ſpear-ſhaped ſawed leaves, placed alternate, and winged foot-ſtalks.* Chryſanthemum Virginianum, caule alato, ramoſius, flore minore. Pluk. Alm. 100.

2. COREOPSIS (*Lanceolata*) foliis lanceolatis, integerrimis ciliatis. Lin. Sp. Plant. 1283. *Tickſeed with ſpear-ſhaped leaves which are entire.* Bidens ſucciſæ folio, radio amplo laciniato. Hort. Elth. 55.

3. COREOPSIS (*Verticillata*) foliis decompoſito pinnatis, linearibus. Lin. Sp. Plant. 907. *Tickſeed with decompound, winged, narrow leaves.* Ceratocephalus delphinii foliis. Vaill. Act. 1720.

4. COREOPSIS (*Tripteris*) foliis ſubternatis, integerrimis. Hort. Upſal. 269. *Tickſeed with leaves growing by threes, which are entire.* Chryſanthemum Virginianum, folio acutiore, lævi, trifoliato, ſc. anagyridis folio. Mor. Hiſt. 3. p. 21.

5. COREOPSIS (*Radiato*) foliis lineari-lanceolatis, acute ſerratis, oppoſitis radio amplo integro. *Tickſeed with narrow ſpear-ſhaped leaves, which are oppoſite and ſharply ſawed, and the rays of the flower large and entire.*

The firſt ſort grows naturally in North America every where. This hath a perennial root; the ſtalks decay to the root every winter, which are ſtrong, herbaceous, and riſe to the height of eight or ten feet, garniſhed with ſpear-ſhaped leaves ſawed on their edges, from three to four inches long, and one broad in the middle, placed alternate on every ſide the ſtalks, having ſhort foot-ſtalks, with a border or wing running from one to the other, the whole length of the ſtalk. The flowers grow at the top of the ſtalks, forming a ſort of corymbus, each foot-ſtalk ſuſtaining one, two, or three yellow flowers, ſhaped like Sun-flowers, but much ſmaller. This flowers in September and October, but doth not produce ſeeds in England. It is a very hardy plant, and may be propagated in plenty by parting the roots. The beſt time for this is in autumn, when the ſtalks begin to decay. It will thrive in almoſt every ſoil and ſituation.

The ſecond ſort is an annual plant. The ſeeds of this were brought me from Carolina by Mr. Cateſby, in the year 1726. This hath an upright ſtalk, garniſhed with ſmooth, narrow, ſpear-ſhaped leaves, placed oppoſite, which are entire; from the wings of the leaves come out the foot-ſtalks of the flowers, by pairs oppoſite, and ſtand erect; the lower part of theſe have one or two pair of very narrow leaves, but the upper is naked, and terminated by one large yellow flower, whoſe border or rays are deeply cut into ſeveral ſegments; theſe are ſucceeded by flat winged ſeeds, which, when ripe, roll up; the naked foot-ſtalks of theſe flowers are more than a foot long. This muſt be ſown upon a gentle hot-bed in the ſpring, and when the plants are fit to tranſplant, they ſhould be each planted into a ſeparate ſmall pot, and plunged into a freſh hot-bed to bring them forward; and in June they ſhould be inured by degrees to the open air, and afterward ſome of them may be ſhaken out of the pots, and planted in a warm border; where, if the ſeaſon is good, they will flower in the middle of July, and ripen their ſeeds the beginning of September.

The third ſort hath a perennial root, ſending up many ſtiff angular ſtalks, which riſe upward of three feet high, garniſhed at each joint with decompound winged leaves, ſtanding oppoſite; theſe are very narrow and entire. The branches alſo come out by pairs oppoſite, as do alſo the foot-ſtalks of the flowers; theſe are long, ſlender, and each terminated by a ſingle flower, of a bright yellow colour, the rays or border being oval and entire. The diſk or middle is of a dark purple colour. Theſe appear in July, and continue till September, during which time they make a fine appearance. This grows naturally in Maryland and Philadelphia. It is propagated by parting the roots, in the ſame manner as the firſt ſort, and delights in a light loamy earth, and ſunny expoſure.

The fourth ſort hath a perennial root. It grows naturally in many parts of North America, but has been long cultivated in the Engliſh gardens; the ſtalks of this are ſtrong, round, and ſmooth, riſing ſix or ſeven feet high, garniſhed at each joint with ſome trifoliate leaves, which ſtand oppoſite. The flowers are produced in bunches at the top of the ſtalks, ſtanding upon long foot-ſtalks; they are of a pale yellow, with a dark purple diſk. It flowers in July, but ſeldom produces good ſeeds in England. This ſort is propagated by parting the roots in the ſame manner as the firſt, but requires a better ſoil and poſition.

The fifth ſort grows naturally in South Carolina, from whence the ſeeds were ſent me by the late Dr. Dale. This is an annual plant, which riſes with upright ſtalks to the height of four feet, garniſhed with narrow ſpear-ſhaped leaves, ending in long points, and are deeply ſawed on their edges, ſtanding oppoſite at each joint, upon ſhort foot-ſtalks; theſe leaves are from three to four inches long, and three quarters of an inch broad in the middle, of a deep green on their upper ſide, and pale on their under. At all the upper joints of the ſtalks come out two long ſlender foot-ſtalks, one on each ſide, which are garniſhed with two or three pair of ſmall leaves, and terminated by one flower, compoſed of ſeven female half florets, which compoſe the ray; theſe are oval and entire. The diſk is compoſed of a great number of hermaphrodite florets, which are of a dark colour, and the ſummits of the ſtamina are of a bright yellow; theſe hermaphrodite florets are each ſucceeded by one flat bordered ſeed, having two horns or teeth. This ſort flowers in Auguſt, and if the autumn proves favourable, will ripen its ſeeds in October; but in cold ſeaſons it will not perfect ſeeds in England.

This is propagated by ſeeds, which ſhould be ſown on a warm border in autumn, and the plants will come up the following ſpring; for if the ſeeds are ſown in the ſpring, the plants ſeldom riſe till the year after. When the plants are fit to remove, they ſhould be carefully taken up, and either planted where they are deſigned to remain, or into a nurſery-bed, at four inches diſtance, to get ſtrength, obſerving to ſhade them from the ſun till they have taken freſh root;

after which, those which are planted out for good, will require no other treatment but to keep them clean from weeds; and as they advance in height, they should be supported by sticks, otherwise the strong winds in autumn often break them; and those which were placed in a nursery-bed, when they have obtained proper strength, should be taken up and transplanted with balls of earth to their roots, where they are designed to stand for flowering.

As these plants continue to produce flowers till the frost puts a stop to them, they merit a place in every curious garden, especially those which do not ramble and spread too much. The first is the least deserving of either, so is seldom preserved, but in botanic gardens for the sake of variety.

CORIANDRUM. Lin. Gen. Plant. 318. Tourn. Inst. R. H. 316. tab. 168. [of Κορίανδρον, of Κόρις, *Gr.* a tick; so called, either because it has the scent of this insect, or, as others say, because it drives away or kills them; and Ἄνδρος, *Gr.* the isle where it grew plentifully.] Coriander.

The Characters are,

*It is a plant with an umbellated flower; the universal umbel hath but few rays, the partial umbels have many. The first hath no involucrum, but the latter hath a three-leaved one; the proper empalement is divided into five parts; the rays of the principal umbel are difform. The hermaphrodite flowers which form the disk, have five equal heart-shaped petals, which are inflexed, but those of the rays have five unequal petals of the same form; they have each five stamina, terminated by roundish summits. The germen which is situated under the flower, supports two styles, crowned by small radiated stigmas; the germen afterward becomes a spherical fruit, divided into two parts, each having a hemispherical concave seed.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flower having five stamina and two styles.

The Species are,

1. Coriandrum (*Sativum*) fructibus globosis. Hort. Cliff. 100. *Coriander with globular fruit.* Coriandrum majus. C. B. P. 158. *Greater Coriander.*
2. Coriandrum (*Testiculatum*) fructibus didymis. Hort. Cliff. 100. *Coriander with twin fruit.* Coriandrum minus testiculatum. C. B. P. 158.

The first of these species is the most common kind, which is cultivated in the European gardens and fields for the seeds, which are used in medicine. The second sort is less common than the first, and is seldom found but in botanic gardens in these parts of Europe. These plants grow naturally in the south of France, Spain, and Italy; but the first sort has been long cultivated in the gardens and fields, though at present there is not near so much of it sown in England as was some years past.

These plants are propagated by sowing their seeds in the autumn, in an open situation, on a bed of good fresh earth; and when the plants are come up, they should be hoed out to about four inches distance every way, clearing them from weeds; by which management these plants will grow strong, and produce a greater quantity of good seeds. The first sort was formerly cultivated in the gardens as a sallad herb, and in the East-Indies is still much cultivated; for the plant is of great use in most of their compound dishes, as a culinary herb, and the seeds are also much esteemed for the like purposes; but in Europe neither of them are now much used.

The second sort will rise easily from seeds, if they are sown in the autumn; but those which are sown in the spring rarely succeed, or at least do not come up till the following spring.

CORIARIA. Lin. Gen. Plant. 458. Nissol. Act. Reg. 1711. Myrtle-leaved Sumach, vulgò.

The Characters are,

*It is male and hermaphrodite in different plants; the male flowers have a five-leaved empalement; the flower has five leaves, which are joined to the empalement; these have ten slender stamina, terminated by oblong summits; the hermaphrodite flowers have the like empalement, and the same number of petals, and in the center are placed five pointals, which turn to a berry, inclosing five kidney-shaped seeds.*

This is ranged in the ninth section of Linnæus's twenty-second class, intitled Diœcia Decandria, the plants having male and hermaphrodite flowers on different roots.

The Species are,

1. Coriaria (*Myrtifolia*) foliis ovato oblongis. Hort. Upsal. 299. *Myrtle-leaved Sumach, with oblong oval leaves.* Coriaria vulgaris mas. Nissol. Act. 1711.
2. Coriaria (*Fœmina*) vulgaris fœmina. Lin. Hort. Cliff. *Female Myrtle-leaved Sumach.*

The sort with male flowers has been the most common in England, the other having been very rarely raised in our gardens: a few years past, when some plants were raised from seeds, which came from Italy, in the Chelsea garden, where the plants so raised have most of them proved of the hermaphrodite sort, and have produced great quantities of seeds, which have grown, though there is not one plant of the male sort at present in the garden; the not finding any plants in the English gardens, but those with male flowers, occasioned my writing abroad for the seeds. These grow wild in great plenty about Montpelier in France, where it is used for tanning of leather; and, from this use, has been titled by the botanists, Rhus coriariorum, i. e. Tanners Sumach.

These shrubs seldom grow more than three or four feet high; and as they creep at the root, they send forth many stems, whereby they form a thicket, so may be planted to fill up vacancies in wilderness quarters; but they are improper for small gardens, where they will take up too much room; and as there is no great beauty in the flowers, they are only admitted for variety.

It is strange that Monsieur Nissol, who lived upon the place where these grew in plenty, who constituted this genus, in the Memoirs of the Acadamy at Paris, has taken no notice of their being male and hermaphrodite in different plants.

It may be propagated plentifully from the suckers, which are produced from the creeping roots in great abundance; these should be taken off in March, and planted into a nursery to form good roots, where they may continue one or two years, and then must be removed to the places where they are to remain.

This plant delights in a loamy soil which is not too stiff, and should be placed where it may have shelter from the north and east winds; where it will endure the cold of our ordinary winters very well, and will flower better than if it is preserved in pots and sheltered in the winter, as hath been by some practised.

CORINDUM. See Cardiospermum.

CORIS. Lin. Gen. Plant. 216. Tourn. Inst. 652. tab. 423. We have no English name for this plant.

The Characters are,

*The empalement of the flower is of one leaf, with a swelling belly, but closed at the top, where it is divided into five parts, which are crowned by five spines; the flower hath one irregular petal, whose tube is the length of the empalement, and spread open at the top, where it is divided into five oblong segments, which are obtuse and indented; it hath five bristly stamina, terminated by single summits. In the center is situated a round germen, supporting a slender declining style, crowned by a thick stigma; the empalement afterward becomes a globular capsule, having five valves, inclosing several small oval seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

We have but one Species of this plant, viz.

Coris (*Monspeliensis*). Hort. Cliff. 68. Coris cærulea maritima. C. B. P. 280. *Blue maritime Coris.*

There are two other varieties of this plant, one with a red, and the other a white flower, but these are only accidental varieties arising from the same seeds.

These plants grow wild about Montpelier, and in many other parts of the south of France, and also in Italy; they seldom grow above six inches high, and spread

ſpread near the ſurface of the ground like heath; and in June, when they are full of flowers, they make a very pretty appearance.

They may be propagated by ſowing their ſeeds in the ſpring, on a bed of freſh earth; and when the plants are about an inch high, they ſhould be tranſplanted, ſome of them into pots filled with freſh light earth, that they may be ſheltered in winter; and the others into a warm border, where they will endure the cold of our ordinary winters very well, but in ſevere froſt they are generally deſtroyed; for which reaſon, it will be proper to have ſome plants of each ſort in pots, which may be put under a common hot-bed frame in winter, where they may be covered in froſty weather; but when it is mild, they ſhould have a great ſhare of free air: theſe plants ſometimes produce ripe ſeeds in England; but as they do not conſtantly perfect their ſeeds, it will be proper to increaſe them from ſlips and cuttings, which will take root, if planted about the end of Auguſt on a very gentle hot-bed, and ſhaded from the ſun and duly watered.

CORISPERMUM. Lin. Gen. Plant. 12. Juſſ. Act. R. S. 1712. Tickſeed.

The Characters are,

*The flower hath no empalement, it hath two compreſſed incurved petals, which ſtand oppoſite and are equal; it hath one, two, or three ſtamina, which are ſhorter than the petals, terminated by ſingle ſummits, with a compreſſed pointed germen, ſupporting two hairy ſtyles, crowned by acute ſtigmas. The germen afterward becomes one oval compreſſed ſeed, with an acute border.*

This genus of plants is ranged in the ſecond ſection of Linnæus's firſt claſs, intitled Monandria Digynia, the flower having one ſtamina and two ſtyles.

The Species are,

1. Corispermum (*Hyſopifolium*) floribus lateralibus Hort. Upſal. 2. *Tickſeed with flowers on the ſide of the ſtalks.* Coriſpermum Hyſſopifolium. Juſſ. Act. R. S. 1712. *Hyſſop-leaved Tickſeed.*
2. Corispermum (*Squarroſum*) ſpicis ſquarroſis. Hort. Upſal. 3. *Tickſeed with rough ſpikes.* Rhagroſtis foliis arundinaceis. Buxb. Cent. 3. p. 30. *Rhagroſtis with Reed-like leaves.*

Theſe plants are preſerved in botanic gardens for the ſake of variety; but as they have no beauty, are ſeldom cultivated in other gardens.

The firſt ſort is an annual plant, which, if ſuffered to ſcatter its ſeeds, the ground will be plentifully ſtocked with the plants, which will require no other care but to prevent the weeds from over-growing them.

The ſecond will not grow but in marſhy places, where there is ſtanding water; over the ſurface of which this plant will ſoon extend, when once it is eſtabliſhed.

As we had no Engliſh name to this genus, I have given it this of Tickſeed, which correſponds with the Greek name.

CORK-TREE. See Quercus.

CORN-FLAG. See Gladiolus.

CORNICULATE PLANTS [Plantæ Corniculatæ,] are ſuch, as after each flower, produce many horned ſeed-pods, called Siliquæ.

CORN-MARIGOLD. See Chrysanthemum.

CORN-SALLAD. See Valeriana.

CORNUS. Lin. Gen. Plant. 139. Tourn. Inſt. 641. tab. 410. [ſo called, of Cornu, *Lat.* a horn; becauſe its wood, or the ſhell of its fruit, is hard as a horn.] The Cornelian Cherry.

The Characters are,

*It hath many flowers included in one common four-leaved involucrum, which is coloured. The flowers have each a ſmall empalement, ſitting on the germen, which is indented in four parts. They have four plain petals, which are ſmaller than the leaves of the involucrum, and four erect ſtamina, which are longer than the petals, terminated by roundiſh ſummits. The round germen ſituated below the empalement, ſupports a ſlender ſtyle, crowned by an obtuſe ſtigma. The germen afterward becomes an oval, or roundiſh berry, incloſing a nut, with two cells, having an oblong kernel.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourth claſs, intitled Tetrandria Monogynia, the flowers having four ſtamina and but one ſtyle.

The Species are,

1. Cornus (*Sanguinea*) arborea, cymis nudis. It. Weſtgoth. Lin. Sp. Plant. 117. *Dogwood-tree with naked ſhoots.* Cornus fœmina. C. B. P. 447. *Female Dogwood, and the Virga Sanguinea.* Matth.
2. Cornus (*Mas*) arborea, umbellis involucrum æquantibus. Hort. Cliff. 38. *Tree Dogwood with umbels equal to the involucrum.* Cornus hortenſis mas. C. B. P. 447. *Male Cornel, or Cornelian Cherry-tree.*
3. Cornus (*Florida*) arborea, involucro maximo, foliolis obverſè cordatis. Hort. Cliff. 38. *Tree Dogwood with a very large involucrum, and obverſe heart-ſhaped leaves.* Cornus mas, Virginiana, floſculis in corymbo digeſtis, à perianthio tetrapetalo albo radiatim cinctis. Pluk. Alm. 120.
4. Cornus (*Fœmina*) arborea, foliis lanceolatis, acutis, nervoſis, floribus corymboſis terminalibus. *Tree Dogwood with ſpear-ſhaped acute leaves which are veined, and flowers diſpoſed in a corymbus, terminating the branches.* Cornus fœmina Virginiana anguſtiore folio. Edit. prior. *Female Virginia Dogwood with a narrower leaf.*
5. Cornus (*Amomum*) arborea foliis ovatis petiolatis, floribus corymboſis terminalibus. *Tree Dogwood with oval leaves having foot-ſtalks, and flowers collected into a corymbus at the end of the branches.* Cornus Americana ſylveſtris, domeſticæ ſimilis, baccâ cærulei coloris elegantiſſimâ, Amomum Novæ Angliæ quorundam. Pluk. Phyt. tab. 169. f. 3. *By ſome ſuppoſed to be the true Amomum of New England.*
6. Cornus (*Candidiſſima*) arborea foliis lanceolatis, acutis, glabris, umbellis involucro minoribus, baccis ovatis. *Tree Dogwood with ſmooth, ſpear-ſhaped, pointed leaves, umbels ſmaller than the involucrum, and oval berries.* Cornus fœmina candidiſſimis foliis Americana. Pluk. Alm. 120.
7. Cornus (*Tartarica*) arborea foliis oblongo ovatis, nervoſis, infernè albis, floribus corymboſis terminalibus. *Tree Dogwood with oblong, oval, veined leaves, white on their under ſide, and flowers growing in a corymbus at the end of the branches.* Cornus ſylveſtris fructu albo. Amman. Ruth. *Wild Dogwood with a white fruit.*
8. Cornus (*Suecica*) herbacea ramis binis. Fl. Lapp. 55. *Herbaceous Dogwood with double branches.* Cornus pumila herbacea, chamæpericlymenum dicta. Hort. Elth. 108. *Low herbaceous Dogwood, called Dwarf Honeyſuckle.*

The firſt of theſe trees is very common in the hedges in divers parts of England, and is ſeldom preſerved in gardens. The fruit of this plant is often brought into the markets, and ſold for Buckthorn berries, from which it may be eaſily diſtinguiſhed, if the berries are opened to obſerve how many ſtones there are in each; which in this fruit is but one, but in the Buckthorn four, and they may be eaſily diſtinguiſhed by rubbing the juice of the berries on paper; that of the Buckthorn will ſtain the paper green, whereas the juice of this ſtains it purple. This tree is called Virga Sanguinea, from the young ſhoots being of a fine red colour. There is a variety of this tree with variegated leaves, which is preſerved in the nurſeries, but is not much eſteemed.

The ſecond ſort is very common in the Engliſh gardens, where it was formerly propagated for its fruit, which was by ſome people preſerved to make tarts. It is alſo uſed in medicine as an aſtringent and cooler: there is alſo an officinal preparation of this fruit, called Rob de Cornis. Of this there are two or three varieties, which differ only in the colour of their fruit, but that with the red fruit is the moſt common in England.

As the fruit of this tree is not at preſent much eſteemed, the nurſery-men about London propagate it as one of the ſorts which is commonly ſold as a flowering ſhrub, and is by ſome people valued for coming ſo early to flower; for if the ſeaſon is mild, the

flowers will appear by the beginning of February; and though there is no great beauty in the flowers, yet, as they are generally produced in plenty, at a season when few other flowers appear upon trees, a few plants of them may be admitted for variety. The fruit of this tree is seldom ripe before September. The tree will grow eighteen or twenty feet high, and make a large head.

The third sort is an American, from whence the seeds have been brought to England: this is found in all northern parts of America, as are also the fourth, fifth, and sixth sorts, being natives of the woods in Virginia, New England, Maryland, and Carolina. These are all of them very hardy, and thrive well in the open air in England, so are cultivated by the nursery-men near London, to add to the variety of their hardy trees: these grow to the same height with our common female Dogberry, and make a much better appearance. The shoots of the fifth sort are of a beautiful red colour in winter; and in summer the leaves being large, of a whitish colour on their under side, and the bunches of white flowers growing at the extremity of every branch, renders this shrub valuable; and in autumn, when the large bunches of blue berries are ripe, they make a fine appearance.

The third sort is now very common in the nurseries, where it is known by the name of Virginia Dogwood. This sort is of much humbler growth than either of the former, seldom rising above seven or eight feet high, but is generally well garnished with leaves, which are larger than either of the other sorts. This does not flower so plentifully as the other sorts, nor have I yet seen any of these shrubs, which have produced berries in England, though they are as hardy as the other.

There is a variety of this with a red involucrum or cover to the flowers, which adds to the beauty of the plant; this was found wild in Virginia by Mr. Banister, and afterward by Mr. Catesby. This and the former sort are great ornaments to the woods in America, first by their early flowering in the spring before the green leaves appear; and in the winter they are also beautiful when the berries are ripe, which hang upon the shrubs till the spring.

The eighth sort grows upon Cheviot-hills in Northumberland, and also upon the Alps, and other mountainous places in the northern countries, but is very difficult to preserve in gardens; the only method is, to remove the plants from the places of their natural growth, with good balls of earth to their roots, and plant them in a moist shady situation, where they are not annoyed by the roots of other plants. In such a situation they may be preserved two or three years, but it rarely happens that they will continue much longer. This is a low herbaceous plant, whose stalks decay in the autumn.

All the sorts of Dogwood may be propagated by their seeds, which, if sown in autumn soon after they are ripe, will most of them come up the following spring; but if the seeds are not sown in autumn, they will lie a year in the ground before the plants will appear, and when the year proves dry, they will sometimes remain two years in the ground; therefore the place should not be disturbed, where these seeds are sown, under two years, if the plants should not come up sooner. When the plants are come up, they should be duly watered in dry weather, and kept clean from weeds; and the autumn following they may be removed, and planted in beds in the nursery, where they may remain two years, by which time they will be fit to transplant where they are to remain for good.

They are also propagated by suckers, and laying down the branches. Most of the sorts produce plenty of suckers, especially when they are planted on a moist light soil, which may be taken off from the old plants in autumn, and planted into a nursery for a year or two, and then may be transplanted into the places where they are to remain; but those plants which are propagated by suckers, rarely have so good roots as those which are propagated by layers; and being much more inclinable to shoot out suckers, whereby they will fill the ground round them with their spawn, they are not near so valuable as those plants which are raised from layers.

CORNUTIA. Plum. Nov. Gen. 17. Lin. Gen. Plant. 684. Agnanthus. Vaill. Act. R. 1722. We have no English name for this plant. It is so called from Cornutus, a physician of Paris, who published a history of Canada plants

The CHARACTERS are,

*The flower hath a small permanent empalement of one leaf, which is tubular, and indented in five parts at the top. The flower is of one petal, having a cylindrical tube, which is much longer than the empalement, and divided into four parts at the top; the upper segment is round and erect, the two side ones spread apart, and the lower is round and entire. It hath four stamina, two of these are longer than the tube, the other are shorter; they are terminated by inclining summits. In the center is situated the roundish germen, supporting a long style, divided into two parts, crowned by two thick stigmas. The germen afterward becomes a globular berry, sitting upon the empalememt, inclosing several kidney-shaped seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, the flowers having two long and two short stamina, and the seeds are included in a capsule.

There is but one SPECIES of this genus, viz.

CORNUTIA (*Pyramidata*). Hort. Cliff. 319. Cornutia flore pyramidato cæruleo, foliis incanis. Nov. Gen. 32. *Cornutia with a blue pyramidal flower and hoary leaves.*

This plant was first discovered by father Plumier in America, who gave it the name. It is found in plenty in several of the islands in the West-Indies, as also at Campeachy and La Vera Cruz, from both which places I received the seeds, which were collected by my late ingenious friend Dr. William Houstoun, and afterward by Mr. Robert Millar, from the same country. It grows to the height of ten or twelve feet; the branches are four-cornered, grow straggling, and the leaves are placed opposite. The flowers are produced in spikes at the end of the branches, which are of a fine blue colour; these usually appear in autumn, and sometimes will remain in beauty for two months or more.

It is propagated by seeds, which should be sown early in the spring on a hot-bed; and when the plants are come up, they should be transplanted each into a separate halfpenny pot, filled with light fresh earth, and plunged into a hot-bed of tanners bark, observing to shade them until they have taken root; after which they should have fresh air let into the bed, in proportion to the warmth of the season, and should be frequently watered (for it naturally grows on swampy soils.) When the plants have filled these pots with their roots, they should be shifted into others of a larger size, and plunged into a hot-bed again, where they should be continued till October, when they must be removed into the bark-stove, and plunged into the tan, for otherwise it will be very difficult to preserve them through the winter. The stove in which these plants are placed should be kept to the temperate heat marked on Mr. Fowler's thermometers, which will agree better with them than a hotter stove. The third year from seeds these plants will flower, when they make a fine appearance in the stove, but they never perfect their seeds in England.

They may also be propagated by cuttings, which, if planted into pots filled with earth, and plunged into a bark-bed, observing to shade and water them, will take root, and must be afterwards treated as the seedling plants.

CORONA IMPERIALIS. See FRITILLARIA.

CORONA SOLIS. See HELIANTHUS.

CORONILLA, Jointed-podded Colutea.

The CHARACTERS are,

*The flower hath a short permanent empalement of one leaf, which is compressed, bifid, and erect. It hath a*

*butterfly flower, whose standard is heart-shaped, and reflexed on each side. The wings are oval, and join at the top. The keel is shorter than the wings, is pointed and compressed. It hath nine stamina which are united, and one standing single, which are broad at the top, terminated by small summits. In the center is situated an oblong taper germen, supporting a bristly rising style, crowned by an obtuse stigma. The germen afterward becomes a taper jointed pod, inclosing oblong seeds.*

This genus of plants is ranged in the second section of Linnæus's seventeenth class, intitled Diadelphia Decandria, the flower having ten stamina, nine of which are united, and one stands single. To this genus Dr. Linnæus has joined the Emerus of Cæsalpinus, and the Securidaca of Tournefort, whereby he multiplies the species; but as these differ essentially in their fructification, I shall treat of them separately, following the example of all the former botanists.

The Species are,

1. Coronilla (*Glauca*) fruticosa, foliis septenis, stipulis lanceolatis. Lin. Sp. 1047. *Shrubby Coronilla with seven pair of small leaves, and spear-shaped stipula.* Coronilla maritima glauco folio. Tourn. Inst. 650.
2. Coronilla (*Argentea*) fruticosa foliolis undenis, extimo majore. Lin. Sp. Plant. 1049. *Shrubby Coronilla with eleven pair of small leaves, the outer being the largest.* Coronilla argentea Cretica. Tourn. Inst. 650.
3. Coronilla (*Valentina*) fruticosa foliis subnovenis suborbiculatis. Lin. Sp. Plant. 1047. *Shrubby Coronilla with nine lobes which are orbicular.* Polygala Valentina.
4. Coronilla (*Hispanica*) fruticosa enneaphylla, foliolis emarginatis, stipulis majoribus subrotundis. *Shrubby nine-leaved Coronilla, whose small leaves are indented, and larger roundish stipulæ.* Coronilla siliquis & seminibus crassioribus. Tourn. Inst. R. H. 650.
5. Coronilla (*Minima*) foliolis plurimis, ovatis, caule suffruticoso declinato, pedunculis longioribus. *Coronilla with many oval lobes, a declining stalk somewhat shrubby, and longer foot-stalks to the flowers.* Coronilla minima. Tourn. Inst. R. H. 650. *Smallest Coronilla.*
6. Coronilla (*Varia*) herbacea, leguminibus erectis, teretibus, torosis, numerosis, foliis glabris. Hort. Cliff. 363. *Herbaceous Coronilla with many taper erect pods, and smooth leaves.* Coronilla herbacea flore vario. Tourn. Inst. 650.
7. Coronilla (*Cretica*) herbacea, leguminibus quinis, erectis, teretibus, articulatis. Prod. Leyd. 387. *Herbaceous Coronilla with five taper, erect, jointed pods.* Coronilla Cretica herbacea, flore parvo purpurascente. Tourn. Cor. 44.
8. Coronilla (*Orientalis*) herbacea leguminibus numerosis, radiatis, crassioribus, articulatis, foliolis subtus glaucis. *Herbaceous Coronilla with many thick jointed pods dispofed like rays, and smaller leaves of a sea-green on their under side.* Coronilla orientalis herbaceo, flore magno luteo. Tourn. Cor. 44.
9. Coronilla (*Juncea*) fruticosa, foliis quinatis ternatisque lineari-lanceolatis subcarnosis obtusis. Lin. Sp. 1047. *Shrubby Coronilla with five and trefoil linear, spear-shaped leaves, which are obtuse and fleshy.* Doricum luteum Hispanicum carnosius. Barrel. Icon. 133.
10. Coronilla (*Scandens*) caule hirsuto, volubili, foliolis quinis ovatis, floribus binis, erectis, axillaribus, leguminibus erectis, villosis. *Coronilla with a twining hairy stalk, five oval leaves, two flowers growing erect on the sides of the branches, and upright hairy pods.* Coronilla scandens pentaphylla. Plum. Cat. 19. *Climbing five-leaved Coronilla.*

The first sort is an humble shrub, which seldom rises more than two or three feet high, with a ligneous branching stalk, garnished closely with winged leaves, each being generally composed of five pair of small leaves (or lobes) terminated by an odd one; these are narrow at their base, and broad at the top, where they are roundish and indented; they are of a sea-green colour, and continue all the year. The flowers are produced on slender foot-stalks from the wings of the leaves, on the upper part of the branches, several standing together in a roundish bunch; they are of the butterfly, or Pea-bloom kind, and of a bright yellow colour, having a very strong odour, which to some persons is agreeable, but to others the contrary. This flowers in April and May, and the seeds ripen in August.

This plant is propagated by sowing the seeds in the spring, either upon a gentle hot-bed, or on a warm border of light fresh earth; and when the plants are come up about two inches high, they should be transplanted either into pots, or a bed of good rich earth, at about four or five inches distance every way, where they may remain until they have obtained strength enough to plant out for good; which should be either into pots filled with good fresh earth, or a warm situated border; in which, if the winter is not too severe, they will abide very well, provided they are in a dry soil.

The second sort is a shrub of the same size with the first, from which it differs in the number of small leaves (or lobes) on each midrib; these having nine or eleven, and are of a silver colour, but the flowers and pods are the same. It flowers at the same time, and requires the same treatment as the former.

The third sort is a shrubby plant, rising four or five feet high; the stalks are shrubby garnished with winged leaves, composed of many small oval lobes along the midrib by pairs, and ending in an odd one. The flowers stand upon long foot-stalks, which arise from the side of the branches; they are yellow, and grow together in close bunches. This flowers in winter and spring, and the seeds are ripe in August.

This is a perennial shrubby plant, which is propagated by seeds; they may be sown on a bed of light earth in April, and when the plants are fit to transplant, some of them should be planted in a warm border, close to a warm wall or pale, to which the branches should be trained; observing to shade them from the sun till they have taken fresh root, and also to refresh them with water when they require it. After they are well rooted, they will require no other culture but to keep them clean from weeds, and fasten their branches to the wall; the next year they will flower, and if they are on a dry soil and in a warm situation, they will continue many years. Some of these plants should be put into pots, that they may be removed into shelter in winter; where, if they are not too tenderly treated, they will flower great part of that season; but these will rarely produce seeds, whereas those in the full ground generally do, provided they are covered with mats in frosty weather.

The fourth sort is nearly like the first, but hath fewer pinnæ on each midrib. The flowers are larger, and have little scent. The pods and seeds are much larger, and the plants are not quite so hardy. This flowers in May and June, but rarely perfects seeds in England; it requires the same treatment as the first, but in winter the plants should be sheltered, otherwise hard frosts will destroy them.

The fifth sort is a low trailing plant with shrubby stalks, which spread near the ground, garnished with winged leaves, composed of many pair of small lobes placed along the midrib, terminated by an odd one; these are oval, and of a bright green; the flowers stand upon long foot-stalks in close bunches, they are yellow, and without scent. It flowers in May, and the seeds ripen in autumn. This is propagated by seeds in the same manner as the third, and requires the same treatment.

The sixth sort dies down every winter, but rises again the succeeding spring; the stalks of this rise to the height of five or six feet, where they have support; otherwise they trail on the ground, and are garnished with winged leaves, composed of several oblong small pinnæ, which are sometimes placed by pairs, and at other times are alternate, ending in a single one, they are

are of a deep green. The flowers come out on long foot-stalks from the wings of the leaves, many growing together in round bunches; they are variable from a deep to a light purple, mixed with white, and are succeeded by slender pods from two to three inches long, standing erect. This plant flowers in June, July, and August, and the seeds ripen in autumn. The roots of this plant creep very far under ground, by which the plant increases greatly; which, when permitted to remain unremoved for two or three years, will spread and overbear what plants grow near it; for which reason the roots should be confined, and it should be planted at a distance from any other plants; it will grow in almost any soil and situation, but thrives best in a warm sunny exposure, in which the flowers will also be much fairer, and in greater quantities. This plant was formerly cultivated to feed cattle.

The seventh sort hath an herbaceous stalk, which rises two feet high, garnished with winged leaves, composed of six pair of small leaves, placed along the midrib, which is terminated by an odd one; these are larger than those of the sixth sort, and broader at the top. The foot-stalks of the flowers come out from the side of the stalks, but they are shorter than those of the sixth sort, and sustain smaller heads of flowers, which are succeeded by five taper jointed pods, near two inches long.

This is an annual plant, which grows naturally in the Archipelago, from whence Tournefort sent the seeds to the royal garden at Paris. The seeds of this sort should be sown on a bed of light earth in the spring, where the plants are designed to remain, and when the plants come up, they should be thinned where they are too close, and afterward kept clean from weeds, which is all the culture they will require. In June they will flower, and the seeds ripen in autumn.

The eighth sort was discovered by Dr. Tournefort in the Levant, from whence he sent the seeds to the royal garden at Paris; this hath a perennial root, and an annual stalk, which rises upward of two feet high, standing erect. The leaves are composed of five or six pair of small oblong leaves, ranged along the midrib, which is terminated by an odd one. The foot-stalks of the flowers are strong, and upward of six inches in length, supporting large bunches of yellow flowers, which are succeeded by short thick pods about an inch long. This flowers in June and July, and in warm seasons the seeds will ripen in autumn: there is a variety of this with large white flowers.

This sort is propagated by seeds, which should be sown on a warm border of light earth in the spring; and when the plants come up, they must be carefully cleaned from weeds; when they are fit to remove, they should be transplanted into a warm border, where they are to remain, shading them from the sun till they have taken fresh root, after which they will require no farther care in summer, but to keep them clean from weeds; and in autumn, when the stalks are decayed, if the surface of the ground is covered with some old tan to keep out the frost, it will be a secure method to preserve the roots. The second year the plants will flower, and, if the same care is taken in winter, the roots may be continued some years.

The ninth sort grows naturally in Spain; this rises from two to four feet high, having many slender ligneous branches, garnished with narrow spear-shaped leaves, which are sometimes trifoliate, and at other times have five lobes on each foot-stalk; the flowers stand upon pretty long foot-stalks, which come out from the wings of the stalk, and are collected in small bunches; they are of a bright yellow colour, and appear for six or seven months together, but have not been succeeded by seeds here as yet.

This is propagated by seeds in the same manner as the first sort, and some of the plants should be planted in pots that they may be sheltered under a common frame in winter, because in hard frosts the plants are often destroyed; but in mild weather they should be exposed to the air, otherwise they will draw up weak.

The tenth sort was discovered by father Plumier in America. I received the seeds of this plant from Carthagena, which were sent me by my late ingenious friend Dr. William Houstoun; this hath a slender, hairy, twining stalk, of a brown colour, twisting round any of the shrubs which stand near it, whereby it rises eight or ten feet high, and is garnished with winged leaves, for the most part composed of five oval lobes, one inch long, and half an inch broad, of a deep green. The flowers come out by pairs at each joint, standing on very short separate foot-stalks erect; they are large, and of a pale yellow; these are succeeded by taper jointed pods, more than three inches long, which are covered with short, soft, white, hairy down, and stand erect. This plant is propagated by seeds, which should be sown early in the spring on a moderate hot-bed; and when the plants are come up, they should be each transplanted into a halfpenny pot filled with fresh rich earth, and plunged into a hot-bed of tanners bark, observing to shade them until they have taken root; after which time they should have air and water in proportion to the warmth of the season, and when they have filled these pots with their roots, they should be shifted into pots of a larger size, and plunged into the hot-bed again, where they must remain until autumn, when they should be removed into the stove, and plunged into the tan. These plants must be constantly kept in the bark-stove, and placed among plants which require a moderate heat; where they will thrive and flower, and should be supported by tall sticks, round which they will twine as Hops do; for if they have not this support, they will twist round other plants and spoil them. These are very proper plants to place against an espalier on the back part of the stove, amongst other climbing plants, where they will make an agreeable variety.

If the plants are carefully managed in the winter, they may be preserved two or three years, and will annually flower in July, and sometimes they will produce ripe seeds in England.

CORONOPUS. See Plantago.

CORTUSA. Lin. Gen. Plant. 181. [This plant is so called from Cortusus, a famous botanist, who first brought it into use.] Bears-ear Sanicle.

The Characters are,

*The flower hath a small, spreading, permanent empalement, which is indented at the brim in five parts; this hath one wheel-shaped petal, spreading open to the bottom, and cut into five parts at the brim, having five prominent tubercles at the base. It hath five short obtuse stamina, which are terminated by oblong erect summits. In the center is situated an oval germen, supporting a slender style, crowned by a single stigma. The germen afterward becomes an oval, oblong, pointed capsule, having two longitudinal furrows, and one cell, opening with two valves, filled with small oblong seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The Species are,

1. Cortusa (*Matthioli*) calycibus corollâ brevioribus. Lin. Sp. Plant. 144. *Bears Ear Sanicle, with an empalement shorter than the petal.* Cortusa Matthioli. Clus. Hist. 1. p. 307. *Bears Ear Sanicle of Matthiolus.*
2. Cortusa (*Gmelini*) calycibus corollum excedentibus. Amœn. Acad. 2. p. 340. *Bears Ear Sanicle with an empalement longer than the petal.*

The first sort grows naturally on the Alps, and also on the mountains in Austria, and in Siberia. This plant sends out many oblong smooth leaves, which are a little indented on the edges, and form a sort of head, like the Auricula. The foot-stalks of the flowers come out in the center of the leaves; these rise about four inches high, and support an umbel of flowers, each sitting on a slender, separate, short foot-

stalk;

ſtalk; they are of a fleſh colour, and ſpread open like thoſe of the Auricula. It flowers in April, but doth not produce ſeeds in the gardens, for this plant is with great difficulty kept in a garden. The only method by which I could ever preſerve it, has been by planting the plants in pots, and placing them in a ſhady ſituation, where they were duly watered in dry weather; in this place they conſtantly remained both ſummer and winter, for the cold will not deſtroy them; the earth for this plant ſhould be light, and not too rich, for dung is very injurious to it. As this very rarely produces any ſeeds in England, the only method to propagate it is, by parting the roots in the ſame manner as is practiſed for Auriculas; the beſt time for this is about Michaelmas, ſoon after which the leaves decay.

The ſecond ſort is very like the firſt, but the flowers are much leſs, and their empalements are larger; this grows naturally in Siberia, but is with great difficulty kept in a garden.

CORYLUS. Lin. Gen. Plant. 953. Tourn. Inſt. R. H. 581. [ſo called from Κόρυλος, *Gr.* a Hazel, or Filbert-tree. It is alſo called Avellana, from Avella, a town in Campania, where it grew in great plenty.] The Hazel, or Nut-tree.

The CHARACTERS are,

*It hath male and female flowers growing at remote diſtances on the ſame tree. The male flowers are produced in long ſcaly katkins, each ſcale including a ſingle flower, having no petals, but eight ſhort ſtamina faſtened to the ſide of the ſcale, and terminated by oblong erect ſummits. The female flowers are included in the future bud, ſitting cloſe to the branches; theſe have a thick two-leaved perianthium, torn on the border, ſitting under the flower when it is ſmall, but afterward is enlarged to the ſize of the fruit; it hath no petal, but a ſmall round germen occupies the center, ſupporting two briſtly coloured ſtyles, which are longer than the empalement, crowned by two ſingle ſtigmas. The germen afterward becomes an oval nut, ſhaved at the baſe, and compreſſed at the top, ending in a point.*

This genus of plants is ranged in the eighth ſection of Linnæus's twenty-firſt claſs, intitled Monœcia Polyandria, from there being male and female flowers on the ſame plant, and the male flowers having many ſtamina.

The SPECIES are,

1. CORYLUS (*Avellana*) ſtipulis ovatis obtuſis. Hort. Cliff. 448. *Hazel Nut with oval blunt ſtipulæ.* Corylus Sylveſtris. C. B. P. 418. *Wild Hazel Nut.*
2. CORYLUS (*Maxima*) ſtipulis oblongis, obtuſis, ramis erectioribus. *Hazel with oblong blunt ſtipulæ, and the branches growing more erect.* Corylus ſativa fructu oblongo. C. B. P. 418. *The Filbert.*
3. CORYLUS (*Colurna*) ſtipulis linearibus acutis. Hort. Cliff. 448. *Hazel with narrow acute ſtipulæ.* Corylus Byzantina. H. L. 191. *Byzantine Nut.*

The firſt of theſe trees is common in many woods in England, from whence the fruit is gathered in plenty, and brought to the London markets by the country people. This tree is ſeldom planted in gardens (except by perſons curious in collections of trees and ſhrubs;) it delights to grow on a moiſt ſtrong ſoil, and may be plentifully increaſed by ſuckers from the old plants, or by laying down their branches, which, in one year's time, will take ſufficient root for tranſplanting; and theſe will be much handſomer and better rooted plants than ſuckers, and will greatly outgrow them, eſpecially while young.

There is a variety of this with fruit growing in great cluſters at the end of the branches, which is diſtinguiſhed by the title of Cluſter Nut; but as this is ſuppoſed to be only a variety, which accidentally came from the other, I have not diſtinguiſhed it; however, this may be continued by layers, ſo the kind may always be preſerved.

The ſecond ſort is by many ſuppoſed to be only a ſeminal variety from the firſt, which hath been improved by culture; but this is very doubtful, for I have ſeveral times propagated both from the nuts, but never have found them vary from one to the other, though they have altered in the ſize and colour of their fruit, from the ſorts which were ſown; but as the ſhrubs of this grow more erect than thoſe of the other, and the ſtipulæ are different in their ſhape, ſo I have enumerated it as a diſtinct ſort; of this there are the red and white Filberts, both which are ſo well known, as to need no deſcription.

The third ſort grows naturally near Conſtantinople; the nuts of this are large, roundiſh, and in ſhape like thoſe of the common Hazel, but are more than twice their ſize. The cups in which the nuts grow are very large, ſo as almoſt to cover the nut, and is deeply cut at the brim. This ſort is not common in England, but I take thoſe large nuts which are annually imported from Barcelona in Spain, to be of the ſame kind, the nuts being ſo alike, as not to be diſtinguiſhed when out of their cups; and thoſe of the Spaniſh ſort come over naked, ſo I cannot with certainty ſay how they eſſentially differ.

All theſe ſorts may be propagated by ſowing their nuts in February; which, in order to preſerve them good, ſhould be kept in ſand in a moiſt cellar, where the vermin cannot come at them to deſtroy them nor ſhould the external air be excluded from them, which would occaſion their growing mouldy.

The manner of ſowing the ſeeds being well known to every one, I need not here mention it, eſpecially ſince it is not the ſureſt way to obtain the ſorts deſired; for they ſeldom prove ſo good as the nuts which were ſown, or at leaſt not one in four of them will; and the method of propagating them by layers being not only the ſureſt, but alſo moſt expeditious, is what I would recommend to every one who would cultivate theſe trees for the ſake of their fruits.

CORYMBIFEROUS PLANTS are ſuch as have a compound diſcous flower, but their ſeeds have no down adhering to them. The name is taken from the manner of bearing its flowers in cluſters, and ſpreading round in the form of an umbrella. Of this kind is the Corn Marigold, common Ox Eye, the Daiſy, Camomile, Mugwort, Feverfew, &c.

Mr. Ray diſtinguiſhes them into ſuch as have a radiated flower, as the Sun Flower, Marigold, &c. and ſuch as have a naked flower, as the Lavender Cotton and Tanſey, and alſo thoſe that are akin to them, as Scabious, Teaſel, Carduus, &c.

CORYMBIUM.

The CHARACTERS are,

*It hath an empalement of two leaves, having ſix angles; the ſmall leaves are erect and cloſe together their whole length, and are triangular on their outſide, cut into three ſegments, and are permanent. The flower has one petal, which is equal, having a very ſhort tube, cut into five ſegments at the brim, which ſpread open; it hath five erect ſtamina ſitting within the tube, crowned with oblong erect ſummits, ſhorter than the petal, joining in a cylinder: the germen is ſituated within the empalement, at the bottom of the petal, ſupporting a ſingle erect ſtyle the length of the petal, terminated by a bifid oblong ſtigma; the germen afterward becomes an oblong ſeed, having a ſort of down adhering to it.*

This genus of plants is ranged in the ſixth ſection of Linnæus's nineteenth claſs, intitled Syngeneſia Monogamia, the flower having five ſtamina which join by their ſummits, and is ſucceeded by one ſeed.

We know but one SPECIES of this genus, viz.

CORYMBIUM (*Africanum*). Hort. Cliff. 494. *African Corymbium.* Bupleurifolia ſemine pappoſo, valerianoides umbellata, cauliculi ſcabro. Pluk. Alm. 73.

This plant grows naturally at the Cape of Good Hope; it riſes with an erect rough ſtalk about a foot high, with a ſingle leaf at each joint, which half embrace the ſtalk with their baſe. The leaves are long, narrow, and triangular, and have a downy ſubſtance intermixed with them at their baſe; the upper part of the ſtalk divides into ſeveral foot-ſtalks, which are terminated by purple flowers of one petal, cut into five parts at the brim, each being ſucceeded by an oblong ſeed.

It is propagated by seeds, which should be sown in a small pot filled with light earth as soon as it is received from abroad; the pots should be plunged into a bed of tanners bark, where the heat is near spent, and covered with a common frame in winter, to protect the seeds from frost, snow, and hard rains. In the spring, if the pots are removed into a moderate hot-bed, the plants will soon appear: when they are about an inch high, they should be each transplanted into a separate small pot, observing to shade them until they have got new roots; soon after which they should be gradually inured to the open air, and in June they should be placed abroad in a sheltered situation; where they may remain till October, when they should be placed in a common frame, where they may be protected from frost, being too tender to live abroad in England.

CORYMBUS [Κόρυμβος, *Gr.*] signifies among botanists, round clusters of berries, as those of Ivy.

Jungius uses it to signify the extremity of a stalk, so subdivided and laden with flowers, or fruits, as to compose a spherical figure.

It is also by modern botanists used to signify a compound discous flower, which does not fly away in down, as the Chrysanthemum, Daisy, Chrysocome, &c. For these kind of flowers, being spread into breadth, do, after a sort, resemble an umbrella, or bunch of Ivy-berries.

COSTUS. Lin. Gen. Plant. 3.

The Characters are,

*It hath a simple spadix and spathæ, with a small empalement, divided into three parts, sitting on the germen. The flower hath three concave petals, which are erect and equal, with a large oblong nectarium of one leaf, having two lips, the lower being broad, and as long as the petal. The upper is shorter and spear-shaped, changing to a stamina; this is fastened to the upper lip of the nectarium, to which adheres a bipartite summit. The germen is situated within the receptacle of the flower, which is roundish, supporting a slender style, crowned by a compressed indented stigma. The germen afterward becomes a roundish capsule with three cells, containing several triangular seeds.*

This genus of plants is ranged in the first section of Linnæus's first class, intitled Monandria Monogynia, the flower having but one stamen and one style.

We have but one Species of this plant, viz.

Costus (*Arabicus*). Hort. Cliff. 2. Costus Arabicus. C. B. P. 36. *Arabian Costus.*

This hath a fleshy jointed root like that of Ginger, which propagates under the surface as that doth; from which arise many round, taper, herbaceous stalks, garnished with oblong smooth leaves, embracing the stalks like those of a Reed; these stalks rise near two feet high; out of the center, the club, or head of flowers is produced, which is near two inches long, the thickness of a man's finger, and blunt at the top, composed of several leafy scales, out of which the flowers come; these have but one thin white petal, which is of short duration, seldom continuing longer than one day before it fades, and is never succeeded by seeds in this country. The time of its flowering is very uncertain, for sometimes it flowers late in the winter, and at other times it has flowered in summer, so is not constant to any season in England. It grows naturally in most parts of India.

This is propagated by parting of the roots; the best time for doing this is in the spring, before the roots put out new stalks. The roots must not be divided too small, because that will prevent their flowering. They should be planted in pots, filled with light kitchen-garden earth, and plunged into the tan-bed in the stove, where they should constantly remain, and may be treated in the same manner as the Ginger, which is fully treated of under the article Amomum.

The roots of this plant were formerly imported from India, and were much used in medicine; but of late years they have not been regarded, the roots of Ginger being generally substituted for these.

COTINUS. See Rhus.

COTONEA MALUS. See Cydonia.

COTONEASTER. See Mespilus.

COTULA. Lin. Gen. Plant. 868. Ananthocyclus. Vaill. Act. Reg. Scien. 1719. Mayweed.

The Characters are,

*It hath a flower composed of hermaphrodite florets in the disk, and female half florets which form the rays; these are included in one common convex empalement, divided into several oval parts. The hermaphrodite florets are tubular, and cut into four unequal segments at the top; these have four small stamina, terminated by tubular summits, and have two obtuse stigmas, having one small, oval, angular seed to each. The female half florets have an oval compressed germen, supporting a slender style, crowned by two stigmas, but have no stamina; these are succeeded by single heart-shaped seeds, plain on one side, and convex on the other, with an obtuse border.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, intitled Syngenesia Polygamia superflua; the plants of this section have hermaphrodite and female flowers, which are fruitful.

The Species are,

1. Cotula (*Anthemoides*) foliis pinnato-multifidis, corollis radio destitutis. Hort. Cliff. 417. *Mayweed with many pointed winged leaves, and no rays to the flower.* Chamæmelum luteum capite aphyllo. C. B. P. 135.
2. Cotula (*Turbinata*) receptaculis subtus inflatis, turbinatis. Hort. Cliff. 417. *Mayweed whose receptacles are swollen and turbinated beneath.* Cotula Africana calice eleganter cæsio. Tourn. Inst. R. H. 495.
3. Cotula (*Coronopi folia*) foliis lanceolato-linearibus, amplexicaulibus pinnatifidis. Hort. Cliff. 417. *Mayweed with narrow spear-shaped leaves embracing the stalk, having many points.* Chrysanthemum exoticum minus, capite aphyllo, Chamæmeli nudi facie. Breyn. Cent. 156.

The first sort grows naturally in Spain, Italy, and the Archipelago; this is an annual plant, which rises with a branching stalk half a foot high, garnished with leaves which are finely divided like those of Chamomile. The flowers are produced singly at the end of the branches, which are very like those of the naked Chamomile, but the heads rise higher in the middle like a pyramid. This flowers in May and June, and the seeds ripen in August. If the seeds of this sort are permitted to scatter, the plants will come up in the spring, and require no other care but to keep them clean from weeds, and thin the plants where they are too close.

The second sort grows naturally at the Cape of Good Hope, from whence I have received the seeds; this is an annual plant, sending out many branching stalks from the root, which spread on the ground, and are garnished with very fine divided leaves, covered with a lanugo, or cotton. The flowers are produced singly upon long foot-stalks, arising from the side of the branches; these have a narrow border of white rays, with a pale yellow disk. It flowers in June and July, and the seeds ripen in autumn. This sort must be raised on a moderate hot-bed in the spring, and when the plants have obtained strength, they may be transplanted into a warm border, where they will ripen their seeds very well.

The third sort is an annual plant, which sends out trailing stalks about six inches long, garnished with succulent leaves, in shape like those of Buckshorn Plantain. The flowers grow from the divisions of the stalks upon short weak foot-stalks, being destitute of rays; they are of a sulphur colour, and appear about the same time with the former. If the seeds of this sort are sown on a warm border where the plants are to remain, they will require no other culture but to keep them clean from weeds. The flowers of the two last sorts stand erect, when they first appear, but so soon as the florets are impregnated, and their colour changes, the foot-stalks become very flaccid toward the top, and the flowers hang downward; but when the seeds are ripe, the foot-stalks become

stiff,

ſtiff, and the heads ſtand erect for the winds to diſperſe the ſeeds.

COTYLEDON. Lin. Gen. Plant. 512. Tourn. Inſt. R. H. 90. tab. 19. [Κοτυληδών, Gr. of Κοτύλη, Gr. a cavity; becauſe the leaves of this are hollowed like the navel, or becauſe it reſembles a veſſel wherewith the ancients uſed to draw water.] Navelwort.

The Characters are,

*The flower hath a ſmall empalement of one leaf, divided into five parts at the top. It hath one funnel-ſhaped petal, cut into five parts at the brim, which turn backward. It hath five germina, which have each a ſquamous concave nectarium at their baſe, and each ſuſtains a ſtyle, crowned by a ſingle ſtigma; theſe are attended by ten erect ſtamina, which are terminated by erect ſummits, having four furrows. The germen afterward become ſo many oblong ſwelling capſules, opening longitudinally, with one valve, filled with ſmall ſeeds.*

This genus of plants is ranged in the fourth ſection of Linnæus's tenth claſs, intitled Decandria Pentagynia, the flower having ten ſtamina and five ſtyles.

The Species are,

1. Cotyledon (*Umbilicus*) foliis cuculato-peltatis, ſerrato-dentatis, alternis, caule ramoſo, floribus erectis. Lin. Sp. Plant. 429. *Navelwort with hooded leaves ſharply indented, growing alternate, and a branching ſtalk with erect flowers.* Cotyledon major. *Greater Navelwort.* Umbilicus Veneris. Cluſ. H.
2. Cotyledon (*Spinoſo*) foliis oblongis ſpinoſo-mucronatis, caule ſpicato. Lin. Sp. Plant. 429. *Navelwort with oblong pointed leaves, ending with a ſpine, and a ſpiked ſtalk.*
3. Cotyledon (*Serrata*) foliis ovalibus, crenatis, caule ſpicato. Lin. Sp. Plant. 429. *Navelwort with oval crenated leaves and a ſpiked ſtalk.* Cotyledon Cretica, folio oblongo, fimbriato. Hort. Elth. 113. tab. 95. *Navelwort of Crete, with an oblong fringed leaf.*
4. Cotyledon (*Hemiſpherica*) foliis ſemigloboſis. Hort. Cliff. 176. *Navelwort with ſemiglobular leaves.* Cotyledon Capenſis, folio ſemiglobato. Hort. Elth. 112. tab. 94.
5. Cotyledon (*Orbiculata*) foliis ſubrotundis, planis integerrimis. Hort. Cliff. 276. *Navelwort with roundiſh, plain, entire leaves.* Sedum Africanum fruteſcens, incanum, orbiculatis foliis. H. L. 349.
6. Cotyledon (*Ramoſiſſimo*) caule ramoſiſſimo, foliis rotundis, planis, marginibus purpureis. *Navelwort with a very branching ſtalk, and round, plain, hairy leaves, with purple edges.*
7. Cotyledon (*Arboreſcens*) caule ramoſo, ſucculento, foliis obverſè ovatis, emarginatis, marginibus purpureis. *Navelwort with a branching ſucculent ſtalk, and obverſe oval leaves, which are indented at the top, and have purple borders.* Cotyledon major, arboreſcens Afra, foliis orbiculatis, glaucus, limbo purpureo, & maculis viridibus ornatis. Boerh. Ind. alt. 1. p. 287.
8. Cotyledon (*Ovata*) caule ramoſo, ſucculento, foliis ovatis, planis, acuminatis oppoſitis ſemiamplexicaulibus. *Navelwort with a ſucculent branching ſtalk, and oval, plain, pointed leaves growing oppoſite, which half embrace the ſtalk.*
9. Cotyledon (*Spuria*) foliis alternis ſpatulatis carnoſis integerrimis. Lin. Sp. 614. *Navelwort with ſpatule-ſhaped leaves.* Cotyledon Africana fruteſcens, folio longo & anguſto, flore flaveſcente. Com. Rar. Plant. 23. tab. 23.
10. Cotyledon (*Laciniata*) foliis laciniatis, floribus quadrifidis. Hort. Cliff. 175. *Navelwort with cut leaves, and four-pointed flowers.* Cotyledon Afra, folio craſſo lato laciniato, floſculo aureo. Boerh. Ind. alt. 288.

The firſt ſort, which is that uſed in medicine, grows upon old walls and buildings in divers parts of England, particularly in Shropſhire and Somerſetſhire; in both which counties it greatly abounds upon old buildings, and on rocky places, but is not often found wild near London, nor often cultivated in gardens. This hath many round ſucculent leaves, whoſe foot-ſtalks are placed almoſt in the center, ſo as to reſemble a target. They are alternately ſawed on their edges, which frequently turn inward; the upper ſurface of the leaves are hollow in the middle, where the foot-ſtalks are joined on the lower ſide, ſo as to reſemble a navel, from whence the plant was titled Navelwort. From between the leaves ariſe the foot-ſtalks of the flowers, which in ſome places grow near three feet high, and in others not more than ſix inches, their lower part being garniſhed with leaves, and their upper part with flowers, which ſtand cloſe to the ſide of the branches, and grow erect; they are of a whitiſh yellow colour, and appear in June. It requires a dry rubbiſhy ſoil, and to have a ſhady poſition. This is a biennial plant, ſo that after it has perfected ſeed, the plant decays; but if the ſeeds are ſcattered on walls and old buildings as ſoon as it is ripe, or if the ſeeds are permitted to fall upon ſuch places, the plants will come up, and thrive much better than when they are ſown in the ground; and when once the plants are eſtabliſhed upon an old wall or building, they will ſow their ſeeds, and maintain their place better than when cultivated with more care.

The ſecond ſort grows naturally in Siberia, from whence it was brought to the imperial garden at Peterſburgh. This was ſent me by Dr. Amman, the late profeſſor of botany in that garden. It is a low plant, in ſhape like the Houſleek, but the leaves are longer, and terminate in ſoft ſpines. The flower-ſtalks riſe about four inches high, and ſupport four or five whitiſh flowers, which are cut at the brim into five parts. Theſe appear in April, and are ſometimes ſucceeded by ſeeds in England. This ſort requires a very ſhady ſituation, for if it is expoſed to the ſun in ſummer, the plants will ſoon decay. It is propagated by offsets like the Houſleek, and requires a pretty ſtrong ſoil.

The third ſort grows naturally in the Levant. This hath a fibrous root, from which is produced a ſingle upright ſucculent ſtalk, garniſhed with oblong, thick, ſucculent leaves, placed alternate, which are ſawed on their edges. The upper part of the ſtalk is garniſhed with purpliſh flowers, growing in a looſe ſpike, two or three being joined on the ſame foot-ſtalk, which is very ſhort. The flowers appear in June, and the ſeeds ripen in autumn. It is a biennial plant, which decays ſoon after the ſeeds are ripe. If this ſort is ſown upon a wall, it will thrive better than in the ground, and be leſs liable to ſuffer by froſt; ſo that where the ſeeds ſcatter themſelves in ſuch ſituations, the plants thrive better than when they are cultivated.

The fourth ſort grows naturally at the Cape of Good Hope. This hath a thick ſucculent ſtalk, which rarely riſes above a ſpan high, dividing into many branches, garniſhed with ſhort, thick, ſucculent leaves, which are very convex on their under ſide, but plain on their upper, not more than half an inch long, and a quarter broad, of a grayiſh colour ſpotted over with ſmall green ſpots, and ſit cloſe to the branches: the foot-ſtalks of the flower riſe from the top of the branches, and are ſix inches long, naked, and ſupport five or ſix flowers, which come out alternate from the ſide, ſitting very cloſe to the ſtalks; they are tubular, and cut into five parts at the top; theſe are greeniſh, with purple tips. It flowers in June and July, but never produces ſeeds in England.

The fifth ſort grows naturally upon dry gravelly ſpots at the Cape of Good Hope. It hath a thick ſucculent ſtalk, which by age becomes ligneous, and riſes three or four feet high, ſending out crooked branches, which grow irregular, garniſhed with thick, fleſhy, ſucculent leaves about two inches long, and near as wide toward the top; they are narrow at their baſe, and rounded at the top, of a ſea-green colour, with a purple edge, which is frequently irregularly indented. The flowers grow upon thick ſucculent foot-ſtalks, which ariſe from the end of the branches, and are near a foot long, naked, and ſupporting eight or ten flowers, growing in an irregular umbel at the top; theſe are of a pale yellow colour, having long tubes, which hang downward, cut into five parts at the brim, which turn backward, the ſtamina and ſtyle being longer than

than the tube of the flower, hanging downward. This ſort flowers in July, Auguſt, and September, but doth not ripen ſeeds in England.

The ſixth ſort is alſo a native of the Cape of Good Hope. This hath a ſhort, thick, ſucculent ſtalk, which rarely riſes more than a foot high, branching out on every ſide, ſo as to ſpread over the pots in which they are planted: they become woody by age, and are cloſely garniſhed with thick round leaves, of a grayiſh colour, with purple borders, plain on their upper ſide, but convex on their under, and very fleſhy, of an herbaceous colour within, and full of moiſture. This ſort hath not flowered in England, ſo far as I can learn, for I have kept plants of it which were twenty years old, but never attempted to flower. It is undoubtedly a different ſort from the former, although they have been ſuppoſed to be the ſame by ſome writers.

The ſeventh ſort is ſomewhat like the ſixth, but the ſtalks riſe higher, the leaves are much larger, and ſhaped more like thoſe of the fifth, but are ſpotted on their upper ſide with great numbers of dark green ſpots; they have a deep border of purple on their edges, and ſit cloſe to the branches. This hath not as yet flowered in England. This is alſo a native of Æthiopia.

The eighth ſort hath been of late years introduced into the gardens in Holland, from the Cape of Good Hope, where it grows naturally, and was ſent me by Dr. Adrian Van Royen, late profeſſor of botany at Leyden. This riſes with a ſucculent ſtalk near three feet high, which divides into many branches, growing erect, garniſhed with oval ſucculent leaves, placed oppoſite; they are of a lively green, and end in points, and half embrace the ſtalks with their baſe. This ſort hath not as yet produced any flowers in England.

The ninth ſort grows on rocky places at the Cape of Good Hope, from whence it was firſt brought to the gardens in Holland, and hath ſince been ſpread into moſt parts of Europe, where there are curious perſons who preſerve exotic plants in their gardens: this hath a ſhort, greeniſh, ſucculent ſtalk, which ſeldom riſes more than a ſpan high, dividing into ſeveral irregular branches, garniſhed with thick ſucculent leaves four inches long, and half an inch broad, and as much in thickneſs, having a broad concave furrow on their upper ſide, running almoſt their whole length, and are convex on their under ſide, of a bright green, with a purple tip. The foot-ſtalks of the flowers are produced at the end of the branches, and riſe near a foot high, having here and there an oblong pointed leaf, growing on their ſide. The flowers ſtand upon ſhort foot-ſtalks, which branch out from the principal ſtem; theſe are yellow, having pretty long tubes, which are cut at the top into five parts, and are reflexed backward. The flowers of this ſort hang downward, and the ſtamina are longer than the tube of the flower; the reflexed parts of the petal are tipped with purple. Dr. Linnæus has ſuppoſed this to be the ſame with the fifth ſort, but whoever has ſeen both plants, cannot doubt of their being diſtinct ſpecies.

The tenth ſort grows naturally in the warm parts of Africa, ſo is much more tender than either of the other ſorts: this riſes with an upright ſtem about a foot high, which is jointed and ſucculent, garniſhed with broad leaves, which are deeply cut on their edges; they are of a grayiſh colour, placed oppoſite, and almoſt embrace the ſtalks with their baſe. The foot-ſtalks of the flowers ariſe from the end of the branches, which are about ſix inches long, ſuſtaining ſeven or eight ſmall flowers of a deep yellow colour, which are divided into four parts almoſt to the bottom. The ſtamina of theſe flowers are not longer than the ſhort tube. This flowers at different ſeaſons of the year, but never produces any ſeeds in England. This ſort requires a warm ſtove to preſerve it through the winter in England, nor ſhould it be expoſed abroad in ſummer; for if it receives much wet, the ſtalks are very ſubject to rot; ſo that it ſhould conſtantly remain either in the ſtoves, or in ſummer ſhould be placed in an airy glaſs-caſe with other tender ſucculent plants, where they may have free air in warm weather, and be ſcreened from cold and wet; but in autumn they muſt be removed into the ſtove, where they ſhould be kept in a moderate temperature of warmth: this is propagated by cuttings, which ſhould be taken off in ſummer, and planted into ſmall pots, and plunged into a moderate hot-bed, and when they have taken root, they ſhould be removed into the ſtove. This plant muſt have but little water, eſpecially in winter.

The African kinds are all of them propagated by planting cuttings in any of the ſummer months, which ſhould be laid in a dry place for a fortnight or three weeks after they are taken from the plant, before they are planted; for theſe abound with juice through every part of the plant, which will certainly rot the cuttings, if they are not ſuffered to lie out of the ground, that the wounded part may heal over, and the great redundancy of ſap evaporate. The ſoil in which theſe plants thrive beſt, is one third freſh light earth from a paſture, one third ſand, and the other third part lime-rubbiſh and rotten tan, in equal quantities; theſe ſhould be well mixed, and laid in a heap ſix or eight months before it is uſed, turning it over five or ſix times, that the parts may the better incorporate; and before it is uſed, it will be proper to paſs it through a ſcreen, to ſeparate the large ſtones, clods, &c. therefrom.

Having prepared the earth, and your cuttings being in a fit order for planting, you muſt fill as many halfpenny pots with earth as you have cuttings to plant; then put one cutting in the middle of each pot about two or three inches deep or more, according to their ſtrength; then give them a little water to ſettle the earth cloſe about them, and ſet the pots in a warm ſhady place for about a week, to prepare the cuttings for putting forth roots; after which they ſhould be plunged into a moderate hot-bed of tanners bark, which will greatly facilitate their rooting; but obſerve to give them air, by raiſing the glaſſes at all times when the weather will permit, as alſo to ſhade the glaſſes in the heat of the day.

In about ſix weeks or two months time after planting, theſe cuttings will be rooted, when you muſt begin to expoſe them to the open air by degrees, firſt drawing the pots out of the tan, and ſetting them on the top, then raiſe the glaſſes very high in the daytime; and in about a week after remove the pots into a green-houſe, and there harden them for another week; after which they may be expoſed to the open air in a well defended place, obſerving not to ſet them into a place too much expoſed to the ſun, until they have been inured to the open air for ſome time.

In this place the plants may remain until the beginning of October, at which time you ſhould remove them into the conſervatory, placing them as near the windows as poſſible at firſt, letting them have as much free open air as the ſeaſon will permit, by keeping the windows open whenever the weather is good; and now you muſt begin to abate your waterings, giving it to them ſparingly; but you ſhould not ſuffer their leaves to ſhrink for want of moiſture, which is another extreme ſome people run into for want of a little obſervation; for when they are ſuffered to ſhrink for want of ſufficient moiſture to keep their veſſels diſtended, they are rendered incapable of diſcharging this moiſture whenever they receive it again. The tenth ſort ſhould be placed in a moderate ſtove in winter, nor muſt it be ſet abroad till Midſummer, for it is much tenderer than any of the others.

The beſt method to treat moſt of theſe plants is, to place them in an open, airy, dry glaſs-caſe, among Ficoideſſes and African Houſleeks, where they may enjoy as much of the ſun-ſhine as poſſible, and have a free, dry, open air; for if theſe are placed in a common green-houſe among ſhrubby plants, which perſpire freely, it will fill the houſe with a damp air, which

which these succulent plants are apt to imbibe; and thereby becoming too replete with moisture, often cast their leaves, and many times their branches also decay, and the whole plant perishes.

COURBARIL. See Hymenæa.

COWSLIP. See Primula.

CRAB-TREE. See Malus.

CRAMBE. Lin. Gen. Plant. 739. Tourn. Inst. R. H. 211. tab. 100. [Κράμβη, *Gr.*] Sea Cabbage.

The Characters are,

*The empalement of the flower is composed of four oval concave leaves which spread open. The flower hath four petals, placed in form of a cross, which are large, oblong, and spread open; it hath six stamina, two of which are the length of the empalement, the other four are longer, and bifid at their points; these are terminated by single summits, which branch into threads on their outside. The petals have honey glands on their inside, which are longer than the stamina. It hath an oblong germen, but no style, crowned by a thick stigma. The germen afterward becomes a round dry capsule, with one cell, inclosing one roundish seed.*

This genus of plants is ranged in the second section of Linnæus's fifteenth class, intitled Tetradynamia siliquosa, the flower having four long and two short stamina, and the seeds growing in pods.

The Species are,

1. Crambe (*Maritima*) foliis cauleque glabris. Fl. Suec. 570. *Sea Cabbage with smooth stalks and leaves.* Crambe maritima brassicæ folio. Tourn. Inst. 211.
2. Crambe (*Suecica*) foliis profundè laciniatis, caule erecto, ramoso. *Sea Cabbage with leaves deeply cut, and an upright branching stalk.*
3. Crambe (*Orientalis*) foliis scabris, caule glabro. Lin. Sp. Plant. 671. *Sea Cabbage with rough leaves and a smooth stalk.* Crambe foliis & foliolis alternatim pinnatifidis. Prod. Leyd. 330.
4. Crambe (*Hispanica*) foliis cauleque scabris. Hort. Upsal. 193. *Sea Cabbage with rough stalks and leaves.* Rapistrum maximum rotundifolium monospermum. Corn. Canad. 147.

The first sort sends out many broad smooth leaves, which are deeply jagged on their sides in obtuse segments, and are of a grayish colour, spreading near the ground; between these arise a thick smooth foot-stalk about one foot high, which spreads out into many branches, which have at each joint one leaf of the same form as those below, but much less; these foot-stalks subdivide again into many smaller, which are garnished with white flowers, growing in a loose obtuse spike, composed of four concave petals, placed in form of a cross; these are succeeded by round dry seed-vessels about the size of large Pease, having a single seed in each. It flowers in June, and the seeds ripen in autumn. The roots of this sort creep under ground, whereby it propagates very fast.

The seeds of the second sort were sent me from Petersburgh for the first sort, from which it differs greatly. This hath a perennial root, which sends out several oblong, smooth, pointed leaves, irregularly cut on their sides into acute segments almost to the midrib; these are very smooth, and of a sea-green colour: between these arise the stalk, which grows three feet high, garnished below by oblong pointed leaves, which are acutely indented on their edges. The stalks branch out into many smaller, and these subdivide again into less, which are garnished with loose spikes of white flowers like those of the first sort, which are succeeded by seeds of the same form. This differs greatly from the first in the shape of its leaves, which are longer, ending in points, and the segments do the same; whereas those of the other are blunt, and not half so deeply cut. The stalks rise more than twice the height of the first, branch out more, and the branches grow more erect; and these differences are constant, where the plants of both sorts grow in the same soil.

The third sort grows naturally in the East. This hath a biennial root, from which arise many leaves in the spring, that are alternately divided to the midrib; and these divisions are again alternately cut on their edges into many points, so that they have the appearance of winged leaves, and are of a grayish colour. The stalks rise about two feet high, and divide into many branches, which are terminated by loose panicles of small white flowers, placed in form of a cross, which are succeeded by small round capsules, each containing a single seed. This flowers in June, and the seeds ripen in autumn, soon after which the roots decay.

The fourth sort is an annual plant, which grows naturally in Spain and Italy. This rises with a very branching stalk near three feet high, garnished with roundish heart-shaped leaves, indented on their edges, standing upon long foot-stalks; the branches subdivide into many slender ones, which end in long loose spikes of small white flowers, which are succeeded by small, round, dry seed-vessels, which contain a single seed. The leaves and stalks of this sort are rough. It flowers in June, and the seeds ripen in autumn.

The first species is found wild upon sea-shores in divers parts of England, but particularly in Sussex and Dorsetshire in great plenty, where the inhabitants gather it in the spring to eat, preferring it to any of the Cabbage kind; as it generally grows upon the gravelly shore, where the tide overflows it, the inhabitants observe where the gravel is thrust up by the shoots of this plant, and open the gravel, and cut the shoots before they come out, and are exposed to the open air, whereby the shoots appear as if they were blanched; and when they are cut so young, they are very tender and sweet; but if they are suffered to grow till they are green, they become tough and bitter. This plant may be propagated in a garden, by sowing the seed soon after it is ripe, in a sandy or gravelly soil, where it will thrive exceedingly, and increase greatly by its creeping roots, which will soon overspread a large spot of ground, if encouraged; but the heads will not be fit to cut until the plants have had one year's growth: and in order to have it good, the bed in which the plants grow, should, at Michaelmas, be covered over with sand or gravel about four or five inches thick, which will allow a proper depth for the shoots to be cut before they appear above ground; and if this is repeated every autumn, in the same manner as is practised in earthing of Asparagus-beds, the plants will require no other culture. This may be cut for use in April and May, while it is young; but if the shoots are suffered to remain, they will produce fine regular heads of white flowers, which appear very handsome, and will perfect their seeds, by which they may be propagated.

The other sorts are only preserved in curious gardens of plants for variety, but are not of any use or beauty. The perennial sorts may be propagated in the same manner as the first.

CRANE's-BILL. See Geranium.

CRANIOLARIA. Lin. Gen. Plant. 670. Martynia. Houst. Gen.

The Characters are,

*The flower hath a permanent empalement, composed of four short narrow leaves which spread open, with a large swollen head, which is cut longitudinally on the side. The flower hath one petal, which is unequal, having a very long narrow tube, whose brim is divided into two lips; the upper being roundish and entire, but the under is divided into three parts, the middle segment being the largest. It hath four stamina, two of which are the length of the tube, and two are shorter; these are terminated by single summits; at the bottom of the tube is situated an oval germen, supporting a slender style, crowned by an obtuse thick stigma. The germen afterward becomes an oval leathery fruit, pointed at both ends, opening with two valves, inclosing a depressed woody nut, pointed at both ends, and recurved, having two or three furrows, so as to resemble a skull, opening in two parts.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, the flowers having two long and

two short stamina, and the seeds being included in a capsule.

The Species are,

1. Craniolaria (*Annua*) foliis cordatis, angulatis lobatis. Lin. Sp. Plant. 862. *Craniolaria with angular heart-shaped leaves.* Martynia annua, villosa, & viscosa, aceris folio, flore albo, tubo longissimo. Houst. MSS.

2. Craniolaria (*Fruticosa*) foliis lanceolatis dentatis. Lin. Sp. Plant. 618. *Craniolaria with spear-shaped indented leaves.* Gesnera arborescens amplo flore fimbriato & maculoso. Plum. Nov. Gen. 27.

The first sort was discovered in the neighbourhood of Carthagena in New Spain, by the late Dr. William Houstoun, who sent the seeds to England. This is an annual plant, which rises with a branching stalk about two feet high; the branches come out opposite, which are hairy and viscous; the leaves also are placed opposite, upon very long foot-stalks; these are of different shapes, some of them are divided into five lobes, others into three, and some are almost heart-shaped, ending in acute points; they are hairy and clammy. The flowers are produced from the side, and also at the end of the branches, standing on short foot-stalks, having an inflated sheath or cover, out of which the tube of the flower arises, which is seven or eight inches long, and very slender; but at the top is divided into two lips, the under being large, divided into three broad segments, the middle being larger than the other two; the upper lip is roundish and entire: the flowers are succeeded by oblong fruit, having a thick dry skin, which opens lengthways, inclosing a hard furrowed nut, with two recurved horns. This is an annual plant, whose seeds must be sown on a hot-bed in the spring; and when the plants are fit to remove, they should be each planted in a separate small pot, filled with light fresh earth, and plunged into a moderate hot-bed, carefully shading them from the sun till they have taken new root; after which they should have free air admitted to them in proportion to the warmth of the season, to prevent their drawing up weak, and afterwards treated in the same manner as other tender exotic plants, being too tender to thrive in the open air in England; so that when they are grown too large to remain under the frames, they should be removed into the bark-stove, and plunged into the tan-bed, where they will flower in July, and with good management they often perfect their seeds in autumn. But the seeds of this plant should remain on till they drop, otherwise they will not grow, for the outer covers of these seeds split open and drop off like those of the Almond, before the seeds are fully ripened.

The second sort grows naturally at the Havannah, and in some of the other islands in America. This rises with a shrubby stalk to the height of ten or twelve feet, dividing upward into a few branches, which are garnished with spear-shaped leaves, cut on their edges; these are soft and hairy. The flowers are produced from the side of the branches, growing several together on the same foot-stalk; they are shaped like those of the Foxglove, of a greenish yellow colour, with brown spots on the inside; the flowers have a swelling tube, which is recurved, and the brim is slightly divided into five unequal segments. These appear in July, but are not succeeded by seeds in England.

This sort is propagated by seeds, which must be procured from the countries where it grows naturally, and should be sown on a hot-bed in the spring; when the plants are fit to remove, they should be each planted into a separate small pot, filled with light kitchen-garden earth, and plunged into a fresh hot-bed, where they must be shaded from the sun till they have taken fresh root; then they must have air admitted to them, according to the warmth of the season, and frequently watered during the heat of summer. In autumn they must be removed into the bark-stove, and plunged into the tan-bed. During the winter season, the plants should not have much water, and may be treated in the same manner as other tender plants from those countries. The plants seldom flower in England till the third year; and as they do not produce seeds here, it is with difficulty the sort is preserved in the European gardens, as there is no other method of propagating the plants but by seeds.

CRASSULA. Dillen. Hort. Elth. 114. Lin. Gen. Plant. 352. Lesser Orpine, or Live-ever. This name was formerly applied to the Anacampseros, or Orpine.

The Characters are,

*The flower hath a five-leaved empalement. The corolla consists of five narrow petals, which are joined at their base, are reflexed, and spread open at the brim. In the bottom of the tube are situated five nectarii, and there are five stamina situated round these, which arise from the bottom of the tube, and extend to the brim. At the bottom of the tube are placed five oblong pointed germina; after the flower is past, these become five capsules, opening lengthways, and filled with small seeds.*

This genus of plants is by Dr. Linnæus ranged in his fifth class of plants, and in the fifth division, intitled Pentandria Pentagynia, which includes those plants whose flowers have five stamina and five styles.

The Species are,

1. Crassula (*Coccinea*) foliis planis cartilagineo-ciliatis, basi connato vaginantibus. Vir. Cliff. 26. *Lesser Orpine with plain leaves, having stiff edges set with silver hairs, and their base surrounding the stalk like sheaths.* Cotyledon Africana frutescens, flore umbellato Coccineo. Com. Rar. 24.

2. Crassula (*Perfoliata*) foliis lanceolato-subulatis sessilibus connatis, canaliculatis, subtus convexis. Hort. Cliff. 116. *Lesser Orpine with spear-shaped awl-fashioned leaves, surrounding the stalks with their base, channelled on their upper side, and convex on their under.* Crassula altissima perfoliata. Dill. Hort. Elth. 114.

3. Crassula (*Cultrata*) foliis oppositis, obtusè ovatis, integerrimis, hinc angustioribus. Hort. Cliff. 496. *Lesser Orpine with oval blunt leaves placed opposite, which are entire, and narrow at their base.* Crassula Anacampserotis folio. Hort. Elth. 115. tab. 65.

4. Crassula (*Ciliata*) foliis oppositis, ovalibus, planiusculis, distinctis, ciliatis, corymbis terminalibus. Hort. Cliff. 496. *Lesser Orpine with oblong plain leaves placed opposite, which are bordered with silver hairs, and stalks terminated by a corymbus of flowers.* Crassula caulescens, foliis sempervivi cruciatis. Hort. Elth. 116. tab. 98.

5. Crassula (*Scabra*) foliis oppositis, patentibus, connatis scabris ciliatis, corymbis terminalibus. Lin. Sp. Plant. 283. *Lesser Orpine with rough spreading leaves growing opposite.* Cotyledon Africana frutescens, foliis asperis, angustis, acuminatis, flore virescente. Mart. Cent. 24.

6. Crassula (*Nudicaulis*) foliis subulatis, radicatis, caule nudo. Hort. Cliff. 116. *Lesser Orpine with awl-shaped leaves which put out roots, and a naked stalk.* Crassula Cæspitosa longifolia. Hort. Elth. 116. tab. 98.

7. Crassula (*Punctata*) caule flaccido, foliis connatis, cordatis, succulentis, floribus confertis terminalibus. *Lesser Orpine with a weak stalk growing through the leaves, which are heart-shaped and succulent, and flowers growing in clusters at the end of the branches.*

8. Crassula (*Fruticosa*) foliis longis, teretibus, alternis, caule fruticoso, ramoso. *Lesser Orpine with long taper leaves placed alternate, and a branching shrubby stalk.*

9. Crassula (*Sediodes*) caule flaccido, prolifero, determinatè-folioso, foliis patentissimis, imbricatis. Hort. Cliff. 496. *Lesser Orpine with a proliferous weak stalk, which is leafy, and leaves placed in the manner of tiles, and spreading open.* Sedum Afrum, saxatile, foliis sedi vulgaris, in rosam verè compositis. Boerh. Ind. alt. 1. 287.

10. Crassula (*Pelucida*) caule flaccido repente, foliis oppositis. Lin. Sp. Plant. 283. *Lesser Orpine with a weak creeping stalk, leaves placed opposite, and a shrubby succulent stalk.* Crassula portulacæ facie repens. Hort. Elth. 119.

11. Crassula (*Portulacaria*) foliis obovatis, oppositis, caule arboreo. Lin. Sp. 406. *Lesser Orpine with obverse oval leaves placed opposite, and a tree-like stalk.* Crassula portulacæ facie arborescens. Hort. Elth. 120. tab. 90.

The first sort hath a round reddish stalk, which is jointed, rising about three feet high, which divides upward into many irregular branches, garnished with oblong plain leaves placed opposite, having a gristly border, set with small silver hairs, and closely embrace the stalks with their base. The flowers are produced at the end of the branches in close umbels, sitting very close to the end of the branches; these are funnel-shaped, having pretty long tubes cut at the top into five parts, which spread open; they are of a fine scarlet colour, and stand erect; the usual time of their flowering is July or August. This is propagated by cuttings during any of the summer months; these should be cut off about a fortnight before they are planted, and laid in a dry place that the wounded part may heal over; then they should be each planted in a small pot filled with light sandy earth, and plunged into a moderate hot-bed, giving them but little water. In about six weeks these will have put out roots and begin to grow, when they should have a large share of air admitted to them, and must be gradually inured to bear the open air, into which they should be removed, placing them in a sheltered situation, where they may remain till autumn; when they must be removed into a dry airy glass-case, where they may enjoy the sun as much as possible, and be screened from the wet and cold. In warm dry weather, during the summer months while they are abroad, these plants should be gently watered two or three times a week; but in winter they should have very little water, lest it rot their stems. These plants require no artificial heat in winter, but they must be secured from frost and wet.

The second sort will rise with an upright stalk ten or twelve feet high, if it is not broken or injured, but it requires support; for the stalks being slender, and the leaves very weighty, they are very subject to break, especially if they are exposed to the wind. The leaves of this plant are about three inches long; they are hollowed on the upper side, and have a convex ridge on their lower, and are placed opposite, surrounding the stalks with their base; these alternately cross each other; they are very thick, succulent, and of a pale green colour, ending in acute points; at the top of the stalk the flowers are produced in large clusters; they are of a whitish herbaceous colour, having short tubes, which are cut into five parts at the brim, spreading open. The stalk which sustains the flowers is pretty thick and succulent, generally turning first downward, and then upward again, almost in the form of a syphon. It flowers in July, but doth not produce seeds here. This sort is propagated by cuttings in the same manner as the first, and the plants require the same treatment.

The third sort rises with a weak succulent stalk about two feet high, sending out many irregular branches, garnished with oblong, oval, thick leaves, plain on their upper side, but convex below, of a deep green; their borders are set with a few silvery hairs. The stalk which supports the flowers rises from the top of the branches, and is from four to six inches long, putting out several side branches, which grow erect; these are terminated by large clusters of small greenish flowers, which appear in June and July. This is propagated by cuttings in the same manner as the two former, but being pretty hardy, should not be so tenderly treated; for if the cuttings of this are planted in a border of light earth, they will put out roots, and may afterward be taken up and potted, to be sheltered in winter.

The fifth sort hath a very weak succulent stalk, which rises about a foot and a half high, dividing upward into small branches, garnished with thin rough leaves which are flat, near two inches long, and a quarter broad at their base, gradually narrowing to a point; these are rough, placed opposite, and embrace the stalks with their base. The flowers come out in small clusters at the end of the branches; they are small, and of an herbaceous colour, so make no figure; they appear in June and July. This may be propagated by cuttings, which may be treated in the same manner as the fourth sort.

The sixth sort never rises with a stalk, but the leaves come out close to the ground, forming a sort of head; they are taper, succulent, ending in points, and frequently put out roots; out of the center of these arise the flower-stalk, which grow about six inches high, branching into two or three shoots upward, each being terminated by clusters of greenish flowers, which make no great appearance. It flowers in May, and sometimes again in the latter part of summer.

This is propagated by taking off the heads, or side offsets, which should be laid to dry three or four days before they are planted; then they may be treated in the same manner as the other hardier sorts before-mentioned.

The seventh sort hath been lately introduced to the gardens in Holland, from the Cape of Good Hope; it was sent me by Dr. Adrian Van Royen, late professor of botany at Leyden. This hath very slender stalks, which are full of joints, so trail upon the ground, unless they are supported, closely garnished with thick, succulent, heart-shaped leaves, placed opposite, which are closely joined at their base, so that the stalks run through them; they are of a grayish colour; the stalks are divided, and grow about eight or nine inches long, and are terminated by clusters of small white flowers, sitting very close to the top of the stalks; these appear in the spring, and also again in the latter part of summer. It is propagated by cuttings in the same manner as the other hardier sorts, and may be treated in the same way.

The eighth sort was sent me from Leyden, by the gentleman before-mentioned; this rises with a shrubby stalk four or five feet high, dividing into many branches, which at first are taper and succulent, but by age becomes ligneous; they are garnished with very slender, taper, succulent leaves, which are near three inches long, and are flaccid, generally turning downward, especially in winter, when they are in the house; but as it hath not as yet flowered here, I can give no further description of it. This is equally hardy with the former sorts, and takes easily from cuttings, so may be treated in the same way as the former.

The ninth sort is a low plant, with the appearance of Housleek, having open spreading heads very like those of some sorts of Housleek, which grow on the ends of very slender trailing stalks, which are produced in plenty on every side the parent plant, in like manner as the childing Marigold. The flower-stalks arise from the center of these heads, which are naked, about four inches long, and are terminated by close clusters of herbaceous flowers, which appear in different seasons of the year. This plant propagates very fast by the side heads, which come out from the parent plant, which frequently put out roots as they trail on the ground, so may be taken off and potted, during any of the summer months; this is equally hardy with the former sorts, so the plants may be treated in the same way.

The tenth sort hath very slender, trailing, succulent stalks, of a reddish colour, which put out roots at the joints as they lie upon the ground. The stalks and leaves of this sort have the appearance of Purslane, but trail upon the ground like Chickweed. The flowers are produced in small clusters at the end of the branches; these are white, with a blush of purple at their brim; they appear in summer at different times, and are often succeded by seeds, which grow easily. This sort is easily propagated by its trailing branches, and the plants require the same treatment as the other hardy sorts, but unless they are often renewed will decay.

The eleventh sort rises with a very thick, strong, succulent stalk to the height of three or four feet, sending out branches

branches on every side, so as to form a kind of pyramid, the lower branches being extended to a great length, and the other diminishing gradually to the top; these are of a red or a purplish colour, and very succulent; they are garnished with roundish succulent leaves very like those of Purslane, from whence the gardeners have titled it the Purslane-tree.

This sort hath not flowered in England, though it has been many years in the gardens, so that we are not sure if it is properly ranged in this genus; but from the outward appearance it seems to be nearly allied to some of the other species, on which account Dr. Dillenius has placed it here.

It is propagated with great facility by cuttings, which may be planted during any of the summer months; but these should be laid to dry for some days before they are planted, that the wounded part may be healed over, otherwise they will rot. This sort is somewhat tenderer than the four sorts last mentioned, so must be placed in a warm glass-case in winter, where it may enjoy the full sun, and should have very little water during that season. In summer the plants should be placed abroad in a sheltered situation, and in warm weather will require to be refreshed with water twice a week; but as the stalks are very succulent, too much wet at any season is very hurtful to these plants.

All the hardy sorts of Crassula may be treated in the same way as the Ficoides, and other hardier kinds of succulent plants, with this difference only, not to give them so much water; but the first, second, and eleventh sorts require to be placed in a warm dry glass-case in winter, and must not be so long exposed abroad in the summer as the other species, nor should have much water, especially in the winter.

These plants are preserved in most curious gardens for the sake of variety, which consists more in the outward appearance of their plants, than in the beauty of their flowers, except the first sort, whose flowers are of a beautiful scarlet, and grow in close bunches at the end of the branches; so that when several of the branches are garnished with flowers at the same time, they make a fine appearance, and these flowers continue in beauty a long time; but the flowers of the other sorts are small, and most of them are of an herbaceous colour, so make no figure.

Dr. Dillenius, who first established this genus, and separated the species from Cotyledon, to which many of them had been joined by former botanists, made their difference to consist in the shape of the flower; so that all the sorts with long tubulous flowers of one leaf, he placed under the genus of Cotyledon, and those whose flowers have five petals, he placed under this genus of Crassula: but Dr. Linnæus makes their difference to consist in the number of their stamina, so that all those whose flowers have but five stamina, he ranges under the title of Crassula, and those which have ten stamina, he puts under that of Cotyledon; so that by his system they are removed to a great distance from each other, and the first sort here mentioned is brought from Cotyledon, with whose characters in every other respect it agrees, and is placed here.

CRATÆGUS. Tourn. Inst. R. H. 633. Lin. Gen. Plant. 547. The Wild Service.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, cut into five concave segments, which spread open. It hath five roundish concave petals, which are inserted into the empalement, and many stamina, terminated by roundish summits, which are also inserted in the empalement. The germen is situated under the flower, supporting two slender styles, crowned with roundish stigmas. The germen afterward becomes an oval or roundish umbilicated berry, inclosing two oblong hard seeds.*

This genus of plants is ranged in the second section of Linnæus's twelfth class, intitled Icosandria Digynia, the flower having twenty or more stamina, which are inserted to the empalement, and two styles.

The SPECIES are,

1. CRATÆGUS (*Aria*) foliis ovatis inæqualiter serratis, subtus tomentosis. Hort. Cliff. 187. *Wild Service with oval leaves unequally sawed, and woolly on their under side.* Cratægus folio subrotundo, serrato, subtus incano. Tourn. Inst. R. H. 633. Aria Theophrasti, and in some countries, *The White Beam, or white Leaf-tree.*
2. CRATÆGUS (*Torminalis*) foliis cordatis septangulis, lobis infimis divaricatis. Lin. Sp. Plant. 476. *Wild Service with heart-shaped leaves, having seven angles, whose lower lobes spread asunder.* Cratægus folio laciniato. Tourn. Inst. 633. *Wild, or Maple-leaved Service.*
3. CRATÆGUS (*Alpina*) foliis oblongo-ovatis serratis, utrinque virentibus. *Wild Service with oblong, oval, sawed leaves, which are green on both sides.* Cratægus folio oblongo, serrato, utrinque virenti. Tourn. Inst. 633.
4. CRATÆGUS (*Coccinea*) foliis ovatis repando-angulatis serratis glabris. Hort. Cliff. 187. *Cratægus with oval, smooth, sawed leaves, having angles.* Mespilus spinosa, sc. oxyacantha Virginiana maxima. Tourn. Inst. 633. *Commonly called Cockspur Hawthorn.*
5. CRATÆGUS (*Crus Galli*) foliis lanceolato-ovatis serratis glabris, ramis spinosis. Lin. Sp. 682. *Cratægus with oval, spear-shaped, sawed leaves, and prickly branches.* Mespilus aculeata pyrifolia denticulato splendens, fructu insigni rutilo, Virginiensis. Pluk. Alm. 249. *Commonly called Virginian L'Azarole.*
6. CRATÆGUS (*Lucida*) foliis lanceolatis serratis lucidus, spinis longissimis, floribus corymbosis. *Cratægus with lucid, spear-shaped, sawed leaves, very long spines, and flowers in a corymbus.* Mespilus prunifolius, spinis longissimis fortibus, fructu rubro magno. Flor. Virg. 55.
7. CRATÆGUS (*Azarolus*) foliis obtusis subtrifidis dentatis. Lin. Sp. 683. *Cratægus with obtuse, trifid, indented leaves.* Mespilus Apii folio laciniato. C. B. P. 453. *Commonly called L'Azarole.*
8. CRATÆGUS (*Oxyacantha*) foliis obtusis subtrifidis serratis. Hort. Cliff. 188. *Cratægus with obtuse, trifid, sawed leaves.* Mespilus Apii folio, sylvestris spinosa, sc. oxycantha. C. B. P. 454. *The common White Thorn.*
9. CRATÆGUS (*Tomentosa*) foliis cuneiformi-ovatis serratis subangulatis subtus villosis ramis spinosis. Lin. Sp. 682. *Cratægus with oval, wedge-shaped, sawed, angular leaves, hoary on their under side, and prickly branches.* Mespilus Virginiana grossulariæ foliis. Pluk. Phyt. 100. f. 1.

The first sort grows naturally on the chalky hills in Kent, Surry, and Sussex, and in some other parts of England, and rises to the height of thirty or forty feet, with a large trunk, dividing upward into many branches; the young shoots have a brown bark, covered over with a meally down, garnished with oval leaves between two and three inches long, and one and a half broad in the middle, of a light green on their upper side, but very white on their under, having many prominent transverse veins, running from the midrib to the border, where they are unequally sawed, some of the indentures being much deeper, and the segments broader than others. The flowers are produced at the ends of the branches in bunches, their foot-stalks being meally, as are also the empalements of the flowers, which are cut into five obtuse segments, and are reflexed. The flowers have five short petals, which spread open like those of the Pear-tree, having a great number of stamina of the same length with the petals, terminated by oval summits. The germen, which is situated below the flowers, afterwards becomes an oval fruit, crowned with the empalement of the flower, having one cell, in which is inclosed three or four seeds. It flowers in May, and the fruit ripens in autumn.

This tree may be propagated by seeds, which should be sown soon after they are ripe; for if they are kept out of the ground till spring, they remain at least one year in the ground before the plants appear; so that the fruit should be buried in the ground, as is practised with the common Haws, Holly-berries, and those other hard seeds which do not come up the same year; and when the plants come up, they may be treated in the same manner as the Haws, but they should

ſhould by no means be headed or cut down; when theſe plants are upon a poor chalky ſoil, they make great progreſs, and the wood is very white and hard, ſo has been often uſed for making cogs for mills, and many other purpoſes where hard tough timber is wanted.

It may alſo be propagated by layers in the ſame manner as the Lime-tree and Elm, but theſe ſhould be laid in the young wood; but they are two years before they have ſufficient roots to tranſplant. I have alſo raiſed a few plants from cuttings, which were planted in autumn, in a ſhady border, but there was not more than one eighth part of the cuttings which ſucceeded; therefore I would recommend the raiſing them from ſeeds, for the trees ſo raiſed grow much larger and ſtraiter than thoſe which are raiſed either from layers or cuttings.

The tree will take by grafting, or budding it upon Pear-ſtocks very well, and Pears will take by grafting upon theſe trees, ſo that there is a nearer affinity between the Cratægus and Pear, than there is between either of theſe and the Meſpilus; for although both theſe will ſometimes take upon the Meſpilus, yet neither of them thrive ſo well, or laſt ſo long, when grafted, or budded upon thoſe ſtocks, as they do upon each other; therefore Tournefort, who has joined the Cratægus in his ſection, with the Pear and Quince, has come nearer to the natural diviſion of their genera, than thoſe who have joined the Cratægus to the Meſpilus.

There is another ſpecies of this tree which grows naturally about Verona, from whence I have received dried ſamples of it, but they were without flower and fruit, and came over by the ſame title as the former; for as there is no other growing in that neighbourhood, they have ſuppoſed it to be the common ſort; but if that is the Aria of Theophraſtus, thoſe trees which grow in England are not, for the leaves of the ſort from Verona are ſpear-ſhaped, and above an inch long, and not ſo broad by an inch as thoſe of the Engliſh, and the nerves on the under ſide of the leaves are purpliſh, the leaves terminating in acute points, ſo that I make no doubt of its being a different ſpecies; but as I have not ſeen the growing tree, I would not enumerate it till I had been better informed.

The ſecond ſort grows naturally in many parts of England, and is chiefly found upon ſtrong ſoils; it formerly grew in great plenty in Cane-Wood, near Hampſtead; and lately there was ſome young trees growing in Biſhop's-Wood, near the ſame place; but in many parts of Hertfordſhire there are large trees now growing: this riſes to the height of forty or fifty feet, with a large trunk, ſpreading at the top into many branches, ſo as to form a large head. The young branches are covered with a purpliſh bark, marked with white ſpots, and are garniſhed with leaves placed alternately, ſtanding on pretty long foot-ſtalks; theſe are cut into many acute angles, like thoſe of the Maple-tree; they are near four inches long, and three broad in the middle, having ſeveral ſmaller indentures toward the top, of a bright green on their upper ſide, but a little woolly on their under. The flowers are produced in large bunches toward the end of the branches, they are white, and ſhaped like thoſe of the Pear-tree, but ſmaller, and ſtand upon longer foot-ſtalks; theſe appear in May, and are ſucceeded by roundiſh compreſſed fruit, which are ſhaped like large Haws, and ripen late in autumn, when they are brown; and if kept till they are ſoft, in the ſame way as Medlars, they have an agreeable acid flavour. The fruit of this tree is annually ſold in the London markets in autumn.

The wood of this tree is hard, and very white, and is very uſeful for many purpoſes; but particularly ſo to the millwrights. It may be propagated in the ſame way as the former ſort, but requires a ſtrong ſoil.

The third ſort grows naturally upon mount Baldus, from whence I received it, and on other mountainous parts of Italy; this riſes with a woody trunk about twenty feet high, dividing into many branches, which are covered with a purpliſh ſpotted bark, and cloſely garniſhed with oblong ſawed leaves, ſtanding alternate, on very ſhort foot-ſtalks; they are about three inches long, and one and a half broad, in the broadeſt part, leſſening toward both ends; they are ſlightly ſawed on their edges, and of a deep green on both ſides. The flowers are produced at the end of the branches in ſmall bunches, which have rarely more than four or five flowers in each; they are white, and much ſmaller than thoſe of the former ſorts; theſe are ſucceeded by fruit about the ſize of the common Haw, which is of a dark brown colour when ripe. It flowers in May, and the fruit ripens in autumn.

The fourth ſort is a native of North America, but has been many years cultivated in the Engliſh gardens, where it is known by the title of Cockſpur Haw. Of this there are two ſpecies, one of which has no ſpikes on the branches; but the other has ſtrong thorns which are curved downwards, greatly reſembling the ſpur of a cock, from whence it had this appellation: in other reſpects both ſorts agree in the form of their leaves, their flowers and fruit. However, Dr. Linnæus has been ill informed of the two ſorts by Kalm, who went to America, and is now profeſſor at Abo in Sweden; for the doctor has added the appellation of Cockſpur to the fifth ſort here mentioned, which has long been known in England by the title of Virginia L'Azarole.

The fourth ſort riſes to the height of near twenty feet in England, where the trunk becomes large, and divides into many ſtrong branches, ſo as to form a large head; the leaves are large, oval, and deeply ſawed on their edges, ſo as almoſt to divide them into lobes, which are placed without order; the flowers come out from the ſide of the branches in cluſters; they are large, compoſed for the moſt part of five petals, which ſpread open, and are ſucceeded by pretty large Pear-ſhaped fruit of a ſcarlet colour. It flowers in May, and the fruit ripens in September.

The fifth ſort is generally known by the title of Virginia L'Azarole; this riſes with a ſtrong ſtem to the height of fifteen feet or more, ſending out many irregular branches covered with a light brown bark, and have a few thorns on their ſides; the leaves have ſhort foot-ſtalks, they are narrow at their baſe, but widen upward ſo as to become almoſt of an oval figure, of a lucid green on their upper ſide, and pretty deeply ſawed on their edges; the flowers are white, pretty large, and compoſed of five petals which expand: theſe are ſucceeded by large fruit of a ſcarlet colour; it flowers the end of May, and the fruit ripens in September.

The ſixth ſort grows naturally in North America; this riſes with a ſtrong ſtem to the height of ten or twelve feet, ſending out many ſtrong irregular branches, which, while young, is covered with a bright brown bark, but that on the older branches is of a lighter colour; the leaves are oval, ſpear-ſhaped, ſlightly ſawed on their edges, of a bright green on their upper ſide, but paler on their under; ſometimes they are placed by pairs, at others three or four come out from the ſame joint; the flowers are produced in large cluſters toward the end of the branches, forming a ſort of corymbus, and are ſucceeded by roundiſh fruit of a middling ſize, and a deep red colour. As the branches of this ſort ſhoot very ſtrong, and are generally interwoven with each other, being armed with very long ſtrong thorns, it is very proper for outward fences round gardens or fields.

The ſeventh ſort grows naturally in Italy and the Levant, where the fruit is ſerved up to table with their deſert; this hath a ſtrong ſtem riſing twenty feet high, having many ſtrong irregular branches, covered with a light-coloured bark; the leaves are in ſhape ſomewhat like thoſe of the common Hawthorn, but they are much larger, have broader lobes, and are of a paler colour; the flowers come out in ſmall cluſters from the ſide of the branches, which are in

ſhape like thoſe of the common Hawthorn, but are much larger; as is alſo the fruit, which when fully ripe has an agreeable acid taſte, for which it is eſteemed by the inhabitants of the countries where it grows naturally.

The eighth ſort is the common Hawthorn, which is generally planted for fences in moſt parts of England, therefore being univerſally known to the inhabitants, it requires no deſcription: there are two or three varieties of this ſort, which differ in the ſize of their leaves and the ſtrength of their ſhoots; however, thoſe with the ſmalleſt leaves are generally preferred for hedges, as their branches always grow cloſer together; the method of raiſing the plants, and planting them for hedges, being fully treated of under the article of HEDGES, I need not repeat here.

The ninth ſort grows naturally in North America, this has a ſlender ſhrubby ſtalk, riſing about ſix or ſeven feet high, ſending out many irregular branches, armed with long ſlender thorns, and garniſhed with ſhort, oval, wedge-ſhaped leaves, which are ſawed on their edges, and are woolly on their under ſide; the flowers are ſmall, proceeding from the ſide of the branches, ſtanding ſometimes ſingle, and at other times two or three upon the ſame foot-ſtalk, having large leafy empalements, and are ſucceeded by ſmall roundiſh fruit, with a large leafy umbilicus, which was before the empalement of the flower: the flowers appear the beginning of June, and the fruit ripens very late in the autumn.

This ſort may be propagated in the ſame manner as the firſt, but requires a ſtrong deep ſoil, otherwiſe it will not thrive. It is very hardy in reſpect to cold, but at preſent is very rare in England.

All the ſorts of Haws may be propagated by ſeeds, which ſhould be ſown in autumn, in the ſame manner as hath been directed for the firſt ſort; but as theſe ſeeds are frequently brought from America, and do not arrive here till ſpring, the fruit may be buried in the ground till the autumn following, when they may be taken up and ſown in drills, being careful to cover them ſo as to prevent birds from deſtroying them. In the ſpring following the plants will come up, which ſhould be moderately watered two or three times a week, if the ſpring ſhould prove dry; during the ſummer, they muſt be kept clean from weeds, which if ſuffered to grow, will ſoon overbear the plants and deſtroy them. The following ſpring the plants ſhould be planted out before they begin to ſhoot, into a nurſery-bed, where they may grow two years to get ſtrength, when they may be tranſplanted where they are to remain. If theſe plants are planted in a moiſt light ſoil, their roots will extend to a conſiderable diſtance, and put up many ſhoots, which may be taken off in the ſpring, and thereby may be increaſed; this will alſo take if grafted on the Pear, and if the young branches are laid down, they will take root, ſo the plants may be propagated either way.

The other ſorts of Hawthorn are generally planted among flowering ſhrubs of the ſame growth, where they add to the variety.

CRATEVA. Lin. Gen. Plant. 528. Tapia. Plum. Nov. Gen. 22. tab. 21. Garlic Pear.

The CHARACTERS are,

*The empalement of the flower is of one leaf, cut at the top into four oval ſegments, which ſpread open. The flower hath four oval petals, which are narrow at their baſe, and broad at the top. It hath many briſtly ſtamina, which are longer than the petals, terminated by oblong erect ſummits. It hath a long incurved ſtyle, upon which ſits the oval germen, crowned by the ſtigma, ſitting cloſe on the top. The germen afterward becomes a large fleſhy globular fruit with one cell, including many kidney-ſhaped ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's eleventh claſs, intitled Dodecandria Monogynia, the plants of this claſs and ſection have twelve ſtamina in their flowers, and one ſtyle.

The SPECIES are,

1. CRATEVA (*Tapia*) inermis foliis integerrimis, foliolis lateralibus baſiantica brevioribus. Lin. Sp. 673. *Smooth Crateva, or Garlic Pear.* Tapia arborea triphylla. Plum. Nov. Gen. 22.
2. CRATEVA (*Marmalos*) ſpinoſa foliis ſerratis. Flor. Zeyl. 212. *Prickly Crateva.* Cucurbitifera trifolia ſpinoſa medica, fructu pulpa Cydonii æmula. Pluk. Alm. 125.

The firſt ſort grows naturally in both Indies. I received the fruit of this from Jamaica, where it grows in great plenty, which were ſent me by William Williams, Eſq; of St. Anne's, in that iſland, who has been ſo kind as to furniſh me with many other curious ſeeds which have ſucceeded in the Chelſea garden.

This tree hath a very large trunk, which riſes to the height of thirty feet or upward, covered with a dark green bark, ſending out many branches, ſo as to form a large head. The branches are garniſhed with trifoliate leaves, ſtanding on pretty long foot-ſtalks; the middle leaf, which is much larger than either of the other, is oval, about five inches long, and two and a half broad in the middle. The two ſide leaves are oblique, thoſe ſides which join the middle leaf being much narrower than the other, and turn at both ends toward the middle, ſo that their midrib is not parallel to the ſides; theſe two end in acute points. The leaves are ſmooth, of a light green on the upper ſide, but pale on their under; their edges are entire. The flowers are produced at the ends of the branches, ſtanding upon long foot-ſtalks; theſe have empalements of one leaf, which are cut into four ſegments, almoſt to the bottom. The flower hath four oblong petals, which ſpread open, and are reflexed, having many long ſlender ſtamina, which are connected at their baſe, but ſpread open above, and are terminated by oblong purple ſummits; theſe ſurround a ſlender long ſtyle, upon which is ſituated the oval germen, which is crowned by an obtuſe ſtigma. The germen afterward becomes a round fruit, about the ſize of an Orange, having a hard brown ſhell, or cover, incloſing a meally pulp, filled with kidney-ſhaped ſeeds. This fruit hath a ſtrong ſmell of Garlic, which is communicated to the animals that feed on it.

This is propagated by ſeeds, which muſt be procured from the countries where the trees grow naturally, and muſt be ſown on a hot-bed in the ſpring; when the plants come up, they muſt be treated in the ſame manner as hath been directed for the ANNONA, to which article the reader is deſired to turn for the culture.

The ſecond ſort grows naturally in India, where it grows to a great height, with a large trunk, ſending out many long branches, garniſhed with trifoliate leaves, which are oblong, entire, and end in acute points; between theſe the branches are armed with long ſharp thorns, which come out by pairs, and ſpread aſunder. The flowers are produced in ſmall cluſters from the ſide of the branches, five or ſeven ſtanding upon a common branching foot-ſtalk; theſe have each five acute petals, which are reflexed, and many ſtamina which ſtand round a ſingle ſtyle of the ſame length; the petals are green on the outſide, whitiſh within, and have a grateful odour. After the flower is paſt, the germen ſwells to a large fruit the ſize of an Orange, having a hard ſhell, which incloſes a fleſhy viſcous pulp, of a yellowiſh colour, having many oblong plain ſeeds ſituated within it; the pulp of this fruit hath an agreeable flavour when ripe, ſo is frequently eaten in India, where they ſerve up the fruit, mixed with Sugar and Orange, in their deſerts, and is eſteemed a great delicacy.

This ſort is propagated by ſeeds, which muſt be procured from the places where it grows naturally; theſe muſt be ſown upon a good hot-bed in the ſpring, and when the plants are fit to remove, they ſhould be each tranſplanted into a ſmall pot filled with light kitchen-garden earth, and plunged into a hot-bed of tanners bark, ſhading them every day from the ſun, until they have taken freſh root, after which they may be treated in the ſame manner as the Annona; but

but should be sparingly watered in the winter season.

CREPIS. Lin. Gen. Plant. 819. Hieraicioides. Vaill. Act. R. Sc. 1721. Hieraicium. Tourn. Bastard Hawkweed.

The Characters are,

*It hath a flower composed of many hermaphrodite florets, which are included in a double empalement; the outer is short, spreading, and falls off; the inner one is permanent, oval, and furrowed, having many narrow scales, which are contracted together at the top. The hermaphrodite florets are of one leaf; they are uniform, tongue-shaped, and are indented at the top in five parts; these spread over each other like the scales of fish; they have each five short hairy stamina, terminated by cylindrical summits. The germen is situated in the center of the florets, supporting a slender style, crowned by two reflexed stigmas. The germen afterward becomes an oblong seed, crowned with a long feathery down, which sits upon little foot-stalks.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia Æqualis. The flowers of this section are composed of hermaphrodite florets, which are fruitful.

The Species are,

1. Crepis (*Rubra*) foliis amplexicaulibus, lyrato-runcinatis. Vir. Cliff. 79. *Crepis with lyre-shaped leaves embracing the stalks.* Hieracium dentis leonis folio, flore suave rubente. C. B. P. 127. *Hawkweed with a Dandelion leaf.*
2. Crepis (*Barbata*) foliis pinnatis angulatis, petiolatis, dentatis. Prod. Leyd. 126. *Crepis with angular, indented, winged leaves, having foot-stalks.* Hieracium foliis Cichorei sylvestris villosis, odore Castorei. Bot. Monsp.
3. Crepis (*Bœtica*) involucris calyce longioribus incurvatis, foliis lanceolatis dentatis. *Crepis with an incurved volucrum longer than the empalement, and spear-shaped indented leaves.* Hieracium medio-nigrum, Bœticum majus. Par. Bat. 185. *Greater Spanish Hawkweed with flowers black in the middle.*
4. Crepis (*Alpina*) foliis amplexicaulibus, oblongis, acuminatis inferioribus, supernè, summis infernè, denticulatis. Hort. Upsal. 238. *Crepis with oblong pointed leaves embracing the stalk, the lower being indented upward; and the upper downward.* Hieracium Alpinum Scorzoneræ folio. Tourn. Inst. 472.

There are several other species of this genus, some of which grow naturally in England, and others are weeds in divers parts of Europe, so are rarely admitted into gardens, therefore I shall not enumerate them here.

The first sort grows naturally in Apulia, but is now commonly cultivated in English gardens for ornament; it is an annual plant, which perishes after it hath ripened seeds. This hath many spear-shaped leaves which spread on the ground, deeply jagged on their sides; between them arise the branching stalks, which grow a foot and a half high, dividing into many slender branches, garnished with oblong leaves deeply indented on their edges, embracing the stalks with their base; the stalks are each terminated by one large radiated flower, of a soft red colour, composed of many half florets, which are succeeded by oblong seeds crowned with a feathery down. It flowers in June and July, and the seeds ripen in autumn. This plant, when bruised, emits an odour like bitter Almonds.

The seeds of this plant should be sown in the spring, on the borders of the flower-garden where they are designed to remain, so that if six or eight seeds are sown in each patch, when the plants come up, they may be reduced to three or four; and if these are kept clean from weeds, they will require no other culture, excepting the putting small sticks down, to fasten the stalks, to prevent their being broken by winds or rain. If the seeds are sown in autumn, or permitted to scatter, the plants will come up and live through the winter without shelter, and these will flower early in the spring.

The second sort grows naturally in the south of France, and in Italy. This is a biennial plant, and sometimes, when it is in poor ground, it will continue longer; it hath a thick tap-root, which strikes deep into the ground, sending out many small fibres; the lower leaves are from four to five inches long, and about a quarter of an inch broad, having several deep jags on their edges, the segments ending in acute points; from the same root arises four or five stalks, which grow about nine or ten inches high, the lower part of these are garnished with leaves of the same form with those near the root, but are smaller, and more jagged; the upper part of the stalks are naked, and branch out into two, and sometimes three branches, each being terminated by one flower of a gold colour, inclining to copper, composed of many florets which are included in a single empalement; the flowers are succeeded by oblong narrow seeds, crowned with a feathery down: the whole plant, when bruised, emits a strong odour of Castor. It flowers in June, and the seeds ripen in autumn. This is frequently preserved in gardens for the sake of variety.

It is propagated by seeds in the same manner as the first sort, but as this continues longer, the seeds need not be annually sown. The plants will require no other culture but to keep them clean from weeds, and if the seeds are permitted to scatter, the plants will come up without any trouble, so need only be thinned where they are too close.

The third sort is an annual plant, which grows naturally in Spain, but is now frequently propagated in the flower-gardens for ornament. This puts out leaves near the root, which are nine inches long, and almost two broad in the middle, of a light green colour, and a little jagged on their edges; the stalks rise a foot and a half high, dividing into many branches, garnished with leaves of the same form as those at bottom, but smaller, and sit close to the branches; the flowers are produced at the end of the branches; these have a double empalement, composed of many long very narrow leaves; the outer series are reflected downward, and turn upward again, and are inflexed at their extremities. The flowers are composed of many florets, which are stretched out on one side at the top like a tongue, these are cut at their extremities into four or five parts; they spread regularly in form of rays, and are situated over each other like scales of fish; there are two varieties of this, one with a deep yellow, and the other of a sulphur colour inclining to white; but both have a dark black bottom or middle, so make a pretty appearance in a garden. It flowers in June and July, and the seeds ripen in autumn. This plant requires the same culture as the first, and is equally hardy, so that where the seeds are permitted to scatter, the plants will come up without care.

The fourth sort grows naturally on the Alps; this is also an annual plant, which sends out many oblong pointed leaves near the root; they are five inches long, and almost two broad at their base, lessening gradually to a point; the upper part of these are slightly indented, but their lower parts are entire; the stalks are strong and upright, rising two feet high, dividing into three or four branches, which grow erect, and are terminated by pale white flowers, inclosed in a strong hairy empalement, which contracts close toward the top; the stalks are garnished with leaves of the same form as the lower, which embrace them with their base, where they are slightly indented, but their upper parts are entire; these leaves are hairy and rough. It flowers in June, and the seeds ripen in autumn. This requires the same culture as the first, and the seeds will scatter about the garden, so that if the plants are not destroyed, they will maintain themselves without any care.

CRESCENTIA. Lin. Gen. Plant. 680. Cujete. Plum. Nov. Gen. 23. tab. 16. Calabash-tree.

The Characters are,

*The flower hath one petal, which is irregular, having a curved*

*curved gibbous tube, whose brim is cut into five unequal segments, which are reflexed; this hath an empalement, which is short, of one leaf, cut into two obtuse segments, which are concave. It hath four stamina, two of which are of the length of the petal; the other are shorter, terminated by twin summits which are prostrate. It hath an oval germen sitting on a foot-stalk, supporting a long slender style, crowned by a roundish stigma. The germen afterward becomes an oval or bottle-shaped fruit, with a hard shell, inclosing many flat heart-shaped seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia. The flower having two long and two short stamina, and the seeds being included in a capsule.

The Species are,

1. Crescentia (*Cujete*) foliis lanceolatis, utrinque attenuatis. Hort. Cliff. 327. *Crescentia with spear-shaped leaves, narrowed at both ends.* Cujete foliis oblongis angustis magno fructu ovato. Plum. Nov. Gen. 23. *Calabash-tree with oblong narrow leaves, and a large oval fruit.*
2. Crescentia (*Latifolia*) foliis oblongo-ovatis, fructu rotundo, cortice fragili. *Crescentia with oblong oval leaves, and round fruit with a tender shell.* Cujete latifolia, fructu putamine fragili. Plum. Nov. Gen. 23. *Broad-leaved Calabash-tree whose fruit hath a tender shell.*

There are some varieties of these trees, which only differ in the size and shape of their fruit; but those are variations which arise from seeds of the same tree, so are not to be enumerated as distinct species; but the two here mentioned are undoubtedly different species, for I have frequently raised them from seeds, and have never found either of them vary.

The first sort grows naturally in Jamaica, and in all the Leeward Islands. This hath a thick trunk, covered with a whitish bark, which rises from twenty to thiry feet high, having several knots all the length, and at the top divides into many branches, which spread every way, and form a large regular head, garnished with leaves which come out irregularly; sometimes single, at others many arise from the same knot; they are near six inches long, and one and a half broad in the middle, diminishing gradually to both ends; they are of a lucid green, and have very short foot-stalks, with one midrib, and several transverse veins running from that to the sides. The flowers are produced from the side of the large branches, and sometimes from the trunk, standing upon long foot-stalks; their empalement is deeply divided into two obtuse segments. The flower hath but one petal, which is irregular, having an incurved tube, which is divided at the brim into two irregular segments, which turn backward; these are of a greenish yellow colour, striped and spotted with brown; the flowers are an inch and a half long, from the bottom of the tube to the extent of the upper segment. They have four slender stamina, of the same colour with the petal, which are of unequal lengths, two being full as long as the petal, and the other are much shorter, terminated by oblong summits, divided in the middle, which lie prostrate on the stamina. From the lower part of the tube arises a long slender foot-stalk, supporting the oval germen, which hath a headed stigma sitting close on the top; the germen afterward turns to a large fruit, of different forms and size; they are often spherical, sometimes they are oval, and at other times they have a contracted neck like a bottle; and are so large, as when the pulp and seeds are cleaned out, the shells will contain three pints or two quarts of liquid. These fruit or shells, are covered with a thin skin of a greenish yellow when ripe, which is peeled off; and under this is a hard ligneous shell, inclosing a pale, yellowish, soft pulp, of a tart unsavory flavour, surrounding a great number of flat heart-shaped seeds.

The shells of this fruit are cleaned of their pulp, and the outer skin taken off, by the inhabitants of the islands, and dried; then they use them for drinking-cups, some of which are tipped with silver, and to the necks they fasten handles, and some of the long small fruit are formed into the shape of spoons or ladles, and are used as such; the round ones are cut through the middle, and are used as cups for Chocolate. The Indians put a number of small stones into these shells, when cleared of the pulp, to make a sort of rattle: in short, they convert these shells into many sorts of furniture, which is the principal use made of the fruit; for the pulp is seldom eaten, except by the cattle in the time of great droughts. The leaves and branches of this tree are also eaten by the cattle in times of scarcity. The wood of this tree is hard and smooth, so is frequently used for making saddles, stools, and other furniture.

The second sort seldom rises more than fifteen or twenty feet high; this hath an upright trunk, covered with a white smooth bark, sending out many lateral branches at the top, garnished with leaves three inches in length, and one and a quarter broad; these are ranged alternately on the branches, sitting upon short foot-stalks; they are of a deeper green than those of the first sort, and their edges are entire. The flowers come out from the side of the large branches and the trunk; these are smaller, and of a deeper yellow colour than those of the first; the fruit of this is sometimes round, at others oval, some being much larger than the other; the shells of this fruit are thin and very brittle, so are unfit for any purposes to which those of the former are employed; the seeds are also much thinner, and the pulp is of a deeper yellow. The wood of this tree is hard, and very white, so might be useful, were it not for the plenty of other sorts, which abound in many of the islands. This was found growing naturally in plenty at Campeachy by the late Dr. Houstoun, who sent the fruit to England.

These trees are too tender to live abroad in England, so require a warm stove to be preserved here. They are easily propagated by seeds, which must be procured from the countries where they grow naturally; the way is to have the entire fruit sent over when fully ripe; for when the seeds are taken out of the pulp abroad, and sent over hither, if they are long in their passage they will lose their growing quality before they arrive, as I have often experienced. These must be sown on a good hot-bed in the spring, and when the plants are fit to remove, they should be each planted into a small halfpenny pot filled with light sandy earth, and plunged into a hot-bed of tanners bark, observing to shade them from the sun till they have taken fresh root; when they must be treated in the same manner as other tender plants, which are natives of the same countries. In winter they must be placed in the tan-bed of the bark-stove, and during that season should have but little water; in summer they will require to be gently watered two or three times a week, according to the warmth of the season; and in hot weather they should have a large share of air admitted to them. With this management the plants will make great progress, and their leaves being of a fine green, they make a pretty variety in the stove, but have not as yet flowered in England.

CRESS the Garden. See Lepidium.

CRESS the Indian. See Tropæolum.

CRESS the Water.<br>CRESS the Winter. } See Sisymbrium.

CRINUM. Lin. Gen. Plant. 366. Lilio-Asphodelus. Com. Rar. 14. Dillen. Hort. Elth. 194. Asphodel Lily.

The Characters are,

*The involucrum is composed of two oblong leaves, in form of a sheath or cover, which dries and is reflexed. The flower hath one petal, which is funnel-shaped, having a long tube, deeply cut at the top into six segments which are reflexed. It hath six long stamina, which are inserted in the tube of the petal, and are stretched out beyond the flower, spreading open; these are terminated by oblong prostrate summits, rising at one end; the germen is situated in*

*in the bottom of the flower, supporting a long slender style, crowned by a small trifid stigma. The germen afterward becomes an oval capsule with three cells, each containing one or two oval seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, intitled Hexandria Monogynia, the flower having six stamina and one style.

The Species are,

1. Crinum (*Africanum*) foliis sublanceolatis planis, corollis obtusis. Lin. Sp. Plant. 292. *Crinum with plain spear-shaped leaves, and obtuse petals.* Hyacinthus Africanus tuberosus, flore cæruleo umbellato. Hort. Amst. 1. p. 133. *African tuberous Hyacinth, with a blue umbellated flower.*
2. Crinum (*Asiaticum*) foliis carinatis. Flor. Zeyl. 127. *Crinum with keel-shaped leaves.* Lilium Zeylanicum, bulbiferum & umbelliferum. H. L. 682.
3. Crinum (*Americanum*) corollarum apicibus introrsum unguiculatis. Lin. Sp. Plant. 292. *Crinum with the tops of the petals formed on the inside like the nails of a finger.* Lilio-asphodelus Americanus sempervirens, maximus Polyanthus albus. Com. Rar. Pl. 15. tab. 15.
4. Crinum (*Latifolium*) foliis ovato-lanceolatis acuminatis sessilibus planis. Lin. Sp. 419. *Crinum with oval, spear-shaped, plain leaves, ending in acute points.* Jovanna-pola-tali. Hort Mal. vol. 11. p. 77.

The first sort grows naturally at the Cape of Good Hope, from whence it was brought to the gardens in Holland, and hath since been spread into most of the curious gardens in Europe. The root of this plant is composed of many thick fleshy fibres, diverging from the same head, which strike deep into the ground, and put out many smaller fibres, which are white and fleshy; from the same head arises a cluster of leaves surrounding each other with their base, so as to form a kind of herbaceous stalk, about three inches high, from which the leaves spread only two ways, appearing flat the other two. The flower-stalk arises by the side of these leaves, which is round, hollow, and near three feet high, terminated by a large head of flowers, included in a kind of sheath, which splits into two parts, and is reflexed. The flowers stand each upon a foot-stalk about one inch long; they are tubulous, have but one petal, which is cut almost to the bottom, into six oblong blunt segments, which are waved on their edges; in the center is situated an oval three-cornered germen, supporting a long style, which is attended by six stamina, two of the same length, two somewhat shorter, and the two which rest upon the lower segments are the shortest. The flowers are of a bright blue colour, and grow in large umbels, so make a fine appearance. They begin to flower in September, and frequently continue in beauty till spring, which renders them more valuable.

This plant is propagated by offsets, which come out from the side of the old plants, and may be taken off the latter end of June, at which time these plants are in their greatest state of rest; when the plants should be turned out of the pots, and the earth carefully cleared away from the roots, that the fibres of the offsets may be better distinguished, which should be separated from those of the old roots, being careful not to break their heads. But where they adhere so closely to the old plant, as not to be so separated, they must be cut off with a knife, taking great care not to wound or break the roots of either the offsets or the parent plant. When these are parted, they should be planted each into a separate pot, filled with light kitchen-garden earth, and placed in a shady situation, where they may enjoy the morning sun, giving them a little water twice a week, if the weather proves dry; but they must not have too much wet, especially at this season, when they are almost inactive; for as the roots are fleshy and succulent, they are apt to rot with great moisture. In about five weeks time the offsets will have put out new roots, when the pots may be removed to a more sunny situation, and then they may have a little more water, which will strengthen their flowering, but it must not be given them too liberally for the reasons before given. In September they will put out their flower-stalks, and toward the end of that month the flowers will begin to open, when, if the weather should not be good, they should be removed under shelter, to prevent the flowers from being injured by frost or too much wet; but they should have as much free air as possible, otherwise the flowers will be pale-coloured and weak. Toward the end of October they should be removed into the green-house, and placed where they may enjoy as much free air as possible, and not be over-hung by other plants; and during the winter, they may have a little water once a week or oftener in mild weather, but in frost they should be kept dry. This plant only requires protection from frost and moisture, so should not have any artificial warmth in winter, and must be placed in the open air in summer.

The second sort hath large bulbous roots, which send out many large fleshy fibres, having bulbs formed at their ends; the leaves are near three feet long, hollow on their upper side, and closely fold over each other at their base, spreading out on every side; the outer leaves generally turn downward at the top; they are of a deep green, obtuse at their points, with a ridge on their under side. The flower-stalk arises on one side the leaves, which is thick, succulent, hollow in the middle, and a little compressed on two sides; this grows two feet high or more, and is of the same colour with the leaves, and are terminated by large umbels of flowers, with a sheath or cover, which splits lengthways, and reflexed back to the stalk, where it dries and remains; the tubes of the flowers are narrow, near four inches long, and the upper part is deeply cut into six long segments, which are reflexed back almost to the tube; in the center arises the style, attended by six long stamina, which stand out beyond the petal, and is terminated by oblong prostrate summits of a yellow colour. After the flowers are past, the germen, which is situated at the bottom of the tube, becomes a large, roundish, three-cornered capsule, having three cells, two of which are generally abortive, and the third hath one or two irregular bulbs, which if planted produce young plants.

The third sort hath broader leaves than the second, which are plain, and not hollowed on their upper side, but they are shorter and of a lighter green; these embrace each other at their base; by the side of these arise the flower-stalk, which is compressed and hollow, rising about two feet high, and terminated by large umbels of white flowers, like those of the former sort, but the segments of the petal are broader and not so much reflexed.

The fourth sort hath roots like those of the second sort; the leaves of this are narrower at their base, and are stained with purple on their under side; the flower-stalks are purple, and grow to the same height as those of the second; the flowers are in shape like them, but the tube is purple, and the segments have a purple stripe running through them; the stamina also are purple, which renders this more beautiful than either of the other sorts; and these differences are constant in all the plants which rise from seeds, so there can be no doubt of its being a distinct sort.

These three sorts grow naturally in both Indies, so are very tender, therefore must be kept in a warm stove, otherwise they will not thrive in England; they are easily propagated by offsets, which the roots put out in plenty; or by the bulbs which succeed the flowers, and ripen perfectly here. These must be planted in pots filled with rich earth, and if plunged into the tan-bed in the stove, the plants will make greater progress and flower oftener, than when they are placed on shelves; though in the latter way they will succeed very well, provided they are kept in a good temperature of heat. The roots should be transplanted in the spring, and all the offsets taken off, otherwise they will fill the pots and starve the old plants: they must be frequently refreshed with

water, but it must not be given them too plentifully, especially in winter. These sorts flower at every season of the year, which renders them more valuable; for where there are many plants, there will be almost a perpetual succession of flowers, which emit a very agreeable odour.

CRITHMUM. Lin. Gen. Plant. 303. Tourn. Inst. R. H. 317. tab. 169. Samphire.

The CHARACTERS are,

*It is a plant with an umbelliferous flower; the great umbel is hemispherical, and composed of many smaller of the same figure; the involucrum of the general umbel is composed of several spear-shaped leaves; those of the particular umbels have very narrow leaves the length of the umbel; the general umbel is uniform; the flowers have five oval inflexed petals, which are almost equal; they have five stamina the length of the petals, which are terminated by roundish summits. The germen is situated under the flower, supporting two reflexed styles, crowned by obtuse stigmas. The germen afterward becomes an oval compressed fruit, dividing into two parts, each having one compressed, elliptical, furrowed seed.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flowers having five stamina and two styles.

The SPECIES are,

1. CRITHMUM (*Maritimum*) foliolis lanceolatis carnosis. Hort. Cliff. 98. *Samphire with spear-shaped fleshy leaves.* Crithmum sive Fœniculum maritimum minus. C. B. P. 288. *Samphire.*
2. CRITHMUM (*Pyrenaicum*) foliolis lateralibus bis trifidis. Hort. Cliff. 98. *Samphire whose smaller leaves on their sides are doubly trifid.* Apium Pyrenaicum thapsicæ facie. Tourn. Inst. 305.

The first sort grows upon the rocks by the sea-side, in many parts of England. This hath a root composed of many strong fibres, which penetrate deep into the crevices of the rocks, sending up several fleshy succulent stalks, which rise about two feet high, garnished with winged leaves, which are composed of three or five divisions, each of which hath three or five small, thick, succulent leaves near half an inch long; the foot-stalks of the leaves embrace the stalks at their base. The flowers are produced in circular umbels at the top of the stalks; these are of a yellow colour, composed of five petals, which are near equal in size, and are afterward succeeded by seeds somewhat like those of Fennel, but are larger. This herb is pickled, and esteemed very comfortable to the stomach, and is very agreeable to the palate; it provokes urine gently, removes the obstructions of the viscera, and creates an appetite; it is commonly used for sauce; it is gathered on the rocks where it grows naturally, but the people who supply the markets with it, seldom bring the right herb, but instead of it they bring a species of Aster, which is called golden Samphire, but hath a very different flavour from the true, nor has it any of its virtues. This grows in greater plenty, and upon the plain ground which is overflowed by the salt water; whereas, the true Samphire grows only out of the crevices of perpendicular rocks, where it is very difficult to come at. It flowers in July, and the seeds ripen in autumn.

This plant is with difficulty propagated in gardens, nor will it grow so vigorous with any culture, as it does upon rocks; but if the plants are planted on a moist gravelly soil, they will thrive tolerably well, and may be preserved some years. It may be propagated either by seeds or parting the roots.

The second sort is by Tournefort ranged in his genus of Apium. This grows naturally on the Pyrenean mountains. It is a biennial plant, which doth not flower till the second year, and perishes soon after the seeds are ripe. There are two or three sorts of this plant, which differ in their outer appearance, but I am not certain of their being distinct species. One of these is titled by Mr. Ray, Apium montanum sive petræum album. This is of humbler growth than the other; the small leaves are broader, and not so much cut on their edges, and are of a paler green: these plants are preserved in a few gardens for the sake of variety; they are propagated by seeds, which should be sown in the autumn where they are designed to remain, and will require no other culture but to keep them clean from weeds, and thin them where they are too close.

CRISTA GALLI. See PEDICULARIS.

CRISTA PAVONIS. See POINCIANA.

CROCUS. Lin. Gen. Plant. 53. Tourn. Inst. R. H. 350. tab. 183, 184. [is so called of the youth Crocus, who (as the poets feign) loved Smilax with so violent a passion, that, by reason of impatience, he was turned into a flower of his name.] Saffron.

The CHARACTERS are,

*It hath a spatha or sheath of one leaf. The flower hath one petal, which is deeply cut into six oblong segments, which are equal. It hath three stamina which are shorter than the petal, terminated by arrow-pointed summits. The roundish germen is situated at the bottom of the tube, supporting a slender style, crowned by three twisted stigmas, which are sawed. The germen afterward becomes a roundish fruit, with three cells, filled with roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's third class, intitled Triandria Monogynia, the flower having three stamina and one style.

The SPECIES are,

1. CROCUS (*Sativus*) spathâ univalvi radicali, corollæ tubo longissimo. Lin. Sp. Plant. 36. *Saffron with a spatha near the root, having one valve, and a long tube to the flower.* Crocus sativus. C. B. P. 65. *Cultivated Saffron.*
2. CROCUS (*Autumnalis*) spathâ univalvi pedunculato, corollæ tubo brevissimo. *Saffron with a spatha on the foot-stalk, having one valve, and a very short tube to the flower.* Crocus juncifolius autumnalis, flore magno purpurascente. Boerh. Ind. alt. 2. 120.
3. CROCUS (*Vernus*) spathâ bivalvi radicali, floribus sessilibus. *Crocus with a bivalve spatha near the root, and flowers sitting close to the ground.* Crocus vernus latifolius, flavo flore varius. C. B. P. 66. *Commonly called Bishop's Crocus.*
4. CROCUS (*Biflora*) spathâ biflorâ corollæ tubo tenuissimo. *Crocus with two flowers in each spatha, having very narrow tubes.* Crocus vernus, striatus, vulgaris. Par. Bat. *Ordinary, spring, striped Crocus.*

There are a much greater variety of these flowers than are here enumerated; but as most, if not all of them are only seminal variations, I thought it would be needless to particularize them here, especially as there are frequently new varieties obtained from seeds. Those which are here enumerated, I think must be allowed to be specifically different, since they have many distinguishing characters, which are sufficient to determine the specific difference in plants.

The first sort is the plant which produces the Saffron, which is a well known drug: this hath a roundish bulbous root as large as a small Nutmeg, which is a little compressed at the bottom, and is covered with a coarse, brown, netted skin; from the bottom of this bulb is sent out many long fibres, which strike pretty deep into the ground; from the upper part of the root come out the flowers, which, together with the young leaves, whose tops just appear, are closely wrapped about by a thin spatha or sheath, which parts within the ground, and opens on one side. The tube of the flower is very long, arising immediately from the bulb, without any foot-stalk, and at the top is divided into six oval obtuse segments, which are equal, of a purple blue colour. In the bottom of the tube is situated a roundish germen, supporting a slender style, which is not more than half the length of the petal, crowned with three oblong golden stigmas (which is the Saffron;) these spread asunder each way. The style is attended by three stamina, whose bases are inserted in the tube of the petal, and rise to the height of the style, where they are terminated by arrow-pointed summits. This plant flowers in October, and the leaves keep growing all the winter, but it never produces any seeds here.

The second sort grows naturally on the Alps and Helvetian mountains: this hath a smaller bulbous root than the first, which is more compressed; the flowers appear about the same season with the former, but they rise with a short foot-stalk, having a short spatha or sheath just below the flower, which covers it before it expands. The tube of the flower is very short, the petal being divided almost to the bottom, and the segments terminate in acute points; the stamina and style are short, and the leaves of the plant are very narrow. The flower is of a deep blue; but there is a variety of this with a sky blue flower, which is supposed to have been produced by seeds. Dr. Linnæus has supposed these, and also all the varieties of the Spring Crocus, to be but one species, but there can be no doubt of these being distinct from those of the Spring.

The third sort hath a pretty large, compressed, bulbous root, covered with a light, brown, netted skin, from which arise four or five leaves, like those of the the other Vernal Crocuses, of a purplish colour on their lower parts; from between these come out one or two flowers of a deep yellow colour, sitting close between the young leaves, never rising above two inches high; these have an agreeable odour; the outer segments of the petal are marked with three black streaks or stripes running lengthways from the bottom to the top of the segment; these are narrower than the inner segments. From the double arrangement of these segments some have called it a double flower. These segments have dark purple bottoms, and the tube of the flower hath as many purple stripes as there are segments in the petal. Out of the center of the tube arises a slender style, crowned by a golden stigma, which is broad and flat, and is attended by three slender stamina of the same length, terminated by yellow summits. After the flower is past, the germen pushes out of the ground, and swells to a roundish three-cornered seed-vessel, which opens in three parts, and is filled with roundish brown seeds. This is one of the earliest Crocuses in the spring.

The fourth sort rises with a few very narrow leaves, which are, together with the flower-buds, closely wrapped round by a spatha or sheath, out of which arise two flowers, one of which hath a longer tube than the other, but these are very slender, and do not rise much above the spatha; there the petal enlarges, and is divided into six obtuse segments, which are of equal size; they are of a dirty white on their outside, with three or four purple stripes in each; the inside of the petal is of a purer white; the stamina and style are nearly the same as those of the former sort. This is one of the earliest sorts which flowers in the spring.

The Varieties of the autumnal Crocus are,

1. The sweet-smelling autumnal Crocus, whose flowers come before the leaves. C. B. This is our second sort.
2. The autumnal mountain Crocus. C. B. This hath a paler blue flower.
3. The many flowering bluish autumnal Crocus. C. B. This hath many sky blue flowers.
4. The small flowering autumnal Crocus. C. B. This hath a small deep blue flower.

The Varieties of the Spring Crocus are,

1. Broad-leaved, purple, variegated, Spring Crocus. C. B. This hath broad leaves and a deep blue flower striped.
2. Broad-leaved Crocus of the spring with a purple flower. C. B. This hath a plain purple flower.
3. Broad-leaved Spring Crocus with a Violet-coloured flower. C. B. This hath a large deep blue flower.
4. Spring Crocus, with a white flower and a purple bottom. C. B.
5. Broad-leaved, white, variegated, Spring Crocus. C. B.
6. Broad-leaved Spring Crocus, with many purple Violet flowers striped with white. C. B.
7. Broad-leaved Spring Crocus with an Ash-coloured flower.
8. Broad-leaved Spring Crocus with a large yellow flower. C. B.
9. Broad-leaved Spring Crocus with a smaller and paler yellow flower. C. B.
10. Broad-leaved Spring Crocus, with smaller yellow flowers striped with black.
11. Narrow-leaved Spring Crocus with a smaller brimstone-coloured flower.
12. Narrow-leaved Spring Crocus with a small white flower.

These are the principal varieties which I have observed in the English gardens, but there are many more mentioned in the foreign catalogues of flowers, many of which are so nearly alike, as scarce to be distinguished; and if the seeds of these flowers were sown, there might be a greater variety of them obtained than is at present; but as they propagate very fast by offsets, the seeds are very rarely regarded.

All these several varieties of Crocuses are very hardy, and will increase exceedingly by their roots, especially if they are suffered to remain two or three years unremoved; they will grow in almost any soil or situation, and are very great ornaments to a garden early in the spring of the year, before many other flowers appear. They are commonly planted near the edges of borders on the sides of walks; in doing of which, you should be careful to plant such sorts in the same line as flower at the same time, and are of an equal growth, otherwise the lines will seem imperfect. These roots, losing their fibres with their leaves, may then be taken up, and kept dry until the beginning of September, observing to keep them from vermin, for the mice are very fond of them. When you plant these roots (after having drawn a line upon the border,) make holes with a dibble about two inches deep or more, according to the lightness of the soil, and two inches distance from each other, in which you must place the roots with the bud uppermost; then with a rake fill up the holes in such a manner as that the upper part of the root may be covered an inch or more, being careful not to leave any of the holes open; for this will entice the mice to them, which, when once they have found out, will destroy all your roots, if they are not prevented.

This is the way in which these flowers are commonly disposed in gardens, but the better way is to plant them six or eight near each other in bunches between small shrubs, or on the borders of the flower-garden; where, if the varieties of these flowers are planted in different patches, and properly intermixed, they will make a much better appearance than when they are disposed in the old method of strait edgings.

In January, if the weather is mild, the Crocus will often appear above ground; and in February their flowers will appear, before the green leaves are grown to any length, so that the flower seems at first to be naked; but soon after the flowers decay, the green leaves grow to be six or eight inches long, which should not be cut off until they decay, notwithstanding they appear a little unsightly; for by cutting off the leaves, the roots will be so weakened as not to arrive at half their usual bigness, nor will their flowers the succeeding year be half so large. Their seeds are commonly ripe about the latter end of April, or the beginning of May, when the green leaves begin to decay.

The autumnal Crocuses are not so great increasers as are those of the spring, nor do they produce seeds in our climate; so that they are less common in the gardens, except the true Saffron, which is propagated for use in great plenty in many parts of England; these must be taken up every third year, as was directed for the Spring Crocuses, otherwise the roots will run long, and produce no flowers; but they should not be kept out of the ground longer than the beginning of August, for they commonly produce their flowers the beginning of October; so that if they remain too long out of the ground, they will not produce their flowers so strong, nor in such plenty, as when they are planted early.

The method of cultivating Saffron being somewhat curious, I thought it not improper to insert in this place an abstract of it, as it was presented to the Royal Society by Dr. James Douglass.

As Saffron grows at present most plentifully in Cambridgeshire, and has grown formerly in several other counties of England, the method of culture does not, I believe, vary much in any of them, and therefore I judge it sufficient to set down here the observations which I employed proper persons, in different seasons, to make, in the years 1723, 1724, 1725, and 1728, up and down all that large tract of ground that lies between Saffron-Walden and Cambridge, in a circle about ten miles diameter.

In that county Saffron has been cultivated, and therefore it may be reasonably expected, that the inhabitants thereof are more thoroughly acquainted with it than they are any where else.

I shall begin with the choice and preparation of the ground. The greatest part of the tract already mentioned is an open level country, with few inclosures; and the custom there is, as in most other places, to crop two years, and let the land be fallow the third. Saffron is generally planted upon fallow ground, and, all other things being alike, they prefer that which has borne Barley the year before.

The Saffron grounds are seldom above three acres, or less than one; and in choosing, the principal thing they have regard to is, that they be well exposed, the soil not poor, nor a very stiff clay, but a temperate dry mould, such as commonly lies upon chalk, and is of an Hazel colour; though if every thing else answers, the colour of the mould is pretty much neglected.

The ground being made choice of, about Lady-Day, or the beginning of April, it must be carefully ploughed, the furrows being drawn much closer together, and deeper, if the soil will allow it, than is done for any kind of corn; and accordingly, the charge is greater.

About five weeks after, during any time in the month of May, they lay between twenty and thirty loads of dung upon each acre, and having spread it with great care, they plough it in as before. The shortest rotten dung is the best; and the farmers, who have the conveniency of making it, spare no pains to make it good, being sure of a proportionable price for it. About Midsummer they plough a third time, and between every sixteen feet and an half, or pole in breadth, they leave a broad furrow or trench, which serves both as a boundary to the several parcels, when there are several proprietors to one inclosure, and to throw the weeds in at the proper season.

To this head likewise belongs the fencing of the grounds, because most commonly, though not always, that is done before they plant. The fences consist of what they call dead hedges, or hurdles, to keep out not only cattle of all sorts, but especially hares, which would otherwise feed on the Saffron leaves during the winter.

About the weather we need not only observe, that the hottest summers are certainly the best, and therewith, if there be gentle showers from time to time, they can hardly miss of a plentiful crop, if the extreme cold, snow, or rain of the foregoing winter have not prejudiced the heads.

The next general part of the culture of Saffron is, planting, or setting the roots; the only instrument used for which is a narrow spade, commonly termed a spit shovel.

The time of planting is commonly in the month of July, a little sooner or later, according as the weather answer. The method is this: one man with his spit shovel raises between three and four inches of earth, and throws it before him about six or more inches; two persons, generally women, following with heads, place them in the farthest edge of the trench he makes, at three inches distance from each other, or thereabouts; as soon as the digger or spitter has gone once the breadth of the ridge, he begins again at the other side, and digging as before, covers the roots last set, and makes the same room for the setters to place a new row, at the same distance from the first, that they are from one another. Thus they go on, till a whole ridge, containing commonly one rod, is planted; and the only nicety in digging is, to leave some part of the first stratum of earth untouched, to lie under the roots, and, in setting, to place the roots directly upon their bottom.

What sort of roots are to be preferred shall be shewn under the fourth head, but it must be observed in this place, that formerly, when roots were very dear, they did not plant them so thick as they do now; and that they have always some regard to the size of the roots, placing the largest at a greater distance than the small ones.

The quantity of roots planted in an acre, is generally about 16 quarters, or 128 bushels, which, according to the distances left between them, as before assigned, and supposing all to be an inch in diameter one with another, ought to amount to 392,040 in number.

From the time that the roots are planted, till about the beginning of September, or sometimes later, there is no more labour about them; but as they then begin to spire, and are ready to shew themselves above ground (which is known by digging a few out of the earth,) the ground must be carefully pared with a sharp hoe, and the weeds, &c. raked into the furrows, otherwise they would hinder the growth of the plants,

In some time after appear the Saffron flowers, and this leads us to the third branch of our present method. The flowers are gathered as well before as after they are full blown, and the most proper time for this is early in the morning. The owners of the Saffron get together a sufficient number of hands, who place themselves in different parts of the field, who pull off the whole flowers, and throw them handful by handful into a basket, and so continue till all the flowers are gathered, which happens commonly about ten or eleven o'clock.

Having then carried home all they have got, they immediately spread them upon a large table, and fall to picking out the filamenta styli, or chives, and together with them a pretty long proportion of the stylus itself, or string to which they are joined; the rest of the flower they throw away as useless. The next morning they return into the field again, whether it be wet or dry weather, and so on daily, even on Sundays, till the whole crop be gathered.

The chives being all picked out of the flowers, the next labour about them is to dry them on the kiln. The kiln is built upon a thick plank (that it may be moved from place to place) supported by four short legs; the outside consists of eight pieces of wood about three inches thick, in form of a quadrangular frame, about twelve inches square at the bottom on the inside, and twenty-two inches at top, which is likewise equal to the perpendicular height of it. On the foreside is left a hole about eight inches square, and four inches above the plank, through which the fire is put in; over all the rest laths are laid pretty thick, close to one another, and nailed to the frame already mentioned, and then are plaistered over on both sides, as are also the planks at bottom very thick, to serve for a hearth. Over the mouth, or widest part, goes a hair cloth, fixed to the sides of the kiln, and likewise to two rollers, or moveable pieces of wood, which are turned by wedges or screws, in order to stretch the cloth. Instead of the hair cloth, many people now use a net-work, or iron wire, with which it is observed that the Saffron dries sooner, and with less quantity of fuel; but the difficulty in preserving the Saffron from burning, makes the hair cloth be preferred by the nicest judges in drying.

The kiln is placed in a light part of the house, and they begin by laying five or six sheets of white paper on the hair cloth, upon which they spread the wet Saffron between two and three inches thick; this they

cover

cover with other sheets of paper, and over these lay a coarse blanket five or six times doubled, or, instead thereof, a canvas pillow filled with straw; and after the fire has been lighted for some time, the whole is covered with a board, having a large weight upon it.

At first they give it a pretty strong heat, to make the chives sweat (as their expression is;) and in this, if they do not use a great deal of care, they are in danger of scorching, and so of spoiling all that is on the kiln.

When it has been thus dried about an hour, they take off the board, blanket, and upper papers, and take the Saffron off from that which lies next it, raising at the same time the edges of the cake with a knife; then laying on the paper again, they slide in another board between the hair cloth and upper papers, and turn both papers and Saffron upside-down, afterwards covering them as above.

The same heat is continued for an hour longer; then they look on the cake again, free it from the papers, and turn it; then they cover it, and lay on the weight as before. If nothing happens amiss during these first two hours, they reckon the danger to be over; for they have nothing more to do but to keep a gentle fire, and to turn their cakes every half hour till thoroughly dry, for the doing of which as it ought, there are required full twenty-four hours.

In drying the larger plump chives they use nothing more, but towards the latter end of the crop, when these come to be smaller, they sprinkle the cake with a little small beer, to make it sweet as it ought; and they begin now to think, that using two linen cloths next the cake, instead of the two innermost papers, may be of some advantage in drying, but this practice is followed as yet but by few.

Their fire may be made of any kind of fuel, but that which smokes the least is best, and charcoal, for that reason, is preferred to any other.

What quantity of Saffron a first crop will produce, is very uncertain; sometimes five or six pounds of wet chives are got from one rood, sometimes not above one or two, and sometimes not enough to make it worth while to gather and dry it; but this is always to be observed, that about five pounds of wet Saffron go to make one pound of dry, for the first three weeks of the crop, and six pounds during the last week; and when the heads are planted very thick, two pounds of dried Saffron may, at a medium, be allowed to an acre for the first crop, and twenty-four pounds for the two remaining, the third being considerably larger than the second.

In order to obtain these, there is only a repetition to be made every year of the labour of hoeing, gathering, picking, and drying, in the same manner as before set down, without the addition of any thing new, except that they let cattle into the fields, after the leaves are decayed, to feed upon the weeds, or, perhaps, mow them for the same use.

About the Midsummer after the third crop is gathered, the roots must be all taken up and transplanted; the management requisite for which, is the fourth thing to be treated of. To take up the Saffron heads, or break up the ground (as the term is,) they sometimes plough it, sometimes use a forked kind of hoe, called a pattock, and then the ground is harrowed once or twice over; during all which time of ploughing, or digging, and harrowing, fifteen or more people will find work enough to follow and gather the heads as they are turned up.

They are next to be carried to the house in sacks, and there cleaned and rased; this labour consists in cleaning the roots thoroughly from earth, and from the remains of old roots, old involucra, and excrescences, and thus they become fit to be planted in new ground immediately, or to be kept for some time without danger of spoiling.

The quantity of roots taken up, in proportion to those which were planted, is uncertain; but at a medium, it may be said, that allowing for all the accidents which happened to them in the ground, and in breaking up from each acre, may be had twenty-four quarters of clean roots, all fit to be planted.

The owners are sure to choose for their own use the largest, plumpest, and fattest roots, but do least of all approve the longest pointed ones, which they call spickets, or spickards, for very small, round, or flat roots, are sometimes observed to flower well.

This is the whole culture of Saffron in the county above-mentioned, and we have only now to consider the charges and profits which may be supposed, one year with another, to attend that branch of agriculture; and of these I have drawn up the following computation for one acre of ground, according to the price of labour in this country.

| | l. | s. | d. |
|---|---|---|---|
| Rent for three years — — — | 3 | 0 | 0 |
| Ploughing for three years — — | 0 | 18 | 0 |
| Dunging — — — — — — | 3 | 12 | 0 |
| Hedging — — — — — | 1 | 16 | 0 |
| Spitting and setting the heads — | 1 | 12 | 0 |
| Weeding or paring the ground — | 1 | 4 | 0 |
| Gathering and picking the flowers | 6 | 10 | 0 |
| Drying the flowers — — — — — | 1 | 6 | 0 |
| Instruments of labour for three years, with the kiln, about — — | 0 | 10 | 0 |
| Ploughing the ground once, and harrowing twice — — — — — | 0 | 12 | 0 |
| Gathering the Saffron heads — — | 1 | 0 | 0 |
| Raising the heads — — — — | 1 | 12 | 0 |
| Total charge | 23 | 12 | 0 |

This calculation is made upon supposition, that an acre of ground yields twenty-six pounds of nett Saffron in three years, which I stated only as a mean quantity between the greatest and the least, and therefore the price of Saffron must be judged accordingly, which I think cannot be done better than by fixing it at 30 shillings per pound; since in very plentiful years it is sold at twenty, and is sometimes worth between three and four pounds; at this rate, twenty-six pounds of Saffron are worth thirty-nine pounds, and the nett profits of an acre of ground producing Saffron, will, in three years, amount to fifteen pounds, thirteen shillings, or about five pounds four shillings yearly.

This, I say, may be reckoned the nett profit of an acre of Saffron, supposing that all the labour were to be hired for ready money; but as the planter and family do a considerable part of the work themselves, some of this expence is saved; that is, by planting Saffron, he may not only reasonably expect to clear about five pounds yearly per acre, but also to maintain himself and family for some part of each year; and it is upon this supposition only, that the result of other computations can be said to have any tolerable degree of exactness, but the calculations themselves are undoubtedly very inaccurate.

I have said nothing here concerning the charge in buying, or profits in selling, the Saffron heads, because, in many large tracts of ground, these must at length balance one another, while the quantity of ground planted yearly continues the same, which has been pretty much the case for several years past.

Dr. Patrick Blair, designing to treat concerning the Crocus, in his sixth Decad of his Pharmaco-Botanologia, did, in the year 1725, send to me the following queries:

1. After what manner the species are propagated?
2. Whether the tap-root springs first, or the bulb?
3. At what season the leaves spring forth?

To these queries I sent him the following answer:

1. As to the propagation of the species.

This is only by the roots or offsets, which the old roots produce in great plenty, for I never saw any thing like a seed, or a seed-vessel produced, though I have let stand great quantities of flowers purposely to try.

2. As to the query, Whether the tap-root springs first, and the bulb be afterwards formed?

As ſoon as the roots begin to ſhoot upwards, there are commonly two or three large tap-roots ſent forth from the ſide of the old root, which will run downright two inches and a half or more, into the ground; at the place where theſe bulbs firſt come out from the old one, will be formed a bulb ſometimes (though not always, as you will hear preſently;) and this tap-root decays. The bulb will increaſe in its bigneſs, till at laſt it quite falls off, and is then left entire, which commonly happens in April, when the green begins to decay; but many times theſe tap or carrotty roots never produce any bulbs, but always retain the ſame figure, and for ever after, I believe are barren; for I planted a parcel of theſe carrotty roots four years ago in a little bed, where they have ever ſince remained, but have not produced one ſingle flower, notwithſtanding they have produced a numerous offspring of the ſame carrotty roots.

And the people about Saffron Walden are well appriſed of this barrenneſs, and therefore throw away all ſuch roots when they make a new plantation; but as this change of the root is not peculiar to the Saffron only, permit me to digreſs a little, to give you ſome account of this matter.

In the pariſh of Fulham, near London, the gardeners uſed to drive a great trade in the Jonquil, or Narciſſus juncifolius, flore multiplici, at which place the greateſt quantity of thoſe roots was raiſed for ſale, as perhaps was in any part of England, and turned to as great account for the maſter, as any crop they could employ their ground in, till of late years, that moſt of their roots have turned carrotty, and ſo proved barren, or have produced only ſingle flowers; ſo that the gardeners being hereby diſheartened, have thrown them out entirely, neglecting to cultivate them, ſatisfying themſelves with this reaſon, that their ground was tired with them.

But to return to the Crocus. Beſides thoſe roots already mentioned, there will be three or four ſmall bulbs formed upon the upper part of the root, and ſome underneath, which from the firſt appearance aſſume the round ſhape of its parent root, and have no tap-root belonging to them; thoſe on the upper part of the root rarely emit ſo much as a fibre, but receive their nouriſhment immediately from the old root; but thoſe on the under ſide ſend out many fibres all around, by which they draw their nouriſhment from the ground; theſe being parted from the old root much ſooner than the other, ſtand in need of fit organs for receiving their nouriſhment.

I have ſometimes taken up ſome, through the middle of which hath been a root of the Gramen caninum, or Couch Graſs, which ſome people have imagined had ſtrength enough to force its way through the Crocus root; but the truth is, the root of the Graſs cloſely adhering to the old root of the Crocus, juſt at the place where the young roots were emitted, theſe young roots being quick of growth, incloſed the root of the Graſs, and thus I have ſeen ſeveral roots run through each other in the ſame manner.

But beſides theſe offsets mentioned, directly upon the upper part of the root is one large root formed, of equal bigneſs with the old one, and this is the time that the root is Radix gemina, as Tournefort calls it; for they are not ſo at any other ſeaſon, and therefore I think it a very improper appellation; for when the new roots are perfectly formed, the old ones, with their coats, fall off and die, and leave the new roots all ſingle. This has occaſioned ſeveral people to doubt of what Tournefort had ſaid of the roots, till I took up ſome plants at that ſeaſon, and with them the two roots of equal bigneſs, i. e. the old at the bottom, and the new one at the top.

Dr. Blair alſo happening, in viewing a root, to be ſurpriſed with a different appearance from what he had ſeen before or heard of, ſent me another letter.

The manner of the root was thus; from the upper part of the bulb, where it ſends forth all the leaves within a common tunicle, at the exit there was an appendix about an inch and a half long, about the groſſneſs of a large turkey or gooſe-quill, cylindrical and blunt, without the leaſt radical fibre, by which it might receive the nouriſhment, ſmooth or poliſhed, and bluiſh in the ſurface, conſiſting of ſeveral circular lines, when cut tranſverſly; white, with a hard greeniſh center like a Carrot, when it hath puſhed forth the flowering-ſtem, not unlike the ſtolones of of ſome running root, ſuch as the Mints below ground, only the extremity deſcended obliquely, inſtead of aſcending, to ſend forth leaves to produce a new plant; and what is moſt remarkable, this did not happen to one or two plants, but to the whole bundle, which were above twenty diſtinct roots, differing in nothing but majus and minus; the bulb ſeemed at the ſame time to be pined and emaciated, though it emitted large radical fibres like thoſe of a Leak.

I having received this account from him by letter, ſent him the following anſwer:

I received yours in anſwer to my laſt, with the figure of the roots of ſome ſets of Crocus Autumnalis you have taken out of the ground; I have found a figure in Dodonæus which correſponds with it, and thoſe roots are no new thing with the Saffron gardeners, who always throw them away when they make freſh plantations.

Your figure does not agree with my tap-roots, as you will ſee by the figure taken as juſt from the life as I could. In mine you will find the bulb turned ſideways, which I ſtill find to be conſtant in all the roots I have examined, which have been a great many, and makes me ſuſpect theſe tap-roots are occaſioned by the accidental poſition of the roots in planting, which may retard the aſcending ſap, the flowering-ſtem being thereby turned into a crooked figure, and the tap-roots are full of longitudinal veſſels, of a conſiderable dimenſion; ſo that the greater attracting power of the ſap being hereby diverted downwards, the flower-ſtem may be quite deſtitute of proper nouriſhment.

The method you propoſe to remedy this inconveniency, will not do, for I have removed ſome of theſe roots at the ſeaſon when the tap-roots were forming, and this alone deſtroyed them all; ſo that I am perſuaded, the cutting them off entirely will kill them.

The method I uſed with the Jonquils was, to lay ſome tiles juſt under the roots, to prevent their running downwards, but this has not anſwered, nor do I think it poſſible wholly to recover them; for the alteration is not only in the root and flower, but alſo in the leaf and blade, which before was fiſtulous, but after this alteration in the root, becomes a plain ſulcated leaf, and if it ever bloſſoms after, the flowers are large and ſingle, which before were ſmall and double; but the Saffron, after the change of its roots, produces a ſmall narrow blade, ſeldom half the length of thoſe in a natural ſtate.

Upon this Dr. Blair formed this concluſion:

Theſe additional obſervations plainly ſhew, that neither the carrotty root, nor the blaſted tap-root, as I may call it, are merely accidental, or what may be called luſus naturæ, but certain diſeaſes incident to ſuch roots; for were they accidental, they would not have the ſame appearances to different perſons in different ſoils and climates, nor would ſo many taken up together have ſuch a reſemblance to each other, as I have twice obſerved.

CROTOLARIA. Lin. Gen. Plant. 771. Dill. Elth. 122. Tourn. Inſt. R. H. 644. [of Κρόταλον, *Gr.* rattle; becauſe its ſeeds in the pods, when ripe, make a rattling noiſe when ſhaken, or becauſe the infants of the Indians make uſe of the branches of this plant furniſhed with pods inſtead of rattles.]

The Characters are,

*The empalement of the flower is divided into three large ſegments; the two upper reſting on the ſtandard, the lower is concave, trifid, and is ſituated below the keel. The flower is of the Butterfly kind; the ſtandard is large, heart-ſhaped and pointed; the wings are oval and half the length of the ſtandard; the keel is pointed and as long as the wings; it hath ten ſtamina which are united, terminated*

*minated by single summits, and an oblong reflexed germen, supporting a single style, crowned by an obtuse stigma. The germen afterward becomes a short turgid pod with one cell, opening with two valves, and filled with kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria the flowers of this class and section having ten stamina joined in two bodies.

The Species are,

1. Crotolaria (*Verrucosa*) foliis simplicibus ovatis, stipulis lunatis declinatis ramis tetragonis. Flor. Zeyl. 277. *Crotolaria with single oval leaves, lunated declining stipulæ, and four-cornered branches.* Crotolaria Asiatica folio singulari verrucoso, floribus cæruleis. H. L. 199.
2. Crotolaria (*Pilosa*) foliis simplicibus lanceolatis pilosis, petiolis decurrentibus. *Crotolaria with single, hairy, spear-shaped leaves, and running foot-stalks.* Crotolaria Americana, caule alato foliis pilosis, floribus in thyrso luteis. Martyn. Cent. 43.
3. Crotolaria (*Sagittalis*) foliis simplicibus lanceolatis stipulis solitariis decurrentibus bidentatis. Hort. Cliff. 357. *Crotolaria with single spear-shaped leaves, and single stipulæ indented.* Crotolaria hirsuta minor Americana herbacea, caule ad summum sagittato. H. L. 202.
4. Crotolaria (*Fruticosa*) foliis simplicibus, lineari-lanceolatis hirsutis, petiolis decurrentibus, caule fruticoso. *Crotolaria with single, narrow, spear-shaped leaves, which are hairy, running foot-stalks, and a shrubby stalk.* Crotolaria frutescens hirsuta, flore luteo, ramulis alatis, foliis mucronatis. Houst. MSS.
5. Crotolaria (*Juncea*) foliis simplicibus lanceolatis, petiolatis caule striato. Hort. Cliff. 357. *Crotolaria with single spear-shaped leaves having foot-stalks.* Crotolaria Benghalensis foliis genistæ hirsutis. Pluk. Alm. 121.
6. Crotolaria (*Perfoliata*) foliis perfoliatis cordato-ovatis. Lin. Sp. Plant. 1005. *Crotolaria with oval heart-shaped leaves perforated by the stalks.* Crotolaria perfoliatæ folio. Hort. Elth. 122. tab. 102.
7. Crotolaria (*Retusa*) foliis simplicibus, oblongis cuneiformibus retusis. Flor. Zeyl. 276. *Crotolaria with single, oblong, wedge-shaped leaves, reflexed at the top.* Crotolaria Asiatica, floribus luteis, folio singularo cordiformi. H. L. 200.
8. Crotolaria (*Villosa*) foliis simplicibus ovatis villosis, petiolis simplicissimis, ramis teretibus. Hort. Cliff. 357. *Crotolaria with single, oval, hairy leaves, single pedicles and taper branches.* Crotolaria arborescens Africana, Styracis folio. H. L. 170.
9. Crotolaria (*Angulata*) foliis ovatis sessilibus, ramulis angulatis hirsutis, floribus lateralibus simplicissimis. *Crotolaria with oval leaves sitting close to the branches, which are angular, hairy, and single flowers proceeding from the sides of the branches.*
10. Crotolaria (*Laburnifolia*) foliis ternatis ovatis acuminatis, stipulis nullis, leguminibus pedicillatis. Flor. Zeyl. 278. *Crotolaria with oval, trifoliate, pointed leaves, no stipula, and foot-stalks to the pods.* Crotolaria Asiatica frutescens, floribus luteis amplis trifoliata. H. L. 196.
11. Crotolaria (*Alba*) foliis ternis lanceolato-ovatis, caule lævi herbaceo, racemo terminali. Hort. Cliff. 499. *Crotolaria with oval, spear-shaped, ternate leaves, smooth herbaceous stalks, which are terminated by loose spikes of flowers.* Anonis Caroliniana perennis non spinosa, foliorum marginibus integris, floribus in thyrso candidis. Martyn. Cent. 44.

The first sort grows naturally in India. This is an annual plant, which hath an herbaceous four-cornered stalk, rising about two feet high, dividing into three or four branches; these have also four acute angles, and are garnished with oval warted leaves, of a pale green colour, standing on very short foot-stalks; the flowers are produced in spikes at the end of the branches, which are of the butterfly shape, and of a light blue colour, succeeded by short turgid pods, which inclose one row of kidney-shaped seeds. It flowers in July and August, and the seeds ripen in autumn.

This plant is propagated by seeds, which must be sown upon a hot-bed in the spring, and when the plants are come up an inch high, they should be transplanted to another hot-bed to bring them forward, observing to shade them from the sun till they have taken new root; after which they should have free air admitted to them in proportion to the warmth of the season, to prevent their being drawn up weak. When the plants have acquired strength in this bed, they should be carefully taken up, with balls of earth to their roots, and each planted in a separate pot, filled with light kitchen-garden earth, and plunged into a moderate hot-bed of tanners bark, carefully shading them till they are rooted again; then they must be treated in the same manner as other tender exotic plants, giving them proper air and water in warm weather; when the plants are grown so tall as to nearly reach the glasses of the hot-bed, the pots may be removed into an airy glass-case, or stove, where they may be screened from inclement weather, and have proper air in hot weather; with this treatment the plants will flower in July, and continue to produce fresh spikes of flowers till the end of August; and those spikes of flowers which appear early in the season, will be succeeded by ripe seeds in September, soon after which the plants will decay.

The second sort grows naturally at La Vera Cruz in New Spain, from whence the seeds were sent me by the late Dr. Houstoun; this rises with a compressed winged stalk near three feet high, putting out several side branches, garnished with spear-shaped leaves near three inches long, and one broad, covered with soft hairs, and sit close to the branches, alternately; from the foot-stalks of each there runs a border or leafy wing, along both sides of the branches; the flowers are produced in loose spikes at the end of the branches, which are of a pale yellow colour, the standard being stretched out a considerable length beyond the wings. These are succeeded by short turgid pods, which, when ripe, are of a deep blue colour, having one row of small kidney-shaped seeds, which are of a greenish brown colour. This flowers and seeds about the same time with the former, and requires the same treatment.

The third sort was sent me from South Carolina by the late Dr. Dale, and also from Jamaica by Dr. Houstoun, so that it grows naturally in several parts of America; this is an annual plant, which rises with a slender stalk a foot and a half high, dividing into three or four spreading branches, garnished with oblong oval leaves sitting close. The upper part of the branches have two leafy borders or wings, running from one leaf to the other, but the lower part of the branches have none; the foot-stalks of the flowers arise from the side of the stalk, those from the lower part of the branches are above a foot long, the upper are about six inches, they are very slender, and sustain one or two pale yellow flowers at their tops, which are not more than half so large as the former sort, and are succeeded by very short turgid pods, in which are inclosed three or four smooth kidney-shaped seeds. This sort requires the same culture as the two former, and flowers at the same season.

The fourth sort grows naturally in Jamaica, from whence the seeds were sent me by the late Dr. Houstoun; this rises with a shrubby taper stalk near four feet high, sending out many side branches which are very slender, ligneous, and covered with a light brown bark, garnished with very narrow spear-shaped leaves, which are hairy, sitting close to the branches; the younger shoots have a leafy border or wing on two sides, but the old branches have none; the flowers are produced near the end of the branches, three or four growing alternate on a loose spike; they are of a dirty yellow, and small; the pods which succeed them are about an inch long, very turgid, and of a dark blue when ripe. This sort is propagated by seed, which should be sown on a hot-bed, and the plants

treated in the same manner as those before; but in autumn they should be placed in the stove, where they will live through the winter, and flower early the following summer, so will perfect their seeds very well.

The seeds of the fifth sort were brought me from the coast of Malabar, which succeeded in the Chelsea garden. This rises with an angular stalk near four feet high, dividing upward into three or four branches, garnished with narrow spear-shaped leaves, placed alternately on very short foot-stalks; they are pretty closely covered with soft silvery hairs. The flowers are produced at the end of the branches, in loose spikes; they are large, and of a deep yellow colour, and the style stands out beyond the standard. The flowers are succeeded by large turgid pods, containing one row of large kidney-shaped seeds.

This plant is annual in England, but by the lower part of the stalk growing woody, it appears to be of longer duration in the country where it naturally grows; though it will not live through the winter here, for if the plants are placed in a stove, the heat is too great for them, and in a green-house they are very subject to mouldiness in damp weather. I have sown the seeds of this in the full ground, where the plants have grown upward of three feet high, and have flowered very well, but no pods were formed on these; and when they have been treated tenderly, the plants have grown much larger, and produced a greater number of flowers, but these have produced no seeds. The only way which I could ever obtain any seeds, was by raising the plants in pots upon hot-beds; and the beginning of July, turning them out of the pots into the full ground on a very warm border under a wall, in which situation they flowered very well, and some few pods of seeds were ripened.

The sixth sort was sent me by the late Dr. Dale from South Carolina, who had the seeds sent him from the country, at a great distance from the English settlements. By the description sent me with the seeds, it grows with a shrubby stalk four or five feet high; but the plants which were raised here, perished at the approach of winter, so that they only flowered, without producing any pods. The stalks of this are round, and covered with a light brown bark, garnished with smooth, oval, heart-shaped leaves, which are about four inches long, and near three broad; surrounding the stalk in such a manner, as if it were run through the middle of the leaves. The flowers grow singly, sitting close to the bosom of each leaf, toward the upper part of the branches; they are of a pale yellow colour, and appear here in August; but as the plants did not produce any pods, so I can give no account of them. This is one of the most singular plants of the genus I have yet seen.

The seventh sort rises with an herbaceous stalk near three feet high, dividing upward into several branches, garnished with oblong leaves, which are narrow at their base, but gradually widen to the top, where they are rounded and indented in the middle in the shape of a heart; they are of a pale green, and smooth. The flowers are produced in spikes at the end of the branches, they are pretty large, and of a yellow colour. These appear in July, and the seeds ripen in autumn, provided the plants are brought forward in the spring, and afterward treated in the same manner as hath been directed for the first sort. This grows naturally in the island of Ceylon, and is an annual plant, perishing soon after it perfects seeds. I received the seeds of this plant from the late Dr. Boerhaave, professor at Leyden.

The eighth sort grows naturally at the Cape of Good Hope, from whence I received the seeds. This rises with a shrubby stalk about five feet high, dividing into several branches, garnished with roundish leaves, sitting close to the branches; they are of a hoary green, and soft to the touch, the branches are taper and smooth; the flowers are produced at the end of the branches in loose spikes; they are about the size of those of the first sort, and of a fine blue cour. This plant flowers in June and July, and in warm seasons will ripen its seeds in autumn. It is propagated by seeds, which must be sown upon a good hot-bed in the spring, and when the plants are fit to remove, should be each transplanted into a small halfpenny pot, and plunged into a hot-bed of tanners bark, and after must be treated in the same manner as hath been directed for the fourth sort, placing the plants in a moderate stove in winter, otherwise they cannot be preserved in England; the second year the plants will flower, and with proper care their seeds will ripen.

The ninth sort was sent me from Campeachy, where the plant grows naturally; this rises with a taper upright stalk near three feet high, dividing upward into several hairy branches, which grow erect, garnished with oval spear-shaped leaves, of a pale green colour; the flowers are produced singly from the side of the branches, which are of a bright yellow, and are succeeded by short turgid pods, having one row of kidney-shaped seeds. It flowers in July and August, and with the same treatment as hath been directed for the first sort, will perfect seeds in autumn. This is an annual plant, which perishes soon after the seeds are ripe.

The tenth sort grows naturally in India; this rises with a shrubby stalk four or five feet high, dividing into many branches, garnished with ternate oval leaves ending in points; the flowers are large, yellow, growing in large bunches from the side of the branches; they appear in July, August, and September, but I have not seen any pods succeed them here. However, when the plants are in flower, they make a fine appearance.

It is easily propagated by cuttings, during the summer months, if the cuttings are planted in pots, and plunged into a moderate hot-bed, being careful to shade them till they have taken root, and frequently refresh them with water: during the months of July, August, and September, the plants may be exposed to the open air in a sheltered situation, where they will produce many flowers; but in the autumn they should be placed in a temperate stove, to preserve them in winter.

The eleventh sort grows naturally in Virginia and Carolina, from both those countries I have received the seeds; there are two varieties of this species, one with a white, and the other a blue flower; but the seeds of one will produce both varieties, as I have more than once experienced. The root is perennial, sending up every spring a number of leaves, in proportion to the size of the root; the foot-stalks of the leaves are smooth, rising two feet high, dividing upward into three or five branches, garnished with ternate smooth leaves, whose lobes are oval, spear-shaped, and entire; the foot-stalks of the flowers arise immediately from the root, and advance rather higher than the leaves, being terminated by a thyrse of large butterfly-shaped flowers, near a foot in length; in one variety they are white, and in the other deep blue: these are succeeded by large swelling pods, of a black colour when ripe, having one row of kidney-shaped seeds. It flowers in June, and the seeds ripen in the autumn.

It is propagated by seeds, which should be sown on a moderate hot-bed in the spring; when the plants come up they should have free air admitted to them daily, to prevent their drawing up weak, and as soon as they are fit to remove, they should be each planted in a separate small pot, plunging them into a moderate hot-bed again, observing to shade them till they have taken fresh root; then they should be gradually inured to the open air; but in the autumn they should be placed in a common frame, or covered with mats in winter to shelter them; but the following spring they should be turned out of the pots, and planted in the full ground, where, if the soil is dry, and the situation sheltered, they will live many years, producing flowers and seeds annually.

As moſt of theſe plants are annual, ſo they require to be brought forward in the ſpring, otherwiſe the ſummers are too ſhort for them to perfect ſeeds; ſo that unleſs they are carefully managed, they will not flower well here; for in general, the ſummers in this country are not very favourable for theſe tender plants. Therefore in order to have theſe tender annual plants in perfection, there ſhould be a low glaſs-caſe erected about five or ſix feet high, which ſhould be made with glaſſes to open or ſlide down on every ſide, as ſhould alſo the top on both ſides, having ſliding glaſſes, that the plants may have ſun and air on every ſide; in this there ſhould be a pit for tanners bark to make a hot-bed, the whole extent, (a particular deſcription of which will be exhibited under the article STOVE) in this hot-bed may be placed all the very curious tender annual plants, where the ſun will conſtantly ſhine on them, ſo long as he makes his appearance above the horizon; and here they may have plenty of free air admitted at all times, when the weather is warm, ſo may be brought to equal perfection, as in the warm countries where they naturally grow; for the warmth of the tan to the roots, and the heat of the ſun through the glaſſes, will in ſummer, be equal to the heat of moſt countries.

Theſe plants naturally grow on ſandy light ſoils, ſo they ſhould always be planted in ſuch; and the pots in which they are planted, muſt not be too large, for in ſuch they will not thrive, ſo that after they have filled the ſmall pots with their roots in which they were firſt planted, they ſhould be ſhaken out of thoſe, and put into penny pots, which will be large enough for moſt of the annual kinds; but thoſe which are of longer duration, will require pots a little larger the following ſpring The waterings of theſe plants ſhould be performed with caution, for too great moiſture will rot the fibres of their roots; ſo that in ſummer, if they are gently watered three or four times a week in hot weather, it will be ſufficient.

**CROTON.** Lin. Gen. Plant. 960. Ricinoides. Tourn. Inſt. 655. tab. 423. Baſtard Ricinus.

The CHARACTERS are,

*It hath male and female flowers in the ſame plant; the flowers have a five-leaved empalement, they have five petals, thoſe of the male being no larger than the leaves of the empalement; the male have five nectarious glands, which are ſmall, and fixed to the receptacle; theſe have ten or fifteen ſtamina, which are joined at their baſe, and terminated by twin ſummits. The female flowers have a roundiſh germen, ſupporting three reflexed ſpreading ſtyles, crowned by bifid reflexed ſtigmas; the germen afterward becomes a roundiſh three-cornered capſule, with three cells, each containing a ſingle ſeed.*

This genus of plants is ranged in the ninth ſection of Linnæus's twenty-firſt claſs, intitled Monœcia Monodelphia. The plants of this claſs and ſection have male and female flowers in the ſame plant, and the male parts are joined in one body.

The SPECIES are,

1. CROTON (*Tinctorium*) foliis rhombeis repandis, capſulis pendulis caule herbaceo. Hort. Upſal. 290. *Croton with rhomboid reflexed leaves, pendulous capſules, and an herbaceous ſtalk.* Ricinoides ex quâ paratur. Tournſol. Gallorum. Tourn. Inſt. 655. *Baſtard Ricinus, from which the Tournſole of the French is made.*
2. CROTON (*Argenteum*) foliis cordato-ovatis ſubtus tomentoſis integris ſubſerratis. Hort. Cliff. 444. *Croton with oval heart-ſhaped leaves, which are entire and woolly.* Ricinoides herbacea, folio ſubrotundo ſerrato fructu parvo conglomerato. Houſt. MSS.
3. CROTON (*Paluſtre*) foliis ovato-lanceolatis plicatis ſerratis ſcabris. Hort. Cliff. 445. *Croton with oval ſpear-ſhaped leaves, which are plaited, ſawed, and rough.* Ricinoides paluſtre, foliis oblongis ſerratis fructu hiſpido. Martyn. Cent. 38.
4. CROTON (*Lobatum*) foliis inermi-ſerratis, inferioribus quinquelobis, ſuperioribus trilobis. Hort. Cliff. 445. *Croton with leaves ſmoothly ſawed, the lower ones having five lobes, and the upper three.* Ricinoides herbacea, foliis trifidis vel quinquefidis & ſerratis. Houſt. MSS.
5. CROTON (*Humile*) tetraphyllum, foliis lanceolatis, acuminatis ſubtus cæſiis, caule herbaceo ramoſo. *Four-leaved Croton with ſpear-ſhaped pointed leaves, gray on their under ſide, and a branching herbaceous ſtalk.* Ricinoides humilis foliis oblongis acuminatis, ſubtus cæſiis. Houſt. MSS.
6. CROTON (*Fruticoſum*) foliis lanceolatis glabris, caule fruticoſo, floribus alaribus & terminalibus. *Croton with ſmooth ſpear-ſhaped leaves, a ſhrubby ſtalk, and flowers growing from the ſides and tops of the branches.* Ricinoides fruteſcens, lauri folio, calyce ampliſſimo viridi. Houſt. MSS.
7. CROTON (*Populi folia*) foliis cordatis, acuminatis, ſubtus tomentoſis, floribus alaribus ſeſſilibus, caule fruticoſo. *Croton with heart-ſhaped pointed leaves, woolly on their under ſide, and flowers growing cloſe to the ſides of the ſtalks, which are ſhrubby.* Ricinoides foliis populi hirſutis. Plum. Cat. 20.
8. CROTON (*Caſcarilla*) foliis lanceolatis acutis integerrimis petiolatis ſubtus tomentoſis, caule arboreo. Amœn. Acad. 5. p. 411. *Croton with ſpear-ſhaped, entire, acute-pointed leaves, woolly on their under ſide, and a tree-like ſtalk.* Ricinoides fruteſcens odorata, foliis anguſtis ſubtus albicantibus. Houſt. MSS. Caſcarilla.
9. CROTON (*Althæafolia*) foliis oblongo-cordatis tomentoſis, caule fruticoſo ramoſo, floribus ſpicatis terminalibus. *Croton with oblong, heart-ſhaped, woolly leaves, a ſhrubby branching ſtalk, and flowers growing in ſpikes at the ends of the branches.* Ricinoides Americana fruteſcens, Althææ folio. Plum. Cat. 20.
10. CROTON (*Salviæ folia*) foliis cordatis acutis, ſubtus tomentoſis, caule fruticoſo, floribus ſpicatis terminalibus & alaribus. *Croton with pointed heart-ſhaped leaves, woolly on their under ſide, a ſhrubby ſtalk, and flowers growing in ſpikes on the tops and ſides of the branches.* Ricinus ſalviæ folio utrinque molli. Pet. Hort. Siec.

The firſt ſort grows naturally in the ſouth of France, from whence I have frequently received the ſeeds; this is an annual plant, which riſes with an herbaceous branching ſtalk about nine inches high, garniſhed with irregular, or rhomboidal figured leaves, which are near two inches long, and one inch and a quarter broad in their wideſt part; theſe ſtand upon ſlender foot-ſtalks, near four inches long. The flowers are produced in ſhort ſpikes from the ſide of the ſtalks, at the end of the branches; the upper part of the ſpike is compoſed of male flowers, having many ſtamina, which coaleſce at the bottom; the lower part hath female flowers, which have each a roundiſh three-cornered germen; theſe afterward become a roundiſh capſule with three lobes, having three cells, each including one roundiſh ſeed. This flowers in July, but unleſs the plants are brought forward in a hot-bed, they do not ripen ſeeds in this country.

The ſeeds of this plant ſhould be ſown in the autumn, ſoon after they are ripe, in a ſmall pot filled with light earth, and plunged into an old tan-bed in a frame, where they may be ſcreened from cold in the winter; and in the ſpring following the pot ſhould be removed to a freſh hot-bed, which will bring up the plants in a month's time; when theſe are grown large enough to remove, they ſhould be each planted in a ſmall pot, and plunged into a freſh hot-bed, being careful to ſhade the glaſſes daily, until the plants have taken new root; then they ſhould have air daily admitted according to the warmth of the ſeaſon, and but little water given to them: with this management I have had the plants flower and produce good ſeeds here, but never could obtain any with other treatment.

This is the plant from which the Tournſole is made, which is uſed for colouring wines and jellies; it is made of the juice which is lodged between the empalement and the ſeeds, which, if rubbed on cloths, at firſt appears of a lively green, but ſoon changes to a bluiſh purple colour; if theſe cloths are put into water, and afterward wrung, they will dye the water to a claret colour; the rags thus dyed, are brought

to England, and sold in the druggists shops by the name of Tournsole.

The second sort grows naturally at La Vera Cruz in New Spain, from whence the seeds were sent me by the late Dr. Houstoun; this is an annual plant, which rises about a foot high; it hath an angular stalk; the branches are naked from their divisions to the top, where they are garnished with a few oval spear-shaped leaves, which are sawed on their edges; they are an inch and a half long, and three quarters of an inch broad, standing on foot-stalks one inch long. The flowers are produced in close short spikes at the end of the branches, those on the upper part being male, and the lower female; they are white, and the male soon falls away, but the female are succeeded by roundish capsules, having three lobes; these grow in close clusters, they have three cells, each containing one roundish seed. It flowers in July, and the seeds ripen in autumn.

The third sort was discovered by the late Dr. Houstoun at La Vera Cruz, from whence he sent me the seeds; this is also an annual plant, which grows naturally in low marshy grounds, where it hath a very different appearance from what it puts on when sown upon dry land; those of the watery places have broad flat stalks, and leaves three inches long, which are scarce a quarter of an inch broad; these are rough, and but little indented on their edges; but those plants upon dry ground have oval leaves three inches long, and upwards of two inches broad, which are sawed on their edges. The flowers are produced at the wings of the leaves, in short loose spikes, having four or five herbaceous male flowers at the top of each, and three or four female flowers at the bottom, which are succeeded by roundish capsules with three lobes, covered with a prickly husk; these have three cells, each inclosing a single seed. It flowers and seeds about the same time as the former.

The fourth sort was discovered by the same gentleman, at the same place as the former; this is an annual plant, which rises with a taper herbaceous stalk a foot and a half high, dividing into several branches, garnished with smooth leaves, standing upon very long foot-stalks, and are for the most part placed opposite, as are also the branches; the lower leaves are divided deeply into five oblong segments or lobes, and the upper into three, which are slightly sawed on their edges, ending in acute points. The flowers are produced in loose spikes at the end of the branches, those on the upper part being male, and the lower female, they are of an herbaceous colour; the female flowers are succeeded by oblong capsules, having three lobes, which open in three parts, having three cells, each containing one oblong seed. This flowers and seeds at the same time as the former sorts.

The fifth sort was found growing naturally at the Havannah, by the late Dr. Houstoun, who sent me the seeds; this is an annual plant, which rarely grows more than six inches high, dividing into two or three branches; the lower part of these are garnished at each joint with four leaves placed in form of a cross, two of which are three inches long, and one inch broad near their base, ending in acute points; these stand opposite, and the other two leaves between these are about two inches long, and a quarter of an inch broad; they are of a light green on their upper side, and of a gray or Ash-colour on their under. The flowers are produced in long loose spikes at the top of the stalks, two or three of these spikes arising from the same joint; the upper part of these spikes have male, and the lower female flowers, of an herbaceous colour; the female flowers are succeeded by round capsules with three cells, each containing one roundish seed. This flowers and seeds about the same time with the former sorts.

The sixth sort was discovered by the late Dr. Houstoun in the island of Jamaica, where it grows naturally. It rises with a shrubby stalk to the height of seven or eight feet, which is covered with an Ash-coloured bark, and divides into many slender branches upward; some of these branches are terminated by five or six smaller, which arise from the same joint; these are naked below, but toward their upper part they are garnished with smooth spear-shaped leaves, about two inches and a half long, and three quarters of an inch broad, standing on pretty long foot-stalks without order; the flowers are produced in short spikes at the end of the branches, in the same manner as the former; they are of an herbaceous colour, and inclosed in large green empalements.

The seventh sort was sent me from Jamaica, by Mr. Robert Millar; this rises with a shrubby stalk seven or eight feet high, sending out many irregular branches, covered with an Ash-coloured bark, and garnished with heart-shaped leaves, near four inches long, and two inches broad in their widest part, ending in acute points; they are of a light green on their upper side, but woolly on their under, standing on slender foot-stalks without any order, sometimes single, and at others, two or three arise from the same joint. The flowers are produced in short spikes from the side of the branches; they are of a whitish green colour, and the female flowers are succeeded by capsules, having three cells, each including a single seed.

The eighth sort grows naturally in Jamaica, from whence the seeds were sent me by the late Dr. Houstoun; this rises with a shrubby stalk about six or seven feet high, sending out many side branches, which are covered with a smooth bark, of a yellowish white colour, garnished very closely with narrow stiff leaves near three inches long, and about one eighth of an inch broad, of a light green on their upper side, but their under side is the same colour as the bark; the midrib is furrowed on their upper side, and very prominent on the lower; the upper part of the branches divide into four or five smaller, which arise from the same joint, and are nearly equal in their length, and between these arise a long loose spike of whitish green flowers. The whole plant hath an aromatic odour when rubbed. The seeds grow in roundish capsules having three cells, each including a single seed.

The ninth sort grows naturally in Jamaica, from whence it was sent me by the late Dr. Houstoun; this rises with a shrubby stalk six or seven feet high, dividing upward into several branches, which are covered with a yellowish down, garnished with long heart-shaped leaves, ending in acute points; these are two inches and a half long, and one broad in their widest part, standing on long foot-stalks, covered on both sides with a woolly down of the same colour as the branches. The flowers are produced on long close spikes at the end of the branches; the male flowers, which are situated on the upper part of the spikes, have white flowers of one leaf, divided into five parts almost to the bottom, and have five taper stamina, situated in the bottom. The female flowers on the lower part of the spikes, have large woolly empalements, and are succeeded by round capsules with three cells, each including a single seed.

The tenth sort rises with a shrubby stalk near four feet high, dividing into many smaller branches, which have a silvery bark, and are garnished with small heart-shaped leaves, about three quarters of an inch long, and half as broad at their base, ending in acute points; these are woolly on both sides, but their under side is silvery, their upper side of a yellowish green. The flowers are produced in short spikes at the end of the branches, which are small, white, and have woolly empalements. The female flowers on the lower part of the spikes are succeeded by roundish capsules with three cells, each containing one seed.

All these plants except the first, are natives of warm countries, so will not thrive in England, unless they are tenderly treated. They are all propagated by seeds; those which are annual perfect their seeds in England;

England; but the ſhrubby ſorts very rarely arrive to that perfection, ſo their ſeeds muſt be procured from the countries where they naturally grow. The ſeeds muſt be ſown on a hot-bed early in the ſpring, and when the plants are fit to remove, they ſhould be each tranſplanted into a ſmall pot, and plunged into a moderate hot-bed of tanners bark, where they ſhould be ſhaded from the ſun till they have taken freſh root; then they muſt have air admitted to them daily, in proportion to the warmth of the ſeaſon; they muſt alſo be frequently refreſhed with water, particularly the ſecond, third, and fourth ſorts, which will often require water, but the others ſhould have it more ſparingly. After the plants are grown too tall to remain in the frames, they ſhould be removed, either into the ſtove, or a glaſs-caſe, where there is a hot-bed of tanners bark, into which the pots ſhould be plunged, and there the annual ſorts will flower and perfect their ſeeds; but the ſhrubby kinds muſt be removed into the bark-ſtove in the autumn, and during the winter ſeaſon they ſhould have but little water; and the ſtove ſhould be kept in a good temperature of heat, otherwiſe they will not live through the winter in England.

As theſe plants retain their leaves all the year, ſo they make a pretty variety in winter, when they are intermixed with other plants, whoſe leaves are of different forms and colours from theſe.

CROWN IMPERIAL. See PETILIUM.

CRUCIANELLA. Lin. Gen. Plant. 118. Rubeola. Tourn. Inſt. R. H. 130. tab. 50. Petty Madder.

The CHARACTERS are,

*The flower hath a two-leaved empalement, which is rigid and compreſſed. It hath one petal, with a ſlender cylindrical tube which is longer than the empalement, and cut into four parts at the brim. It hath four ſtamina ſituated in the mouth of the tube, terminated by ſingle ſummits. It hath a compreſſed germen, ſituated at the bottom of the tube, ſupporting a ſlender bifid ſtyle, crowned by two obtuſe ſtigmas. The germen afterward become two twin capſules, each containing one oblong ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourth claſs, intitled Tetrandria Monogynia, the flower having four ſtamina and one ſtyle.

The SPECIES are,

1. CRUCIANELLA (*Anguſtifolia*) erecta, foliis ſenis linearibus. Hort. Upſal. 27. *Upright Crucianella with ſix narrow leaves.* Rubeola anguſtiore folio. Tourn. Inſt. 130. *Petty Madder.*
2. CRUCIANELLA (*Latifolia*) procumbens, foliis quaternis lanceolatis, floribus ſpicatis. Hort. Upſal. 27. *Trailing Crucianella with four ſpear-ſhaped leaves and ſpiked flowers.* Rubeola latiore folio. Tourn. Inſt. 130.
3. CRUCIANELLA (*Maritima*) procumbens ſuffruticoſa foliis quaternis, floribus oppoſitis quinquefidis. Lin. Sp. Plant. 158. *Crucianella with trailing ſhrubby ſtalks, four leaves at each joint, and flowers growing in whorls.* Rubeola maritima. C. B. P.
4. CRUCIANELLA (*Hiſpida*) caule hiſpido, foliis lanceolatis hirſutis oppoſitis, floribus umbellatis terminalibus. *Crucianella with a ſtinging ſtalk, ſpear-ſhaped hairy leaves placed oppoſite, and flowers growing in umbels at the ends of the branches.* Rubeola Americana hirſuta, parietariæ foliis, floribus umbellatis purpureis. Houſt. MSS.
5. CRUCIANELLA (*Americana*) foliis lineari-lanceolatis hirſutis oppoſitis, caule erecto villoſo, floribus ſolitariis alaribus. *Crucianella with narrow, ſpear-ſhaped, hairy leaves placed oppoſite, an erect hairy ſtalk, and ſingle flowers proceeding from the ſides of the branches.*

The firſt ſort grows naturally in the ſouth of France and Italy; this is an annual plant, which riſes with ſeveral upright ſtalks a foot high, having ſix or ſeven very narrow linear leaves placed in whorls, at each joint. The flowers grow in cloſe ſpikes at the top and from the ſide of the branches; theſe are ſmall, white, and not longer than the empalement, ſo make no great appearance. It flowers in June and July, and the ſeeds ripen in autumn.

The ſecond ſort grows in the iſlands of the Archipelago, and alſo about Montpelier; this is alſo an annual plant, ſending out ſeveral branching ſtalks from the root, which lie proſtrate, and are garniſhed with four ſpear-ſhaped leaves at each joint. The flowers are produced in long ſpikes at the extremity of the branches; theſe are very ſmall, ſo make no great appearance. It flowers about the ſame time as the former.

The third ſort is like the ſecond in the appearance of leaves and ſtalks, but the flowers grow on the ſide of the ſtalks, almoſt in whorls, and make little appearance. This grows naturally on the borders of the ſea, in the ſouth of France and Italy.

Theſe three ſorts are preſerved in ſome gardens for the ſake of variety; if the ſeeds are ſown on a bed of light earth early in the ſpring, where they are deſigned to remain, they will require no other culture, but to thin them where they are too cloſe, and keep them clean from weeds; or if the ſeeds are permitted to ſcatter, the plants will come up in the ſpring, and require no other treatment; but the third ſort will not ripen its ſeeds here, when the autumn is not favourable.

The fourth ſort hath four-cornered, rough, prickly ſtalks, which bend downward, and are garniſhed with ſpear-ſhaped leaves, which are hairy and ſtand oppoſite; the flowers are produced in ſmall cluſters at the end of the branches, which are blue, and cut into four parts at the top; after theſe decay, they are ſucceeded by twin capſules joined, in each of theſe is one oblong ſeed.

The fifth ſort riſes with a ſhrubby branching ſtalk near three feet high, which is garniſhed with narrow ſpear-ſhaped leaves, covered with ſtinging hairs. The flowers are produced from the wings of the leaves, on each ſide the ſtalk ſingly; theſe are of a pale blue colour, and are ſucceeded by twin fruit like the former.

Both theſe ſorts grow naturally at La Vera Cruz in New Spain, from whence the ſeeds were ſent me by the late Dr. Houſtoun; and the plants grew in the Chelſea garden very well during the ſummer ſeaſon, but periſhed in the autumn before their ſeeds were ripe.

CRUCIATA. See VALANTIA.

CRUPINA BELGARUM. See SERRATULA.

CUCUBALUS. Lin. Gen. Plant. 502. Tourn. Inſt. R. H. 339. tab. 176. Berry-bearing Chickweed.

The CHARACTERS are,

*The flower hath an oblong permanent empalement of one leaf, cut into five ſegments. It hath five petals, with tails as long as the empalement, but ſpread open at the top. It hath ten ſtamina, five of which are alternately inſerted in the tail of the petals; theſe are terminated by oblong ſummits. In the center is ſituated the oblong germen, ſupporting three ſtyles which are longer than the ſtamina, crowned by oblong hairy ſtigmas. The empalement afterward becomes a pointed cloſe capſule with three cells, opening at the top in five parts, and filled with many roundiſh ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's tenth claſs, intitled Decandria Trigynia, the flowers having ten ſtamina and three ſtyles.

The SPECIES are,

1. CUCUBALUS (*Bacciferus*) calycibus campanulatis, petalis diſtantibus, pericarpiis coloratis, ramis divaricatis. Lin. Sp. Plant. 414. *Cucubalus with a bell-ſhaped empalement, petals ſtanding aſunder, a coloured cover to the fruit, and divaricated branches.* Cucubalus Plinii. Lugd. 1429.
2. CUCUBALUS (*Latifolius*) caulibus erectis glabris, calycibus ſubgloboſis, ſtaminibus corollâ longioribus. *Cucubalus with ſmooth erect ſtalks, globular empalements, and ſtamina longer than the petals.* Lychnis ſylveſtris quæ behen album vulgò. C. B. P. 205. *Commonly called Spatling Poppy.*
3. CUCUBALUS (*Anguſtifolius*) calycibus ſubgloboſis, caule ramoſo patulo, foliis linearibus acutis. *Cucubalus with globular empalements, a branching ſpreading ſtalk, and*

*and narrow-pointed leaves.* Lychnis fylveftris quæ behen album vulgò, foliis anguftioribus & acutioribus. C. B. P. 250. *Spatling Poppy, with narrower pointed leaves.*

4. Cucubalus (*Behen*) calycibus fubglobofis glabris reticulato-venofis, capfulis trilocularibus corollis fubnudis. Flor. Suec. 360. *Cucubalus with fmooth globular empalements which have netted veins, capfules having three cells, and naked petals.* Lychnis Suecica behen album folio, habitu, calyce ampliffimo: gumfepungar five fcrotum arietis dicta. Boerh. Ind. alt. 212. *Called Gumfepungar in Sweden.*

5. Cucubalus (*Fabarius*) foliis obovatis carnofis. Prod. Leyd. 448. *Cucubalus with oval flefhy leaves.* Lychnis maritima faxatilis, folio anacampferotis. Tourn. Cor. 24.

6. Cucubalus (*Dubrenfis*) floribus lateralibus decumbentibus, caule indivifo, foliis bafi reflexis. Lin. Sp. Plant. 414. *Cucubalus with declining flowers on the fides of the ftalk, which is undivided, and leaves reflexed at their bafe.* Lychnis major noctiflora Dubrenfis perennis. Raii Hift. 995. *Greater perennial night-flowering Lychnis of Dover.*

7. Cucubalus (*Stellatus*) foliis quaternis. Hort. Upfal. 110. *Four-leaved Cucubalus.* Lychnis carophyllæus Virginianus, gentianæ foliis glabris quatuor ex fingulis geniculis caulem amplexantibus, flore amplo fimbriato. Raii Hift. 1895.

8. Cucubalus (*Noctiflora*) calycibus ftriatis acutis petalis bipartitis, caule paniculato, foliis linearibus. *Cucubalus with ftriated acute empalements, petals divided in two parts, a paniculated ftalk, and narrow leaves.* Lychnis noctiflora anguftifolia odorato. Tourn. Inft. R. H. 335. *Narrow-leaved, fweet-fcented, night-flowering Lychnis.*

9. Cucubalus (*Otites*) floribus dioicis, petalis linearibus indivifis. Hort. Cliff. 272. *Cucubalus with male and female flowers on different plants, and linear undivided petals.* Lychnis vifcofa, flore mufcofo. C. B. P. 206.

10. Cucubalus (*Acaulis*) acaulis. Flor. Lapp. 184. *Cucubalus without ftalks.* Lychnis Alpina pumila, folio gramineo, five mufcus Alpinus Lychnidis flore. C. B. P. 206.

11. Cucubalus (*Catholicus*) petalis bipartitis, floribus paniculatis, ftaminibus longis, foliis lanceolato ovatis. Hort. Upfal. 111. *Cucubalus with bifid petals, flowers growing in panicles, long ftamina, and fpear-fhaped acute leaves.* Lychnis altiffima, ocymaftri facie, flore mufcofo. Triumfet.

12. Cucubalus (*Paniculatus*) foliis radicalibus ovatis acutis, caulinis lanceolatis oppofitis, floribus paniculatis erectis. *Cucubalus with lower leaves oval and pointed, thofe on the ftalks fpear-fhaped, oppofite, and flowers growing in panicles which are erect.*

13. Cucubalus (*Italicus*) petalis bipartitis, caule paniculato, foliis radicalibus ovato-lanceolatis caulinis linearibus. *Cucubalus with petals divided in two parts, a paniculated ftalk, whofe lower leaves are oval and fpear-fhaped, and thofe on the ftalks very narrow.*

The firft fort grows naturally in France, Germany, and Italy, in fhady places, and is feldom kept in gardens, unlefs for the fake of variety; it fends out many climbing ftalks, which grow four or five feet high where they meet with fupport, otherwife they trail on the ground; thefe ftalks fend out fide branches oppofite, at each joint; the leaves are like thofe of Chickweed, and are placed oppofite. The flowers come out fingle at the end of the branches, which have large inflated empalements; they confift of five petals, which are white, cut at the brim into feveral narrow fegments, and are placed at a diftance from each other; they are fucceeded by oval berries, which, when ripe, are black and full of juice, inclofing feveral flat fhining feeds. It flowers in June, and the feeds ripen in autumn. This hath a perennial creeping root, whereby it is apt to multiply too faft in gardens. It delights in fhade, and will thrive in almoft any foil.

The fecond fort grows naturally in moft parts of England, where it is generally called Spatling Poppy. This ftands in the catalogue of medicinal plants, under the title of Behen album; the roots of it are fometimes ufed, and are accounted cordial, cephalic, and alexipharmic. It hath a perennial root, which ftrikes deep into the ground, fo that they are not eafily deftroyed by the plough, therefore it is frequently feen growing in bunches among corn. It is a rambling weed, fo is feldom cultivated.

The third fort grows naturally on the Alps; this differs from the former, in having much longer and narrower leaves, and the ftalks being more divided and fpreading, nor do the roots creep under ground like that. Thefe differences are conftant, for I have fown it above thirty years, and never found it vary.

The fourth fort grows naturally in Sweden, and fome other northern countries, where it paffes for the common fort; but although it is there fo, yet is very different from the fecond here mentioned, which is the fort that grows common in moft other parts of Europe. The ftalks of this are much larger, the leaves longer and more pointed; the empalement of the flower is curioufly veined like net-work, of a purplifh colour, whereas that of our common fort is plain. Thefe differences are lafting, when the plants are cultivated in a garden.

The fifth fort was difcovered by Tournefort in the Levant, who fent the feeds to the royal garden at Paris. This puts out many oval, thick, fucculent leaves near the ground, out of the middle of which, arifes an upright ftalk about fifteen inches high, the lower part of which is garnifhed with leaves of the fame form and confiftence as thofe at bottom, but are fmaller; thefe are placed oppofite; the upper part of the ftalk divides into two fmaller, on which ftand a few fmall herbaceous flowers at each joint. It flowers in June, and fometimes ripens feeds in autumn. The plant is biennial, generally perifhing when it has produced feeds; but unlefs it is fown upon a very dry rubbifh, and in a warm fituation, the plants will not live through the winter in England; for when they are in good ground, they grow large, and are fo replete with moifture, as to be affected by the firft froft in the autumn; but where they have grown upon an old wall, I have known them efcape, when all thofe were killed which grew in the ground.

The fixth fort grows naturally upon the cliffs near Dover. This hath a perennial root, from which arifes a fingle ftalk about a foot and a half high, garnifhed with long narrow leaves placed oppofite; the flowers are produced from the fide of the ftalks, each foot-ftalk fuftaining three flowers; the foot-ftalks come out by pairs oppofite, the empalement of the flower is long and ftriped, the flowers are of a pale red. Thefe appear in June, and the feeds ripen in autumn.

The feventh fort grows naturally in Virginia, and feveral other parts of North America. This hath a perennial root, from which arife two or three flender upright ftalks about a foot high, their lower part being garnifhed with four leaves at each joint, placed in form of a crofs; thefe are fmooth, of a deep green, about an inch and a half long, and half an inch broad near their bafe, terminating in acute points; the joints of the upper part of the ftalk are garnifhed with white fringed flowers, ftanding fingle upon pretty long foot-ftalks, which come out by pairs oppofite. The flowers appear in June, and in warm feafons the feeds will ripen in England.

The eighth fort grows naturally in Spain and Italy. This is a perennial plant, which rifes with an upright branching ftalk a foot and a half high, garnifhed with very narrow leaves placed oppofite; the upper part of the ftalk is very branching; fome of thefe branches are long, and others fhort; the flowers ftand upon long naked foot-ftalks, each fupporting three or four flowers, which have long tubes, with ftriped empalements; the petals are large, and deeply divided at the top; they are of a pale bluifh colour. Thefe flowers are clofed all day, but when the fun leaves them, they expand, and then they have a very agreeable fcent. This fort may be propagated by feeds,

seeds, which should be sown in the spring upon a bed of light earth; and when the plants are fit to remove, they should be planted in a nursery-bed, at about four inches distance, where they may remain till autumn, when they may be planted in the borders of the flower-garden, where they are designed to remain. The following summer these will produce their flowers, and ripen their seeds in the autumn; but the roots will continue several years, provided they are not planted in rich ground, where they are very subject to rot in winter.

The ninth sort grows naturally in Austria, Silesia, and Italy, as also in some parts of England. This is male and female in different plants; it hath a thick, fleshy, biennial root, which strikes deep in the ground, sending out many oblong leaves, which are broad at their extremity, but contract narrower to their base; from between these arise the stalks, which in the male plants often grow four or five feet high, but those of the female are seldom above three feet high; the stalks are garnished with narrow leaves, placed opposite at each joint, where there exsudes a viscous clammy juice, which sticks to the fingers when handled, and the small insects which settle upon those parts of the stalks, are thereby fastened so as not to get loose again. The flowers of the male plants are produced in loose spikes from the lower joints of the stalk, but on the upper part, they stand on single foot-stalks in clusters quite round the stalks; these are small, of a greenish colour, and have each ten stamina. The female plants have three or four flowers growing upon each foot-stalk, which arise from the side of the stalk. These are succeeded by oval seed-vessels, containing many small seeds; they flower in June, and the seeds ripen in autumn. This is propagated by seeds, which should be sown where the plants are designed to remain; for as they send out long tap-roots, they do not bear transplanting, unless it is performed while the plants are young. The plants are very hardy, so will thrive in almost any soil or situation, but agree best with a dry soil. It is necessary to have some male plants among the female, to have perfect seeds.

The tenth sort grows naturally on the Alps, and also upon the hills in the north of England and Wales. This is a very low plant, with small leaves, which spread on the ground, and have the appearance of moss. The flowers are small, erect, and rarely rise more than half an inch high; they are of a dirty white colour, and appear in May. This is a perennial plant, which will not thrive but in a moist soil and a shady situation.

The eleventh sort grows naturally in Italy and Sicily. This is a perennial plant, with large thick roots, sending out many long spear-shaped leaves near the ground; between these arise round viscous stalks, which grow three feet high, garnished at each joint by two long narrow leaves, ending in acute points. The stalks branch out into many divisions, on the upper parts of which the foot-stalks of the flowers arise from each joint by pairs opposite; each of these sustain three or four flowers of an herbaceous colour, whose petals are divided into two parts; the flowers appear in June, and the seeds ripen in the autumn. This is propagated by seeds in the same manner as the ninth.

The twelfth sort grows naturally in Spain and Italy, from whence I received the seeds. This is a biennial plant, which decays soon after it hath perfected seeds: this hath many oval pointed leaves near the root, standing upon long foot-stalks; between these arise an upright stalk, sending out two side branches at each joint, placed opposite; under each of these is situated one spear-shaped leaf, ending in an acute point; these side branches, and also the upright stalks, are terminated by whitish flowers, formed into a panicle, and standing erect; these appear in June, and are succeeded by seeds which ripen in autumn. This is propagated by seeds, which may be sown on an open border where the plants are designed to remain, and require no other culture but to keep them clear from weeds.

The thirteenth sort grows naturally in Italy, from whence I received the seeds; this is a perennial plant, which hath many oval spear-shaped leaves near the root; the stalks rise about two feet high; they are viscous, and from each joint comes out two side branches, under which are situated two very narrow leaves; the stalks spread out and form a sort of panicle, and are terminated by clusters of greenish flowers, whose petals are divided into two parts. This flowers in June, and the seeds ripen in autumn. It is propagated in the same manner as the ninth sort, and requires the same treatment.

CUCULLATE PLANTS are so called, of cucullа, *Lat.* a hood or cowl, such as monks wear, because their flowers resemble it.

CUCUMIS. Lin. Gen. Plant. 969. Tourn. Inst. R. H. 104. tab. 28. Cucumber; in French, *Concombre.*

The CHARACTERS are,

*It hath male and female flowers placed at distances on the same plant; these have a bell-shaped empalement of one leaf, whose border is terminated by five bristles. The flowers are bell-shaped, have one petal which adheres to the empalement, and is cut into five oval rough segments. The male flowers have three short stamina, which are inserted to the empalement, two of which have bifid tops. These are terminated by very narrow summits or lines, which run upward and downward, and adhere to the outside. The female flowers have no stamina, but have three small pointed filaments without summits. The germen, which is oblong, is situated under the flower, supporting a short cylindrical style, crowned by three thick convex stigmas, which are bipartite. The germen afterward becomes an oblong fleshy fruit with three cells, including many oval, flat, pointed seeds.*

This genus of plants is ranged in the tenth section of Linnæus's twenty-first class, intitled Monœcia Syngenesia. The plants of this class have male and female flowers on different parts of the same plant, and those of this section have their stamina joined. To this genus he has joined the Melon, Water Melon, and Bitter Apple; but however these may agree in their characters, so as to be joined together in a system of botany, it will not be proper in a book of gardening to be followed.

The SPECIES are,

1. CUCUMIS (*Sativus*) foliorum angulis rectis, pomis oblongis scabris. Hort. Cliff. 451. *Cucumber with leaves having right angles, and an oblong rough fruit.* Cucumis sativus vulgaris. C. B. P. 310. *The common Garden Cucumber.*
2. CUCUMIS (*Flexuosus*) foliorum angulis rectis, pomis longissimis glabris. *Cucumber with leaves having right angles, and a very long smooth fruit.* Cucumis flexuosus. C. B. P. 310. *The long Turkey Cucumber.*
3. CUCUMIS (*Chata*) hirsutis foliorum angulis integris dentatis, pomis fusciformibus hirtis utrinque attenuatis. Hasselq. It. 491. *Hairy Cucumber with angular indented leaves, and narrow hairy fruit.* Cucumis Ægyptius rotundifolius. C. B. P. 310.

The first sort is the Cucumber which is generally cultivated for the table, and is so well known as to need no description. The second sort is the long Turkey Cucumber, which is also pretty well known in England. The stalks and leaves of this sort are much larger than those of the common sort. The fruit is generally twice the length, and hath a smooth rind: this is undoubtedly different from the common sort, for I have cultivated it above forty years, and have not found it alter. There are green and white fruit of this sort, which differ but little except in their colour, so I have not distinguished them as distinct species, though I have also found them keep their difference from seeds. The white is less watery than the green, so is generally better esteemed. I have also received seeds from China of another sort, with a much longer fruit than the Turkey, but I have found this will degenerate in time, and become more like the common sort.

In Holland they cultivate a long white prickly Cucumber only, which is very different from the Turkey Cucumber, being near as rough as the common ſort; but this is not ſo hardy as our common ſort, ſo is ſeldom cultivated in England; but the fruit is not ſo watery or full of ſeeds as the common, therefore is preferable to it for the table.

The third ſort here enumerated is rarely cultivated, but in botanic gardens for the ſake of variety, the fruit being very indifferent, and the plants being tender, require a good heat to bring them to perfection in England; theſe plants ramble very far, ſo muſt have much room, and they are not very fruitful.

The common ſort is cultivated in three different ſeaſons, the firſt of which is on hot-beds under garden-frames, for early fruit; the ſecond is under bell or hand-glaſſes, for the middle crop; and the third is in the common ground, for a late crop, or to pickle.

I ſhall begin with giving directions for raiſing Cucumbers early, which is what moſt gentlemens gardeners have an emulation to excel each other in; and ſome have been at the pains and expence to have ripe fruit in every month of the year, which is rather a curioſity than any real advantage; for Cucumbers that are produced before April, cannot be ſo wholeſome as thoſe that are later; for before the ſun hath ſtrength enough to warm the beds through the glaſſes in the day-time, all the heat muſt proceed from the fermentation of the dung, which muſt conſequently occaſion a very conſiderable ſteam, as alſo a great quantity of air will be thereby generated, which, being pent up in the hot-bed, ſoon becomes rancid; and the ſteam of the bed being by the cold of the night condenſed into large drops of water, theſe, being abſorbed or inſpired by the plants, muſt certainly make the fruit crude and unwholeſome, eſpecially when the nights are very long. This, together with the great expence and trouble of procuring them earlier, having in ſome meaſure got the better of peoples ambition, ſo this is leſs practiſed than it hath been ſome years ſince; but as there are many perſons who yet value themſelves on their ſkill in raiſing early Cucumbers, we may probably be cenſured, as being deficient in what they call an eſſential part of gardening, ſhould we omit the method practiſed for raiſing theſe fruit early in the year. Therefore ſhall proceed to give ſuch directions, as if carefully attended to, will not fail of ſucceſs.

Thoſe perſons who are very deſirous to be early with their Cucumbers, generally ſow their ſeeds before Chriſtmas, but the generality of gardeners commonly put their ſeeds into the hot-bed about Chriſtmas. Where perſons have the conveniency of a ſtove for raiſing theſe plants, it is attended with leſs trouble than a common hot-bed, and is a much ſurer method, becauſe the plants will have a much greater ſhare of air, which will alſo be leſs mixed with damp or rancid vapours; for by the heat of the fires theſe will be diſſipated, and the temperature of the air is kept more equal than can be done with all poſſible care in a hot-bed, at a ſeaſon when we enjoy but little ſun; therefore where there is this convenience, the ſeeds ſhould be ſown in ſmall pots, filled with light dry earth, and plunged into the tan-bed, in the warmeſt part of the ſtove. The pots with earth ſhould be plunged three or four days before the ſeeds are ſown, that the earth may be properly warmed to receive them; the ſeeds ſhould be at leaſt three or four years old, but if it is more, provided it will grow, it will be the better. If the ſeeds are good, the plants will be begin to appear in about a week or nine days, at which time there muſt be as many halfpenny pots filled with dry light earth, as there are plants deſigned for planting (always allowing for loſs; ſo that where twenty-four plants are wanting, there ſhould be thirty raiſed); theſe pots ſhould be plunged into the bark-bed, that the earth may be warmed to receive the plants, which ſhould be pricked into theſe pots as ſoon as the two firſt leaves are raiſed above ground; into each of theſe pots may be two plants pricked, but when they have taken root, and are ſafe, the worſt ſhould be drawn out, being careful not to diſturb the roots of thoſe which are left. In the management of theſe plants, there muſt be great care taken not to give them too much water; and it will be very proper to put the water into the ſtove ſome hours before it is uſed, that the cold may be taken off; but there muſt be caution uſed not to make it too warm, for that will deſtroy the plants; they muſt alſo be guarded from the moiſture which frequently drops from the glaſſes of the ſtove, which is very deſtructive to theſe plants while young. As theſe plants muſt not be kept too long in the ſtove leſt they become troubleſome to the other plants, there ſhould be a proper quantity of new dung prepared for making a hot-bed to receive them; this muſt be in proportion to the quantity of holes or plants intended: for a middling family ſix or nine lights of Cucumbers will be ſufficient, and for a large one double the quantity; but the beds where they are deſigned to remain need not be made ſo ſoon, but rather a ſmall bed of one light, in which the plants may be trained up, till they have acquired a greater ſhare of ſtrength; and for this bed one good cart load of dung will be ſufficient. This ſhould be new, and not too full of ſtraw, nor ſhould it want a proper portion; it ſhould be well mixed together and thrown in a heap, mixing ſome ſea-coal aſhes with it; after it hath lain in a heap a few days, and has fermented, it ſhould be carefully turned over and mixed, laying it up again in a heap; and if there is a great ſhare of ſtraw in it, there may be a neceſſity for turning it over a third time, after having laid a few days: this will rot the ſtraw and mix it thoroughly with the dung, ſo there will be leſs danger of its burning afterward when the bed is made, which ſhould be done when the dung is in proper order. The place where the hot-bed is made ſhould be well ſheltered by Reed hedges, and the ground ſhould be dry; then there ſhould be a trench made in the ground, of a proper length and breadth, and a foot deep at leaſt; into which the dung ſhould be wheeled and carefully ſtirred up and mixed, ſo that no part of it ſhould be left unſeparated, for where there is not this care taken, the bed will ſettle unequally; there ſhould alſo be great care taken to beat the dung down cloſe in every part of the bed alike. When the bed is made, the frame and glaſſes ſhould be put upon it to keep out the rain, but there ſhould be no earth laid upon the dung till two or three days after, that the ſteam of the dung may have time to evaporate. If there ſhould be any danger of the bed burning, it will be proper to lay ſome ſhort old dung, or ſome neats dung, over the top of the hot dung about two inches thick, which will keep down the heat, and prevent the earth from being burnt; after this there ſhould be a ſufficient number of three farthing pots placed upon the bed, filled with light dry earth, and all the interſtices between them filled up with any common earth. In two or three days the earth in theſe pots will be of a proper temperature of warmth to receive the plants, which ſhould be then turned out of the halfpenny pots, preſerving the ball of earth to their roots, and planted into the three farthing pots, filling up the pots with good earth; then a little water ſhould be given them to ſettle the earth about their roots, being careful not to give them too much wet; and as theſe will have ſuch large balls of earth to their roots, they will not feel their movement, therefore will not require ſhading from the ſun; but the glaſſes ſhould be raiſed up a little on the contrary ſide from the wind, to let the ſteam of the bed paſs off; and they ſhould alſo be frequently turned in the day-time, that the wet occaſioned by the ſteam of the dung may be dried, otherwiſe the moiſture will fall on the plants, which will be very injurious to them. If the bed ſhould heat too violently, ſo as to endanger ſcalding the roots of the plants, the pots may be raiſed ſo as to allow of a little hollow at their bottoms, which will effectually prevent injury thereby; and when the heat declines, the pots may be ſettled down again.

again. The glaſſes of the hot-bed ſhould be well covered with mats every night, to keep the bed in a proper temperature of heat, and great care muſt be taken to admit freſh air every day to the plants; but this ſhould be done with caution, ſo as to guard againſt the cold winds which uſually blow at that ſeaſon; ſo that a mat or canvaſs ſhould be hung over the opening made by raiſing of the glaſſes, to prevent the cold air from ruſhing in too violently, and the glaſſes ſhould always be raiſed on that ſide which is contrary to the wind. The plants will alſo require to be frequently watered, but it muſt be cautiouſly given them at this ſeaſon, and the water ſhould not be cold, but either placed in a ſtove, or put into a warm heap of dung, to take off the chill from it before it is uſed.

If the weather ſhould prove bad, and the heat of the bed decline, there ſhould be ſome hot dung laid round the ſides of the bed to renew the heat, which muſt not be ſuffered to fail; for as the plants have been tenderly brought up, they muſt not ſuffer from cold, for that will ſoon deſtroy them.

In this bed the plants may remain about three weeks or a month, in which time, if they have been properly managed, they will have obtained ſufficient ſtrength to put out for good; therefore a proper quantity of dung ſhould have been mixed and turned ready for making of the beds. The uſual quantity allowed for making of the beds at this ſeaſon, is one good cart load to each light: this ſhould be well mixed and turned over in the manner before directed; then a trench ſhould be dug in the ground the length and width of the intended bed, into which the dung ſhould be wheeled, and properly worked according to the above directions, and ſome old dung or neats dung ſpread over the top. The frames and glaſſes ſhould then be put on the bed, which ſhould be raiſed every day to let the ſteam of the dung paſs off, and in about three days the bed will be in a proper temperature of heat to receive the plants; at which time the dung ſhould be covered over with dry earth about four inches thick, and in the middle of the bed it ſhould be three or four inches thicker; this ſhould be laid upon the dung at leaſt twenty-four hours before the plants are removed into the bed, that the earth may be properly warmed; then the plants ſhould be carefully ſhaken out of the pots, preſerving all the earth to their roots, and placed on the top of the earth in the middle of the bed. Two, or at moſt, three of theſe plants will be ſufficient for each light, and theſe ſhould be placed at about ſeven or eight inches aſunder, not all the roots together, as is too often practiſed. When the plants are thus ſituated in the bed, the earth which was laid ſo much thicker in the middle of the bed, ſhould be drawn up round the ball which remained to the roots of the plants, into which their roots will ſoon ſtrike; there ſhould always be a magazine of good earth laid under cover to keep it dry, for the earthing of theſe beds; for if it is taken up wet, it will chill the beds, and alſo occaſion great damps therein, therefore it is quite neceſſary to have a ſufficient quantity of earth prepared long before it is uſed. When the plants are thus ſettled, they muſt have proper air and water, according as they may require, being careful not to admit too much cold air, or give too much water; the glaſſes ſhould alſo be well covered with mats every night, to keep up the warmth of the bed, and ſome freſh earth ſhould be put into the bed at different times, which ſhould be laid at ſome diſtance from the roots of the plants till it is warmed, and then ſhould be drawn up round the heap of the earth in which the plants grow, to increaſe the depth; this ſhould be raiſed to the full height of the former ball, that the roots of the plants may more eaſily ſtrike into it: by this method of ſupplying the earth, the whole ſurface of the beds will be covered nine or ten inches with earth, which will be of great ſervice to the roots of the plants; for where the earth is very ſhallow, the leaves of the plants will always hang in the heat of the day, unleſs they are ſhaded, and the plants will require more water to keep them alive, than is proper to give them; therefore it will be found much the better way to allow a proper depth of earth to the beds: but the reaſon of not laying the quantity of earth on the bed when it is firſt made, is, that the dung ſhould not be too much chilled by it, or that the earth may not be burned, which might be endangered thereby, were the whole thickneſs to be laid on at once; beſides, by thus gradually applying the earth, it will be freſh, and much better for the roots of the plants, than that which has been long upon the bed, and has been too much moiſtened by the ſteam ariſing from the dung.

If the heat of the bed ſhould decline, there ſhould be ſome hot dung laid round the ſide of the bed to renew the heat; for if that ſhould fail at the time when the fruit appears, they will fall off and periſh, therefore this muſt be carefully regarded; and when the plants have put out ſide branches (which the gardeners call runners) they ſhould be properly placed, and pegged down with ſmall forked ſticks to prevent their riſing up to the glaſſes, and alſo from croſſing and entangling with each other; ſo that when they are properly directed at firſt, there will be no neceſſity of twiſting and tumbling the plants afterward, which is always hurtful to them.

When the earth of the bed is laid the full thickneſs, it will be neceſſary to raiſe the frames, otherwiſe the glaſſes will be too cloſe to the plants; but when this is done, there muſt be care taken to ſtop the earth very cloſe round the ſide of the frame, to prevent the cold air from entering under them. The watering the plants, and admitting freſh air to them, muſt be diligently attended to, otherwiſe the plants will be ſoon deſtroyed; for a little neglect either of admitting air, or letting in too much, or by over watering, or ſtarving the plants, will very ſoon deſtroy them paſt recovery.

When the fruit appears upon the plants, there will alſo appear many male flowers on different parts of the plant; theſe may at firſt ſight be diſtinguiſhed, for the female flowers have the young fruit ſituated under the flowers, but the male have none; but theſe have three ſtamina in their center with their ſummits, which are loaded with a golden powder. This is deſigned to impregnate the female flowers, and when the plants are fully expoſed to the open air, the ſoft breezes of wind convey this farina or male powder from the male to the female flowers; but in the frames where the air is frequently too much excluded at this ſeaſon, the fruit often drops off for want of it; and I have often obſerved, that bees that have crept into the frames when the glaſſes have been raiſed to admit the air, have ſupplied the want of thoſe gentle breezes of wind, by carrying the farina of the male flowers on their hind legs into the female flowers, where a ſufficient quantity of it has been left to impregnate them. For as the bees make their wax of the farina or male powder of flowers, they ſearch all the flowers indifferently to find it; and I have obſerved them come out of ſome flowers with their hind legs loaded with it, and going immediately into other flowers which have none, they have ſcattered a ſufficient quantity of this farina about the ſtyle of the female flowers, to impregnate and render them prolific. Theſe inſects have taught the gardeners a method to ſupply the want of free air, which is ſo neceſſary for the performance of this in the natural way. This is done by carefully gathering the male flowers, at the time when this farina is fully formed, and carrying them to the female flowers, turning them down over them, and with the nail of one finger, gently ſtriking the outſide of the male, ſo as to cauſe the powder on the ſummits to ſcatter into the female flowers, and this is found to be ſufficient to impregnate them; ſo that by practiſing this method, the gardeners have now arrived at a much greater certainty than formerly, to procure an early crop of Cucumbers and Melons; and by this method the floriſts have arrived to greater certainty of procuring new varieties of flowers

from seeds, which is done by the mixing of the farina of different flowers into each other.

When the fruit of the Cucumbers are thus fairly set, if the bed is of a proper temperature of warmth, they will soon swell, and become fit for use; so all that is necessary to be observed, is to water the plants properly, which should be done by sprinkling the water all over the bed, for the roots of the plants will extend themselves to the side of the bed; therefore those who are inclined to continue these plants as long as possible in vigour, should add a sufficient thickness of dung and earth all round the sides of the beds, so as to enlarge them to near double their first width; this will supply nourishment to the roots of the plants, whereby they may be continued fruitful great part of the summer; whereas, when this is not practised, the roots of the plants, when they have reached the side of the beds, are dried by the wind and sun, so that the plants languish and decay long before their time.

Those gardeners who are fond of producing early Cucumbers, generally leave two or three of their early fruit, which are situated upon the main stem of the plant near the root, for seed; which, when fully ripe, they carefully save to a proper age for sowing, and by this method they find a great improvement is made of the seed; and this they always use for their early crops only, for the succeeding crops do not deserve so much care and attention.

I have here only mentioned the method of raising the young Cucumber plants in stoves; for as these conveniencies are now pretty generally made in the curious kitchen-gardens in most parts of England, this method may be more universally practised; but in such gardens where there are no stoves, the seeds should be sown upon a well prepared hot-bed: and here it will be the best way to sow the seeds in small halfpenny pots, because these may be easily removed from one bed to another, if the heat should decline; or, on the contrary, if the heat should be too great, the pots may be raised up, which will prevent the seed or the young plants from being injured thereby. When the plants are come up as was before directed, there should be a fresh hot-bed prepared, with a sufficient number of halfpenny pots plunged therein ready to receive the plants, which must be planted into them in the same manner as was before directed, and the after-management of the plants must be nearly the same; but as the steam of the hot-bed frequently occasions great damps, there must be great care to turn and wipe the glasses frequently, to prevent the condensed moisture falling on the plants, which is very destructive to them. There must also be great attention to the admitting fresh air at all proper times, as also to be careful in keeping the bed to a proper temperature of heat; for as there is a want of fire to warm the air, that must be supplied by the heat of dung, afterward these plants must be ridged out in the same manner as before directed.

If the bed is of a good temper for heat, your plants will take root in less than twenty-four hours; after which time you must be careful to let in a little air at such times when the weather will permit, as also to turn the glasses upside down every day to dry; for the steam of the bed condensing on the glasses, will fall down upon the plants, and be very injurious to them; therefore whenever the weather is so bad as not to permit the glasses to lie turned long, you should at least turn them once or twice a day, and wipe off the moisture with a woollen cloth; but you must also be very careful how you let in too much cold air, which is equally destructive to the tender plants; therefore, to avoid this, it is a very good method to fasten before the upper side of the frame, where the air is suffered to enter the bed, a piece of coarse cloth or mat, so that the air which enters may pass through that, which will render it less injurious to your plants.

You must also be very cautious in giving water to the plants while young; and whenever this is done, it should be sparingly, and the water should be placed either into a heap of dung, or in some other warm place, for some time before it is used, so as to be nearly of a temperature for warmth with the inclosed air of the hot-bed; and as the plants advance in height, you should have a little dry sifted earth always ready to earth up their shanks, which will greatly strengthen them. You must also be very careful to keep up the heat of the bed, which, if you should find decline, you must lay a little fresh litter round about the sides of the bed, and also keep the glasses well covered in the nights, or in bad weather: but if, on the other hand, your bed should prove too hot, you should thrust a large stake into the side of the dung in two or three places, almost to the middle of the bed, which will make large holes, through which the greatest part of the steam will pass off without ascending to the top of the bed; and when you find it has answered your purpose by slacking the heat of your bed, you must stop them up again with dung.

These directions, if carefully attended to, will be sufficient for raising the plants in the first bed: you must therefore, when you perceive the third, or rough leaf begin to appear, prepare another heap of fresh dung, which should be mixed with ashes, as was before directed; this should be in quantity according to the number of holes you intend to make. The common allowance for ridging out the earliest plants is, one load to each light or hole, so that the bed will be near three feet thick in dung; but for such as are not ridged out till March, two loads of dung will be sufficient for three holes, for I could never observe any advantage in making these beds so thick with dung as some people do; their crops are seldom better, if so good, as those which are of a moderate substance; nor are they forwarder, and the fruit is rarely so fair, nor do the Vines continue so long in health.

In making these beds, you must carefully mix the dung, shaking it well with the fork, so as not to leave any clods of dung unseparated, as also to beat it down pretty close, to prevent the steam from rising too hastily; you must also be careful to lay it very even, and to beat or press down the dung equally in every part of the bed, otherwise it will settle in holes, which will be very hurtful. When you finish laying the dung, you must make a hole exactly in the middle of each light, about a foot deep, and eight or nine inches over; these holes must be filled with light fresh earth, which should be screened to take out all large stones, clods, &c. laying it up in a hill; and in the middle of each thrust in a stick about eighteen inches long, which should stand as a mark to find the exact place where the hole is; then earth the bed all over about three inches thick, levelling it smooth, and afterwards set the frame upon it, covering it with glasses; but if there is any apprehension of the dung heating too violently, the earth should not be laid upon the bed until the heat is somewhat abated, which will be in a few days, and then the earth may be laid upon the bed by degrees, covering it at first two inches thick; and a week or ten days after another inch in thickness may be laid on, but there should be the whole thickness of earth laid upon the bed before the Vines begin to run; and if this thickness of earth is at last six or seven inches, the Vines will grow the stronger for its being so thick; for if the roots are observed, they will be found to spread and cover the whole bed as much as the Vines extend above; and when the earth is very shallow, or too light, the Vines will hang their leaves every day for want of a sufficient depth of earth to support their roots; so that if they are not constantly and well watered, they will not have strength to last long, nor to produce fair fruit; and the giving them too much water is not so proper, nor will it answer near so well, as the giving a depth of earth upon the dung.

In four or five days time your bed will be in fit order to receive your plants, of which you may easily judge by pulling out one of the sticks which was put in the middle

middle of the holes, and feeling the lower part of it, which will satisfy you what condition your bed is in; then you must stir up the earth in the middle of the hole with your hand, breaking all clods, and removing all large stones, making the earth hollow in form of a bason; into each of these holes you must plant two plants, in doing of which, observe to make the holes for the plants a little slanting towards the middle of the bason, especially if your plants are long shanked; this is intended to place the roots of the plants as far as possible from the dung, to which if they approach too near, the lower part of their roots is subject to be burned off; then settle the earth gently to each plant, and, if the earth is dry, it will be proper to give them a little water (which should be warmed to the temper of the bed, as was before directed;) and if the sun should appear in the middle of the day, they should be shaded therefrom with mats until the plants have taken root, which will be in two or three days; after which, you must let them enjoy as much of the sun as possible, observing to turn the lights in the day time to dry, as also to give a little air whenever the weather will permit.

You must also observe to keep the glasses covered every night, and in bad weather, but be very careful not to keep them covered too close, especially while the bed has a great steam in it, which will cause a damp to settle upon the plants, which, for want of air to keep the fluid in motion, will stagnate and rot them.

When your plants are grown to be four or five inches high, you must, with some slender-forked sticks, incline them toward the earth, each one a separate way; but this must be done gently at first, lest by forcing them too much, you should strain or break the tender vessels of the plants, which would be very hurtful to them. In this manner you should, from time to time, observe to peg down the runners as they are produced, laying each in exact order, so as not to interfere or cross each other; nor should you ever after remove them from their places, or handle them too roughly, whereby the leaves may be broken or displaced, which is also equally injurious to them; but whenever you have occasion to weed the bed between the plants, do it with great care, holding the leaves aside with one hand, while with the other you pull out the weeds.

In about a month after they are ridged out, you may expect to see the beginnings of fruit, which very often are preceded by male flowers, which many people are so ignorant as to pull off, calling them false blossoms; but this I am fully convinced, by many experiments, is wrong; for these flowers are of absolute service to promote the welfare of the fruit, which, when these male flowers are entirely taken off, does very often fall away, and come to nothing: nor should the Vines be pruned, as is too often the practice of unskilful people, especially when they are too luxuriant, which often happens when the seeds were fresh, or of the last year's saving, and the plants in good heart. If this should happen to be the case, it would be very proper to pull up one of the plants, before they have run so far as to entangle with the other; for it often happens, that one or two plants are better than four or five, when they are vigorous; for when the frame is too much crouded with Vine, the fruit is seldom good, nor in such plenty, as when there is a more moderate quantity of shoots; for the air being hereby excluded from the fruit, they often decay, and fall off very young.

You must also be very careful to cover the glasses every night when your fruit begins to appear, as also to lay a little fresh litter, or mowing of grass round the sides of the bed, to add a fresh heat thereto; for if the heat of the bed be spent, and the nights prove cold, the fruit will fall away and come to nothing; and when the sun is extreme hot in the middle of the day, you must cover the glasses with mats to shade the Vines; for although they delight in heat, yet the direct rays of the sun, when it has great force, are very injurious, by either scorching those leaves which are near the glasses, or by causing too great a perspiration, whereby the extreme part of the shoots and the large leaves are left destitute of nourishment, and the fruit will be at a stand, and often turn yellow before it arrives at half its growth; this is too often the case, when the beds have not a sufficient depth of earth over the dung.

At this time, when your Vines are spread so as to cover the hot-bed, it will be of great service when you water them, to sprinkle them all over gently so as not to hurt the leaves; but observe to do this not at a time when the sun is very hot, for hereby I have known a whole bed of Cucumbers spoiled; for the water remaining upon the surface of the leaves in drops, doth collect the rays of the sun as it were to a focus, and so scorches the leaves, that in one day's time they have, from a bright green, become of the colour of brown paper. The watering of the beds all over will be of great service, by giving nourishment to those roots, which by this time will have extended themselves all over the bed; and if the warmth of the bed should now decline, it will be of great service to add a lining of fresh dung round the sides of the beds, to give a new heat to them; for as the nights are often cold at this season, where the beds have not a kindly warmth left in them, the fruit will frequently drop off the Vines, when grown to the size of a little finger; and if upon this lining of dung there is a thickness of strong earth laid for the roots of the plants to run into, it will greatly strengthen them, and continue the plants in vigour a much longer time than they otherwise will do; for the roots of these plants extend to a great distance when they have room, which they cannot have in a bed not more than five feet wide; so that when they have no greater extent for their roots, the plants will not continue in vigour above five or six weeks, which, if they have a depth and extent of earth, will continue three months in bearing; so that where there are several beds made near each other, it will be the best way to fill up the bottom of the alleys between them with warm dung, and cover that with a proper thickness of earth, so as to raise them to the level of the beds. These directions, with diligent observation, will be sufficient for the management of this crop of Cucumbers; and Vines thus treated will continue to supply you with fruit till the beginning of July, by which time the second crop will come to bear; the sowing and managing of which is what I shall next proceed to.

About the middle of March, or a little later, according to the earliness of the season, you must put in your seeds, either under a bell-glass, or in the upper side of your early hot-bed; and when the plants are come up, they should be pricked upon another moderate hot-bed, which should be covered with bell or hand-glasses, placed as close as possible to each other; the plants should also be pricked at about two inches distance from each other, observing to water and shade them until they have taken new root, which will be in a very short time. This is to be understood of such places where a great quantity of plants are required, which is constantly the case in the kitchen-gardens near London; but where it is only for the supply of a family, there may be plants enough raised on the upper side of the beds where the first crop is growing; or if the Vines should have extended themselves so far as to cover the whole bed, whereby there will not be room to prick the plants, a single light will contain a sufficient number of plants, while young, to plant out in ridges, as will supply the largest family with Cucumbers during the latter season. You must also cover the glasses with mats every night, or in very bad weather; but in the day time, when the weather is hot, you must raise the glasses with a stone on the opposite side from the wind, to give air to the plants, which will greatly strengthen them; you must also water them as you shall find they require it, but this must be done spa ingly while the plants are young.

The middle of April the plants will be ſtrong enough to ridge out, you muſt therefore be provided with a heap of new dung, in proportion to the quantity of holes you intend to plant, allowing one load to ſix holes. When your dung is fit for uſe, you muſt dig a trench about two feet four inches wide, and in length juſt as you pleaſe, or the place will allow; and if the ſoil be dry, it ſhould be ten inches deep, but if wet, very little in the ground, levelling the earth in the bottom; then put in your dung, obſerving to ſtir and mix every part of it as was directed for the firſt hot-beds, laying it cloſe and even.

When this is done, you muſt make holes about eight inches over, and ſix inches deep, juſt in the middle of the ridge, and three feet and a half diſtance from each other; and if there be more than one ridge, the diſtance of thoſe ought to be eight feet and a half from each other; then fill the holes with good light earth, putting a ſtick into the middle of each for a mark, and afterwards cover the ridge over with earth about four inches thick, laying the earth the ſame thickneſs round the ſides. When the earth is levelled ſmooth, you muſt ſet the glaſſes on upon the holes, leaving them cloſe down about twenty-four hours, in which time the earth in the holes will be warmed ſufficiently to receive the plants; then with your hand ſtir up the earth in the holes, making it hollowin form of a baſon; into each of which you ſhould plant three or four plants, obſerving to water and ſhade them until they have taken root; after which time you muſt be careful to give them a little air by raiſing the glaſſes on the oppoſite ſide to the wind, in proportion to the heat of the weather, as alſo to water them as you ſhall ſee they require it; but you muſt only raiſe the glaſſes in the middle of the day, until the plants fill the glaſſes, at which time you ſhould raiſe the glaſſes with a forked ſtick on the ſouth ſide, in height proportionable to the growth of the plants, that they may not be ſcorched by the ſun; this alſo will harden and prepare the plants to endure the open air, but you ſhould not expoſe them too ſoon thereto; for it often happens, that there are morning froſts in May, which are many times deſtructive to theſe plants when expoſed thereto; it is therefore the ſureſt method to preſerve them under the glaſſes, as long as they can be kept in without prejudice to the plants; and if the glaſſes are raiſed with two bricks on the backſide, and the forked ſtick on the other ſide, they may be kept in a great while without danger.

Towards the latter end of May, when the weather appears ſettled and warm, you ſhould turn your plants down gently out of the glaſſes; but do not perform this in a very dry, hot, ſunny day, but rather when there is a cloudy ſky, and an appearance of rain; you muſt in doing of this raiſe the glaſſes either upon bricks, or forked ſticks, whereby they may ſtand ſecure at about four or five inches high from the ground, that the plants may lie under them without bruiſing; nor ſhould you take the glaſſes quite away till the latter end of June, or the beginning of July, for theſe will preſerve the moiſture much longer to their roots than if they were quite expoſed to the open air; about three weeks after you have turned the plants out of the glaſſes, they will have made a conſiderable progreſs, eſpecially if the weather has been favourable, at which time you ſhould dig up the ſpaces of ground between the ridges, laying it very even; then lay out the runners of the Vines in exact order, and be careful in this work not to diſturb the Vines too much, nor to bruiſe or break the leaves; this digging of the ground will looſen it, and thereby render it eaſy for the roots of the plants to ſtrike into it, as alſo render the ſurface of the earth more agreeable to the Vines that run upon it. After this there will be no farther care needful, but only to keep them clear from weeds, and to water them as often as they ſhall require, which they will ſoon ſhew, by the hanging of their greater leaves. The ridges, thus managed, will continue to produce large quantities of fruit from June until the latter end of Auguſt, after which time the coldneſs of the ſeaſon renders them unwholeſome, eſpecially if the autumn prove wet.

From theſe ridges people commonly preſerve their Cucumbers for ſeed, by making choice of two or three of the faireſt fruit upon each hole, never leaving above one upon a plant, and that ſituated near the root of it; for if you leave more, they will weaken the plant ſo much, that your other fruit will be ſmall, and fewer in number: but thoſe perſons who value themſelves upon producing Cucumbers very early, commonly leave three or four Cucumbers of the firſt produce of their earlieſt crop, when the fruit is fair; and the ſeeds of theſe early fruit, are generally preferred to any other for the firſt crop. Theſe ſhould remain upon the Vines until the middle or end of Auguſt, that the ſeeds may be perfectly ripe; and when you gather them from the Vines, it will be proper to ſet the fruit in a row upright againſt a hedge or wall, where they may remain until the outer cover begins to decay; at which time you ſhould cut them open, and ſcrape out the ſeeds, together with the pulp, into a tub, which ſhould be afterwards covered with a board, to prevent filth from getting amongſt the pulp. In this tub it ſhould be ſuffered to remain eight or ten days, obſerving to ſtir it well with a long ſtick to the bottom every day, in order to rot the pulp, that it may be eaſily ſeparated from the ſeeds; then pour ſome water into the tub, ſtirring it well about, which will raiſe the ſcum to the top, but the ſeeds will ſettle to the bottom; ſo that by two or three times pouring in water, and afterwards ſtraining it off from the ſeeds, they will be perfectly cleared from the pulp; then you ſhould ſpread the ſeeds upon a mat, which ſhould be expoſed to the open air three or four days until they are perfectly dry, when they may be put up in bags, and hung up in a dry place where vermin cannot come to them, where they will keep good for ſeveral years, but are generally preferred when three or four years old, as being apt to produce leſs vigorous, but more fruitful plants.

I ſhall, in the next place, proceed to give directions for managing Cucumbers for the laſt crop, or what are generally called picklers.

The ſeaſon for ſowing theſe is towards the latter end of May, when the weather is ſettled. The ground where theſe are commonly ſown, is between Cauliflowers, in the wide rows, between which are allowed four feet and a half ſpace when the Cauliflowers were planted. In theſe rows you ſhould dig up ſquare holes at about three feet and a half diſtance from each other, breaking the earth well with a ſpade, and afterwards ſmoothing and hollowing it in the form of a baſon with your hand; then put eight or nine ſeeds into the middle of each hole, covering them over with earth about half an inch thick; and if it ſhould be very dry weather, it will be proper to water the holes gently in a day or two after the ſeeds are ſown, in order to facilitate their vegetation.

In five or ſix days, if the weather be good, your plants will begin to thruſt their heads above ground; at which time you ſhould be very careful to keep off the ſparrows, which are very fond of the young tender ſeed-leaves of theſe plants; and, if they are not prevented, will deſtroy your whole crop: but as it is not above a week that the plants are in danger, it will be no great trouble to look after them during that time; for when the plants are come up, and have expanded their ſeed leaves, the ſparrows will not meddle with them.

You muſt alſo be careful to water them gently, as you find the drought of the ſeaſon may require; and when you perceive the third or rough leaf of the plants begin to appear, you muſt pull out all the weakeſt plants, leaving only three or four of the moſt promiſing and beſt ſituated in each hole, ſtirring the earth round about them with a ſmall hoe to deſtroy the weeds, and raiſe the earth about the ſhanks of the plants, putting a little earth between them, preſſing it gently down with your hand, that the plants may

may be thereby separated from each other to a greater distance; then give them a little water (if the weather be dry) to settle the earth about them, which you must afterwards repeat as often as you shall find it necessary, still being careful to keep the ground clear from weeds.

When your Cauliflowers are quite drawn off the ground from between the Cucumbers, you must hoe and clean the ground, drawing the earth up round each hole in form of a bason, the better to contain the water when it is given them; you must also lay out the plants in exact order as they are to run and extend, so that they may not interfere with each other; then lay a little earth between the plants left, pressing it down gently with your hand, the better to spread them each way, giving them a little water to settle the earth about them, repeating it as often as the season shall require, and observing to keep the ground clean from weeds. The plants thus managed, will begin to produce fruit toward the latter end of July, when you may either gather them young for pickling, or suffer them to grow for large fruit.

The quantity of holes necessary for a family, is about fifty or sixty; for if you have fewer, they will not produce enough at one gathering to make it worth the trouble and expence of pickling, without keeping them too long in the house, for you cannot expect to gather more than two hundred at each time from fifty holes; but this may be done twice a week during the whole season, which commonly lasts five weeks; so that from fifty holes you may reasonably expect to gather about two thousand in the season, which, if they are taken small, will not be too many for a private family. And if so many are not wanted, they may be left to grow to a proper size for eating.

CUCUMIS AGRESTIS. See Momordica.

CUCURBITA. Lin. Gen. Plant. 968. Tourn Inst. R. H. 107. [so called from Curvata, *Lat.* bended, becau sethe fruit of this plant generally bends,] the Gourd.

The Characters are,

*It hath male and female flowers in the same plant. The flowers have a bell-shaped empalement of one leaf, whose borders are terminated by five bristles; the flowers are bell-shaped, adhering to the empalement, and are of one petal, which is veined and rough, divided at the top into five parts. The male flowers have three stamina, which are connected at their extremity, but are distinct at their base, where they adhere to the empalement; these are terminated by linear summits running up and down. The female flowers have a large germen, situated under the flower, supporting a conical trifid style, crowned by a large trifid stigma. The germen afterward becomes a large fleshy fruit, having three soft membranaceous cells which are distinct, inclosing two rows of seeds which are bordered.*

This genus of plants is ranged in the tenth section of Linnæus's twenty-first class, intitled Monœcia Syngenesia, the plants having male and female flowers on the same plant, and the stamina of the male flowers being connected.

The Species are,

1. Cucurbita (*Lagenaria*) foliis cordatis denticulatis tomentosis basi subtus biglandulosis; pomis lignosis. Lin. Sp. 1434. *Gourd with heart-shaped, indented, woolly leaves, having two glands at their base, and a ligneous shell to the fruit.* Cucurbita longa, folio molli, flore albo. J. B. 2. 221. *Commonly called the Long Gourd.*
2. Cucurbita (*Pepo*) foliis lobatis, pomis lævibus. Lin. Sp. Plant. 1010. *Gourd with lobed leaves and a smooth fruit.* Cucurbita major rotunda, flore luteo, folio aspero. C. B. P. 213. *Commonly called Pompion, or Pumpkin.*
3. Cucurbita (*Verrucosa*) foliis lobatis, pomis nodoso-verrucosis. Lin. Sp. Plant. 1010. *Gourd with lobed leaves, and a warted knobby fruit.* Cucurbita verrucosa. J. B. 2. 222. *Warted Gourd.*
4. Cucurbita (*Melopepo*) foliis lobatis, caule erecto, pomis depresso-nodosis. Lin. Sp. Plant. 1010. *Gourd with lobed leaves, an erect stalk, and a depressed knotty fruit.* Melopepo clypeiformis. C. B. P. 312. *Commonly called Squash.*
5. Cucurbita (*Lignosus*) foliis lobatis asperis, flore luteo, pomis lignosis. *Gourd with rough-lobed leaves, a yellow flower, and fruit having a hard shell; commonly called Calabash.*

The first sort is sometimes propagated in the English gardens by way of curiosity, but the fruit is very rarely eaten here; though, if they are gathered when they are young, while their skins are tender, and boiled, they have an agreeable flavour. In the eastern countries these fruit are very commonly cultivated and sold in the markets for the table, and are a great part of the food of the common people, from June to October. These fruit are also eaten in both the Indies, where the plants are cultivated as culinary; and in those countries, where the heat of their summers is too great for many of our common vegetables, these may be a very good substitute.

This sort doth not vary like most of the others, but always produces the same shaped fruit; the plants of this extend to a great length, if the season proves warm and favourable, and will then produce ripe fruit; but in cold summers, the fruit seldom grows to half its usual size. I have measured some of these fruit when growing, which were six feet long, and a foot and a half round; the plants were near twenty feet in length: the stalks of this, and also the leaves, are covered with a fine soft hairy down; the flowers are large, white, and stand upon long foot-stalks, being reflexed at their brim; the fruit is generally incurved and crooked, and when ripe, is of a pale yellow colour. The rind of this fruit becomes hard, so that if the seeds and pulp are taken out, and the shell dried, it will contain water; and in those countries where they are much cultivated, are used for many purposes.

The second sort, which is commonly known by the title of Pumpkin, is frequently cultivated by the country people in England, who plant them upon their dunghills, where the plants run over them, and spread to a great distance; when the seasons are favourable, they will produce plenty of large fruit: these they usually suffer to grow to maturity, then they cut open a hole on one side, and take the seeds out of the pulp as clean as possible, after which they fill the shell with Apples sliced, which they mix with the pulp of the fruit, and some add a little sugar and spice to it; then bake it in an oven, and eat it in the same manner as baked Apples; but this is a strong food, and only fit for those who labour hard, and can easily digest it.

These may be propagated by sowing their seeds in April, on a hot-bed; and when the plants come up, they should be transplanted on another moderate bed, where they should be brought up hardily, and have a great deal of air to strengthen them; and when they have got four or five leaves, they should be transplanted into holes made upon an old dunghill, or some such place, allowing them a great deal of room to run, for some of the sorts will spread to a great distance. I have measured a single plant, which had run upwards of forty feet from the hole, and had produced a great number of side branches; so that if the plant had been encouraged, and all the side branches permitted to remain, I dare say it would have fairly overspread twenty rods of ground; which, to some people, may seem like a romance, yet I can affirm it to be fact. But what is this to the account printed in the Transactions of the Royal Society, which was communicated to them by Paul Dudley, Esq; from New England, wherein mention is made of a single plant of this kind, which, without any culture, spread over a large spot of ground, and from which plant were gathered two hundred and sixty fruits each, one with another, as big as a half peck.

There are several varieties of this fruit, which differ in their form and size; but as these are annually varying from seeds, so I have omitted the mentioning them, for they seldom continue to produce the same kinds of fruit three years together.

The third sort is very common in most parts of America, where it is cultivated as a culinary fruit; of this sort there are also several varieties, which differ in their form and size; some of these are flat, others round; some are shaped like a bottle, and others are oblong, their outer cover or rind being white when ripe, and covered with large protuberances or warts. The fruit are commonly gathered when they are half grown, and boiled by the inhabitants of America to eat as a sauce with their meat; but in England they are only cultivated by way of curiosity, few persons having a relish for them here, where they have a great variety of better esculent plants at that season, when these are fit for use. These may be propagated in the same manner as the second sort.

The fourth sort is also very common in North America, where it is cultivated for the same purposes as the third. This very often grows with a strong, bushy, erect stalk, without putting out runners from the side, as the other sorts, but frequently varies; for after it has been cultivated a few years in the same garden, the plants will become trailing like the others, and extend their branches to as great distance; and yet I have known when part of the seeds, taken out from the same fruit have been sown in another garden, at a considerable distance, the fruit have been the same, and the plants have grown erect, when those which were sown in the same garden, have produced trailing plants with larger fruit of a different shape.

The fruit of the fifth sort hath a hard shell when ripe like the first, which may be dried and preserved many years: these are of very different forms and size; some are shaped like a Pear, and are no bigger than a large Catherine Pear; some are as large as quart bottles, and almost of the same form; others are round and shaped like an Orange, and are of the same size and colour, but these are very variable; for I have cultivated most of the sorts near forty years, and have not been able, with all possible care, to preserve the varieties longer than two or three years in the same garden, without procuring fresh seeds from some distant place. Whether these changes are brought about by the admixture of the farina with each other, or from what cause I cannot say, because I have frequently planted them at as great distance from each other as I possibly could in the same garden, and yet the effect has been the same as when near.

The first sort requires to be treated more tenderly than the others, in order to procure ripe fruit; so the seeds should be sown upon a moderate hot-bed in April, and the plants afterward planted each into a penny pot, and plunged into a very moderate hot-bed to bring them forward; but they must not be tenderly treated, for if they have not a large share of free air admitted to them every day, they will draw up weak. When the plants are grown too large to be continued in the pots, there should be holes dug where they are designed to grow, and three or four barrows full of hot dung put into each; these should be covered with earth, into which the plants must be planted, and covered with hand-glasses till they run out.

There are some people who plant these plants by the sides of arbours, over which they train the vines; so that in a short time they will cover the whole arbour, and afford a strong shade, and upon some of these arbours I have seen the longest fruit. There are others who plant them near walls, pales, or hedges, to which they fasten the Vines, and train them to a great height: the Orange-shaped Gourd is the sort which is most commonly so planted for the ornament of its fruit, which has a pretty effect, especially when seen at some distance. All the sorts require a large supply of water in dry weather.

These plants requiring so much room to spread, and their fruit being very little valued in England, hath occasioned their not being cultivated amongst us; we having so many plants, roots, or fruits, which are greatly preferable to those for kitchen uses: but in some parts of America, where provisions are not in so great plenty, or so great variety, these fruits may be very acceptable.

CUIETE See Crescentia.

CULMIFEROUS PLANTS [so called of Culmus, *Lat.* straw or haulm,] are such as have a smooth jointed stalk, usually hollow, and at each joint wrapped about with single, narrow, sharp-pointed leaves; and their seeds are contained in chaffy husks, as Wheat, Barley, &c.

CUMINOIDES. See Lagoecia.

CUMINUM. Lin. Gen. Plant. 313. Mor. Umb. Κύμινον, *Gr.* Cumin.

The Characters are,

*It hath an umbelliferous flower; the general umbel is composed of smaller, which are divided into four parts; their involucrum is longer than the umbel. The great umbel is uniform; the flowers have five unequal petals, whose borders are inflexed, and five single stamina, terminated by slender summits. It hath a large germen situated under the flower, supporting two small styles, crowned by single stigmas. The germen afterward becomes an oval striated fruit, composed of two oval seeds, which are convex and furrowed on one side, and plain on the other.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flower having five stamina and two styles.

We have but one Species of this genus, viz.

Cuminum (*Cyminum.*) Lin. Mat. Med. 139. Cumin. Cuminum semine longiore. C. B. P. 146. *Cumin with a longer seed.*

This plant is annual, perishing soon after the seeds are ripe; it seldom rises more than nine or ten inches high, in the warm countries where it is cultivated; but I have never seen it grow more than three or four inches high in England, where I have sometimes had the plants come so far as to flower very well, but never to produce seeds. The leaves of this plant are divided into long narrow segments like those of Fennel, but much smaller; they are of a deep green, and generally turn backward at their extremity; the flowers grow in small umbels at the top of the stalks; these are composed of five unequal petals, which are of a pale blush colour, and are succeeded by long, channelled, aromatic seeds.

The seeds of this plant is the only part used in medicine; these are ranged among the greater hot seeds; they consist of very warm dissolving parts, and are esteemed good to expel wind out of the stomach and bowels, so they are frequently put into clysters for that purpose, and are sometimes given in powder; and outwardly applied, they are of great service to ease the pains of the breast or side.

This plant is propagated for sale in the island of Malta, where it is called Cumino aigro, i. e. *hot Cumin.* But Anise, which they also propagate in no less quantity, they call Cumino dulce, i. e. *sweet Cumin.* So that many of the old botanists were mistaken, when they made two species of Cumin, viz. acre and dulce.

If the seeds of this plant are sown in small pots filled with light kitchen-garden earth, and plunged into a very moderate hot-bed to bring up the plants, and these after having been gradually inured to the open air, turned out of the pots, and planted in a warm border of good earth, preserving the balls of earth to their roots, and afterward kept clean from weeds, the plants will flower pretty well, and by thus bringing of the plants forward in the spring, they may perfect their seeds in very warm seasons.

CUNILA. See Sideritis.

CUNONIA. Buttn. Cun. tab. 1. Antholyza. Lin. Gen. Plant. 56.

The Characters are,

*The flowers grow alternate in an imbricated spike, each having a spatha or sheath, composed of two spear-shaped concave leaves; the flower hath one ringent petal, having a short slender tube, which is dilated at the chaps, and compressed on the sides; the upper lip is arched, and stretched*

*ſtretched out a conſiderable length beyond the alæ or wings, and is rounded at the top: it hath three long ſlender ſtamina, which are ſituated in the upper lip, terminated by oblong flat ſummits, which are faſtened in their middle and lie proſtrate. It hath a ſlender ſtyle, which is ſhorter than the ſtamina, crowned by three cylindrical ſtigmas which join the ſummits, and are included in the upper lip. The germen, which is ſituated below the flower, becomes an oblong capſule with three cells, filled with compreſſed ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's third claſs, intitled Triandria Monogynia, the flowers having three ſtamina and one ſtyle, but he has joined it to the Antholyza, making it only a ſpecies of that genus; whereas by the form and characters of the flower, it ſhould be ſeparated from that, there being full as great difference between the flowers of this and thoſe of the Antholyza, as is between thoſe and the Gladiolus; for the flowers of Cunonia have no carina or under lip, but thoſe of the Antholyza have, in which one of the ſtamina is included, which is ſeparated from the other two, which are ſituated in the upper lip; but in this all three are of equal length, and ſituated in the hollow of the upper lip. The two wings of this are ſhort, whereas thoſe of Antholyza are long, ſo that I think they ſhould be ſeparated.

We have but one Species of this genus at preſent in the Engliſh gardens, which is

Cunonia (*Antholyza*) floribus ſeſſilibus, ſpathis maximis. Buttn. Cun. 211. tab. 1. *Cunonia with flowers ſitting cloſe to the ſtalk, and very large ſpathæ or ſheaths.* Dr. Linnæus titles it Antholyza ſtaminibus omnibus adſcendentibus. Sp. Plant. 37. *Antholyza with all the ſtamina aſcending.*

There is a plant of this kind figured in Cornutus's book of Canada plants, under the title of Gladiolus Æthiopicus, flore Coccineo, p. 78. but by his figure and deſcription, it appears to be a different ſpecies from this, his flowers having much ſmaller ſpathæ or ſheaths, nor does the ſtalks of his riſe near ſo high as this; there are alſo ſome other differences between them.

The ſeeds of this plant I received from the Cape of Good Hope, where it grows naturally, which ſucceeded ſo well in the Chelſea garden, as to produce a great number of plants, which flowered well the third ſeaſon after they appeared, and have continued to produce flowers, and perfect their ſeeds every year ſince.

This hath a compreſſed bulbous root, ſomewhat like that of Corn Flag, covered with a brown ſkin; from this ariſe ſeveral narrow ſword-ſhaped leaves, about nine inches long, and a quarter of an inch broad in the middle, terminating in acute points; theſe have one longitudinal midrib which is prominent, and two longitudinal veins running parallel on each ſide; they are of a ſea-green colour, and appear in autumn, growing in length all the winter; in ſpring the ſtalk ariſes from between the leaves, which is round, ſtrong, and jointed; at each joint is ſituated a ſingle leaf, which almoſt embraces the ſtalk for near three inches from the baſe, then by the curvature of the ſtalk it is ſeparated, ſtanding erect: the ſtalks riſe near a foot and a half high, which is generally curved two oppoſite ways; the upper part of the ſtalk is terminated by a looſe ſpike of flowers, coming out of large ſpathæ or ſheaths, compoſed of two oblong concave leaves, terminating in acute points: theſe are at their firſt appearance placed imbricatim over each other, but as the ſtalk increaſes in length, ſo theſe are ſeparated; from between theſe two leaves comes out the flower, each having a ſlender Saffron-coloured tube near half an inch long, which is then enlarged where the petal is divided, and the upper ſegment is extended two inches in length, being arched over the ſtamina and ſtyle. This is narrow as far as to the extent of the wings, but above them is enlarged and ſpread open half an inch in length, and is concave, covering the ſummits and ſtigmas which are extended to that length; the two wings are alſo narrow at their baſe, but are enlarged upward in the ſame manner, ending in concave obtuſe points, which are compreſſed together, and cover the ſtamina and ſtyle. This flower is of a beautiful ſoft ſcarlet colour, ſo makes a fine appearance, about the latter end of April or beginning of May, which is the ſeaſon of its flowering. After the flowers decay, the germen becomes an oval ſmooth capſule, opening in three cells, which are filled with flat bordered ſeeds.

This plant is too tender to thrive in the open air in England, ſo the roots muſt be planted in pots filled with light earth, and may remain in the open air till October, when they muſt be removed into ſhelter, either into an airy glaſs-caſe, or placed under a hot-bed frame, where the leaves will keep growing all winter, and in the ſpring the ſtalks ariſe and flower. During the winter ſeaſon, the plants will require a little water when the weather is mild, once a week, but it muſt not be given in great quantities, eſpecially in cold weather; in the ſpring they ſhould be watered oftener; and when the flowers are paſt, the pots ſhould be removed into the open air to perfect their ſeeds, which will ripen the latter end of June, ſoon after which the ſtalks will decay to the root, which will remain inactive till September. When the ſtalks are decayed, the roots may be taken out of the ground, and kept in a dry room till the end of Auguſt, when they ſhould be planted again.

This plant is eaſily propagated by offsets, which it ſends out in great plenty, or by ſowing of the ſeeds, which ſhould be ſown in pots about the middle of Auguſt, and placed in a ſituation where they may enjoy the morning ſun, and in dry weather ſhould be gently watered; in September the pots may be removed to a warmer ſituation, and in October they muſt be placed under a frame, where they may be protected from froſt and hard rains, but in mild weather enjoy the free air. The plants will appear in October, and continue growing all the winter, and in June their leaves will decay; then they may be taken up, and four or five roots may be planted in each pot, till they have grown another year, when they may be each put into a ſeparate pot. Theſe ſeedling plants muſt be ſheltered in the ſame manner as the old roots in winter, and the third year they will flower.

CUPRESSUS. Lin. Gen. Plant. 958. Tourn. Inſt. R. H. 587. tab. 358. Cypreſs [takes its name either of κύω, to bring forth, and πάρισος, becauſe it produces equal branches on both ſides; or of Cypariſſus, a certain infant whom the poets feign to have been transformed into a Cypreſs-tree.] The Cypreſs-tree.

The Characters are,

*It hath male and female flowers growing at diſtances on the ſame plant; the male flowers are formed into oval katkins, in which the flowers are placed thinly, among ſeveral roundiſh ſcales, each having a ſingle flower. Theſe have no petals nor ſtamina, but have four ſummits which adhere to the bottom of the ſcales. The female flowers are formed in a roundiſh cone, each containing eight or ten flowers; the ſcales of the cones are oppoſite, each having a ſingle flower, theſe have no petals; the germen is ſcarce viſible, but under each ſcale there are many punctures or ſpots, and a concave truncated apex inſtead of a ſtyle; this afterward becomes a globular cone, opening in angular target-ſhaped ſcales, under which are ſituated angular ſeeds.*

This genus of plants is ranged in the ninth ſection of Linnæus's twenty-firſt claſs, intitled Monœcia Monadelphia; the plants of this ſection have male and female flowers on the ſame plant, and the male flowers are joined in one bdoy.

The Species are,

1. Cupressus (*Sempervirens*) foliis imbricatis, ramis erectioribus. *Cypreſs with imbricated leaves, and upright branches.* Cupreſſus metâ in faſtigium convolutâ qua fæmina. Plinii. Dod. Pempt. 856. *Female or common upright Cypreſs.*

2. Cupressus (*Horizontalibus*) foliis imbricatis acutis, ramis horizontalibus. *Cypress with imbricated acute leaves, and branches growing horizontally.* Cupressus ramos extra se spargens quæ Mas. Plinii. Tourn. Inst. R. H. 587. *Male spreading Cypress.*

3. Cupressus (*Lusitanica*) foliis imbricatis, apicibus aculeatis, ramis dependentibus. *Cypress with imbricated leaves terminating in spines, and branches hanging downward.* Cupressus Lusitanica, patula, fructu minore. Inst. R. H. 587. *Portugal spreading Cypress with a smaller fruit.*

4. Cupressus (*Disticha*) foliis distichis patentibus. Hort. Cliff. 409. *Cypress with leaves on two sides the branches.* Cupressus Virginiana foliis Acaciæ deciduis. Hort. Amst. 1. p. 113. *Virginia Cypress which sheds its leaves, commonly called Deciduous Cypress.*

5. Cupressus (*Thyoides*) foliis imbricatis, frondibus ancipitibus. Lin. Sp. Plant. 1003. *Cypress with imbricated leaves, and branches standing two ways.* Cupressus nana Mariana, fructu cæruleo parvo. Pluk. Mant. 61. *Dwarf Maryland Cypress with a small blue fruit.*

6. Cupressus (*Africana*) foliis linearibus simplicibus cruciatim positis. *Cypress with narrow single leaves placed crossways.* Cupressus Africana of Herman and Oldenburgh. *African Cypress-tree, called by the Dutch Cypress Boom.*

The first of these trees is very common in most of the old gardens in England, but at present is not so much in request as formerly, though it is not without its advantages; nor should it be entirely rejected, although many persons are of that opinion; for it serves to add to the beauty of wildernesses, or clumps of Evergreens, and where they are properly disposed, they have their beauties. It was formerly planted in borders of pleasure-gardens, and kept shorn into a pyramidal or conic form; and some people, believing them subject to be killed if they cut them, tied them up with cords into a pyramidal figure, which form they are naturally disposed to grow in; but this winding them about, prevented the air from entering the inward parts of the branches, so that the leaves decayed, and became unsightly, and greatly retarded their growth. And those which are sheared, if the operation is not performed in the spring, or early in the summer, are very subject to be injured by sharp winds and cuttings frosts in winter. Wherefore, upon the whole, I think it much better to suffer them to grow wild as they are naturally disposed, planting them only amongst other Evergreen Trees, where, by the darkness of their green leaves, together with their waving heads, they will greatly add to the variety.

The second sort is by far the largest growing tree, and is the most common timber in some parts of the Levant. This, if planted upon a warm, sandy, gravelly soil, will prosper wonderfully; and though the plants of this sort are not so finely shaped as those of the first, yet they greatly recompense for that defect, by its vigorous growth and strength, in resisting all weathers. This tree is very proper to intermix with Evergreens of a second size next to Pines and Firs, to form clumps; in which class it will keep pace with the trees of the same line, and be very handsome. Besides, the wood of this tree is very valuable, when grown to a size fit for planks, which I am convinced it will do in as short a space as Oaks; therefore, why should not this be cultivated for that purpose, since there are many places in England where the soil is of a sandy or gravelly nature, and seldom produces any thing worth cultivating? Now, in such places these trees will thrive wonderfully, and greatly add to the pleasure of the owner, while growing, and afterwards render as much profit to his successors, as perhaps the best plantation of Oaks; especially should the timber prove as good here, as in the islands of the Archipelago, which I see no reason to doubt of; for we find it was so gainful a commodity to the island of Candia, that the plantations were called Dos Filiæ, the felling of one of them being reckoned a daughter's portion.

The timber of this tree is said to resist the worm, moth, and all putrefaction, and is said to last many hundred years. The doors of St. Peter's church at Rome were framed of this material, which lasted from the great Constantine to Pope Eugenius IVth's time, which was eleven hundred years, and were then found and entire, when the Pope would needs change them for gates of brass. The coffins were made of this material, in which Thucydides tells us the Athenians used to bury their heroes; and the mummy chests, brought with those condited bodies out of Egypt, are many of them of this material.

This tree is by many learned authors recommended for the improvement of the air, and a specific for the lungs, as sending forth great quantities of aromatic and balsamic scents; wherefore many of the antient physicians of the Eastern countries used to send their patients, who were troubled with weak lungs, to the island of Candia, which at that time abounded with these trees, where, from the effects of the air alone, very few failed of a perfect cure.

The fourth sort is a native of America, where it grows in watery places, and rises to a prodigious height, and is of a wonderful bulk. I have been informed, that there are trees of this kind in America which are upwards of seventy feet high, and several fathoms in circumference, which trees grow constantly in the water; therefore they may probably be of singular advantage to plant in such swampy or wet soils, where few other trees will grow, especially of the resinous kind. That they are very hardy in respect to cold, is evident, from some few trees of this kind which were formerly planted in England; particularly one in the gardens of John Tradescant, at South Lambeth, near Vaux-Hall, which is upwards of thirty feet high, and of a considerable bulk, which, though in a common yard at present, where no care is taken of it, but, on the contrary, many hooks are driven into the trunk, to fasten cords thereto for drying of cloaths, yet the tree is in great health and vigour, but hath not produced any fruit as yet, which may be occasioned for want of moisture: for we often see many aquatic plants will grow upon a drier soil, but yet are seldom so productive of either flowers or fruit, as those which remain growing in the water.

There is also a pretty large tree of this kind now growing in the gardens of the late Sir Abraham Janssen, Bart. at Wimbleton in Surry, which has produced great quantities of cones for some years past, which, in favourable seasons come to maturity, and the seeds have been as good as those which have been brought from America. This tree was transplanted when it was very large, which has stinted its growth; which, together with its being planted upon a dry soil, may have occasioned its fruitfulness, for it has made very little progress in its growth since it was removed.

These trees are all propagated from seeds, which should be sown early in the spring on a bed of warm, dry, sandy earth, which must be levelled very smooth; then sow the seeds thereon pretty thick, sifting the same light earth over them half an inch thick. If the weather should prove very warm and dry, it will be proper to shade the bed from the sun in the daytime, and water the bed, which must be done very carefully, observing not to wash the seeds out of the ground. In about two months time (if your seeds are good) the young plants will appear above ground, which must be constantly kept clean from weeds, and in very dry weather should be often refreshed with water; but this should be done with great caution, lest you beat these tender rooted plants out of the ground. If the seeds are sown upon a moderate hot-bed, and the bed covered with mats, they will come up much sooner, and with greater certainty, than when they are sown in the cold ground.

In this bed the young plants may remain two years, by which time they will have strength enough to be transplanted into a nursery; but while the plants are young, they are tender, so should be covered in severe frost with mats to prevent their being injured thereby.

thereby. The beſt ſeaſon for removing them is in the beginning of April, when the drying eaſterly winds of March are over, and, if poſſible, chooſe a cloudy day, when it is inclinable to rain; and in taking them out of the ſeed-bed, preſerve the roots as entire as poſſible, and, if you can, a ball of earth to each plant. The ſoil in which theſe trees ſhould be planted (as I before ſaid) ſhould be, for the two firſt ſorts, a warm ſand or gravel, which, when you have prepared, by carefully digging and cleanſing from all noxious weeds, you muſt lay level. Then draw the lines where the trees are to be planted at three feet aſunder, and plant the trees at eighteen inches diſtance in the rows, obſerving to cloſe the earth well to their roots, as alſo to lay a little mulch upon the ſurface of the ground about their ſtems; and water them well to ſettle the earth to their roots, which ſhould be repeated twice a week, until the plants have taken freſh root.

Theſe plants may remain in the nurſery three or four years, according to the progreſs they make, or till your ground is ready where they are to be planted: but if you intend to let them remain longer, you ſhould take up every other tree in the rows, and tranſplant out; for otherwiſe their roots will be matted together, ſo that it will render it difficult to tranſplant them, as alſo endanger the future growth of the trees. The plants ſhould by no means be let ſtand too long in the nurſery before they are tranſplanted out for good, becauſe the roots do not mat together ſo cloſely as thoſe of many other ſorts of Evergreen Trees, whereby they may be taken up with good balls of earth to their roots; but the roots of the Cypreſs are apt to extend out in length, ſo it is one of the moſt difficult trees to remove when grown large; therefore moſt curious perſons chooſe to plant the young plants into ſmall pots, when they firſt take them out of the ſeed-bed, and ſo train them up in pots two or three years, until they are fit to plant out where they are to ſtand for good, and, by this management, they are ſecure of all the plants; for theſe may be ſhaken out of the pots at any time of the year without danger, and planted with their whole ball of earth, which is likewiſe a great advantage. When they are planted out for good (if they are deſigned for timber) they ſhould be planted about twelve or fourteen feet diſtance every way, and be very careful in removing thoſe in the full ground, not to ſhake the earth from their roots; to prevent which, you ſhould open the ground about each tree, cutting off all long roots, then working under the ball of earth, cut the downright roots off; and after having pared off all the earth from the upper part of the ball, as alſo reduced the bulk of it, ſo that its weight may not be too great for the fibres to ſupport, they may be carried upon a handbarrow by two perſons to the place where they are to be planted; but if they are to be carried to a diſtant place, they ſhould either be put into baſkets, or their roots cloſely matted up. When they are planted, you muſt ſettle the earth cloſe to their roots as before, laying a little mulch upon the ſurface of the ground about their ſtems, to prevent the ſun and wind from entering the earth to dry their fibres; and water them well, to ſettle the ground to their roots, which muſt alſo be repeated, if the weather proves dry, until they have taken root, after which time they will require little more care than to keep them clear from weeds.

The firſt, which is the moſt common ſort in England, ſeldom produces good ſeeds in this country; it is therefore the beſt way to have the cones brought over entire from the ſouth parts of France and Italy, where they ripen perfectly well, and take the ſeeds out juſt before you ſow them, for they will keep much better in the cones than if they are taken out. The method to get the ſeeds out is to expoſe the cones to a gentle heat, which will cauſe them to open, and eaſily emit their ſeeds.

The ſecond ſort grows naturally in the Levant, and from thence it has been formerly brought to Italy, but at preſent this is pretty rare in England; for what has paſſed under this title here, is only a variety of the common ſort, whoſe branches grow much looſer, and not ſo upright as the firſt; but the cones taken from theſe trees, and the ſeeds ſown, have frequently produced plants of both varieties; but the true ſpreading Cypreſs extends its branches horizontally from the firſt year, and continues to extend them to a great length as the plants advance, and the plants raiſed from the ſeeds do not vary, ſo that it is certainly a diſtinct ſpecies. This grows to be a large timber tree in the Levant, and in Italy there are ſome of a conſiderable ſize.

The Virginian kind may alſo be propagated in as great plenty, for the cones of this may be eaſily procured from Carolina or Virginia, in both which places they grow in great abundance; and the ſeeds will riſe as eaſily as any of the other ſorts, and the plants are equally as hardy: theſe have been formerly kept in pots, and houſed in winter, with which management they have not ſucceeded ſo well as they have done in England, ſince people have planted them into the full ground; and where they have had a moiſt ſoil, I have obſerved them to thrive beſt, which is ſince confirmed by Mr. Cateſby, in his Natural Hiſtory of Carolina; where he ſays, that this tree grows in places where the water commonly covers the ſurface of the ground three or four feet, ſo that it may be a very great improvement to our boggy ſoils. This tree, caſting its leaves in winter, does not ſo well ſuit with plantations of Evergreens at that ſeaſon; though, in ſummer, when there is the greateſt pleaſure in walking among plantations of trees, it hath ſo much the appearance of an Evergreen, as to paſs for ſuch. It may alſo be propagated by cuttings, which ſhould be planted in a bed of moiſt earth in the ſpring before they begin to ſhoot.

The third ſort is at preſent pretty rare in the Engliſh gardens, though of late years there have been many plants raiſed here; but this ſort is not quite ſo hardy, I fear, as the common Cypreſs, for the plants are frequently killed, or greatly injured in ſevere winters; and in the hard froſt in 1740, there was a large tree of this kind entirely killed in the gardens of his Grace the Duke of Richmond, at Goodwood in Suſſex, which had been growing there ſeveral years; and in the year 1762, many large trees were killed. There are great plenty of theſe trees growing at a place called Buſaco, near Cœmbra in Portugal, where this tree is called the Cedar of Buſaco; and there it grows to be a timber tree, ſo that from thence the ſeeds may be eaſily procured.

This tree grows naturally at Goa, from whence it was firſt brought to Portugal, where it has ſucceeded, and been propagated; formerly there were ſome trees of this ſort growing in the Biſhop of London's garden at Fulham, where it paſſed under the title of Cedar of Goa, by which it was ſent from thence to the Leyden garden with that name.

The fifth ſort is a native of North America, where it grows to a conſiderable height, and affords an uſeful timber to the inhabitants for many purpoſes. This ſort is extremely worth cultivating in England; for as it grows in a much colder country, there is no danger of its thriving well in the open air in England; and being an Evergreen of regular growth, will add to the variety of wilderneſs quarters, or other plantations of Evergreen Trees.

This ſort is propagated by ſeeds, which ſhould be ſown in the ſpring in boxes or tubs filled with light freſh earth, and placed where they may enjoy the morning ſun till eleven or twelve o'clock. In dry weather they ſhould be duly watered, and conſtantly kept clear from weeds. In this ſituation they may remain till Michaelmas, when they ſhould be removed to a warmer place; for the plants ſeldom appear till the following ſpring, ſo that it will be proper to place the boxes or tubs near a ſouth wall, pale, or hedge, during the winter ſeaſon; leſt, by being too much ſhaded, the wet of the winter ſeaſon ſhould rot

th:

the seeds. In the spring following, if these tubs or boxes are placed on a moderate hot-bed, it will bring up the plants very soon, and greatly forward their growth; but as the spring advances, they should be inured to bear the open air by degrees; and in May they must be taken out of the hot-bed, and placed in a sheltered situation, where they may enjoy the morning sun, being careful to keep them clear from weeds, as also to water them duly in dry weather. The following winter it will be proper to remove the tubs near a south wall or pale, for the plants being very young, are sometimes tenderer than they will be afterward. Toward the latter end of March, or the beginning of April, just before the plants begin to shoot, they should be carefully taken up out of the boxes; and having prepared a bed or two (according to the quantity of plants raised) of fresh earth in a sheltered situation, the plants should be planted therein in rows about eighteen inches asunder, and about a foot distance plant from plant in the rows. This work should be done in cloudy weather, when there is rain; for in dry weather, when easterly winds commonly blow at this season, it will be very dangerous to transplant these plants; so that it had better be deferred a fortnight longer, till there is an alteration of the weather, than hazard the plants. When the plants are planted, they should be watered to settle the earth to their roots; and then the surface of the ground should be covered with mulch, to prevent the sun and wind from penetrating to the roots of the plants; for nothing is more injurious to these plants, than to have their fibres dried when they are transplanted; therefore the plants should not be taken out of the tubs till you are ready to place them in the ground, for they will not bear to lie out of the ground any time without great danger.

The branches of this tree are garnished with flat evergreen leaves, resembling those of the Arbor Vitæ; and the cones are no larger than the berries of the Juniper, from which they are not easily distinguished at a little distance; but upon closely viewing, they are perfect cones, having many cells like those of the common Cypress. If these trees are planted in a moist strong soil, they make very great progress, and may, in such situations, become profitable for timber; but however this tree may succeed for timber, yet it will be a great ornament to large plantations of evergreen trees, especially in such places where there is naturally a proper soil for them; because, in such situations, there are not many sorts of Evergreen Trees which thrive well, especially in cold places, and by increasing the number of sorts of these Evergreens, we add to the beauty of our gardens and plantations.

The third sort sends forth its branches almost horizontally, so that they extend to a great distance every way, and the trees are generally furnished with branches from the ground upward; but as these grow without much order, the trees have a very different appearance from all the other sorts. This grows to be a large timber tree in Portugal, but the largest tree which I have seen in England, has not been above fifteen feet high, and the side branches of this were extended more than eight feet on every side from the stem. This sort may be propagated from seeds in the same manner as the common Cypress, and the plants should be treated in the same manner as hath been directed for them, with this difference only, that it will be proper to cover these plants during the two first winters after they are come up, especially if the frost should be severe, which might destroy them, if they are exposed to it while they are young. This sort may also be propagated by cuttings, which, if planted in autumn, and screened in winter, they will take root; but it is generally two years before they will be rooted enough to transplant, nor will the plants so raised thrive so fast as the seedlings; therefore, when the seeds can be obtained, that is the best method to propagate this tree. The American deciduous Cypress may also be propagated by cuttings, as I have several times tried; so that when seeds cannot be had, this method may be practised successfully. I suppose the common sort will also take from cuttings; but this I have not experienced, so cannot recommend it to practice.

These trees are so very ornamental to gardens, that no large garden can be compleat without many of them; and it is to these trees that the Italian villas owe a great share of their beauty, for there is no tree so proper to place near buildings; the pyramidal upright growth of their branches affords a picturesque appearance, and obstructs not the view of the building, and the dark green of their leaves make a fine contrast with the white of the building; so that, wherever there are temples or other buildings erected in gardens, there is no sort of tree so proper to place near them as these. In all the landschapes of Italian villas, we see many Cypress-trees represented, which have a very agreeable effect in the picture; and the trees, when rightly disposed in a garden, afford a no less agreeable prospect.

The seeds of the sixth sort were sent me from the Cape of Good Hope, where the trees grow naturally, and by the account which I received with the seeds, the cones of the tree are black when ripe. The young plants which I have raised from these seeds have loose spreading branches, which are closely garnished with narrow strait leaves, which come out opposite, and are alternately crossing each other; these are near one inch long, and of a light green colour; they continue in verdure all the year. These plants being young, are too tender to thrive in the open air in England as yet; but when they have obtained more strength, it is very probable they may do well in warm situations. I had two of these plants growing in the full ground, which were killed in the winter 1756. But those which were placed under a frame, where there were no covering of glass, and only wooden shutters, were not injured by the cold, though the earth of the pots was frequently hard frozen.

**CURCUMA.** Lin. Gen. Plant. 6. Cannacorus. Tourn. Inst. R. H. 367. Turmerick.

The CHARACTERS are,

*The flowers have each several spathæ, which are single and drop off; the flower hath one petal with a narrow tube, which is cut at the brim into three segments; it hath an oval-pointed nectarium of one leaf, which is inserted in the sinus of the largest segment of the petal; it hath five stamina, four of which are barren, and one fruitful, which is situated within the nectarium, and hath the appearance of a petal, having a bifid point, to which the summit adheres. It hath a roundish germen situated under the flower, supporting a style the length of the stamina, crowned by a single stigma. The germen afterward becomes a roundish capsule, having three cells, which are filled with roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's first class, intitled Monandria Monogynia, the flower having one stamina and one style.

The SPECIES are,

1. CURCUMA (*Rotunda*) foliis lanceolato-ovatis, nervis lateralibus rarissimis. Lin. Sp. Plant. 2. *Curcuma with spear-shaped oval leaves, having very few nerves on the sides.* Curcuma radice rotundâ. C. B. *Turmerick with a round root.*
2. CURCUMA (*Longa*) foliis lanceolatis nervis lateralibus numerosissimis. Lin. Sp. Plant. 2. *Curcuma with spear-shaped leaves, having many lateral veins.* Curcuma radice longâ. H. L. 288. *Turmerick with a long root.*

The first sort hath a fleshy jointed root somewhat like that of Ginger, but rounder, which sends up several spear-shaped oval leaves, that rise upwards of a foot high; these have one longitudinal midrib, and a few transverse nerves running from the midrib to the sides; they are of a sea-green colour; from between these arise the flower-stalk, supporting a loose spike of flowers of a pale yellowish colour, inclosed in several different spathæ or sheaths, which drop off. These flowers are never succeeded by seeds in the gardens here.

The

The second sort hath long fleshy roots, of a deep yellow colour, which spread under the surface of the ground like those of Ginger; they are about the thickness of a man's finger, having many round knotty circles, from which arise four or five large spear-shaped leaves, standing upon long foot-stalks; they have a thick longitudinal midrib, from which a numerous quantity of veins are extended to the sides; these leaves are of a glaucous or sea-green colour. The flowers grow in loose scaly spikes on the top of the foot-stalks, which arise from the larger knobs of the roots, and grow about a foot high; they are of a yellowish red colour, and shaped somewhat like those of the Indian Reed.

These plants grow naturally in India, from whence the roots are brought to Europe for use. They are very tender, so will not live in this country, unless they are placed in a warm stove. As they do not produce seeds in England, they are only propagated by parting their roots: the best time for removing and parting these roots is in the spring, before they put out new leaves; for the leaves of these plants decay in autumn, and the roots remain inactive till the spring, when they put out fresh leaves. The roots should be planted in rich kitchen-garden earth, and the pots should be constantly kept plunged in a bark-bed in the stove. In the summer season, when the plants are in a growing state, they will require to be frequently refreshed with water, but it should not be given to them in large quantities; they should also have a large share of air admitted to them in warm weather. When the leaves are decayed, they should have very little wet, and must be kept in a warm temperature of air, otherwise they will perish. These plants usually flower in August, but it is only the strong roots which flower, so they must not be parted into small roots, where the flowers are desired.

CURRAN-TREE. See Ribes.

CURURU. See Paullinia.

CUSPIDATED PLANTS [so called, of cuspis, *Lat.* the point of a spear] are such plants, the leaves of which are pointed like a spear.

CUSTARD-APPLE. See Annona.

CYANELLA. Royen.

The Characters are,

*The flower has no empalement; it hath six oblong, concave, spreading petals, which join at their base, the three lower hanging downward, with six short spreading stamina, terminated by oblong erect summits, and a three-cornered obtuse germen, supporting a slender style the length of the stamina, having an acute stigma. The germen afterward becomes a roundish capsule, having three furrows, with three cells, inclosing many oblong seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, intitled Hexandria Monogynia, the flower having six stamina and one style.

We know but one Species of this genus, viz.

Cyanella (*Capensis*). Lin. Sp. 443. Cape Cyanella.

This plant grows naturally at the Cape of Good Hope. The root is shaped like those of the Spring Crocus; the leaves are long, narrow, and have a sulcus on their upper side; the foot-stalk of the flower arises immediately from the root, supporting one flower with six petals, of a fine blue colour, which appears in May, but the flowers have not been succeeded by seeds as yet in England.

It is too tender to thrive in the full ground in this country, therefore the roots should be planted in pots filled with light earth; and in winter must be placed in a frame, and treated in the same manner as is directed for Ixia, with which the plant will thrive and produce flowers annually.

CYANUS. See Centauria.

CYCAS, the Sago-tree.

There are several small plants of this sort in the English gardens, but from these no characters of the tree can be drawn; nor are there any just accounts of these to be met with in the several authors who have figured and described the tree.

We know but one Species of it at present, viz.

Cycas (*Circinalis*) frondibus pinnatis circinalibus, foliolis linearibus planis. Lin. Sp. 1658. *Sago-tree with full branches, whose wings are placed circularly, and the small leaves are plain.* Arbor Zagoe Amboinensis. Seb. Thes. 1. p. 39.

This tree has been ranged in the tribe of Palms, to which it has great affinity, especially by its outer appearance the branches and trunk having the same structure.

This tree requires to be plunged into tanners bark in a stove, which should be kept up full to temperate heat in winter; but in summer should be much warmer, when it should be frequently refreshed with water during hot weather, but in autumn and winter it should be given sparingly.

Most of the plants of this kind now in the English gardens, have been communicated to the possessors by Richard Warner, Esq; of Woodford, in Essex, who received a tree of this sort, which was brought from India by the late Captain Hutchenson; but his ship being attacked by the French near home, the head of the tree was shot off, but the stem being preserved, put out several heads, which being taken off, produced so many plants.

CYCLAMEN. Lin. Gen. Plant. 184. Tourn. Inst. R. H. 154. tab. 68. Cyclamen; in French, *Pain de Pourceau.* [Κυκλάμινος, of Κύκλος, *Gr.* a circle, because the root of this plant is orbicular; it is called Sowbread, because the root is round like a loaf, and the sows eat it]. Sowbread.

The Characters are,

*The flower hath a roundish permanent empalement of one leaf, divided into five parts at the top. It hath one petal with a globular tube, which is much larger than the empalement; the upper part is divided into five large segments, which are reflexed; it hath five small stamina situated within the tube of the petal, terminated by acute summits, which are connected in the neck of the tube. It hath a roundish germen, supporting a slender style, which is longer than the stamina, and crowned by an acute stigma. The germen afterward becomes a globular fruit with one cell, opening in five parts at the top, inclosing many oval angular seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The Species are,

1. Cyclamen (*Europæum*) foliis hastato-cordatis angulatis. *Cyclamen with spear-pointed heart-shaped leaves, which are angular.* Cyclamen hederæ folio. C. B. P. 306. *Sowbread with an Ivy leaf.*
2. Cyclamen (*Purpurascens*) foliis orbiculato-cordatis, infernè purpurascentibus. *Cyclamen with round heart-shaped leaves, purple on their under side.* Cyclamen orbiculato folio infernè purpurascente. C. B. P. 308. *Round-leaved Sowbread with a purple under side.*
3. Cyclamen (*Persicum*) foliis cordatis serratis. *Cyclamen with sawed heart-shaped leaves; or Persian Cyclamen.*
4. Cyclamen (*Vernale*) foliis cordatis angulosis integris. *Cyclamen with heart-shaped angular leaves which are entire.* Cyclamen hyeme & vere florens folio anguloso amplo, flore albo, basi purpurea, Persicum dictum. H. R. Par.
5. Cyclamen (*Orbiculatum*) radice inæquali, foliis orbiculatis. *Cyclamen with an unequal root and round leaves.* Cyclamen radice castaneæ magnitudinis. C. B. P. 308.
6. Cyclamen (*Coum*) foliis orbiculatis planis, pediculis brevibus floribus minoribus. *Sowbread with orbicular plain leaves, shorter foot-stalks and smaller flowers.* Cyclamen Hyemale, orbiculatis foliis infernè rubentibus, purpurascente flore Coum Herbariorum. H. R. Par.

The first sort is the most common in the English gardens. This grows naturally in Austria, Italy, and other parts of Europe, so will thrive in the open air in England, and is never killed by the frost. It hath a large, orbicular, compressed root, from which arise a great number of angular heart-shaped leaves, upon

 single

single foot-stalks, which are six or seven inches long; these leaves are marked with black in their middle; the flowers appear before the leaves, rising immediately from the root, with long fleshy foot-stalks; they appear in August and September, and soon after the leaves come out, continue growing all the winter and spring till May, when they begin to decay, and in June they are entirely dried up. After the flowers are fallen, the foot-stalks twist up like a screw, inclosing the germen in the center, and lay down close to the surface of the ground between the leaves, which serve as a protection to the seed. This germen becomes a round fleshy seed-vessel with one cell, inclosing several angular seeds. The seeds ripen in June, and should be sown in August. There are two varieties of this, one with a white and the other with a purplish flower, which appear at the same time.

The second sort flowers in autumn: this is at present very rare in England; the leaves of this sort are large, orbicular, and heart-shaped at their base, and of a purple colour on their under side; the leaves and flowers of this come up from the root at the same time; the flowers are of a purplish colour, and their bottoms are of a deep red. It flowers late in the autumn, and requires protection from the frost in winter.

The third sort hath stiff heart-shaped leaves which are sawed on their edges; these have strong fleshy foot-stalks near six inches long, of a purple colour, as are also the veins of the leaves on their under side, but the upper side is veined and marbled with white. The flowers rise with single foot-stalks from the root; these are pure white with a bright purple bottom; the petal is divided into nine segments to the bottom, which are twisted and reflexed backward like the other sorts. This flowers in March and April, and the seeds ripen in August.

The fourth sort is commonly called the Persian Cyclamen. This hath large, angular, heart-shaped leaves, whose edges are entire; they are veined and marbled with white on the upper side, and stand upon pretty long foot-stalks; the flowers are large, of a pale purple colour, with a bright red or purple bottom. These appear in March and April, and the seeds ripen in August.

The fifth sort hath a small irregular root not larger than a Nutmeg; the leaves are orbicular and small; the flowers are of a flesh colour, small, and have purple bortoms. They appear in the autumn, but rarely produce seeds in England.

The sixth sort is not so tender as the four last mentioned, so may be planted in warm borders, where, if they are covered in hard frost, they will thrive and flower very well. This hath plain orbicular leaves, which have shorter and weaker foot-stalks than either of the other; their under sides are very red in the beginning of winter, but that colour goes off in the spring; their upper sides are smooth, of a lucid green, and spread open flat; whereas the other sorts are hollowed, and reflexed at their base. The flowers are of a very bright purple colour, and appear in the middle of winter, at a time when there are few other flowers, which renders the plants more valuable. The seeds of this sort ripen in the end of June.

There are several other varieties of this plant, which chiefly differ in the colour of their flowers, particularly among the Persian kind, of which there is one with an entire white flower, which smells very sweet; but as these are accidental variations, I have not enumerated them here, those which are here mentioned being undoubtedly distinct species; for I have many years propagated them from seeds, and have not found them vary, nor have I heard that any other person has observed either of them alter farther than varying of their colours. Though Dr. Linnæus supposes them but one species, it is well known that the first sort will endure the greatest frost in the open air, whereas all the Persian sorts are tender, and require shelter in winter.

All the sorts are propagated by seeds, which should be sown soon after they are ripe, in boxes or pots filled with light kitchen-garden earth, mixed with a little sand, and covered about half an inch deep, placing them where they may have only the morning sun till the beginning of September, when they may be removed to a warmer exposure. Those of the first sort may be plunged into the ground close to a south wall, a pale, or Reed hedge, in October, where, if it should be very severe frost, it will be proper to cover them either with mats or Pease-haulm, but in common winters they will not require any covering. The pots or tubs in which the Persian kinds are sown, should then be placed under a common hot-bed frame, where they may be protected from frost and hard rains, but in mild weather the glasses may be taken off every day to admit fresh air to them. The first sort will come up about Christmas, if the seeds were sown in August, and their leaves will continue green till May; and those of the Persian kinds will come up early in the spring, and continue green till June, when they will begin to decay; then they should be removed to an east aspect, where they will have only the morning sun, in which situation they may remain till the middle of August; during which time they should have very little water, for then the roots are in an inactive state, when much wet will rot them. The pots and tubs in which they are sown, must be constantly kept clean from weeds; for if the weeds are permitted to grow, their roots will closely entangle with those of the Cyclamen; so that in pulling out the weeds, the other roots will be drawn out with them. In the beginning of October, there should be some fresh earth spread over the tubs or pots, which should be removed again into shelter, in the same manner as before; and the following summer they must be managed also in the same way till their leaves decay, when they should be carefully taken up, and those of the first sort placed in a warm border at three or four inches distance, but the other sorts must be planted in pots to be sheltered in winter.

The third, fourth, and fifth sorts, are more impatient of cold and wet than the other three; these must constantly be preserved in pots filled with sandy light earth, and housed in winter, but should be placed near the glasses, where they may enjoy as much free open air as possible, when the weather will permit; for if they are crowded under other plants, and are kept too close, they are very subject to mould and rot; nor should they have much water in winter, which is also very injurious to them, but whenever they want water, it should be given them sparingly. In summer these plants may be exposed to the open air, when their green leaves will decay; at which time you should remove them to a place, where they may have the morning sun until eleven o'clock; but during the time that the roots are destitute of leaves, they should have very little water given them, because at that season they are not capable of discharging the moisture. This is also the proper season to transplant the roots, or to fresh earth them; and as the autumn comes on, that the heat decreases, they may be removed into places more exposed to the sun, where they may remain until October before they need be housed.

Toward Christmas, if the roots are in good health, the sixth sort will begin to flower, and continue producing fresh flowers till the middle of February, and these will be succeeded by the Persian sorts, which continue till May; but if you intend to have any seeds, you must let the pots be placed so as to receive a great share of fresh air, for if their flowers are drawn up in the house, they seldom produce any seeds. These seeds are ripe about July, when they should be immediately sown in pots or cases of good light undunged earth, which should be sheltered in winter under a frame, and exposed in summer in the same manner as is directed for the older roots, observing to remove them into pots at a wider distance when they are two years old; and so from time to time, as their roots increase in bulk, you must give them more room;

room; and in about four or five years time they will begin to flower, when you should let each root have a separate pot, which at first may be small, but when the roots are grown large, they must be put into larger pots.

These sorts have been planted under warm walls in the full ground, where, in mild winters they have done very well, but in severe frost all those roots have been destroyed; therefore, whenever these roots are planted in an open border, there should be common hot-bed frames placed over them in winter, that in bad weather they may be covered to protect them from frost: and where they are thus managed, the plants will produce more flowers, which will be much fairer than what are produced from the roots in the pots, and from these there may always be good seeds expected: therefore such persons who are curious in flowers, should have a border framed over on purpose for these, the Guernsey and Belladonna Lilies, with some other of the curious bulbous-rooted flowers; in which border there may be many of these curious flowers cultivated, to more advantage than in any other method now practised.

CYDONIA. Tourn. Inst. R. H. 632. tab. 405. Pyrus. Lin. Gen. Plant. 550. [so called from Cydon, a town of Crete, famous for this fruit.] The Quince-tree.

The Characters are,

*The flower is composed of five large, roundish, concave petals, which are inserted in the permanent empalement of one leaf. The germen is situated under the flower, and supports five slender styles, crowned by single stigmas; these are attended by near twenty stamina, which are inserted in the empalement, but are not so long as the petals; the germen afterward becomes a pyramidal or roundish fruit, which is fleshy, and divided into five cells, in which are lodged several hard kernels or seeds.*

This genus of plants is ranged in the eighth section of Tournefort's twenty-first class, which includes the trees and shrubs with a Rose flower, whose empalement becomes a fruit pregnant with hard seeds. Dr. Linnæus has joined this genus, and also the Apple to the Pear, making them only species of the same genus, to which the Quince is nearly allied by its characters, which the Apple is not. However, though the joining of the Quince to the Pear may be allowed in a system of botany, yet in a book of gardening, it may not be quite so proper, therefore I have chosen to continue them under their former well known titles.

The Species are,

1. Cydonia (*Oblonga*) foliis oblongo-ovatis subtus tomentosis, pomis oblongis basi productis. *Quince-tree with oblong oval leaves, woolly on their under side, and an oblong fruit lengthened at the base.* Cydonia fructu oblongo læviori. Tourn. Inst. R. H. 632.
2. Cydonia (*Maliforma*) foliis ovatis, subtus tomentosis, pomis rotundioribus. *Quince-tree with oval leaves, woolly on their under side, and a rounder fruit.* Cydonia fructu breviore & rotundiore. Tourn. Inst. R. H. 633. *Commonly called the Apple Quince.*
3. Cydonia (*Lusitanica*) foliis obversè-ovatis subtus tomentosis. *Quince-tree with obverse oval leaves, woolly on their under side.* Cydonia latifolia Lusitanica. Tourn. Inst. 633. *Broad-leaved Portugal Quince.*

There are some other varieties of this fruit which are propagated in fruit-gardens, and in the nurseries for sale, one of which is a soft eatable fruit; there is another with a very astringent fruit, and a third with a very small fruit, cottony all over, and is scarce worth keeping: these I suppose to be seminal variations, but the three sorts before enumerated, I take to be distinct species, having propagated them by seeds, and have not found them to vary.

The Portugal Quince is the most valuable, the pulp of it turning to a fine purple when stewed or baked, and becomes much softer and less austere than the others, so is much better for making of marmalade.

They are all easily propagated either by layers, suckers, or cuttings, which must be planted in a moist soil. Those raised from suckers are seldom so well rooted as those which are obtained from cuttings or layers, and are subject to produce suckers again in greater plenty, which is not so proper for fruit-bearing trees. The cuttings should be planted early in the autumn, and in very dry weather must be often watered to encourage their rooting. The second year after they should be removed into a nursery at three feet distance row from row, and one foot asunder in the rows, where they must be managed as was directed for Apples. In two or three years time these trees will be fit to transplant, where they are to remain for good, which should be either by the side of a ditch, river, or in some other moist place, where they will produce a greater plenty, and much larger fruit than in a dry soil; though those in a dry soil will be better tasted, and earlier ripe. These trees require very little pruning; the chief thing to be observed is, to keep their stems clear from suckers, and cut off such branches as cross each other; likewise all upright luxuriant shoots from the middle of the tree should be taken entirely out, that the head may not be too much crowded with wood, which is of ill consequence to all sorts of fruit-trees. These sorts may also be propagated by budding or grafting upon stocks raised by cuttings, so that the best sorts may be cultivated in greater plenty this way, than by any other method; and these trees will bear fruit much sooner, and be more fruitful than those which come from suckers or layers.

These are also in great esteem for stocks to graft and bud Pears on, which for summer and autumn fruits are a great improvement to them, especially those designed for walls and espaliers; for the trees upon these stocks do not shoot so vigorously as those upon free stocks, and therefore may be kept in less compass, and are sooner disposed to bear fruit: but hard winter fruits do not succeed so well upon these stocks, their fruit being very subject to crack, and are commonly stony, especially all the breaking Pears; therefore these stocks are only proper for the melting Pears, and for a moist soil. The best stocks are those which are raised from cuttings or layers.

As the Pear will take upon the Quince by grafting or budding, and so vice versâ, we may conclude there is a near alliance between them; but as neither of these will take upon the Apple, nor that upon either of these, so we should separate them under different genera, as will be further mentioned under the article Malus.

CYNANCHUM. Lin. Gen. Plant. 268. Apocynum. Tourn. Inst. R. H. 91. Periploca. Tourn. Inst. 93. tab. 22.

The Characters are,

*The flower hath one petal; it hath scarce any tube, but is spread open, plain, and divided into five parts; this hath a small, erect, permanent empalement of one leaf, divided into five parts; the nectarium, which is situated in the center of the flower, is erect, cylindrical, and the length of the petal. It hath five stamina which are parallel to the nectarium, and of the same length, terminated by summits which reach to the mouth of the petal. It hath an oblong bifid germen, with scarce any style, crowned by two obtuse stigmas; the empalement becomes a capsule with two oblong pointed leaves, having a cell which opens longitudinally, and is filled with seeds lying over each other imbricatim, and are crowned with long down.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flower having five stamina and two styles.

The Species are,

1. Cynanchum (*Acutum*) caule volubili herbaceo, foliis cordato-oblongis glabris. Hort. Cliff. 79. *Cynanchum with a twining herbaceous stalk, and oblong, smooth, heart-shaped leaves.* Periploca Monspeliaca foliis acutioribus. Tourn. Inst. 93. *Commonly called Montpelier Scammony.*
2. Cynanchum (*Monspeliacum*) caule volubili herbaceo, foliis reniformi-cordatis acutis. Hort. Cliff. 79. *Cynanchum with a twining herbaceous stalk, and kidney, heart-shaped, pointed leaves.* Periploca Monspeliaca foliis

foliis rotundioribus. Tourn. Inst. R. H. 93. *Round-leaved Montpelier Scammony.*

3. Cynanchum (*Suberosum*) caule volubili infernè suberoso fisso, foliis cordatis acuminatis. Hort. Cliff. 79. *Cynanchum with a twining fungous stalk, having fissures on the under side, and heart-shaped pointed leaves.* Periploca Caroliniensis, flore minore stellato. Hort. Elth. 300.

4. Cynanchum (*Hirtum*) caule volubili fruticoso, infernè suberoso fisso, foliis ovato-cordatis. Hort. Cliff. 79. *Cynanchum with a shrubby twining stalk, whose lower part is fungous, having fissures, and oval heart-shaped leaves.* Periploca scandens, folio citri, fructu maximo. Plum. Cat. 2.

5. Cynanchum (*Erectum*) caule erecto divaricato, foliis cordatis glabris. Hort. Cliff. 79. *Cynanchum with an upright divaricated stalk, and heart-shaped smooth leaves.* Apocynum folio subrotundo. C. B. P. 302.

6. Cynanchum (*Asperum*) caule volubili fruticoso, foliis cordatis acutis asperis, floribus lateralibus. *Cynanchum with a twining shrubby stalk, heart-shaped, pointed, rough leaves, and flowers growing from the sides of the stalks.* Apocynum scandens foliis cordatis asperis, floribus amplis patulis luteis. Houst. MSS.

The first and second sorts grow naturally about Montpelier; these have perennial creeping roots, but annual stalks, which decay to the root every autumn, and rise afresh in the spring; these stalks twist themselves like Hops, round whatever plants are near them, and rise to the height of six or eight feet; the first of these is garnished with oblong, heart-shaped, smooth leaves, ending in acute points, and are placed by pairs opposite on long foot-stalks; the flowers come out in small bunches from the wings of the leaves; they are of a dirty white colour, and divided into five acute segments, which spread open in form of a star. These appear in June and July, but are not succeeded by any seed-vessels in England, which may be occasioned by their roots creeping so far under ground; for most of those plants which propagate themselves so much by their roots, become barren of seeds, especially if their roots have full liberty to extend.

The second sort differs from the first in the shape of its leaves, which are broader and rounder at their base. The roots of this sort are very thick, running deep into the ground, and extend themselves far on every side; so that where this plant hath got possession of the ground it is not easily extirpated, for every piece of the root will shoot, which may happen to be left in the ground. Both these plants abound with a milky juice like the Spurge, which issues out wherever they are broken; and this milky juice when concreted, has been frequently sold for scammony.

These plants propagate too fast by their creeping roots when they are admitted into gardens, so few people care to have them: the roots may be transplanted any time after their stalks decay, till they begin to shoot in the spring.

The third sort grows naturally in Carolina, from whence the seeds were brought to England; this is a perennial plant with twining hairy stalks, which, if supported, will rise six or seven feet high; the lower part of the stalks are covered with a thick fungous bark, somewhat like cork, which is full of fissures; these stalks are slender, and garnished at each joint with two oblong, heart-shaped, pointed leaves, standing on long hairy foot-stalks. The flowers are produced in small bunches at the wings of the leaves, these are star-shaped and green when they first appear, but afterward fade to a worn-out purple colour. They appear in July and August, but are not succeeded by seeds in England.

This plant will live in the open air in England, if it is planted in a dry soil and warm situation. It may be propagated by laying down some of the young shoots about Midsummer, which, if they are now and then refreshed with water, will put out roots, so may be transplanted in the autumn, where they are designed to remain. The roots of this plant should be covered in winter with some rotten tan to keep out the frost, otherwise in severe winters they are liable to be destroyed.

The fourth sort grows naturally in Jamaica, from whence the seeds were sent me by the late Dr. Houstoun; this rises with a twining stalk to the height of twenty feet or upward, provided it hath support; the lower part of the stalks are covered with a thick fungous bark, full of fissures, which gape open; the leaves are oblong and smooth, and placed by pairs opposite, standing on long foot-stalks: the flowers are produced from the wings of the leaves in small bunches, they are star-shaped, and are of a yellowish green colour, but are not succeeded by pods in England.

This sort is tender, so will not thrive in this country unless it is placed in a warm stove, and requires the same treatment as other tender plants from the same country; and as it abounds with a milky juice, so the plants must have little water in winter. This may be propagated by laying down of the young shoots, which in three or four months will put out roots, and may then be transplanted into pots filled with light sandy earth, and plunged into the tan-bed in the bark-stove, where the plants should continue all the year.

The fifth sort grows naturally in Syria; this is a perennial plant, which rises with slender upright stalks about three feet high, garnished with broad, smooth, heart-shaped leaves ending in points, placed opposite; the flowers come out from the wings of the leaves in small bunches, standing on branching foot-stalks; these are small and white, greatly resembling those of the common white Asclepias, or Swallow-wort, and are succeeded by oblong taper pods, filled with flat seeds crowned with down, but these rarely ripen in this country.

It is propagated by parting of the root; the best time for doing of this or transplanting of the roots, is in the spring, before they shoot: this requires a warm situation, otherwise it will not live abroad in England.

The sixth sort grows naturally at La Vera Cruz in New Spain, from whence the seeds were sent me by the late Dr. Houstoun; this hath a shrubby twining stalk, which twists about whatever prop is near it, and rises to the height of twenty feet or upward; the stalks are very slender, and are armed with small stinging hairs, and garnished with broad heart-shaped leaves, which end in acute points; these are placed by pairs at each joint, which are far distant, and have slender foot-stalks; they are covered with rough hairs on their under side; the flowers are produced in small clusters, sitting close to the side of the stalks; they are pretty large, yellow, and star-shaped, spreading open to the bottom; they are succeeded by long swelling pods, filled with flat seeds lying imbricatim, which are crowned with long down.

This sort is tender, so requires the same treatment as the fourth, and is propagated the same way.

CYNARA. Lin. Gen. Plant. 835. Cinara. Tourn. Inst. R. H. 442. tab. 254. Artichoke, in French *Artichaut.*

The Characters are,

*It hath a compound flower, made up of many hermaphrodite florets, which are included in one common scaly empalement, which is swollen in the bottom. The florets are tubulous, equal, and uniform, divided at the top into five narrow segments. These have five short hairy stamina, terminated by cylindrical summits, which have five indentures; at the bottom of each is situated an oval germen, supporting an oblong style, crowned by an oblong indented stigma. The germen afterward becomes a single, oblong, compressed, four-cornered seed, crowned with long hairy down.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia æqualis; the plants of this class and section have only hermaphrodite florets which are fruitful.

The SPECIES are,

1. CYNARA (*Scolymus*) foliis subspinosis, pinnatis indivisisque, calycinis squamis ovatis. Lin. Sp. Plant. 827. *Artichoke with spiny leaves which are winged and undivided, and an oval scaly empalement.* Cynara hortensis aculeata. C. B. P. 383. *The green or French Artichoke.*
2. CYNARA (*Hortensis*) foliis pinnatis inermibus, calycinis squamis obtusis emarginatis. *Artichoke with winged leaves having no spines, and obtuse indented scales to the empalement.* Cynara hortensis foliis non aculeatis. C. B. P. 383. *The Globe Artichoke.*
3. CYNARA (*Cardunculus*) foliis spinosis, omnibus pinnatifidis, calycinis squamis ovatis. Lin. Sp. Plant. 827. *Cynara with prickly leaves which all end in winged points, and oval scales to the empalement.* Cynara spinosa, cujus pediculi esitantur. C. B. P. 383. *The Cardoon, in French* Chardon.
4. CYNARA (*Humilis*) foliis spinosis, pinnatifidis, subtus tomentosis, calycibus squamis subulatis. Lin. Sp. Plant. 828. *Cynara with winged prickly leaves, woolly on their under side, and awl-shaped scales to the empalement.* Cynara sylvestris Bœtica. Clus. Cur. Post. 15. *Wild Artichoke of Spain.*

The first sort is commonly known here by the title of French Artichoke, being the sort which is most commonly cultivated in France, and is the only kind in Guernsey and Jersey; the leaves of this sort are terminated by short spines, the head is oval, and the scales do not turn inward at the top like those of the Globe Artichoke, the heads are also of a green colour; the bottoms of these are not near so thick of flesh as those of the Globe, and they have a perfumed taste, which to many persons is very disagreeable; so that it is seldom cultivated in the gardens near London, where the Globe or red Artichoke is the only sort in esteem. The leaves of this are not prickly, the head is globular, a little compressed at the top, the scales lie close over each other, and their ends turn inward, so as to closely cover the middle.

The culture of these having been fully treated under the article ARTICHOKE, the reader is desired to turn to that, to avoid repetition.

The Chardon, or Cardoon, is propagated in the kitchen gardens to supply the markets; this is annually raised from seeds, which should be sown upon a bed of light earth in March; and when the plants come up, they should be thinned where they are too close; and if the plants are wanted, those which are drawn out may be transplanted into a bed at about three or four inches distance, where they should remain till they are transplanted out for good. These young plants must be kept clean from weeds, and in the beginning of June they must be transplanted out, on a moist rich spot of ground at about four feet asunder every way; the ground should be well dug before they are planted, and the plants should be well watered until they have taken new root, after which the ground must be kept very clean from weeds, to encourage the growth of the plants; and as they advance in height, there should be some earth drawn up about each plant; and when they are fully grown, their leaves should be closely tied up with a hay-band, and the earth drawn up in hills about each plant, almost to their tops, being careful to keep the earth from falling between the leaves, which may occasion the rotting of the plants. The earth should be smoothed over the surface that the wet may run off, and not fall into the center of the plants, which will also cause them to rot; in about eight or ten weeks after the plants have been thus earthed, they will be blanched enough for use; so that if a succession of them are wanted for the table, there should be but few plants earthed up at the same time; but once in a fortnight there may be a part of them earthed, in proportion to the quantity desired.

Toward the middle, or latter end of November, if the frost should be severe, it will be proper to cover the tops of those plants which remain with Peafe-haulm or straw, to prevent the frost from penetrating to the tender leaves, which frequently pinches them where there is not this covering, but this should be taken off again in mild weather; if this care is taken, the plants may be preserved for use most part of the winter.

If a few of the plants are planted out in a warm situation to stand for seed, they should not be blanched, but only in very hard frost some light litter, or Pease-haulm, may be laid round them to keep out frost, which should be removed in the spring, and the ground gently dug between the plants, which will not only destroy the weeds, but also encourage the roots of the plants to shoot out on every side, whereby their stems will be stronger; these will flower about the beginning of July, and if the season proves dry, their seeds will ripen in September; but in cold wet seasons, these seeds will not come to maturity in England.

The fourth sort grows naturally in Spain, and also on the African shore, and is preserved in gardens for the sake of variety; this is very like the third sort, but the stems of the leaves are much smaller, and do not grow more than half so high. The heads of this have some resemblance to those of the French Artichoke, but have no meat, or fleshy substance in their bottoms: this may be planted in the same manner as the third sort, at about three or four feet apart, and will require no other treatment, than the keeping them clean from weeds; the second year they will flower, and, if the season proves dry, they will ripen their seeds in September, and the plants generally decay the following winter, especially if the winter proves severe, unless they are covered.

CYNOGLOSSUM. Lin. Gen. Plant. 168. Tourn. Inst. R. H. 139. tab. 57. Omphalodes. Tourn. 140. tab. 59. [Κυνόγλωσσον, of Κυνός, a dog, and Γλῶσσα, *Gr.* the tongue, so called because the leaves of this plant resemble a dog's tongue.] Hounds Tongue, in French, *Langue de Chien.*

The CHARACTERS are,

*It hath a funnel-shaped flower of one leaf, with a long tube, and a short brim, which is slightly cut into five parts, and is shut up at the chaps; this hath an oblong permanent empalement, cut into five acute segments. The flower hath five short stamina in the chaps of the petal, terminated by roundish summits, and at the bottom of the tube are situated four germen, between which arises a permanent style the length of the stamina, crowned by an indented stigma; the empalement afterward becomes four capsules, inclosing four oval seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. CYNOGLOSSUM (*Officinale*) staminibus corollâ brevioribus, foliis lato-lanceolatis tomentosis sessilibus. Lin. Sp. Plant. 134. *Hounds Tongue with stamina shorter than the petal, and broad spear-shaped leaves, which are woolly, sitting close to the stalk.* Cynoglossum majus vulgare. C. B. P. 257. *Common greater Hounds Tongue.*
2. CYNOGLOSSUM (*Appeninum*) staminibus corollam æquantibus. Hort. Upsal. 33. *Hounds Tongue with stamina equalling the petal.* Cynoglossum montanum maximum. Tourn. Inst. R. H. 139.
3. CYNOGLOSSUM (*Creticum*) foliis oblongis tomentosis, amplexicaulibus, caule ramoso, spicis florum longissimis sparsis. *Hounds Tongue with oblong woolly leaves embracing the stalks, a branching stalk, and very long loose spikes to the flowers.* Cynoglossum Creticum latifolium fœtidum. C. B. P. 257.
4. CYNOGLOSSUM (*Cheirifolium*) corollis calyce duplo longioribus, foliis lanceolatis. Prod. Leyd. 406. *Hounds Tongue having a petal twice the length of the empalement, and spear-shaped leaves.* Cynoglossum Creticum, argenteo angusto folio. C. B. P. 257.
5. CYNOGLOSSUM (*Virginianum*) foliis amplexicaulibus ovatis. Lin. Sp. 193. *Hounds Tongue with oval leaves which embrace the stalk.* Cynoglossum Virginianum flore minimo albo. Banister. Cat.

6. Cynoglossum (*Lusitanicum*) foliis lineari lanceolatis scabris. Lin. Sp. 193. *Hounds Tongue with linear, spear-shaped, rough leaves.* Omphalodes Lusitanica elatior Cynoglossi folio. Tourn. Inst. R. H. 140.

7. Cynoglossum (*Linifolium*) foliis lineari-lanceolatis glabris. Hort. Cliff. 47. *Hounds Tongue with smooth, narrow, spear-shaped leaves.* Omphalodes Lusitanica lini folio. Tourn. Inst. 140. *Commonly called Venus Navelwort.*

8. Cynoglossum (*Omphalodes*) repens, foliis radicalibus cordatis. Hort. Cliff. 47. *Creeping Hounds Tongue, whose lower leaves are heart-shaped.* Omphalodes pumila verna symphyti folio. Tourn. Inst. 140.

The first sort grows naturally by the side of hedges and foot-ways in many parts of England, so is seldom admitted into gardens; the roots of this sort are used in medicine, which are gathered by the herb-folks in the fields. The leaves of this plant have a strong odour, like that of mice in a trap. It flowers in June, and the seeds ripen in autumn.

The second sort grows naturally on the Apennine mountains; the leaves of this sort are much larger, the petal of the flower is shorter, and the plants grow taller than those of the first, and come earlier to flower in the spring; this is equally hardy as the common sort, and where the seeds are permitted to scatter, there will be plenty of the plants arise without care.

The third sort grows naturally in Andalusia, I received the seeds of this from Gibraltar; this hath a tall branching stalk, garnished with oblong woolly leaves, which embrace the stalk with their base. The flowers are produced in loose spikes, which come out from the side of the stalk, and are from six to eight inches long, the flowers are thinly placed on one side; these are blue, striped with red, and appear in June. The seeds ripen in autumn, soon after which the root decays.

The fourth sort grows naturally in Spain, and also in the island of Crete; I received this from Gibraltar, with those of the former; this rises with an upright stalk little more than a foot high, garnished with long, narrow, silvery leaves, having no foot-stalks. The flowers are produced from the side, and at the top of the stalks, which are but thinly dispersed on the side, but at the top of the stalk are in small clusters; they are of a deep purple colour, and much longer than the empalement; these are succeeded by four broad buckler-shaped seeds, which are rough. It flowers in June, and the seeds ripen in autumn, soon after which the roots generally perish.

The fifth sort grows naturally in Virginia, and in other northern parts of America; this rises with an upright branching stalk near four feet high. The stalks and leaves are covered with rough hairs, the branches are spread out on every side, and are but thinly garnished with leaves, from three to near four inches in length, and little more than one inch broad in the middle, gradually lessening to both ends; they embrace the stalks with their base, and are placed alternate; the flowers grow scatteringly toward the end of the branches; these are small and white; they appear in June, and are succeeded by four small seeds, which ripen in autumn, and then the plants decay.

The sixth sort grows naturally in Portugal, where it was first distinguished from the seventh by Dr. Tournefort. The seventh sort had been long before that cultivated in the gardens for ornament, by the title of Venus Navelwort, but of late years that has been almost lost; and the sixth sort is now generally preserved in the English gardens, and the seeds are sold by the seedsmen under that title, and is a much larger plant than the other, so makes a better appearance. The leaves of the sixth sort are broad at their base, and are gradually narrowed to the end; they are slightly covered with hairs. The stalks grow nine or ten inches high, and divide into many branches, each being terminated by a long loose spike of white flowers, standing on separate foot-stalks, which are succeeded by four umbilicated seeds, from whence it had the title of Navelwort.

The seventh sort seldom rises more than five or six inches high; the stalks do not branch near so much as those of the sixth. The leaves are very narrow and long, of a grayish colour, and smooth. The flowers grow in short loose panicles at the end of the branches; these are white, but smaller than those of the other sort, and are succeeded by seeds of the same form. This plant was formerly titled Linum Umbillicatim, i. e. *umbilicated Flax*, from the leaves having some appearance of Flax, and the seeds having a hollow like a navel.

These are both annual plants, and have been commonly sown in gardens, with other low annual flowers, to adorn the borders of the flower-garden; but these should be sown in autumn, for those which are sown in the spring often fail, especially in dry seasons; and the autumnal plants always grow much larger than those which arise from the spring sowing, and come to flower earlier in the year. The seeds should be sown where the plants are designed to remain, for they do not bear transplanting, unless it is performed while they are young. The plants require no other culture but to be thinned where they are too close, and kept clean from weeds. They flower in June and July, and the autumnal plants come a month earlier; their seeds ripen in autumn.

The eighth sort is a low perennial plant, which grows naturally in the woods of Spain and Portugal, where it usually flowers about Christmas; this hath trailing branches, which put out roots from their joints, whereby it propagates very fast. The leaves are heart-shaped, of a bright green colour, and stand upon long slender foot-stalks. The flowers grow in loose panicles, which arise from the divisions of the stalk; they are shaped like those of Borage, but are smaller, and of a lively blue colour; they appear in March and April, and in a cool shady situation continue great part of May, but are rarely succeeded by seeds; but the plants propagate themselves so fast by their trailing branches, as to render the cultivation of them by seeds unnecessary. It delights in a moist cool situation.

CYPERUS, Cypress Grass.

There are about twenty species of this genus known, some of which grow naturally in England, but the far greatest number are natives of America, where they grow in moist squalid places; and as there are not above two or three species which are preserved in gardens, so it will be to little purpose to enumerate the others.

The Species are,

1. Cyperus (*Longus*) culmo triquetro folioso, umbella folioso supra decomposita, pedunculis nudis, spicis alternis. Prod. Leyd. 50. *Cypress with a three-cornered stalk, an umbel with many leaves, alternate spikes on naked foot-stalks. Long-rooted Cypress of the shops.*

2. Cyperus (*Rotundus*) culmo triquetro subnudo, umbella decomposita, spicis alternis linearibus. Flor. Zeyl. 36. *Cypress with a three-cornered naked stalk, a decompounded umbel, and linear spikes placed alternate. Round-rooted Cypress of the shops.*

The first sort grows naturally in France and Italy, from whence the plant was brought for medicinal use, but at present it is very seldom used in England. The roots of this sort are composed of many strong fleshy fibres which root deep in the ground, sending up every spring a great number of grassy three-cornered leaves near two feet long; the flower-stalks are triangular, nearly of the same length, supporting an umbel at the top, having many narrow triangular leaves under it; the spikes of the umbel are like those of some sorts of grass, but the seeds rarely ripen in England; so the plant is here propagated by dividing the root in the spring, and if planted in a warm situation, will thrive here in the open air.

The second sort is tenderer than the first, so the round compressed roots should be planted in pots, and sheltered in winter.

CYPRIPEDIUM. Lin. Gen. Plant. 906. Calceolus. Tourn. Inst. R. H. 436. tab. 249. Ladies Slipper, in French, *Sabot*.

The CHARACTERS are,

*It hath a simple spadix. The germen sits under the flower, which is covered with a spatha or sheath. The flowers have four or five narrow spear-shaped petals, which expand. The nectarium, which is situated between the petals, is swollen and hollow, in shape of a shoe, or slipper. It hath two short stamina which sit upon the pointal, and are terminated by erect summits, which join to the upper lip of the nectarium; below the flower is fixed a slender contorted germen, supporting a short style, adhering to the upper lip of the nectarium, crowned by an obsolete stigma. The germen afterward becomes an oval blunt capsule with three corners, having three furrows, three valves, and one cell, which is filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's twentieth class, intitled Gynandria Diandria, the plants of this class and section have two stamina fixed to the style.

The SPECIES are,

1. CYPRIPEDIUM (*Calceolus*) radicibus fibrosis, foliis ovato-lanceolatis caulinis. Act. Upsal. 1740. *Ladies Slipper with fibrous roots, the leaves on the stalks oval and spear-shaped.* Calceolus Mariæ. Ger. 359. *Our Lady's Slipper.*
2. CYPRIPEDIUM (*Bulbosum*) scapo unifloro, foliis oblongis glabris petalis angustis acuminatis. *Ladies Slipper with one flower in a sheath, oblong smooth leaves, and very narrow pointed petals.* Calceolus Mariæ luteus. Mor. H. R. Bloss. *Yellow Ladies Slipper.*
3. CYPRIPEDIUM (*Hirsutum*) foliis oblongo-ovatis venosis hirsutis, flore maximo. *Ladies Slipper with oblong, oval, veined leaves, which are hairy, and a very large flower.* Calceolus flore majore. Tourn. Inst. R. H. 437. *Ladies Slipper with a larger flower.*

The first sort grows naturally in some shady woods in the north of England. I found it in the park of Borough-Hall, in Lancashire, the seat of the late Robert Fenwick, Esq; It hath a root composed of many fleshy fibres, from which arise, in the spring, two, three, or more stalks, in proportion to the strength of the root; these grow nine or ten inches high, and are garnished with oval spear-shaped leaves, having a few longitudinal veins; in the bosom of one of the upper leaves is inclosed the flower-bud, which is supported by a slender foot-stalk, which generally turns a little bud on one side. The flower hath four dark purple petals, placed in form of a cross, which spread wide open. In the center is situated the large hollow nectarium, almost as large as a bird's egg, shaped like a wooden shoe, of a pale yellowish colour, with a few broken streaks; the opening is covered with two ears; the upper one is tender, white, and spotted with purple; the lower is thick, and of an herbaceous colour. The flowers appear about the end of May, and the stalks decay early in autumn.

The second sort grows naturally in Virginia, and other parts of North America; this hath longer and smoother leaves than the former. The two side petals of the flower are long, narrow, and terminate in acute points, and are wreathed, or undulated on their sides. The nectarium is oblong, and narrower than in the first sort, and is yellow, spotted with brownish red. The stalks rise near a foot and a half high.

The third sort grows naturally in America, where the inhabitants call it Moccasin Flower; this rises a foot and a half high. The leaves are of an oblong oval form, and are deeply veined. The flower is large, of a reddish brown colour, marked with a few purple veins. This sort flowers in the end of May.

All these sorts are with difficulty preserved in gardens; they must be planted in a loamy soil, and in a situation where they may have the morning sun only. They must be procured from the places where they naturally grow, for they cannot be propagated in gardens. The roots should be seldom removed, for transplanting them prevents their flowering.

CYSTICAPNOS. See FUMARIA.

CYTISO-GENISTA. See SPARTIUM.

CYTISUS. Lin. Gen. Plant. 785. Tourn. Inst. R. H. 647. tab. 416. [so called from Cythos, an island in the Archipelago, where it grew in great plenty.] Base-tree Trefoil, in French, *Citise*.

The CHARACTERS are,

*It hath a butterfly flower, with a short bell-shaped empalement of one leaf, divided in two lips, the upper being bifid and acute, the under indented in three parts. The standard of the flower is rising, oval, and reflexed on the sides. The wings are obtuse, erect, and the length of the standard. The keel is bellied and acute. It hath ten stamina, nine joined, and one standing separate, terminated by rising summits. It hath an oblong germen, supporting a single style, crowned by an obtuse stigma. The germen afterward becomes an oblong blunt pod, narrow at their base, filled with kidney-shaped flatted seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, from the flowers having ten stamina divided into two bodies.

The SPECIES are,

1. CYTISUS (*Laburnum*) foliis oblongo-ovatis, racemis brevioribus pendulis, caule arboreo. *Cytisus with oblong oval leaves, short spikes of flowers hanging downward, and a tree-like stalk.* Cytisus Alpinus latifolius, flore racemoso pendulo. Tourn. Inst. R. H. 648. *Commonly called Laburnum.*
2. CYTISUS (*Alpinus*) foliis ovato-lanceolatis, racemis longioribus pendulis, caule fruticoso. *Cytisus with oval spear-shaped leaves, long pendulous bunches of flowers, and a shrubby stalk.* Cytisus Alpinus angustifolius, flore racemoso pendulo longiore. Tourn. Inst. R. H. 648. *Commonly called long-spiked Laburnum.*
3. CYTISUS (*Nigricans*) racemis simplicibus erectis, foliolis ovato-oblongis. Hort. Cliff. 354. *Cytisus with single erect bunches of flowers, and oval oblong leaves.* Cytisus glaber nigricans. C. B. P. 390. *Black smooth Cytisus.*
4. CYTISUS (*Sessilibus*) racemis erectis, calycibus bracteâ triplici auctis, foliis floralibus sessilibus. Lin. Sp. Plant. 739. *Cytisus with erect bunches of flowers, three laminæ under the empalement, and the leaves on the flower branches sitting close.* Cytisus glabris, foliis subrotundis, pediculis brevissimis. C. B. P. 390. *Commonly called by the gardeners,* Cytisus secundus Clusii.
5. CYTISUS (*Hirsutis*) pedunculis simplicibus lateralibus, calycibus hirsutis trifidis ventricoso-oblongis. Hort. Upsal. 211. *Cytisus with single foot-stalks on the side of the branches, trifid hairy empalements, oblong and bellied.* Cytisus incanus siliqua longiore. C. B. P. 390. *Commonly called hairy, or Evergreen Cytisus of Naples.*
6. CYTISUS (*Argenteus*) floribus sessilibus, foliis tomentosis, caulibus herbaceis. Lin. Sp. Plant. 740. *Cytisus with flowers sitting close to the branches, woolly leaves, and an herbaceous stalk.* Cytisus humilis argenteus angustifolius. Tourn. Inst. 648.
7. CYTISUS (*Supinus*) floribus umbellatis terminalibus, ramis decumbentibus, foliolis ovatis. Lin. Sp. 1042. *Low Cytisus with umbellated flowers terminating the branches, which are trailing, and oval leaves.* Cytisus supinus foliis infra & siliquis molli lanugine pubescentibus. C. B. P. 390.
8. CYTISUS (*Austriacus*) floribus umbellatis terminalibus, caulibus erectis foliolis lanceolatis. Lin. Sp. 1042. *Cytisus with umbellated flowers terminating the branches, erect stalks and spear-shaped leaves.* Cytisus floribus capitatis, foliolis ovato-oblongis, caule fruticoso. Dict. Hort. *Commonly called Siberian Cytisus.*
9. CYTISUS (*Æthiopicus*) racemis lateralibus strictis, ramis angulatis, foliolis cuneiformibus. Lin. Sp. 1042. *Cytisus with narrow bunches of flowers proceeding from the side of the branches, which are angular, and wedge-shaped leaves.* Cytisus Æthiopicus, subrotundis incanis minoribus foliis, floribus parvis luteis. Pluk. Alm. 128.
10. CYTISUS (*Græcus*) foliis simplicibus lanceolato-linearibus, ramis angulatis. Lin. Sp. 1043. *Cytisus with single, linear, spear-shaped leaves, and angular branches.* Barba Jovis linariæ folio, flore luteo parvo. Tourn. Cor. 44.

11. Cytisus (*Cayan*) racemis axillaribus erectis, foliolis sublanceolatis tomentosis, intermedio longiùs petiolato. Flor. Zeyl. 357. *Cytisus with erect spikes of flowers proceeding from the sides of the branches, and spear-shaped leaves which are woolly, the foot-stalk of the middle one being the longest.* Cytisus arborescens, fructu eduli albo. Plum. Cat. 19. *Commonly called Pidgeon Pea in America.*

The first sort is the common broad-leaved Laburnum, which was formerly in greater plenty in the English gardens than at present; for since the second sort hath been introduced, it has almost turned this out; the spikes of flowers being much longer, they make a finer appearance when they are in flower, which has occasioned their being more generally cultivated; but the first grows to be the largest tree, and the wood of it is very hard, of a fine colour, and will polish very well; it approaches near to green Ebony, so is by the French titled Ebony of the Alps, and is there used for many kinds of furniture; but in England there are few of these trees which have been suffered to stand long enough to arrive to any considerable size, for as they have been only considered as an ornamental tree, the frequent alterations which most of the gardens in England have undergone, have occasioned their being rooted out wherever they were growing; but in some of the old gardens in Scotland, where they have been permitted to stand, there are large trees of this kind, which are fit to cut down for the use of the timber. I have seen two old trees of it in gardens, which were more than a yard in girt, at six feet from the ground, and these had been broken and abused, otherwise might have been much larger: they grow very fast, and are extremely hardy, so may be well worth propagating upon poor shallow soils, and in exposed situations. His Grace the Duke of Queensberry sowed a great quantity of the seeds of this tree, upon the side of the downs, at his seat near Amesbury, in Wiltshire, where the situation was very much exposed, and the soil so shallow, as that few trees would grow there; yet in this place the young trees were twelve feet high in four years growth, so became a shelter to the other plantations, for which purpose they were designed; but the hares and rabbits are great enemies to these trees, by barking them in winter, so that where these trees are cultivated, they should be fenced from these animals.

Both these sorts are easily propagated by seeds, which the trees produce in great plenty. If these are sown upon a common bed in March, the plants will appear by the middle or end of April, and will require no other care but to be kept clean from weeds during the following summer; and if the plants are too close together, they may be transplanted the autumn following, either into a nursery, where they may grow a year or two to get strength, or into the places where they are designed to remain: where people would cultivate them for their wood, it will be the best way to sow the seeds upon the spot where they are intended to grow, because these trees send out long, thick, fleshy roots to a great distance, which will penetrate gravel or rocks; and if these roots are cut or broken, it greatly retards their growth; therefore when they are not sown upon the intended spot, they should be transplanted thither young, otherwise they will not grow to near the size; though where they are only designed for ornament, the removing the plants twice will stop their growth, and cause them to be more productive of flowers; but all trees intended for timber, are much better sown on the ground where they are designed to stand, than if they are transplanted.

If the seeds of these trees are permitted to scatter in winter, the plants will rise in great plenty the following spring, so that a few trees will soon supply any person with a sufficient number of the plants.

These trees flower in May, at which time they make a fine appearance, their branches being generally loaded with long strings of yellow flowers, which hang down from every part. The seeds grow in long pods, which ripen in autumn. There is a variety of both these trees with variegated leaves, which some persons are fond of cultivating; but this is only to be done by cuttings or layers, for the seeds of these will produce plants with green leaves: the cuttings should be planted in autumn, when the leaves begin to fall, and the plants must have a poor soil, for in good ground they are apt to become plain.

If the first sort comes to be considered as a useful wood, which there is no reason to doubt it may be, it may be planted in large clumps in parks, where they will be very ornamental; and I am certain, from long experience, that this tree will thrive upon many soils, and in such situations as few other trees will make any progress; the objection to fencing is the same here, as for any other trees, for wherever plantations are made, if they are not well secured from animals, they will not answer the design of the planters.

The second sort differs from the first, in having narrower leaves, longer bunches of flowers, and the trees do not grow so large and strong; this difference I find is constant from seed. There is another sort mentioned by Tournefort, with shorter bunches of flowers than either of these, one tree of which kind I thought I had found in a garden; the bunches of the flowers upon this tree were close and almost round, but I sowed the seeds of it, and the plants proved to be only the common sort.

The third sort grows naturally in Austria, in Italy and Spain, and at present is pretty rare in the English gardens; it was formerly in some of the curious gardens here, but had been long lost, till a few years ago, when I procured the seeds from abroad, which succeeded in the Chelsea gardens, where the plants have flowered and produced ripe seeds, which have been communicated to several curious persons.

This shrub seldom rises more than three or four feet high in England; it naturally puts out many lateral branches near the ground, which spread out on every side, so as to form a low shrubby bush, so is with difficulty raised to a stem: the branches are very slender, and their ends are frequently killed if the winter is severe; these are garnished with oblong oval leaves, growing by threes on each foot-stalk; they are equal in size, and of a dark green colour; the branches grow erect, and are terminated by spikes of yellow flowers, about four or five inches in length, standing upright; and as all the branches are thus terminated, so when the shrubs are in flower, they make a fine appearance; it flowers in July, after most of the other sorts are past, and the seeds ripen in autumn. This is propagated by seeds, which should be sown upon a bed of light earth in March, covering them about one third of an inch with fine screened mould; in the beginning of May the plants will appear, when they must be carefully weeded, and during the following summer they must constantly be kept clean, which is all the culture they require till autumn, when it will be very proper to arch the bed over with hoops, that in frosty weather the plants may be covered with mats, to prevent their tender shoots from being killed; for as these young plants are apt to continue growing later in the autumn than those which are become woody, so they are much more susceptible of cold; therefore where there is not some care taken to cover them, if the winter should prove severe, many of them may be entirely destroyed, and the others killed to the ground. The spring following, after the danger of hard frost is over, the plants should be carefully taken up, and planted out at the distance of one foot, row from row, and six inches asunder in the rows; this should be in a sheltered situation, and as these plants do not shoot till late in the spring, so they need not be transplanted before the end of March, or the beginning of April; and if the season should then prove warm and dry, it will be proper to give the plants some water to settle the earth to their roots; and if the drought continue, and the waterings are three times repeated at a week's interval from each, it will be of service to the plants. After they have taken new root, they will require

no

no farther care, but to keep them constantly clean from weeds; in this nursery the plants may remain two years, in which time they will have acquired strength enough to be transplanted where they are to remain. There is a figure of this shrub exhibited in the 117th plate of my figures of plants.

The fourth sort grows naturally in the south of France, in Spain and Italy, but has been long cultivated in the nursery gardens, as an ornamental flowering shrub, by the title of Cytisus secundus Clusii. This rises with a woody stalk, putting out many branches which are covered with a brownish bark, and garnished by obverse, oval, small leaves, growing by threes on very short foot-stalks. The flowers are produced in close short spikes at the end of the branches, standing erect; they are of a bright yellow colour, and appear in June; these are succeeded by short broad pods, which contain one row of kidney-shaped seeds, which ripen in August. These shrubs will rise to the height of seven or eight feet, and become very bushy; they are very hardy, so will thrive in any situation, and upon almost any soil, which is not too wet. They are propagated by seeds, which may be sown upon a common bed of light earth in the spring, and kept clean from weeds the following summer; and in autumn the plants may be transplanted into a nursery in rows, one foot apart, and at six inches distance in the rows, where they may remain two years to acquire strength, and should then be removed to the places where they are designed to grow.

The fifth sort hath a soft shrubby stalk, dividing into many branches, which grow erect, and frequently rise to the height of eight or ten feet; the stalks and leaves of this are very hairy; the leaves are oval, growing three upon each foot-stalk, and are placed closely on the branches; the flowers come out from the side of the stalk, in short bunches; they are of a pale yellow, and appear in June; these are succeeded by long, narrow, hairy pods, with one row of kidney-shaped seeds, which ripen in September.

This sort, of late years, has been much cultivated in the nursery gardens near London, by the title of Evergreen Cytisus of Naples; but as in severe frost these shrubs are sometimes killed, so they are not proper for every situation, therefore should only be planted on a dry soil, and in warm situations; they are also very difficult to remove, when grown to any size, for they shoot long roots deep into the ground, and when these are broken or cut, the plants seldom survive it. This may be propagated in the same manner as hath been directed for the third sort. It grows naturally in the south of France, in Spain and Italy.

The sixth sort hath herbaceous stalks, garnished with woolly leaves; the flowers are produced sometimes single, at other times two, three, or more grow together at the end of the branches; these appear in June, and are succeeded by hairy pods.

This plant is propagated by seeds, which may be sown at the same time, and the plants should be afterward treated in the same way, as is directed for the third sort.

The seventh sort grows naturally in Sicily, Italy, and Spain; this is a perennial plant, from whose down-right root proceed several weak branches which trail upon the ground, and extend to the length of eight or ten inches; these are garnished with oblong leaves, placed by threes upon pretty long foot-stalks; they are hoary on their under side, but smooth above; the flowers are collected in heads at the end of the stalks, having a cluster of leaves under them; they are of a deep yellow colour, and appear the latter end of June, and in warm seasons these are succeeded by flat woolly pods, containing one row of small kidney-shaped seeds, which ripen in September. This plant is propagated by seeds, which should be sown where the plants are to remain, and should be treated in the same manner as the sixth sort.

The eighth sort grows naturally in Tartary, from whence the eeds were sent to the Imperial garden at Petersburgh, and hath since been sent to many of the curious gardens in Europe, which have been furnished with the seeds. This hath a shrubby stalk, which rises near four feet high, dividing into many branches, which when young are covered with a green bark, closely garnished by oblong, oval, smooth leaves, which are of a hoary green colour; the flowers are produced in close heads at the end of the branches, having a cluster of leaves under them; they are of a bright yellow colour, and appear in the beginning of May; these are sometimes succeeded by short woolly pods, containing three or four small kidney-shaped seeds in each. This is propagated by seeds, which should be sown early in April, on a border of strong ground exposed to the east; for if they are sown where they have full sun, the plants will not thrive. This requires a cold situation and a pretty strong soil, otherwise it will not thrive.

The ninth sort grows naturally about Algiers, from whence the Rev. Dr. Shaw brought the seeds, which succeeded in the Chelsea garden. This rises with a soft shrubby stalk to the height of eight or ten feet, putting out many slender branches on every side, garnished with small wedge-shaped leaves, which are indented at the top, of a dark green colour and smooth; the flowers come out frequently single from the side of the branches, these are large and of a bright yellow; they appear in June, and are sometimes succeeded by pods containing three or four kidney-shaped seeds, which ripen in autumn. This sort is too tender to live in the open air through the winter in England, therefore the plants must be treated in the same way as those which are natives of the same country.

The tenth sort grows naturally in the islands of the Archipelago; it rises with a ligneous stalk six or seven feet high, sending out many angular lateral branches, garnished with single, narrow, spear-shaped leaves; the flowers are produced in short bunches from the side of the branches; they are small, yellow, and appear in July and August, but are not succeeded by seeds in England.

This is propagated by cuttings, which if planted on a bed of light earth the beginning of July, and are closely covered with a bell or hand-glass, which should be shaded from the sun in the middle of the day, they will put out roots by the middle or end of September; when they should be carefully taken up, planting each in a separate small pot, carefully watering and shading them until they have taken new root; after which they may be exposed in a sheltered situation till the end of October, when they must be removed into shelter, for this plant is too tender to live in the open air in England.

The eleventh sort grows naturally in the islands of America, and also at the Cape of Good Hope. This rises with a weak shrubby stalk eight or ten feet high, sending out many erect side branches, which grow erect, and are garnished with spear-shaped woolly leaves, placed by threes, the middle lobe having a longer distinct foot-stalk, than the two on each side which grow close to the principal foot-stalk. The flowers come out from the side of the branches, sometimes single, at other times in clusters; they are of a deep yellow colour, and about the size of those of the common Laburnum; these are succeeded by hairy pods about three inches long, which are sickle-shaped, ending with a long acute point, swelling at the place where each seed is lodged; the seeds are roundish, a little inclined to a kidney-shape. These seeds are esteemed an excellent food for pigeons in America, from whence it had the title of Pigeon Pea.

This plant grows only in very warm countries, so cannot be preserved in England, unless it is placed in a warm stove. It rises easily from seeds in a hot-bed, and will grow three or four feet high the first year, provided they have a proper heat, and the second year they will produce flowers and seeds. The plants must be placed in the bark-bed in the stove, and treated in the same manner as other tender plants from the same countries: they should have but little water in winter, and in the summer should have a large share of free air admitted to them in warm weather.

# D.



DAFFODIL. See Narcissus.
DAISIES. See Bellis.
DALECHAMPIA. Lin. Gen. Plant. 1022. Plum. Nov. Gen. 17. tab. 38.

This plant was so named by father Plumier, in honour of the memory of Jacobus Dalechamp, who was a curious botanist.

The Characters are,

*It hath male and female flowers on the same plant; the male flowers are situated between two bractea; they have a common involucrum cut into four erect segments; the empalement is composed of six obtuse oval leaves, reflexed at their points. They have no petals, but have a broad nectarium, having many plain folds lying over each other, and many stamina joined in a long column, terminated by roundish summits having four furrows; the female flowers are also situated in the same manner as the male; these have a permanent three-leaved involucrum, and each have a permanent ten-leaved empalement; they have no petals, but a roundish germen shorter than the empalement, having three furrows supporting a long slender style, bending toward the male flowers, crowned by a headed stigma; the germen afterward becomes a roundish capsule with three cells, inclosing one roundish seed in each.*

This genus of plants is ranged in the ninth section of Linnæus's twenty-first class, intitled Monœcia Monadelphia, the plants having male and female flowers on the same root, and the stamina of the male flowers are joined in one body to the style.

We have but one Species of this in England, viz.

Dalechampia (*Scandens*) foliis trilobis glabris, floribus axillaribus caule volubili. *Dalechampia with smooth leaves having three lobes, flowers growing from the sides of the branches, and a twining stalk.* Dalechampia scandens, lupuli foliis, fructu tricocco glabro, calyce hispido. Houst. MSS.

This plant grows naturally in Jamaica, from whence the late Dr. Houstoun sent me the seeds, which succeeded in the Chelsea garden, where the plants have flowered and perfected their seeds. This must be a different plant from that which Plumier found growing in Martinico, or he has taken the involucrum for the seed-vessel by his title of it; for he calls it fructu tricocco hispido, whereas this hath a smooth fruit with a hispid empalement.

It hath a root composed of many fibres, which extend to a great distance, from which arise several weak twining stalks, that fasten themselves to the neighbouring plants, and mount up to a considerable height; these are garnished at each joint by one leaf, having three lobes; they are smooth, the two side lobes are oblique to the midrib, but the middle one is equal. The flowers are produced from the side of the stalks, three or four growing upon each footstalk; some of these are male, and others female; they are of an herbaceous colour, and small, so make no appearance; they have each a double involucrum, made up of two orders of leaves, which are narrow, and armed with small bristly hairs, which sting the hands of those who unwarily touch them; the flowers are succeeded by roundish capsules, having three prominent lobes which are smooth, each inclosing a single seed.

This plant is propagated by seeds, which must be sown early in the spring on a hot-bed; and when the plants are come up three inches high, they should be carefully transplanted, each into a separate small pot, filled with light rich earth, and then plunged into a hot-bed of tanners bark, being careful to screen them from the sun until they have taken new root; after which time the glasses of the hot-bed should be raised every day, in proportion to the heat of the weather, to admit fresh air to the plants; they must also be frequently watered, for they naturally grow in moist places. When the plants have grown so large as to fill these pots with their roots, they should be removed into larger pots, and placed in the bark-bed in the stove, where they must be supported either with stakes or a trellis, round which they will twine, and rise to the height of eight or ten feet. These plants must be kept constantly in the stove, for they are too tender to bear the open air in this country, even in the summer season; therefore they should be placed with Convolvuluses, and other twining plants, near the back of the stove, where should be made an espalier to support them; in which situation they will thrive, and produce their flowers, and sometimes will perfect their seeds in this country; but, in order to this, they should have a large share of fresh air in warm weather, by drawing down the upper glasses of the stove; but in winter the stove should be kept to a temperate heat, or rather higher. In summer they will require a large share of water, but in winter it should be given to them in less quantities, but must be frequently repeated. These plants do not continue above two years, so that young plants should be raised in order to preserve the kind.

DAMASONIUM, Star-headed Water Plantain.

The Characters are,

*It hath a flower composed of three leaves, which are placed orbicularly, and expand in form of a Rose: out of the flower-cup rises the pointal, which afterward becomes a star-shaped fruit, with many cells, which are full of oblong seeds.*

The Species are,

1. Damasonium (*Alisma*) stellatum. Lugd. *Star-headed Water Plantain.*
2. Damasonium (*Flava*) Americanum maximum, plantaginis folio, flore flavescente, fructu globoso. Plum. *Greatest American Water Plantain, with a Plantain leaf, a yellowish flower, and a globular fruit.*

The first of these plants is a native of England; it grows commonly in standing waters, which are not very deep. It is sometimes used in medicine, but never cultivated in gardens, so must be gathered for use in the places of its growth.

The second sort grows in Jamaica, Barbadoes, and several other places in the warm parts of America, where it is generally found in stagnating waters, and other swampy places; so that it would be difficult to preserve this plant in England, for it will not live in the open air, and requires a bog to make it thrive; but as it is a plant of no great beauty or use, it is not worth the trouble of cultivating in this country.

DANDELION. See Leontodon.

DAPHNE. Lin. Gen. Plant. 436. Thymelæa. Tourn. Inst. R. H. 594. tab. 366. Spurge Laurel, or Mezereon.

The Characters are,

*The flower hath no empalement; it is cylindrical, of one petal, which is cut into four parts at the top, where it spreads open; it hath eight short stamina inserted in the tube, which are alternately lower, terminated by erect bilocular summits. The oval germen is situated at the bottom of the tube, and is crowned by a headed depressed stigma; the germen afterward becomes a roundish berry with one cell, inclosing one roundish fleshy seed.*

This genus of plants is ranged in the first section of Linnæus's eighth class, intitled Octandria Monogynia, from the flower having eight stamina and one germen.

The Species are,

1. Daphne (*Laureola*) racemis axillaribus, foliis lanceolatis glabris. Lin. Sp. Plant. 357. *Daphne with bunches of flowers proceeding from the sides of the branches, and smooth spear-shaped leaves.* Thymelæa lauri folio sempervirens, seu laureola mas. Tourn. Inst. 595. *Commonly called Spurge Laurel.*
2. Daphne (*Mezereon*) floribus sessilibus ternis caulinis, foliis lanceolatis deciduis. Lin. Sp. Plant. 357. *Daphne with three flowers together sitting close to the stalk, and spear-shaped leaves, which fall off in autumn.* Thymelæa lauri folio deciduo, sive laureola fœmina. Tourn. Inst. 595. *Commonly called Mezereon.*
3. Daphne (*Thymelæa*) floribus sessilibus axillaribus, foliis lanceolatis, caulibus simplicissimis. Lin. Sp. Plant. 356. *Daphne with flowers sitting close to the sides of the branches, spear-shaped leaves, and single stalks.* Thymelæa foliis polygalæ glabris. C. B. P. 463.
4. Daphne (*Tarton-raire*) floribus sessilibus aggregatis axillaribus, foliis ovatis utrinque pubescentibus nervosis. Lin. Sp. Plant. 356. *Daphne with flowers in clusters sitting close to the sides of the branches, and oval nervous leaves covered with silky hairs on both sides.* Thymelæa foliis candicantibus serici instar mollibus. C. B. P. 463. *Commonly called Tarton-raire.*
5. Daphne (*Alpina*) floribus sessilibus aggregatis lateralibus, foliis lanceolatis obtusiusculis subtus tomentosis. Lin. Sp. Plant. 356. *Daphne with clusters of flowers growing close to the sides of the branches, and spear-shaped blunt leaves woolly on their under side.* Chamelæa Alpina, folio inferne incano. C. B. P. 462.
6. Daphne (*Cneorum*) floribus congestis terminalibus sessilibus, foliis lanceolatis nudis. Lin. Sp. Plant. 357. *Daphne with clusters of flowers sitting close on the tops of the branches, and naked spear-shaped leaves.* Cneorum. Matth. Hist. 46.
7. Daphne (*Gnidium*) paniculâ terminali, foliis lineari-lanceolatis acuminatis. Lin. Sp. Plant. 357. *Daphne with a panicle of flowers terminating the branches, and narrow, spear-shaped, pointed leaves.* Thymelæa foliis lini. C. B. P. 463.
8. Daphne (*Squarrosa*) floribus terminalibus pedunculatis, foliis sparsis linearibus patentibus mucronatis. Lin. Sp. Plant. 358. *Daphne with flowers terminating the branches, having foot-stalks, and narrow, spreading, acute-pointed leaves, placed scatteringly on the branches.* Thymelæa capitata lanuginosa, foliis creberrimis minimis aculeatis. Burm. Afr. 134. tab. 49. fol 1.
9. Daphne (*Americana*) foliis linearibus acutis, floribus racemosis axillaribus. *Daphne with very narrow acute leaves, and flowers growing in bunches from the sides of the branches.* Thymelæa frutescens rorismarini folio, flore albo. Plum. Cat.

The first sort grows common in the woods in many parts of England, and is commonly known by the title of Spurge Laurel; of late years there are poor people, who get the young plants out of the woods, and carry them about the town to sell in the winter and spring. This is a low evergreen shrub, which rises with several stalks from the root to the height of two or three feet, dividing upward into several branches, garnished with thick spear-shaped leaves, which come out irregularly on every side, sitting pretty close to the branches, they are smooth and of a lucid green; between these, toward the upper part of the stalks, come out the flowers in small clusters; they are of a yellowish green, and appear soon after Christmas, if the season is not very severe; these are succeeded by oval berries, which are green till June, when they ripen and turn black, soon after which they fall off. The whole plant is of a hot caustic taste, burning and inflaming the mouth and throat. The leaves continue green all the year, so these plants are ornamental in winter; and as they will thrive under tall trees, they are very proper to fill up the spaces in plantations.

The second sort grows naturally in Germany, and there hath been a discovery made of its growing in some woods near Andover in Hampshire, from whence a great number of plants have been taken of late years. This has been long cultivated in the nursery-gardens as a flowering shrub, and is a very ornamental plant in gardens, very early in the spring, before others make their appearance. There are two distinct sorts of this, one with a white flower which is succeeded by yellow berries, the other with Peach-coloured flowers and red fruit. These are by some supposed to be accidental varieties arising from the same seeds, but I have several times raised these plants from seeds, and always found the plants come up the same, as those from which the seeds were taken, so they do not vary, therefore may be called different species. There is a variety of the Peach-coloured Mezereon, with flowers of a much deeper colour than the common, but these I have always found to vary in their colours when raised from seeds. This shrub grows to the height of five or six feet, with a strong woody stalk, putting out many woody branches on every side, so as to form a regular head; the flowers come out very early in the spring, before the leaves appear, growing in clusters all round the shoots of the former year; there are commonly three flowers produced from each knot or joint, standing on the same short foot-stalk; these have short swelling tubes, which are divided into four parts at the top, which spread open; they have a very fragrant odour, so that where there are plenty of the shrubs growing together, they perfume the air to a considerable distance round them: after the flowers are past, the leaves come out, which are smooth, spear-shaped, and placed without order; they are about two inches long, and three quarters broad in the middle, gradually lessening to both ends; the flowers are succeeded by oval berries, which ripen in June; those of the Peach-coloured flowers are red, and those of the white yellow. The flowers appear in February and March, and sometimes in mild winters they appear in January. This plant was formerly used in medicine, but as every part of it has a hot caustic taste, so few prescribe the use of it at present.

This is propagated by seeds, which should be sown on a border exposed to the east, soon after the berries are ripe; for if they are not sown till the spring following they often miscarry, and always remain a year in the ground before the plants appear; whereas those which are sown in August, will grow the following spring, so that a year is saved, and these never fail. When the plants come up, they will require no other care but to keep them clean from weeds, and if the plants are not too close together, they may continue in the seed-bed, to have the growth of two summers, especially if they do not make great progress the first year; then at Michaelmas, when the leaves are shedding, they should be carefully taken up so as not to break or tear their roots, and planted into a nursery at about sixteen inches row from row, and eight or nine inches asunder in the rows; in this nursery they may remain two years, by which time they will be fit to remove to the places where they are designed to remain for good: the best season to transplant these trees is in autumn, for as these plants begin to vegetate very early in the spring, so it is not proper to transplant them at that season. These plants grow best in a light sandy earth which is dry, for in cold wet land they become mossy, and make little progress; so that upon such soils they never grow to any size, and produce few flowers.

Although the berries of this tree are fo very acrid, as to burn the mouth and throat of thofe who may incautioufly tafte them, yet the birds greedily devour them, as foon as they begin to ripen; fo that unlefs the fhrubs are covered with nets to preferve the berries, they will all be deftroyed before they are fit to gather. There is of this and the former fort, fome plants with variegated leaves, which fome perfons are fond to have in their gardens, but the plain are much more beautiful.

The third fort grows naturally in Spain, Italy, and the fouth of France, where it rifes to the height of three or four feet, with a fingle ftalk covered with a light-coloured bark; the flowers come out in clufters on the fides of the ftalks, which are of an herbaceous colour, fo make but little appearance; they appear early in the fpring, and are fucceeded by fmall berries which are yellowifh when ripe.

The fourth fort grows naturally in the fouth of France, from whence I received the feeds. This is a low fhrubby plant, which fends out feveral weak ftalks from the root, which grow about a foot long, and fpread about irregularly; thefe feldom become woody in England, but are tough and ftringy, covered with a light bark; the leaves are fmall, of an oval form, and are very foft, white, and fhining like fattin; thefe fit pretty clofe to the ftalks; between thefe the flowers come out in thick clufters from the fide of the ftalks; they are white, and are fucceeded by roundifh berries having one hard feed. This flowers here in June, but doth not produce ripe feeds.

The fifth fort grows on the mountains near Geneva, and in other parts of Italy, where it rifes about three feet high; the flowers of this come out in clufters from the fide of the branches, early in the fpring. The leaves are fpear-fhaped, ending in blunt points, and are hoary on their under fide. The flowers are fucceeded by fmall roundifh berries, which turn red when ripe.

The fixth fort grows naturally on the Alps, as alfo upon the mountains near Verona, from whence it was fent me; this is a very humble fhrub, feldom growing more than one foot high, with ligneous ftalks, which put out feveral fide branches; thefe are garnifhed with narrow fpear-fhaped leaves, which are placed round the ftalks without order; the branches are terminated by fmall clufters of purple flowers which ftand erect, having no foot-ftalks; the tubes of thefe flowers are longer and narrower than thofe of the Mezereon, and the mouth is cut into four acute parts which are erect. Thefe flowers emit a pleafant odour; they appear early in the fpring, but do not produce feeds here.

The feventh fort grows naturally about Montpelier; this rifes with a fhrubby ftalk about two feet high, dividing into many fmall branches, which are clofely garnifhed with narrow fpear-fhaped leaves growing erect, ending in acute points; the ends of the branches are terminated by panicles of flowers, which are much fmaller than thofe of the Mezereon, having fwelling tubes, which are contracted at the mouth. Thefe appear in June, but are not fucceeded by feeds here.

The eighth fort grows naturally at the Cape of Good Hope; this fhrub rifes to the height of five or fix feet, dividing upward into feveral branches which grow erect, and are covered with a white bark, and clofely garnifhed with fmall narrow leaves, which come out on every fide of the branches without order, fpreading open; the tops of the branches are terminated by woolly heads, out of which the flowers come in fmall clufters; they are white, having oblong tubes, which are divided into four obtufe fegments at the mouth, which fpread open. Thefe plants do not produce feeds in Europe.

The ninth fort grows naturally in many iflands in the Weft-Indies, it was fent me from Antigua. This fhrub rifes to the height of four or five feet, with a woody ftalk, covered with a rugged bark of an Afh colour; the upper part of the branches are garnifhed with leaves about the fize, and the fame form as thofe of Rofemary; between the leaves the flowers come out in fmall bunches, upon foot-ftalks an inch long; they have fhort tubes cut into four parts at the top, and are white; thefe are fucceeded by fmall round berries, of a brown colour when they are ripe.

The third, fourth, and feventh forts are hardy, fo will live through the winters in England in the open air, provided they are in a dry foil and a warm fituation. The fifth and fixth forts are as hardy as the common Mezereon, fo are not in danger of being hurt by froft in England; but they are all very difficult to keep in gardens, becaufe neither of them will bear to be tranfplanted. I have feveral times raifed the plants from feeds, which have fucceeded well in the places where they were fown, but whenever they were removed, they certainly died, though performed at different feafons, and with the greateft care, and the fame has happened to every other perfon who has raifed any of thefe plants; and fome of my correfpondents have affured me, they have frequently attempted to remove thefe plants from their natural places of growth, into their gardens, and have chofen plants of all fizes, from the youngeft feedlings to the oldeft plants, yet have never fucceeded in it; though they have ufed their utmoft care, and have performed it at different feafons. Therefore thofe who are defirous to have thefe plants in their gardens, muft procure their feeds from the countries where they naturally grow; and when they arrive, they fhould be immediately fown where they are defigned to remain, which for the third, fourth, and feventh forts, fhould be on a very warm dry border, where, if there is a foundation of lime, rubbifh, or chalk, under the upper furface of the ground, the plants will thrive better and continue much longer, than in better ground; and all the culture they require, is to keep the place clean from weeds, for the lefs the ground is ftirred near their roots, the better the plants will thrive; for they naturally grow on poor fhallow land, and out of crevices in rocks; fo the nearer the foil approaches to this, the more likely the plants will be to fucceed.

The fifth and fixth forts may have a cooler fituation; if thefe are fown where they may have only the morning fun, they will thrive better than in a warmer fituation, and the ground near the roots of thefe fhould not be difturbed; therefore in the choice of the fituation, there fhould be regard had to this, not to fow them near other plants, which may require tranfplanting, or to have the ground dug and loofened. The feeds of thefe plants coming from diftant countries, rarely arrive here time enough to fow in autumn, fo that when they are fown in the fpring, the plants do not appear till the fucceeding fpring; and I have fometimes had the feeds remain till the fecond fpring in the ground, before the plants have appeared; but as this may be too long for many people to leave the ground undifturbed, fo they had better put the feeds into fmall pots of earth, and bury them in the ground the firft fummer, and in autumn take them up, and fow them where they are to ftand; by this method, the feeds will be forwarded to vegetate the following fpring.

The fifth fort is a beautiful fweet fhrub, fo deferves a place in gardens, as much as any of thofe we cultivate for ornament. The firft and fecond forts are fometimes ufed in medicine as was before obferved, but being of a very cauftic nature, are feldom prefcribed; but if proper trials were with caution made, it is not doubted but they may be found very efficacious in many ftubborn diforders, for fome very ignorant quacks have performed great cures with thefe plants. The feventh fort produces the Grana gnitida of the fhops.

The eighth fort grows naturally at the Cape of Good Hope, fo will not live abroad in winter in England, but requires a good green-houfe to preferve it. This plant is very difficult to keep or propagate in gardens.

The ninth sort will not thrive in England, unless it is preserved in the bark-stove; this plant will not bear transplanting, for I raised several from seeds which throve pretty well while they continued in the pot where they were sown, but when they were transplanted, they all decayed.

DATISCA. Lin. Gen. Plant. 1003. Cannabina. Tourn. Cor. 52. Bastard Hemp.

The CHARACTERS are,

*It is male and female in different plants; the male flowers have an empalement composed of five narrow acute leaves; these have no petals, and scarce any visible stamina, but have ten summits which are much longer than the empalement. The female flowers have no petals, but the empalements are the same as the male, having an oblong pervious germen, supporting three styles, crowned by single stigmas; the empalement afterward becomes an oblong triangular capsule, opening with three valves, having one cell filled with small seeds, adhering to the three sides of the capsule.*

This genus of plants is ranged in the tenth section of Linnæus's twenty-second class, intitled Diœcia Dodecandria, from the male and female flowers growing in separate plants, and the male flowers having ten stamina.

The SPECIES are,

1. DATISCA (*Cannabina*) caule lævi. Lin. Sp. Plant. 1037. *Datisca with a smooth stalk.* Cannabina Cretica florifera & fructifera. Tourn. Cor. 52.
2. DATISCA (*Hirta*) caule hirsuto. Lin. Sp. Plant. 1037. *Datisca with a rough stalk.*

The first sort grows naturally in Crete, and some other eastern countries. This hath a perennial root, from which arise several herbaceous stalks, about four feet high, garnished with winged leaves placed alternately, each being composed of three pair of lobes, terminated by an odd one; these are two inches long and half an inch broad, ending in acute points, and are deeply sawed on their edges, of a light green. The flowers come out in long loose spikes from the upper part of the stalks at the wings of the leaves, but having no petals, make but a poor appearance. The summits of the male flowers being pretty long, and of a bright yellow colour, are the only visible parts of the flowers to be discerned at any distance.

The flowers on the female plants are succeeded by oblong three-cornered capsules, filled with small seeds, which adhere to the three valves. The plants flower in June, and the seeds ripen in September. The stalks decay in autumn and new arise in spring.

This sort may be propagated by parting the roots, which should be performed in autumn when the stalks decay, (which is the best time to transplant the roots), but they must not be parted too small; they may be planted in any open beds, where they are not under the drip of trees, and will require no other culture but to keep them clean from weeds.

It may also be propagated by seeds, but these should be taken from such plants as grew in the neighbourhood of male plants, otherwise they will not succeed; and if the seeds are not sown in autumn, they seldom grow the first year. The seedling plants when they rise, will require no other care but to keep them clean from weeds till autumn, when they may be transplanted where they are to grow.

The second sort grows naturally in Canada, and other parts of North America. This differs from the former, in having hairy stalks, which grow taller; the leaves are larger, and do not stand so near each other upon the stalks. It is equally hardy with the first sort, and may be propagated in the same manner, but should have a more shady situation and a moister soil.

DATURA. Lin. Gen. Plant. 218. Stramonium. Tourn. Inst. R. H. 118. Thorn Apple.

The CHARACTERS are,

*The flower is of one petal which is funnel-shaped, having a long cylindrical tube, spreading open at the top, which in some species is pentangular, each angle being pointed; the empalement of the flower is permanent, swelling in the middle, five-cornered, and tubulous; the flower hath five stamina, which are as long as the empalement, terminated by oblong compressed summits; it hath an oval germen, supporting an upright style, crowned by a thick obtuse stigma. The germen afterward becomes an oval capsule, divided into four cells by a cross intermediate partition, which are filled with kidney-shaped seeds adhering to the partition.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. DATURA (*Stramonium*) pericarpiis spinosis erectis ovatis, foliis ovatis glabris. Hort. Cliff. 55. *Datura with an oval erect fruit having a prickly cover.* Stramonium fructu spinoso rotundo, flore albo simplici. Tourn. Inst. R. H. 118. *Thorn Apple with a round prickly fruit, and a single white flower.*
2. DATURA (*Tatula*) pericarpiis spinosis erectis ovatis, foliis cordatis glabris dentatis. Lin. Sp. 256. *Datura with an erect oval fruit with a prickly cover, and smooth, heart-shaped, indented leaves.* Stramonium fructu spinoso oblongo, flore violaceo. Tourn. Inst. R. H. 119. *Thorn Apple with an oblong prickly fruit, and a Violet-coloured flower.*
3. DATURA (*Metel*) pericarpiis spinosis nutantibus globosis, foliis cordatis subintegris pubescentibus. Hort. Cliff. 55. *Datura with a globular nodding fruit having a prickly cover, and heart-shaped, entire, hairy leaves.* Datura alba. Rump. 5. p. 242.
4. DATURA (*Ferox*) pericarpiis spinosis erectis ovatis, spinis supremis maximis convergentibus. Amœn. Acad. 3. p. 403. *Datura with an oval erect fruit, whose upper spines are largest, and converge together.* Stramonium ferox. Bocc. 50. *Rough Thorn Apple.*
5. DATURA (*Inoxia*) pericarpiis spinosis inoxiis ovatis propendentibus, foliis cordatis pubescentibus. *Datura with an oval hanging fruit, whose cover is beset with harmless spines, and heart-shaped hairy leaves.* Stramonium folio hyoscyami, flore toto candido, fructu propendente rotundo, spinis inoxiis ornato. Boerh. Ind. alt. 1.
6. DATURA (*Fastuosa*) pericarpiis tuberculosis nutantibus globosis, foliis lævibus. Lin. Sp. 256. *Datura with a globular nodding fruit, whose cover is set with tubercles and soft leaves.* Stramonium Ægyptiacum flore pleno, intus albo, foris violaceo. Tourn. Inst. 119. *Egyptian Thorn Apple with a double flower, white on the inside, and Violet-coloured on the outside.*
7. DATURA (*Arborea*) pericarpiis inermibus nutantibus, caule arboreo. Lin. Sp. Plant. 179. *Datura with a nodding fruit having an unarmed cover, and a tree-like stalk.* Stramonioides arboreum, oblongo & integro folio, fructu lævi, vulgò. Flori pondio. Feuil. tab. 46.

The first sort here enumerated is the most common Thorn Apple in Europe, and was probably first introduced from Italy or Spain, where it naturally grows; but it is now become so common about London, and near other great towns in England, as to appear like a native plant; for there are few gardens or dunghills without this plant in summer, though it is only near such places, where the plants may have been cultivated first in the gardens; and wherever any of these plants are permitted to seed, they will furnish a supply of the plants for some years to come, as they produce a vast quantity of seeds, some of which will lie years in the ground, and when they are turned up to the air will vegetate.

This sort seldom grows much more than two feet high, dividing into many strong irregular branches which are hollow, garnished with large smooth leaves divided into irregular angles, and emit a fœtid odour. The flowers come out first from the forks or divisions of the branches, and afterward near the extremities of the branches; they have long swelling tubes, which are dilated at the top into large pentagonal brims, each angle ending in a long point or ligula; these stand in long, green, five-cornered empalements, and are succeeded by large roundish seed-vessels, covered with strong thorns, divided by four furrows, to which adhere the partitions, which separate the four cells, filled with black kidney-shaped seeds. It flowers in July, August, and September, and the seeds ripen in

in autumn, which, if permitted to ſcatter, will fill the ground about them with plants the following years. There was formerly a cooling ointment made with the leaves of this plant and hogs lard, which was greatly eſteemed for burns and ſcalds.

There is a variety (if not a diſtinct ſpecies of this) which grows naturally in North America; the plants of this grow more than twice the ſize of the former; the leaves are ſmoother, and of a lucid green, but the flowers and fruit are of the ſame form as thoſe of the other, ſo may be deemed a diſtinct ſpecies, eſpecially as the difference continues in the plants propagated in England.

The ſecond ſort grows naturally in moſt parts of America, for I have frequently received the ſeeds of it from the iſlands in the Weſt-Indies, and alſo from all the northern parts of America. This riſes with a purple ſtrong ſtalk to the height of four or five feet, dividing into many ſtrong branches, garniſhed with leaves ſhaped ſomewhat like thoſe of the former ſort, but larger, and have a greater number of angles and lacinæ on their edges; the flowers have longer and narrower tubes, and are of a purple colour; the fruit is alſo longer, and theſe differences are permanent. This is equally hardy with the former, and if the ſeeds are permitted to ſcatter, the plants will become troubleſome weeds. The third ſort hath a ſtrong ſtem, which riſes three feet high, and divides into many woolly branches; the leaves of this ſort are almoſt entire, having only two or three ſlight indentures on their edges; the flowers have long tubes, which extend beyond the bifid empalement, then they ſpread out very broad, where the brim is divided into ten obtuſe angles; they are of a pure white above, but the tubes have a tincture of green within. Theſe are ſucceeded by roundiſh fruit, cloſely covered with thorns, and are divided into four cells as the other, but the ſeeds of this are of a light brown colour when ripe.

This plant is not ſo hardy as the others, ſo the ſeeds muſt be ſown upon a gentle hot-bed in the ſpring, and the plants muſt be afterward treated in the ſame manner as the Marvel of Peru, and other of the hardier kinds of annual plants, and may be tranſplanted into the full ground the latter end of May. They will flower in July, and the ſeeds will ripen in autumn.

There is a variety of this with double flowers, but unleſs the plants of this are placed in a glaſs-caſe, they will not produce ſeeds in this country.

The fourth ſort is of humbler growth, ſeldom riſing more than a foot and a half high, ſpreading out into many branches, which are garniſhed with leaves ſomewhat like thoſe of the firſt ſort, but are ſmaller, and ſtand upon longer foot-ſtalks; the flowers are like thoſe of the firſt ſort, but ſmaller; the fruit is round, and armed with very ſtrong ſharp thorns, the upper being large, and converge toward each other. The ſeeds of this are black when ripe.

This ſort is too tender to be ſown in the full ground in England, ſo the plants ſhould be raiſed on a hot-bed, and afterward tranſplanted into borders as the former ſort.

The fifth ſort grows naturally at La Vera Cruz, from whence I received the ſeeds. This riſes with a purpliſh ſtem three or four feet high, dividing into ſeveral ſtrong branches, garniſhed with oblong heart-ſhaped leaves. The ſtalks, branches, and leaves of this ſort are covered with ſoft hairs; the flowers come out at the diviſion of the ſtalks and branches, ſtanding erect; they are large, white, and are ſucceeded by oval fruit, covered with long, ſoft, innocent ſpines, opening in four cells, which are full of brown ſeeds.

This plant is annual, and ſhould be firſt raiſed on a moderate hot-bed, then may be tranſplanted into open borders, where it will flower and perfect its ſeeds in the autumn. If theſe ſeeds are permitted to ſcatter, the plants will riſe the following ſpring, and if the ſummer proves warm, they will flower and often perfect their ſeeds.

The ſixth ſort grows naturally in Egypt, and alſo in India. This riſes with a fine poliſhed purple ſtalk four feet high, dividing into ſeveral branches, which are garniſhed with large, ſmooth, ſinuated leaves, ſtanding upon pretty long foot-ſtalks. The flowers are produced at the diviſions of the branches; theſe have large ſwelling tubes, which expand very broad at the top, their brims being divided into ten angles, each ending with a long ſlender point. The flowers are of a beautiful purple on their outſide, and a ſattiny white within; ſome of theſe are ſingle, others have two or three flowers ſtanding one within another, and ſome are double, having four or five petals within each other of equal length, ſo as to appear a full flower at the brim; they have an agreeable odour at firſt, but if long ſmelt to, become leſs agreeable, and are narcotic. If theſe plants are brought forward upon a hot-bed in the ſpring, and in June planted out on a warm border of rich earth, they will flower very finely in July and Auguſt; but unleſs they are covered with glaſſes, the ſeeds ſeldom ripen well in England. The fruit of this ſort is round, and grows nodding downward; the ſeed-veſſel is thick and fleſhy, as are alſo the intermediate partitions which divide the cells. The outſide of the fruit is covered with blunt protuberances, and the ſeeds are of a bright brown colour when ripe.

The ſeventh ſort was ſent me from La Vera Cruz by the late Dr. Houſtoun, who found it growing there naturally. This riſes with a woody ſtalk to the height of twelve or fourteen feet, dividing into ſeveral branches, which are garniſhed with oblique leaves ſix inches long, and two inches and a half broad in their broadeſt part, growing narrower at each end; they are oblique to the foot-ſtalk, which ſtands nearer to one ſide than the other; they are downy, and ſtand upon long foot-ſtalks. The flowers come out at the diviſion of the branches; theſe have a looſe tubular empalement near four inches long, which opens at the top on one ſide like a ſpatha or ſheath, within the empalement; the tube of the flower is narrow, but immediately above it ſwells very large for near ſix inches in length, then ſpreads open at the brim, where it is divided into five angles, which terminate in very long points; they are white, with ſome longitudinal ſtripes, of a pale yellow on their outſide; theſe are ſucceeded by round ſmooth capſules, filled with kidney-ſhaped ſeeds.

This tree is one of the greateſt ornaments to the gardens in Chili, where the inhabitants propagate it with great care. When the flowers are fully blown, they make a fine appearance, and a ſingle tree will perfume the air of a large garden.

This plant is tender, ſo requires to be kept in a ſtove in England. The ſeeds of this muſt be procured from the places where the trees naturally grow; they ſhould be perfectly ripe when gathered, and carefully put up, ſo as that the vermin cannot get to them, for they will deſtroy them. Moſt of the ſeeds which were ſent over by Dr. Houſtoun, were devoured in their paſſage by inſects, ſo that but few plants were raiſed. There were two or three of them raiſed in the gardens of the late Lord Petre, and two in the Chelſea garden; one of which came ſo far as to flower, but periſhed without producing ſeeds, ſo that at preſent I believe there is not any of the plants in England.

DAUCUS. Lin. Gen. Plant. 296. Tourn. Inſt. R. H. 307. tab. 161. [δαῦκος, which ſome derive of δαίω, *Gr.* to burn, of its ſharp and fiery power, or fervent taſte.] The Carrot.

The CHARACTERS are,

*It hath an umbelliferous flower; the principal umbel is compoſed of a great number of ſmall ones called rays, which are ſhort, and in cluſters. The involucrum of the principal umbel is compoſed of many narrow leaves, having winged points; theſe are ſcarce ſo long as the umbel; thoſe of the rays are ſhorter and ſimple. The flowers have five heart-ſhaped petals which turn inward; thoſe which compoſe the rays are unequal in ſize, but thoſe of the diſk are nearly ſo; theſe have each five hairy ſtamina, terminated by roundiſh ſummits. The germen ſits under the flower, ſupport-*

*supporting two reflexed styles, crowned by obtuse stigmas. The germen afterward becomes a small, roundish, striated fruit, dividing in two parts, each having a single seed, convex and furrowed on one side, and plain on the other.* This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flower having five stamina and two styles.

The SPECIES are,

1. DAUCUS (*Sylvestris*) seminibus hispidis, radice tenuiore fervido. *Carrot with a prickly seed, and a slender hot root.* Daucus vulgaris. Clus. Hist. 2. p. 198. *Common wild Carrot.*
2. DAUCUS (*Carota*) seminibus hispidis, radice carnoso esculento. *Carrot with a prickly seed, and a fleshy eatable root.* Daucus sativus, radice aurantii coloris. Tourn. Inst. R. H. 307.
3. DAUCUS (*Gingidium*) radiis involucri planis, laciniis recurvis. Prod. Leyd. 97. *Carrot with plain rays to the involucrum, and recurved jags.* Daucus montanus lucidus. Tourn. Inst. 307. *Shining maritime Carrot.*
4. DAUCUS (*Hispidus*) caule hispido, segmentis foliorum latioribus. *Carrot with a prickly stalk, and broader segments to the leaves.* Pastinaca Oenanthes folio. Bocc. Rar. Pl. 75. *Parsnep with a Water Dropwort leaf.*
5. DAUCUS (*Creticus*) radiis involucri pinnatifidis, umbellis duplo longioribus, foliolis acutis. *Carrot with wing-pointed rays to the involucrum, which are twice the length of the umbel, and acute leaves.* Daucus tenuifolius Creticus, radiis umbellæ longioribus. Tourn. Inst. R. H. 308. *Narrow-leaved Carrot of Crete, with rays longer than the umbel.*
6. DAUCUS (*Mauritanicus*) seminibus hispidis, flosculo centrali sterili carnoso, receptaculo communi hemisphærico. Lin. Sp. 348. *Carrot with hispid seeds, the central flower barren, and the common receptacle hemispherical.* Daucus Hispanicus, umbella magna. Tourn. Inst. 308.
7. DAUCUS (*Visnaga*) seminibus nudis. Hort. Cliff. 89. *Carrot having naked seeds.* Gingidium umbella oblongâ. C. B. P. 151. *Gingidium with an oblong umbel.*
8. DAUCUS (*Muricatus*) seminibus aculeatus. Lin., Sp. 349. *Carrot with prickly seeds.* Caucalis major Daucoides Tingitana. Mor. Hist. 3. p. 308.

The first sort is the common wild Carrot, which grows by the side of fields, and in pasture grounds in many parts of England. The plants of this sort do not differ greatly in appearance from the Garden Carrot, which has led some persons into an opinion of their being the same plant; but those who have attempted to cultivate the wild sort, are fully convinced of their being distinct plants. I have tried to cultivate the wild sort for many years, but could never get the seeds which were sown in the spring to grow, upon which I sowed the seeds in autumn, part of which have come up well; these plants I cultivated in the same manner as the Garden Carrot, but could not improve the roots in the least, for they continued to be small, sticky, and of a hot biting taste; and this has been always the case, wherever the plants have been sown, therefore there can be no doubt of their being different plants. The seeds of this sort are used in medicine, and are esteemed good to bring away gravel: it is an excellent diuretic, but instead of these seeds, the shops are usually supplied with old seeds of the Garden Carrot, when they have lost their vegetative quality, then the seedsmen sell them to the druggists for medicinal use; but certainly all seeds which are too old to grow, can have little virtue remaining in them.

There are several varieties of the Garden Carrots, which differ in the colour of their roots, and these variations may be continued, where there is proper care taken not to mix the different sorts together in the same garden; but the Orange Carrot is generally esteemed in London, where the yellow and the white Carrots are seldom cultivated.

The dark red, or purple Carrot, I take to be a distinct sort from either of these; but as it is much tenderer, I have not had an opportunity of seeing it in the flower, for the roots were all destroyed by the first frosts in autumn. The seeds of this sort were sent me from Aleppo, which succeeded very well; the roots were not so large as those of the other sorts of Carrots, and were of a purple colour, very like that of a deep-coloured Radish; they were very tender and sweet; the leaves were finer cut than those of the common Carrot, and were less hairy.

The second sort is commonly cultivated in gardens for the kitchen, and the different varieties of it are, in some places, esteemed, though in London, the Orange Carrot is preferred to all the other.

They are propagated at two or three different seasons, or sometimes oftener, where people are fond of young Carrots, whenever they can be procured. The first season for sowing the seeds is soon after Christmas, if the weather is open, which should be in warm borders, near walls, pales, or hedges, but they should not be sown immediately close thereto; but a border of Lettuce, or other young sallad herbs, of about a foot wide, should be next the wall, &c. for if the Carrots were sown close to the wall, they would draw up weak, without making any tolerable roots.

These delight in a warm sandy soil which is light, and should be dug pretty deep, that the roots may the better run down; for if they meet with any obstruction, they are very apt to grow forked, and shoot out lateral roots, especially where the ground is too much dunged the same year that the seeds are sown, which will also occasion their being worm-eaten; it is therefore the better method to dung the ground intended for Carrots the year before they are sown, that it may be consumed, and mixed with the earth; but in such places where there has not been ground so prepared the year before, and there may be a necessity for dunging it the same year as the Carrots are sown, the dung should be well rotted which is laid upon it, and should be thinly spread over the ground; and in the digging of it into the ground, great care should be taken to disperse it all through the ground, and not to bury it in heaps, for that will stop the roots of the Carrots in their downright growth, and cause them to be short and forky. Where the ground is inclinable to bind, there cannot be too much care taken to break and divide the parts; therefore in digging the land for Carrots, there should never be large spits taken, but they must be very thin, and the clods well broken; which, if not attended to by the master, is seldom properly performed by workmen, who are too apt to hurry over their work, if they are not well observed.

The ground when dug should be laid level and even, otherwise when the seeds are sown and the ground is raked over, part of the seeds will be buried too deep, and others will be in danger of being drawn up into heaps; so the plants will come up in bunches, and other parts of the ground be naked, which should always be carefully avoided.

The seeds have a great quantity of small forked hairs upon their borders, by which they closely adhere, so that they are difficult to sow even, so as not to come up in patches; you should therefore rub it well through both hands, whereby the seed will be separated before it is sown; then you should choose a calm day to sow it in, for if the wind blows, it will be impossible to sow it equal, for the seeds being very light, will be blown into heaps. When the seed is sown, you should tread the ground pretty close with your feet, that it may be buried, and then rake the ground level.

When the plants are come up and have got four leaves, you should hoe the ground with a small hoe about three inches wide, cutting down all young weeds, and separating the plants to four inches distance each way, that they may get strength; and in about a month or five weeks after, when the weeds begin to grow again, you should hoe the ground over a second time, in which you should be careful not to leave two Carrots close to each other, as also to separate them to a greater distance, cutting down all weeds, and slightly stirring the surface of the ground in every place,

place, the better to prevent young weeds from springing, as also to facilitate the growth of the young Carrots.

In about a month or five weeks after, you must hoe them a third time, when you must clear the weeds as before; and now you should cut out the Carrots to the distance they are to remain, which must be proportioned to the size you intend to have them grow. If they are to be drawn while young, five or six inches asunder will be sufficient, but if they are to grow large before they are pulled up, they should be left eight or ten inches distant every way; you must also keep them clear from weeds, which, if suffered to grow amongst the Carrots, will greatly prejudice them.

The second season for sowing these seeds is in February, on warm banks, situated near the shelter of a wall, pale, or hedge; but those which are intended for the open large quarters, should not be sown before the beginning of March, nor should you sow any later than the end of the same month; for those which are sown in April or May, will run up to seed before their roots have any bulk, especially if the weather should prove hot and dry.

In July you may sow again for an autumnal crop, and at the end of August you may sow some to stand the winter; by which method you will have early Carrots in March, before the spring sowing will be fit to draw; but these are seldom so well tasted, and are often very tough and sticky. However, as young Carrots are generally expected early in the spring, most people sow some at this season; but these should be sown upon warm borders and dry land, otherwise they are seldom good. If the winter should prove very severe, it will be proper to cover the young Carrots with Pease-haulm, the haulm of Asparagus, or some such light covering, to prevent the frost from penetrating into the ground, which often destroys the Carrots, where this care is wanting: but if in very hard winters the Carrots should be all destroyed which were sown in autumn, there should be a hot-bed made early in the spring to sow some, which will be fit for use long before any that are sown in the full ground; but these beds should be earthed fifteen or sixteen inches deep, that the roots may have a proper depth of soil to run down. If these beds are lined with hot dung twice, at such times when the heat of the beds decline, it will greatly forward the growth of the Carrots, but there should be great care taken not to draw the plants up too weak; these may be allowed to grow closer together than those sown in the full ground, because they will be drawn for use very young. Many people mix several other sorts of seeds, as Leek, Onion, Parsnep, Radish, &c. amongst their Carrots; and others plant Beans, &c. but, in my opinion, neither of these methods are good; for, if there is a full crop of any one of these plants, there can be no room for any thing else amongst them, so that what is got by one is lost by another; and besides, it is not only more sightly, but better, for the plants of each kind to be sown separate; and also by this means your ground will be clear, when the crop is gone, to sow or plant any thing else; but when three or four kinds are mixed together, the ground is seldom at liberty before the succeeding spring: besides, where Beans, or any other tall-growing plants are planted amongst the Carrots, they are apt to make them grow more in top than root; so that they will not be half so large as if sown singly, without any other plants amongst them.

The covetousness of some gardeners will not permit them to cut out their Carrots to a proper distance when they hoe them, so that by leaving them close, they draw each other up weak: and if they are drawn while young, they never recover their strength afterward so perfectly, as to grow near the size of those which are properly thinned at the first hoeing; therefore where the Carrots are designed to have large roots, they must never stand too close, nor should they have any other crop mixed with them.

This root has been long cultivated in gardens for the table, but has not till of late years been cultivated in the fields for cattle, nor has it been practised as yet but in few parts of England; it is therefore greatly to be wished, that the culture of it was extended to every part of England, where the soil is proper for the purpose; for there is scarce any root yet known, which more deserves it, being a very hearty good food for most sorts of animals. One acre of Carrots, if well planted, will fatten a greater number of sheep or bullocks, than three acres of Turneps, and the flesh of these animals will be firmer and better tasted. Horses are extremely fond of these roots, and for hogs there is not any better food. I have also known these roots cultivated for feeding of deer in parks, which has proved of excellent use in hard winters, when there has been a scarcity of other food; at which times great numbers of deer have perished for want, and those which have escaped, have been so much reduced, as not to recover their flesh the following summer; whereas, those fed with Carrots have been kept in good condition all the winter, and upon the growth of the grass in the spring, have been fat early in the season, which is an advantage, where the grass is generally backward in its growth.

There is also an advantage in the cultivation of this root beyond that of the Turnep, because the crop is not so liable to fail; for as the Carrots are sown in the spring, the plants generally come up well, and unless the months of June and July prove very bad, there is no danger of the crop succeeding; whereas Turneps are frequently destroyed by the flies at their first coming up, and in dry autumns they are attacked by caterpillars, which in a short time devour whole fields, but Carrots are not attacked by these vermin: therefore every farmer who has a stock of cattle or sheep, should always have a supply of these roots, if he has land proper for the purpose, which must be light, and of a proper depth to admit of the roots running down.

In preparing the land for Carrots, if it has not been in tillage before, it should be ploughed early in autumn, and then ploughed across again before winter, laying it up in high ridges to mellow by the frost; and if the ground is poor, there should be some rotten dung spread over it in winter, which should be ploughed in about the beginning of February; then in March, the ground should be ploughed again to receive the seeds; in the doing of which, some farmers have two ploughs, one following the other in the same furrow, so that the ground is loosened a foot and a half deep. Others have men with spades following the plough in the furrows, turning up a spit of earth from the bottom, which they lay upon the top, levelling it smooth and breaking the clods; the latter method is attended with a little more expence, but is much to be preferred to the first, because in this way the clods are more broken, and the surface of the ground is laid much evener.

If the land has been in tillage before, it will require but three ploughings; the first just before winter, when it should be laid in high ridges for the reasons before given; the second cross ploughing should be in February, after which, if it is well harrowed to break the clods, it will be of great service; the last time must be in March to receive the seeds, this should be performed in the manner before mentioned. After this third ploughing, if there remain great clods of earth unbroken, it will be proper to harrow it well before the seeds are sown. One pound and a half of seeds will be sufficient for an acre of land, but as they are apt to adhere together, it renders them more difficult to sow even than most other sorts; therefore some mix a quantity of dry sand with their seeds, rubbing them well together, so as to separate the Carrot seeds from each other, which is a good method. After the seeds are sown, they must be gently harrowed in to bury them; and when the plants come up, they should be hoed in the manner before directed.

But in order to preserve your Carrots for use all the winter and spring, you should, about the beginning of November, when the green leaves are decayed, dig them up, and lay them in sand in a dry place, where the frost cannot come to them, taking them out from time to time as you have occasion for them, reserving some of the longest and straitest roots for seed, if you intend to save any; which roots should be planted in the middle of February, in a light soil, about a foot asunder each way, observing to keep the ground clear from weeds; and about the middle of August, when you find the seeds are ripe, you must cut it off, and carry it to a dry place, where it should be exposed to the sun and air for several days to dry; then you may beat out the seeds, and put it up in bags, keeping it in a dry place until you use it. This seed is seldom esteemed very good after the first or second year at most, but new seed is always preferred, nor will it grow when it is more than two years old.

The third sort grows naturally about Montpelier; this hath smoother stalks than the common Carrot, the segments of the leaves are broader, and of a lucid green; the umbels of the flowers are larger, and not so regular. This is an annual plant, but it succeeds best when sown in autumn.

The fourth sort is of lower growth than either of the former; the stalks are closely covered with short prickles, the segments of the leaves are broad and obtuse, the umbels are small, and the involucrum is longer than the umbel, and the leaves are trifid which compose it.

The fifth sort rises with a slender, rough, hairy stalk upward of two feet high; the leaves are short, and have a few small ones intermixed, which are thinly placed, and cut into acute segments; the umbels are not so large as those of the common sort, and the involucrum is twice the length of the umbel; the leaves which compose it are divided into five or seven parts, ending in acute points; the flowers are yellow.

The sixth sort hath a channelled stalk rising near three feet, which is terminated by large umbels of flowers, with a wing-pointed involucrum; the segments of the lower leaves are cut into obtuse segments, and are of a deep green colour.

The seventh sort is an annual plant, which grows naturally in Spain and Italy; this rises with an upright, smooth, channelled stalk three feet high, garnished with smooth leaves, which are divided into many fine narrow segments like those of Fennel; the stalks branch out upward, and each branch is terminated by a large umbel, composed of a great number of small ones; the involucrum is shorter than the umbel, and each of the leaves which compose it is trifid: the foot-stalks which sustain the small umbels (or rays) are long and stiff; these are by the Spaniards used for picking their teeth, from whence the plant had the title of Visnaga, or Pick-tooth. The seeds of this plant should be sown in autumn, for those which are sown in the spring frequently fail, or at least remain in the ground till next year before they grow; the plants require no other culture but to keep them clean from weeds, and thin them where they are too close.

The eighth sort grows naturally about Tangier. This rises with an upright stalk above two feet high, garnished with double-winged leaves which are hairy; the stalk branches upward into several divisions, each being terminated by an umbel of white flowers, which are succeeded by prickly seeds.

If the seeds of this sort are not sown in the autumn, the plants rarely perfect their seeds in this country; for when they are sown in the spring, and the plants come up soon after, they generally run up to seed in autumn, so that the frosts come on before they have time to ripen.

These sorts are sometimes preserved in botanic gardens for the sake of variety, but being of no use, are not cultivated in other gardens.

DAUCUS CRETICUS. See ATHAMANTA.

D'AYENIA, Monier.

This genus of plants receives its title from Monseigneur Le Duc D'Ayen, who is a great lover and promoter of the science of botany; and has a noble garden at St. Germains, which is well stored with rare plants from many different parts of the world, and has appointed Dr. Monier, member of the Royal Academy of Sciences, the superintendent of it.

The CHARACTERS are,

*It hath an empalement composed of five small oval leaves which are dry. The flower hath five petals, whose points are united to a plain starry nectarium; the nectarium sits upon a cylindrical column which is erect, and the length of the empalement; it is bell-shaped, having five depressed lobes at the margin: it hath five short stamina inserted into the border of the nectarium, terminated by roundish summits, which are joined to the border of the petals. It hath a roundish germen in the bottom of the nectarium, supporting a cylindrical style, crowned by a five-cornered obtuse stigma. The capsule hath five cells, inclosing five oblong seeds fastened to the capsule.*

This genus of plants is ranged in the fourth section of Linnæus's twentieth class, intitled Gynandria Pentandria, the flowers having five stamina, which are fastened with the style to the nectarium.

We at present know but one SPECIES of this genus, viz.

D'AYENIA (*Pusilla*) foliis cordatis glabris. Lin. Sp. 1354. *D'Ayenia with heart-shaped smooth leaves.*

The seeds of this plant were sent by the younger De Jussieu from Peru to Paris, where they succeeded, and have since been communicated to many other gardens in Europe. I received the seeds from Dr. Monier, intendent of the garden of the Duke D'Ayen at St. Germains, which have for some years grown in the Chelsea garden, where the plants annually flower and perfect their seeds.

This plant hath a weak ligneous stalk, which divides into several slender branches, rising from nine inches to a foot high, garnished by heart-shaped smooth leaves, which are slightly indented on their edges, standing upon pretty long foot-stalks; they are of a lucid green, and end in acute points, placed alternately on the branches. At the base of each foot-stalk, from the side of the branches, come out the flowers, two, three, or four, arising from the same point, each standing upon a separate slender foot-stalk; they have five slender stamina, collected into a sort of column, like the malvaceous flowers, having a five-cornered germen at the bottom, which afterward becomes a roundish five-cornered capsule, having five cells, in each of these is lodged one kidney-shaped seed. The flowers are tubulous, spreading open at the top, where they are cut into five acute segments, each being terminated by a slender tail; they are purple, and continue in succession on the same plants from July to the winter.

This plant is propagated by seeds, which should be sown upon a moderate hot-bed early in the spring; and when the plants are come up, and have four leaves, they should be transplanted on a fresh hot-bed to bring them forward; part of them may be planted in small pots, and the others may be planted on the bed: those in the pots should be plunged into a hot-bed of tanners bark; they must be shaded till they have taken new root, then they must have free air admitted to them every day, in proportion to the warmth of the season; they require to be frequently watered in warm weather, but they should not have it in too great plenty. The plants should continue all the summer in the hot-bed, where they must have a good share of air; for those which are fully exposed to the open air will not thrive, and if they are too much drawn, they do not flower well. The plants will live through the winter in a moderate stove, but as they perfect their seeds well the first year, few persons care to continue the old plants. There is a figure of this plant exhibited in the 118th plate of our figures of plants.

DAY-LILY. See HEMEROCALLIS.

DECORTICATION; is the pulling off the outward bark of trees, also the peeling or barking of roots.

DELPHINIUM. Lin. Gen. Plant. 602. Tourn. Inst. R. H. 426. tab. 241. [Δελφὶν, *Gr.* a dolphin; so called, because the flower, before it opens, resembles a dolphin. It is called Consolida Regalis, from its consolidating virtue. Caspar Bauhin calls it the Royal Plant, because it has its cup turned backwards, like a nobleman's badge. Cæsalpinus, Pliny, and the poets say, this plant is the true Hyacinth, because it has the syllable ai inscribed on its flower, which is a particle of bewailing,] Larkspur, or Larksheel.

The CHARACTERS are,

*The flower hath no empalement; it is composed of five unequal petals placed circularly; the upper petal is extended at the hinder part into a tubular obtuse tail; the two side petals are nearly of the same size with the upper, but the two lower are smaller; these spread open. There is a bifid nectarium situated in the center of the petals, and is involved in the tube by the back part. The flower hath many small stamina which incline to the petals, and are terminated by small erect summits; it hath three oval germen, supporting three styles which are as long as the stamina, crowned by reflexed stigmas; the germen afterward become so many capsules joined together, which open crossways, each having one cell filled with angular seeds.*

This genus of plants is ranged in the third section of Linnæus's thirteenth class, intitled Polyandria Trigynia, the flower having many stamina and three styles

The SPECIES are,

1. DELPHINIUM (*Consolida*) nectariis monophyllis, caule subdiviso. Hort. Cliff. 217. *Larkspur with a one-leaved nectarium and a divided stalk.* Delphinium segetum. Tourn. Inst. 426. *Corn Larkspur, and the* Consolida regalis arvensis. C. B. P. 142. *Field Royal Consound.*
2. DELPHINIUM (*Ajacia*) nectariis monophyllis, caule simplici. *Larkspur with a one-leaved nectarium, and an erect stalk.* Delphinium hortense, flore majore & simplici cæruleo. Tourn. Inst. R. H. 426. *Garden Larkspur, with a larger single blue flower.*
3. DELPHINIUM (*Ambiguum*) nectariis monophyllis, caule ramoso. *Larkspur with a one-leaved nectarium and a branching stalk.* Delphinium elatius purpuro violaceum. Suvert. Flor. *Branched Larkspur.*
4. DELPHINIUM (*Peregrinum*) nectariis diphyllis corollis enneapetalis capsulis teretis, foliis multipartitis obtusis. Hort. Cliff. 213. *Larkspur with a two-leaved nectarium, a flower with eleven petals and three capsules, and leaves divided into many obtuse segments.* Delphinum latifolium, parvo flore. Tourn. Inst. R. H. 426. *Broad-leaved Larkspur with a small flower.*
5. DELPHINIUM (*Elatum*) nectariis diphyllis, labellis bifidis, apice barbatis, foliis incisis, caule erecto. Hort. Upsal. 151. *Larkspur with a two-leaved nectarium, a bifid lip bearded at the top, cut leaves, and an erect stalk.* Delphinium perenne montanum villosum, aconiti folio. Tourn. Inst. 426. *Perennial hairy Mountain Larkspur with a Monkshood leaf, commonly called the Bee Larkspur.*
6. DELPHINIUM (*Grandiflorum*) nectaris diphyllis, labellis integris, floribus subsolitariis, foliis compositis lineari-multipartitis. Hort. Upsal. 150. *Larkspur with a two-leaved nectarium, an entire lip, flowers growing singly, and compound leaves divided into many narrow parts.* Delphinium humilius angustifolium perenne, flore azureo. Amman. *Dwarf narrow-leaved perennial Larkspur with an azure flower.*
7. DELPHINIUM (*Americanum*) nectariis diphyllis, labellis integris, floribus spicatis, foliis palmatis multifidis glabris. Plate 119. *Larkspur with a two-leaved nectarium, an entire lip, flowers growing in spikes, and palmated, multifid, smooth leaves, commonly called American Larkspur.*
8. DELPHINIUM (*Staphisagria*) nectariis diphyllis, foliis palmatis, lobis integris. Hort. Cliff. 213. *Larkspur with a two-leaved empalement, and palmated leaves having entire lobes.* Delphinium platani folio, staphysagria dictum. Tourn. Inst. R. H. 428. *Larkspur with a Plane-tree leaf, called Stavesacre.*

The several varieties of the Garden Larkspur are not here enumerated, as they would swell the work beyond its intended bulk, if all these were distinguished, therefore here are only the distinct species mentioned; and as the gardeners distinguish the Garden Larkspurs into those which are branched, and such as have upright stalks; which difference is permanent, and never alters, whatever may be asserted to the contrary by ignorant pretenders; so I shall just mention the several varieties which there are of each sort, commonly cultivated in the gardens of the curious. And first of the branched Larkspur, there are of the following colours, with single and double flowers.

Blue, purple, white, flesh, Ash, and Rose colours; and some have flowers beautifully spotted, with two or three of these different colours.

The upright or unbranched Larkspur, produces a greater variety of colours than the branched, and the flowers are larger and fuller than those; but the principal colours run nearly the same with those of the other, though many of the colours are deeper, and there are more different shades of these colours in the flowers of this sort.

The first sort grows naturally on arable lands, in France, Spain, and Italy, and is supposed to be the same as the Garden Larkspur, which is a great mistake; for I have cultivated it many years in the garden, and never found it alter: the leaves of this sort are broader, and not so much divided as those of the garden kind, and are placed thinner upon the stalks; the flowers are smaller, and grow in longer spikes; the stalks are not so much branched as that sort which is called the branched, nor are they single like the upright, so that I think it may be allowed to be a different species.

The second sort hath upright stalks, which scarce put out any branches; the spikes of flowers grow erect, and the flowers are placed very close together, so that they make a fine appearance. These plants flower in July and August, and are very great ornaments to the borders of the flower-garden.

The branching Larkspur, which is the third sort, comes later to flower than the upright; this rises with a very branching stalk three feet high or more; the branches come out horizontally from the side of the stalks, but afterward turn that part on which the spike of flowers grow, which is at the extremity upward, so as to make an angle; the leaves are long and finely divided; the flowers are placed thinner in the spikes than those of the upright sort; they are large, and some of them very double and of various colours.

These plants are annual, so are every year propagated by seeds, which should be sown where the plants are designed to remain, for they do not bear transplanting well, especially if they are not removed very young; those seeds which are sown in autumn, produce the strongest plants and most double flowers, and ripen their seeds better than those which are sown in the spring, as they come earlier to flower; but to continue a succession of these flowers, there should be some seeds sown in the spring. When they are sown on the borders of the flower-garden for ornament, they should be in patches of about a foot diameter, in the middle of the borders, at proper distances; in each of these patches may be scattered ten or a dozen seeds, covering them over about a quarter of an inch with earth; and in the spring the plants may be thinned, leaving about five or six of the upright sort in each patch to stand for flowering; but of the branching sort, not more than three or four, because these require room; after this the plants will require no farther care but to keep them clean from weeds, and when they begin to flower should be supported by flower-sticks to prevent their being broken by wind, especially if they are not in a sheltered situation. If the seeds were well chosen, there will be very few

ordinary flowers among them; and if there are feeds of the different coloured flowers fown in each patch, they will make a pleafing variety: but the upright fort fhould never be mixed in the fame patches with the branching, becaufe they do not flower at the fame time.

But in order to preferve the two forts fine without degenerating to fingle or bad colours, there fhould be a bed of each fort fown in autumn, in fome feparate part of the garden, where the plants fhould be properly thinned, and kept clean from weeds, till they begin to fhew their flowers; when they fhould be carefully looked over every other day, to pull out all thofe plants, whofe flowers are not very double nor of good colours; for if thefe are permitted to ftand among the others till their farina has impregnated them, it will certainly caufe them to degenerate; fo that thofe perfons who are contented with only marking their good flowers for feed, and fuffer the others to ftand for feed among them, will always find themfelves difappointed in the goodnefs of their flowers the following feafon: therefore thofe who propofe to have thefe flowers in perfection, fhould never gather the feeds of fuch as grew in the borders of the flower-garden; becaufe there it will be almoft impoffible to preferve them fo true, as when they are in beds at a diftance from all other kinds.

When the feed-veffels turn brown, they muft be carefully watched, to gather them before they open and difcharge the feeds; fo that thofe which are fituated on the lower part of the ftalk, will open long before thofe on the upper part of the ftalk are ripe; for which reafon the pods fhould from time to time be gathered as they ripen, and not fuffered to ftand till the ftalks are pulled up, which is often practifed. Thofe pods which are fituated on the lower part of the ftalks, are much preferable to fuch as grow near the top; for which reafon thofe who are very curious in the choice of their feeds, crop off the upper part of the fpikes of flowers, and never fuffer them to ftand for feeds.

As thefe plants are very hardy, and require fo little care in their culture, fo they are worthy of a place in every good garden; for during their continuance in flower, there are few plants which make a better appearance; and for gathering to make flower-pots to adorn rooms, there is fcarce any flower fo proper; becaufe by their upright growth and long fpikes, they rife to a proper height above the pots; and when the feveral colours are fkilfully intermixed they make a rich appearance, and continue long in beauty.

The fourth fort grows naturally in Sicily and Spain, I received the feeds of it from Gibraltar; this hath a very branching ftalk, which rifes about two feet high; the lower leaves are divided into many broad obtufe fegments, but thofe which are upon the ftalks are generally fingle; the flowers grow fcatteringly toward the upper part of the branches, they are fmall, and of a deep blue colour; thefe are fucceeded by very fmall feed-veffels, which are fometimes fingle, and at others double, and very rarely three together, as in the common forts. This is an annual plant, whofe feeds fhould be fown in autumn, and the plants treated as the common fort; it hath little beauty, and is only kept in fome gardens for the fake of variety.

The fifth fort hath a perennial root, which fends out feveral upright ftalks in the fpring, rifing to the height of four feet, garnifhed with leaves which are divided into many broad fegments, in form of a fpreading hand; thefe fegments are cut at their extremities into two or three acute points; the leaves are hairy, and ftand upon long foot-ftalks; the flowers terminate the ftalks, growing in long fpikes; they are of a light blue, covered toward their hinder part with a meally down. This flowers in July and Auguft, and in autumn the ftalks decay to the root.

The fixth fort grows naturally in Siberia, from whence the feeds were fent to the Imperial garden at Peterfburgh, where they fucceeded; and the feeds were fent me from thence by the late Dr. Amman, who was profeffor of botany in that univerfity. This hath a perennial root, which puts out two or three branching ftalks every fpring; thefe rife about a foot and a half high, and are garnifhed at each joint with leaves compofed of many narrow fegments, which terminate with feveral acute points; they are fmooth, and of a light green colour; the flowers come out toward the upper part of the ftalks fingly, each ftanding upon a long naked foot-ftalk; thefe are large, and of a fine azure colour; they appear the latter part of July, and are fucceeded by feeds which ripen in the autumn.

The feventh fort grows naturally in America; this is a perennial plant, which rifes with ftrong branching ftalks fix or feven feet high, garnifhed with hand-fhaped leaves, which are divided into four or five broad lobes, ending with many acute points; thefe are fmooth, and ftand upon long foot-ftalks; the flowers terminate the ftalks, growing in long fpikes; they are of a fine blue colour, with a bearded nectarium, having two lips; and of a dark colour, refembling at a fmall diftance the body of a bee.

All the perennial Larkfpurs are propagated by feeds, which, if fown in autumn, will more certainly fucceed, than thofe which are fown in the fpring; when the plants come up, they fhould be kept clean from weeds, and where they are too clofe together, part of them fhould be drawn out, to allow room for the others to grow till the following autumn, when they muft be planted where they are to remain; the following fummer they will flower, and the roots continue many years growing in magnitude, fo will produce a greater number of flower-ftalks.

The eighth fort is an annual plant, which grows naturally in the Levant, as alfo in Calabria; this rifes with a ftrong hairy ftalk about two feet high, garnifhed with hand-fhaped hairy leaves, compofed of five or feven oblong lobes, which have frequently one or two acute indentures on their fides; the flowers form a loofe fpike at the upper part of the ftalk, each ftanding on a long foot-ftalk; the flowers are of a pale blue or purple colour, and have a two-leaved nectarium: this is propagated by feeds, which fhould be fown in autumn, for thofe fown in the fpring never grow the fame year. The feeds fhould be fown where the plants are to remain, and require no other treatment than the common Larkfpur. The common people ufe the powder of this feed to kill lice, from whence it has been titled Loufewort.

**DENS CANIS.** See Erythronium.

**DENS LEONIS.** See Leontodon.

**DENTARIA.** Lin. Gen. Plant. 726. Tourn. Inft. R. H. 225. tab. 110. Toothwort; in French *Dentaire.*

The Characters are,

*The empalement of the flower is compofed of four oblong oval leaves, which fall off; the flower hath four obtufe petals placed in form of a crofs; it hath fix ftamina, four of which are as long as the empalement, the other two are fhorter; thefe are terminated by oblong heart-fhaped fummits, which ftand erect. In the center is fituated an oblong germen, fupporting a fhort thick ftyle, crowned by an obtufe ftigma; the germen afterward becomes a long taper pod with two cells, divided by an intermediate partition, opening with two valves, including many roundifh feeds.*

This genus of plants is ranged in the fecond fection of Linnæus's fifteenth clafs, intitled Tetradynamia Siliquofa, the flowers having four long and two fhort ftamina, and the feeds being inclofed in long pods.

The Species are,

1. Dentaria (*Pentaphyllos*) foliis fummis digitatis. Lin. Sp. 912. *Five-leaved Toothwort, whofe upper leaves are hand-fhaped.* Dentaria pentaphyllos, foliis mollioribus. C. B. P. 322. *Five-leaved Toothwort with foft leaves.*
2. Dentaria (*Bulbifera*) foliis inferioribus pinnatis, fummis fimplicibus. Hort. Cliff. 335. *Toothwort with lower leaves winged, and the upper ones fingle.* Dentaria

ria heptaphyllos baccifera. C. B. P. 322. *Seven-leaved bulb-bearing Toothwort.*

3. Dentaria (*Enneaphyllos*) foliis ternis ternatis. Lin. Sp. Plant. 653. *Toothwort with three-leaved trifoliate leaves.* Dentaria triphyllos. C. B. P. 322. *Three-leaved Toothwort.*

The firſt ſort riſes with a ſtrong ſtalk a foot and a half high, garniſhed with a leaf at each joint, compoſed of five lobes, which are four inches long, and near two broad in the wideſt part, ending in acute points, deeply ſawed on their edges; theſe are ſmooth, and ſtand on long foot-ſtalks; the flowers grow in looſe ſpikes at the top of the ſtalks; they are ſmall, of a bluſh colour, and ſucceeded by long taper pods filled with ſmall roundiſh ſeeds. It grows in the ſhady woods in the ſouth of France and Italy.

The ſecond ſort riſes with ſlender ſtalks about a foot high; the leaves at the bottom have ſeven lobes, thoſe a little above five, others but three, and at the upper part of the ſtalk they are ſingle: the flowers grow in cluſters at the top of the ſtalk; theſe have four obtuſe purple petals, and are ſucceeded by taper pods filled with roundiſh ſeeds.

The third ſort riſes with an upright ſtalk a foot high; the leaves are compoſed of nine lobes, three growing together, ſo that one leaf has three times three; the flowers grow in ſmall bunches on the top of the ſtalks, and are ſucceeded by ſmall taper pods filled with roundiſh ſeeds.

Theſe plants grow on the mountains in Italy, and in the woods of Auſtria. The ſecond ſort is found wild in ſome parts of England, but particularly near Hare-field, in moiſt ſhady woods, and is ſeldom preſerved in gardens: this produces bulbs on the ſide of the ſtalks, where the leaves are ſet on, which, if planted, will grow and produce plants. Theſe plants are propagated by ſeeds, or parting their roots; the ſeeds ſhould be ſown in autumn, ſoon after they are ripe, in a light ſandy ſoil and a ſhady ſituation: in the ſpring the plants may be taken up where they grow too cloſe, and tranſplanted out in the like ſoil and ſituation; where, after they have taken root, they will require no farther care, but to keep them clear from weeds: the ſecond year they will produce flowers, and ſometimes perfect their ſeeds.

The beſt time to tranſplant the roots is in October, when they ſhould be planted in a moiſt ſoil and a ſhady ſituation; for they will not live in a dry ſoil, or when they are expoſed to the ſun.

DEW is by ſome defined to be a meteor bred of a thin cold vapour, or compoſed of the ſteams and vapours of the earth; which, being exhaled by the heat of the ſun, and kept ſuſpended during his preſence, do, upon his abſence, convene into drops, and then fall down unto the earth again.

Others define it, a thin, light, inſenſible miſt or rain, falling while the ſun is below the horizon.

The origin and matter of dews are, without doubt, from vapour and exhalations of the earth and water, raiſed by the warmth of the ſun and earth, &c.

There being many vapours in the air, though not always viſible, hence it comes to paſs, that even in clear weather great dews fall, eſpecially in countries where it ſeldom rains; for when it happens that the ſcattered vapours are collected and condenſed together, and forced downwards, they muſt needs fall, and bedew the plants and graſs.

The thin veſicles, of which vapours conſiſt, being once detached from their bodies, keep riſing in the air till they arrive at ſuch a ſtage as is of the ſame ſpecific gravity with themſelves, when their riſe is ſtopped: now, as it is the warmth or fire that dilates the parts of water, and forms thoſe veſicles that are ſpecifically lighter than the air, and are capable of aſcending therein; ſo when that heat declines, or is loſt, as by the approach or contiguity of any colder body, the veſicles condenſe, and become heavier and deſcend.

Therefore the ſun warming the atmoſphere in the day-time, by the continual influx of his rays, the vapours being once raiſed, continue their progreſs, not meeting with any thing to increaſe their gravity, till ſuch time as they are got far beyond the reach of the reflected warmth of the earth in the middle region of the atmoſphere, and there condenſe and form clouds.

Though ſome ſay, it is diſputable whether dews ever congregate ſo as to form clouds, as they are only elevated by the ſun; ſo that when that power is gone, as it is after the ſetting of the ſun, they immediately deſcend; and this is more obſervable in very warm weather, and very hot climates.

The time for the falling of the dew is either before ſun-riſing, or after ſun-ſet; that it may regularly fall at ſuch times, it is neceſſary for the air to be calm, for windy or ſtormy weather hinders it; but when it is calm weather, and gentle breezes are felt from the weſt about the ſetting, and from the eaſt about the riſing of the ſun, it is probable, that by moderately cooling the air, they collect the vapours and precipitate them; and becauſe the morning breezes are more general than the evening ones, for this reaſon the evening dews fall only here and there, but thoſe in the morning ſeldom fail to be univerſal: or, as it may be otherwiſe expreſſed, when the ſun is got below the horizon, the atmoſphere cools the vapours, which have in the preceding day been raiſed by the warmth of the earth; and the rays of the ſun being lodged there, as ſoon as they are got out of the air, they begin to condenſe apace, and ſpend their ſtock of heat and fire on the cold moiſt air that they paſs through.

Hence it is, that dews are more copious in the ſpring than other ſeaſons, there being a greater ſtock of vapour in readineſs, by reaſon there has been but a ſmall expence thereof during the winter's cold and froſt than at other times.

It is found by experience, that the dews are more copious in hotter countries than in cold, as Pliny obſerves of the ſummer nights in Africa, which he calls Roſcidæ æſtate noctes; the reaſon of which ſeems to be this, that in the day-time the heat of the ſun raiſes abundance of vapours out of the water; which vapours are ſo extremely rarefied by the ſame heat, that they are diſperſed far and wide; but the cool of the night brings them together, and condenſes them to that degree, that they fall to the ground, but not in ſuch large drops as rain does; but in colder countries, where there are frequent rains, and the vapours are leſs rarefied, moſt of them come down in rain, and but a ſmall part turns to dew: beſides, in Africa there is a great difference between the heat of the day and night, particularly in ſummer; for their nights are long, and very cold; whereas in northern countries they are little colder than the day, and much ſhorter than in places nearer the line.

Pliny likewiſe relates of Egypt, that it abounds in dews throughout all the heat of ſummer; for the air being there too hot to conſtipate the vapours in the day-time, they never gather into clouds, and for that reaſon they have no rain. But it is known, in climates where the days are exceſſive hot, the nights are remarkably cold, ſo that the vapours that are raiſed after ſun-ſet are readily condenſed into dews: or, perhaps notable coldneſs may be rather the effect than the cauſe of the quantity of dews; for much vapour being raiſed by the great heat of the earth, and the ſtock of fire being ſpent on it in the day-time, the influx of ſuch a great quantity of moiſture muſt greatly chill the air.

The difference between dew and rain ſeems to be only this, that dew falls at ſome particular times as aforeſaid, and in very ſmall drops, ſo as to be ſeen when down, but ſcarce perceivable while it is falling; whereas rain falls at any time, and in groſſer drops.

The reverend Dr. Hales, in his Treatiſe of Vegetable Statics, tells us, That in order to find out the quantity of dew that fell in the night on the 15th of Auguſt, 7 p. m. he took two glazed earthen pans, which were three inches deep, and twelve inches diameter in

in furface: that he filled them with pretty moift earth, taken off the furface of the ground, and they increafed in weight by the night's dew 180 grains; and decreafed in weight by the evaporation of the day 1 ounce + 282 grains.

He fays likewife, he fet thefe in other broader pans to prevent any moifture from the earth fticking to the bottom of them. He adds, that the moifter the earth is, the more dew falls on it in a night, and more than a double quantity of dew falls on a furface of water than there does on an equal furface of moift earth. The evaporation of a furface of water in nine hours winter's dry day, is $\frac{1}{21}$ of an inch: the evaporation of a furface of ice fet in the fhade during a nine hours day, was $\frac{1}{31}$.

So here are 540 grains more evaporated from the earth every 24 hours in fummer than fall in dew in the night; that is, in 21 days near 26 ounces from a circular area of a foot diameter; and circles being as the fquares of their diameters, 10 pounds + 2 ounces will in 21 days be evaporated from the hemifphere of 30 inches diameter, which the Sunflower's root occupies; which, with the 29 pounds drawn off by the plant in the fame time, makes 39 pounds, that is, 9 pounds and $\frac{3}{4}$ out of every cubic foot of earth, the plant's roots occupying more than 4 cubic feet: but this is a much greater degree of drinefs than the furface of the earth ever fuffers for 15 inches depth, even in the drieft feafons in this country.

In a long dry feafon therefore, efpecially within the tropics, we muft have recourfe, for fufficient moifture to keep plants and trees alive, to the moift ftrata of earth, which lie next below that in which the roots are.

Now moift bodies always communicate of their moifture to more dry adjoining bodies; but this flow motion of the afcent of moifture is much accelerated by the fun's heat to confiderable depths in the earth, as is probable, he fays, from the twentieth experiment in the faid book.

Now 180 grains of dew falling in one night on a circle of a foot diameter = 113 fquare inches; thefe 180 grains being equally fpread on this furface, its depth will be $\frac{1}{159}$ part of an inch $= \frac{180}{113 \times 254}$. He adds, that he found the dew in a winter night to be the $\frac{1}{90}$ part of an inch; fo that if we allow 151 nights for the extent of the fummer dew, it will in that time arife to one inch depth: and reckoning the remaining 214 nights for the extent of the winter's dew, it will produce 2,39 inches depth, which makes the dew of the whole year amount to 3,39 inches depth.

And the quantity which evaporated in a fair fummer's day from the fame furface, being as 1 ounce 282 grains, gives $\frac{1}{40}$ part of an inch depth for evaporation, which is four times as much as fell at night.

He fays likewife, that he found by the fame means, the evaporation of a winter's day to be nearly the fame as in a fummer's day; for the earth being in winter more faturate with moifture, that excefs of moifture anfwers to the exceffive heat in fummer.

Nic. Cruquius, N° 381. of the Philofophical Tranfactions, found, that 28 inches depth evaporated in a whole year from water, i. e. $\frac{1}{12}$ of an inch each day at a mean rate: but the earth in a fummer's day evaporates $\frac{1}{40}$ of an inch, fo the evaporation of a furface of water is to the evaporation of a furface of earth in fummer as 10 : 3.

The quantity of rain and dew that falls in a year is at a medium 22 inches. The quantity of the earth's evaporation in a year is at leaft 9 + $\frac{1}{2}$ inches; fince that is the rate at which it evaporates in a fummer's day: from which 9 + $\frac{1}{2}$ inches are to be deducted 3,39 inches for circulating daily dew, there remains 6,2 inches; which 6,2 inches deducted from the quantity of rain that falls in a year, there remains at leaft 16 inches depth to replenifh the earth with moifture for vegetation, and to fupply the fprings and rivers.

Dr. Hales proceeds to inftance, in the cafe of a Hop-ground which he gives in the ninth experiment of his book of Vegetable Statics, that the evaporation there found, from the Hops, confidered only for three months, at $\frac{1}{101}$ part of an inch each day, which will be $\frac{9}{10}$ of an inch: but before it be allowed 6,2 inches to form the furface of the ground, which added to the $\frac{9}{10}$ give 7,1 inches, which is the utmoft that can be evaporated from a furface of Hop-ground in a year; fo that of 22 inches depth of rain, there remain 15 inches to fupply fprings, which are more or lefs exhaufted, according to the drinefs or wetnefs of the year.

Hence we find, that 22 inches depth of rain in a year is fufficient for all the purpofes of nature in fuch flat countries as that about Teddington near Hampton Court. But in the hill countries, as in Lancafhire, there falls 42 inches depth of rain water, from which, deducting 7 inches for evaporation, there remains 35 inches depth of water for the fprings, befides great fupplies from much more plentiful dews than fall in plain countries; which vaft ftores feem fo abundantly fufficient to anfwer the great quantity of water, which is conveyed away by the fprings and rivers from thofe hills, that we need not have recourfe for fupplies to the great abyfs, whofe furface at high water is furmounted fome hundreds of feet by thofe vaft hills from whence the longeft and greateft rivers take their rife.

DIANTHERA. Lin. Gen. Plant. 37. Flor. Virg. 6.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, which is tubulous, and cut at the top into five equal parts; the flower is of the grinning kind, having one petal with a fhort tube; the upper lip is reflexed and bifid, the lower is divided into three parts, the middle being the broadeft; it hath two fhort flender ftamina adhering to the back of the petal, one of thefe hath a twin fummit, the other is a little taller. It hath an oblong germen, fupporting a flender ftyle the length of the ftamina, crowned by an obtufe ftigma. The empalement afterward becomes a capfule with two cells, opening with two valves, which are alternately compreffed at the top and bottom, and open with an elafticity, cafting a fingle flat feed out of each cell.*

This genus of plants is ranged in the firft fection of Linnæus's fecond clafs, intitled Diandria Monogynia, the flower having two ftamina and one ftyle. This is one of the genera which, by Linnæus's method, is feparated to a great diftance from their congeners; for by all their other characters they fhould be joined to his fourteenth clafs, but having only two ftamina, they are put under his fecond.

We know but one SPECIES of this genus at prefent, viz.

DIANTHERA (*Americana*) fpicis folitariis alternis. Lin. Sp. 24. *Dianthera with folitary alternate fpikes.*

This plant grows naturally in Virginia, and other parts of North America, from whence the feeds have been fent to England, where they have fucceeded. This is a low herbaceous plant with a perennial root, which fends out feveral weak ftalks about four inches long, garnifhed with roundifh leaves of an aromatic odour, ftanding clofe to the ftalks; they are hairy, and of a dark green colour; from the fide of the ftalks the flowers are produced in fmall fpikes, placed alternately; thefe are in fhape and colour very like thofe of the Clinopodium, but have only two ftamina in each. It flowers the latter end of July, but rarely produces feeds in England.

This plant is very difficult to preferve in this country, for although it is hardy enough to live in the open air in England, yet it is very fubject to rot in winter; and if it is placed under fhelter, it is apt to draw up weak, and foon after decay, fo that at prefent the plants are rare in this country.

DIANTHUS. Lin. Gen. Plant. 500. Caryophyllus. Tourn. Inft. R. H. 329. Clove Gilly Flower, Carnation Pink; in French, *Oeillet.*

The CHARACTERS are,

*The flower hath a long cylindrical empalement which is permanent; it hath five petals, whose tails are as long as the empalement, but their upper part is broad, plain, and crenated on their borders; these are inserted in the bottom of the tube, and spread open above. It hath ten stamina which are as long as the empalement, terminated by oblong compressed summits. In the center is situated an oval germen, supporting two styles which are longer than the stamina, crowned by recurved stigmas. The germen afterward becomes a cylindrical capsule with one cell, opening in four parts at the top, and filled with compressed angular seeds.*

This genus of plants is ranged in the second section of Linnæus's tenth class, intitled Decandria Digynia, the flowers having ten stamina and two styles.

The SPECIES are,

1. DIANTHUS (*Deltoides*) floribus solitariis, squamis calycinis lanceolatis binis, corollis crenatis. Hort. Cliff. 164. *Dianthus with a single flower having a double scaly empalement, and crenated petals.* Caryophyllus sylvestris vulgaris latifolius. C. B. P. 209. *Maiden Pink.*

2. DIANTHUS (*Virgineus*) caule subunifloro, corollis crenatis, squamis calycinis brevissimis, foliis subulatis. Lin. Sp. Plant. 412. *Dianthus with one flower on a stalk, crenated petals, very short scales to the empalement, and awl-shaped leaves.* Caryophyllus minor repens. Nostras. Raii. Syn. 335. *English small creeping Pink, commonly called the matted Pink by seedsmen.*

3. DIANTHUS (*Glaucus*) floribus subsolitariis, squamis calycinis lanceolatus quaternis, corollis crenatis. Hort. Cliff. 164. *Dianthus with one flower on a stalk, having four spear-shaped scales to the empalement, and crenated petals.* Tunica ramosior flore candido cum corollâ purpureâ. Hort. Elth. 400. *Branching Pink with a white flower, having a purple circle, commonly called Mountain Pink.*

4. DIANTHUS (*Plumarius*) floribus solitariis, squamis calycinis subovatis brevissimis, corollis multifidis fauce pubescentibus. Lin. Sp. Plant. 411. *Dianthus with a single flower, having short oval scales to the empalement, and petals cut into many points, with a hairy bottom.* Caryophyllus simplex flore minore pallido rubente. C. B. P. 208. *Single wild Pink, with a small, pale, reddish flower.*

5. DIANTHUS (*Caryophyllus*) floribus solitariis squamis calycinis subovatis brevissimis, corollis crenatis. Hort. Cliff. 164. *Dianthus with a single flower, having short oval scales to the empalement, and crenated petals.* Caryophyllus hortensis simplex, flore majore. C. B. P. 208. *Single Garden Carnation with a large flower.*

6. DIANTHUS (*Armeria*) floribus aggregatis fasciculatis, squamis calycinis lanceolatis villosis tubum æquantibus. Hort. Cliff. 165. *Dianthus with many flowers gathered into bunches, having hairy spear-shaped scales to the empalement, as long as the tube of the flower.* Caryophyllus barbatus sylvestris. C. B. P. 208. *Bearded wild Pink, called Deptford Pink.*

7. DIANTHUS (*Barbatus*) floribus aggregatis fasciculatis, squamis calycinis linearibus, foliis lanceolatis. *Dianthus with many flowers gathered in bunches, having very narrow scales to the empalement, and spear-shaped leaves.* Caryophyllus barbatus hortensis latifolius. C. B. P. 208. *Broad-leaved Garden Sweet William.*

8. DIANTHUS (*Prolifer*) floribus aggregatis capitatis, squamis calycinis ovatis obtusis muticis tubum superantibus. Lin. Sp. Plant. 587. *Dianthus with flowers collected into heads, and obtuse, oval, chaffy scales to the empalements, which are longer than the tube.* Caryophyllus sylvestris prolifer. C. B. P. 209. *Wild childing Sweet William.*

9. DIANTHUS (*Ferrugineis*) floribus aggregatis capitatis, squamis calycinis lanceolatis aristatis, corollis crenatis. *Dianthus with flowers collected in heads, having spear-shaped scales to the empalement which are bearded, and crenated petals.* Caryophyllus montanus umbellatus, floribus variis luteis ferrugineis Italicus. Barrel. Obs. 648. *Italian umbellated Mountain Pink, with flowers varying from yellow to an iron colour.*

10. DIANTHUS (*Chinensis*) floribus solitariis, squamis calycinis subulatis patulis, tubum æquantibus, corollis crenatis. Hort. Cliff. 164. *Dianthus with a single flower on each stalk, awl-shaped spreading scales to the empalement equalling the tube, and crenated petals.* Caryophyllus sinensis supinus, leucoii folio, flore unico. Tourn. Act. Par. 1705. *The China Pink.*

11. DIANTHUS (*Arenarius*) caulibus unifloris squamis calycinis ovatis obtusis, corollis multifidis, foliis linearibus. Flor. Suec. 318. *Dianthus having a single flower upon a stalk, oval scales to the empalement, the petals of which are cut into many points, and narrow leaves.* Caryophyllus sylvestris humilis, flore unico. C. B. P. 209. *Dwarf wild Pink with one flower.*

12. DIANTHUS (*Alpinus*) caule unifloro, corollis crenatis, squamis calycinis exterioribus tubum æquantibus, foliis linearibus obtusis. Lin. Sp. Plant. 412. *Dianthus with one flower having crenated petals, the outer scales of the empalement equalling the tube, and narrow obtuse leaves.* Caryophyllus pumilus latifolius. C. B. P. 209. *Dwarf broad-leaved Pink.*

13. DIANTHUS (*Superbus*) floribus paniculatis, squamis calycinis brevibus acuminatis, corollis multifido-capillaribus, caule erecto. Amœn. Acad. 4. p. 272. *Dianthus with paniculated flowers, having short-pointed scales to their empalement, multifid petals, and an upright stalk.*

14. DIANTHUS (*Diminutus*) floribus solitariis, squamis calycinis octonis florem superantibus. Lin. Sp. 587. *Dianthus with a single flower on each stalk, having eight scales which rise above the petals of the flower.* Caryophyllus sylvestris minimus. Tabern. Hist. 290.

The first sort hath creeping stalks, from which come out several tufted heads, closely garnished with narrow leaves, whose base lie over each other embracing the stalks; between these arise the flower-stalks, which grow about six inches high, garnished at every joint by two narrow grassy leaves placed opposite. The stalks are terminated by a single flower. It flowers in June and July, and the seeds ripen in autumn. This is rarely admitted into gardens, the flower having no beauty.

The second sort is a low trailing plant, whose stalks lie on the ground; these grow very close together, and are garnished with short, narrow, grassy leaves of a deep green colour; the stalks are terminated by small red flowers, each standing upon a separate footstalk. It flowers in July, and the seeds ripen in September. This sort grows naturally in several parts of England, so is not often cultivated in gardens at present; but formerly the seeds were sown to make edgings for the borders of the flower-garden by the title of matted Pink, by which the seeds were sold in the shops.

The third sort grows naturally upon Chidder rocks in Somersetshire, and some other parts of England. This was formerly cultivated in the gardens by the title of Mountain Pink. It hath a resemblance of the second sort, but the leaves are shorter, and of a grayish colour; the stalks grow taller, and branch more; the flowers are larger, of a white colour, with a purple circle in the bottom, like that sort of Pink called Pheasants Eye. As the flowers of this sort have no scent, the plants are seldom kept in gardens.

The fourth sort grows naturally in several parts of England, frequently upon old walls; it is a small single Pink, of a pale red colour, so is not cultivated in gardens.

The fifth sort is a small single Carnation, which has been long cast out of all the gardens; from one of this sort it is supposed, many of the fine flowers now cultivated in the gardens have been raised.

The sixth sort grows naturally in several parts of England, and particularly in a meadow near Deptford in Kent, from whence it had the title of Deptford Pink. This is of the kind called Sweet William; the flowers of these grow in clusters at the end of the branches; they are red, and have long bearded empalements. I have cultivated this sort above forty years, and have never observed it to vary.

The seventh sort is the common Sweet William, which has been long cultivated in the gardens for ornament, of which there are now great varieties which differ in the form and colour of their flowers, as also in the size and shape of their leaves; those which have narrow leaves were formerly titled Sweet Johns by the gardeners, and those with broad leaves were called Sweet Williams; there are some of both these sorts with double flowers, which are very ornamental plants in gardens.

The eighth sort grows naturally in the south of France, in Spain, Italy, and in England. This is an annual plant, which rises with an upright stalk about a foot high, garnished with narrow grassy leaves, and is terminated by a small head or cluster of pale red flowers, which are included in one common scaly empalement. These have little beauty, so the plants are seldom kept in gardens.

The ninth sort is a biennial plant, which rises with an upright stalk a foot and a half high, having two long narrow leaves placed opposite at each joint, which embrace the stalk with their base; they are of a deep green colour, stiff, and end in acute points. The flowers grow in close clusters at the top of the stalks, having stiff bearded empalements; they are yellow and iron coloured intermixed on the same stalk, and frequently they are of both colours in the same head. This plant flowers in July, and the seeds ripen in autumn.

The tenth sort came originally from China, so it is titled the China Pink; the flowers of this have no scent, but there are a great variety of lively colours among them; and of late years there has been great improvements made in the double flowers of this sort, some of which are as full of petals as the double Pink, and their colours are very rich. The plants seldom grow more than eight or nine inches high, branching out on every side; the branches grow erect, and are terminated each by a single flower. These flower in July, and continue in succession till the frost stops them; they are commonly raised every year from seeds, but the roots will continue two years in dry ground.

The eleventh sort is found growing naturally upon old walls and buildings in many parts of England; this is a single small Pink, of a sweet odour, but of a pale colour and small, so makes no appearance; and since the great improvement which has been made in these flowers by culture, this has been entirely neglected.

The twelfth sort grows naturally on the Alps. This hath round, short, blunt leaves; the stalks seldom rise more than four inches high, each being terminated by a single flower of a pale red colour. It is sometimes preserved in botanic gardens for the sake of variety, but is rarely admitted into other gardens.

The thirteenth sort grows naturally in Germany and Denmark; the leaves of this sort are like those of the narrow-leaved Sweet William; the stalk rises more than a foot high, and is terminated by a single flower, having five large petals of a pale red colour, which are cut into many long segments. The roots of this sort will live three or four years, but the second year from seeds they are in greatest beauty; therefore as the seeds ripen well in England, young plants should be annually raised.

The fourteenth sort is a very diminutive plant, having short narrow leaves growing in close heads; the stalk seldom rises six inches high, which is terminated by a single flower, of a pale red colour, so has little beauty, therefore is only kept in botanic gardens for variety.

The sorts here enumerated, are such as the botanists allow to be distinct species; and all the varieties of fine flowers, which are now cultivated in the gardens of the curious, are only accidental variations which have been produced by culture; and the number of these are greatly increased annually, in many different parts of Europe; so that as new varieties are obtained, the old flowers are rejected.

The plants of this genus may be properly enough divided into three sections. The first to include all the variety of Pinks, the second all the Carnations, and the third those of the Sweet William; for although these agree so nearly in their principal characters, as to be included under the same genus by the botanists, yet they never vary from one to the other, though they frequently change and vary in the colour of their flowers.

I shall now proceed to treat of these under their different sections, and first I shall begin with the Pink, of which there are a great variety now cultivated in the gardens; the principal of which are, the damask Pink, the white Shock, the Pheasant Eye, with double and single flowers, varying greatly in their size and colour; the common red Pink, Cob's Pink, Dobson's Pink, white Cob Pink, and Bat's Pink. The old Man's Head, and painted Lady Pink, rather belong to the Carnation.

The damask Pink is the first of the double sorts in flower. This hath but a short stalk; the flower is not very large, and not so double as many others; the colour is of a pale purple, inclining to red, but is very sweet.

The next which flowers is the white Shock, which was so called from the whiteness of its flowers, and the borders of the petals being much jagged and fringed; the scent of this is not so agreeable as of some others.

Then comes all the different kinds of Pheasants Eye, of which there are frequently new varieties raised, which are either titled from the persons who raised them, or the place where they were raised; some of these have very large double flowers, but those which burst their pods are not so generally esteemed.

The Cob Pink comes after these to flower; the stalks of this are much taller than those of any of the former; the flowers are very double, and of a bright red colour; these have the most agreeable odour of all the sorts, so merits a place in every good garden. The time of the Pinks flowering is from the latter end of May to the middle of July, and frequently that sort of Pheasant Eye, which is called Bat's Pink, will flower again in autumn.

The old Man's Head Pink, and the painted Lady, do not flower till July, coming at the same season with the Carnation, to which they are more nearly allied than the Pink. The first when it is in its proper colours, is purple and white striped and spotted, but this frequently is of one plain colour which is purple; this sort will continue flowering till the frost in autumn puts a stop to it, and the flowers having an agreeable scent, renders them valuable. The painted Lady is chiefly admired for the liveliness of its colour, for it is not so sweet, or of so long continuance as the other.

The common Pinks are propagated either by seeds, which is the way to obtain new varieties, or by making layers of them, as is practised for Carnations; or by planting slips, which, if carefully managed, will take root very well.

If they are propagated by seeds, there should be care taken in the choice of them, and only the seeds of the best sorts saved, where the persons are curious to have the finest flowers. These seeds may be sown in the spring, and the plants afterward treated in the same manner as is hereafter directed for the Carnation; with this difference only, that as the Pinks are less tender, they may be more hardily treated. Those which are propagated by layers, must be also managed as the Carnation, for which there are full instructions hereafter given. The old Man's Head and painted Lady Pinks, are commonly propagated this way, but most of the other sorts are propagated from slips.

The best time to plant the slips of Pinks is about end of July, when, if there should happen rain, it will be of great service to them; but if the weather should prove dry, they will require to be watered every other day, until they have taken root; these

ſhould be planted in a ſhady border, and the ground ſhould be dug well, and all the clods broken, and if no rain falls, it ſhould be well ſoaked with water a few hours before the ſlips are planted; then the ſlips ſhould be taken from the plants, and all their lower leaves ſtripped off, and planted as ſoon as poſſible after, for if they are ſuffered to lie long after they are taken from the plants, they will wither and ſpoil; theſe need not be planted at a greater diſtance than three inches ſquare, and the ground muſt be cloſed very hard about them; then they muſt be well watered, and this muſt be repeated as often as is found neceſſary, till the cuttings have taken root; after which they will require no other care but to keep them clean from weeds till autumn, when they ſhould be tranſplanted to the borders of the flower-garden where they are to remain. There are ſome who plant the ſlips of Pinks later in the ſeaſon than is here directed; but thoſe plants are never ſo ſtrong nor flower ſo well, as thoſe which are early planted.

We ſhall next proceed to the culture of the Carnation; theſe the floriſts diſtinguiſh into four claſſes.

The firſt they call Flakes; theſe are of two colours only, and their ſtripes are large, going quite through the leaves.

The ſecond are called Bizarrs; theſe have flowers ſtriped or variegated with three or four different colours, in irregular ſpots and ſtripes.

The third are called Piquettes; theſe flowers have always a white ground, and are ſpotted (or pounced, as they call it) with ſcarlet, red, purple, or other colours.

The fourth are called painted Ladies; theſe have their petals of a red or purple colour on the upper ſide, and are white underneath.

Of each of theſe claſſes there are numerous varieties, but chiefly of the Piquettes, which ſome years ago were chiefly in eſteem with the floriſts, but of late years the Flakes have been in greater requeſt than any of the other kinds. To enumerate the varieties of the chief flowers in any one of theſe claſſes, would be needleſs, ſince every country produces new flowers almoſt every year; ſo that thoſe flowers, which, at their firſt raiſing, were greatly valued, are in two or three years become ſo common, as to be of little worth, eſpecially if they are defective in any one property. Therefore (where flowers are ſo liable to mutability, either from the fancy of the owner, or that better kinds are yearly produced from ſeeds, which, with good floriſts, always take place of older or worſe flowers, which are turned out of the garden to make room for them) it would be but ſuperfluous in this place to give a liſt of their names, which are generally borrowed either from the names and titles of noblemen, or from the perſon's name, or place of abode, who raiſed it.

Theſe flowers are propagated either from ſeeds (by which new flowers are obtained), or from layers, for the increaſe of thoſe ſorts which are worthy maintaining; but I ſhall firſt lay down the method of propagating them from ſeeds, which is thus:

Having obtained ſome good ſeeds, either of your own ſaving, or from a friend that you can confide in, about the middle of April, prepare ſome pots or boxes (according to the quantity of ſeed you have to ſow); theſe ſhould be filled with freſh light earth mixed with rotten neats dung, which ſhould be well incorporated together; then ſow your ſeeds thereon (but not too thick) covering it about a quarter of an inch with the ſame light earth, placing the pots or caſes ſo as to receive the morning ſun only till eleven of the clock, obſerving alſo to refreſh the earth with water as often as it may require. In about a month's time your plants will come up, and if kept clear from weeds, and duly watered, will be fit to tranſplant about the latter end of July; at which time you ſhould prepare ſome beds (of the ſame ſort of earth as was directed to ſow them in) in an open airy ſituation, in which you ſhould plant them at about three inches ſquare, obſerving to water and ſhade them till they have taken new root, then you muſt obſerve to keep them clear from weeds; in theſe beds they may remain until the end of Auguſt, by which time they will have grown ſo large as almoſt to meet each other; then prepare ſome more beds of the like good earth (in quantity proportionable to the flowers you have raiſed) in which you ſhould plant them at ſix inches diſtance each way, and not above four rows in each bed, for the more conveniently laying ſuch of them as may prove worthy preſerving, for in theſe beds they ſhould remain to flower.

The alleys between theſe beds ſhould be two feet wide, that you may paſs between the beds to weed and clean them. If the ſeaſon ſhould prove very dry at this time, they ſhould not be tranſplanted till there is ſome rain; ſo that it may happen to be the middle, or latter end of September ſome years, before there may be wet enough to moiſten the ground for this purpoſe; but if there is time enough for the plants to get good root before the froſt comes on, it will be ſufficient. If the winter ſhould prove ſevere, the beds ſhould be arched over with hoops, that they may be covered with mats, otherwiſe many of the plants may be deſtroyed, for the good flowers are not ſo hardy as the ordinary ones of this genus. There will be no other culture wanting to theſe, but to keep them clean from weeds, and when they ſhoot up their ſtalks to flower, they muſt be ſupported by ſticks to prevent their breaking. When your flowers begin to blow, you muſt look over them to ſee which of them proffer to make good flowers, which as ſoon as you diſcover, you ſhould lay down all the layers upon them; thoſe which are well marked, and blow whole without breaking their pods, ſhould be reſerved to plant in borders, to furniſh you with ſeed; and thoſe which burſt their pods, and ſeem to have good properties, ſhould be planted in pots, to try what their flowers will be, when managed according to art; and it is not till the ſecond year that you can pronounce what the value of a flower will be, which is in proportion to the goodneſs of its properties; but, that you may be well acquainted with what the floriſts call good properties, I ſhall here ſet them down.

1. The ſtem of the flower ſhould be ſtrong, and able to ſupport the weight of the flower without hanging down.

2. The petals (or leaves) of the flower ſhould be long, broad, and ſtiff, and pretty eaſy to expand, or (as the floriſts term them) ſhould be free flowers.

3. The middle pod of the flower ſhould not advance too high above the other petals of the flower.

4. The colours ſhould be bright, and equally marked all over the flower.

5. The flower ſhould be very full of leaves, ſo as to render it, when blown, very thick and high in the middle, and the outſide perfectly round.

Having made choice of ſuch of your flowers as promiſe well for the large ſort, theſe you ſhould mark ſeparately for pots, and the round whole blowing flowers for borders; you ſhould pull up all ſingle flowers, or ſuch as are ill-coloured, and not worth preſerving, that your good flowers may have the more air and room to grow ſtrong; theſe having been laid at a proper ſeaſon, as ſoon as they have taken root (which will be ſome time in Auguſt) they ſhould be taken off, and planted out, thoſe that blow large, in pots, and the other in borders (as hath been already directed).

Of late years the whole-blowing flowers have been much more eſteemed than thoſe large flowers which burſt their pods, but eſpecially thoſe round flowers which have broad ſtripes of beautiful colours, and round Roſe leaves, of which kinds there have been a great variety introduced from France within theſe few years; but as theſe French flowers are extremely apt to degenerate to plain colours, and being much tenderer than thoſe which are brought up in England, there are not ſuch great prices given for the plants now, as have been a few years paſt; from the preſent taſte for theſe whole-blowing Flake flowers, many of

of the old varieties, which had been turned out of the gardens of the florists many years ago, to make room for the large flowers, which were then in fashion, have been received again; and large prices have been paid of late for such flowers as some years ago were sold for one shilling a dozen, or less, which is a strong proof of the variableness of the fancies of the florists.

But I shall now proceed to give some directions for propagating these flowers by layers, and the necessary care to be taken in order to blow them fair and large.

The best season for laying these flowers is in June, as soon as the shoots are strong enough for that purpose, which is performed in the following manner: after having stripped off the leaves from the lower part of the shoot intended to be laid, make choice of a strong joint about the middle part of the shoot (not too near the heart of the shoot, nor in the hard part next the old plant); then with your penknife make a slit in the middle of the shoot from the joint upwards half way to the other joint, or more, according to their distance; then with your knife cut the tops of the leaves, and also cut off the swelling part of the joint where the slit is made, so that the part slit may be shaped like a tongue; for if that outward skin is left on, it would prevent their pushing out roots; then having loosened the earth round the plant, and, if need be, raised it with fresh mould, that it may be level with the shoot intended to be laid down, lest by the ground being too low, by forcing down the shoot you split it off; then with your finger make a hollow place in the earth, just where the shoot is to come, and with your thumb and finger bend the shoot gently into the earth, observing to keep the top as upright as possible, that the slit may be open; and being provided with forked sticks for that purpose, thrust one of them into the ground, so that the forked part may take hold of the layer, in order to keep it down in its proper place; then gently cover the shank of the layer with the same sort of earth, giving it a gentle watering to settle the earth about it, observing to repeat the same as often as is necessary, in order to promote their rooting. In about five or six weeks after this, the layers will have taken root sufficient to be transplanted; against which time you should be provided with proper earth for them, which may be composed after the following manner:

Make choice of some good up-land pasture, or a common that is of a hazel earth, or light sandy loam; dig from the surface of this your earth about eight inches deep, taking all the turf with it; let this be laid in a heap to rot and mellow for one year, turning it once a month, that it may sweeten; then mix about a third part of rotten neats dung, or for want of that, some rotten dung from a Cucumber or Melon-bed; let this be well mixed together, and if you can get it time enough before-hand, let them lie mixed six or eight months before it is used, turning it several times, the better to incorporate their parts.

Observe, that although I have mentioned this mixture as the best for these flowers, yet you must not expect to blow your flowers every year equally large in the same composition; therefore some people who are extremely fond of having their flowers succeed well, alter their compositions every year in this manner, viz. one year they mix the fresh earth with neats dung, which is cold; the next year with rotten horse dung, which is of a warmer nature, adding thereto some white sea sand to make the earth lighter.

But, for my part, I should rather advise the planting two or three layers of each of the best kinds in a bed of fresh earth not over dunged, which plants should only be suffered to shew their flowers, that you may be sure they are right in their kind and colours; and when you are satisfied in that particular, cut off the flower-stems, and do not suffer them to spend the roots in blowing, by which means you will strengthen your layers. And it is from these beds I would make choice of some of the best plants for the next year's blowing, always observing to have a succession of them yearly, by which means you may have every year fine flowers, provided the season proves favourable: for it is not reasonable to suppose, that the layers taken from such roots as have been exhausted in producing large flowers, and have been forced by art to the utmost of their natural strength, should be able to produce flowers equally as large as their mother root did the year before, or as such layers as are fresh from a poorer soil, and in greater health can do. But this being premised, let us proceed to the planting of these layers, which (as I said before) should be done in August, or the beginning of September.

The common method used by most florists is, to plant their layers at this season, two in each pot (the size of which pots are about nine inches over in the clear at the top); in these pots they are to remain for bloom; and therefore, in the spring of the year, they take off as much of the earth from the surface of the pots as they can, without disturbing their roots, filling the pots up again with the same good fresh earth as the pots were before filled with. But there is some difficulty in sheltering a great quantity of these flowers in winter, when they are planted in such large pots, which in most winters they will require, more or less; my method therefore is, to put them singly into halfpenny pots in autumn, and in the middle or latter end of October, to set these pots into a bed of old tanners bark, which has lost its heat, and cover them with a common frame (such as is used for raising Cucumbers and Melons); and in two of these frames, which contain six lights, may be set a hundred and fifty of these pots: in these frames you may give them as much free air as you please, by taking off the lights every day when the weather is mild, and putting them on only in bad weather and great rains; and if the winter should prove severe, it is only the covering the glasses with mats, straw, or Pease-haulm, so as to keep out the frost, which will effectually preserve your plants in the utmost vigour.

In the middle or latter end of February, if the season is good, you must transplant these layers into pots for their bloom (the size of which should be about eight inches over at the top in the clear); in the doing of which, observe to put some potsherds or oyster-shells over the holes in the bottoms of the pots, to keep the earth from stopping them, which would detain the water in the pots to the great prejudice of the flowers: then fill these pots about half way with the same good compost as was before directed, and shake the plants out of the small pots with all the earth about the roots; then with your hands take off some of the earth round the outside of the ball, and from the surface taking off the fibres of the roots on the outside of the ball of earth; then put one good plant exactly in the middle of each pot, so that it may stand well as to the height, i. e. not so low as to bury the leaves of the plant with earth, nor so high, that the shank may be above the rim of the pot; then fill the pot up with the earth before-mentioned, closing it gently to the plant with your hands, giving it a little water, if the weather is dry, to settle the earth about it; then place these pots in a situation where they may be defended from the north wind, observing to give them gentle waterings, as the season may require.

In this place they may remain till the middle or latter end of April, when you should prepare a stage of boards to set the pots upon, which should be so ordered as to have little cisterns of water round each post, to prevent the insects from getting to your flowers in their bloom, which, if they are suffered to do, will mar all your labour, by destroying all your flowers in a short time; the chief and most mischievous insect in this case is, the earwig, which will gnaw off all the lower parts of the petals of the flowers (which are very sweet) and thereby cause the whole flower to fall to pieces; but since the making one of these stages is somewhat expensive, and not very easy to be understood

derstood by such as have never seen them, I shall describe a very simple one, which I have used for several years, which answers the purpose full as well as the best and most expensive one can do: first, prepare some common flat pans, about fourteen or sixteen inches over, and three inches deep; place these two and two opposite to each other, at about two feet distance, and at every eight feet lengthways, two of these pans; in each of these whelm a flower-pot, which should be about six inches over at the top, upside-down, and lay a flat piece of timber, about two feet and a half long, and three inches thick, cross from pot to pot, till you have finished the whole length of your stage; then lay your planks lengthways upon these timbers, which will hold two rows of planks for the size pots which were ordered for the Carnations; and when you have set your pots upon the stage, fill the flat pans with water, always observing, as it decreases in the pans, to replenish it, which will effectually guard your flowers against insects; for they do not care to swim over water, so that if by this, or any other contrivance, the passage from the ground to the stage, on which the pots are placed, is defended by a surface of water three or four inches broad, and as much in depth, it will effectually prevent these vermin from getting to the flowers.

This stage should be placed in a situation open to the south-east, but defended from the west winds, to which these stages must not be exposed, lest the pots should be blown down by the violence of that wind, which is often very troublesome at the season when these flowers blow; indeed they should be defended by trees at some distance, from the winds of every point; but these trees should not be too near the stage, nor by any means place them near walls, or tall buildings, for in such situations the stems of the flowers will draw up too weak. About this time, viz. the middle of April, your layers will begin to shoot up for flower; you must therefore be provided with some square deal sticks, about four feet and a half long, which should be thicker toward the bottom, and planed off taper at the top; these sticks should be carefully stuck into the pots as near as possible to the plant, without injuring it; then with a slender piece of bass mat, fasten the spindle to the stick to prevent its being broken; this you must often repeat, as the spindle advances in height, and also observe to pull off all side spindles as they are produced, and never let more than two spindles remain upon one root, nor above one, if you intend to blow exceeding large. Toward the beginning of June your flowers will have attained their greatest height, and their pods will begin to swell, and some of the earliest begin to open on one side; you must therefore observe to let it open in two other places at equal angles; this must be done so soon as you perceive the pod break, otherwise your flower will run out on one side, and be in a short time past recovering, so as to make a complete flower, and in a few days after the flowers begin to open, you must cover them with glasses which are made for that purpose, in the following manner:

Upon the top of the glass, exactly in the center, is a tin collar, or socket, about three fourths of an inch square, for the flower-stick to come through; to this socket are soldered eight slips of lead at equal distances, which are about six inches and a half long, and spread open at the bottom about four inches asunder; into these slips of lead are fastened slips of glass, cut according to the distances of the lead, which, when they are fixed in, are bordered round the bottom with another slip of lead quite round, so that the glass hath eight angles, with the socket in the middle, and spread open at the bottom about eleven inches wide.

When your flowers are open enough to cover with these glasses, you must make a hole through your flower-stick, exactly to the height of the under part of the pod, through which you should put a piece of small wire about six inches long, making a ring at one end of the wire to contain the pod, into which ring you should fix the stem of the flower; then cut off all the tyings of bass, and thrust the stem of the flower so far from the stick, as may give convenient room for the flower to expand without pressing against the stick; to which distance you may fix it, by turning your wire so as not to draw back through the hole; then make another hole through the stick, at a convenient distance above the flower, through which you should put a piece of wire, an inch and a half long, which is to support the glasses from sliding down upon the flowers; and be sure to observe, that the glasses are not placed so high as to admit the sun and rain under them to the flowers, nor so low as to scorch their leaves with the heat. At this time also, or a few days after, as you shall judge necessary, you should cut some stiff paper, cards, or some such thing, into collars about four inches over, and exactly round, cutting a hole in the middle of it about three fourths of an inch diameter, for the bottom of the flower to be let through; then place these collars about them, to support the petals of the flower from hanging down; this collar should be placed with inside the calyx of the flower, and should be supported thereby; then observe from day to day what progress your flowers make; and if one side comes out faster than the other, you should turn the pot about, and shift the other side towards the sun; and also if the weather proves very hot, you should shade the glasses in the heat of the day with Cabbage leaves, &c. to prevent their being scorched, or forced out too soon; and when the middle pod begins to rise, you should take out the calyx thereof with a pair of nippers made for that purpose; but this should not be done too soon, lest the middle part of the flower should advance too high above the sides, which will greatly diminish the beauty of it: and you should also observe whether there are more leaves in the flower, than can properly be expanded for want of room; in which case you should put out some of the lowermost or most unlikely leaves to spread, drawing out and expanding the others at the same time: and when your flowers are fully blown, if you cut them off, you should put on a fresh collar of stiff paper, which should be cut exactly to the size of the flower, that it may support the petals to their full width, but not to be seen wider than the flower in any part: when this is put on, you must draw out the widest leaves to form the outside of the flower, which although they should be in the middle (as it often happens,) yet by removing the other leaves they may be drawn down, and so the next longest leaves upon them again, that the whole flower may appear equally globular without any hollow parts. In the doing of this, some florists are so curious as to render an indifferent flower very handsome; and on this depends, in a great measure, the skill of the artist to produce large fine flowers.

During the flowering season, particular care should be taken not to let them suffer for want of water, which should by no means be raw spring water; nor do I approve of compound waters, such as are enriched with various sorts of dung; but the best and most natural water is that of a fine soft river; next to that is pond water, or standing water; but if you have no other than spring water, it should be exposed to the sun and air two days before it is used, otherwise it will give the flowers the canker and spoil them.

The directions here given are chiefly for the management of those large Carnations, which require the greatest skill of the florists, to have them in perfection; but as of late years these have not been so much in esteem as formerly, and those flowers which do not break their pods, and are termed whole Blowers, have now the preference. These are generally planted in pots, and treated in the same way as the large flowers, but do not require so much trouble to blow them: all that is necessary to be done for these, is to fasten their stems up to flower-sticks to prevent their

being broken, and to take off the pods which proceed from the side of the stalks, leaving only the top bud to flower, if they are intended to be large and fair; and when the flowers begin to open, if they are screened from the sun in the heat of the day, and also from wet, they will continue much longer in beauty.

But although the most valuable of these flowers are usually planted in pots, and thus carefully treated, yet many of these whole blowing flowers may be planted in beds, or borders of the flower-garden, where they are some of the principal ornaments during their continuance in flower, which is from the beginning of July till the middle of August, especially if the several colours are properly intermixed; for the Flakes and Bizarrs should be intermixed with the Picquettes, and not planted separate, unless where they are designed for saving the seeds; in which case, those which are the finest of each sort, should be planted in beds at a distance from each other, especially where persons are desirous to keep them distinct; for where the sorts are blended together, there will be an admixture of their farina, so that the seeds will vary, and not produce the particular kinds; though I do not remember ever to have seen any Flake flowers arise from seeds of the Picquettes, nor vice versâ.

The flowers which are planted in the full ground, generally produce seeds better than those in pots; but whoever proposes to raise a supply of new flowers from seeds, must always observe to save the best of their seedling flowers for this purpose; for it is well known, that after any of these flowers have been a few years propagated by layers, they become barren, and do not seed; which is also the case with most other plants which are propagated by slips, layers, or cuttings; so that the young plants which have been newly obtained from seeds, are always the most productive of seeds: the plants which are propagated by layers or slips, will always continue to produce the same flowers, so that when a fine variety is obtained, it is this way propagated and maintained; but all the new varieties come from seeds, so that all those who are curious in these flowers, annually sow their seeds.

I shall next proceed to the culture of that species, which is commonly known by the title of Sweet William; of this there are a great variety of different colours, which are single, and three or four with double flowers: some of these have narrow leaves, which were formerly titled Sweet Johns, but of late that distinction has not been made, because they are found to vary when raised from seeds.

Some of the single flowers have very rich colours, which frequently vary in those of the same bunch; there are others with fine variegated flowers, and others whose middles are of a soft red, bordered with white, which are called Painted Ladies; but where persons are desirous to preserve any of these varieties in perfection, the best flowers of each should be particularly marked, and no other permitted to stand near them, lest their farina should impregnate them, which would cause them to vary.

That which is called the Painted Lady Sweet William, is a very beautiful variety; the stalks of this do not rise so high as most of the other; the bunches of flowers are larger, and produced more in the form of an umbel, the flowers standing equal in height, make a better appearance: there are others whose stalks rise three feet high, and the flowers of a very deep red or scarlet colour. These all flower at the same time with the Carnations, which renders them less valuable, because they have no scent.

The single kinds of these flowers are generally propagated by seeds, which must be sown the latter end of March or the beginning of April, in a bed of light earth, and in June they will be fit to transplant out; at which time you must prepare some beds ready for them, and set them at six inches distance every way: in these beds they may remain till Michaelmas, at which time they may be transplanted into the borders of the pleasure-garden or wilderness. These will flower the next year in June, and perfect their seeds in August, which you should save from the best coloured flowers for a supply.

They may be also propagated by slipping their roots at Michaelmas; but this is seldom practised, since their seedling roots will always blow the strongest, and new varieties are obtained yearly.

The four sorts with double flowers are, 1. The broad-leaved sort, which hath very double flowers, of a deep purple colour inclining to blue, which bursts its pods, so that it is not so much esteemed as the others, and therefore has been less regarded, and is now almost totally banished the gardens of the curious. 2. The Double Rose Sweet William, whose flowers are of a fine deep Rose colour, and smell sweet; this is much valued for the beauty and sweetness of its flowers; the empalement (or pods) of these flowers never burst, so the flowers remain with their petals fully expanded, and do not hang down loosely as those of the former. 3. The Mule, or Fairchild's Sweet William; it hath narrower leaves than either of the former, and is of that variety called Sweet John: this was said to have been produced from seeds of a Carnation, which had been impregnated by the farina of the Sweet William; the flowers of this are of a brighter red colour than either of the former, their bunches are not quite so large, but the flowers have an agreeable odour. The fourth sort has fine variegated flowers.

The double kinds are propagated by layers, as the Carnations; they love a middling soil, not too light, nor too heavy or stiff, nor too much dunged, which very often occasions their rotting: these continue flowering for a long time, and are extremely beautiful, especially the Mule, which produces two full blooms of flowers, one in June, and the other in July. This is very subject to canker and rot away, especially if planted in a soil over wet or too dry, or if watered with sharp spring water. These flowers being planted in pots, are very proper to adorn court-yards at the time they are in flower.

The China Pink is generally supposed an annual plant, because the plants which are raised from seeds flower and produce ripe seeds the same season, so their roots are not often preserved; but where they are planted on a dry soil, they will continue two years, and the second year will produce a greater number of flowers than the first. There are a great variety of very rich colours in these flowers, which annually vary when raised from seeds. The double flowers of this sort are most esteemed, though the colours of the single are more distinct and beautiful; for the multiplicity of petals in the double flowers, in a great measure, hides the deep shades, which are toward the lower part of the petals.

These plants are propagated by seeds, which should be sown upon a gentle hot-bed about the beginning of April; this moderate heat is only intended to forward the vegetation of the seeds, therefore when the plants come up, they must have a large share of air admitted to them, to prevent their drawing up weak; and as soon as the weather will permit, they must be exposed to the open air; in about three weeks or a month after, the plants will be fit to remove; then they should be carefully taken up with good roots, and planted in a bed of rich earth, at about three inches asunder, being careful to shade them from the sun till they have taken new root, and in dry weather they must have water three or four times a week. The farther care is to keep them clean from weeds till the end of May, at which time they may be transplanted to the places where they are designed to remain for flowering, when they may be taken up with large balls of earth to their roots, so as scarcely to feel their removal, especially if it happens to rain at that time.

As these plants do not grow large, so when they are planted singly in the borders of the flower-garden, they do not make so fine an appearance, as where they are planted by themselves in beds; or if they are

planted in small clumps, of six or eight roots in each, where the flowers being of different colours, set off each other to advantage.

Those who are curious in these flowers, take particular care in saving their seeds, for they never permit any single flowers to stand among their double, but pull them up as soon as they shew their flowers, and also draw out all those which are not of lively good colours; where this is observed, the flowers may be kept in great perfection; but where persons have trusty friends, who live at some distance, with whom they can exchange seeds once in two or three years, it is much better so to do, than to continue sowing seeds in the same place many years in succession, and this holds true in most sorts of seeds: but the great difficulty is to meet with an honest person of equal skill, who will be as careful in the choice of his plants for seed, as if he was to sow them himself.

DIAPENSIA. See Sanicula.

DICTAMNUS. Lin. Gen. Plant. 468. Fraxinella. Tourn. Inst. R. H. 430. tab. 243. White Dittany, or Fraxinella; in French, *Fraxinelle.* This plant was titled Fraxinella, from Fraxinus the Ash-tree, the leaves of this having some resemblance in their form, to those of the Ash-tree, so it was called Little Ash. But as this plant has been long mentioned under the title of Dictamnus albus, i. e. *White Dittany* in the dispensaries, so Dr. Linnæus has adapted that title to this genus.

The Characters are,

*The empalement of the flower is composed of five small oblong leaves, ending in points. The flower hath five oblong petals which are unequal, two of them turning upward, two are oblique on the sides, and one turns downward. It hath ten rising stamina, which are as long as the petals, which are situated between the two side petals; they are not equal in length, and are terminated by obtuse four-cornered summits standing erect. In the center is situated a five-cornered germen, supporting a short incurved style, crowned by an acute stigma; the germen afterward becomes a capsule with five cells, each having a compressed margin, which spreads open at their exterior parts, but join together at their inner, opening with two valves, and inclosing several roundish, hard, shining seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, the flower having ten stamina and one style.

We have but one distinct Species of this genus, viz.

Dictamnus (*Albus*). Hort. Cliff. 161. Fraxinella. Clus. Hist. 99. and the Dictamnus albus, vulgò Fraxinella. C. B. P. 222. *White Dittany, commonly called Fraxinella.*

There are three varieties of this plant, one with a pale red flower striped with purple, another with a white flower, and one with shorter spikes of flowers; but as I have observed them to vary when propagated by seeds, so I esteem them only seminal varieties.

This is a very ornamental plant for gardens, and as it requires very little culture, so deserves a place in all good gardens. It hath a perennial root, which strikes deep into the ground, and the head annually increases in size; these send up many stalks, which rise from two to three feet high, garnished with winged leaves placed alternate, composed of three or four pair of oblong lobes, terminated by an odd one: they are smooth and stiff, sitting close to the midrib, which hath a longitudinal furrow on the upper side; the lobes (or small leaves) placed on each side the midrib, are oblique, but those which terminate the leaf have their sides equal. The flowers are produced in a long pyramidal loose spike or thyrse; on the top of the stalk, which is nine or ten inches long; the flowers of one sort is white, and of the other they are of a pale red, marked with red or purple stripes. The whole plant when gently rubbed, emits an odour like that of Lemon peel, but when bruised has something of a balsamic scent. It flowers the latter end of May, and in June, and the seeds ripen in September.

These plants are propagated by seeds, which, if sown in the autumn soon after they are ripe, the plants will appear the following April; but when they are kept out of the ground till the spring, the seeds seldom succeed; or if they do grow, it is the following spring before the plants appear, so that a whole year is lost. When the plants come up, they must be constantly kept clean from weeds; and in the autumn when their leaves decay, the roots should be carefully taken up, and planted in beds at six inches distance every way; these beds may be four feet broad, and the paths between them two, that there may be room enough to pass between the beds to weed them. In these beds the plants may stand two years, during which time they must be constantly kept clean from weeds; and if they thrive well, they will be strong enough to flower; so in the autumn they should be carefully taken up, and planted in the middle of the borders of the flower-garden, where they will continue thirty or forty years, producing more stems of flowers in proportion to the size of the roots. All the culture these require, is to be kept clean from weeds, and the ground about them dug every winter.

The roots of this plant are used in medicine, and esteemed cordial and cephalic, resisting putrefaction and poison, and are useful in malignant and pestilential distempers, as also in epilepsies.

DICTAMNUS CRETICUS. See Origanum.

DIERVILLA. Tourn. Act. R. Par. 1706. Lonicera. Lin. Gen. Plant. 210.

The title of this genus was given it by Dr. Tournefort, after Mr. Dierville, a surgeon, who brought this plant from Acadia.

The Characters are,

*The empalement of the flower is cut into five parts, almost to the bottom; the flower is of one leaf, having a tube at the bottom, but is cut into five parts at the top, and has the appearance of a lip flower; it hath five stamina, which are terminated by oblong summits, which are equal with the petal. At the bottom of the flower is situated an oval germen fixed to the empalement, supporting a slender style equal with the stamina, crowned by an obtuse stigma; the germen afterward becomes a pyramidal berry, divided into four cells, which contain small round seeds.*

This genus of plants is ranged in the fourth section of Tournefort's third class, which includes the plants with a tubulous anomalous flower of one leaf. It is ranged by Dr. Linnæus under his genus of Lonicera, in the first section of his fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

We know but one Species of this genus at present, viz.

Diervilla (*Lonicera*) Acadiensis fruticosa, flore luteo. Act. R. Par. 1706. *Shrubby Diervilla of Acadia with a yellow flower.* This is the Lonicera racemis terminalibus foliis serratis. Lin. Sp. Plant. 275. *Lonicera with bunches of flowers terminating the branches, and sawed leaves.*

This plant grows naturally in the northern parts of America, from whence it was brought to Europe, and is now propagated in the gardens for sale. It hath woody roots which spread far in the ground, and put out shoots at a distance from the principal stalk, whereby it multiplies greatly: the stalks are ligneous, and seldom rise more than a foot and a half high; these are garnished with oblong heart-shaped leaves, ending in acute points; they are very slightly sawed on their edges, and are placed opposite, sitting close to the stalks: the upper part of the stalks are garnished with flowers, which usually come out from the side of the stalk at the sitting on of the leaves, and also at the top of the stalks; there are two or three flowers sustained upon each foot-stalk: they are of a pale yellow, and being small, make no great appearance. These come out in May, and if the season proves moist and cold, they frequently flower again in August.

It is easily propagated by suckers, which it sends out in plenty, and loves a moist soil and shady situation, where the cold will never injure it.

**DIGITALIS.** Lin. Gen. Plant. 676. Tourn. Inst. R. H. 164. tab. 73. Raii Meth. Plant. 89. Foxglove; in French, *Digitale*.

The Characters are,

*It hath a permanent empalement, which is cut into five parts; the flower is bell-shaped, of one petal, with a large open tube, whose base is cylindrical and contracted, and the brim is divided into four parts slightly; the upper lip spreading and indented at the top, the lower is larger. It hath four stamina, which are inserted in the base of the petal, two being longer than the other, which are terminated by bipartite acuminated summits; the flower being past, the germen swells to an oval capsule, having two cells sitting on the empalement, inclosing many small angular seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, the flower having two long and two shorter stamina, and the seeds being included in a capsule.

The Species are,

1. Digitalis (*Purpurea*) calycinis foliolis ovatis acutis, corollis obtusis, labio superiore integro. Hort. Upsal. 178. *Foxglove whose small leaves of the empalement are oval and acute, the petals obtuse, and the upper lip entire.* Digitalis purpurea folio aspero. C. B. P. 243. *Purple Foxglove with a rough leaf, or common Foxglove.*
2. Digitalis (*Thapsi*) foliis decurrentibus. Lin. Sp. 867. *Foxglove with running leaves.* Digitalis Hispanica purpurea minor. Tourn. Inst. 165. *Lesser Spanish purple Foxglove.*
3. Digitalis (*Lutea*) calycinis foliolis lanceolatis corollis acutis labio superiore bifido. Hort. Upsal. 178. *Foxglove with spear-shaped leaves to the empalement, an acute petal, whose upper lip is bifid.* Digitalis minor lutea, parvo flore. C. B. P. 244. *Lesser yellow Foxglove with a small flower.*
4. Digitalis (*Magno flore*) foliolis calycinis linearibus, corollis acutis, labio superiore integro, foliis lanceolatis. *Foxglove with long narrow leaves to the empalement, an acute petal, whose upper lip is entire, and spear-shaped leaves.* Digitalis lutea, magno flore. C. B. P. 244. *Yellow Foxglove with a larger flower.*
5. Digitalis (*Ferruginea*) calycinis foliolis ovatis obtusis, corollæ labio inferiore longitudine floris. Lin. Sp. Plant. 622. *Foxglove with oval blunt leaves to the empalement, and the lower lip of the petal as long as the flower.* Digitalis angustifolia, flore ferrugineo. C. B. P. 244. *Narrow-leaved Foxglove with an iron-coloured flower.*
6. Digitalis (*Canariensis*) calycinis foliolis lanceolatis, corollis bilabiatis acutis, caule fruticoso. Lin. Sp. Plant. 622. *Foxglove with spear-shaped leaves to the empalement, an acute petal with two lips, and a shrubby stalk.* Digitalis acanthoides Canariensis frutescens, flore aureo. Hort. Amst. 2. p 105. *Shrubby Canary Foxglove like Bearsbreech, with a golden flower.*
7. Digitalis (*Orientalis*) calycinis foliolis acutis, foliis ovato-lanceolatis nervosis. *Foxglove with acute leaves to the empalement, and oval, spear-shaped, veined leaves.* Digitalis lutea non ramosa, scorzoneræ folio. Buxb. Cent. 25. *Yellow unbranched Foxglove with a leaf like Scorzonera.*

The first sort grows naturally by the side of hedges in shady woods in most parts of England, so is rarely cultivated in gardens. This is a biennial plant, which the first year produces a great tuft of long rough leaves which are hairy; the second year it shoots up a strong herbaceous stalk, which rises from three to four feet high, garnished with leaves of the same form as the lower, but they gradually lessen upward, so those which are intermixed with the flowers on the top are very narrow. The flowers grow in a long loose thyrse, standing only on one side of the stalk; they are large, tubulous, and shaped like a thimble, of a purple colour, with several white spots on the under lip; these flowers are succeeded by oval capsules with two cells, which are filled with dark brown seeds. It flowers in June, and the seeds ripen in autumn; if they are permitted to scatter, the plants will come up in the spring, and become troublesome weeds; but whoever has a [illegible] should sow the seeds in autumn, for those which are sown in the spring seldom succeed, or at least lie one year in the ground before they grow. This plant stands in the list of medicinal simples of the dispensaries, and there is an ointment made of the flowers, and May butter, which has been in good esteem.

There is a variety of this with a white flower, which is found growing naturally in some parts of England, which differs from this only in the colour of the flower and leaves; but this difference is permanent, for I have cultivated it more than thirty years in the garden, and have never found it vary.

The second sort grows naturally in Spain, from whence I received the seeds; this plant seldom rises much more than a foot and a half high; the lower leaves are ten inches long, and three broad in the middle; they are soft, woolly, and roughly veined on their under side; the stalks are garnished with leaves of the same shape, but smaller; the upper part of the stalk hath a short thyrse of purple flowers like those of the common sort, but they are smaller, and the segments of the petal are acute. This plant retains its difference when cultivated in gardens.

The third sort hath very long obtuse leaves near the root; the stalk is small, and rises from two to three feet high, the lower part being pretty closely garnished with smooth leaves, about three inches long and one broad, ending in obtuse points: the upper part of the stalk, for ten inches in length, is adorned with small yellow flowers, which are closely ranged on one side of the stalk, having a few very small acute leaves placed between them, which are situated on the opposite side of the stalk; the upper lip of the flower is entire, and the petal is obtuse. It flowers in June, and the seeds ripen in autumn.

The fourth sort hath long smooth-veined leaves at the bottom; the stalk is strong, and rises two feet and a half high, garnished with leaves which are five inches long, one and a half broad, ending in acute points; these have many longitudinal veins, and are slightly sawed on their edges; the upper part of the stalk is adorned with large yellow flowers, nearly of the size of those of the common sort, the brim having acute points, and the upper lip entire. This flowers and ripens its seeds about the same time as the former.

The fifth sort hath narrow smooth leaves, which are entire; the stalk rises near six feet high, and puts out some slender branches from the side toward the bottom; the lower part of the stalks is garnished with very narrow small leaves, three inches long, and one third of an inch broad; the flowers terminate the stalk, growing in a very long spike, with very few leaves between them, and those very small; the empalement is divided into four obtuse parts, the lower lip extending much longer than the upper. The flowers are of an iron colour, and appear in June.

The sixth sort grows naturally in the Canary Islands, from whence the seeds were first brought to England; and many of the plants were raised in the bishop of London's gardens at Fulham, part of which were sent to the royal gardens at Hampton Court, and some were sent over to the gardens in Holland: those which were sent to Hampton Court, were preserved there a few years, but by the ignorance of the gardeners, to whose care those gardens were committed, this, with many other valuable plants, were soon destroyed.

This plant hath a shrubby stalk which rises to the height of five or six feet, dividing into several branches, garnished with rough spear-shaped leaves, near five inches long, and two broad in the middle, gradually decreasing to both ends, having a few short serratures on their edges; these are placed alternately on the branches; each of these branches is terminated by a loose spike of flowers, about four inches in length; the empalement of these is cut into five acute seg-

ments almost to the bottom; the upper lip is long and entire, this is arched, and immediately under it the stamina and style are situated; the lower lip is obtuse, and indented at the top; there are two acute segments on the side, which compose the chaps of the flower; there are two of the stamina longer than the other; these are crowned with roundish summits. In the bottom of the flower is situated the germen, supporting a slender style, crowned by an oval stigma; the germen afterward becomes an oval capsule, filled with small angular seeds.

This plant begins to flower in May, and there is generally a succession of flowers on the same plant, till the winter puts a stop to them, which renders the plant more valuable. It is propagated by seeds, which should be sown in pots filled with light earth, in the autumn, soon after the seeds are ripe; these pots should be plunged into an old bed of tanners bark, whose heat is gone, and in mild weather the glasses should be drawn off to admit the air; but in hard rains and frost they must be kept on, to protect the seeds from both, which frequently destroys them here when they are exposed; in the spring the plants will come up, when they should enjoy the free air in mild weather, but must be protected from the cold. When these are large enough to transplant, they should be each planted into a separate small pot filled with light earth, and placed under the frame till they have taken new root, then they should be gradually inured to the open air. During the summer season the plants should remain abroad in a sheltered situation, but in the winter they must be placed in a green-house, for they will not live abroad in England; they must not be kept too warm and close in the house, for they only want protection from the frost; therefore in mild weather, they should have free air constantly admitted to them, and they require frequent waterings, but they should not have it in too great plenty in winter.

The seventh sort grows naturally in Tartary, from whence the seeds were sent to the imperial garden at Petersburgh, and from thence I received them. This plant hath many oval spear-shaped leaves, which are smooth, arising from the root; between these arise the stalk, which grows about a foot high, and is garnished below with smooth spear-shaped leaves, from four to five inches long, and one and a half broad in the middle, lessening gradually at both ends; these have no foot-stalks, but their base embraces the stalks half round; the upper part of the stalk is adorned by a short loose spike of yellow flowers, which are almost as large as those of the great yellow sort before-mentioned, but they are shorter. This flowers in May, and the seeds ripen in autumn.

All these sorts should be sown in the autumn; for if the seeds are sown in the spring, they commonly fail, or at least lie a whole year in the ground before they vegetate. The plants are biennial (except the seventh sort) and generally perish soon after the seeds are ripe.

DIOSCOREA. Plum. Nov. Gen. 9. tab. 26. Lin. Gen. Plant. 995.

The Characters are,

*It hath male and female flowers in different plants; the male flowers have a bell-shaped perianthium of one leaf, cut into six parts, but have no petals or empalement; they have six short hairy stamina, terminated by single summits. The female flowers have the same perianthium as the male; they have no petals, but have a small three-cornered germen, supporting three styles, which are crowned by single stigmas; the perianthium afterward becomes a triangular capsule with three cells, opening with three valves, containing two compressed bordered seeds in each.*

This genus of plants is ranged in the sixth section of Linnæus's twenty-second class, intitled Diœcia Hexandria. The plants of this class and section have male and female flowers on different plants, and the male flowers have six stamina.

The Species are,

1. Dioscorea (*Sativa*) foliis cordatis alternis, caule lævi tereti. Hort. Cliff. 459. *Dioscorea with heart-shaped leaves placed alternate, and a smooth taper stalk.* Dioscorea scandens, foliis tamni fructu racemoso. Plum. Nov. Gen. 9. *Climbing Dioscorea with black Briony leaves, and fruit growing in long bunches.*
2. Dioscorea (*Hastata*) foliis hastato-cordatis, caule lævi, racemis longissimis. *Dioscorea with spear-pointed heart-shaped leaves, a smooth stalk, and very long bunches of flowers.* Dioscorea scandens, folio hastato fructu racemoso. Houst. MSS. *Climbing Dioscorea with a spear-pointed leaf, and fruit growing in bunches.*
3. Dioscorea (*Villosa*) foliis cordatis alternis, oppositisque caule lævi. Lin. Sp. 1463. *Dioscorea with heart-shaped leaves placed alternate and opposite, and a smooth stalk.* Dioscorea scandens, folio subrotundo acuminato fructu racemoso. Houst. MSS. *Climbing Dioscorea with a roundish pointed leaf, and fruit growing in long bunches.*
4. Dioscorea (*Bulbifera*) foliis cordatis, caule lævi bulbifera. Flor. Zeyl. 360. *Dioscorea with heart-shaped leaves, and a smooth stalk bearing bulbs.* Volubilis nigra, radice albâ aut purpureâ maxima tuberosa esculenta, caule membranulis extantibus alato, folio cordato nervoso. Sloan. Cat. Jam. 46. *The Yam, or Yammes.*
5. Dioscorea (*Oppositifolia*) foliis oppositis ovatis acuminatis. Lin. Sp. 1483. *Dioscorea with oval-pointed leaves growing opposite.*
6. Dioscorea (*Digitata*) foliis digitatis. Hort. Cliff. 459. *Dioscorea with hand-shaped leaves.* Nureni Kelengu. Hort. Mal. 7. p. 67.

The first sort grows naturally in most of the islands in the West Indies. I received the seeds of this sort from Jamaica, where the late Dr. Houstoun found it growing plentifully. This hath slender climbing stalks, which fix themselves to any support near them, and rise to the height of eighteen or twenty feet, garnished with heart-shaped leaves, ending with acute points, having five longitudinal veins, which arise from the foot-stalks, which diverge toward the sides, but meet again at the point of the leaves. They stand upon pretty long foot-stalks, from the base of which arise the branching spikes of flowers, which are small, and have no beauty; the female flowers are succeeded by three-cornered oblong capsules, having three cells, each containing two compressed seeds.

The second sort differs from the first in the shape of their leaves, these having two round ears at their base, but the middle extends to an acute point, like that of an halbert. The bunches of flowers are longer, and are looser placed than those of the former sort.

The third sort hath broad, round, heart-shaped leaves, which end in acute points; these have many longitudinal veins which arise from the foot-stalk, and diverge to the side, but afterward join at the point of the leaf; the flowers come out on long loose strings, standing on short foot-stalks; the female flowers are succeeded by three-cornered oblong capsules, with three cells, having compressed bordered seeds.

The fourth sort hath triangular winged stalks, which trail upon the ground and extend to a great length; these frequently put out roots from the joints as they lie upon the ground, whereby the plants are multiplied. The roots of this plant are eaten in many parts of both Indies, where the plants are much cultivated.

The fifth sort grows naturally in Virginia, and in other parts of North America. This hath a smooth stalk which climbs on the neighbouring plants, and rises five or six feet high, garnished with heart-shaped leaves, which are placed opposite; they are covered with small hairs, and have several longitudinal veins. The flowers come out from the side of the stalk in the same manner as the other sorts, but have no beauty. These plants are preserved in some curious botanic gardens for the sake of variety; but as they have no beauty, there are few persons who will allow them a place, especially as most of the sorts require a good stove to preserve them through the winter in England.

These

This plant may be propagated by laying their branches into the ground, which in about three months will put out roots, and may then be taken from the old plant, and placed into separate pots, which should be plunged into the tan-bed in the stove; during the winter these plants should have but little water given them: but in summer, when they are growing vigorously, they should be watered three or four times a week, and in warm weather the glasses should be opened to admit a large share of free air. These plants rarely flower in England, but when the seeds are sent from America, they should be immediately sown in pots, and plunged into a hot-bed, where, if the seeds are sown early in the spring, the plants will come up the same season; but when they are sown late, the seeds often remain in the ground till the following spring before they vegetate; therefore when the plants do not come up the first season, the pots should be screened from the frost the following winter, and put into a new hot-bed in the spring, which will bring up the plants, if the seeds were good.

The fourth sort is much cultivated by the inhabitants of the islands in America, and is of great use to them for feeding of their negroes; and the white people make puddings of their roots, when ground to a sort of flour. This plant is supposed to have been brought from the East to the West Indies, for it has not been discovered to grow wild in any part of America; but in the island of Ceylon, and on the coast of Malabar, it grows in the woods, and there are in those places a great variety of sorts.

This sort, which is chiefly cultivated in the West Indies, has a root as big as a man's leg, of an irregular form, and of a dirty brown colour on the outside, but when cut, are white and meally within. The stalks of this plant are triangular and winged; the leaves are heart-shaped, having two ears, somewhat like those of Arum. These stalks climb to the height of ten or twelve feet, when they grow near trees or shrubs, to which they fasten themselves, otherwise they trail upon the ground.

This plant is propagated by cutting of the root into pieces, observing to preserve an eye or bud to each, as is practised in planting of Potatoes; each of these being planted will grow, and produce three or four large roots. In America they are commonly six or eight months in the ground before the roots are taken up for use. The roots are roasted or boiled, and eaten by the inhabitants, and sometimes are made into bread.

In some curious gardens this plant is preserved for the sake of variety, but it is so tender as not to live in England, unless it is placed in a warm stove. As these roots are frequently brought from America, whoever hath an inclination to preserve the plant, may cut them in the manner before described, and plant each piece in a pot filled with fresh earth, and plunged into a hot-bed of tanners bark, and give them little water until they shoot, lest they should rot. With this management I have had the shoots ten feet high, but the roots have not grown to any great size with me. This plant will not thrive in the open air in the warmest time of the year, so must constantly be kept in the bark-stove.

DIOSMA. Lin. Gen. Plant. 241. Spiræa. Com. Rar. Plant. 2. African Spiræa, vulgò.

The Characters are,

*The flower hath a permanent empalement, which is divided into four acute segments, which are plain at their base; it hath five obtuse petals, which spread open and are as long as the empalement; it hath five stamina terminated by oval erect summits, and a five-pointed hollow nectarium sitting on the germen, from which arises a single style, crowned by an obsolete stigma. The germen afterward becomes a fruit composed of five compressed capsules, which open lengthways, each inclosing one smooth oblong seed.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flowers having five stamina and one style.

The Species are,

1. Diosma (*Oppositifolia*) foliis subulatis acutis oppositis. Hort. Cliff. 71. *[illegible] leaves placed opposite.* Spiræa Africana, foliis cruciatim positis. Com. Rar. Plant. 1. tab. 1. *African Spiræa with leaves placed in form of a cross.*
2. Diosma (*Hirsuta*) foliis linearibus hirsutis. Hort. Cliff. 71. *Diosma with narrow hairy leaves.* Spiræa Africana odorata, foliis pilosis. Com. Rar. Plant. 2. tab. 3. *Sweet African Spiræa with hairy leaves.*
3. Diosma (*Rubra*) foliis linearibus acutis glabris, carinatis subtus bifarium punctatis. Lin. Sp. Plant. 198. *Diosma with smooth, narrow, acute leaves, which are spotted on their under side.* Spiræa Africana odorata, floribus suaverubentibus. Com. Rar. Plant. 2. *Sweet African Spiræa with soft red flowers.*
4. Diosma (*Erricoides*) foliis lineari-lanceolatis subtus convexis, bifariam imbricatis. Lin. Sp. Plant. 198. *Diosma with narrow spear-shaped leaves, which are convex on their under side, and imbricated two ways.* Spiræa Africana ericæ bacciferæ foliis. Raii Hist. 91. *African Spiræa with leaves like the Berry-bearing Heath.*
5. Diosma (*Lanceolata*) foliis lanceolatis glabris. Lin. Sp. 287. *Diosma with smooth spear-shaped leaves.* Spiræa Africana, Saturejæ foliis brevioribus. Raii Dendr. 91.

The first sort rises to the height of three feet; the branches are very long and slender, and are produced from the stem very irregularly; the leaves are placed crossways, and are pointed; these are every evening closed up to the branches. The flowers are produced along the branches from between the leaves; and in the evening, when these flowers are expanded, and the leaves are closely embracing the stalks, the whole plant appears as if covered with spikes of white flowers; and as these plants continue a long time in flower, they make a fine appearance when the plants are intermixed with other exotics in the open air.

The second sort has been long known under the title of Spiræa Africana odorata, foliis pilosis, or *Sweet-scented African Spiræa, with hairy leaves.* This sort makes a very handsome shrub, growing to the height of five or six feet; the stalks are woody, sending out many slender branches; the leaves come out alternately on every side, which are narrow-pointed and hairy. The flowers are produced in small clusters at the end of the shoots, which are white; these are succeeded by starry seed-vessels, having five corners, like those of the starry Anise; each of these corners is a cell, having one smooth, shining, oblong, black seed; these seed-vessels abound with a resin, which affords a grateful scent, as doth also the whole plant.

The third sort is of humbler growth than either of the former, seldom rising above three feet high, and spreads out into many branches; the leaves of this sort are smooth, and resemble those of the Heath, and this plant from thence had the name of Erica Æthiopica, &c. given it by Dr. Plukenet: the flowers of this kind are produced in clusters at the end of the branches, like those of the second sort, but are smaller, and the bunches are not so large.

All these plants are propagated by cuttings, which may be planted during any of the summer months, in pots filled with light fresh earth, and plunged into a very moderate hot-bed, where they should be shaded in the day time from the sun, and frequently refreshed with water. In about two months the cuttings will have taken root, when they should be each transplanted into a small pot, and placed in a shady situation until the plants have taken fresh root, when they may be placed among other exotic plants, in a sheltered situation: these plants may remain abroad until the beginning of October or later, if the season continues favourable; for they only require to be sheltered from frost, so that in a dry airy green-house they may be preserved very well in winter, and in summer they may be exposed to the open air with other green-house plants.

These plants grow naturally at the Cape of Good Hope, from whence the seeds were sent to Europe,

where some of the species have been long preserved in the gardens of the curious. There have been some other species in the English gardens than are here enumerated, but these are all that are at present to be found here.

The second sort frequently ripens its seeds in England; but if the seeds are not sown soon after they are ripe, they rarely grow, or they commonly lie a whole year in the ground.

DIOSPYROS. Lin. Gen. Plant. 1027. Guaiacana. Tourn. Inst. R. H. 600. tab. 371. The Indian Date Plumb.

The CHARACTERS are,

*It hath hermaphrodite and female flowers on the same plant, and male flowers on separate plants; the hermaphrodite flowers have a large obtuse permanent empalement of one leaf, which is divided into four parts; the flower hath one petal which is shaped like a pitcher, and cut at the brim into four segments, which spread open; it hath eight short bristly stamina firmly joined to the empalement, terminated by oblong summits which have no farina. In the center is situated a roundish germen, supporting a single quadrifid style, crowned by an obtuse bifid stigma; the germen afterward becomes a large globular berry with many cells, each including one oblong, compressed, hard seed. The male flowers have a one-leaved empalement, cut into small acute segments; the petal is thick and four-cornered, cut into four obtuse segments which turn backward; they have eight short stamina, terminated by long, acute, twin summits, but have no germen.*

This genus of plants is ranged in the second section of Linnæus's twenty-third class, intitled Polygamia Dioecia. The plants of this class and section have hermaphrodite and female flowers growing on the same plant, and the male on separate plants.

The SPECIES are,

1. DIOSPYROS (*Lotus*) foliorum paginis discoloribus. Lin. Sp. Plant. 1057. *Diospyros with the surface of the leaves of two colours.* Guaiacana. J. B. 2. 138. *The Indian Date Plumb.*
2. DIOSPYROS (*Virginiana*) foliorum paginis concoloribus. Lin. Sp. Plant. 1057. *Diospyros with the surface of the leaves of one colour.* Guaiacana Virginiana Pishamin dicta. Boerh. Ind. alt. 2. *The Pishamin or Persimon, and by some Pitchumon Plumb.*

The first sort is supposed to be a native of Africa, and was transplanted from thence into several parts of Italy, and also the south of France. The fruit of this tree is by some supposed to be the Lotus, which Ulysses and his companions were inchanted with. This is a tree of a middling growth in the warm parts of Europe, where there are several of them which are upward of thirty feet high; but particularly in the botanic garden at Padua there is one very old tree, which has been described by some of the former botanists, under the title of Guaicum Patavinum. This tree produces plenty of fruit every year, from the seeds of which many plants have been raised. In England there are none of these trees, but what have been raised within a few years past, in the physic garden at Chelsea; for the seeds of which I was greatly obliged to my much honoured friend, his excellency the Chevalier Rathgeb, his imperial majesty's minister at Venice, who has also supplied me with many other curious plants, trees, and fruits, from different parts of the world, where his extensive correspondence has been employed to collect whatever rare plants he could procure; and his generosity in communicating what seeds and plants he can procure to the physic garden at Chelsea, requires this public acknowledgment.

The second sort is a native of America, but particularly in Virginia and Carolina there is great plenty of these trees growing in the woods. The seeds of this sort are frequently brought to England, where the trees are now become pretty common in the nurseries about London. This rises to the height of fourteen or sixteen feet, but generally divides into many irregular trunks near the ground, so that it is very rare to see a handsome tree of this sort. This produces plenty of fruit in England, but they never come to perfection here. In America the inhabitants preserve the fruit until it be rotten (as is practised by Medlars in England) when they are esteemed a pleasant fruit.

These are both propagated by seeds, which will come up very well in the open ground; but if they are sown upon a moderate hot-bed, the plants will come up much sooner, and make a greater progress; but in this case the seeds should be sown in pots or boxes of earth, and plunged into the hot-bed, because the plants will not bear transplanting till autumn, when the leaves fall off; so that when the plants are up, and have made some progress, they may be inured by degrees to the open air; and in June they may be wholly exposed, and may remain abroad until November, when it will be proper to set the pots under a hot-bed frame to protect them from hard frost, which, while they are very young, may kill the tops of the plants; but they must have as much free air as possible in mild weather. The following spring, before the plants begin to shoot, they should be transplanted into a nursery, in a warm situation, where they may be trained up for two years, and then removed to the places where they are designed to remain. These are both hardy enough to resist the greatest cold of this country, after the plants have acquired strength.

DIPSACUS. Lin. Gen. Plant. 107. Tourn. Inst. R. H. 466. tab. 265. [διψακὸς, *Gr.* i. e. thirsty. It is said to have taken its name by way of contrary, because it receives the dew or rain in the hollow sinus of its leaves that cohere together, by which it drives away the injuries of thirst. It is also called Labrum Veneris, from the position of its leaves, which form a sort of bason, containing a liquor that beautifies the face.] The Teazel; in French, *Chardon à Bonnitier.*

The CHARACTERS are,

*It hath many florets collected in one common perianthium, which is permanent; the florets have but one petal, which is tubular, cut into four parts at the top, which are erect. They have four hairy stamina which are as long as the petal, terminated by prostrate summits; the germen is situated below the flower, supporting a slender style, crowned by a single stigma. The germen afterward becomes a column-shaped seed, inclosed in the common conical fruit, which is divided by long prickly partitions.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia, the flower having four stamina and one style.

The SPECIES are,

1. DIPSACUS (*Sylvestris*) foliis sessilibus serratis, aristis fructibus erectis. *Teazel with sawed leaves set close to the stalks, and erect beards to the fruit.* Dipsacus sylvestris. Dod. Pemp. 735. *Wild Teazel.*
2. DIPSACUS (*Fullonum*) foliis connatis, aristis fructibus recurvis. *Teazel with leaves joined at their base, and the beards of the fruit recurved.* Dipsacus sativus. Dod. Pemp. 735. *Cultivated Teazel.*
3. DIPSACUS (*Laciniatus*) foliis connatis sinuatis. Lin. Sp. Plant. 97. *Teazel with sinuated leaves joined at their base.* Dipsacus folio laciniato. C. B. P. 385. *Teazel with a laciniated leaf.*
4. DIPSACUS (*Pilosus*) foliis petiolatis appendiculatis. Hort. Upsal. 25. *Teazel with foot-stalks having appendices.* Dipsacus sylvestris, capitulo minore, seu Virga Pastoris minor. C. B. P. 385. *Wild Teazel with a smaller head, or smaller Shepherd's Rod.*

The first of these plants is very common upon dry banks in most parts of England, and is seldom cultivated in gardens, unless for the sake of variety.

The fourth sort grows naturally in many places near London, and is rarely admitted into gardens.

The third sort grows naturally in Alsace, and is kept in botanic gardens for the sake of variety; this differs from the wild Teazel in having the leaves deeply cut and jagged.

But it is the second sort only which is cultivated for use, which is called Carduus Fullorum, or Fullonum, being of so singular use in raising the knap upon woollen cloth, for which purpose there are great

quantities of this plant cultivated in the weſt country. This plant is propagated by ſowing the ſeeds in March, upon a ſoil that has been well ploughed: about one peck of this ſeed will ſow an acre; for the plants ſhould have room to grow, otherwiſe the heads will not be ſo large, nor in ſo great quantity. When the plants are come up, you muſt hoe them in the ſame manner as is practiſed for Turneps, cutting down all the weeds, and ſingling out the plants to about ſix or eight inches diſtance; and as the plants advance, and the weeds begin to grow again, you muſt hoe them a ſecond time, cutting out the plants to a wider diſtance, for they ſhould be, at laſt, left at leaſt a foot aſunder: and you ſhould be particularly careful to clear them from weeds, eſpecially the firſt ſummer; for when the plants have ſpread ſo as to cover the ſurface of the ground, the weeds will not ſo readily grow between them. The ſecond year after ſowing, the plants will ſhoot up ſtalks with heads, which will be fit to cut about the beginning of Auguſt; at which time they ſhould be cut, and tied up in bunches, ſetting them in the ſun if the weather be fair; but if not, they muſt be ſet in rooms to dry. The common produce is about an hundred and ſixty bundles or ſtaves upon an acre, which they ſell for about one ſhilling a ſtave. Some people ſow Caraway and other ſeeds among their Teazels, but this is not a good method, for the one ſpoils the other; nor can you ſo eaſily clear them from weeds, as when alone. Dr. Linnæus ſuppoſes this to be only a ſeminal variety of the common wild Teazel; but I have cultivated both the ſorts more than forty years, and have never found either of them alter, ſo that there can be no doubt of their being diſtinct ſpecies.

**DIRCA**, Leather Wood.

The Characters are,

*There is no empalement to the flower, which is club-ſhaped, of one petal, having a ſhort-bellied tube, and an unequal border; it hath eight ſlender ſtamina ſituated in the middle of the tube, terminated by erect roundiſh ſummits, with an oval germen, ſupporting a ſlender ſtyle which is longer than the ſtamina, crowned by a ſimple ſtigma. The germen afterward becomes a berry with one cell, incloſing one ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's eighth claſs, intitled Octandria Monogynia, the flower having eight ſtamina and one ſtyle.

We know but one Species of this genus, viz.

Dirca (*Paluſtris*). Amoen. Acad. 3. p. 12. *Marſh Leatherwood.* Thymelæa floribus albis primo vere erumpentibus, foliis oblongis acuminatis, viminibus & cortice valde tenacibus. Flor. Virg. 155.

This ſhrub grows naturally in ſwamps in Virginia, Canada, and other parts of North America, where it ſeldom riſes more than five or ſix feet high, but in Europe it rarely is more than half ſo high; it ſends out many articulated branches near the root, garniſhed with oval leaves, of a pale yellowiſh colour, and ſmooth; the flowers come out from the ſide of the branches, two or three upon each foot-ſtalk; they are of a greeniſh white colour, and appear early in the ſpring, juſt at the time when the leaves begin to ſhoot; the flowers are ſeldom ſucceeded by ſeeds in England. This ſhrub is very difficult to propagate in Europe; for as it does not produce ſeeds here, it can only be increaſed by layers or cuttings, and theſe are generally two years before they put out roots; for as the ſhrubs grow naturally in very moiſt places, they are with difficulty preſerved in gardens, unleſs they are planted in wet ground, but they are ſeldom injured by cold.

**DITTANY**, the white. See Dictamnus.

**DITTANY** of Crete. See Origanum.

**DOCK.** See Lapathum.

**DODARTIA.** Lin. Gen. Plant. 698. Tourn. Cor. 47. tab. 478. [This plant was ſo named by Dr. Tournefort, from Monſieur Dodart, a member of the Academy of Sciences at Paris.] We have no Engliſh name for this plant.

The Characters are,

*The flower hath a permanent empalement of one leaf, which is bell-ſhaped, cut into five parts at top; the flower hath one petal, is ringent, having a cylindrical diſtexed tube much longer than the empalement; the upper lip riſes and is indented, the lower lip ſpreads open and is trifid, the middle ſegment being narrow. It hath four ſtamina which incline to the upper lip, two of which are ſhorter than the other, and are terminated by ſmall roundiſh ſummits. In the center is ſituated a round germen, ſupporting an awl-ſhaped ſtyle, crowned by a bifid obtuſe ſtigma. The germen afterward becomes a globular capſule with two cells, filled with ſmall ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fourteenth claſs, intitled Didynamia Angioſpermia, the flower having two long and two ſhort ſtamina, and the ſeeds being included in a capſule.

The Species are,

1. Dodartia (*Orientalis*) foliis linearibus integerrimis glabris. Lin. Sp. Plant. 633. *Dodartia with very narrow, ſmooth, entire leaves.* Dodartia Orientalis, flore purpuraſcente. Tourn. Cor. 47. *Eaſtern Dodartia with a purpliſh flower.*
2. Dodartia (*Linaria*) foliis radicalibus oblongo-ovatis, ſerratis, caulinis linearibus integerrimis floribus ſpicatis terminalibus. *Dodartia with oblong, oval, ſawed leaves at the bottom, thoſe on the ſtalks narrow and entire, and flowers growing in ſpikes at the end of the ſtalks.* Linaria bellidis folio. C. B. P. 212. *Toad Flax with a Daiſy leaf.*

The firſt ſort was diſcovered by Dr. Tournefort near mount Ararat in Armenia, from whence he ſent the ſeeds to the royal garden at Paris, where they ſucceeded, and from thence moſt of the curious gardens in Europe have been ſupplied with this plant. This plant having characters which are different from all thoſe of Tournefort's Inſtitutions, he conſtituted this genus, and gave it the title from Monſieur Dodart, member of the Royal Academy of Sciences at Paris, and phyſician to her Royal Highneſs the Princeſs of Conti.

It hath a perennial root which creeps far under the ſurface, and ſends out new ſtalks at a great diſtance from the parent plant; theſe ſtalks are firm, a little compreſſed, and grow a foot and a half high, ſending out ſeveral ſide branches, garniſhed with long, fleſhy, narrow leaves placed oppoſite, of a deep green colour; thoſe on the lower part of the ſtalk are ſhorter and broader than thoſe above, but thoſe on the upper part of the ſtalk are entire; and at theſe joints the flowers come out ſingly on each ſide the ſtalk, ſitting cloſe to it; theſe are near an inch long; the bottom is tubulous, but divides into two lips above; the upper lip is hollow like a ſpoon, the convex ſide ſtanding upward, and is divided into two parts; the lower lip is divided into three parts, the middle being the narroweſt. The flower is of a deep purple colour, and appears in July, and is rarely ſucceeded by ſeeds in England. It propagates very faſt by its creeping roots, ſo that when it is once eſtabliſhed in a garden, it will multiply faſt enough; it loves a light dry ſoil, and may be tranſplanted either in autumn when the ſtalks decay, or in the ſpring before the new ſtalks ariſe.

The ſecond ſort is a biennial, or at moſt a triennial plant, which frequently periſhes ſoon after the ſeeds are ripe. This ſends out from the root ſeveral oblong leaves, which are near four inches long, narrow at their baſe, but increaſe in width upward, where they are about an inch broad, rounded at the end, and deeply ſawed on the edges; between theſe ariſe the ſtalks, which grow a foot high, their lower parts being garniſhed with leaves of the ſame form as the lower leaves, but much ſmaller; the upper leaves are very narrow and entire. The flowers grow in ſpikes on the top of the ſtalks; they are very ſmall and white, but are ſhaped like thoſe of the former ſort. This is propagated by ſeeds, which ſhould be ſown in autumn ſoon after they are ripe, upon a border of light earth, where they are deſigned to remain. When the plants appear the following ſpring, they muſt be thinned, and kept clear from weeds, which is all the cul-

culture they require: the second year they will flower and seed, after which the plants usually decay; when the seeds are sown in the spring, the plants never come up the same year.

DODECATHEON. See MEADIA.

DOG's TOOTH. See ERYTHRONIUM.

DOG-WOOD. See CORNUS.

DOLICHOS, Kidney Bean.

The CHARACTERS are,

*The empalement is of one leaf, short, and cut into four equal segments. The flower is of the butterfly kind, having a large round vexillum which is reflexed. The wings are oval, obtuse, and the length of the keel. The keel is moon-shaped, compressed, and the top ascends; it hath nine stamina joined below, and a single one standing separate, terminated by single summits, with a linear compressed germen, supporting an ascending style, crowned by a bearded stigma. The germen afterward becomes a large oblong pod with two valves, containing compressed elliptical seeds.*

*This genus is distinguished from Phaseolus, by the keel of the flower not being spiral.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, the flower having ten stamina in two bodies.

The SPECIES are,

1. DOLICHOS (*Lablab*) volubilis, leguminibus ovato-acinaciformibus, seminibus ovatis hilo arcuato versus alteram extremitatem. Prod. Leyd. 368. *Dolichos with a winding stalk, oval bill-shaped pods, and oval seeds.* Phaseolus Ægyptiacus nigro semine. C. B. P. 341.
2. DOLICHOS (*Uncinatus*) volubilis, pedunculis multifloris leguminibus cylindricis hirsutis apice unguiculo subulato hamato, caule hirto. Lin. Sp. 1019. *Dolichos with a winding stalk, many flowers on each foot-stalk, cylindrical hairy pods, whose points are crooked and awl-shaped.*
3. DOLICHOS (*Pruriens*) volubilis, leguminibus racemosis hirtis, valvulis subcarinatis, pedunculis ternis. Jacq. Amer. 27. *Dolichos with a winding stalk, hairy pods growing in a racemus, almost boat-shaped valves, and each foot-stalk having three pods.*
4. DOLICHOS (*Urens*) volubilis, leguminibus racemosis hirtis transversim lamellatis, seminibus hilo cinctis. Jacq. Amer. 27. *Dolichos with a winding stalk, hairy pods in a racemus, whose hairs are situated in transverse lamellæ, commonly called Cow-itch.*

There are many other species of this genus, as there are also of Phaseolus; but as there are few of them cultivated in the English gardens, it would swell this work to a great bulk, if they were all inserted which have come to our knowledge, as the author has cultivated more than sixty species, beside many varieties.

The two first sorts here mentioned, are cultivated in warm countries for the table, but in England these seldom perfect their seeds; and were they to thrive here as well as in the warm countries, they would be little esteemed, because we have much better sorts in our gardens already; for the scarlet flowering Kidney Bean is preferable to all the other sorts for eating, so deserves our care to cultivate it more than any other.

The third and fourth sorts are sometimes preserved in botanic gardens, but especially the fourth, whose pods are closely covered with stinging hairs, commonly known by the title of Cow-itch; but these are too tender to thrive in the open air in this country, so that whoever is desirous to have the plants, should sow their seeds in a hot-bed in March; and when the plants are come up, they should be each planted in a separate pot, and plunged into the hot-bed again, being careful to shade them till they have taken root; after which they must have fresh air every day admitted to them, in proportion to the warmth of the season; and when the plants are too tall to remain in the hot-bed, they should be removed into the bark-stove, where, if they are allowed room to run, they will flower and perfect their seeds.

DORIA. See SOLIDAGO and OTHONNA.

DORONICUM. Lin. Gen. Plant. 862. Tourn. Inst. R. H. 487. tab. 477. Leopard's Bane.

The CHARACTERS are,

*It hath a flower composed of several hermaphrodite florets, which are situated in the center, and form the disk, and of female florets which compose the rays; these are included in one common empalement, which hath a double series of leaves as long as the rays. The hermaphrodite florets are funnel-shaped, and cut into five parts at the top; these have five short hairy stamina, terminated by cylindrical summits. In the bottom is situated the germen, supporting a slender style, crowned by an indented stigma; the germen afterward becomes a single, oval, compressed seed, crowned with hairy down. The female florets are formed like a tongue, which are spread out and compose the border; these have a germen, supporting a style, crowned by two reflexed stigmas, but have no stamina; the germen becomes a single furrowed seed, covered with a hairy down.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, intitled Syngenesia Polygamia superflua. The plants of this section have female and hermaphrodite flowers, which are both fruitful.

The SPECIES are,

1. DORONICUM (*Pardalianches*) foliis cordatis obtusis, denticulatis radicalibus petiolatis, caulinis amplexicaulibus. Lin. Mat. Med. 394. *Leopard's Bane with obtuse, heart-shaped, indented leaves, those from the root having foot-stalks, and those above embracing the stalks.* Doronicum maximum, foliis caulem amplexiantibus. C. B. P. 184. *Greatest Leopard's Bane with leaves embracing the stalks.*
2. DORONICUM (*Plantagineum*) foliis ovatis acutis, subdentatis, ramis alternis. Hort. Cliff. 411. *Leopard's Bane with oval-pointed leaves indented at bottom, and alternate branches.* Doronicum plantaginis folio. C. B. P. 184. *Leopard's Bane with a Plantain leaf.*
3. DORONICUM (*Helveticum*) foliis lanceolatis, denticulatis, subtus tomentosis, caule unifloro. Prod. Leyd. 160. *Leopard's Bane with spear-shaped indented leaves, woolly on their under side, and one flower on a stalk.* Doronicum Helveticum incanum. C. B. P. 185. *Hoary Helvetian Leopard's Bane.*
4. DORONICUM (*Bellidiastrum*) caule nudo simplicissimo unifloro. Hort. Cliff. 500. *Leopard's Bane with a naked single stalk having one flower.* Bellis sylvestris media caule carens. C. B. P. 261. *Middle wild Daisy having a tall stalk.*

The first sort grows naturally in Hungary, and upon the Helvetian mountains, but is frequently preserved in the English gardens. It hath thick fleshy roots, which are divided into many knots or knees, sending out strong fleshy fibres, which penetrate deep into the ground; and from these arise in the spring a cluster of heart-shaped leaves, which are hairy, and stand upon foot-stalks; between these arise the flower-stalks, which are channelled and hairy, growing near three feet high, putting out one or two smaller stalks from the side, which grow erect, and are garnished with one or two heart-shaped leaves, closely embracing the stalks with their base; each stalk is terminated by one large yellow flower, composed of about twenty-four rays or female florets, which are about an inch long, plain, and indented in three parts at the top. In the center is situated a great number of hermaphrodite florets, which compose the disk; these are tubulous, and slightly cut at the top into five parts. The flowers appear in May, and are succeeded by seeds which ripen in July; these are crowned by a hairy down, which serves to convey them to a distance.

This plant multiplies very fast by its spreading roots, and if the seeds are permitted to scatter, they will produce plants wherever they happen to fall, so that it becomes a weed where it is once established; it loves a moist soil and a shady situation.

The second sort hath oval leaves, ending in acute points; these are indented on their edges toward their base, but their upper parts are entire; the stalks rise about two feet high; each is terminated by a large

yellow flower, like those of the former fort; the ftalks of this fort have two or three leaves, which are placed alternately, and their bafe fits clofe to the ftalks; thefe are not fo hairy as thofe of the former fort; it flowers about the fame time with that, and the feeds ripen well in England. This grows naturally in Portugal, Spain, and Italy, but is equally hardy with the firft, and multiplies in as great plenty; the root is perennial.

The third fort hath longer leaves than either of the former, which are covered with a hoary down on their under fide, and are indented on their edges; the ftalks are fingle, and have feldom more than one leaf upon each; thefe grow a foot and a half high, and are terminated by a fingle flower on the top, like thofe of the former forts. This grows naturally on the Pyrenees and Helvetian mountains. It delights in a moift foil and a fhady fituation, and propagates in plenty, either from feeds or by parting the roots: it flowers and feeds about the fame time with the former.

The fourth fort grows naturally on the Alps and Pyrenean mountains; this hath a perennial root; the leaves are like of the leffer Daify, but longer, and not fo broad. The flower grows upon a naked foot-ftalk, which is near a foot long; the roots feldom fend out more than one ftalk; the rays of the flower are white, and very like thofe of the common Daify; the difk of the flower is yellow, which is compofed of hermaphrodite flowers.

This plant is preferved in botanic gardens for the fake of variety, but the flowers make little better appearance than thofe of the common Field Daify, only they ftand upon much taller foot-ftalks. It muft have a fhady fituation and a moift foil, otherwife it will not thrive in this country; it is propagated by parting of the roots, for the feeds do not ripen well in England. I received this from Verona, near which place it grows naturally.

The roots of the firft fort have been fometimes ufed in medicine, fome having commended it as an expeller of the poifon of fcorpions; but others reckon it to be a poifon, and affirm that it will deftroy wolves and dogs.

The other forts which have been formerly ranged under this genus, are now feparated, and may be found under the title Arnica.

**DORSIFEROUS** plants [of dorfum, the back, and fero, *Lat.* to bear,] fuch plants as are of the capillary kind, without ftalk, and that bear their feeds on the backfide of their leaves.

**DORSTENIA.** Plum. Nov. Gen. 29. tab. 8. Lin. Gen. Plant. 147. [This plant was fo named by father Plumier, from Dr. Dorften, a German phyfician, who publifhed a hiftory of plants in folio.] Contrayerva.

The Characters are,

*It hath one common plain involucrum fituated vertically, upon which fit many fmall florets as in a difk; thefe have no petals, but have four fhort flender ftamina, terminated by roundifh fummits. In the center is fituated a roundifh germen, fupporting a fingle ftyle crowned by an obtufe ftigma; the germen afterward becomes a fingle feed, inclofed in the common flefhy receptacle.*

This genus of plants is ranged in the firft fection of Linnæus's fourth clafs, intitled Tetrandria Monogynia, the flower having four ftamina and one ftyle.

The Species are,

1. Dorstenia (*Contrayerva*) acaulis, foliis pinnatifido-palmatis, ferratis, floribus quadrangulis. Lin. Sp. 176. *Dwarf Dorftenia with many pointed, hand-fhaped, fawed leaves, and flowers placed on a quadrangular receptacle.* Dorftenia fphondylii folio, dentariæ radice. Plum. Nov. Gen. 29. *Dorftenia with a Cow Parfnep leaf, and a Toothwort root.*
2. Dorstenia (*Houftoni*) acaulis, foliis cordatis angulatis acuminatis, floribus quadrangulis. Lin. Sp. 176. *Dwarf Dorftenia with angular, heart-fhaped, pointed leaves, and quadrangular receptacles to the flowers.* Dorftenia dentariæ radice, folio minùs laciniato, placentâ quadrangulari & undulatâ. Houft. MSS. *Contrayerva with a Toothwort root, a leaf lefs cut, and a quadrangular waved placenta.*
3. Dorstenia (*Drakena*) acaulis, foliis pinnatifido-palmatis integerrimis, floribus ovalibus. Lin. Sp. 176. *Dwarf Dorftenia with many pointed, hand-fhaped, entire leaves, and an oval receptacle to the flowers; handed leaves, whofe angles are very acute, and an oblong four-cornered placenta.*

The firft of thefe plants was difcovered by my late ingenious friend Dr. William Houftoun, near Old Vera Cruz in New Spain. The fecond was found by the fame gentleman, on the rocky grounds about Campeachy. The third fort was found in great plenty in the ifland of Tobago, by Mr. Robert Millar, furgeon. But the roots of all thefe fpecies are indifferently brought over, and ufed in medicine, and for dyeing.

The firft fort fends out feveral leaves from the root, which are about four inches long, and as much in breadth; thefe are deeply laciniated into five or feven obtufe parts, ftanding upon foot-ftalks near four inches long; they are fmooth, and of a deep green. The ftalk which fupports the placenta arifes from the root, and grows near four inches high, upon which the flefhy placenta is vertically placed; this is of an oval form about one inch long, and three quarters broad. Upon the upper furface of this, the fmall flowers are clofely fituated, the flefhy part becoming an involucrum to them; thefe are very fmall, and fcarce confpicuous at a diftance, being of an herbaceous colour.

The fecond fort fends out feveral angular heart-fhaped leaves from the root, which have foot-ftalks eight or nine inches in length and very flender; the leaves are about three inches and a half long, and almoft four broad at their bafe, the two ears having two or three angles which are acute, and the middle of the leaves are extended and end in acute points like a halbert; thefe are fmooth and of a lucid green; the foot-ftalk which fuftains the placenta is nine inches long, and about half an inch fquare, and the upper furface clofely fet with fmall flowers like the firft.

The third fort fends out leaves of different forms; fome of the lower leaves are heart-fhaped, having a few indentures on their edges, and ending in acute points, but the larger leaves are deeply cut like the fingers on a hand, into fix or feven acute fegments. Thefe leaves are five inches long, and fix broad in the middle; they are of a deep green, and ftand upon long foot-ftalks. The placenta is very thick and flefhy, an inch and a half long, and three quarters broad, having four acute corners; thefe have a number of fmall flowers, placed on their upper furface like the other fpecies.

Thefe plants are at prefent very rare in Europe, nor was it known what the plant was, whofe roots were imported, and had been long ufed in medicine in England, until the late Dr. Houftoun informed us: for although father Plumier had difcovered one fpecies of this plant, and given the name of Dorftenia to the genus, yet he feems not to have known, that the Contrayerva was the root of that plant.

It will be difficult to obtain thefe plants, becaufe the feeds are feldom to be found good; nor will they grow, if they are kept long out of the ground; fo that the only fure method to obtain them is, to have the roots taken up at the time when their leaves begin to decay, and planted pretty clofe in boxes of earth, which may be brought very fafe to England, provided they are preferved from falt water, and are not over-watered with frefh water in their paffage. When the plants arrive, they fhould be tranfplanted each into a feparate pot filled with frefh earth, and plunged into the bark-ftove, which fhould be kept of a moderate heat; and the plants muft be frequently refrefhed with water during the fummer feafon; but in winter, when the leaves are decayed, it fhould be given to them more fparingly. With this management thefe plants may not only be maintained, but

may

may alſo be increaſed by parting their roots in the ſpring, before the plants put out their leaves.

DORYCNIUM. See Lotus.

DOUGLASSIA. See Volkameria.

DRABA. Dillen. Gen. Lin. Gen. Plant. 714. Alyſſon. Tourn. Inſt. R. H. 216. tab. 104.

The Characters are,

*The flower hath a four-leaved empalement, which falls off. It hath four petals placed in form of a croſs. It hath ſix ſtamina, four of which are as long as the empalement, the other two are much ſhorter and incurved; theſe are terminated by roundiſh ſummits. In the center is ſituated a bifid germen, ſupporting a permanent ſtyle, crowned by an oblong ſtigma. The germen afterward becomes a very ſhort capſule with two cells, ſeparated by the ſwelling ſtyle, which is oblique, and longer than the capſule. The valves are parallel to the middle, and divide the lower part of the cell from the upper, which is open, round, concave, and opens oblique, each cell containing a ſingle ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifteenth claſs, intitled Tetradynamia Siliculoſa, the flower having four long and two ſhort ſtamina, and the ſeeds growing in ſhort capſules or pods.

The Species are,

1. Draba (*Alpina*) ſcapo nudo ſimplici, foliis lanceolatis integerrimis. Fl. Lapp. 255. *Draba with a ſingle naked ſtalk, and very entire ſpear-ſhaped leaves.* Alyſſon Alpinum, hirſutum luteum. Tourn. Inſt. 217. *Yellow hairy Alpine Madwort.*
2. Draba (*Verna*) ſcapis nudis, foliis lanceolatis ſub inciſis. Hort. Cliff. 333. *Draba with naked ſtalks and cut leaves.* Alyſſon vulgare, polygoni folio, caule nudo. Tourn. Inſt. 217. *Common Madwort with a Knot-graſs leaf and naked ſtalk.*
3. Draba (*Pyrenaica*) ſcapo nudo, foliis cuneiformibus trilobis. Lœfl. Lin. Sp. Plant. 642. *Draba with a naked ſtalk, and wedge-ſhaped leaves with three lobes.* This is the Alyſſon Pyrenaicum, perenne, minium, foliis trifidis. Tourn. Inſt. 217. *Leaſt perennial Madwort of the Pyrenees with trifid leaves.*
4. Draba (*Muralis*) caule ramoſo, foliis cordatis dentatis amplexicaulibus. Prod. Leyd. 33. *Draba with a branching ſtalk, and heart-ſhaped indented leaves embracing the ſtalks.* Alyſſon veronicæ folio. Tourn. Inſt. 217. *Madwort with a Speedwell leaf.*
5. Draba (*Polygonifolia*) caule ramoſo, foliis ovatis ſeſſilibus dentatis. Lin. Sp. Plant. 643. *Draba with a branching ſtalk, and oval indented leaves growing cloſe to the branches.* Alyſſon Alpinum, polygoni folio incano. Tourn. Inſt. R. H. 217. *Alpine Madwort with a hoary Knot-graſs leaf.*
6. Draba (*Incana*) foliis caulinis numeroſis incanis, ſiliculis oblongis. Flor. Suec. 526. *Draba with many hoary leaves on the ſtalks, and oblique pods.* Lunaria ſiliqua oblongâ intortâ. Tourn. Inſt. 219. *Moonwort with an oblong intorted pod.*

The firſt ſort grows naturally on the Alps, and other mountainous parts of Europe; this is a very low plant, which divides into ſmall heads like ſome ſorts of Houſeleek, and from thence it was titled Sedum Alpinum &c. or Alpine Houſeleek. The leaves are ſhort, narrow, and very hairy; from each of theſe heads come out a naked flower-ſtalk an inch and a half high, terminated by looſe ſpikes of yellow flowers, having four obtuſe petals placed in form of a croſs; when they fade they are ſucceeded by triangular or heart-ſhaped pods, which are compreſſed, and incloſe three or four roundiſh ſeeds. It flowers in March, and the ſeeds ripen the beginning of June.

This plant is eaſily propagated by parting of the heads; the beſt time for doing of this is in autumn, becauſe it ſhoots up to flower very early in the ſpring. It ſhould have a moiſt ſoil and a ſhady ſituation, where it will thrive and flower annually. It requires no other culture but to keep it clean from weeds.

The ſecond ſort is an annual plant, which grows naturally upon walls and dry banks in many parts of England, ſo is never cultivated in gardens. This flowers in April, and the ſeeds ripen in May.

The third ſort grows naturally on the Alps, and other mountainous parts of Europe. This is a low perennial plant, which ſeldom riſes more than two inches high; it has a ſhrubby ſtalk, which divides into many ſmall heads like the firſt ſort. The leaves are ſmall, ſome of them are winged, having five ſhort narrow lobes, placed on a midrib, others have but three. The flowers come out in cluſters, ſitting cloſe to the leaves. They are of a bright purple colour, and appear early in the ſpring. This is a perennial plant, which may be propagated by parting of the heads in the ſame manner as the firſt, and requires the ſame treatment.

The fourth ſort grows naturally in ſhady woods in many parts of Europe, and is but ſeldom kept in gardens, unleſs for the ſake of variety. It is an annual plant, riſing with an upright branching ſtalk about ten inches high, garniſhed with heart-ſhaped indented leaves, which embrace the ſtalks with their baſe. The ſtalks are terminated by looſe ſpikes of white flowers, which appear the beginning of May; in June the ſeeds ripen, and the plants ſoon after decay. If the ſeeds are permitted to ſcatter, the plants will come up without trouble. It muſt have a ſhady ſituation, and delights in a moiſt ſoil.

The fifth ſort is an annual plant, which grows in ſhady woods in the northern parts of Europe. This is like the former ſort, but the leaves are larger, rounder, and do not embrace the ſtalks; they are alſo hairy, and the flowers are yellow. If the ſeeds of this are permitted to ſcatter, the plants will maintain themſelves if they have a ſhady ſituation.

The ſixth ſort riſes with an upright ſtalk about a foot high, the lower part being very cloſely garniſhed by oblong hoary leaves, which are indented on their edges. The upper part of the ſtalks puts out two or three ſhort branches; theſe are almoſt naked of leaves, as is alſo the upper part of the ſtalk. The flowers come out looſely on the top of the ſtalk; they are compoſed of four ſmall white petals placed in form of a croſs, which are ſucceeded by oblong pods, which are twiſted, containing three or four roundiſh compreſſed ſeeds. It flowers in June, and the ſeeds ripen in July. This grows naturally in the north of England and in Wales.

This plant ſeldom continues more than two years, but if the ſeeds are ſown in autumn in a ſhady border, the plants will come up in the ſpring; or where the ſeeds are permitted to ſcatter, the plants will riſe without any trouble.

DRACO ARBOR. See Palma.

DRACO HERBA. [i. e. Dragon's-wort.] Tarragon, vulgò. See Abrotanum.

DRACOCEPHALUM. Lin. Gen. Plant. 648. Dracocephalon. Tourn. Inſt. R. H. 181. tab. 83. [of δράκων, a dragon, and κεφαλὴ, a head.] i. e. Dragon's-Head.

The Characters are,

*The flower hath a ſhort permanent empalement of one leaf, which is tubulous. It hath one ringent petal, with a tube the length of the empalement, with large oblong inflated chaps. The upper lip is obtuſe and arched, the under lip is trifid; the two ſide ſegments are erect, the middle turns downward and is indented. It hath four ſtamina ſituated near the upper lip, two being ſhorter than the other, and are terminated by heart-ſhaped ſummits. It hath a fourparted germen, ſupporting a ſlender ſtyle, ſituated with the ſtamina, and crowned by a bifid reflexed ſtigma. The germen afterward becomes four oval oblong ſeeds, incloſed in the empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourteenth claſs, intitled Didynamia Gymnoſpermia, the flower having two long and two ſhorter ſtamina, and the ſeeds are naked.

The Species are,

1. Dracocephalum (*Virginianum*) floribus ſpicatis foliis lanceolatis ſerratis. Lin. Sp. 828. *American Dragon's-Head with ſingle leaves and ſpiked flowers.* Dracocephalon Americanum. Breyn. Prod. 1. 34. *American Dragon's-Head.*

2. Dracocephalum (*Canariense*) floribus ſpicatis, foliis compoſitis. Lin. Hort. Cliff. 308. *Dragon's-Head with ſpiked flowers and compound leaves.* Moldavica Americana trifolia odore gravi. Tourn. Inſt. 184. *Three-leaved American Balm, having a ſtrong ſmell, commonly called Palm of Gilead.*

3. Dracocephalum (*Moldavica*) floribus verticillatis, bracteis lanceolatis ſerraturis capillaceis. Lin. Hort. Cliff. 308. *Dragon's-Head with flowers growing in whorls, and ſpear-ſhaped bracteæ.* Moldavica betonicæ folio, flore cæruleo. Tourn. Inſt. R. H. 184. *Moldavian Balm with a Betony leaf and blue flower.*

4. Dracocephalum (*Ocymifolia*) floribus verticillatis, foliis floralibus orbiculatis. Lin. Hort. Cliff. 308. *Dragon's-Head with flowers growing in whorls, and the upper leaves round.* Moldavica orientalis minima ocymifolio, flore purpuraſcente. Tourn. Cor. 11. *Leſſer Eaſtern Moldavian Balm with a Willow leaf and a bluiſh flower.*

5. Dracocephalum (*Caneſcens*) floribus verticillatis, bracteis oblongis, ſerraturis ſpinoſis, foliis tomentoſis. Hort. Upſal. 166. *Dragon's-Head with flowers growing in whorls, and the little leaves under the flowers ſawed, ending in ſpines, and woolly leaves.* Moldavica orientalis betonicæ folio, flore magno violaceo. Tourn. Cor. 11. *Eaſtern Moldavian Balm with a Betony leaf, and a large blue flower.*

6. Dracocephalum (*Nutans*) floribus verticillatis, bracteis oblongis ovatis integerrimis, corollis majuſculis nutantibus. Hort. Upſal. 167. *Dragon's-Head with flowers growing in whorls, the ſmall leaves under the flowers are oblong, entire, and hanging flowers much larger than the empalement.* Moldavica betonicæ folio, floribus minoribus cæruleis pendulis. Amman. Ruth. 44. *Moldavian Balm with a Betony leaf, and ſmaller blue pendulous flowers.*

7. Dracocephalum (*Thymiflorum*) floribus verticillatis, bracteis oblongis integerrimis, corollis vix calyce majoribus. Hort. Upſal. 167. *Dragon's-Head with flowers growing in whorls, the ſmall leaves are oblong, entire, and the flowers equal with the empalement.* Moldavica betonicæ folio, floribus minimis pallidè cæruleis. Amman. Ruth. 46. *Moldavian Balm with a Betony leaf, and very ſmall blue flowers.*

8. Dracocephalum (*Peltatum*) floribus verticillatis, bracteis orbiculatis ſerratociliatis. Hort. Upſal. 166. *Dragon's-Head with flowers growing in whorls, oval bracteæ and very narrow ſpear-ſhaped leaves.* Moldavica orientalis, ſalicis folio, flore parvo cæruleo. Tourn. Cor. 11. *Eaſtern Moldavian Balm with a Willow leaf, and a ſmall blue flower.*

9. Dracocephalum (*Grandiflorum*) floribus verticillatis foliis ovatis inciſo-crenatis, bracteis lanceolatis integerrimis. Lin. Sp. Plant. 595. *Dragon's-Head with flowers growing in whorls, oval leaves which are cut and crenated, and ſpear-ſhaped bracteæ which are entire.*

The firſt ſort is a native of North America, where it grows in the woods, and by the ſides of rivers. This riſes with an upright ſtalk, which is four-cornered, near three feet high, garniſhed with ſpear-ſhaped leaves about three inches long, and half an inch broad, ſitting cloſe to the ſtalk; they are ſawed on their edges, and are placed oppoſite at each joint, ſometimes there are three leaves ſtanding round at the ſame place. The flowers are purple and grow in ſpikes on the top of the ſtalks, ſo make a pretty variety among other hardy plants, eſpecially if the plants are ſtrong and vigorous. This is a perennial plant, which will live in the open air, but requires a moiſt ſoil, or ſhould be duly watered in dry weather, otherwiſe the leaves will ſhrink, and the flowers will make little appearance. This may be allowed a place in the ſhady borders of a garden, ſince it will not ramble, or take up much room. It flowers in July, and continues until the middle or end of Auguſt, and may be propagated by parting of the roots in autumn.

The ſecond ſort is a native of the Canary Iſlands, and hath been long an inhabitant in the gardens; it is uſually called by the gardeners Balm of Gilead, from the ſtrong reſinous ſcent which the leaves emit on being rubbed. This is a perennial plant, which riſes with ſeveral ſquare ſtalks to the height of three feet or more, becoming ligneous at their lower parts, and are garniſhed with compound leaves at each joint, which are placed oppoſite; theſe have three or five lobes, which are oblong, pointed, and ſawed on their edges. The flowers come out in ſhort thick ſpikes on the top of the ſtalks; they are of a pale blue colour, and are ſucceeded by ſeeds, which ripen very well in England. This plant continues producing flowers moſt part of ſummer; it is uſually kept in green-houſes; but in mild winters the plants will live abroad, if they are planted in warm borders; and thoſe plants which are kept in pots, will thrive much better when they are ſheltered under a frame, than if placed in a green-houſe, where the plants are apt to draw up weak, for they ſhould have as much free air as poſſible in mild weather, and only require to be ſheltered from ſevere froſt. This may be propagated by ſeeds, which, if ſown in autumn, will more certainly grow, than thoſe which are ſown in the ſpring; but if theſe are ſown in pots, they muſt be ſheltered under a frame in the winter, and if the plants do not come up the ſame autumn, they will ariſe in the ſpring; but if the ſeeds are ſown in the full ground, it ſhould be in a warm border; and in hard froſt they ſhould be ſheltered, otherwiſe the young plants will be deſtroyed. The plants may alſo be propagated by cuttings; which, if planted in a ſhady border any time in ſummer, will very ſoon take root, and furniſh plenty of rooted plants.

The third ſort is a native of Moldavia; this has been long preſerved in curious gardens. It is an annual plant, which riſes with branching ſtalks a foot and a half high, garniſhed with oblong leaves, which are placed oppoſite, and are deeply ſawed on their edges. The flowers come out in whorls round the ſtalks at every joint; theſe are blue, and appear in July, continuing to the middle of Auguſt, and the ſeeds ripen in September. The plants have a ſtrong balſamic odour, which is to ſome perſons very agreeable: the ſeeds ſhould be ſown in ſmall patches in the ſpring, upon the borders where they are to remain, and when the plants come up, they ſhould be thinned where they grow too near together, and kept clear from weeds, which is the only culture they require. Of this there is a variety with white flowers, which is pretty common in the gardens; this only differs from the other in the colour of the flowers, but yet theſe conſtantly retain their difference from ſeeds.

The fourth ſort was diſcovered by Dr. Tournefort in the Archipelago, who ſent the ſeeds to the royal garden at Paris, which have ſince been communicated to many curious gardens in Europe; this riſes with upright ſtalks about a foot high, which ſeldom put out branches; theſe are garniſhed with long narrow leaves, which are entire, placed oppoſite at each joint, where the flowers come out in whorls, almoſt the whole length of the ſtalks; theſe are of a pale blue, and appear about the ſame time as the former; this ſort has very ſmall flowers, which make no great appearance, therefore is ſeldom cultivated, except in botanic gardens for the ſake of variety.

The fifth ſort was diſcovered by Dr. Tournefort in the Levant; this hath hoary ſquare ſtalks, which riſe a foot and a half high, putting out two or three ſide branches, garniſhed with hoary leaves near two inches long, and half an inch broad, a little indented on their edges; they are placed oppoſite at the joints, juſt under the whorls of flowers, which ſit cloſe to the ſtalk; theſe are larger than thoſe of the other ſpecies, and are of a fine blue colour, which between the hoary leaves of the plant, make a pretty appearance. It flowers and ſeeds about the ſame time as the former ſorts; this is generally treated as an annual plant, like the former ſorts, but the roots of this will live two years if they are in a dry ſoil. There is a variety of this with white flowers, the ſeeds of which generally produce the ſame coloured flowers.

The sixth sort grows naturally in Siberia, from whence the seeds were sent to the imperial garden at Petersburgh, and the late Dr. Amman, who was professor of botany, sent me the seeds. This is an annual plant, from whose roots come out many square weak stalks, which grow about nine inches long; these are at the bottom garnished with oval spear-shaped leaves about two inches long, and one inch and a quarter broad, standing opposite upon pretty long foot-stalks, and are crenated on their edges. The upper part of the stalks have smaller leaves, which sit close at the joints, from whence come out the flowers in whorls; they are of a deep blue colour, and hang downward; these appear at the same time with the former, and the seeds ripen in autumn.

The seventh sort grows also in Siberia, the seeds of this were sent me with the former. It hath square stalks, which rise a foot and a half high; the lower leaves are very like those of Betony, and stand upon very long foot-stalks. The upper leaves are small, and sit closer to the stalks. The flowers come out in whorls at every joint; these are very small, and of a pale purple or blue colour, so make little appearance, but it is preserved in some gardens for the sake of variety.

The eighth sort grows naturally in the Levant, from whence Dr. Tournefort sent the seeds to the royal garden at Paris. This is an annual plant, which rises with a square stalk about a foot high, sending out two small side branches from the lower part. The leaves are spear-shaped, and crenated on their edges; they are placed opposite, and stand on foot-stalks. The flowers are small, of a purplish colour, and come out in whorls round the stalks, having two roundish small leaves (called bracteæ) immediately under them, which are sawed on their edges, each serrature ending with a long hair. This sort flowers and seeds at the same time as the former.

All these sorts are propagated by seeds, which may be sown either in the spring or autumn, in the places where the plants are to remain, and will require no other treatment than the third sort.

**DRACONTIUM.** Lin. Gen. Plant. 916. Dracunculus. Tourn. Inst. R. H. 160. tab. 70. Dragon; in French, *Serpentaire.*

The Characters are,

*It hath a single cylindrical spadix (or stalk) on the upper part of which the parts of fructification are disposed in a singular manner. The flowers have no empalement, but have five oval concave petals, which are equal; they have seven narrow depressed stamina the length of the petals, terminated by oblong, four-cornered, twin summits, which stand erect; they have an oval germen, supporting a taper style, crowned by a three-cornered stigma. The germen afterward becomes a roundish berry, inclosing several seeds; these are all inclosed in a large fleshy spatha (or sheath) opening with one valve.*

This genus of plants is ranged in the seventh section of Linnæus's twentieth class, intitled Gynandria Polyandria. This class and section contains the plants which have male and female flowers joined in the same spike, and the male flowers have several stamina.

The Species are,

1. Dracontium (*Pertusum*) foliis pertusis, caule scandente. Lin. Sp. Plant. 968. *Dragon with leaves having holes, and a climbing stalk.* Arum hederaceum, amplis foliis perforatis. Plum. Amer. 40. tab. 56. *Climbing Arum with large perforated leaves.*
2. Dracontium (*Polyphyllum*) scapo brevissimo, petiolo radicato, lacero, foliolis tripartitis, laciniis pinnatifidis. Hort. Cliff. 434. *Dragon with a very short stalk, the foot-stalk cut, and the small leaves divided into three parts, which terminate in many points.* Arum polyphyllum, caule scabro punicante. Par. Bat. 93. *Many leaved Arum with a rough purple stalk.*
3. Dracontium (*Spinosum*) foliis sagittatis, pedunculis petiolisque aculeatis. Flor. Zeyl. 328. *Dragon with arrow-pointed leaves, whose foot-stalks have spines.* Arum Zeylanicum spinosum, sagittæ foliis. Par. Bat. 75. *Prickly Arum of Ceylon with arrow-pointed leaves.*
4. Dracontium (*Camtschatcense*) foliis lanceolatis. Amœn. Acad. 2. p. 360. *Dragon with spear-shaped leaves.*

The first sort grows naturally in most of the islands in the West-Indies. This hath slender jointed stalks, which put out roots at every joint, that fasten to the trunks of trees, walls, or any support which is near them, and thereby rise to the height of twenty-five or thirty feet. The leaves are placed alternately, standing upon long foot-stalks; they are four or five inches long, and two and a half broad, having several oblong holes in each, which on the first view appears as if eaten by insects, but they are natural to the leaves. The flowers are produced at the top of the stalk, which always swells to a larger size in that part than in any other; these are covered with an oblong spatha (or hood) of a whitish green colour, which opens longitudinally on one side, and shews the pistil, which is closely covered with flowers, of a pale yellow, inclining to white. When this plant begins to flower, it seldom advances farther in height, so that these seldom are more than seven or eight feet high; but the leaves are much larger on these, than those of the plants which ramble much farther.

This plant is easily propagated by cuttings, which, if planted in pots filled with poor sandy earth, and plunged into a hot-bed, will soon put out roots, if they had none before; but there are few of the joints which have not roots: the plants are tender, so will not live in the open air in England, therefore the pots should be placed near the walls of the hot-house, against which the plants will climb, and fasten their roots into the wall, and thereby support the stalks. They should have but little water given them in the winter, but in warm weather it must be given them three or four times a week, and in the summer the free air should be admitted to them in plenty. The plants have no particular season of flowering, for they sometimes flower in autumn, and at other times in the spring, but they do not ripen their seeds in England.

The second sort grows naturally in several of the islands of America. I received roots of this from Barbuda. This hath a large knobbed irregular root, covered with a rugged brown skin. The stalk rises about a foot high, is naked to the top, where it is garnished with a tuft of leaves, which are divided into many parts. The stalk is smooth, of a purple colour, but is full of sharp protuberances of different colours, which shine like the body of a serpent. The spadix (or stalk) of the flower rises immediately from the root, and is seldom more than three inches high, having an oblong swelling hood at the top, which opens lengthways, shewing the short, thick, pointed pistil within, upon which the flowers are closely ranged.

This sort is tender, so requires a warm stove to preserve it in England. The roots must be planted in pots filled with light kitchen-garden earth, and plunged into the tan-bed in the stove, where they should constantly remain; in the winter they must be watered very sparingly, but in warm weather, when the plants are in vigour, they must be often refreshed, but it should not be given them in too great quantities; with this management the plants will flower, but their roots do not increase here.

The third sort grows naturally in the island of Ceylon, and in several parts of India; this hath an oblong thick root, full of joints, from which arise several leaves, shaped like those of the common Arum, but their foot-stalks are covered with rough protuberances. The stalk which supports the flower is short, and set with the like protuberances; and at the top is a hood, or spatha, about four inches long, as thick as a man's finger, which opens longitudinally, and exposes the pistil, which is set with flowers. This is a tender plant, and requires the same treatment as the former sort.

The fourth sort hath roots like the common Arum, from which come out several spear-shaped leaves, standing each upon a separate foot-stalk, arising im-

mediately from the root, as those of the common Arum. This hath not yet flowered in England, so I can give no further account of it. This grows naturally in Siberia, so requires a shady situation, and will bear the greatest cold of this country.

These plants are preserved in the gardens of the curious in England and Holland, more for the sake of variety than for beauty; for except the first sort, there is not any of them which make much appearance; that indeed may be suffered to have a place against the wall of the stove, over which it will spread, and cover the nakedness of the wall; and the leaves remaining all the year, which are so remarkably perforated, make a singular appearance.

All the other sorts of Dragon are tender plants, so will not live in this country, unless they are preserved in the warmest stoves; the several American sorts grow naturally in the woods in Jamaica, and other hot parts of America; the climbing sorts twist themselves round the trunks of trees, into which they fasten their roots, which are sent forth from their joints, and rise to the height of thirty or forty feet. These climbing sorts are easily propagated by cuttings, which, being very succulent, may be brought over to England in a box of dry hay, if they are packed up separate, so as not to injure each other by the moisture, which is apt to flow out at the part where they are cut off, which may occasion a fermentation, and thereby rot the cuttings. When the cuttings arrive, they should be planted in small pots filled with light fresh earth, and plunged into a hot-bed of tanners bark, being very careful not to let them have too much moisture until they have taken root, lest it rot them: when they have taken root, they must be frequently refreshed with water; and when they are grown pretty large, they should be placed in the bark-bed in the stove, where they must be placed near some strong plants, to which they may fasten themselves, otherwise they will not thrive; for though they will send forth roots at their joints, which will fasten to the mortar of the stove, when placed against the wall, yet they will not thrive near so well as against a strong plant, which will afford them nourishment.

The other sorts are propagated by offsets from their roots; these may be procured from the countries of their growth, and should be planted in tubs of earth, about a month before they are put on board the ship to transport them; these tubs should be placed in a shady situation until they have taken root. In their passage great care should be had to keep them from salt water, as also not to let them have too much water given them; for if they have a little water once or twice a week at most, while they are in a hot climate, and when they are come into a cooler climate, once in a fortnight, this will be sufficient for them; and it should be done sparingly, lest it rot them; for if the tops of the plants should decay for want of water in their passage, if the roots are not rotted, they will soon recover with proper care.

When the plants arrive, they should be transplanted into pots filled with light fresh earth, and plunged into a hot-bed of tanners bark, and gently watered until they have taken good root, after which time they will require to be frequently refreshed with water; but as their stems are very succulent, they must not have too much moisture. These plants should be constantly kept in the stove, where, in hot weather, they should have fresh air admitted to them; but in winter they must be kept very warm, otherwise they cannot be preserved in this country.

These plants will rise to the height of three, four, or five feet, and will afford a very agreeable variety amongst other tender exotic plants in the stove.

DRACUNCULUS PRATENSIS. See ACHILLEA.

DRAGON. See DRACONTIUM.

DROSERA. Ros Solis, or Sun-dew.

We have two or three species of this plant, which grow naturally upon bogs in many parts of England, and there are three or four other sorts, which are natives of warmer countries; but as these cannot be cultivated in gardens, unless where there are bogs, it would be needless to describe them.

The common round-leaved sort is used in medicine, so is gathered by the herb-folks who supply the markets.

DRYAS, Cinquefoil Avens.

There are two species of this genus, which grow naturally in Scotland and Ireland, upon mountainous places, where the soil is wet; one of them hath five petals to the flower, and winged leaves, the other hath eight petals to the flower, and simple leaves; but as neither of the plants make much appearance. they are rarely preserved except in some botanic gardens for variety.

DULCAMARA. See SOLANUM.

DUNGS are designed to repair the decays of exhausted or worn-out lands, and to cure the defects of land, which are as various in their qualities as the dungs are, that are used to meliorate and restore them: some lands abound too much in coldness, moisture, and heaviness; others again are too light and dry, and so, to answer this, some dungs are hot and light, as that of sheep, horses, pigeons, &c. others again are fat and cooling, as that of oxen, cows, hogs, &c.

And as the remedies that are to be used must be contrary to the distempers they are to cure, so the dung of oxen, cows, and hogs, must be given to clean, dry, light earths, to make them fatter and closer, and hot and dry dungs to meliorate cold, moist, and heavy lands.

There are two peculiar properties in dungs, the one is to produce a certain sensible heat, capable of producing some considerable effect, which properties are seldom found but in the dung of horses and mules, while it is newly made, and a little moist; the other property of dung is, to fatten the earth and render it more fruitful.

The dung of horses and mules is of admirable use in gardens in the winter time, because it then animates and enlivens all things; and, in some measure, supplies the office which is performed by the heat of the sun in the summer time, affording us all the novelties of the spring, as Asparagus, Cucumbers, Radishes, sallads, &c. Horse dung is the best improvement for cold jejune lands that we can procure in any quantity; but yet horse dung being used alone, or when it is too new, is frequently prejudicial to some plants; and if it be spread thin over lands in the summer time, it is of very little service, because the sun, drawing out all the virtue and goodness of it, renders it little better than thatch or dry straw; and though too much of it can scarcely be used in a kitchen-garden for Cabbages, Cauliflowers, and all other plants that grow there, and require abundance of nourishment; yet may it be a fault to lay too much of it on corn-lands, because it produces abundance of straw.

In very cold moist land, I have frequently seen new horse dung buried as it came from the stable, and always observed that the crops have succeeded better, than where the ground was dressed with very rotten dung.

Horse dung being of a very hot nature, is best for cold lands, and cow dung for hot lands; and being mixed together, may make a very good manure for most sorts of soil, and for some they may be mixed with mud.

Sheeps dung and deers dung differ not much in their quality, and are esteemed by some the best of dungs for cold clays. Some recommend them to be beat into powder, and spread very thin over autumn or spring crops, about four or five loads to an acre, after the same manner as ashes, malt dust, &c. are strewed.

This I have seen practised upon corn, and also upon grass land, to great advantage for the first year; but these light dressings do not last long, therefore require to be often repeated.

In Flanders and other places, they house their sheep at nights in places spread with clean sand, laid about five or six inches thick, which, being laid on fresh every night, is cleared out once a week; this mixture of sand and dung makes an excellent dressing for strong land, for the dung and urine of the sheep is a very rich manure, bears a considerable price, and is an excellent manure for all stiff cold land: and Mr. Quinteney is of opinion, that it is the greatest promoter of fruitfulness in all sorts of ground.

Others recommend hogs dung as the fattest and most beneficial of all sorts of dungs; and say, that one load of it will go as far as two loads of other dung, and that it is the best of all dungs for fruit-trees, especially for Pear and Apple-trees in a light soil, and a very rich dung for grass. I have often used this dung to fruit-trees when it was well rotted, and have found it the most beneficial to them of any manure.

The dung of pigeons, hens, and geese, are great improvers of meadow or corn land, the first of these being the best superficial improvement that can be laid on meadow or corn land: but before it is used, it ought to have lain abroad out of the dove-house some time, that the air may have a little sweetened it, and mollified the fiery heat that is in those dungs.

Especially it is good for cold, wet, clayey lands; but it ought to be dried before it be strewed, because it is naturally apt to clod in wet; and it should be mixed with earth or sand to keep it from clinging together, that it may be strewed thin, being naturally very hot and strong.

Some recommend the dung of pigeons, and also of other fowls, as the best manure for Asparagus, Strawberries, or any sorts of flowers; but this should be rotted and well mixed with the earth, before it is used to flowers.

Monsieur Gentil approves of pigeons dung, as being good for such trees whose leaves are apt to turn yellow, if they grow in free soils that are rather cold than hot, provided the heat of it has been abated by lying two or three years in the dunghill; but this should be applied in autumn, and in small quantities.

This being spread about an inch thick at the foot of a tree, whose leaves are yellow, and being left there till March, he recommends as very useful in cold and moist soils.

The dung of poultry being hot and full of salts, tends much to facilitate vegetation, and is abundantly quicker in its operation than the dung of animals which feed on herbs.

Sir Hugh Plat says, one load of grain will enrich ground more than ten loads of common dung; which if it be true, it is rational to suppose, that if simple grain, by only infusion in the mixture of composts, has a very good effect, it will be more powerful when it has passed through the bodies of animals.

Human dung is a great improver of all cold sour lands, and especially if it be mixed with other earths or dungs to give it a fermentation.

But there is not any sort of manure equal to the cleansing of London streets, for all stubborn clayey soils; the parts of which will be better separated, and in a much less time, with this manure, than with any other compost whatever; and where it can be obtained, is extremely well worth procuring, either for corn, grass, or garden land.

DURANTIA. Lin. Gen. Plant. 704. Castorea. Plum. Nov. Gen. 30. tab. 17.

The Characters are,

*The flower hath a permanent empalement of one leaf, which is erect, and cut into five acute segments at the top, and sits upon the germen; the flower is of the ringent kind, with one petal, having a long tube, which opens at the top in two lips; the upper lip is oval, erect, and concave; the under is divided into four equal segments, which are round. It hath four short stamina, situated in the bottom of the tube, the two middle being a little shorter than the other, terminated by prostrate summits; the germen which is situated under the flower, supports a long slender style, crowned by a headed stigma. The germen afterward becomes a globular berry, terminated by three acut points, having one cell inclosing four angular seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, the flower having two long and two shorter stamina, and the seeds being included in a capsule.

The title which was first given by father Plumier to this genus, was Castorea, in memory of Castor Durant, a physician of Rome, who published a history of plants in Italian, which was printed at Rome in 1585. Dr. Linnæus has now altered the title of the genus, and instead of the christian name, he has given it the surname of the same person.

The Species are,

1. Durantia (*Plumeiri*) spinosa. Lin. Sp. Plant. 637. *Prickly Durantia.* Castorea repens spinosa. Plum. Nov. Gen. 30. *Creeping prickly Castorea.*
2. Durantia (*Racemosa*) inermis. Lin. Sp. Plant. 637. *Durantia without thorns.* Castorea racemosa flore cæruleo, fructu croceo. Plum. Nov. Gen. 30. *Branching Castorea with a blue flower and Saffron-coloured fruit.*
3. Durantia (*Erecta*) caule erecto spinoso, foliis ovatis integerrimis, floribus racemosis. *Durantia with an upright prickly stalk, oval entire leaves, and flowers growing in long bunches.* Jasminum folio integro, obtuso, flore cæruleo racemoso, fructu flavo. Sloan. Cat. Jam. 169. *Jasmine with entire obtuse leaves, blue flowers growing in bunches, and a yellow fruit.*

The first sort hath many trailing branches, which are armed with hooked thorns at every joint, and are garnished with oblong leaves, which are placed without order, and are slightly sawed on their edges; the flowers come out from the side of the stalks in pretty long bunches, like those of the common Currant; they are of a pale bluish colour, and succeeded by brown berries not unlike the fruit of the Hawthorn; these have one cell, and inclose four angular seeds.

The second sort hath a branching woody stalk, which rises seven or eight feet high; the branches are garnished with oval spear-shaped leaves three inches long, and one and a half broad in the middle; they are sawed on their edges, of a lucid green colour, and stand opposite. The flowers are produced in long bunches at the end of the branches; these are blue, and succeeded by pretty large, round, yellow berries, which contain four angular seeds.

The third sort rises with a strong woody stem to the height of ten or twelve feet, covered with a white bark, dividing into many branches, which are armed with sharp thorns on their side; these are garnished with oval stiff leaves one inch long, and three quarters broad. The flowers come out in long bunches from the end of the branches, which are blue, and are succeeded by small, round, yellow berries, which contain four angular seeds. I received this from the late Dr. Houstoun, who found it growing in Jamaica.

The plants are natives of warm countries, so they require a stove to preserve them in England; they are propagated by seeds, which should be sown in small pots, and plunged into a hot-bed of tanners bark; and when the plants are fit to remove, they must be planted each into a separate small pot filled with light earth, and plunged into the hot-bed again, observing to shade them till they have taken new root, then they must be treated in the same manner as other plants from the same country.

The second sort may be propagated by cuttings, which may be planted in any of the summer months; but these should be plunged into a moderate hot-bed, and shaded from the sun till they have taken root, then they may be treated in the same manner as the seedling plants. This sort is not so tender as the other two, so may be placed in the open air in summer; and if they are kept in a moderate temperature of warmth in the winter, they will thrive better than in great heat. I kept some of the plants of this sort three winters, in a dry warm glass-case without fires, and

and they have ſucceeded pretty well; but the winter 1762 proving ſevere, cauſed their leaves to fall, but ſince they have put out again very well.

DWARF-TREES. Theſe were formerly in much greater requeſt than they are at preſent; for though they have many advantages to recommend them, yet the diſadvantages attending them greatly over-balance; and ſince the introducing of eſpaliers into the Engliſh gardens, Dwarf-trees have been in little eſteem for the following reaſons:

1ſt, The figure of a Dwarf-tree is very often ſo much ſtudied, that, in order to render the ſhape beautiful, little care is taken to procure fruit, which is the principal deſign in planting theſe trees.

2dly, The branches being ſpread horizontally near the ſurface of the ground, render it very difficult to dig or clean the ground under them.

3dly, Their taking up too much room in a garden (eſpecially when they are grown to a conſiderable ſize) ſo that nothing can be ſown or planted between them.

4thly, Theſe trees ſpreading their branches near the ground, continually ſhade the ſurface of the earth; ſo that neither the ſun nor air can paſs freely round their roots and ſtems, to diſſipate noxious vapours; whereby the circumambient air will be continually replete with crude rancid vapours, which, being drawn in by the fruit and leaves, will render its juices crude and unwholſome, as well as ill taſted.

It is alſo very difficult to get to the middle of theſe Dwarf-trees in the ſummer, when their leaves and fruit are on the branches, without beating off ſome of the fruit, and breaking the young ſhoots; whereas, the trees on an eſpalier can at all times be come at on each ſide, to tie up the new ſhoots, or to diſplace all vigorous ones, which, if left on, would rob the trees of their nouriſhment.

Add to this, the fruit-buds of all ſorts of Pears and Apples, and moſt ſorts of Plumbs and Cherries, are firſt produced at the end of the former year's ſhoot, which muſt be ſhortened in order to keep the Dwarfs to their proper figure, ſo that the fruit-buds are cut off, and a greater number of branches are obtained, than can be permitted to ſtand; ſo that all thoſe ſorts of fruit-trees, whoſe branches require to be trained at their full length, are very improper to train up as Dwarfs; and the Peaches and Nectarines which will bear amputation, are too tender to be trained ſo in this country.

Theſe evils being entirely remedied by training the trees to an eſpalier, hath juſtly gained them the preference; however, if any one has a mind to have Dwarf-trees, notwithſtanding what has been ſaid, I ſhall lay down a few rules for their management.

If you deſign to have Dwarf Pear-trees, you ſhould bud or graft them on Quince ſtocks; but as many ſorts of Pears will not thrive if they are immediately budded or grafted on Quince ſtocks, ſo ſome of thoſe ſorts which will take freely, ſhould be firſt budded on the Quince ſtocks; and when theſe have ſhot, the ſorts you intend to cultivate, ſhould be budded into theſe; for free ſtocks are apt to make them ſhoot ſo vigorouſly, as not to be kept within bounds. Theſe grafts or buds ſhould be put in about four or ſix inches above the ſurface of the ground, that the heads of the trees may not be advanced too high; and when the bud or graft has put out four ſhoots, you ſhould ſtop the end of the ſhoots, to force out lateral branches.

Two years after budding, theſe trees will be fit to tranſplant where they are to remain; for though many people chuſe to plant trees of a greater age, yet they ſeldom ſucceed ſo well as young ones. The diſtance theſe trees ſhould be planted is twenty-five or thirty feet aſunder, for leſs will not do if the trees thrive well. The ground between them may be cultivated for kitchen-garden herbs while the trees are young, but you ſhould not ſow or plant too near their roots.

In order to train your trees regularly, you ſhould drive ſtakes into the ground round the tree, to which the branches ſhould be faſtened down with liſt in a horizontal poſition; for if they are ſuffered to grow perpendicularly while young, they cannot be afterwards reduced without great violence to any tolerable figure. The neceſſary directions to be afterwards followed are, not to ſuffer any branches to croſs each other; and always in ſhortening any ſhoots be ſure to leave the uppermoſt eye outwards, whereby the hollowneſs in the middle of the tree will be better preſerved; and be careful to rub off all perpendicular ſhoots in the middle of the trees, as ſoon as they are produced. The other neceſſary rules you will find under the article of PRUNING.

The ſorts of Pears which do beſt in Dwarfs, are all ſummer and autumn fruits; for winter Pears are not worth planting in Dwarfs, they ſeldom bearing well, nor are ever well taſted, and commonly are very ſtony, becauſe they are commonly grafted on Quince ſtocks.

Apples are alſo planted in Dwarfs, moſt of which are now budded or grafted on Paradiſe ſtocks; but as theſe are for the moſt part of a ſhort duration, they are not profitable, and are fit only for ſmall gardens as a matter of curioſity, producing fruit ſooner, and in greater plenty, than when they are upon Crab or Apple ſtocks.

The diſtance theſe trees ſhould be planted, if on Paradiſe ſtocks, ſhould be ſix or eight feet, and upon Dutch ſtocks eighteen or twenty; but if on Crab ſtokcs, twenty-five or thirty feet aſunder each way. The management of theſe being the ſame with Pears, I need not repeat it.

Some perſons alſo plant Apricots and Plumbs for Dwarfs, but theſe ſeldom ſucceed well, as being of a tender conſtitution; and thoſe which will produce fruit on Dwarfs, are much more likely to do ſo when trained on an eſpalier, where they can be much better managed; and therefore I judge it much the better method, as being more certain, and the trees will make a better appearance.

# E.



EARTH is the principal matter whereof our globe consists; the character of which, according to Dr. Boerhaave, is, that it is a fossil body, neither dissoluble by fire, water, nor air; that it is insipid and transparent; more fusible than stone; still friable, and containing usually a share of fatness.

There is no such thing as a strictly simple earth. Mr. Boyle says, that it doth not appear, that nature, any more than art, affords an elementary earth; at least, some which appear of the simplest sorts are found, upon examination, to have qualities not ascribed to pure earth.

Of such earths some are simple and immutable, as chalk, pumice, and rotten stone; others compound and fatty; of which kind are all boles, red, white, and brown; fullers earth, and divers kinds of medicinal earths, as the Cretica, Hungarica, Lemnian earth, and others.

Which earth are all resolvable into oil, a little acid salt, &c. and a calx, which is the basis, or the earth properly so called.

Sand is by naturalists generally ranked as a species of earth, though not very properly; in that sands, strictly speaking, are a sort of crystals, or little transparent pebbles, and are calcinable; and, by the addition of a fixed alkaline salt, fusible and convertible into glass.

The fat earth is rendered fertile by the means of sand, and becomes fit to feed and nourish vegetables, &c. for pure earth is liable to coalesce into a hard coherent mass, as in clay; and earth thus embodied, and as it were glued together, would be very unfit for the nourishment of plants.

But if hard sand, i. e. crystals, which are indissoluble in water, and still retain the same figure, be intermixed with such earth, they will keep the pores of the earth open, and the earth itself loose and incompact, and by that means give room for the juices to move, ascend, &c. and for plants to be nourished thereby.

Thus a vegetable, being planted either in the sand alone, or in the fat glebe and earth alone, receives no growth or increment, but is either starved or suffocated; but mix the two, and the mass becomes fertile.

In effect, by means of sand the earth is rendered, in some measure, organical; pores and interstices being hereby maintained or preserved, something analogous to vessels is effected, by which the juices of the earth may be conveyed, prepared, digested, circulated, and at length excerned and thrown off in the roots of plants.

The earth is made up of two parts; the first the containing part, i. e. the body, bed, or couch: the second the part contained, and those are the nitrous or sulphureous particles, or prolific salts. The first is a lifeless inanimate mass, and is only the receptacle of the other; for the earth, considered simply, and abstracted from the before-mentioned nitrous and prolific salts, is a lifeless, dead, and inanimate mass; but by the co-operation of water, sun, and air, is put into motion, and promotes the work of vegetation: but if it were stript of those prolific salts and spirituous particles, would produce no manner of plant, herb, &c. that should be planted or sown in it.

These nitrous particles, or prolific salts, are of various and different qualities; and according as the earth is more or less stored with all or some of them, it is more or less productive; and according as it abounds with some of them more than others, differing from one another in contexture, it constitutes the different species or kinds of soils adapted to the propagation of different plants, the pores of whose roots are formed to receive, and whose nature is to attract, those salts that are congenial to them.

Some distinguish earths into three classes, sand, loam, and clay, as those upon one or other of which all others do in some respects depend.

Gravel, and all the open soils, till the loam is come at, are of the sandy kind.

Those binding earths from the loam downwards, till the stiffness of chalk may be come at, may be reckoned of the clay kind.

All these sorts of earth have a little tendency to vegetation, and have their salts proper for it, but in a different proportion; as a peck of clay may probably have double the quantity of salts in it that a peck of loam has, and a peck of loam may have six times the quantity of salts that a peck of sand has.

Loam. Some call the superficial earth that we meet with in England by this name, without having regard to what proportion of sand and clay it contains: others again call that earth loam, that inclines more to clay than sand. Some by loam mean that sort of earth that equally partakes of sand and clay, being a medium between sand and clay, which they call mother earth; but the true definition of loam is, that sort of earth which is fat and slippery, not of so close a texture as clay, nor too loose and sandy, but of a middle nature between them, and is easily dissolved by frost, and gentle or easy to be wrought. This is one of the best soils for most esculent plants and roots.

This mother earth, they say, may be in colour either black or yellow, and of which of these colours soever it be, plants of most sorts will grow in it.

Sand and clay likewise produce certain plants, which are natural to each of them, and consequently will thrive better in them than in any other soil.

But sand is apt to precipitate those plants that are set in it, earlier than clay, and will cause them to germinate near a month sooner than those that grow in clay, and that for this reason, because the salts which are in sand, are liable to be put in motion by the least approach of the warmth of the sun; but as sand is quick in the operation, the salts are soon exhaled and spent.

Clay. The pores of clay are more closely compacted together, and do not so easily give out those salts that are contained in it; nor can the fibres of every tender plant make their way through it in quest of their proper nutriment.

But if the parts of the clay be opened, by digging and breaking it into small particles, and those parts be kept open by a mixture of some sharp sand, or some other body of the like quality, the effects of its vigour will plainly appear.

Some distinguish the several temperaments of the earth either into a light, sandy, or loose contexture, or into those of a stiff, clayey, or close one, either of which

which have their respective good qualities; and all of them, when they are in their extremes, require art to render them useful and beneficial in the production and growth of plants.

A light, sandy, or loose earth, requires a proper ligature, and should have a compost of a heavier nature; and those that are heavy, clayey, and cloddy, should have a compost of a more fiery sprightly nature, that will insinuate itself into the heavy, lumpy, indigested clods, which would otherwise very much obstruct the business of vegetation.

A good earth should be of a blackish colour, fat, pliant, or easy to be digged; it should be neither cold nor light; it ought to have no ill smell or taste, and it should be of the same quality three or four feet deep for trees, which, if they have not that depth, will languish and decay after they have been planted six years. But this depth is not required for fruit-trees, which will thrive very well if they have two feet and a half of good earth, and generally produce the most generous fruits, when their roots spread near the surface of the earth.

In order to know whether the earth has any ill smell or taste, they direct to lay a handful of it to soak in water for seven or eight hours, and afterwards to strain it, and taste and smell it, by which the taste or smell will easily be perceived.

EARWIGS.

These are very troublesome vermin in a garden, especially where Carnations are preserved; for they are so fond of these flowers, that if care is not taken to prevent them, they will entirely destroy them, by eating off the sweet part at the bottom of the petals or leaves. To prevent which, most people have stands erected, which have a bason of earth or lead round each supporter, which is constantly kept filled with water. See the article CARNATION.

Others hang the hollow claws of crabs and lobsters upon sticks in divers parts of the garden, into which these vermin get; and by often searching them, you will destroy them without much trouble, which will be of great service to your wall fruit, for these are great destroyers of all soft fruits.

EBENUS. Lin. Gen. Nov. Barba Jovis. Tourn. Inst. R. H. tab. 419. Ebony.

The CHARACTERS are,

*The empalement of the flower is of one leaf, which is divided into five acute segments at the top; the flower is of the butterfly kind; the vexillum is obtuse and reflexed; the wings are equal in length with the vexillum; they are broad and roundish; the keel is shorter and turns upwards. It hath ten stamina, nine joined, standing together, and the other separate, terminated by single summits. In the bottom is situated an oblong germen, supporting a rising style, crowned by a single stigma. The germen afterward becomes an oblong swelling pod, opening with two valves, and inclosing three or four kidney-shaped seeds.* This is distinguished from Trifolium, by the bracteæ which are situated between the flowers on the spike.

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, the flowers having ten stamina in two bodies.

We know but one SPECIES of this genus, viz.

EBENUS. Lin. Sp. Plant. 764. Ebony. Barba Jovis lagopoides, Cretica, frutescens, incana, flore spicato purpureo amplo. Breyn. Prod. 2. *Shrubby Haresfoot Jupiter's Beard of Crete with hoary leaves, and a large purple flower growing in spikes.*

This plant grows naturally in Crete, and in some of the islands of the Archipelago; it rises with a shrubby stalk three or four feet high, which puts out several side branches, garnished with hoary leaves at each joint, which are composed of five narrow spear-shaped lobes, which join at their tails to the foot-stalk, and spread out like the fingers of a hand. The branches are terminated by thick spikes of large purple flowers, which are of the butterfly or Pea-bloom kind; the spikes are from two to three inches long, so make a fine appearance, especially when the plants are strong, and have many spikes of flowers on them. It flowers in June and July, and in very warm seasons will sometimes perfect their seeds in England.

This is propagated by seeds, which should be sown in the autumn, for those which are sown in the spring often fail; they must be sown in pots, and placed under a frame in the winter, where they may be protected from frost. In the spring the plants will come up, which should be kept clean from weeds, and refreshed now and then with water. When these have acquired strength enough to be removed, they should be each planted in a separate small pot filled with light earth, and plunged into a moderate hot-bed just to promote their taking new root; then they should be gradually inured to bear the open air, into which they should be removed the latter end of May, placing them in a sheltered situation, where they may remain till autumn, when they must be removed into shelter; for these plants will not live in the open air through the winter, nor should they be too tenderly treated, lest they draw up weak. I have found them succeed best when placed in an airy glass-case without fire in winter, where they will have more sun and air than in a green-house. During the winter season, the plants must be sparingly watered, but in the summer they will require to be often refreshed. The other management is the same as for other of the hardier exotic plants, among which this will make a fine variety.

EBULUS. See SAMBUCUS.

ECHINATE SEEDS [of echinus, *Lat.* a hedge-hog,] such seeds of plants as are prickly and rough.

ECHINOMELOCACTUS. See CACTUS.

ECHINOPHORA. Lin. Gen. Plant. 292. Tourn. Inst. R. H. 656. tab. 423. [of Ἐχῖνος, a hedge-hog, and φέρω, *Gr.* to bear.] Prickly Parsnep.

The CHARACTERS are,

*It hath an umbellated flower; the general umbel is composed of many smaller, the intermediate being the shortest; the involucrum of the general umbel ends in acute thorns; those of the rays are turbinated, of one leaf, cut into six unequal parts, with acute points; the perianthium is divided into five parts, and sits on the germen; the general umbel is uniform; the flowers have five unequal petals which spread open; they have each five stamina, terminated by roundish summits. Under the perianthium is situated an oblong germen within the empalement, supporting two styles, crowned by single stigmas; the germen afterward turns to two seeds, which are inclosed in the hard empalement.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, the flower having five stamina and two styles.

The SPECIES are,

1. ECHINOPHORA (*Spinosa*) foliolis subulato-spinosis integerrimis. Lin. Sp. Plant. 344. *Prickly-headed Parsnep, with awl-shaped prickly leaves which are entire.* Echinophora maritima spinosa. Tourn. Inst. 656. *Prickly maritime Parsnep.*

2. ECHINOPHORA (*Tenuifolia*) foliolis incisis inermibus. Lin. Sp. Plant. 344. *Prickly-headed Parsnep, whose small leaves are cut, but have no thorns.* Echinophora pastinacæ folio. Tourn. Inst. 656. *Prickly-headed Parsnep with a Carrot leaf.*

These plants grow naturally on the borders of the Mediterranean sea; they are preserved in the gardens of botany for the sake of variety; they have both perennial roots, which creep in the ground; the first hath branching stalks, growing five or six inches high, which are garnished with short thick leaves, that terminate in two or three sharp thorns; they are placed by pairs opposite: the flowers grow in an umbel, sitting upon a naked foot-stalk, which arises from the side of the stalk; they are white, and under the umbel is situated an involucrum, composed of several leaves, which terminate in sharp spines. It flowers in June, but seldom ripens seeds in this country.

The second sort rises near a foot and a half high; from the principal stalk are sent out two side branches

at

at every joint, which are placed opposite; the lower part is garnished with leaves, which are finely divided like those of the Carrot; the flowers grow in small umbels at the extremity of the branches, having a short prickly involucrum. This flowers in July, but doth not ripen seeds in England.

These plants are propagated by their creeping roots in England, as they do not produce seeds here: the best time to transplant them is the beginning of March, a little before they shoot. The roots should be planted in a gravelly or sandy soil, and in a warm situation, or otherwise they should be covered in the winter to prevent the frost from destroying them.

ECHINOPS. Lin. Gen. Plant. 829. Echinopus. Tourn. Inst. R. H. tab. 463. Globe Thistle.

The CHARACTERS are,

*It hath a permanent perianthium, which is oblong, angular, and imbricated; the flower hath one funnel-shaped petal, which is divided at the top into five parts, which spread open and are reflexed. It hath five short hairy stamina, terminated by cylindrical summits. In the bottom of the tube is situated an oblong germen, supporting a slender style the length of the tube, crowned by two oblong depressed stigmas which turn back; the germen afterward becomes an oblong oval seed narrowed at the base, but obtuse and hairy at the top.*

This genus of plants is ranged in the first section of Linnæus's seventeenth class, intitled Syngenesia Polygamia Æqualis. This section includes those plants which have only hermaphrodite fruitful florets.

The SPECIES are,

1. ECHINOPS (*Sphærocephalus*) capitulis globosis pubescentibus. Lin. Sp. Plant. 1314. *Globe Thistle with globular heads and hairy leaves.* Echinopus major. J. B. 3. p. 69. *Greater Globe Thistle.*
2. ECHINOPS (*Ritro*) capitulo globoso, foliis supra glabris. Lin. Sp. Plant. 1314. *Globe Thistle with a globular head, and the upper side of the leaves smooth.* Echinopus minor. J. B. 3. 72. *Smaller Globe Thistle.*
3. ECHINOPS (*Strigosus*) capitulis fasciculatis calycibus, lateralibus sterilibus, foliis supra strigosis. Lin. Sp. Plant. 1315. *Globe Thistle with bundled heads, whose side empalements are barren, and wing-pointed leaves.* Echinopus minor annuus, magno capite. Tourn. Inst. 463. *Smaller annual Globe Thistle with a large head.*
4. ECHINOPS (*Græcus*) caule unicapitato, foliis spinosis, omnibus pinnatifidis villosis, radice reptartice. *Globe Thistle with one head on each stalk, prickly leaves, which are all wing-pointed and woolly, and a creeping root.* Echinopus Græcus, tenuissime divisus & lanuginosus, capite minori cæruleo. Tourn. Cor. 34. *Greek Globe Thistle whose leaves are divided into narrow segments and are woolly, with a smaller blue head.*

The first is the common Globe Thistle, which has been long cultivated in some gardens for the sake of variety; this grows naturally in Italy and Spain; it hath a perennial root, from which arise many stalks that grow to the height of four or five feet; these are garnished with long jagged leaves, which are divided into many segments almost to the midrib, the jags ending in spines; they are of a dark green on their upper side, but woolly on their under; the flowers are collected in globular heads, several of these grow upon each stalk; the common hath blue flowers, but there is a variety of it with white. It flowers in July, and the seeds ripen in August.

This plant is easily propagated by seeds, which, if permitted to scatter, the plants will come up in plenty, so a few of them may be transplanted to the places where they are designed to remain to flower; they require no other culture but to keep them clean from weeds: the second year they will flower and produce seeds, and the roots will continue two or three years after; but if the seeds scatter, the plants will become troublesome weeds; to prevent which, the heads should be cut off as soon as the seeds are ripe.

The second sort grows in the south of France and in Italy; this hath a perennial creeping root, which sends up several strong stalks that rise two feet high, garnished with leaves, which are cut into many fine segments to the midrib, which are set with prickles, and are white on their under side: the stalks branch out toward the top; each of these branches is terminated by a globular head of flowers, which are smaller than those of the first, and of a deeper blue; there is also a variety of this with white flowers. This flowers about the same time as the first, and is propagated in the same way. These will both grow in almost any soil or situation.

The third sort grows naturally in Spain and Portugal: this is an annual plant, which rises with a stiff white stalk two feet high, garnished with divided leaves, ending in many points which have spines; their upper side is green, and covered with brown hairs, their under side white and woolly; the stalk is terminated by one large head of pale blue flowers. These appear in July, and if the season proves warm and dry, the seeds will ripen in autumn, but in wet cold years they rarely ripen here.

These seeds should be sown in the spring, upon a border of light earth, where the plants are to remain; and they require no other management, but to thin them where they are too close.

The fourth sort grows naturally in Greece, from whence Dr. Tournefort sent the seeds to the royal garden at Paris: this hath a perennial creeping root, by which it multiplies fast enough; the stalks rise about a foot high, and are closely garnished with leaves which are shorter and much finer divided than either of the former sorts; these are hoary, and armed on every side with sharp thorns; the stalks are terminated by one middle-sized globular head of flowers, which in some are blue, and in others white. They appear the latter end of June, and in warm seasons the seeds will ripen well in England. This is easily propagated by its creeping roots, or from seeds; it loves a dry soil and a warm situation.

ECHINUS, *Lat.* is the prickly head or cover of the seed or top of any plant, so called from its likeness to a hedgehog.

ECHIUM. Lin. Gen. Plant. 157. Tourn. Inst. R. H. 135. tab. 54. [of Ἔχις, *Gr.* a viper, because the ripe seed of this plant resembles the head of a viper. It is called Herba Viperaria, because the ancients believed that this plant killed vipers.] Viper's Bugloss; in French, *Viperine.*

The CHARACTERS are,

*The flower hath a permanent empalement, divided into five segments. It hath one petal with a short tube, having an erect broad brim, cut into five parts, and is obtuse; the two upper being longer than the lower, which are acute and reflexed. It hath five awl-shaped stamina, terminated by oblong prostrate summits. In the bottom are situated four germen with one slender style, crowned by an obtuse bifid stigma; the germen afterward become so many roundish pointed seeds, inclosed in the rough empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The SPECIES are,

1. ECHIUM (*Anglicum*) caule simplici erecto, foliis lanceolatis, floribus spicatis lateralibus, staminibus corolla æquantibus. *Viper's Bugloss with a single erect stalk, having rough spear-shaped leaves, and flowers in spikes proceeding from the side, with the stamina equalling the petal.* Echium vulgare C. B. P. 254. *Common Viper's Bugloss.*
2. ECHIUM (*Vulgare*) caule simplici erecto, foliis caulinis lanceolatis hispidis, floribus spicatis lateralibus staminibus corollâ longioribus. *Viper's Bugloss with a single erect stalk, having rough narrow spear-shaped leaves, flowers growing in short spikes on the sides, and stamina longer than the petal.* Lycopsis Anglica. Lob. *English Lycopsis.*
3. ECHIUM (*Italicum*) corollis vix calycem excedentibus, margine villosis. Hort. Upsal. 35. *Viper's Bugloss, whose petals scarce exceed the empalement, having hairy borders.* Echium majus & asperius, flore albo. C. B. P. 255. *Great rough Viper's Bugloss with a white flower.*



4. ECHIUM

4. Echium (*Lusitanicum*) corollis stamine longioribus. Lin. Sp. 200. *Viper's Bugloss with the petal of the flower longer than the stamina.* Echium amplissimo folio, Lusitanicum. Tourn. *Portugal Viper's Bugloss with a large leaf.*

5. Echium (*Creticum*) calycibus fructescentibus distantibus, caule procumbente. Lin. Hort. Upsal. 35. *Viper's Bugloss with fruitful empalements growing at a distance, and a trailing stalk.* Echium Creticum latifolium rubrum. C. B. P. 254. *Broad-leaved Viper's Bugloss of Candia, having a red flower.*

6. Echium (*Angustifolium*) caule ramoso, aspero, foliis calloso-verrucosis, staminibus corollâ longioribus. *Viper's Bugloss with a rough branching stalk, warted leaves, and stamina longer than the petal.* Echium Creticum angustifolium rubrum. C. B. P. 254. *Narrow-leaved Viper's Bugloss of Candia, having a red flower.*

7. Echium (*Fruticosum*) caule fruticoso. Hort. Cliff. 43. *Viper's Bugloss with a shrubby stalk.* This is the Echium Africanum fruticans, foliis pilosis. Hort. Amst. 2. p. 107. *Shrubby African Viper's Bugloss, having hairy leaves.*

The first sort grows naturally in Germany and Austria, from whence I received the seeds. This and our common Viper's Bugloss, which is the second, have been confounded by most of the writers on botany, who have supposed they were the same plant, whereas they are very different; for the leaves of this are shorter, and much broader than those of the second; the spikes of flowers are much longer, and the stamina of the flowers are in this equal in length with the petal; whereas those of the second stand out much beyond the petal, which is an essential difference.

The second sort grows naturally upon chalky lands in most parts of England: this is what Lobel titles Lycopsis Anglica, and has been generally taken for the common Echium.

The third sort grows naturally in the south of France, in Italy, and the isle of Jersey; this rises with an upright hairy stalk; the flowers are produced in short spikes on the side of the branches; they are small, and scarce appear above the empalements; some plants have white flowers, and others are purplish; the empalements of the flowers are very hairy, and cut into acute segments.

The fourth sort grows naturally in Portugal and Spain; the lower leaves of this are more than a foot long, and two inches broad in the middle, gradually lessening to both ends; these are covered with soft hairs. The stalks grow two feet high; the flowers are in short spikes coming from the side of the stalks; the petals of these are longer than the stamina.

The fifth sort grows naturally in Crete; this hath trailing hairy stalks, which grow about a foot long, and put out several side branches, garnished with hairy spear-shaped leaves about three inches long, and three quarters of an inch broad, sitting close to the stalks. The flowers come out on slender spikes upon long foot-stalks, which come from the wings of the leaves; they are large, of a reddish purple colour, which turns to a fine blue when they are dried; these stand at a distance from each other on the spike. It is an annual plant, which flowers in July and decays in autumn.

The sixth sort hath branching stalks which grow a foot and a half long, declining toward the ground; they are covered with stinging hairs; the leaves are four inches long, and not more than half an inch broad; these are pretty much warted, and are hairy. The flowers grow in loose spikes from the side of the stalks, and also at the end of the branches; they are of a reddish purple colour, but not so large as those of the former sort, and the stamina of these are longer than the petal. This is also an annual plant, which grows naturally in Crete.

These are most of them biennial plants, except the fifth and sixth sorts, which are annual, and are the most beautiful of all the kinds: the seeds of these must be sown every year, in the places where they are designed to remain; and the plants require no other culture but to keep them clean from weeds, and thin them where they grow too close. In July they flower, and their seeds ripen in five or six weeks after. The seeds of the other sorts being sown in the spring, will the second summer after produce flowers and seeds, after which they seldom continue. They all delight in a rubbishy gravelly soil, and will grow upon the tops of old walls or buildings; where, when once they have established themselves, they will drop their seeds, and thereby maintain a succession of plants without any care, and on these places they appear very beautiful.

The seventh sort grows naturally at the Cape of Good Hope, from whence the seeds were brought to Holland, where the plants are now preserved in some curious gardens. This rises with a shrubby stalk two or three feet high, dividing upward into several branches, garnished with oval leaves placed alternate, whose base sits close to the stalk; they are hairy, and of a light green colour. The flowers are produced singly between the leaves at the end of the branches; they are of a purple colour, and in shape much like those of the fifth sort. These appear in May and June, but the seeds do not ripen in England.

It is propagated by seeds, when they can be obtained, which should be sown in pots filled with light sandy earth soon after they are received. These may be exposed to the open air till the beginning of October, when the pots should be placed under a frame, to guard them from frost; but in mild weather, they should be opened to have the free air, to prevent the seeds from vegetating till the winter is past; for if the plants come up at that season, their stems will be weak and full of juice, and very liable to rot with damps; therefore it is much better if the plants do not come up till toward March, which is the usual time of their appearing, when the seeds are not forced by warmth. When the plants are fit to remove, they should be each planted into a small pot filled with light earth, and placed under a frame to forward their putting out new roots; then they should be gradually inured to bear the open air, and the latter end of May be placed abroad in a sheltered situation, where they may remain till the beginning of October; at which time they must be removed into an airy glass-case, where they may enjoy the sun and have free air in mild weather. During the winter season these plants must be sparingly watered; for as their stems are succulent, so much moisture will cause them to rot. In the summer they should be set abroad in a sheltered situation, and treated in the same manner as other plants from the same country.

EDERA QUINQUEFOLIA. See Vitis.

EDGINGS. The best and most durable plant for edgings in a garden is Box; which, if well planted, and rightly managed, will continue in beauty several years: the best season for planting this, is either in the autumn, or very early in the spring; for if you plant it late, and the season should prove hot and dry, it will be very subject to miscarry, unless great care be taken to supply it with water. The best sort for this purpose is the dwarf Dutch Box.

These edgings are only planted upon the sides of borders next walks, and not (as the fashion was some years ago) to plant the edgings of flower-beds, or the edges of fruit-borders in the middle of gardens, unless they have a gravel-walk between them; which renders it proper to preserve the walks clean, by keeping the earth of the borders from washing down into the walks in hard rains.

It was also the practice formerly to plant edgings of divers sorts of aromatic herbs, as Thyme, Savory, Hyssop, Lavender, Rue, &c. But as these very soon grow woody, so that they cannot be kept in due compass, and in hard winters they are often killed in patches, whereby the edgings are rendered incomplete, they are now seldom used for this purpose.

Some people make edgings of Daisies, Thrift, Catchfly, and other flowering plants; but these also re-

quire to be tranſplanted every year, in order to have them handſome; for they ſoon grow out of form, and are ſubject alſo to decay in patches; ſo that there is not any plant which ſo completely anſwers the deſign as Dwarf Box, which muſt be preferred to all others for this purpoſe.

EFFLORESCENCE, *Lat.* the blowing out of a flower.

To EGERMINATE, *Lat.* to bud or ſpring out.

EHRETIA. Trew. tab. 24.

The CHARACTERS are,

*It hath a ſmall, permanent, bell-ſhaped empalement of one leaf, cut into five points; the flower hath one petal, whoſe tube is longer than the empalement, cut into five ſegments; it hath five awl-ſhaped ſpreading ſtamina the length of the corolla, terminated by roundiſh incumbent ſummits, and a roundiſh germen, ſupporting a ſlender ſtyle the length of the ſtamina, crowned by an obtuſe indented ſtigma; the germen afterward becomes a round berry with one cell, incloſing four angular ſeeds.*

This genus of plants is ranged in the firſt order of Linnæus's fifth claſs, intitled Pentandria Monogynia, the flower having five ſtamina and one ſtyle.

The SPECIES are,

1. EHRETIA (*Tinifolia*) foliis oblongo-ovatis integerrimis glabris, floribus paniculatis. Amœn. Acad. 5. p. 395. *Ehretia with oblong, oval, entire, ſmooth leaves, and flowers growing in panicles.*
2. EHRETIA (*Bourreria*) foliis ovatis integerrimis lævibus, floribus ſubcorymboſis, calycibus glabris. Lin. Sp. 275. *Ehretia with oval entire leaves, flowers growing in a ſort of corymbus, and ſmooth empalements.* Bourreria fructibus ſucculentis. Jacq. Amer.

The ſeeds of the firſt ſort were ſent me from Jamaica in the year 1734, which ſucceeded in the Chelſea garden, where the plants have grown to the height of eight or nine feet, with ſtrong woody ſtems, and have ſeveral times produced their flowers, but have not perfected their ſeeds as yet in England. This is by Dr. Linnæus ſuppoſed to be the ſame plant mentioned by Sir Hans Sloane, under the title of Ceraſo affinis arbor baccifera racemoſa, flore albo pentapetalo, fructu flavo monopyreno eduli dulce. Hiſt. Jam. 2. p. 94. But I differ in my opinion from him, for the leaves of our plant are ſmoother, longer, and more pointed, and the corymbus of flowers is much longer than in Sir Hans's plant.

This hath a rough woody ſtalk, which divides into ſeveral irregular branches, garniſhed with oblong, oval, ſmooth leaves, nine inches long, three broad in the middle, ending in acute points; the flowers are white, and produced in an oblong corymbus toward the end of the branches; they have one petal in each, which is cut at the top into five ſegments which are reflexed. Theſe appear toward the end of July, but fall away without being ſucceeded by ſeeds.

The ſeeds of the ſecond ſort I received from Surinam, which ſucceeded in the Chelſea garden. This hath a woody upright ſtem, covered with a brown bark, ſending out branches regularly toward the top, garniſhed with ſmooth oval leaves placed alternate, having ſhort foot-ſtalks; the leaves are ſix inches long, and more than two broad, ending with blunt oval points. As this ſort hath not produced flowers here, ſo I can give no farther account of them. This Doctor Linnæus ſuppoſes to be the ſame with a plant figured by Mr. Cateſby, under the title of Pittonia ſimilis laureolæ foliis, floribus albis, baccis rubris. But in this he is alſo miſtaken, for there are plants in the Chelſea garden, which were raiſed from ſeeds ſent from the Bahama Iſlands, which are very different from the former.

Theſe plants are too tender to thrive abroad in England, where they require a moderate warm ſtove in winter; but when the plants have acquired ſtrength, they may be placed in the open air during the heat of ſummer; but it ſhould be in a ſheltered ſituation, and when the evenings grow cold in the autumn, they muſt be removed into ſhelter.

They are both propagated by ſeeds when they can be obtained, which ſhould be ſown in ſmall pots plunged into a hot-bed; they may alſo be propagated by laying down their branches, but theſe are long before they put out roots.

ELÆAGNUS. Lin. Gen. Plant. 148. Tourn. Cor. 53. tab. 489. [from Ἐλαία, an Olive, and Ἀγνὸς Vitex; becauſe this plant hath leaves like thoſe of the Chaſte-tree, and a fruit like an Olive.] Oleaſter, or wild Olive.

The CHARACTERS are,

*The flower hath a bell-ſhaped empalement of one leaf, which is quadrifid, rough on the outſide, but coloured within. It hath no petals, but four ſhort ſtamina which are inſerted in the diviſions of the empalement, and are terminated by oblong proſtrate ſummits. At the bottom is ſituated a roundiſh germen ſupporting a ſingle ſtyle, crowned by a ſingle ſtigma; the germen afterward becomes an obtuſe oval fruit, with a puncture at the top, incloſing one obtuſe nut.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourth claſs, intitled Tetrandria Monogynia, from the flower having four ſtamina and one ſtyle.

The SPECIES are,

1. ELÆAGNUS (*Spinoſus*) aculeatus, foliis lanceolatis. *Prickly wild Olive with ſpear-ſhaped leaves.* Elæagnus Orientalis latifolius, fructumaximo. Tourn. Cor. App. 52. *Eaſtern broad-leaved wild Olive with a large fruit.*
2. ELÆAGNUS (*Inermis*) inermis, foliis lineari-lanceolatis. *Wild Olive without thorns, and narrow ſpear-ſhaped leaves.* Elæagnus Orientalis anguſtifolius, fructu parvo olivæformi ſubdulci. Tourn. Cor. App. 52. *Eaſtern wild Olive with narrow leaves, and a ſmall, ſweet, Olive-ſhaped fruit.*
3. ELÆAGNUS (*Latifolia*) foliis ovatis. Prod. Leyd. 250. *Wild Olive with oval leaves.* Elæagnus foliis rotundis maculatis. Burm. Pl. Zeyl. 92. *Wild Olive with round ſpotted leaves.*

The firſt and ſecond ſorts Dr. Tournefort found growing naturally in the Levant, and the firſt I take to be the common ſort, which grows naturally in Bohemia, of which I ſaw ſome trees growing in the curious garden of the late Dr. Boerhaave, near Leyden, in Holland. The leaves of this ſort are not more than two inches long, and about three quarters of an inch broad in the middle; they are white, and have a ſoft cottonny down on their ſurface; at the foot-ſtalk of every leaf, there comes out a pretty long ſharp thorn; as the leaves are placed alternate on the branches, ſo the ſpines come out on each ſide the branches; juſt below the foot-ſtalks of the leaves, they are alternately longer: the flowers are ſmall, the inſide of the empalement is yellow, and they have a ſtrong ſcent when fully open.

The ſecond ſort hath no thorns on the branches, the leaves are more than four inches long, and not half an inch broad; they are very ſoft, and have a ſhining appearance like ſattin. The flowers come out at the foot-ſtalks of the leaves, ſometimes ſingly, at other times two, and frequently three at the ſame place; the outſide of the empalement is ſilvery and ſtudded, the inſide of a pale yellow, having a very ſtrong ſcent. This flowers in July, and ſometimes the flowers are ſucceeded by fruit. This is the ſort which is moſt commonly preſerved in the Engliſh gardens.

Theſe plants may be propagated by laying down the young ſhoots in autumn, which will take root in one year, when they may be cut off from the old trees, and either tranſplanted into a nurſery for two or three years to be trained up, or into the places where they are to remain. The beſt ſeaſon for tranſplanting of theſe trees is in the latter end of February, or the beginning of March; though they may be removed at Michaelmas, provided the roots are mulched, to protect them from ſevere froſt in winter. Theſe plants ſhould be placed where they may be ſcreened from ſtrong winds, for they grow very freely, and are very ſubject to be ſplit down by the wind, if they are too much expoſed.

These trees commonly grow to twelve or fourteen feet high, and when they are intermixed with other trees of the same growth, make a pretty diversity; for their leaves being of a silver colour, are easily distinguished at a distance.

The third sort grows naturally at Ceylon, and in some other parts of India. This is pretty rare at present in the English gardens, but some years past there were several pretty large plants of it growing in the garden at Hampton Court. This rises with a woody stem to the height of eight or nine feet, dividing into many branches, garnished with oval silvery leaves, which have several irregular spots of a dark colour on their surface; they are placed alternately on the branches, and continue all the year. The flowers I have not seen, though some of the trees at Hampton Court produced flowers, but I was not so lucky as to see them.

This sort requires a warm stove to preserve it in this country, for it is too tender to live in the open air, excepting for a short time in the warmest part of summer.

The two first sorts are extremely hardy, so are not injured by the frost, but the trees are not of very long duration, therefore young plants should be raised once in three or four years, to preserve the kinds.

ELATERIUM. See MOMORDICA.

ELATINE. See LINARIA.

ELECAMPANE. See INULA.

ELEPHANTOPUS. Lin. Gen. Plant. 827. Vaill. Act. Par. 1719. Dill. Hort. Elth. 104. [of Ἐλέφας, an elephant, and Πȣ̃ς, a foot,] Elephant's foot; so called by Monsieur Vaillant, because he says the under leaves of the first sort somewhat resemble an Elephant's foot.

The CHARACTERS are,

*There are many flowers collected together in one common large involucrum which is permanent, and each empalement contains four or five florets; the florets are tubulous and hermaphrodite; they have one petal which is tongue-shaped; the brim is narrow, and divided into five equal parts; they have five very short hairy stamina, terminated by cylindrical summits. In the bottom is situated an oval germen, supporting a slender style, crowned by two slender stigmas; the germen afterward becomes a single compressed seed crowned with bristles, sitting on a placenta inclosed in the empalement.*

This genus of plants is ranged in the first section of Linnæus's seventeenth class, which includes the plants with flosculous flowers, whose florets are all hermaphrodite and fruitful.

The SPECIES are,

1. ELEPHANTOPUS (*Scaber*) foliis oblongis scabris. Hort. Cliff. 390. *Elephantopus with oblong rough leaves.* Elephantopus conyzæ folio. Vaill. Mem. Acad. Scien. 1719. *Elephant's foot with a Flea-bane leaf.*

2. ELEPHANTOPUS (*Tomentosus*) foliis ovatis tomentosis. Gron. Virg. 90. *Elephantopus with oval woolly leaves.* Elephantopus helenii folio, purpurascente flore. Houst. MSS. *Elephantopus with an Elecampane leaf, and a purplish flower.*

The first sort grows naturally in both the Indies, I have received it from several parts of America; this sends out many oblong rough leaves, which spread near the ground; between these in the spring arises a branching stalk, little more than a foot high. The side branches are short, and are generally terminated by two heads of flowers, each standing upon a short foot-stalk. The heads contain several hermaphrodite florets, included in a common involucrum, composed of four oval leaves, ending in acute points. The florets are of a pale purple colour. They appear in July, but are rarely succeeded by seeds in England.

The second sort grows naturally in South Carolina; the plants of this have frequently come up in the earth, which has been sent over from thence with other plants as weeds; this hath several oval woolly leaves, four inches long, and three inches broad, growing from the root, having many transverse nerves, running from the midrib to the sides; they spread flat on the ground, and between these arise a stiff stalk, about a foot high, which divides into several branches, each being terminated by two flowers, which are composed of several florets, inclosed in a four-leaved involucrum; two of these leaves are alternately larger than the other. The involucrum is longer than the florets, so they do but just appear within the two larger leaves; the flowers make no appearance. They appear in July, but the seeds never ripen in this country.

The first sort hath a perennial root, but an annual stalk. If this is planted in pots, and sheltered in the winter from frost, it may be preserved several years, and the plants will annually flower; but the second sort seldom continues longer than two years.

These plants are propagated by seeds, which should be sown on a hot-bed in the spring; and when the plants are come up, they must be transplanted into pots filled with fresh light earth, and plunged into a hot-bed of tanners bark, observing to water and shade them until they have taken root; then you should let them have a large share of fresh air in warm weather, and they will require to be frequently refreshed with water.

ELEPHAS. See RHINANTHUS.

ELICHRYSUM. See GNAPHALIUM.

ELM. See ULMUS.

ELLISIA.

The CHARACTERS are,

*The flower has a permanent empalement, composed of five small, erect, spreading leaves; it is of one petal, funnel-shaped the length of the cup, cut into five obtuse segments at top; it hath five stamina the length of the tube, terminated by roundish summits, and a round germen supporting a short slender style, crowned by an oblong bifid stigma; the germen afterward becomes a roundish fleshy berry with two cells, inclosing two rough seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

We know but one SPECIES of this genus, viz.

ELLISIA (*Nyctelea.*) Lin. Sp. 1662. *Tea-leaved Ellisia*

This plant grows naturally in Jamaica, where it forms a bushy shrub about six or seven feet high. I have raised many of the plants from seeds, some of which are now four or five feet high, but have not as yet produced flowers. It sends out many branches from the stem, so as to form a thick bush; the branches are generally covered with a dark purple bark; the leaves also when the plants are exposed in summer turn of the same colour, but after they have been some time removed into the stove, they recover their verdure again. The leaves are placed opposite on the branches, which are an inch and a half long, spear-shaped and indented on their edges, and have commonly two or three small leaves sitting close to the branches; at the foot-stalks of the larger leaves, and at the same place, arises pretty long black spines, generally placed opposite toward the lower part of the branches, but upward they are alternate, and the ends of the branches are without thorns. As the plants have not as yet produced flowers in England, so I can give no farther account of them.

This plant may be propagated by cuttings, which if planted in small pots filled with light earth, and plunged into a moderate hot-bed, covering them close with a hand-glass any time in July, will put out roots in about two months, so may then be separated and put into small pots, plunging them again into the hot-bed to promote their taking new root, after which they should be gradually inured to the open air; but the beginning of October they should be removed into the dry stove, where, during the winter, they should have a moderate warm air, in which they will thrive better than in a great heat.

When seeds of this plant can be procured from abroad, if they are sown on a hot-bed the plants will rise easily, and may be afterward treated in the same way as is directed for those raised by cuttings.

EMERUS. Tourn. Inſt. R. H. 650. Coronilla. Lin. Gen. Plant. 789. [this name was given it by Theophraſtus, and reſtored by Cæſalpinus.] Scorpion Sena.

The CHARACTERS are,

*The flower hath a very ſhort empalement of one leaf, divided into five parts which is permanent. The flower is of the butterfly kind. The tails of the petals are much longer than the empalement. The ſtandard is narrow, and ſhorter than the wings, over which it is arched. The wings are large and concave. The keel is heart-ſhaped and reflexed. There are ten ſtamina in each, one of which ſtands ſeparate, the other nine are joined; theſe are ſituated in the ſtandard. In the empalement is ſituated an oblong ſlender germen, ſupporting a ſlender ſtyle, crowned by a taper ſtigma. The germen afterward becomes a taper cylindrical pod, ſwelling in thoſe parts where the ſeeds are lodged, which are alſo cylindrical.*

This genus of plants is ranged in the third ſection of Tournefort's twenty-ſecond claſs, which includes the trees and ſhrubs with a butterfly flower, whoſe leaves are placed by pairs along the midrib. Dr. Linnæus has joined this genus, and alſo the Securidacca of Tournefort to the Coronilla; but hereby the number of ſpecies are increaſed, and therefore it is much better to keep them ſeparate, as there are more eſſential differences between them, than in ſome of the other genera of this claſs which he has ſeparated.

The SPECIES are,

1. EMERUS (*Major*) caule fruticoſo, pedunculis longioribus caule angulato. *Scorpion Sena with a ſhrubby ſtalk, longer foot ſtalks to the flowers, and angular ſtalks.* Emerus. Cæſalp. *Scorpion Sena, vulgò.*
2. EMERUS (*Minor*) foliolis obcordatis, pedunculis brevioribus, caule fruticoſo. *Scorpion Sena with long heart-ſhaped leaves, ſhorter foot-ſtalks to the flowers, and a ſhrubby ſtalk.* Emerus minor. Tourn. Inſt. R. H. 650. *Leſſer Scorpion Sena.*
3. EMERUS (*Herbacea*) caule erecto, herbaceo, foliolis multijugatis, floribus ſingularibus alaribus, ſiliquis longiſſimis erectis. *Scorpion Sena with an erect herbaceous ſtalk, the leaves compoſed of many pair of lobes, ſingle flowers proceeding from the ſides of the ſtalks, and very long erect pods.* Emerus ſiliquis longiſſimis & anguſtiſſimis. Plum. Cat. 19. *Emerus with very long and narrow pods.*

The firſt of theſe ſhrubs is very common in all the nurſeries near London; this riſes with weak ſhrubby ſtalks to the height of eight or nine feet, dividing into many ſlender branches, garniſhed with winged leaves, compoſed of three pair of lobes (or ſmall leaves) terminated by an odd one. The flowers come out upon long foot-ſtalks from the ſide of the branches, two or three of theſe foot-ſtalks ariſing from the ſame point; each of theſe ſuſtains two, three, or four yellow butterfly flowers; theſe appear in May, and are frequently ſucceeded by long ſlender pods, which are taper, ſwelling in thoſe parts where the ſeeds are lodged, and hang downward; theſe ſhrubs continue long in flower, eſpecially in cool ſeaſons, and frequently flower again in autumn, which renders them valuable.

The ſecond ſort riſes with many ſhrubby ſtalks like the firſt, but not more than half the height; this hath larger leaves, which are of an oblong heart-ſhape. The flowers are rather larger than thoſe of the firſt, and ſtand upon ſhorter foot-ſtalks; theſe differences hold in the plants which are raiſed from ſeeds, therefore I think they may be allowed to ſtand as diſtinct ſpecies, though there is a great likeneſs at firſt ſight in them.

The leaves of theſe ſhrubs, when fermented in a vat, in the ſame manner as is practiſed with the Indigo plants, will afford a dye, very near to that of Indigo; but whether it will anſwer the ſame purpoſes is not yet certain, or whether it may be worth cultivating for that purpoſe, either here or abroad, is what we cannot yet determine; but there is ſo great affinity between theſe plants, and thoſe of the Indigo in their characters, that Dr. Tournefort, and ſeveral other botaniſts, have ranged them in the ſame genus.

Theſe ſhrubs are eaſily propagated by ſowing their ſeeds (which they commonly produce in great plenty) in March, upon a bed of light ſandy earth, obſerving to keep the bed clear from weeds; and in very dry weather the bed muſt often be refreſhed with water, which ſhould be given carefully, leſt the ſeeds ſhould be waſhed out of the ground by haſty watering. When the plants are come up, they muſt be kept clean from weeds, and in very dry weather, if they are watered, it will promote their growth; the Michaelmas following (if the plants have thriven well) you may draw out the largeſt, which may be tranſplanted into a nurſery, at three feet diſtance row from row, and one foot aſunder in the rows. This will give room to thoſe plants which are left to grow in the ſeed-bed, in which place they may remain another year, when they will alſo be fit to tranſplant into a nurſery, where they ſhould be two years, when they will be fit to plant out, where they are to remain for good; in doing of which, you ſhould be careful in taking them up, not to break or wound the roots, nor ſhould they remain too long in the nurſery before they are tranſplanted, for they are ſubject to ſhoot downright roots, which, when cut off, oftentimes proves the death of the tree. In all other reſpects it muſt be treated like other flowering ſhrubs, among which this is commonly ſold at the nurſeries. It may alſo be propagated by laying down the tender branches, which will take root in about a year's time, and may then be tranſplanted into a nurſery, and managed in the ſame manner as the ſeedling plants.

The third ſort grows naturally in the Weſt-Indies, where Plumier firſt diſcovered it in the French ſettlements; but it was found growing in plenty at La Vera Cruz, in New Spain, by the late Dr. Houſtoun, who ſent me the ſeeds, which ſucceeded in the Chelſea garden, where the plants flowered, but did not perfect their ſeeds, and the plants being annual, the ſpecies was loſt here. This riſes with a round herbaceous ſtalk three feet high, which is garniſhed at each joint with one long winged leaf, compoſed of about twenty pair of lobes, terminated by an odd one; theſe have obtuſe points, and are of a deep green. The flowers come out ſingly from the ſide of the ſtalk, immediately above the foot-ſtalk of the leaves, ſtanding upon ſlender foot-ſtalks two inches long; they are larger than thoſe of either of the former ſorts, and are of a pale yellow colour; theſe are ſucceeded by ſlender compreſſed pods, which are more than ſix inches long, having a border on each ſide, and a ſwelling where each ſeed is lodged.

This is an annual plant, whoſe ſeeds muſt be ſown upon a hot-bed in the ſpring, and when the plants are fit to remove, they ſhould be each planted into a ſeparate ſmall pot filled with light kitchen-garden earth, and plunged into a moderate hot-bed of tanners bark, ſhading them from the ſun until they have taken new root, then they muſt be treated in the ſame manner as other exotic plants from thoſe warm countries. If theſe plants are brought forward in the ſpring, and kept under a deep frame in a tan-bed, or plunged into the bark-bed in the ſtove, when they are grown too tall to remain under common frames, they will ripen ſeeds in England; for thoſe ſeeds which I received did not arrive here till May, and yet thoſe plants flowered well in Auguſt; but the autumn coming on ſoon after, prevented their perfecting ſeeds, and that part of the ſeed which I reſerved till the next year did not grow.

EMPETRUM. Lin. Gen. Plant. 977. Tourn. Inſt. R. H. 579. tab. 421. [Ἔμπετρον, of ἐν, in, and πέτρα, *Gr.* a rock or ſtone, becauſe this tree grows in ſtony places.] Black-berried Heath.

The CHARACTERS are,

*It hath male and female flowers on different plants; the male flowers have a three-pointed empalement, which is permanent; they have three oblong petals, which are narrow at their baſe, and three long hanging ſtamina which are*

*are hairy, terminated by short two-pointed summits, which stand erect. The female flowers have the same empalement and petals as the male, but no stamina. In the center is situated a depressed germen, supporting nine reflexed spreading stigma. The germen afterward becomes a depressed round berry of one cell, inclosing nine seeds placed circularly.*

This genus of plants is ranged in the third section of Linnæus's twenty-second class, which includes those plants whose male and female flowers grow on separate plants, and the male flowers have three stamina.

We have but one Species of this genus in England, viz.

Empetrum (*Nigrum*) procumbens. Hort. Cliff. 470. *Trailing Berry-bearing Heath.* Empetrum montanum, fructu nigro. Tourn. Inst. 579. *Black-berried Heath, Crow berries, Crake berries.*

This little shrub grows wild upon the mountains of Staffordshire, Derbyshire, and Yorkshire, and is seldom propagated in gardens unless for variety sake; but it may be cultivated in shady places, and will thrive very well in gardens, where the soil is stiff. The plants should be procured from the places where they grow naturally, for the seeds remain a year in the ground before they vegetate, and afterward are very slow in their growth, so they are not worth the trouble of cultivating from seeds. If the plants are planted on a moist boggy soil in autumn, they will get roots in the winter, and will require no farther care than to clear them from weeds, provided they have a moist soil, otherwise they will require to be frequently watered; for these low shrubs commonly grow upon the tops of wild mountains, where the soil is generally peaty, and full of bogs. The heath cocks feed much upon the berries of this plant; so that wherever there is plenty of these low shrubs, there are commonly many of these fowls to be found.

EMUSCATION, the clearing a tree of moss, *Lat.*

ENUCLEATION, a taking out the nut or kernel of any fruit, *Lat.*

ENULA CAMPANA. See Inula.

EPHEDRA. Lin. Gen. Plant. 1007. Tourn. Inst. 663. tab. 477. Shrubby Horse-Tail, vulgò.

The Characters are,

*It hath male and female flowers in different plants; the male flowers are collected in katkins, which are scaly; under each scale is a single flower; these have no petals, but seven stamina, which are joined in form of a column, and are terminated by roundish summits. The female flowers have an oval perianthium, composed of five series of leaves, which alternately lie over the divisions of the lower range; these have no petals, but have two oval germen sitting upon the perianthium, supporting short styles, crowned by single stigma. The germen afterward turn to oval berries, each having two seeds.*

This genus of plants is ranged in the twelfth section of Linnæus's twenty-second class, intitled Diœcia Monadelphia, the plants of this class and section having male flowers on different plants from the female, and their stamina join in form of a column.

We have but one Species of this genus in England, viz.

Ephedra (*Distachia*) pedunculis oppositis, amentis geminis. Hort. Cliff. 465. *Shrubby Horse-Tail with opposite foot-stalks, and twin katkins.* Ephedra maritima minor. Tourn. *Lesser Sea Horse-Tail.*

This is a low shrubby plant, which grows naturally upon the rocks by the sea in the south of France, in Spain, and Italy; it is also preserved in several gardens for the sake of variety, but has little beauty. This hath a low shrubby stalk, which puts out a few short branches, rising about two feet high, which have many protuberant joints, at which come out several narrow rushy leaves, like those of the Horse-Tail, which continue green all the year, but the plants rarely flower in this country.

It may be propagated by offsets, which the plants send forth in great plenty; for the roots creep under ground, and send forth suckers, which may be taken off to transplant in the spring. They love a pretty moist strong soil, and will endure the cold of our ordinary winters very well in the open air. Some of these plants were formerly preserved in pots, and were housed in winter, but by later experience they are found to thrive better in the full ground.

EPHEMERUM. See Tradescantia.

EPIDENDRUM. Lin. Gen. 1016. Vanilla.

There are near thirty species of this genus, which grow naturally upon trees in Africa and both Indies; but as the plants cannot, by any art yet known, be cultivated in the ground, it would be to little purpose the enumerating of them here; though could the plants be brought to thrive by culture, many of them produce very fine flowers of uncommon forms. I had three species of them sent me from America, which were stripped from the trees on which they grew; these I planted with care in pots, which were placed in a stove, where they came so far as to shew their flowers, but the plants soon after perished.

EPIGÆA. Lin. Gen. Plant. 486. Memecylum. Mitch. 13. Trailing Arbutus.

The Characters are,

*The flower hath a double empalement, which is permanent; the outer is composed of three, and the inner of one leaf, divided at the top into five parts. The flower is of the salver shape, with one petal, having a cylindrical tube, which is longer than the empalement, and hairy within. The brim is cut into five parts, which spread open. It hath ten slender stamina the length of the tube, which are fixed to the base of the petal, and are terminated by oblong summits. In the center is situated a globular hairy germen, crowned by an obtuse quinquefid stigma. The germen afterward becomes a depressed, half globular, five-cornered fruit, having five cells, opening with five valves, containing several seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, the flowers having ten stamina and one style.

We know but one Species of this genus, viz.

Epigæa. Lin. Gen. Plant. 486. Trailing Arbutus.

This plant grows naturally in North America, from whence it has been introduced to the English gardens. It is a low plant, with a trailing shrubby stalk, which puts out roots at the joints, and when in a proper soil and situation, multiplies very fast. The stalks are garnished with oblong rough leaves which are waved on their edges. The flowers are produced at the end of these branches in loose bunches; these are white, and divided at the top into five acute segments, which spread open in form of a star. It flowers in July, but doth not produce fruit in England.

The plants are easily propagated by their trailing stalks, which put out roots at the joints, so may be cut off from the old plant, and placed in a shady situation and a moist soil: the best time for this is in autumn, that the plants may be well rooted before the spring. If the winter should prove very severe, it will be proper to lay a few dried leaves, or some such light covering over them, which will prevent their being injured by frost; and after they are well rooted, they will require no farther care but to keep them clean from weeds.

EPILOBIUM. Lin. Gen. Plant. 426. Chamænerion. Tourn. R. H. 302. tab. 157. Willow Herb, or French Willow.

The Characters are,

*The empalement of the flower is composed of four oblong pointed leaves, which are coloured. The flower hath four bordered petals which spread open, and eight stamina which are alternately shorter, terminated by oval compressed summits. Below the flower is situated a long cylindrical germen, supporting a slender style, crowned by an obtuse quadrifid stigma. The germen afterward becomes a long, cylindrical, furrowed capsule with five cells, filled with oblong seeds, crowned with down.*

This genus of plants is ranged in the first section of Linnæus's eighth class, intitled Octandria Monogynia, the flower having eight stamina and one style.

The SPECIES are,

1. EPILOBIUM (*Angustifolium*) foliis sparsis lineari-lanceolatis, floribus inæqualibus. Lin. Sp. 493. *Epilobium with linear spear-shaped leaves which are placed thinly, and unequal flowers.* Chamænerion latifolium vulgare. Tourn. Inst. R. H. 302. *Common broad-leaved Willow Herb, or French Willow.*
2. EPILOBIUM (*Hirsutum*) foliis oppositis lanceolatis serratis decurrenti-amplexicaulibus. Lin. Hort. Cliff. 145. *Epilobium with opposite spear-shaped leaves, which are sawed on their edges.* Chamænerion villosum, magno flore purpureo. Tourn. Inst. R. H. 303. *Hoary Willow Herb with a large flower, commonly called Codlins and Cream.*

There are several other species of this genus, some of which grow naturally in shady woods and moist places in most parts of England, where they are often very troublesome weeds, therefore are seldom admitted in to gardens, so I shall not trouble the reader with their distinctions.

The first sort here mentioned was formerly planted in gardens for the beauty of its flowers; but as it usually spreads far by the creeping roots, whereby it over-runs all the neighbouring plants, it has been generally cast out of most gardens: however, in some low moist places, or in great shade, if there was a place assigned for this plant, it will make a good appearance when it is in flower, and these flowers are very proper to cut for basons to adorn chimnies in the summer season. This usually grows about four feet high, with slender stiff branches, which are beset with leaves, resembling those of the Willow, from whence it had the name of Willow Herb, or French Willow. On the upper part of the stalks the flowers are produced in a long spike or thyrse, which are of a fine Peach colour, and, if the season is not very hot, they will continue near a month in beauty. This sort is found growing wild in divers parts of England, but several botanists have supposed it was only found in such places where the plants had been cast out of gardens; however, I think it must be allowed to be a native of this country, since it is found in great plenty in woods at a great distance from any habitation, particularly in Charlton forest, and several other woods in Suffex. It is a great creeper at the root, so may be easily propagated.

There is a variety of this with white flowers, which is planted in gardens, but differs from it only in the colour of the flower; however, some persons are fond of propagating these varieties, for which reason I mentioned it here.

The second sort is found wild by the side of ditches and rivers in many parts of England. This plant grows about three feet high, and produces its flowers on the top of the stalks; but these are much less beautiful than those of the first, and the plant being a great rambler at the root, is seldom admitted into gardens. The leaves of this plant being rubbed, emit a scent like scalded Apples, from whence some have given the name of Codlins and Cream to this plant.

EPIMEDIUM. Lin. Sp. Plant. 138. Tourn. Inst. R. H. 232. tab. 117. Raii Meth. Plant. 129. Barrenwort.

The CHARACTERS are,

*The flower hath a three-leaved empalement which falls off. It hath four obtuse oval fruit, which are concave, and spread open, and four nectariums which are cup-shaped, obtuse at the bottom, and as large as the petals. It hath four stamina, terminated by oblong, erect, bilocular summits. The oblong germen is situated at the bottom, supporting a short style, crowned by a single stigma. The germen afterward becomes an oblong pointed pod, with one cell, opening with two valves, inclosing many oblong seeds.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia, the flower having four stamina and one style.

We know but one SPECIES of this genus, viz.

1. EPIMEDIUM (*Alpinum.*) Hort. Cliff. 37. *Alpine Barrenwort.*

This plant hath a creeping root, from which arise many stalks about nine inches high, divided at the top into three, each of which is again divided into three smaller; upon each of these stands a stiff heart-shaped leaf, ending in a point, of a pale green on the upper side, but gray on the under. A little below the first division of the stalk comes out the foot-stalk of the flowers, which is near six inches long, dividing into smaller, each of these sustaining three flowers; these are composed of four leaves, placed in form of a cross; they are of a reddish colour, with yellow stripes on the border. In the center of the flower arises the style, situated upon the germen, which afterward turns to a slender pod, containing many oblong seeds. It flowers in May, and the leaves decay in autumn. The roots, if planted in a shady border, should be every year reduced, so as to keep them within bounds, otherwise it will spread its roots and interfere with the neighbouring plants. It grows naturally on the Alps, but I received some plants of it which were found growing naturally in a wood in the North of England.

EPIPHYLLOSPERMOUS PLANTS [of ἐπὶ, upon, Φύλλον, a leaf, and Σπέρμα, *Gr.* seed,] such plants as bear their seeds on the back of their leaves, the same as capillaries.

EQUINOCTIAL, ÆQUINOCTIAL [of equus, equal, and nox, *Lat.* night.] A great and immoveable circle of the sphere, under which the equator moves in its diurnal motion.

The equinoctial, or equinoctial line, is ordinarily confounded with the equator; but there is a difference, the equator being moveable, and the equinoctial unmoveable, and the equator drawn about the convex surface of the sphere, but the equinoctial on the concave surface of the Magnus Orbis.

The equinoctial is conceived, by supposing a semidiameter of the sphere, produced through a point of the equator, and there describing a circle on the immoveable surface of the Primum Mobile, by the rotation of the sphere about its axis.

Whenever the sun comes to this circle, in his progress through the ecliptic, it makes equal day and night all round the globe; as then arising due east, and setting due west, which he never does at any other times of the year.

The people who live under this circle, have their days and nights constantly equal; and the sun is in their zenith at noon, and casts no shadow.

EQUINOXES are the times when the sun enters into the equinoctial points, which are the two points where the equator and ecliptic intersect each other; the one being in the first point of Aries, called the vernal equinox; and the other in the first point of Libra, called the autumnal equinox.

So the equinoxes happen when the sun is in the equinoctial circle, when, of consequence, the days are equal to the nights throughout the world, which is the case twice a year, viz. about the 21st of March, and the 22d of September; the first of which is the vernal, and the second the autumnal equinox.

EQUISETUM [of equus, a horse, and seta, a bristle, because the leaves and branches represent the bristles or hair of a horse's main or tail. It is by the Greeks called Ἵππουρις, of Ἵππος, a horse, and Οὐρά, a tail; and hipposeta, of ἵππος and seta.] Horse-Tail.

There are several species of this plant, which are found in England, on the sides of ditches, or in shady woods; but as they are plants which are never cultivated in gardens, I shall pass them over in this place.

ERANTHEMUM. See ADONIS.

ERICA. Lin. Gen. Plant. 435. Tourn. Inst. R. H. 602. tab. 373. [Ἐρείκη, of ἐρείκω, or ἐρίκω, *Gr.* to break, because this plant is said to have the virtue of breaking the stone in the bladder.] Heath; in French, *Bruyere.*

The CHARACTERS are,

*The flower hath a coloured permanent empalement of four oval*

*oval erect leaves. It hath one swelling petal, which is erect and quadrifid, and eight hairy stamina, which are fixed to the receptacle, and terminated by bifid summits. In the bottom is situated the roundish germen, supporting a declining style, which is longer than the stamina, crowned by a four-cornered stigma. The germen afterward becomes a round capsule, having four cells, which are filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's eighth class, intitled Octandria Monogynia, the flower having eight stamina and one style.

The Species are,

1. Erica (*Vulgaris*) antheris bicornibus inclusis, corollis inæqualibus, campanulatis mediocribus foliis oppositis sagittatis. Lin. Sp. Plant. 352. *Heath with two horns including the summits, bell-shaped unequal petals, and middling arrow-pointed leaves placed opposite.* Erica vulgaris glabra. C. B. 485. *Common smooth Heath.*
2. Erica (*Herbacea*) antheris bicornibus inclusis campanulatis mediocribus secundis, foliis ternis triquetris patulis. Lin. Sp. Plant. 500. *Heath with a horned summit, a bell-shaped petal, and five narrow spreading leaves.* Erica foliis coridis, multiflora. J. B. vol. 1. p. 356. *Pine-leaved Heath with many flowers.*
3. Erica (*Cinerea*) antheris bicornibus inclusis, corollis ovatis racemosis, foliis ternis glabris linearibus. Lin. Sp. Plant. 352. *Heath with two horns including the summits, oval branchy petals, and three long, narrow, smooth leaves.* Erica humilis, cortice cinereo, arbuti flore. C. B. P. 486. *Dwarf Heath with an Ash-coloured bark, and Strawberry-tree flower.*
4. Erica (*Ciliaria*) antheris simplicibus inclusis, corollis ovatis irregularibus, floribus ternoracemosis, foliis ternis ciliatis. Lœfl. Epist. 2. p. 9. Lin. Sp. Plant. 354. *Heath with single summits, oval irregular petals, triple branching flowers, and hairy leaves placed by threes.*
5. Erica (*Arborea*) antheris bicornibus inclusis, corollis campanulatis longioribus, foliis quaternis patentissimis, caule subarboreo tomentoso. Lin. Sp. 502. *Tree Heath, whose antheræ are included in two horns, a longer bell-shaped flower, and four spreading leaves at each joint.*

The four first sorts grow wild upon barren uncultivated places in divers parts of England; but notwithstanding their commonness, yet they deserve a place in small quarters of humble flowering shrubs, where, by the beauty and long continuance of their flowers, together with the diversity of their leaves, they make an agreeable variety.

These are seldom propagated in gardens, and so not to be had from the nurseries, but may be taken up, with a ball of earth to their roots, from the natural place of their growth in autumn, and may be transplanted into the garden. The soil where they are planted should not be dunged, nor should you bestow any other culture on them than clearing them from weeds; for the less the ground is dug, the better these will thrive, for they commonly shoot their roots near the surface, which, in digging, are subject to be hurt, whereby the plant is often destroyed; these may also be propagated by seeds, but this being a tedious method, the other is much preferable to it.

The fifth sort grows naturally at the Cape of Good Hope, and also in great plenty in Portugal, where it rises with a strong ligneous stem to the height of eight or ten feet, sending out many branches the whole length, garnished with narrow leaves, four coming out from the same point; the flowers are produced between the leaves on the upper part of the branches; they are white, with a blush of red on their outside; these appear in May, but are not succeeded by seeds in England.

This plant will live in the open air in England, provided it is planted in a dry soil and a warm situation, but is generally kept in pots and housed in winter; however, the plants so managed, do not thrive or flower so well as those in the full ground, therefore it is much better to be at the trouble of sheltering the plants in the ground in winter, than to keep them in pots.

It is with difficulty propagated here, which is done by laying down the young shoots, though these are often two years before they put out roots: others plant the young slips or cuttings into pots filled with light earth, covering them close with a bell-glass, and shading them from the sun; where this is skilfully practised, the cuttings will put out roots, and make better plants than the layers.

ERICA BACCIFERA. See Empetrum.

ERIGERON. Lin. Gen. Plant. 855. Senecionis. Sp. Dill. Conyzella. Dill. Groundsel.

The Characters are,

*It hath a compound radiated flower, composed of many hermaphrodite florets which form the disk, and female half florets which make the rays; these are contained in one oblong scaly empalement. The hermaphrodite florets are funnel-shaped, and cut at the top into five parts; these have five short hairy stamina, terminated by cylindrical summits; they have a small germen, crowned with down, which is longer than the petal. Upon the germen sits a slender style the length of the down, crowned by two oblong stigmas; the germen afterward becomes a small oblong seed, crowned with long down. The female half florets, which compose the rays, have one side of their petals stretched out like a tongue; these have no stamina, but a small downy germen, supporting a slender style, which is hairy, crowned by two slender stigmas. The germen afterward becomes a seed like the hermaphrodite florets.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, which includes the plants with a compound flower, composed of hermaphrodite and female flowers, which are both fruitful. To this genus Dr. Linnæus has added several species of Conyza and Aster of former botanists.

The Species are,

1. Erigeron (*Viscosum*) pedunculis unifloris lateralibus foliis lanceolatis denticulatis calycibus squarrosis, corollis radiatis. Hort. Upsal. 258. *Groundsel with one flower on a foot-stalk, proceeding from the side of the stalk, spear-shaped leaves, and a rough empalement.* Conyza mas Theophrasti, major Dioscoridis. C. B. P. 265. *Male Fleabane of Theophrastus, and greater Fleabane of Dioscorides.*
2. Erigeron (*Acre*) pedunculis alternis unifloris. Hort. Cliff. 407. *Groundsel with alternate foot-stalks having one flower.* Conyza cærulea acris. C. B. P. 265. *Blue acrid Fleabane.*
3. Erigeron (*Bonariense*) foliis basi revolutis. Lin. Sp. Plant. 863. *Groundsel whose leaves are curved at their base.* Senecio Bonariensis purpurascens, foliis imis coronopi. Hort. Elth. 344. tab. 257. *Purplish Groundsel of Buenos Ayres, with under leaves like Hartshorn Plantain.*
4. Erigeron (*Canadense*) caule floribusque paniculatis. Hort. Cliff. 407. *Groundsel with a paniculated stalk and flowers.* Virga aurea Virginiana annua. Zan. Hist. 205. *Annual Virginia Golden Rod.*
5. Erigeron (*Alpinum*) caule subbifloro, calyce subhirsuto. Lin. Sp. Plant. 864. *Groundsel with two flowers on a stalk, and hairy empalements.* Conyza cærulea Alpina. C. B. P. 265. *Blue Alpine Fleabane.*
6. Erigeron (*Graveolens*) ramis lateralibus multifloris, foliis lanceolatis integerrimis, calycibus squarrosis. Amœn. Acad. 4. p. 290. *Groundsel with many flowers on the side of the stalks, entire spear-shaped leaves, and rough empalements.* Virga aurea minor, foliis glutinosis & graveolentibus.
7. Erigeron (*Fœtidum*) foliis lanceolato-linearibus retusis, floribus corymbosis. Lin. Sp. 1213. *Groundsel with linear spear-shaped leaves, and flowers in a corymbus.* Senecio Africanus folio retuso. Herm. 661.

The first sort grows naturally in the south of France, and in Italy. This hath a perennial root, from which arise several upright stalks near three feet high, garnished with oblong oval leaves which are hairy, and sit close to the stalk; they are placed alternate, and are four inches long, and two broad in the middle; these in warm weather sweat out a clammy juice. The flowers are produced single upon pretty long foot-stalks, some arising from the side of the stalk, and others

others terminate it; they are yellow, and have an agreeable odour. They flower in July, and the feeds ripen in autumn.

This plant is propagated by feeds, which, if fown in autumn, will more certainly fucceed than thofe which are fown in the fpring. When the plants come up, they fhould be thinned if they are too clofe, and kept clean from weeds till autumn, when they fhould be tranfplanted where they are to remain. They delight in a dry foil and a funny expofure. The fecond year the plants will flower and perfect their feeds, but the roots will continue feveral years, and annually produce their flowers and feeds.

The next four forts are preferved in botanic gardens for the fake of variety, but are feldom admitted into gardens for pleafure. The fifth fort is a perennial plant, which grows naturally on the Alps, and may be propagated by feeds in the fame manner as the firft fort, but fhould have a fhady fituation and a moift foil.

The others are annnual plants, which, if once admitted into a garden, and fuffered to fcatter their feeds, will become very troublefome weeds there.

The fixth fort rifes with ftiff ftalks three feet high, garnifhed with narrow fpear-fhaped leaves; the flowers are yellow, and are produced in clofe bunches from the fide of the ftalk toward the top; thefe appear in July, and in warm feafons are fucceeded by feeds in England.

It may be propagated by cutting the ftalk in proper lengths, which, if planted in a fhady border, and duly watered, will put out roots; and the following autumn, thefe may be taken up and planted in the borders of the flower-garden.

The feventh fort grows naturally in Africa: the roots of this fend up five or fix upright ftalks near four feet high, clofely garnifhed with linear fpear-fhaped leaves which are hairy; the ftalks are terminated by pretty large bunches of yellow flowers, formed in a corymbus. Thefe appear in October, and frequently continue more than two months, which renders the plant more valuable.

This is too tender to thrive in the open air in this country, fo the plants fhould be kept in pots; and if in the winter they are placed in a common frame, where they may have a large fhare of free air in mild weather, and fcreened from hard frofts, they will thrive better than with tender treatment. It is eafily propagated by cuttings, which, if planted in May, will readily put out roots, and the young plants will flower the autumn following.

ERINUS. Lin. Gen. Plant. 689. Ageratum. Tourn. Inft. R. H. 651. tab. 422.

The CHARACTERS are,

*The flower hath a permanent empalement, compofed of five leaves, which are equal; it hath one petal which is tubulous, and of the ringent kind, cut into five equal fegments, which fpread open, three ftanding upward from the upper lip, and two turn downward. It hath four ftamina fituated within the tube, two of which are a little longer than the other, terminated by fmall fummits. In the bottom of the tube is fituated the oval germen, fupporting a fhort ftyle, crowned by a head-fhaped ftigma. The germen afterward becomes an oval capfule, covered by the empalement, having two cells filled with fmall feeds.*

This genus of plants is ranged in the fecond fection of Linnæus's fourteenth clafs, which includes thofe plants whofe flowers have two long and two fhort ftamina, and their feeds growing in a capfule. Tournefort has it in his appendix, but it fhould be placed in his third clafs, and the fifth fection, which contains the plants with an anomalous tubulous flower of one leaf.

The SPECIES are,

1. ERINUS (*Alpinus*) floribus racemofis. Lin. Sp. Plant. 630. *Erinus with branching flowers.* Ageratum ferratum, Alpinum, glabrum, flore purpurafcente. Tourn. R. H. 651. *Smooth fawed Alpine Ageratum, having a purplifh flower.*
2. ERINUS (*Tomentofus*) tomentofus, caulibus procumbentibus, floribus feffilibus axillaribus. *Woolly Erinus with trailing ftalks, and flowers fitting clofe to their fides.* Ageratum Americanum procumbens, gnaphalii facie, floribus ad foliorum nodos. Houft. MSS. *Trailing American Ageratum with the appearance of Cudweed, and flowers growing at the knots of the leaves.*
3. ERINUS (*Americanus*) caule erecto, foliis lanceolatis oppofitis, floribus laxè fpicatis terminalibus. *Erinus with an upright ftalk, fpear-fhaped leaves placed oppofite, and flowers growing in loofe fpikes, terminating the ftalks.* Ageratum Americanum erectum fpicatum, flore purpureo. Houft. MSS. *Upright American Ageratum with fpikes of purple flowers.*
4. ERINUS (*Frutefcens*) caule erecto fruticofo, foliis ovato-lanceolatis ferratis, alternis, floribus axillaribus. *Erinus with a fhrubby erect ftalk, oval, fpear-fhaped, fawed leaves placed alternate, and flowers on the fides of the ftalk.* Ageratum frutefcens, foliis dentatis latioribus, villofum. Houft. MSS. *Shrubby hoary American Ageratum with broad indented leaves.*
5. ERINUS (*Verticillatus*) caule ramofo procumbente, foliis ovatis ferratis glabris oppofitis, floribus verticillatis. *Erinus with a branching trailing ftalk, oval, fmooth, fawed leaves placed oppofite, and flowers growing in whorls round the ftalks.* Ageratum Americanum procumbens, foliis fubrotundis ferratis glabris. Houft. MSS. *Trailing American Ageratum with roundifh, fmooth, fawed leaves.*
6. ERINUS (*Procumbens*) caulibus procumbentibus, foliis ovatis glabris, floribus fingulis alaribus, pedunculis longioribus. *Erinus with trailing ftalks, oval fmooth leaves, and fingle flowers on the fides of the ftalks, having longer foot-ftalks.* Ageratum Americanum, procumbens, glabrum, floribus luteis, longis pediculis infidentibus. Houft. MSS. *Smooth trailing American Ageratum, with yellow flowers fitting upon long foot-ftalks.*

The firft fort grows naturally upon the Alps and Helvetian mountains: this is a very low plant, whofe leaves lie clofe to the ground, growing in clofe tufts; they are about half an inch long, and one eighth of an inch broad, fawed on their edges, and of a dark green; between thefe arifes the flower-ftalk, which is fcarce two inches high, fupporting a loofe bunch of purple flowers, which ftand erect. Thefe appear in May, and fometimes are fucceeded by ripe feeds in July.

It is propagated by parting the roots; the beft time for this is in autumn; they muft have a fhady fituation and a loamy foil without dung, for in rich earth thefe plants are very fubject to rot.

The fecond fort was fent me by the late Dr. Houftoun from La Vera Cruz, where he found it growing naturally. This fends out feveral trailing ftalks about fix inches long, which are clofely garnifhed with fmall oval leaves, placed on every fide; they are very white and woolly, and at the joints juft above the leaves come out the flowers, fitting very clofe to the ftalks; thefe are white, and are fucceeded by round capfules, having two cells, filled with fmall feeds: this plant has great refemblance at a diftance to the Sea Cudweed.

The third fort was difcovered by Dr. Houftoun, in the fame country with the former: this hath an upright ftalk two feet high, garnifhed with fpear-fhaped leaves placed oppofite; and toward the top of the ftalk is produced two fmaller branches placed oppofite, which ftand erect; and thefe, as alfo the middle ftalk, are terminated by loofe fpikes of purple flowers, which are fucceeded by oval feed-veffels, filled with fmall feeds.

The fourth fort rifes with a fhrubby ftalk about four feet high, dividing into feveral fmall branches, which are hairy; thefe are garnifhed with oval fpear-fhaped leaves, deeply fawed on their edges; they are placed alternate, and have pretty long foot-ftalks. The flowers come out from the fide of the ftalks, fometimes fingle, at other times two or three at a joint, fitting clofe to the ftalks; they are white, and are fucceeded by round feed-veffels, filled with fmall feeds.

The fifth sort sends out many trailing smooth stalks, which branch out very much on every side; they grow about seven or eight inches long, and are garnished with small oval leaves placed opposite. The flowers come out in whorls, sitting very close to the stalks; they are white, and make but little appearance; these are succeeded by round capsules, filled with small seeds.

The sixth sort sends out several trailing stalks about six inches long, which divide into many smaller branches; these are garnished with small oval leaves, standing opposite. The flowers come out singly from the side of the stalk; they are of a bright yellow, and stand on long slender foot-stalks; these are succeeded by oval seed-vessels, filled with small seeds.

The fourth sort is a perennial shrubby plant, which will continue several years, if kept in a warm stove; but the second, third, fifth, and sixth sorts are annual, decaying soon after they have perfected their seeds.

These are propagated by seeds, which should be sown in pots filled with light earth, and plunged into a moderate hot-bed, where sometimes the plants will come up in five or six weeks, and at other times the seeds do not vegetate till the following spring; this happens frequently when the seeds have been kept long after they were gathered. When the plants are fit to remove, they should be each planted in a separate small pot filled with light earth, not too rich with dung, and then plunged into a hot-bed of tanners bark. When they have taken new root, they should be treated in the same way as other plants from those countries, by admitting proper air to them at all times when the weather is warm, and frequently refreshing them with water: with this management the annual sorts will flower in July and August, and frequently ripen their seeds in autumn, if the plants are brought forward early in the spring, otherwise the winter will come on before their seeds ripen.

The shrubby kind must be placed in the bark-stove in autumn, and during the winter the plants should be frequently refreshed with water, but it must not be given them in large quantities, nor too often repeated in cold weather, for moisture will then destroy them; the second year the plants will flower and perfect their seeds.

ERIOCEPHALUS. Dill. Hort. Elth. 110. Lin. Gen. Plant. 890.

The Characters are,

*It hath a radiated flower, composed of female half florets which form the rays, and hermaphrodite florets, which form the disk; these are included in one common scaly empalement. The hermaphrodite florets are funnel-shaped, and cut into five parts at the brim, which spread open; these have five short hairy stamina, terminated by cylindrical summits; they have a small naked germen, supporting a single style, crowned by a pointed stigma; these are barren. The female florets have their petals stretched out on one side like a tongue, which is divided at the end into three small lobes; these have no stamina, but an oval naked germen, with a single style, crowned by an inflexed stigma; these have one naked seed, sitting on the naked plain receptacle.*

This genus of plants is ranged in the fourth section of Linnæus's nineteenth class, which includes those plants with compound flowers, whose hermaphrodite florets are barren, and the female half florets are fruitful.

We know but one Species of this genus, viz.

Eriocephalus (*Africanus.*) Lin. Sp. Plant. 926. We have no proper title for this in English. Eriocephalus sempervirens, foliis fasciculatis & digitatis. Hort. Elth. 132. *Evergreen Eriocephalus with fingered leaves growing in bunches.*

This plant hath a shrubby stalk, which rises from four to six feet high, putting out many side branches the whole length, closely garnished with woolly leaves, which come out in clusters; some of these are taper and entire, others are divided into three or five parts, which spread open like a hand; they have a strong smell when bruised, approaching to that of Lavender Cotton, but not quite so rank. The flowers are produced in small clusters at the extremity of the branches, standing erect; they are tubulous. The female florets which compose the rays, form a hollow, in the middle of which the hermaphrodite flowers are situated which form the disk. The border is white, with a little reddish cast on the inside, and the disk is of a purplish colour. The flowers appear in autumn, but are not succeeded by seeds in this country.

This plant is propagated by cuttings, which may be planted any time from May to the middle of August, for if they are planted later in the season, there will not be time for them to get good root before the winter; these cuttings should be planted in small pots filled with light earth, and plunged into a very moderate hot-bed, where they should be shaded from the sun till they have taken root; these must be refreshed with water two or three times a week, but they should not have too much at each time, for much moisture is very hurtful to these plants. When the cuttings have taken root, they should be gradually inured to the open air, to prevent their shoots from being drawn up weak; afterward they should be removed into the open air, and placed in a sheltered situation, where they may remain till October, when they must be removed into an airy glass-case, that they may have as much sun as possible, and enjoy the free air in mild weather, but secured from frost and damp air, either of which will soon destroy them. During the winter they must be sparingly watered, for the reason before given; but, in the summer, when the plants are placed in the open air, they will require to be frequently refreshed with water in hot weather.

These plants retain their leaves all the year, so they add to the variety of exotics in the winter season.

ERUCA. Tourn. Inst. R. H. 226. tab. 111. Brassica. Lin. Gen. 734. Rocket; in French, *Roquette.*

The Characters are,

*The empalement of the flower is composed of four oblong leaves, which stand erect, forming a tube. The flower hath four oblong petals, placed in form of a cross, which are rounded at their ends, where they are broad, but narrow at their base, and are much longer than the empalement. It hath six stamina, four of which are a little longer than the empalement; the other two are shorter, terminated by acute segments. It hath an oblong taper germen, supporting a short style, crowned by an obtuse bifid stigma. The germen afterward becomes a taper-cornered pod with two cells, filled with roundish seeds.*

This genus of plants is ranged in the second section of Linnæus's fifteenth class, which includes the plants whose flowers have four long and two short stamina, and their seeds are contained in long pods. Dr. Linnæus has joined the common Rocket to his genus of Brassica, and some of the other species he has distributed under his other genera; but as the common Rocket has been long established as an officinal plant, I chuse to continue this genus by its old title.

The Species are,

1. Eruca (*Sativa*) foliis pinnato-laciniatis, laciniis exterioribus majoribus. *Rocket with wing-shaped jagged leaves, whose outer segments are the largest.* Eruca sativa major annua, flore albo striato. J. B. 2. 859. *Greater Garden annual Rocket with a white striped flower.*
2. Eruca (*Bellidis folia*) foliis lanceolatis, pinnato-dentatis, caule nudo simplici. *Rocket with spear-shaped leaves which are indented, and a naked single stalk.* Eruca bellidis folio. Mor. Hist. 2. 231. *Rocket with a Daisy leaf.*
3. Eruca (*Perennis*) foliis pinnatis glabris, caule ramoso, floribus terminalibus. *Rocket with winged smooth leaves, and a branching stalk terminated by flowers.* Eruca tenuifolia perennis, flore luteo. J. B. 2. 861. *Narrow-leaved perennial Rocket with a yellow flower.*

4. Eruca (*Aspera*) foliis dentato-pinnatifidis hirsutis, caule hispido, siliquis lævibus. *Rocket with indented, wing-pointed, hairy leaves, a rough stalk, and smooth pods.* Eruca sylvestris, major, lutea, caule aspero. C. B. P. 98. *Greater wild Saffron-coloured Rocket with a rough stalk.*

5. Eruca (*Tenacetifolia*) foliis pinnatis, foliolis lanceolatis pinnatifidis. Prod. Leyd. 342. *Rocket with winged leaves, whose lobes are spear-shaped and wing-pointed.* Eruca Tenacetifolia. H. R. Par. *Rocket with a Tansey leaf.*

6. Eruca (*Viminia*) foliis sinuato-pinnatis, sessilibus, caule ramoso. *Rocket with wing-shaped sinuated leaves sitting close to the stalks, which are branching.* Eruca Sicula bursæ pastoris folio. C. B. P. 98. *Sicilian Rocket with a Shepherd's Purse leaf.*

The first sort is an annual plant, which was formerly much cultivated in the gardens as a sallad herb, but at present is little known here, for it has been long rejected on account of its strong ungrateful smell. It stands in the list of medicinal plants, but at present is seldom used, though it is reckoned a provocative and a good diuretic. If it is propagated for sallads, the seeds should be sown in drills, in the same manner as is usually practised for other small sallad herbs; for it must be eaten young, otherwise it will be too strong for most palates. The winter and spring seasons are the times when this herb is used; for when it is sown in the summer, the plants soon run up to seed, and are then too rank. Where it is cultivated for the seed, which is sometimes used in medicine, they should be sown in March, on an open spot of ground; and when the plants have put out four leaves, the ground should be hoed to destroy the weeds, and the plants must be thinned, so as to leave them three or four inches asunder; and in about five or six weeks after, the ground should be a second time hoed to destroy the weeds, which, if well performed, will prevent them from growing to injure the plants, till the seeds are ripe; when the plants should be drawn up, and spread upon a cloth in the sun for two or three days to dry, then the seeds may be beaten out of the pods, and put up for use.

The second sort grows naturally in the south of France and Italy, where it is often eaten as a sallad herb; this hath many spear-shaped leaves arising from the root, which are four or five inches long, and one inch broad in the middle, regularly indented on their edges, and spread on the ground; the stalks are single, and rise about a foot high; they are naked, seldom having more than one leaf, which is situated at the bottom; the flowers grow in loose bunches on the top of the stalks, which are succeeded by pods two inches long, having two cells filled with small round seeds. This is an annual plant, which may be propagated by seeds in the same manner as the former.

The third sort grows naturally about Paris, and in many other parts of Europe; the leaves of this are narrow, and regularly divided like a winged leaf; the stalks branch out upward, and are terminated by loose spikes of yellow flowers. This hath a perennial root, and an annual stalk.

The fourth sort grows naturally upon old walls and buildings in many parts of England, where it continues flowering all the summer, but is rarely admitted into gardens. It is sometimes used in medicine, for which reason I have here mentioned it.

The fifth sort grows naturally about Turin, from whence I received the seeds. This hath fine divided leaves, somewhat like those of Tansey, but are of a hoary green colour; the stalks rise a foot and a half high, which are fully garnished with leaves of the same form, but gradually diminish in their size upward; the flowers are produced in clusters at the top of the stalks, they are small, and of a pale yellow colour; these are succeeded by slender taper pods two inches long, which contain two rows of small round seeds.

The sixth sort grows naturally in Italy and Spain; this is an annual plant, with many oblong leaves, which are smooth and regularly sinuated on their sides, in form of a winged leaf; they are five or six inches long, and one inch and a half broad, of a light green, having a hot biting taste; the stalks rise about a foot high, they are strong, and divide into several branches; these are garnished with a single leaf at each joint, shaped like those below, but smaller. The flowers are produced in loose clusters at the end of the branches; these are white, and near as large as those of the Garden Rocket, and are succeeded by taper pods three inches long, containing two rows of round seeds. These plants are preserved in some gardens for the sake of variety, therefore they are here mentioned; and those who are inclined to cultivate them, may do it by sowing their seeds on a bed of light earth in an open situation; and when the plants come up, they will require no other culture but to thin them, and keep them clear from weeds. They flower in June and July, and their seeds ripen in August.

ERUCAGO. See Bunias.

ERVUM. Lin. Gen. Plant. 784. Tourn. Inst. R. H. 398. tab. 221. *Bitter Vetch.*

The Characters are,

*The empalement of the flower is divided into five equal parts, which end in acute points; the flower is of the butterfly kind, having a large, roundish, plain standard, two obtuse wings half the length of the standard, and a shorter keel which is pointed. It hath ten stamina, nine joined, and one standing separate, terminated by single summits. It hath an oblong germen, supporting a rising style, crowned by an obtuse stigma. The germen afterward becomes an oblong taper pod, jointed between each seed.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes those plants with a butterfly flower, with ten stamina separated in two bodies. To this genus Dr. Linnæus has joined the Lens of Tournefort, and some species of Vicia. The difference which he makes between Vicia and Ervum is only in their stigmas, that of Vicia having an obtuse stigma, bearded on the under side, and that of the Ervum is smooth.

The Species are,

1. Ervum (*Ervilia*) germinibus undato-plicatis foliis impari pinnatis. Hort. Upsal. 224. *Ervum whose germens are waved and folded, and unequal winged leaves.* Ervum verum. Camer. Hort. *The true Bitter Vetch.*
2. Ervum (*Lens*) pedunculis subbifloris seminibus compressis convexis. Lin. Sp. Plant. 738. *Ervum with foot-stalks having two flowers, and compressed seeds which are convex.* Lens vulgaris. C. B. P. 346. *Common Lentils.*
3. Ervum (*Monanthos*) pedunculis unifloris. Lin. Sp. Plant. 738. *Ervum with one flower on each foot-stalk.* Lens monanthos. H. L. 360. *One flowered Lentil.*
4. Ervum (*Tetraspermum*) pedunculis subbifloris, seminibus globosis quaternis. Flor. Suec. 606. *Ervum with two flowers on each foot-stalk, and four globular seeds in each pod.* Vicia segetum singularibus siliquis glabris. C. B. P. 345. *Corn Vetch with single smooth pods.*
5. Ervum (*Hirsutum*) pedunculis multifloris, seminibus globosis binis. Lin. Sp. Plant. 738. *Ervum having many flowers on a foot-stalk, and two globular seeds in each pod.* Vicia segetum, cum siliquis plurimis hirsutis. C. B. P. 345. *Corn-Vetch having many hairy pods.*

The first sort grows naturally in Italy and Spain: it is an annual plant, which rises with angular weak stalks a foot and a half high, garnished at each joint with one winged leaf, composed of fourteen or fifteen pair of lobes, very like those of the Vetch, but narrower; the flowers come out from the side of the stalks, on foot-stalks an inch long, each sustaining two pale-coloured flowers, which are succeeded by short pods a little compressed, each having three or four round seeds; the pods swell at the place where each seed is lodged, so that it is called a jointed pod by many. The seeds of this plant ground to flour is sometimes used in medicine; and the green herb is used for feeding of cattle in some countries, but it is not worth cultivating for that purpose in England.

The second sort is the common Lentil, which is cultivated in many parts of England, either as fodder for

for cattle, or for the seeds, which are frequently used for meagre soups. This is also an annual plant, and is one of the least of the pulse kind, which is cultivated: it rises with weak stalks a foot and a half high, garnished with winged leaves at each joint, composed of several pair of narrow lobes, terminated by a tendril or clasper, which fastens to any neighbouring plant, and is thereby supported; the flowers come out upon short foot-stalks from the side of the branches; they are small, of a pale purple colour, three or four standing upon a foot-stalk; these are succeeded by short flat pods, containing two or three seeds, which are flat, round, and a little convex in the middle. The flowers appear in May, and the seeds ripen in July. The seeds of this plant are commonly sown in March, where the land is dry, but in moist ground the best time is in April. The usual quantity of seed allowed to an acre of land, is from one bushel and a half to two bushels. If these are sown in drills in the same manner as Peas, they will succeed better than when they are sown in broad cast: the drills should be a foot and a half asunder, to allow room for the Dutch hoe to clean the ground between them; for if the weeds are permitted to grow among them, they will get above the Lentils and starve them. The seeds of these will ripen in July, when the plants should be cut and dried, and afterward the seeds should be threshed out for use.

The seeds of Lentils are frequently the common food of the poorer sort of people in some of the islands of the Archipelago, and other warm countries, when they can meet with no better fare; for these they loath, when they have better food, from whence came the proverb, *Dives factus jam dísit gaudere lente*; which is applied to those who spurn at those things in easy circumstances, which they were glad of in a low condition.

There is another sort of Lentil which has been cultivated of late years in England, by the title of French Lentil. This is the Lens major of Caspar Bauhin, and is undoubtedly a different species from the common, being twice the size, both in plant and seed, and constantly produces the same from seeds, though they do not differ much in their characters, but this is much better worth cultivating than the other. This pulse is frequently called Tills in many parts of England.

The third sort is very like the common Lentil, but differs from it, in having but one flower on each foot-stalk, whereas the other has three or four, but in other respects is the same, so may be cultivated in the same manner.

The fourth and fifth sorts are small annual Vetches, which grow naturally among the Wheat and Rye in many parts of England, so are not admitted into gardens; they are only mentioned here as weeds, which may be easily rooted out of the fields, if they are cut up when they begin to flower, and not permitted to ripen their seeds; for as they have annual roots, so if they do not scatter their seeds, they may be soon destroyed.

ERVUM ORIENTALE. See SOPHORA.

ERYNGIUM. Lin. Gen. Plant. 287. Tourn. Inst. R. H. 327. tab. 173. Sea Holly, or Eryngo.

The CHARACTERS are,

*It hath many small flowers sitting upon one common conical receptacle, whose involucrum is composed of several plain leaves; the flowers have a five-leaved erect empalement, coloured on the upper side, sitting upon the germen; these form a roundish general umbel, which is uniform. The flowers have five oblong petals, which are turned inward at top and bottom, and five erect hairy stamina, standing above the flowers, terminated by oblong summits; under the empalement is situated a prickly germen, supporting two slender styles, crowned by single stigmas. The germen afterward becomes an oval fruit divided in two parts, each having one oblong taper seed.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and two styles.

The SPECIES are,

1. ERYNGIUM (*Maritimum*) foliis radicalibus subrotundis plicatis spinosis, capitulis pedunculatis. Hort. Cliff. 87. *Sea Holly whose lower leaves are folded, roundish, and prickly, and flower-heads having foot-stalks.* Eryngium maritimum. C. B. P. 386. *Sea Holly, or Eryngo.*
2. ERYNGIUM (*Campestre*) foliis amplexicaulibus pinnato laciniatis. Hort. Cliff. 87. *Sea Holly whose leaves embrace the stalks, and are cut like winged leaves.* Eryngium vulgare. C. B. P. 386. *Common Eryngo.*
3. ERYNGIUM (*Planum*) foliis radicalibus ovalibus planis crenatis, capitulis pedunculatis. Hort. Cliff. 87. *Sea Holly whose lower leaves are plain, oval, and crenated, with flower-heads having foot-stalks.* Eryngium latifolium planum. C. B. P. 386. *Broad-leaved plain Eryngo.*
4. ERYNGIUM (*Amethystinum*) foliis trifidis basi subpinnatis. Lin. Sp. Plant. 337. *Eryngo with trifid leaves, and those at the base winged.* Eryngium montanum amethystinum. C. B. P. 386. *Purple Violet-coloured Mountain Eryngo.*
5. ERYNGIUM (*Pallescente*) foliis radicalibus rotundato-multifidis, capitulis pedunculatis. *Eryngo whose lower leaves are roundish and multifid, having foot-stalks to the heads of flowers.* Eryngium Alpinum amethystinum, capitulo majore pallescente. Tourn. Inst. 328. *Alpine Eryngo with a large pale-coloured head.*
6. ERYNGIUM (*Orientale*) foliis radicalibus pinnatis, serrato-spinosis, foliolis trifidis. *Eryngo whose lower leaves are winged, spiny indented, and the smaller ones trifid.* Eryngium Orientale, foliis trifidis. T. Cor. 23. *Oriental Eryngo with trifid leaves.*
7. ERYNGIUM (*Aquaticum*) foliis gladiatis serrato-spinosis, floralibus indivisis caule simplici. Lin. Sp. Plant. 336. *Eryngo with sword-shaped leaves which are spiny and indented, and the upper ones entire.* Eryngium foliis gladiolatis utrinque laxè serratis, denticulis subulatis. Lin. Hort. Cliff. 88. *American Sea Holly with leaves like the Aloe, lightly sawed, commonly called Rattlesnake Weed in America.*
8. ERYNGIUM (*Pusillum*) foliis radicalibus oblongis incisis, caule dichotomo, capitulis sessilibus. Hort. Cliff. 87. *Eryngo with oblong lower leaves which are cut, a stalk divided by pairs, and heads sitting close.* Eryngium planum minus. C. B. P. 386. *Lesser plain Eryngo.*
9. ERYNGIUM (*Alpinum*) foliis radicalibus cordatis oblongis, caulinis pinnatifidis, capitulo subcylindrico. Lin. Sp. Plant. 233. *Eryngo with oblong, heart-shaped, lower leaves, those upon the stalks wing-pointed, and cylindrical heads.* Eryngium Alpinum cæruleum, capitulis dispaci. C. B. P. 386. *Blue Alpine Eryngo with heads like the Teasel.*
10. ERYNGIUM (*Fœtidum*) foliis radicalibus subensiformibus serratis floralibus multifidis caule dichotomo. Lin. Sp. Plant. 336. *Eryngo with sword-shaped lower leaves having spiny saws, the upper leaves ending in many points.* Eryngium foliis angustis serratis fœtidum. Sloan. Cat. Jam. 127. *Stinking Eryngo having narrow sawed leaves, commonly called Feverweed.*

The first of these species grows in great plenty on the sandy and gravelly shores in divers parts of England, the roots of which are candied, and sent to London for medicinal use, and is the true Eryngo. This hath creeping roots, which run deep into the ground; the leaves are roundish, stiff, and of a gray colour, set with sharp spines on the edges. The stalks rise a foot high, and divide upward into two or three smaller branches; they are smooth, and garnished at each joint with leaves of the same form as the lower, but smaller, which embrace the stalks with their base; at the end of the branches come out the flowers in roundish prickly heads; under each is situated a range of narrow, stiff, prickly leaves, spreading like the rays of a star; the flowers are of a whitish blue colour. They appear in July, and the stalks decay in autumn.

This sort will grow in a garden, if the roots are planted in a gravelly soil, and produce their flowers annually; but the roots will not grow near so large or fleshy as those which grow on the sea-shore, where they are flowed with salt water. The best time to transplant the roots is in autumn, when their leaves decay;

decay; the young roots are much better to remove than the old, becaufe they are furnifhed with fibres, fo will readily take root: when thefe are fixed in the ground, they fhould remain unremoved; and if they are kept clean from weeds, it is all the culture they will require.

The fecond fort grows naturally in feveral parts of England, where it is a very troublefome weed, for the roots run deep into the ground, fo are not eafily deftroyed by the plough; and they fpread and multiply greatly in the ground, to the prejudice of whatever is fown or planted on the land, therefore it is not admitted into gardens.

The third fort makes a very pretty appearance when it is in flower, efpecially that with the blue ftalks and flowers, for there is a variety of this with white flowers and ftalks; but as this doth not fpread at the root, but keeps within bounds, fo a few of the plants fhould be allowed a place in the pleafure-garden. This is propagated by feeds, which, if fown in the autumn, will more certainly fucceed than when it is fown in the fpring, for the latter commonly remains in the ground a year before they vegetate; and if the feeds are fown where the plants are to remain, they will flower ftronger than thofe which are tranfplanted; for as they have long downright roots, fo thefe are commonly broken in taking out of the ground, which greatly weaken the plants. The culture they require is to thin them where they are too near, keep them clean from weeds, and dig the ground about them every fpring before they fhoot.

The ftalks of this fort will rife from two to three feet high, the lower leaves are oval and plain; thofe of the white fort are of a lighter green than thofe of the blue; the upper part of the ftalks of the white are of that colour, thofe of the blue are of the colour of amethyft; the ftalks divide upward, where they are garnifhed with leaves divided into many points ending with fpines; the flowers are produced in oval heads at the top of the ftalk, ftanding upon feparate foot-ftalks. The flowers come out in July, and the feeds ripen in September.

The fourth fort grows naturally upon the mountains of Syria, and alfo upon the Apennines. The lower leaves of this fort are divided like the fingers of a hand, into five or fix fegments, which are very much cut at their extremities into many parts, and have fmall fpines; the ftalk rifes about two feet high, garnifhed with fmaller and more divided leaves; the upper part of the ftalk, and alfo the heads of flowers, are of the fineft amethyft colour, fo that they make a very fine appearance. This fort flowers in July, and when the autumn proves dry, their feeds will ripen in September, but in wet feafons the feeds never ripen in England. This is propagated by feeds in the fame manner as the former fort.

The fifth fort has been fuppofed by many, to be only a variety of the fourth; but I have propagated it by feeds more than thirty years, without finding the leaft alteration, fo that I make no doubt of its being a diftinct fpecies. The lower leaves of this are very much divided, and the extremity of the fegments form an oval or circle; thefe are divided into many fine parts, which end in fpines; they are of a whitifh gray in the middle, and green on the borders. The ftalks rife about two feet high, garnifhed at the joints with fmaller leaves which are finely cut; the flowers terminate the ftalk, they are of a light blue colour, and grow in larger heads than either of the former forts. It flowers in June and July, and the feeds ripen in autumn. This grows naturally on the Alps; it is a perennial plant, and may be propagated by feeds in the fame manner as the former.

The fixth fort was difcovered by Dr. Tournefort in the Levant, from whence he fent the feeds to the royal garden at Paris. This hath a perennial root, the lower leaves are regularly divided into feven or nine parts to the midrib, as the other winged leaves; thefe fegments are fawed on their edges, which end in fharp thorns. The ftalks rife two feet high, fending out fide branches, garnifhed with ftiff leaves, which are divided into narrower fegments than the lower, and are terminated by three points. The flowers terminate the ftalks, fitting clofe among the leaves, and are of a fine blue, as are alfo the leaves on the upper part of the ftalks, fo they make a pretty appearance. This flowers in July, but feldom ripens feeds in England. It is propagated in the fame manner as the three former forts, and the plants require the fame treatment.

The feventh fort grows naturally in Virginia and Carolina, where it is titled Rattlefnake Weed, from its virtues of curing the bite of that venomous reptile. This hath a perennial root, from which arife feveral long leaves, which are fawed on their edges, ending in fpines; thefe leaves are difpofed round the root, after the fame form of the Aloe or Yucca; they are of a gray colour, a foot long or more, and one inch and a half broad, ftiff, and end in fpines. The ftalk is ftrong, grows two feet high, dividing upward into feveral foot-ftalks, each being terminated by an oval head of flowers, fhaped like thofe of the former forts; they are white, with a little caft of pale blue. This fort flowers in July, but unlefs the feafon is very warm, the feeds will not ripen in England.

This fort is propagated by feeds, which, if fown in pots and plunged into a moderate hot-bed, the plants will come up much fooner than thofe which are fown in the full ground, whereby they will be much ftronger before the winter. When the plants are fit to remove, they fhould be each planted in a feparate fmall pot, filled with light earth; and if they are plunged into a moderate hot-bed, it will forward their taking root; then they muft be gradually inured to bear the open air, into which they may be removed toward the latter end of May, and placed among other hardy exotic plants. When the plants have filled thefe pots with their roots, fome of them may be fhaken out, and planted in a warm border; the others may be put into larger pots, and in the autumn placed under a common frame, where they may be expofed to the free air in mild weather, but fheltered from fevere froft: the following fpring thefe may be turned out of the pots, and planted in a warm fituation, where they will endure the cold of our ordinary winters very well; and if in fevere froft they are covered with Straw, Peas-haulm, or any fuch light covering, it will fecure them from injury.

The eighth fort grows naturally in Spain and Italy. This puts out oblong plain leaves from the root, which are cut on their edges; the ftalks rife about a foot high, and branch out into many forked divifions, which are regular, and at each of thefe divifions is fituated a fmall head of flowers, fitting very clofe between the branches. Thefe have no great beauty, fo the plants are feldom cultivated in gardens, except for the fake of variety.

The ninth fort grows naturally on the mountains of Helvetia and Italy. The root is perennial, the lower leaves are oblong, heart-fhaped, and plain; the ftalks rife from two to three feet high, branching out on their fides upward; thefe are garnifhed with ftiff leaves, which are deeply divided, ending in many points with fharp fpines; the flowers terminate the ftalks, they are collected into conical heads, and are of a light blue colour, as are alfo the upper part of the ftalks. This flowers in July, and the feeds are ripe in September; it is propagated by feeds in the fame manner as the other forts.

The tenth fort grows naturally in the Weft-Indies, where it is much ufed in medicine, being accounted of great fervice in the cure of fevers, from whence it hath the appellation of Feverweed in thofe countries. The roots of this plant are compofed of many fmall fibres, which fpread near the furface; the lower leaves are fix or feven inches long; they are narrow at their bafe, and enlarge upward to an inch in breadth near the top, where they are rounded off on one fide like a fcymitar; they are finely fawed on their edges, and are of a light green colour; the ftalk rifes about a

foot high, and spreads out into many branches, garnished with small leaves, which end in many points; the flowers are produced in small heads which sit close to the stalks, coming out at every division of the stalks, and at the end of the branches; these are of a dull white colour, so make little appearance. They appear in June and July, and the seeds ripen in autumn. As this plant is a native of hot countries, so it will not thrive in England, but in a warm stove. It is propagated by seeds, which must be sown on a hot-bed; and when the plants are fit to remove, they should be each planted into a small pot, and plunged into the bark-bed, and afterward treated like other tender plants from the same country; the second year they will produce flowers and seeds, soon after which they commonly decay.

ERYSIMUM. Lin. Gen. Plant. 729. Tourn. Inst. R. H. 228. tab. 111. [Ἐρύσιμον, of ἐρύω, *Gr.* to draw out, because this plant, by means of its hot quality, has the quality of drawing any thing out of the body in which it lies hid.] Hedge-Mustard; in French, *Velar*, or *Tortelle*.

The Characters are,

*The empalement of the flower is composed of four oblong, oval, coloured leaves; the flower hath four petals, placed in form of a cross; these are oblong, plain, and obtuse; it hath two nectarious glands, situated between the stamina. It hath six stamina, four of which are the length of the empalement, the other two are a little shorter, terminated by single summits. It hath a very narrow four-cornered germen as long as the stamina, with a short style, crowned by a small permanent stigma; the germen afterward becomes a long, narrow, four-cornered pod with two cells, filled with small round seeds.*

This genus of plants is ranged in the second section of Linnæus's fifteenth class, which includes those plants whose flowers have four long and two short stamina, and the seeds are included in long pods.

The Species are,

1. Erysimum (*Officinale*) siliquis spicæ adpressis foliis runcinatis. Hort. Cliff. 337. *Hedge Mustard whose pods are pressed close to the spikes.* Erysimum vulgare. C. B. P. 100. *Common Hedge Mustard.*
2. Erysimum (*Barbarea*) foliis lyratis extimo subrotundo. Flor. Suec. 557. *Hedge Mustard with harp-shaped leaves, the outer segment being roundish.* Sisymbrium erucæ folio glabro flore. Tourn. Inst. 226. *Winter Cress with a Rocket leaf and yellow flower.*
3. Erysimum (*Vernum*) foliis radicalibus lyratis, caulinis pinnato-sinuatis, floribus laxè spicatis. *Hedge Mustard with lower leaves shaped like a harp, those on the stalks sinuated and winged, and flowers growing in loose spikes.* Sisymbrium erucæ folio glabro minus & præcocius. Tourn. Inst. 226. *Smaller early Winter-Cress with a smooth Rocket leaf.*
4. Erysimum (*Orientale*) foliis radicalibus ovatis integerrimis, petiolis decurrentibus, caulinis oblongis dentatis sessilibus. *Hedge Mustard with lower leaves oval and entire, a winged foot-stalk, and the leaves upon the stalks oblong, indented, and sitting close.* Sisymbrium Orientale barbareæ facie, plantaginis folio. Tourn. Cor. 16. *Oriental Sisymbrium with the appearance of Water-Cress and a Plantain Leaf.*
5. Erysimum (*Minus*) foliis inferioribus pinnato-sinuatis, superioribus oblongis dentatis, floribus solitariis alaribus. *Hedge Mustard whose lower leaves are winged and sinuated, the upper oblong and indented, and single flowers proceeding from the sides of the stalks.* Sisymbrium minus erucæ folio glabro nigro, crasso lucido. Boerh. Ind. alt. 2. 16. *Smaller Winter Cress, with a smooth, dark, thick, shining Rocket leaf.*
6. Erysimum (*Alliaria*) foliis cordatis. Hort. Cliff. 338. *Hedge Mustard with heart-shaped leaves.* Hesperis allium redolens. Mor. Hist. 2. 252. *Dames Violet smelling like Garlick, commonly called Alliaria, Sauce alone, or Jack by the Hedge.*
7. Erysimum (*Cheiranthoides*) foliis lanceolatis integerrimis. Flor. Lapp. 263. *Hedge Mustard with entire spear-shaped leaves.* Leucoium hesperidis folio. Tourn. Inst. 221. *Gilliflower with a Dames Violet leaf.*

The first sort is used in medicine; this grows naturally on the side of foot-paths, and upon old walls in most parts of England, so is rarely cultivated in gardens, where, if it is once admitted, will soon become a troublesome weed.

The second and third sorts also grow naturally on the banks in most parts of England; these were formerly eaten in winter sallads, before the English gardens were furnished with better plants; since when they have been rejected, for they have a rank smell, and are disagreeable to the palate.

The fourth and fifth sorts are not natives of this country, but since they have been introduced into some English gardens, they have propagated themselves by their scattered seeds in so plentiful a manner, as to become troublesome weeds. These have a resemblance of the common Winter Cress, but the lower leaves of the fourth sort are entire, and of an oblong form; the upper leaves are oblong and indented, in which this differs.

The fifth sort hath thicker leaves, which are of a dark lucid green colour, and the flowers come out single from the wings of the stalk the whole length. These differences are lasting, and do not alter.

The sixth sort grows naturally on the sides of banks in many parts of England, so is not suffered to have a place in gardens. This was formerly eaten as a sallad herb by the poorer sort of people, who gave it the title of Sauce alone. This hath a rank smell and taste of Garlick, and is very biting and hot on the palate; it is frequently prescribed in medicine.

The seventh sort is sometimes found growing naturally upon old walls in some parts of England, particularly at Cambridge and Ely, at both which places I have observed it. This hath pretty long, hairy, soft leaves at the root; the stalks rise near a foot high, their upper part being garnished with small greenish white flowers in loose spikes; these are succeeded by long compressed pods which hang downward. It flowers in May, and the seeds ripen in July and August; but the roots will abide several years, if they have a dry lean soil, or grow upon a wall, for in rich land they soon decay.

The other sorts are sometimes kept in botanic gardens for the sake of variety; they are biennial plants, which perish after they have perfected their seeds. These may be propagated by sowing their seeds in the autumn, in the places where they are to remain, and require no other culture but to thin them, and keep them clear from weeds.

ERYTHRINA. Lin. Gen. Plant. 762. Corallodendron. Tourn. Inst. R. H. 661. tab. 446. Coral-tree.

The Characters are,

*The flower hath a tubulous empalement of one leaf, which is entire and indented at the brim. The flower is of the butterfly kind, composed of five petals; the standard is spear-shaped, and deflexed on the styles; it is very long, and rises upward; the two wings are scarce longer than the empalement, and are oval; the keel is composed of two petals which are no longer than the wings, and are indented at the top; it hath ten stamina which are joined below, and are a little curved, about half as long as the standard, and are unequal in their length, terminated by arrow-pointed summits; it hath an awl-shaped germen with a foot-stalk, narrowed at the style, which is the length of the stamina, terminated by a single stigma. The germen afterward becomes a long swelling pod ending in an acute point, having one cell, filled with kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes the plants with a butterfly flower, having ten stamina joined in two bodies.

The Species are,

1. Erythrina (*Herbacea*) foliis ternatis, caule simplicissimo inermi. Hort. Cliff. 354. *Erythrina with trifoliate leaves, and a single smooth stalk.* Corallodendron humile, spicâ florum longissimâ, radice crassissimâ. Catesb. Carol. 49. tab. 49. *Low Coral-tree with a very long*

*long spike of flowers and thick root, commonly called the Carolina Coral-tree.*

2. Erythrina (*Corallodendron*) inermis, foliis ternatis, caule arboreo. *Smooth Erythrina with trifoliate leaves, and a tree-like stalk.* Coral arbor Americana. Hort. Amst. 1. p. 211. *Smooth American Coral-tree.*

3. Erythrina (*Spinosa*) foliis ternatis, caule arboreo aculeato. Hort. Cliff. 354. *Erythrina with trifoliate leaves, and a tree-like prickly stalk.* Corallodendron triphyllum Americanum, spinosum, flore ruberrimo. Tourn. Inst. R. H. 661. *Prickly three-leaved American Coral-tree, with a very red flower.*

4. Erythrina (*Picta*) foliis ternatis aculeatis caule arboreo aculeato. Lin. Sp. 993. *Erythrina with trifoliate prickly leaves, and a prickly tree-like stalk.* Corallodendron triphyllon Americanum, minus spinis & seminibus nigricantibus. Tourn. Inst. R. H. 661. *Smaller three-leaved American Coral-tree, with blacker spines and seeds.*

5. Erythrina (*Americana*) foliis ternatis acutis, caule arboreo aculeato, floribus spicatis longissimis. *Erythrina with trifoliate acute-pointed leaves, a prickly tree-like stalk, and very long spikes of flowers.* Corallodendron triphyllon Americanum, foliis mucronatis, seminibus coccineis. Houst. MSS. *Three-leaved American Coral-tree, with acute-pointed leaves and scarlet seeds.*

6. Erythrina (*Inermis*) foliis ternatis acutis, caule fruticoso inermi, corollis longioribus clausis. *Erythrina with acute trifoliate leaves, a shrubby unarmed stalk, and longer flowers which are closed.* Coral arbor non spinosa, flore longiore & magis clauso. Sloan. Cat. Jam. 142. *Coral-tree without spines, having a longer closer flower.*

The first sort grows naturally in South Carolina, from whence Mr. Catesby sent the seeds in the year 1724, and many of the plants were then raised in several curious gardens. This hath a very large woody root, which seldom rises more than a foot and a half high, from which come out fresh shoots every spring; these grow about two feet high, their lower part being garnished with trifoliate leaves, of a deep green colour, which are shaped like the point of an arrow; the upper part of the stalks are terminated by a long spike of scarlet flowers, composed of five petals, the upper petal being much longer than the other, so that at a small distance the flowers appear to have but one petal. After the flowers are past, the germen turns to a taper pod five or six inches long, swelling in every part where the seeds are lodged, opening in one cell, containing five or six kidney-shaped scarlet seeds. These plants flower in England, but they never produce seeds here.

The second sort hath a thick woody stem, which rises about ten or twelve feet high in this country, but in its native country grows to twice that height, sending out many strong irregular branches, which are covered with a brown bark, garnished with trifoliate leaves standing upon long foot-stalks, the middle lobe which terminates the leaf, being much larger than the other two; they are all heart-shaped, smooth, and of a deep green colour; the flowers come out at the end of the branches, in short, thick, close spikes; they are of a deep scarlet colour, and make a fine appearance. These commonly are in beauty in May and June in this country, but are not succeeded by pods here; but in America, where the trees grow naturally, they have thick, swelling, crooked pods, which contain large kidney-shaped seeds, of a reddish purple colour. The leaves of this tree decay in the spring and fall off, so that in summer they appear to have no life; but in the autumn it puts out new leaves, which continue green all the winter. The flowers do not appear till the leaves drop, so that the branches are often naked at the time when the flowers are out.

The third sort chiefly differs from the second, in having its trunk, branches, and the foot-stalks of the leaves, armed with short crooked spines, the leaves and flowers being very like those of the second sort.

The fourth sort hath shrubby stalks, which divide into branches, and seldom rise above eight or nine feet high; these are armed in every part with strong, crooked, black spines; the leaves are smaller than those of the two last sorts, and have a nearer resemblance of the first; the foot-stalks of the leaves are armed with the same sort of spines, and the midrib of the leaves have also some which are smaller and not so black; the flowers are of a paler scarlet, and grow in looser spikes. The seeds are as large as those of the second sort, but are of a dark purple colour.

This tree is generally planted in the East-Indies for a support to the Pepper plants, which twine round the stem and branches, whereby they are prevented trailing on the ground; and as the branches of this tree will put out roots and grow, so they are preferable to any dead props, which in those hot countries, where there is much rain, would soon rot.

The seeds of the fifth sort were sent me from La Vera Cruz, where the plants grow naturally; and since I have received seeds of the same sort from the Cape of Good Hope, so that it is a native of both countries. The seeds of this are not half so large as those of the second or third sorts, and are of a bright scarlet colour; the leaves are also much smaller, and have long acute points; the branches are very closely armed with crooked greenish spines, as are also the ribs and foot-stalks of the leaves. The flowers grow in very long close spikes, and are of a beautiful scarlet colour.

I have also raised a variety of this with paler flowers and seeds, and the plants were less thorny; but as I was doubtful of its being a distinct species, so I only mention it here.

The sixth sort grows in Jamaica, and some of the other islands in America, from whence I have received the seeds. The pods of this sort are longer, and not more than half so thick as those of the second sort; the seeds are of a bright scarlet colour, they are longer and slenderer than those of the other sorts; the leaves are small and acute-pointed, and the stalks are smooth and without spines: this doth not grow very large, but shoots out into branches at a little distance from the ground, which grow erect, so form a bushy shrub. The flowers come out at the end of the branches in short spikes; the standard of the flower is long, and the sides turn down over the wings, which are also longer than those of the other species, and the whole flower is more closed.

I have also received specimens of a variety of the third sort from the island of Barbuda, with very short flowers and pods; they came by the title of Bean-tree, which is the common appellation given to these trees in America; but the flowers were separated from the stalks, so that I can give no account in what manner they grow, whether in long or short spikes; but the stamina of these are much longer than the petals, in which it differs from all the other; the pods are very short and crooked, but are rather thicker than those of the third sort; the leaves have the same appearance, and are armed with spines, as are also the stalks and branches, but the plants have not as yet produced any flowers here.

A few years ago I received a few very small seeds of a Coral-tree from the Cape of Good Hope, which were of a bright scarlet colour; the plants have no spines on them, the leaves are much larger than the other sorts, their stems are strong, and have the appearance of growing to large trees; but as they are young, so there is no determining how they may differ from the other species.

There are two other sorts of Coral-tree mentioned by Sir Hans Sloane, in his History of Jamaica: one of which is by its characters a Sophora, under which genus we shall place it; and the other will be put under Robinia, to which genus it properly belongs.

These plants when they produce their flowers, are some of the greatest ornaments to the stoves we yet know; for their flowers are produced in large spikes, and are of a beautiful scarlet, so they make a fine appearance; but it is seldom they flower here, or in any of the northern parts of Europe; yet in the

countries where they naturally grow, they produce flowers in great plenty every year; so that it is very common there to see most of their branches terminated by large spikes of flowers, when they have no leaves upon them; and the first sort, which grows in Carolina, is equally productive of flowers there, tho' here they do not flower oftener than once in two or three years, and the other sorts not so frequent. I have tried by various methods to get them to flower; some I have treated hardily, by exposing them to the open air during the summer season, and in the winter kept them in a very moderate temperature of warmth; others I have kept plunged all the year in the tan-bed of the stove, and some have remained in a dry stove all the year, where in warm weather they had a large share of air admitted to them, and in winter the air was kept to the temperate point. In this last place the plants have succeeded best, yet with this treatment they seldom flower; and this is the general complaint of every one who is possessed of these plants, not only in England, but also in Holland and France.

The first sort may be kept through the winter in a warm green-house, but the plants so kept rarely flower; and the two sorts which I have received from the Cape of Good Hope, have lived through the winter in a warm glass-case, without fire; but these have not made so good progress, as those plants which were kept in a temperate warmth; so that in this country, it is much the best method of treating these plants, especially while they are young.

These plants are best propagated by seeds, when they can be procured from the countries where they naturally grow, for they do not produce any here, tho' they are annually brought to England in plenty. The seeds should be sown in small pots, and plunged into a moderate hot-bed; where, if the seeds are good, the plants will come up in a month or five weeks; when they are two inches high, they should be carefully shaken out of the pots, and each planted in a separate small pot, filled with light earth, and plunged into a moderate hot-bed of tanners bark, where they must be shaded from the sun till they have taken new root; then they should have a large share of air admitted to them at all times when the weather is warm, to prevent their being drawn up weak; and as the plants increase in strength, so they must have a larger share of air. They must be frequently refreshed with water, but not given to them in great plenty, for too much moisture will rot the fibres of their roots. In the autumn the plants should be removed into the stove; and for the two or three first winters, while the plants are young, they will require more warmth than when they have acquired more strength. During the time the leaves continue in vigour, the plants will require to have water two or three times a week; but when they are destitute of leaves, it must be sparingly given, for moisture then is very hurtful to them. As the plants grow in strength, so they must be more hardily treated; and by managing them differently, there will be a greater chance of getting them to flower.

The third sort is frequently planted in the gardens near Lisbon, where they annually flower and ripen their seeds, which have been brought me by persons who gathered the pods from the trees.

These plants may also be propagated by cuttings, which, if planted in pots during the summer months, and plunged into a hot-bed, will take root, but the seedling plants are best.

ERYTHRONIUM. Lin. Gen. Plant. 375. Dens canis. Tourn. Inst. R. H. 378. tab. 202. Dog's Tooth, or Dog's Tooth Violet.

The Characters are,

*The flower has no empalement; it is bell-shaped, and composed of six oblong petals, which spread open to their base. It hath six stamina joined to the style, terminated by oblong, erect, quadrangular summits. In the center is situated an oblong, obtuse, three-cornered germen, supporting a single style which is longer than the stamina, crowned by a triple, obtuse, spreading stigma. The germen afterward becomes an oblong obtuse capsule with three cells, filled with flat seed.*

This genus of plants is ranged in the first section of Linnæus's sixth class, in which he places those plants whose flowers have six stamina and one style.

The Species are,

1. Erythronium (*Dens Canis*) foliis ovatis. *Erythronium with oval leaves.* Dens canis latiore rotundioreque folio, flore ex purpurâ rubente. C. B. P. 87. *Dog's Tooth Violet with a broader and rounder leaf, and a purple red flower.*
2. Erythronium (*Longifolium*) foliis lanceolatis. *Erythronium with spear-shaped leaves.* Dens canis angustiore longioreque folio, flore ex albo purpurascente. C. B. P. 87. *Dog's Tooth Violet, with a longer and narrower leaf, and a purplish white flower.*

These are the only distinct species which I have seen, but there are some varities of them, which are preserved in curious gardens. Of the first sort there is a white flower, which is pretty common in the gardens; another with a pale purple, and a third with yellow flowers, which are rare in England: and of the second sort there is one with a white, and another with a soft red flower, both which are now very rare in the gardens.

The first sort sends out two oval leaves, which are joined at their base: they are three inches long and one and a half broad in the middle, gradually lessening toward the end; these at first embrace each other inclosing the flower, but afterward they spread flat upon the ground; they are spotted with purple and white spots all over their surface; between these rises a single naked stalk about four inches high, which is smooth, of a purple colour; this sustains one flower, composed of six spear-shaped petals, which in this are purple, but in some they are white; the flower hangs downward, and the petals reflex and spread open to their base. In the center is situated the oblong three-cornered germen, supporting a single style which is longer than the stamina, crowned by a triple stigma; the purple stamina stand close about the style, and the stigma stands farther out. This plant flowers early in April, but seldom produces seeds in England. The root of this plant is white, oblong, and fleshy, and shaped like a tooth; from whence it had the title of Dog's Tooth.

The second sort differs from the first in the shape of its leaves, which are longer and narrower, and the flowers are a little larger but not so well coloured. They grow naturally in Hungary, and in some parts of Italy. They are propagated by offsets from their roots, which they do not send out very plentifully, so they are not so commonly seen in the gardens, as most other flowers of the same season: they love a shady situation and a gentle loamy soil, but should not be too often removed. They may be transplanted any time after the beginning of June, when their leaves will be quite decayed, till the middle of September; but the roots should not be kept very long out of the ground, for if they shrink, it will often cause them to rot. The roots of these flowers should not be planted scattering in the borders of the flower-garden, but in patches near each other, where they will make a good appearance.

ESCHYNOMENE. See Æschynomena.

ESCHYNOMENOUS, ÆSCHYNOMENOUS PLANTS [Αἰσχυνόμενοι, of αἰσχύνομαι, *Gr.* to be ashamed,] the sensitive plants; which, when one touches them, will shrink in, or let their leaves fall down.

ESCULENT PLANTS [of esculentus, *Lat.* eatable,] such plants, or the roots of them, as may be eaten; as Beets, Carrots, Leeks, Onions, Parsneps, Potatoes, Radishes, Horse-radish, Scorzonera, &c.

ESPALIERS, are either rows of trees planted about a whole garden or plantation, or in hedges, so as to inclose quarters or separate parts of a garden, which are trained up flat in a close hedge, for the defence of tender plants against the violence and injury of wind and weather.

The

The most commonly received notion of Espaliers are hedges of fruit-trees, which are trained up regularly to a lattice of wood work, formed either of Ash-poles, or square long timbers cut out of Fir, &c. and it is of this sort of Espalier that I shall treat in this place.

Espaliers of fruit-trees are commonly planted to surround the quarters of a kitchen-garden, for which purpose they are of admirable use and beauty; for by laying out the walks of this garden regularly, which are bounded on each side by these hedges, when they are handsomely managed, they have a wonderful effect in sheltering the kitchen-plants in the quarters, and also screening them from the sight of persons in the walks; so that a kitchen-garden well laid out in this manner, and properly managed, will be equal to the finest regular parterre for beauty.

The trees chiefly planted for Espaliers are Apples, Pears, and some Plums; but the two former are mostly used: some plant Espaliers of Apples grafted upon Paradise-stocks; but these being of humble growth, and a short duration, are not so proper for this purpose, unless for very small gardens; therefore I should rather advise the having them upon Crab-stocks, or (if in smaller gardens, where the trees cannot be allowed to grow so high) upon what the gardeners call the Dutch-stock; which will cause them to bear sooner, and prevent their growing too luxuriantly, and these will continue many years in vigour.

In chusing the trees for an Espalier, endeavour as near as possible, to plant the several sorts which are nearly of the same growth in one line, that the Espalier may be the more regular, and of an equal height, which greatly adds to their beauty; for if you plant trees which shoot very unequally in the same line, it will be impossible to make the Espalier regular: besides, the distance of the trees must be in proportion to their growth; for some trees, viz. those of a larger growth, should be planted thirty or thirty-five feet asunder; whereas those of smaller growth, need not be above twenty-five feet distance from each other.

The width of the walks and borders between these Espaliers should (in a large garden) be fourteen or sixteen feet at least; and if the trees are designed to be carried up pretty high, the distance should be greater, that each side may receive the advantage of the sun and air, which is absolutely necessary, if you would have the fruit well tasted. And if your ground is so situated, that you are at full liberty which way to make the Espaliers, I would advise the placing the lines from the east a little inclining to the south, and toward the west a little inclining to the north, that the sun may shine between the rows in the morning and evening when it is low; for in the middle of the day, when the sun is advanced far above the horizon, it will shine over the tops of the Espaliers, and reach the surface of the earth about their roots, which is a matter of more consequence than many people are aware of.

The sorts of Apples proper for Espaliers, are the Golden Pippin, Nonpareil, Rennette Grise, Aromatick Pippin, Holland Pippin, French Pippin, Wheeler's Russet, Pile's Russet, with some others. The season for planting, and the method of pruning and training these trees, you will see under the articles of Apples and Pruning.

The sorts of Pears proper for an Espalier, are chiefly the summer and autumn fruits, for some of the winter Pears seldom succeed well in an Espalier. These trees, if designed for a strong moist soil, should be upon Quince-stocks; but if for a dry soil upon free-stocks. Their distance of planting must also be regulated by the growth of the trees, which are more unequal in Pears than Apples, and should therefore be more carefully examined before they are planted. As for those Pears upon free-stocks, the distance should never be less than thirty feet for moderate growing trees; but for vigorous shooters, the space of forty feet is little enough; especially if the soil be strong, in which case they should be planted at a greater distance. The particular sorts of Pears I would recommend for an Espalier, are the Jargonelle, Blanquette, Poire sans Peau, Summer Boncretien, Hamden's Bergamot, Autumn Bergamot, L'ambrette, Gros Rousselet, Chaumontelle, Beurre du Roy, Le Marquis, Cressane, with some others of less note; always remembering, that those Pears which are of the melting kind, will do better in Espalier than the breaking Pears, which seldom ripen well on an Espalier; as also that many sorts of Pears will ripen well on an Espalier in a warm soil and situation, which require a wall in other places; you should also be careful of the stocks these are grafted on; for if the breaking Pears are grafted upon Quince-stocks, the fruit will be stony, but the melting Pears will be improved by them. As to the method of planting, see the article Pear; and for pruning and managing, see Pruning.

I shall now give directions for making the Espalier, to which the trees are to be trained; but this should not be done until the third year after the trees are planted; for while they are young, it will be sufficient to drive a few short stakes into the ground on each side of the trees, in a strait line, to which the branches should be fastened in an horizontal position, as they are produced, in order to train them properly for the Espalier; which stakes may be placed nearer, or at a farther distance, according as the shoots produced may require; and these will be sufficient for the three first years; for should you frame the Espalier the first year the trees are planted, many of the stakes would rot before the Espalier is covered. The cheapest method to make these Espaliers is with Ash-poles, of which you should have two sorts; one of the largest size, which contains thirteen poles in a bundle, and the other size those of half a hundred. The first or largest size poles, should be cut about seven feet and a half long; these are intended for upright stakes, and must be sharpened at the largest end, that they may, with more ease, be driven into the ground; and if their bottoms are burred, or rubbed over with that composition mentioned in the article of Coverings, they may be preserved a long time found; these should be placed at a foot distance from each other in a direct line, and of an equal height, about six feet above ground; then you should nail a row of strait slender poles along upon the tops of the upright stakes, which will keep them exactly even, and continue to cross the stakes with the smaller poles, and also with the tops which were cut off from the larger stakes, at about nine inches distance, row from row, from the top to the bottom of the stakes. These rows of poles should be fastened with wire to the stakes, which if made of Fir, and painted over, will last a long time; and the largest end of the poles should be cut flat, and nailed to the upright stakes, which will secure the Espalier almost as long as the poles will endure; whereas, if your fastening is not strong, the poles will be continually displaced with every strong wind.

When your Espalier is thus framed, you must fasten the branches of the trees thereto either with small Osier-twigs, rope-yarn, or some such binding, observing to train them in a horizontal position, and at equal distances; being careful not to cross any of the branches, nor to lay them in too thick. The distance which should be allowed for the branches of Pears and Apples, must be proportioned according to the size of their fruit; such of them whose fruit is large, as the Summer Boncretien, Monsieur John, and Beurre du Roy Pears, and the Rennet Grise, Holland Pippin, French Pippin, and other large Apples, should have their branches six or eight inches distance at least; and to those of lesser growth, four or five inches will be sufficient. But for farther directions, I shall refer to the articles of the several fruits: as also that of Pruning, where these particulars will be sufficiently explained.

But besides this sort of Espalier made with Ash-poles, there is another sort that is by many people preferred; which is framed with square timbers cut to a proper size, according to the strength thereof, or the expence the owner is willing to go to. These, though they appear more sightly, when well fixed and painted, are not of longer duration than one of the former, provided

vided it is well made, and the poles are strong which are set upright; nor will they answer the purpose better, though they are vastly more expensive; for the greatest beauty consists in the disposing of the branches of tree; which, especially in summer, when the leaves are on, will entirely hide from the sight the frame of the Espalier; therefore all expence in erecting these is needless, farther than making provision to secure the branches of the trees in a regular order.

Fruit-trees thus planted, and well managed, are much preferable to those trained up in any other figure, upon several accounts; as first, these take up very little room in a garden, so as not to be hurtful to the plants which grow in the quarters; and, secondly, the fruit upon these are better tasted than those which grow upon dwarfs, the sun and air having freer access to every part of the tree; whereby the dampness arising from the ground is sooner dissipated, which is of singular advantage to fruit-trees (as hath been already shewn.) And as the trees against an Espalier are kept low, and the branches being fastened to the Espalier, the fruit will not be blown down so soon by the wind; so that upon the whole, Espaliers must be allowed to be of great use and beauty.

EVER-GREEN THORN. See PYRACANTHA.

EVERLASTING PEA. See LATHYRUS.

EUGENIA. Michel. 108.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, cut into four segments: the flower hath four oblong obtuse petals, twice as large as the empalement. It hath many stamina which are inserted in the empalement, terminated by small summits, and a turbinated germen situated under the flower, supporting a simple style the length of the stamina, crowned by a single stigma. The germen afterward becomes a quadrangular plumb-shaped fruit crowned, having one cell inclosing one smooth roundish nut.*

This genus of plants is ranged in the first section of Linnæus's twelfth class, intituled Icosandria Monogynia, the flower having many stamina inserted in the empalement, and one style.

The SPECIES are,

1. EUGENIA (*Malaccensis*) foliis integerrimis, pedunculis racemosis lateralibus. Flor. Zeyl. 187. *Eugenia with entire leaves and branching foot-stalks of flowers.* Jambosa domestica. Rump. Amb. 1. p. 121.
2. EUGENIA (*Jamboo*) foliis integerrimis, pedunculis racemosis terminalibus. Flor. Zeyl. 188. *Eugenia with entire leaves, and branching foot-stalks of flowers terminiating the branches.* Jambosa sylvestris alba. Rump. Amb. 1. 127.

There are some other species of this genus which grow naturally in India, but those here mentioned are the only sorts which I have seen in the English gardens. Some plants of the first sort I received from Dr. Heberden with some other plants, which were sent by his brother from the Brasils, where it is cultivated for the table; so that the plants of this kind are common in most parts of the East-Indies.

This rises with a tree-like stem, covered with a brown bark, which, in the countries where it grows naturally, rises from twenty to thirty feet high, sending out many branches, garnished with oblong entire leaves, ending in acute points: these are placed opposite, and when young, are of a bright purple colour; but as they grow older, become of a light green. The flowers are produced on the side of the branches, each foot-stalk branching into three or four others, each supporting one flower. These are succeeded by irregular-shaped succulent fruit, inclosing one nut.

The second sort rises to the same height as the first, but the leaves are longer and narrower. The flowers do, for the most part, terminate the branches, though there are some which come on their sides. The fruit of this is smaller, rounder, and not so much esteemed as those of the first.

These plants are preserved in the gardens of the curious for the sake of variety, though there is little hopes of their producing fruit in England. They may be propagated by their stones, if they can be obtained fresh from the countries of their natural growth. The stones should be planted in small pots filled with light earth, and plunged into a hot-bed, observing to keep the earth moist but not wet; in about six weeks the plants will appear; and when grown four inches high, they should be carefully separated, planting each into a small pot, plunging them into the hot-bed again, being careful to shade them till they have taken new root; after which, they should be treated in the same way as other tender plants from the same country, always plunging them into the tan-bed in the stove; and in winter be sparing in water to them, for much wet will kill them.

EUONYMUS. Lin. Gen. Plant. 240. Tourn. Inst. R. H. 617. tab. 388. [Εὐώνυμος, of εὖ, good, and ὄνομα, a name; so called by way of antiphrasis, because it is hurtful to animals.] The Spindle-tree, or Prickwood; in French, *Fusain.*

The CHARACTERS are,

*It hath a short empalement to the flower of one leaf, which is divided into four or five segments. The flower hath four or five oval petals, which spread open. It hath five short stamina, which are joined at their base to the germen, terminated by twin summits. In the center is situated a large oval germen, supporting a short style, crowned by an obtuse stigma. The germen afterward becomes a succulent four-cornered coloured capsule, having as many cells as angles, each containing one oval seed.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

The SPECIES are,

1. EUONYMUS (*Vulgaris*) foliis lanceolatis, floribus tetrandriis, fructu tetragono. *Spindle-tree with spear-shaped leaves, flowers having four stamina, and quadrangular fruit.* Euonymus vulgaris, granis rubentibus. C. B. P. 428. *The common Spindle-tree.*
2. EUONYMUS (*Latifolius*) foliis ovato-lanceolatis, floribus pentandris, fructu pentagono, pedunculis longissimis. *Spindle-tree with oval spear-shaped leaves, flowers having five stamina, a five-cornered fruit, and very long foot-stalks.* Euonymus latifolius. C. B. P. 428. *Broad-leaved Spindle-tree.*
3. EUONYMUS (*Americanus*) floribus omnibus quinquefidis. Lin. Sp. Plant. 197. *Spindle-tree whose flowers are all divided into five points.* Euonymus Virginianus, pyracanthæ foliis, sempervirens, capsulâ verrucarum instar asperatâ rubente. Pluk. Phyt. 115. f. 5. *Virginian evergreen Spindle-tree with rough, warted, red seed-vessels.*
4. EUONYMUS (*Pinnatis*) foliis pinnatis, fructu racemoso trigono. *Spindle-tree with winged leaves, and three-cornered fruit growing in bunches.* Euonymus caudice non ramoso, folio alato, fructu rotundo tripyreno. Sloan. Cat. Jam. 171. *Spindle-tree with an unbranching stalk, a winged leaf, and a round fruit having three seeds.*

The first sort grows naturally in England. It is very common in hedges, and is sometimes found growing in woods. This, when growing in hedges, is seldom seen of any considerable size, but rather appears like a shrub; but if planted single, and trained up like other trees, will have a strong woody stem, and rise more than twenty feet high, dividing into many branches, garnished with spear-shaped leaves about three inches long, and one inch and a quarter broad in the middle, gradually diminishing to both ends; they are entire, of a deep green colour, and are placed opposite. The flowers come out in small bunches from the side of the stalks, standing upon slender foot-stalks; they are composed of four whitish petals, which are expanded in form of a cross. The empalement is divided into four parts. The flowers have four stamina, and the fruit is four-cornered, and opens into four cells. This tree flowers the latter part of May and the beginning of June, and the fruit ripens in October, at which time the seed-vessels spread open

 and

and expose the seeds, which are of a beautiful red colour; so that when the branches are well stored with them, the trees make a good appearance at that season, when growing among other sorts. The wood of this tree is used by the musical instrument-makers for toothing of organs and virginal keys; the branches are cut into tooth-pickers, and for making of skewers; and spindles are made of the wood, from whence the tree was titled Spindle-tree; but in some counties it is called Dogwood.

The second sort grows naturally in Austria and Hungary; this was very seldom seen in England till of late years, since I procured it from France, and from the seeds of those plants great numbers have been since raised, so it is now pretty common in several of the nurseries near London; this rises with a stronger stem than the first, and grows to a larger size. The leaves are oval and spear-shaped, about four inches long, and two inches broad in the middle, of a light green colour, and entire; they are placed opposite on the branches, with short foot-stalks. The flowers come out from the side of the branches, upon very slender foot-stalks, which are two inches and a half long; these branch out into a loose bunch, so that the flowers stand upon separate foot-stalks. The flowers have five petals, which at first are white, but afterward change to a purple colour; the empalement of the flower is divided into five parts. It hath five stamina, and the fruit is frequently five-cornered; the fruit is much larger than that of the common sort, and the foot-stalks being weak, the fruit always hang down. Dr. Linnæus has supposed these to be but one species, and has taken the characters of this genus from the second sort, whose flowers have five stamina and five petals, and the fruit five corners; but all those of the common sort which I have examined have but four, and these differences are permanent in those plants which rise from seeds; for I have raised many of both sorts from seeds, but have never found either of them alter.

The third sort grows naturally in Virginia, Carolina, and other parts of North America; this rises with a shrubby stalk to the height of eight or ten feet, dividing into many branches, which come out opposite from the joints of the stem; these are garnished with spear-shaped leaves, which are two inches long, and about three quarters of an inch broad in the middle, ending in acute points; they are placed opposite, and continue green all the year. The flowers are produced at the end of the branches, and also from the sides, in small clusters, which are succeeded by round capsules, which are closely armed by rough protuberances. This flowers in July, but seldom produces ripe fruit in England,

As this is an evergreen shrub, so it merits a place in every curious garden, and particularly in all plantations of evergreen trees and shrubs; there is a variety of this with variegated leaves, which is preserved in the nursery-gardens.

The fourth sort grows naturally in Jamaica, and some of the other islands in the West-Indies; this rises with an upright woody stalk, to the height of ten or twelve feet; at the top it divides into two or three short branches, which are garnished by winged leaves, composed of six or seven pair of small leaves (or lobes) about two inches long, and one inch broad; these leaves come out without order, standing upon long foot-stalks. The flowers come out in clusters from the side of the branches, toward their end; these are succeeded by roundish capsules, having a thick brown cover, which open in three cells, each containing a single hard seed.

The two first sorts may be propagated either by seeds, or layers; if by seeds, they should be sown in autumn, soon after they are ripe; then the plants will come up the spring following; but if the seeds are not sown till spring, the plants will not appear till the following spring, whereby a whole year is lost. The seeds should be sown upon a shady border, where they will succeed better than when they are more exposed to the sun. When the plants come up, they will require no other care but to keep them clean from weeds till the following autumn, when, as soon as their leaves decay, the plants should be taken up and transplanted into a nursery, in rows two feet distant, and the plants one foot asunder in the rows; in this place they may remain two years, and then they may be removed to the places where they are to remain.

When these are propagated by layers, the young shoots should be laid down in autumn; and if the joint which is laid deepest in the ground is slit, as is practised for Carnations, it will cause them to put out roots much sooner than they otherwise would do; these layers will be sufficiently rooted in one year to bear transplanting, when they should be taken from the old plants, and treated in the same way as the seedlings. The cuttings of these sorts, planted in a shady border, will take root, but they should be planted in autumn, as soon as their leaves begin to fall; they should be the shoots of the same year, with a knot of the former year at bottom.

The third sort, which grows naturally in North America, is so hardy as rarely to suffer by cold in England, provided it is not planted in places very much exposed. This may be propagated by laying down the young branches in the autumn, observing to tongue them in the same manner as is practised in laying of Carnations: these will have made good roots in one year, when they may be cut from the old plants, and planted in a nursery for two years to get strength; after which, they should be planted where they are designed to remain.

The fourth sort is a native of warmer countries, so cannot be preserved in England, unless it is placed in a stove in winter: this is generally propagated by seeds, which must be sown in pots, and plunged into a hot-bed; and when the plants are fit to remove, they should be each planted in a separate small pot, and plunged into the hot-bed again, being careful to shade them until they have taken new root; after which they must be treated in the same way as other tender plants of the same countries. This sort may also be propagated by cuttings during any of the summer months.

EUPATOROIPHALACRON. See VERBESINA.

EUPATORIUM. Lin. Gen. Plant. 842. Tourn. Inst. R. H. 455. tab. 259. [Εὐπατώριον, of king Eupator, who first brought this plant into use.] Hemp Agrimony; in French, *Eupatoire.*

The CHARACTERS are,

*It hath a compound flower, composed of several hermaphrodite florets, which are funnel-shaped, cut into five parts at the brim, which spread open; these are included in one common scaly empalement, whose scales are narrow, erect, and unequal. The florets have each five short hairy stamina, terminated by cylindrical summits. In the bottom is situated a small germen, supporting a long slender style, which is bifid, crowned by a narrow stigma. The germen afterward becomes an oblong seed, crowned with down, sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which includes those plants with compound flowers, which have only hermaphrodite fruitful flowers.

The SPECIES are,

1. EUPATORIUM (*Cannabinum*) foliis digitatis. Hort. Cliff. 396. *Eupatorium with fingered leaves.* Eupatorium cannabinum. C. B. P. 320. *Common Hemp Agrimony.*
2. EUPATORIUM (*Maculatum*) foliis lanceolato-ovatis, serratis, petiolatis, caule erecto. Hort. Cliff. 396. *Eupatorium with spear-shaped oval leaves which are sawed, having foot-stalks, and an upright stalk.* Eupatorium Novæ Angliæ, urticæ foliis, floribus purpurascentibus, maculato caule. H. L. *New England Hemp Agrimony with Nettle leaves, purplish flowers, and spotted stalks.*
3. EUPATORIUM (*Purpureum*) foliis subverticillatis, lanceolatis serratis petiolatis rugosis. Lin. Sp. Plant. 838. *Eupatorium with leaves placed in whorls, which are*

*spear-shaped, sawed, rough, and have foot-stalks.* Eupatorium folio oblongo rugoso, caule purpurascente. Tourn. Inst. 456. *Canada Hemp Agrimony with a long rough leaf, and purplish stalk.*

4. Eupatorium (*Scandens*) caule volubili, foliis cordatis dentatis acutis. Hort. Cliff. 396. *Eupatorium with a twining stalk and heart-shaped leaves, which are sharply indented.* Eupatorium Americanum scandens, hastato magis acuminato folio. Vaill. Mem. 1719. *Climbing American Hemp Agrimony, with a spear-like sharp-pointed leaf.*

5. Eupatorium (*Rotundifolium*) foliis sessilibus distinctis subrotundo-cordatis. Lin. Sp. Plant. 837. *Eupatorium with roundish heart-shaped leaves sitting close to the stalks, and are distinct.* Eupatorium Americanum, foliis rotundioribus absque pediculis. Vaill. Mem. 1719. *American Hemp Agrimony with round leaves, having no foot-stalks.*

6. Eupatorium (*Fruticosum*) foliis oblongo-cordatis, floribus paniculatis, caule fruticoso scandente. *Eupatorium with oblong heart-shaped leaves, paniculated flowers, and a climbing shrubby stalk.* Eupatorium scandens, foliis subrotundis lucidis, floribus spicatis albis. Houst. MSS. *Climbing Hemp Agrimony with roundish shining leaves, and white flowers growing in spikes.*

7. Eupatorium (*Odoratum*) foliis ovatis, obtuse serratis petiolatis trinerviis, calycibus simplicibus. Lin. Sp. Plant. 839. *Eupatorium with oval, obtuse, sawed, three-veined leaves, having foot-stalks, and single empalements to the flowers.* Eupatorium Americanum, teucrii folio, flore niveo. Vaill. Mem. Acad. Scien. *American Hemp Agrimony with a Tree Germander leaf, and a white flower.*

8. Eupatorium (*Perfoliatum*) foliis connatis tomentosis. Hort. Cliff. 396. *Eupatorium with woolly leaves joined at their base.* Eupatorium Virginianum, salviæ foliis longissimis acuminatis, perfoliatum. Pluk. Alm. *Virginian perfoliate Hemp Agrimony, with long Sage-like leaves closely surrounding the stalk.*

9. Eupatorium (*Betonicifolium*) foliis oblongis, obtusis, crenatis, glabris, calycibus simplicibus. *Eupatorium with oblong, obtuse, smooth, crenated leaves, and single empalements to the flowers.* Eupatorium betonicæ folio glabro & carnoso, flore cœruleo. Houst. MSS. *Hemp Agrimony with a fleshy smooth Betony leaf, and a blue flower.*

10. Eupatorium (*Morifolium*) foliis cordatis serratis caule erecto arboreo. *Eupatorium with heart-shaped sawed leaves, and an upright tree-like stalk.* Eupatorium Americanum arborescens, mori folio, floribus albicantibus. Houst. MSS. *Tree-like American Hemp Agrimony, with a Mulberry leaf and white flowers.*

11. Eupatorium (*Punctatum*) foliis ovatis petiolatis integris, caule fruticoso ramoso, calycibus simplicibus. *Eupatorium with oval entire leaves having foot-stalks, a branching shrubby stalk, and single empalements to the flowers.* Eupatorium Americanum frutescens, balsaminæ lutæ foliis, nigris maculis punctatis. Houst. MSS. *American shrubby Hemp Agrimony, with yellow Balsamine leaves spotted with black.*

12. Eupatorium (*Hyssopifolium*) foliis lanceolato-linearibus trinerviis sub integerrimis. Lin. Sp. Plant. 836. *Eupatorium with narrow, spear-shaped, entire leaves, having three nerves.* Eupatorium Virginianum, folio angusto floribus albis. Hort. Elth. 141. tab. 115. f. 140. *Virginia Hemp Agrimony, with a narrow leaf, and white flowers.*

13. Eupatorium (*Ramosum*) foliis lanceolato-linearibus acutis, supernè serratis caule ramoso. *Hemp Agrimony with narrow, spear-shaped, pointed leaves, sawed on their upper part, and a branching stalk.*

14. Eupatorium (*Conyzoides*) foliis cordatis acutis, dentatis, trinerviis, caule fruiticosò ramoso. *Eupatorium with pointed, heart-shaped, sawed leaves, having three veins, and a branching shrubby stalk.* Conyza fruticosa, folio hastato, flore pallidè purpureo. Sloan. Cat. Jam. 124. *Shrubby Fleabane with a spear-shaped leaf, and a pale purple flower.*

15. Eupatorium (*Paniculatum*) foliis cordatis rugosis crenatis, caule paniculato. *Eupatorium with rough, heart-shaped, crenated leaves, and a paniculated stalk.* Conyza Salviæ foliis conjugatis, floribus spicatis rubentibus. Houst. MSS. *Fleabane with Sage leaves placed opposite, and red flowers growing in spikes.*

16. Eupatorium (*Houstonis*) foliis cordatis acuminatis, caule volubili, floribus spicatis racemosis. *Eupatorium with heart-shaped pointed leaves, a twining stalk, and branching spiked flowers.* Eupatorium Americanum, scandens, folio hastato glabro, floribus spicatis. Houst. MSS. *Climbing American Hemp Agrimony with a smooth spear-shaped leaf, and spiked flowers.*

17. Eupatorium (*Trifoliatum*) foliis ternis. Flor. Virg. 119. Lin. Sp. Plant 838. *Hemp Agrimony with trifoliate leaves.*

18. Eupatorium (*Altissimum*) foliis lanceolatis nervosis, inferioribus extimo sub serratis, caule fruticoso. Hort. Upsal. 152. *Eupatorium with nervous spear-shaped leaves, whose lower leaves are sawed on their edges, and stand in whorls round the stalks.* Eupatorium folio oblongo, rugoso, ampliori, caule virescente. Tourn. Inst. R. H. 456. *Hemp Agrimony with a large, oblong, rough leaf, and a green stalk.*

19. Eupatorium (*Cœlestinum*) foliis cordato-ovatis, obtuse serratis petiolatis, calycibus multifloris. Lin. Sp. Plant. 838. *Eupatorium with heart-shaped oval leaves obtusely sawed, having foot-stalks, and many flowers to the empalements.* Eupatorium scorodoniæ folio, flore cæruleo. Hort. Elth. 140. tab. 114. *Hemp Agrimony with a Wood Sage leaf, and a blue flower.*

The last grows naturally in Carolina, from whence the late Dr. Dale sent me the seeds; these plants flowered very finely the year after they were raised, but never have flowered since, for the roots creep greatly in the ground, but never send up any stalks.

The first sort grows naturally by the side of rivers and ditches in most parts of England, and is the only species of this genus, which is known to grow naturally in Europe; this is esteemed as a very good vulnerary herb, so stands in the list of medicinal plants. It is seldom admitted into gardens, because, wherever it is suffered to seed, the ground will be well stored with the plants to a great distance.

The second sort grows naturally in several parts of North America, from whence it has been introduced to the gardens in Europe; this hath a perennial root, but an annual stalk, which rises about two feet and a half high; it is purple, and has many dark spots upon it. The leaves are rough, oval and spear-shaped, having foot-stalks; they are placed by threes round the stalk toward the bottom, but upward by pairs opposite at each joint. The stalks are terminated by clusters of purple flowers, growing in a sort of corymbus; these come out in July and August, and in warm seasons will ripen its seeds in autumn.

The third sort grows naturally in North America; this rises with an upright stalk near four feet high, garnished with long, narrow, spear-shaped leaves at each joint; these are deeply sawed on their edges, and the midrib is oblique to the foot-stalk; they are placed by fours round the stalk in whorls, and are of a dark green colour. The stalks are terminated by bunches of purple flowers like the last, which appear at the same time. This hath a perennial root and an annual stalk.

The fourth sort grows naturally in Virginia and Carolina; this hath a perennial root, which sends out many twining stalks in the spring; these twist about any neighbouring support, and rise to the height of five or six feet, garnished at each joint with two heart-shaped leaves, which are indented on their edges, and terminate in acute points; at each joint there are two small side branches come out, which are terminated by clusters of white flowers, so that the stalks seem covered with them most part of their length; but as these come pretty late in the season, so unless the summers prove warm, the plants do not flower well in England.

There is another of these plants with purple flowers, standing upon longer foot-stalks, which was sent me from Campeachy; but the stalks and leaves are very

like thoſe of this ſort, ſo that I doubt whether it be a diſtinct ſpecies.

The fifth ſort grows naturally in New England and Virginia, from both of theſe counties I have received the ſeeds; this hath a perennial root and an annual ſtalk; it riſes with upright ſtalks about a foot high; theſe have their joints pretty near each other, where they are garniſhed with roundiſh heart-ſhaped leaves, ſitting cloſe to the ſtalks; they are ſawed on their edges, and are of a light green colour. The flowers are produced in ſmall looſe panicles at the top of the ſtalks; they are white, and have two ſmall green leaves immediately under the flowers. Theſe flowers appear the latter end of June, but the ſeeds ſeldom ripen in England.

The ſixth ſort grows naturally at La Vera Cruz in America, from whence the late Dr. Houſton ſent me the ſeeds; this hath a ſhrubby climbing ſtalk, which riſes to the height of ten or twelve feet, faſtening itſelf to any neighbouring prop for ſupport, and is garniſhed with heart-ſhaped leaves, placed oppoſite; they are about three inches long, and one and a half broad, of a lucid green; the flowers come out in long branching panicles, which proceed from the ſide of the ſtalks, and are terminated by a branching panicle of white flowers. This ſort is tender, ſo will not live in this country without artificial heat.

The ſeventh ſort riſes with upright ſtalks three feet high, garniſhed with oval leaves at each joint, which are placed oppoſite; they have very ſhort foot-ſtalks, and are ſawed on their edges; from the ſides of the ſtalks, at every joint, is produced two ſlender branches, which ſtand erect; theſe, and the principal ſtalks alſo, are terminated by cluſters of white flowers; they appear in Auguſt and September, and the ſtalks decay in winter, but the root is perennial. This grows naturally in Penſylvania, and other parts of America.

The eighth ſort grows naturally in Virginia and Philadelphia; this hath a perennial root and an annual ſtalk. The ſtalks riſe from two to three feet high; they are hairy, and garniſhed with rough leaves at each joint, which are from three to four inches long, and about an inch broad at their baſe, gradually leſſening to a very acute point; the two leaves are joined at their baſe, ſo the ſtalks ſeem to grow through them; they are of a dark green, and are covered with ſhort hairs. The upper part of the ſtalk divides into many ſlender foot-ſtalks, each ſuſtaining a cloſe cluſter of white flowers. Theſe come out in July, and in warm ſeaſons the ſeeds will ſometimes ripen in England.

The ninth ſort grows naturally at La Vera Cruz, from whence the late Dr. Houſtoun ſent me the ſeeds; this riſes with an upright ſtalk near two feet high, garniſhed toward the bottom with oblong obtuſe leaves, which are of a thick ſubſtance, and crenated on their edges; the upper part of the ſtalk is naked to the top, where the flowers come out in a thick panicle; they are blue, and have ſingle empalements. This flowers late in autumn, but never ripens ſeeds here; the root is biennial, and periſhes ſoon after it has flowered.

The tenth ſort was ſent me by the late Dr. Houſtoun from La Vera Cruz, where he found it growing naturally; this hath a thick woody ſtalk, which riſes twelve or fourteen feet high, ſending out many branches, which are channelled, and covered with a brown bark, garniſhed with regular heart-ſhaped leaves as large as thoſe of the Mulberry-tree; they are of a light green colour, and ſawed on their edges, placed oppoſite upon foot-ſtalks, near two inches long; the upper part of the branches are terminated by four or five pair of foot-ſtalks, which come out oppoſite from the joints, and the top is terminated by an odd one; theſe ſuſtain branching panicles of white flowers, which together form a long looſe pyramidal thyrſe, and make a fine appearance, for there are no leaves intermixed with the flowers, but ſo far as the ſpike reaches the ſtalks are naked. This ſort has flowered in the Chelſea garden, but did not produce ſeeds.

The eleventh ſort grows naturally at La Vera Cruz, from whence the late Dr. Houſtoun ſent it me; this riſes with many ſhrubby ſtalks near five feet high, which divide into many ſlender branches, whoſe joints are three or four inches aſunder; at each of theſe come out two oval leaves about three quarters of an inch long, and half an inch broad, ſtanding upon long ſlender foot-ſtalks; they have ſeveral black ſpots on their ſurface. The branches come out horizontal, and are terminated by ſmall bunches of white flowers, whoſe empalements are ſingle, and compoſed of ſeven narrow ſpear-ſhaped leaves, which are divided to the bottom.

The twelfth ſort riſes with an upright round ſtalk to the height of three feet, ſending out ſeveral branches toward the top, which come out regularly by pairs; they are garniſhed with leaves, placed by pairs; theſe are two inches and a half long, and about one third of an inch broad, having three longitudinal veins; they are of a light green colour, and entire. The flowers ſtand upon long foot-ſtalks at the end of the branches, ſome ſuſtaining one, ſome two, and others three or four flowers; they are white, and appear late in autumn. This grows naturally in Carolina.

The thirteenth ſort grows naturally in Maryland; this hath a perennial root and an annual ſtalk, which riſes three feet high, dividing upward into many branches, which are cloſely garniſhed with narrow ſpear-ſhaped leaves, which are from two to three inches long, and a quarter of an inch broad, of a deep green, ſitting cloſe to the branches; they have three longitudinal veins, and their upper part ſharply ſawed on their edges, ending in acute points. The branches are terminated by roundiſh cluſters of white flowers, which appear in Auguſt, and continue till October; and in warm ſeaſons they are ſucceeded by ſeeds, which ripen here.

The fourteenth ſort grows naturally in Jamaica, and in moſt of the other iſlands in the Weſt-Indies; this riſes with ſhrubby ſtalks about ſix or ſeven feet high, dividing into many branches, which are garniſhed with heart-ſhaped leaves, ending in acute points, indented on their edges, having three longitudinal veins; the upper part of the branches are terminated by ſlender foot-ſtalks, each ſuſtaining a ſmall cluſter of white flowers, included in oblong ſcaly empalements of a ſilvery colour.

The fifteenth ſort was ſent me from La Vera Cruz by the late Dr. Houſtoun; this riſes with an upright branching ſtalk three feet high, ſending out two ſide branches from every joint, almoſt the whole length, which are terminated by looſe ſpikes of red flowers, as is alſo the principal ſtalk. The leaves are heart-ſhaped, rough, and are crenated on their edges, ſitting cloſe to the ſtalks; they are of a light green, and a little hoary.

The ſixteenth ſort was ſent me from Jamaica by the late Dr. Houſtoun; this hath ſlender twining ſtalks, which faſten themſelves to any neighbouring ſupport, and riſe eight or ten feet high, ſending out ſmall branches oppoſite, at moſt of the upper joints. The leaves on the lower part of the ſtalk are heart-ſhaped, ending in acute points; the upper leaves are almoſt triangular, they are ſmooth, and of a lucid green; the upper part of the ſtalks have long branching ſpikes of white flowers, which are ſmall, and ſit cloſe to the foot-ſtalks.

The ſeventeenth ſort grows naturally in Penſylvania; this hath a perennial root, from which ariſe ſeveral upright ſtalks, which grow to the height of ſeven or eight feet, in a moiſt ſoil, or where they are ſupplied with water in dry weather, and are garniſhed with oval, rough, ſpear-ſhaped leaves, which are a little ſawed on their edges; they are placed in whorls round the ſtalks, ſometimes ſeven, at other places four or five of theſe ſtand at each joint; they are about three inches long, and two inches broad. The ſtalks are terminated by a looſe corymbus of purple flowers, which appear in Auguſt and continue till October, but are not ſucceeded by ſeeds in England.

The

The eighteenth ſort riſes with a ſingle, upright, green ſtalk, about four feet high, garniſhed at each joint by four ſpear-ſhaped leaves, placed in whorls round the ſtalks; they are ſix inches long, and two inches broad in the middle, leſſening to both ends, terminating in acute points; they are rough, ſawed on their edges, and ſtand on ſhort foot-ſtalks; the ſtalk is terminated by a cloſe corymbus of purple flowers, which appear in July, and continue till September. The root is perennial, but the ſtalks decay every winter; it grows naturally in North America.

The nineteenth ſort grows naturally in Carolina; this hath a creeping root, which ſpreads and multiplies very faſt. The ſtalks riſe about two feet high; they are garniſhed with oval heart-ſhaped leaves, which have foot-ſtalks, and are ſawed on their edges. The flowers are produced at the top of the ſtalks in a ſort of corymbus; they are of a fine blue colour, but the roots ſpread ſo much as to cauſe barrenneſs of flowers after the firſt year.

All theſe ſorts may be propagated by ſeeds; ſeveral of them ripen their ſeeds in England; theſe ſhould be ſown in autumn as ſoon as they are ripe, for then the plants will come up the following ſpring; but if they are kept out of the ground till ſpring, the plants will not come up till the year after; and thoſe ſeeds which are procured from America ſhould be ſown as ſoon as they arrive, for though they may not grow the firſt year, yet there will be a greater certainty of their ſucceeding, than when they are kept longer out of the ground.

The ſecond, third, fifth, ſeventh, eighth, twelfth, thirteenth, ſeventeenth, eighteenth, and nineteenth ſorts are hardy plants, ſo the ſeeds of theſe may be ſown in the full ground, but there muſt be care taken in the ſowing to keep the ſorts ſeparate; for as the ſeeds of theſe plants have a light down adhering to them, they are eaſily diſplaced by the leaſt wind; ſo that the beſt way will be to ſow them in drills, but theſe ſhould be but ſhallow, for if the ſeeds are buried too deep they will not grow. The bed in which theſe are ſown ſhould not be too much expoſed to the ſun, but rather have an eaſt aſpect, where the morning ſun only reaches it; but where it is more expoſed, it ſhould be ſhaded with mats in the heat of the day, and the ground ſhould be kept pretty moiſt; for as theſe plants generally grow in moiſt ſhady ſituations in their native countries, they will ſucceed better when they have a ſoil and ſituation ſomewhat like that; though as we want their heat in ſummer, the plants will thrive here when expoſed to the ſun, provided they have a moiſt ſoil, or are ſupplied with water in dry weather.

When the young plants come up, they muſt be kept clean from weeds; and where they are too cloſe, ſome of them ſhould be drawn out, to give room for the others to grow; and if theſe are wanted, they may be planted in another bed, where, if they are ſhaded and watered, they will ſoon take root; after which they will require no farther care but to keep them clean from weeds till the following autumn, when they may be tranſplanted to the places where they are to remain. As the roots of theſe plants ſpread out to a conſiderable diſtance, they ſhould not be allowed leſs than three feet from any other plants, and ſome of the largeſt growing ſhould be allowed four feet. If the ſoil in which they are planted is a ſoft gentle loam, they will thrive much better, and flower ſtronger than in light dry ground; in which, if they are not duly watered in dry ſummers, their leaves will ſhrink, and their ſtalks will not grow to half their uſual height.

All theſe ſorts have perennial roots, by which they may be propagated; for as ſome of them do not perfect their ſeeds in England, ſo that is the only way of increaſing the plants here; ſome of the ſorts have creeping roots, ſending out offsets in great plenty, ſo theſe are eaſily propagated; and the others may be taken up, or the heads taken off from them every other year, in doing of which there ſhould be care taken not to cut or injure the old plants too much, which would cauſe them to flower weak the following year. The beſt time to remove theſe plants is in autumn, as ſoon as they have done growing, that they may get freſh roots before the froſt comes on; but if that ſhould happen ſoon after their removal, if the ſurface of the ground is covered with tan, or dried leaves, to keep out the froſt, it will effectually ſecure them; and if this is done to the old plants in very ſevere winters, it will always preſerve them; but the nineteenth ſort is the only one which I have known killed by froſt: however, it may not be amiſs to practiſe this on the young ſeedling plants, which have not ſo good roots, nor are ſo well eſtabliſhed in the ground; the future culture will be only to dig the ground about them every ſpring, and keep them clean.

The fourth ſort ſends out many weak twining ſtalks, which require ſupport; ſo there ſhould be ſome ſtakes fixed down by their roots in the ſpring when they begin to ſhoot, to which the young ſtalks ſhould be led and faſtened, and afterward they will naturally twine round them and riſe four or five feet high if they are ſupplied with water, and in warm ſeaſons they will produce plenty of white flowers in Auguſt. This ſort is ſometimes killed in very ſevere winters, if they are not covered; but if, when the ſtalks decay in the autumn, the ground about them is covered with ſome old tanners bark, it will effectually ſecure the roots. This ſort multiplies very faſt by its creeping roots, which may be parted every other year.

The ſixth and ſixteenth ſorts have twining ſlender ſtalks, which require to be ſupported in the like manner; but theſe are natives of warm countries, ſo they will not thrive in England, unleſs they are placed in a warm ſtove; therefore they ſhould be planted in pots and plunged into the tan-bed in the ſtove, where, if they are ſupplied with wet in hot weather, they will thrive and produce flowers. The ſixth ſort hath ſhrubby ſtalks, and does not propagate by the root, ſo there ſhould be layers made of the young branches, which will put out roots if they are properly ſupplied with water; but the ſixteenth ſort may be propagated by parting the roots, in the ſame manner as the fourth ſort.

The ninth and fifteenth ſorts have perennial roots, but their ſtalks decay every winter. Theſe are tender plants, ſo ſhould be planted in pots, and kept conſtantly plunged in the tan-bed in the ſtove, where they will thrive and flower. Theſe may be propagated by cutting off ſome of their young ſhoots about the middle of June, when they have ſtrength, and planted into pots filled with light earth, and plunged into a moderate hot-bed, where, if they are ſhaded from the ſun, and gently watered as they may require it, they will put out roots in ſix weeks, and may then be tranſplanted into ſeparate pots, and treated as the old plants.

The tenth, eleventh, and fourteenth ſorts have ſhrubby ſtalks, which are perennial. Theſe are natives of warm countries, ſo will not thrive in England out of a ſtove; therefore they ſhould be planted in pots and kept plunged in the tan-bed of the ſtove, and treated as the former ſorts. Theſe will ſometimes take root from cuttings, but not very freely, ſo that the beſt way is from ſeeds when they can be procured. When the ſeeds of theſe tender ſorts can be had from their native countries, the plants raiſed that way are much preferable to thoſe which are obtained by any other method, and will flower much ſtronger, therefore ſhould be preferred; but as theſe ſeeds ſeldom grow the firſt year, few perſons have patience enough to wait for the plants coming up. When any of theſe ſeeds are brought over, they ſhould be ſown as ſoon as they arrive in pots, that they may be removed at any time; the pots ſhould be plunged into a moderate hot-bed, and the earth kept tolerably moiſt; the glaſſes ſhould alſo be ſhaded in the heat of the day, to prevent the earth from drying; in this hot-bed the pots may remain till autumn, when, if the plants are not up, they ſhould be plunged between

the plants in the bark-ſtove, and in the ſpring removed to a gentle hot-bed, which will bring up the plants ſoon after. When theſe are fit to remove they ſhould be planted in ſeparate ſmall pots, and plunged into the hot-bed again, ſhading them from the ſun till they have taken new root; then they ſhould have a large ſhare of free air admitted to them in warm weather, and frequently refreſhed with water.

In the winter theſe plants ſhould be more ſparingly watered, eſpecially thoſe ſorts whoſe ſtalks decay; and in the ſummer they ſhould have a large ſhare of free air admitted to them, with which management they will thrive and flower.

EUPHORBIA. Lin. Gen. Plant. 536. Euphorbium. Boer. Ind. alt. 1. 258. Tithymalus. Tourn. Inſt. R. H. 85. tab. 18. The Burning Thorny Plant.

This plant was named Euphorbia by King Juba, the father of Ptolemy, who governed both the Mauritanias; whoſe phyſician was named Euphorbus, and his brother Antonius Muſa is ſaid to have healed Auguſtus with this plant.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, which is ſwelling, rough, and divided into five parts at the brim. The flower hath four or five thick truncated petals, and twelve or more ſtamina which are inſerted in the receptacle; they are longer than the petals, and are terminated by globular ſummits. In the center is ſituated a three-cornered germen, ſupporting three bifid ſtyles, crowned by obtuſe ſtigmas. The germen afterward becomes a roundiſh capſule with three cells, each containing one roundiſh ſeed.*

This genus of plants is ranged in the third ſection of Linnæus's eleventh claſs, which includes the plants whoſe flowers have twelve ſtamina and three ſtyles. To this genus he has added the Tithymalus and Tithymaloides of Tournefort and others. The difference between the Euphorbium and Tithymalus, conſiſts more in their outward form, than in the characters of either flower or fruit, ſo may be properly enough joined together; but the flower of Tithymaloides being very different in its form, ſhould be ſeparated from them, therefore I ſhall place them under the title of Tithymalus; and as the number of Tithymali is very great, many of which are common weeds, I ſhall ſelect only the more rare or uſeful kinds to enumerate here.

The SPECIES are,

1. EUPHORBIA (*Antiquorum*) aculeata triangularis ſubnuda articulata, ramis patentibus. Lin. Hort. Cliff. 196. *Euphorbia with triangular jointed ſtalks which are naked, and have ſpines and ſpreading branches.* Euphorbium verum antiquorum. Hort. Amſt. 1. p. 23. *Prickly triangular-pointed Euphorbia, with ſpreading branches, commonly called the true Euphorbium of the ancients.*

2. EUPHORBIA (*Canarienſis*) aculeata nuda ſubquadangularis, aculeis geminatis. Hort. Cliff. 196. *Euphorbia with naked ſtalks, which have four angles and double ſpines.* Euphorbium tetragonum & pentagonum ſpinoſum Canarinum. Boerh. Ind. alt. 1. 258. *Canary Euphorbium with four or five angles which have ſpines.*

3. EUPHORBIA (*Trigonum*) aculeata nuda triangularis articulata, ramis erectis. *Thorny-jointed triangular Euphorbia with upright naked branches.* Euphorbium trigonum & tetragonum ſpinoſum, ramis compreſſis. D'Iſnard. Act. Par. 1720. *Prickly Euphorbium having three and four angles with compreſſed branches.*

4. EUPHORBIA (*Officinarum*) aculeata nuda multangularis, aculeis geminatis. Lin. Hort. Cliff. 196. *Thorny Euphorbia having many angles and ſpines growing by pairs.* Euphorbium cerei effigie caulibus craſſioribus, ſpinis validioribus armatum. Hort. Amſt. 1. p. 21. *Torch-ſhaped Euphorbium, with thick ſtalks armed with ſtrong ſpines.*

5. EUPHORBIA (*Neriifolia*) aculeata ſeminuda, angulis obliquè tuberculatis. Lin. Hort. Cliff. 196. *Thorny half-naked Euphorbia with oblique tubercular angles, commonly called the Oleander-leaved Euphorbium.* Euphorbium anguloſum, foliis nerii latioribus. Boerh. Ind. alt. 1. 258. *Angular Euphorbium, with broad Oleander leaves.*

6. EUPHORBIA (*Heptagona*) aculeata nuda, ſeptem-angularis, ſpinis ſolitariis ſubulatis floriferis. Lin. Hort. Cliff. 196. *Naked ſeptangular thorny Euphorbia, with ſingle awl-ſhaped ſpines, producing flowers at their extremities.* Euphorbium heptagonum, ſpinis longiſſimis in apice fructiferis. Boerh. Ind. alt. 1. 258. *Euphorbium with ſeven angles and very long ſpines, bearing fruit at their tops.*

7. EUPHORBIA (*Caput Meduſæ*) inermis tuberculis imbricatis, foliolo lineari inſtructis. Lin. Hort. Cliff. 197. *Euphorbia without thorns, cloſely covered with tubercles lying over each other like tiles, and narrow leaves, commonly called Meduſa's Head.* Euphorbium Afrum, caule craſſo ſquamoſo, ramis in capitis Meduſæ ſpeciem cincto. Boerh. Ind. alt. 258. *African Euphorbium with a thick ſcaly ſtalk, and branches diſpoſed like Meduſa's head.*

8. EUPHORBIA (*Mamillaris*) aculeata nuda, angulis tuberoſis, ſpinis interſtinctis. Lin. Sp. Plant. 451. *Naked prickly Euphorbia, with tuberous angles having ſpines growing between them.* Euphorbium polygonum aculeis longioribus ex tuberculorum internodiis prodeuntibus. D'Iſnard. Act. Par. 1720. *Euphorbium with many angles, and long ſpines growing out from between the knots.*

9. EUPHORBIA (*Cereiformis*) aculeata nuda, multangularis, ſpinis ſolitariis ſubulatis. Prod. Leyd. 195. *Naked thorny Euphorbia with many angles, and ſingle awl-ſhaped ſpines.* Euphorbium cerei effigie, caulibus gracilioribus. Boerh. Ind. alt. 1. 258. *Euphorbium with the appearance of Torch Thiſtle, and a ſlender ſtalk.*

10. EUPHORBIA (*Fructus Pini*) inermis imbricata tuberculis foliolo lineari inſtructis. Hort. Cliff. 197. *Imbricated Euphorbia without ſpines, having tubercles furniſhed with very narrow leaves.* Euphorbium Afrum, facie fructûs pini. Boerh. Ind. alt. 1. 258. *African Euphorbium with the appearance of Pine fruit, commonly called Little Meduſa's Head.*

11. EUPHORBIA (*Patula*) inermis, ramis patulis ſimplicibus teretibus, foliolis linearibus inſtructis. *Euphorbia without ſpines, having ſingle ſpreading branches which are taper, terminated with very narrow leaves.*

12. EUPHORBIA (*Procumbens*) inermis ramis teretibus procumbentibus tuberculis quadragonis. *Euphorbia without ſpines, having trailing branches with quadrangular tubercles.*

13. EUPHORBIA (*Inermis*) inermis, ramis plurimis procumbentibus, ſquamoſis, foliolis deciduis. *Euphorbia without ſpines, having many trailing branches which are ſcaly, and deciduous leaves.*

14. EUPHORBIA (*Tiruaculii*) inermis fruticoſa ſubnuda filiformis erecta, ramis patulis determinatè confertis. Lin. Hort. Cliff. 197. *Shrubby erect Euphorbia without ſpines, and ſlender ſpreading branches terminating in cluſters, commonly called Indian-tree Spurge.* Tithymalus Indicus fruteſcens. Hort. Amſt. 1. p. 27. *Indian ſhrubby Spurge.*

15. EUPHORBIA (*Viminalis*) inermis fruticoſa nuda filiformis volubilis, cicatricibus oppoſitis. Hort. Cliff. 197. *Shrubby naked Euphorbia without ſpines, and ſlender twining branches, commonly called Indian Climbing Spurge.* Tithymalus Indicus vimineus penitus aphyllos. *Indian Spurge with ſlender branches, entirely without leaves.*

16. EUPHORBIA (*Mauritanica*) inermis fruticoſa ſeminuda filiformis flaccida, foliis alternis. Lin. Hort. Cliff. 197. *Naked ſhrubby Euphorbia without ſpines, taper flaccid branches, and leaves placed alternately.* Tithymalus aphyllus Mauritania. Hort. Elth. 384. *Mauritanian Spurge without leaves.*

17. EUPHORBIA (*Cotinifolia*) foliis oppoſitis ſubcordatis petiolatis emarginatis integerrimis, caule fruticoſo. Lin. Sp. Plant. 453. *Euphorbia with heart-ſhaped leaves placed oppoſite upon foot-ſtalks, which are indented at the top, entire, and a ſhrubby ſtalk.* Tithymalus arboreus Americanus cotini folio. Hort. Amſt. 1. p. 29. *Tree American Spurge with a Venice Sumach leaf.*

18. EUPHORBIA (*Lathyris*) umbellâ quadrifidâ, dichotomâ, foliis oppoſitis integerrimis. Lin. Sp. Plant. 457.

457. *Euphorbia with a quadrifid umbel, a forked stalk, and entire leaves placed opposite.* Tithymalus latifolius Cataputia dictus. H. L. *Broad-leaved Spurge, called Cataputia.*

19. Euphorbia (*Myrsinites*) umbellâ suboctifidâ, bifida, involucellis subovatis, foliis spathulatio patentibus carnosis mucronatis margine scabris. Lin. Sp. Plant. 461. *Euphorbia with an umbel divided into eight points, whose small involucrums are oval, and spreading fleshy-pointed leaves shaped like a spatula, having rough borders.* Tithymalus myrsinites latifolius. C. B. P. 296. *Broad-leaved Myrtle Spurge.*

20. Euphorbia (*Dendroides*) umbellâ multifidâ, dichotomâ, involucellis subcordatis, primariis triphyllis, caule arboreo. Lin. Sp. Plant. 462. *Euphorbia with a multifid forked umbel, heart-shaped small involucrums, the first three-leaved, and a tree-like stalk.* Tithymalus myrtifolius arboreus. C. B. P. 290. *Myrtle-leaved Tree Spurge.*

21. Euphorbia (*Amygdaloides*) umbellâ multifidâ, dichotomâ, involucellis perfoliatis emarginatis, orbiculatis foliis obtusis. Lin. Sp. Plant. 662. *Euphorbia with a multifid umbel divided by pairs, orbicular perfoliate involucrums, and obtuse leaves.* Tithymalus characias amygdaloides. C. B. P. 290. *Wood Spurge.*

22. Euphorbia (*Palustris*) umbellâ multifidâ, subtrifidâ, bifidâ, involucellis ovatis, foliis lanceolatis, ramis sterilibus. Lin. Sp. Plant. 462. *Euphorbia with a multifid umbel, which is subtrifid and bifid, the small involucrums oval, spear-shaped leaves, and steril branches.* Tithymalus palustris fruticosus. C. B. P. 292. *Shrubby Marsh Spurge.*

23. Euphorbia (*Orientalis*) umbellâ quinquefidâ, quadrifidâ, dichotomâ, involucellis subrotundis acutis, foliis lanceolatis. Lin. Sp. Plant. 460. *Euphorbia with a quinquefid and quadrifid forked umbel, a pointed roundish involucrum, and spear-shaped leaves.* Tithymalus Orientalis, salicis folio, caule purpureo, flore magno. Tourn. Cor. 2. *Eastern Spurge with a Willow leaf, a purple stalk, and large flower.*

24. Euphorbia (*Characias*) umbellâ quinquefidâ, trifidâ dichotomâ, involucellis ovatis, foliis lanceolatis, capsulis lanatis. Lin. Sp. Plant. 460. *Euphorbia with a quinquefid trifid umbel, dividing by pairs, an oval involucrum, spear-shaped leaves and woolly capsules.* Tithymalus arboreus, caule corallino, folio Hyperici, pericarpio barbato. Boerh. Ind. alt. 1. p. 256. *Tree Spurge with a red stalk, a St. John's Wort leaf, and bearded capsule.*

25. Euphorbia (*Hiberna*) umbellâ sextifidâ, dichotomâ, involucellis ovalibus, foliis integerrimis, ramis nullis capsulis verrucosis. Lin. Sp. Plant. 462. *Euphorbia with a six-pointed forked umbel, oval involucrums, entire leaves, no branches, and warted capsules.* Tithymalus Hibernicus Machingboy dictus. Mer. Pin. *Irish Spurge, called Machingboy.*

26. Euphorbia (*Apios*) umbellâ quinquefidâ, bifidâ, involucellis obcordatis. Lin. Sp. Plant. 457. *Euphorbia with a quinquefid bifid umbel, and heart-shaped involucrums.* Tithymalus tuberosâ pyriformi radice. C. B. P. 292. *Spurge with a tuberous Pear-shaped root.*

27. Euphorbia (*Aleppica*) umbellâ quinquefidâ, dichotomâ, involucellis ovato-lanceolatis mucronatis, foliis inferioribus setaceis. Lin. Sp. Plant. 458. *Euphorbia with a quinquefid forked umbel, oval spear-shaped involucrums which are pointed, and the lower leaves bristly.* Tithymalus Cyparissius. Alp. Exot. 65. *Cypress Spurge.*

28. Euphorbia (*Cretica*) umbellâ multifidâ, bifidâ, involucellis orbiculatis, foliis lineari-lanceolatis villosis. *Euphorbia with a multifid bifid umbel, orbicular involucrums, and narrow, spear-shaped, hairy leaves.* Tithymalus Creticus characias, angustifolius, villosus & incanus. Tourn. Cor. 1. *Cretan Wood Spurge, with narrow, hairy, and hoary leaves.*

29. Euphorbia (*Sylvatica*) umbellâ multifidâ, dichotomâ, involucellis perfoliatis, subcordatis, foliis lanceolatis integerrimis. Lin. Sp. Plant. 463. *Euphorbia with a multifid forked umbel, heart-shaped perfoliate involucrums, and entire spear-shaped leaves.* Tithymalus sylvaticus lunato flore. C. B. P. 290. *Wood-Spurge with a moon-shaped flower.*

30. Euphorbia (*Heterophylla*) inermis foliis serratis petiolatis difformibus ovatis lanceolatis panduriformibus. Lin. Sp. Plant. 453. *Euphorbia without spines, having sawed leaves with foot-stalks which are deformed, oval, spear-shaped, and like a fiddle.* Tithymalus Curassavicus, salicis & atriplicis foliis variis, caulibus viridantibus. Pluk. Alm. 396. *Spurge from Curassao, with variable leaves like Willow and Orach, and a green stalk.*

31. Euphorbia (*Hypericifolia*) dichotomâ, foliis serratis ovali-oblongis glabris, corymbis terminalibus, ramis divaricatis. Lin. Sp. Plant. 454. *Forked Euphorbia with oblong, oval, smooth, sawed leaves, and divaricated branches terminated by umbels.* Tithymalus erectus acris, parietariæ foliis glabris, floribus ad caulim nodos conglomeratis. Sloan. Cat. Jam. 82. *Upright acrid Spurge, with smooth Pellitory leaves, and flowers growing in clusters from the joints of the stalk.*

32. Euphorbia (*Ocymoides*) inermis, herbacea, ramosa, foliis, subcordatis integerrimis petiolatis floribus solitariis. Lin. Sp. Plant. 453. *Branching herbaceous Euphorbia without spines, having entire heart-shaped leaves with foot-stalks, and single flowers.* Tithymalus Americanus, erectus, annuus, ramosissimus ocymi caryophyllati foliis. Houst. MSS. *Upright, annual, branching Spurge of America, with leaves like small Basil.*

The first sort has been generally taken for the true Euphorbium of the ancients, and as such hath been directed for medicinal use; but it is from the second sort, that the drug now imported under that title in England is taken. Dr. Linnæus supposes the fourth to be the sort which should be used, though as they are all nearly of the same quality, it may be indifferent which of them that drug is taken from, which is the inspissated juice of the plant.

The first sort hath a triangular, compressed, succulent stalk, which is jointed, and rises to the height of eight or ten feet, sending out many irregular twisting branches, which are for the most part three-cornered, but have sometimes only two, and at others four angles; they are compressed, succulent, and spread out on every side the stalk; these have at the extremity of the branches a few short roundish leaves, which soon fall off; and near these come out now and then a few flowers, which have five thick whitish petals, with a large three-cornered germen in the center; these soon drop off without having any seeds. It grows naturally in India, from whence the plants were brought to the gardens in Holland, and have since been communicated to most of the curious gardens in Europe.

The second sort grows naturally in the Canary Islands, from whence I have been credibly informed, the Euphorbium which is imported in England, is now brought, and is the inspissated juice of this plant. In its native country this grows to the height of twenty feet or more, but in England it is rarely seen more than six or seven; nor is it of any advantage to have them so tall here, because they send out many branches which are large and succulent, so render the plants too heavy to be easily removed. This hath a very thick, green, succulent stalk, which has four or five large angles or corners, closely armed with black crooked spines, which come out by pairs at every indenture: the stalks send out from every side large succulent branches of the same form, which extend to the distance of two or three feet, then turn their ends upwards, so that when the plants are well grown, they have some resemblance to a branched chandelier; these have no leaves, but are closely armed with black spines like the stalks; at the end of the branches come out the flowers, which are shaped like those of the first sort.

The third sort hath a naked three-cornered stalk which is compressed, sending out a great number of branches which grow erect, and join up to the main stalk; these are generally three-cornered, but some vary to four; they are jointed and armed with short crooked spines, but have no leaves, nor do the plants

plants produce flowers here. This grows naturally in India.

The fourth ſort puts out many ſtalks juſt above the ſurface of the ground, which are thick, ſucculent, and roundiſh, having eight or ten angles while they are young, but as they grow old they loſe their angles and become round; the branches grow diſtorted and irregular, firſt horizontal, and afterward turn upward; they are armed with ſmall crooked ſpines on their angles, and on the upper part of the branches come out the flowers, which are ſmall, and of a greeniſh white, ſhaped like thoſe of the ſecond ſort. This grows naturally in India.

The fifth ſort grows naturally in India; this riſes with a ſtrong upright ſtalk five or ſix feet high, which hath irregular angles, and protuberances which are oblique to the angles; the lower part of the ſtalk is naked, the upper part is branching, and the branches are armed with crooked ſpines; at every protuberance, and at the top, they are garniſhed with oblong leaves of a lucid green, which are very ſmooth, entire, and rounded at their ends; theſe fall off, and the plants remain naked for ſome months, and then the flowers come out, which ſit cloſe to the branches, and are of a greeniſh white colour; the leaves come out in the autumn, and fall off in the ſpring.

The ſixth ſort riſes with a roundiſh, upright, ſucculent ſtalk about three feet high, putting out ſeveral branches on the ſide of the ſame form; theſe have ſeven angles or furrows, which are armed with long, ſingle, black thorns; at the end of which come out ſmall flowers, of the ſame form with thoſe of the other ſorts, and are ſometimes ſucceeded by ſmall fruit.

The ſeventh ſort hath thick, roundiſh, ſucculent ſtalks, which are ſcaly; theſe ſend out many branches from their ſides of the ſame form, which are twiſted, and run one over another, ſo as to appear like a parcel of ſerpents coming out from the ſtalks, from whence it had the appellation of Meduſa's Head. The ends of the branches are garniſhed with narrow, thick, ſucculent leaves, which drop off, and round the upper part of the branches the flowers come out; theſe are white, and of the ſame form with thoſe of the other ſpecies, but larger, and are frequently ſucceeded by round ſmooth capſules with three cells, each including a ſingle roundiſh ſeed.

The eighth ſort hath roundiſh ſtalks, which ſwell out like a belly in the middle, and have knobbed angles, between which come out long ſpines which are ſtrait; theſe ſtalks riſe two feet high, and put out a few branches on their ſide of the ſame form; the flowers are produced at the end of the branches, ſitting cloſe upon the angles; they are ſmall, of a yellowiſh green colour, and ſhaped like thoſe of the other ſpecies.

The ninth ſort hath ſtalks and branches very like thoſe of the fourth, but much ſlenderer; the ſpines of this are ſingle, and thoſe of the other double; and the ends of the branches are cloſely garniſhed with flowers on every angle, in which it differs from the fourth ſort.

The tenth ſort hath a thick ſhort ſtalk, which ſeldom riſes more than eight or ten inches high, from which come out a great number of trailing branches which are ſlender, and grow about a foot in length; theſe intermix with each other like thoſe of the ſeventh ſort, but they are much ſmaller, and do not grow near ſo long, but have the ſame appearance, from whence it is called Little Meduſa's Head: the ends of theſe branches are beſet with narrow leaves, between which the flowers come out, which are white, and ſhaped like thoſe of the other ſpecies.

The eleventh ſort riſes with a taper ſtalk ſix or ſeven inches high, ſending out from the top a few taper branches, which ſpread out on every ſide; theſe are not ſcaly, like thoſe of the laſt ſort, but taper, and garniſhed at their ends with ſeveral ſmall narrow leaves which drop off. This ſort hath not yet flowered here, having been but a ſhort time in England.

The twelfth ſort hath a ſhort thick ſtalk, which never riſes three inches high, ſo that the branches ſpread on the ſurface of the ground; theſe ſeldom grow more than ſix inches long, and their ſcales ſwell into a ſort of protuberances which are ſquare; they have no leaves, and very rarely produce flowers in England, but has been long an inhabitant in the gardens.

The thirteenth ſort is very like the ſeventh, but the ſtalks never riſe more than a foot or fifteen inches high, ſo that the branches ſpread out near the ground; theſe are alſo much ſhorter than thoſe of the ſeventh, but have the ſame appearance, and are garniſhed with narrow leaves at their end, which fall off as the branches are extended in length: this produces a great number of ſmall white flowers at the end of the branches, which are ſhaped like thoſe of the other ſpecies, and are frequently ſucceeded by round ſmooth capſules with three cells, including one or two roundiſh ſeeds which ripen here.

Theſe ſorts have been by moſt of the modern botaniſts ranged under the title of Euphorbium, and have been diſtinguiſhed from the Tithymali, more from the ſtructure and outward appearance of the plants, than any real difference in their characters, as hath been before obſerved; but as the number of ſpecies of thoſe commonly called Spurge was very great, ſo many of the writers were willing to ſeparate the Euphorbia from that genus, to leſſen the number of ſpecies.

Theſe plants are preſerved in many curious gardens, more for the oddneſs of their ſtructure, than any real beauty; but being ſo extremely different in their form, from almoſt any plants of European production, many curious perſons have been induced to preſerve the ſeveral ſorts in their gardens.

They are all of them full of a milky acrid juice, which flows out on their being wounded in any part; this juice will bliſter the fleſh, if it happen to lie upon any tender part for a ſhort time, and will burn linen almoſt as bad as aqua fortis, therefore the plants ſhould be handled with great caution; nor ſhould the ends of their branches be ever bruiſed or injured; for if they are, it frequently occaſions their rotting down to the next joint, and ſometimes will deſtroy the whole plant, if thoſe injured branches are not cut off in time; ſo that whenever the branches appear to have been injured, the ſooner they are cut from the plants, the leſs danger there will be of their ſuffering from it; nor ſhould any of the branches be cut between the joints, for the ſame reaſon.

Moſt of theſe plants were firſt brought to Europe by the Dutch, who have been very curious to introduce great numbers of plants from India, and alſo from the Cape of Good Hope: from the latter there hath been a very great variety of curious plants of late years brought to Europe, many of which produce very elegant flowers, and are the greateſt ornaments of the conſervatory in the winter and ſpring ſeaſons. Theſe have been brought over in ſeeds, but the different kinds of Euphorbia came over moſt of them in plants or cuttings; for theſe may be eaſily tranſported to any diſtance, if either of them are put up in boxes, with any ſoft dry package, to prevent their being bruiſed, or their ſpines from wounding each other, and kept from moiſture and cold; with this care they may be kept ſix months out of the ground, and if carefully planted will take root, and thrive as well as if they had been newly taken from the old plants, or out of the ground but a ſhort time; which is a much more expeditious method of obtaining the plants than from ſeeds, when they can be procured.

The greateſt part of theſe ſucculent plants grow naturally upon barren rocky places, or in dry ſandy ſoils, where few other plants will thrive; therefore they ſhould never be planted in rich or loamy earth here, nor ſuffered to receive much wet, which will cauſe them to rot. The beſt mixture of earth for theſe plants is about a fourth part of ſcreened lime-rubbiſh, a fourth part of ſea-ſand, and half of light freſh earth from a common; theſe ſhould be mixed well

well together, and frequently turned over before it it used, that the parts may be incorporated, and the compost sweetened by being exposed to the air. If this mixture is prepared a year before it is wanted, it will be the better, that it may have the benefit of the winter's frost and the summer's heat to mellow it; and the oftener it is turned over, and the smaller the heaps are in which it is laid, the air will penetrate it better, and render it more fit for use.

These sorts are easily propagated by cuttings, which should be taken from the old plants in June; these must be cut at a joint, otherwise they will rot. When these cuttings are taken off, the milky juice of the old plants will flow out in plenty; therefore there should be some dry earth or sand applied upon the wounded part, which will harden and stop the sap; and the wounded part of the cuttings should also be rubbed in sand, or dry earth, for the same purpose; then the cuttings should be laid in a dry part of the stove, for ten days or a fortnight; and some of those whose branches are large and very succulent, may lie three weeks or more before they are planted, that their wounds may be healed and hardened, otherwise they will rot. When the cuttings are planted, they should be each put into a small halfpenny pot, laying stones or rubbish in the bottom, and filling the pots with the mixture before directed; then plunge the pots into a moderate hot-bed, and if the weather is very hot, the glasses of the hot-bed should be shaded in the middle of the day, and the cuttings should be gently watered once or twice a week, according as the earth may dry: in about six weeks or two months the cuttings will have put out roots, so if the bed is not very warm, the plants may continue there, provided they have free air admitted to them every day, otherwise it will be better to remove them into the stove, where they may be hardened before the winter; for if they are too much drawn in summer, they are very apt to decay in winter, unless they are very carefully managed. During the summer season, these plants should be gently watered two or three times a week, according to the warmth of the season; but in winter they must not be watered oftener than once a week, and it should be given more sparingly at that season, especially if the stove is not warm: the first sort will require more warmth in the winter than any of the other, as also less water at that season. This, if well managed, will grow seven or eight feet high; but the plants must constantly remain in the stove, giving them a large share of air in warm weather, and in winter the stove should be kept in a temperate degree of warmth.

The sixth sort is at present the most rare in England: the plants of this sort, which have been procured from Holland, have been most of them destroyed by placing them in stoves, where, by the heat, they have in one day turned black, and rotted immediately after. This sort will thrive well if placed in a dry airy glass-case with Ficoides, and other succulent plants in the winter, where they may have free air in mild weather, and be protected from frost; in summer the plants of this sort may be exposed in the open air, in a warm situation, but should be screened from much wet: with this treatment, the plants will thrive much better than when they are more tenderly nursed.

The seventh, eighth, tenth, eleventh, twelfth, and thirteenth sorts, are also pretty hardy, so will live in a good glass-case in winter without fire, provided the frost is kept entirely out, and in summer they may be placed abroad in a warm situation: as these are very succulent plants, they should not have too much wet; therefore, if the summer should prove very moist, it will be very proper to place these plants under some shelter, where they may enjoy the free air, and be screened from the rain, otherwise by receiving too much wet in summer they will rot in winter.

The seventh sort will require to be supported, otherwise the weight of the branches will draw them upon the pots; and, by training of the stems up to stakes, they will grow four or five feet high, and a great number of side branches will be produced; these, being very succulent and heavy, are very apt to draw down the stem if it hath not support.

The following sorts have been, by all the writers on botany, placed under the title of Tithymalus; but the fourteenth and fifteenth sorts should, according to their own distinction, have been placed in the genus of Euphorbium, because they are as destitute of leaves as most of the species which they have there placed.

The fourteenth sort rises with a taper succulent stalk to the height of eighteen or twenty feet, sending out many branches of the same form, which subdivide into many smaller; these are jointed but at a great distance: they are smooth, and of a deep green colour, having a few small leaves at their extremities, which soon fall off. As the plants grow older, their stalks become stronger and less succulent, especially toward the bottom, where they turn to a brown colour, and become a little woody. The branches grow diffused and intermix with each other, so form a sort of bush toward the top, but this doth not produce flowers here.

The fifteenth sort sends out a great number of slender taper stalks of a dark green colour, which are smooth, and twist about each other, or any neighbouring support, whereby they will rise to the height of ten or twelve feet, putting out smaller branches upward, which also twine and intermix with the other stalks; they are naked, having no leaves, nor do the plants flower in England. These grow in India.

The sixteenth sort sends out many taper succulent stalks from the root, which rise about four feet high; they are slender and weak, so require support to prevent their falling to the ground; these have a light green bark, and their lower parts are naked, but their upper parts are garnished with oblong leaves, which are smooth, entire, and placed alternate on every side the stalks: the flowers are produced in small clusters at the end of the branches, they are of a yellowish green colour, and are sometimes succeeded by smooth round fruit, but the seeds rarely ripen in England. This sort grows naturally on the African shore in the Mediterranean.

The seventeenth sort grows naturally in some of the islands of the West-Indies, and also upon the continent there. I received specimens of this sort from the island of Tobago, and also from Carthagena, where the plants were growing in plenty; the Dutch gardens were furnished with it from Curassao, where it also grows naturally. This hath an upright stalk, which rises to the height of six or seven feet, covered with a light brown bark, and divides upward into many branches; these are garnished with roundish leaves, which are indented at their ends, and have foot-stalks: they are smooth and of a beautiful green, but fall away in winter, so that in the spring they are almost naked; the flowers come out from the end of the branches, they are yellow and small, soon falling away without having any fruit succeed them here.

These sorts are propagated by cuttings, in the same manner as the Euphorbiums, and the plants must be treated in the same way, as hath been directed for them.

The fourteenth, fifteenth, and seventeenth sorts, are tender, so require a stove; these must have the same treatment as the tender kinds of Euphorbiums, but the sixteenth sort will live in a common green-house in winter, and may be exposed abroad in the summer.

The eighteenth sort stands in the list of medicinal plants, but is rarely used in England at present; this is a biennial plant, which perishes after the seeds are ripe. It grows naturally in Italy and the south of France, and where it is allowed to scatter its seeds in a garden, becomes a weed here. This rises with an upright succulent stalk from three to four feet high, garnished with oblong smooth leaves which are placed opposite, and sit close to the stalks; the upper part of the stalk divides by pairs into smaller forked

branches, and from the fork between these divisions come out the umbels of flowers, each fork having one; that which is situated in the first division being the largest, and those in the upper the smallest. The flowers are of a greenish yellow colour; they appear in June and July, and the fruit follows soon after, which is divided into three lobes, and has three cells, each containing one roundish seed, which is cast out at a distance by the elasticity of the pods. This sort will propagate itself fast enough when it is once introduced into gardens, so requires no care but to keep it clean from weeds.

The nineteenth sort grows naturally in the south of France, in Spain, and Italy. This sends out many trailing branches from the root, which grow about a foot long, lying upon the ground, which are closely garnished with thick succulent leaves; these are flat, short, and pointed; they spread open on every side the branches, and are placed alternate, sitting close to the stalks: the flowers are produced in large umbels at the end of the branches; the involucrum of the principal umbel is composed of several oval-pointed leaves, but those of the small umbels have only two heart-shaped concave leaves, whose borders are rough; the flowers are yellow, and are succeeded by three seeds, inclosed in a roundish capsule with three cells. This plant will continue two or three years upon a dry warm soil, and will ripen seeds annually; which, if permitted to scatter, the plants will come up, and require no other care but to keep them clean from weeds.

The twentieth sort grows naturally in Crete, and in several islands of the Archipelago; this rises with an upright branching stem to the height of four feet; the leaves of this are oblong and pointed, and are placed alternate on the branches; the flowers come out in umbels from the fork between the branches; they are small and yellow, and are rarely succeeded by seeds in England. It is easily propagated by cuttings during any of the summer months, and requires a little protection from the frost in winter.

The twenty-first sort grows naturally in the woods in many parts of England; it rises with a shrubby stalk three feet high; the flowers are produced in umbels sitting close to the stalks, so form a long spike; the empalements are of a greenish yellow, and the petals black, so they make an odd appearance. It flowers in May, and the seeds ripen in July. If the seeds of this are sown under trees in the autumn, the plants will rise the following spring, and require no culture.

The twenty-second sort stands in the list of medicinal plants by the title of Esula major, but at present is seldom used: this grows naturally in France and Germany upon marshy places, where it rises three or four feet high. It hath a perennial root, by which it may be propagated better than by seeds, which seldom grow, unless they are sown soon after they are ripe.

The twenty-third sort was discovered in the Levant, by Dr. Tournefort, who sent the seeds to the royal garden at Paris; this hath a perennial root, from which arise many succulent stalks three feet high, covered with a purple bark, and garnished with oblong smooth leaves, shaped like those of Willow, of a dark green colour. The upper part of the stalks divide, and in the fork is situated an umbel of flowers of a greenish yellow colour, which are succeeded by round capsules with three cells, each containing a single seed. It flowers in June, and the seeds are ripe in August; this may be propagated by parting the roots, or by sowing the seeds in autumn. The plant is hardy, so will endure the greatest cold of this country, if it is planted in a dry soil.

The twenty-fourth sort grows naturally in Sicily, and on the borders of the Mediterranean Sea; this rises with several shrubby stalks to the height of five or six feet, having a red bark, and are garnished with oblong, smooth, blunt leaves, which are placed alternate. The flowers grow in small umbels from the division of their branches; they are yellow, and are succeeded by roundish capsules, which are rough, having three cells like the other species. This is easily propagated by cuttings during any of the summer months, and requires protection from the frost in winter.

The twenty-fifth sort grows naturally in Ireland, from whence the roots have been brought to England; this hath thick fibrous roots, which send up several single unbranched stalks about a foot high, garnished with oblong leaves, placed alternate on every side. The flowers are produced in small umbels at the top of the stalks; they are yellow, and are succeeded by rough warted capsules with three cells; it flowers in June, and the seeds ripen in August. This may be propagated by the roots, which should be planted in a shady situation and a moist soil.

This plant was almost the only physic used by the native inhabitants of Ireland formerly; but since the use of mercury has been known to them, the other has been generally neglected.

The twenty-sixth sort grows naturally in the Levant; this hath a knobbed Pear-shaped root, from which arise two or three stalks about a foot and a half high, garnished with oblong leaves, which are hairy, placed alternate on every side the stalk. The flowers are produced in small umbels from the divisions of the stalk; they are small, of a greenish yellow colour, and are seldom succeeded by seeds here; it may be propagated by offsets, sent out from the main root; these may be taken off in autumn, and planted in a shady situation, where they will thrive better than in the full sun.

The twenty-seventh sort grows naturally at Aleppo, and in other parts of the Levant; this hath a perennial creeping root, by which it multiplies very fast where it is once established. The stalks of this rise a foot and a half high; the lower leaves are narrow, stiff, and bristly; but those on the upper part of the stalk are shaped like the narrow-leaved Myrtle. The flowers are produced in large umbels from the divisions of the stalk; they are yellow, and appear in June, but are rarely succeeded by seeds in this country. The roots of this should be confined in pots; for when they are planted in the full ground, they creep about to a great distance.

The twenty-eighth sort grows naturally in many parts of the Levant, and also in Spain and Portugal. The seeds of this were brought me from Scanderoon, by the late Mr. Robert Millar, who found the plants growing plentifully there; and he assured me, that he saw the inhabitants wounding of these plants, and collecting their milky juice, which they mixed up with the Scammony to send abroad.

The seeds of this plant were since sent me from Portugal, by Robert More, Esq; who found the plants growing there naturally, but this plant had been many years before an inhabitant in the English gardens; this rises with a purple shrubby stalk near three feet high, which is garnished with narrow, spear-shaped, hairy leaves, set closely on the stalk alternately on every side; the upper part of the stalk is terminated by umbels of flowers, which form a sort of spike. The greater umbels are multifid, but the small ones are bifid. The involucrums of the flowers are yellow, and the petals of the flowers black; these appear in May, and are succeeded by seeds which ripen in July: the young plants which have been lately raised from seeds, are generally very fruitful, but the old ones, and those raised by cuttings are barren; this may be propagated by seeds, or from cuttings, and will live abroad if planted in a dry rubbishy soil and a warm situation, otherwise they are frequently killed by severe frost.

The twenty-ninth sort grows naturally in the south of France, in Spain, and Italy; this is a biennial plant, from whose root arise two or three stalks, which grow two or three feet high, garnished with spear-shaped leaves, which are entire. The umbels of flowers arise from the division of the branches; the involucrums are

are heart-shaped, and surround the pedicle with their base. The flowers are yellow, and appear in June. The seeds ripen in August; which, if permitted to scatter, the plants will come up, and require no other care but to keep them clean from weeds; this must have a shady situation.

The thirtieth sort grows naturally at La Vera Cruz, from whence the late Dr. Houstoun sent me the seeds; this is an annual plant, which rises from two to three feet high. The leaves of these are sometimes narrow and entire, at other times oval, and divided in the middle, almost to the midrib, in shape of a fiddle; they also vary in their colour, some being inclinable to purple, others of a light green; they are sawed on their edges, and stand upon short foot-stalks. The flowers are produced in small umbels at the end of the branches; they are of a greenish white, and are succeeded by small round capsules with three cells.

The thirty-first sort grows naturally in most of the islands in the West-Indies; this is an annual plant, which rises with a branching stalk about two feet high, garnished with oblong, oval, smooth leaves, which are sawed on the edges. The flowers grow in small umbels at the foot-stalks of the leaves, gathered into close bunches; these are white, and are succeeded by small round capsules, inclosing three seeds.

The seeds of the thirty-second sort were sent me from La Vera Cruz, by the late Dr. Houstoun; this is an annual plant, which rises with an upright stalk about a foot high, dividing into a great number of branches, which spread very wide on every side, garnished with roundish, heart-shaped leaves, which are entire, standing upon pretty long foot-stalks. The flowers come out singly from the divisions of the stalk; they are small, and of an herbaceous colour, and are succeeded by small round capsules, containing three seeds.

The last three sorts are annual; the seeds of these must be sown upon a hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a small pot filled with light earth, and plunged into the hot-bed again, and must afterward be treated in the same manner as other tender annual plants from warm countries.

EUPHRASIA. Eyebright.

This is a medicinal plant, which grows naturally in the fields and commons in most parts of England, always among grass, heath, furz, or some other cover, and will not grow when these are cleared from about it; nor will the seeds grow when they are sown in a garden; for which reason I shall not trouble the reader with a description, or any farther account of it, than that the herb-women supply the markets with it in plenty from the fields.

EXCORTICATION [excorticatio, *Lat.*] a pulling or peeling off the outward bark of trees.

EXOTICS [exotica, *Lat.*] Exotic plants are such as are natives of foreign countries.

# F.



FABA. Tourn. Inst. R. H. 391. tab. 212. Vicia. Lin. Gen. Plant. 782. The Bean; in French, *Féve*.

The Characters are,

*The flower hath a tubulous empalement of one leaf, which is cut into five segments at the brim; the three lower segments being long, and the two upper are very short. The flower is of the butterfly kind. The standard is large, oval, and indented at the end; the two sides turn backward, after some time; it hath two oblong erect wings, which inclose the keel, being much longer. The keel is short, swelling, and closely covers the parts of generation; these are joined in one column, almost to the top where they are divided; the nine stamina are in three parts, and one stands separate; these are terminated by roundish reclined summits. At the bottom is situated an oblong compressed germen, supporting a short angular style, crowned by an obtuse stigma, which is bearded on the two sides. The germen afterward becomes a long, compressed, leathery pod, having one cell, filled with compressed kidney-shaped seeds.*

Tournefort ranges this genus of plants in the second section of his tenth class, which includes the herbs with a butterfly flower, whose pointal turns to a long pod with one cell. This is in the third section of Linnæus's seventeenth class, in which he places those plants whose flowers have ten stamina, joined in two bodies; and he joins it to his genus of Vicia, so he makes only a specific difference between them; but as the Bean hath a compressed leathery pod and kidney-shaped seeds, and the Vetch a swelling pod with round seeds, they should be separated.

There are several varieties of the Garden Bean, which are known and distinguished by the gardeners, but do not essentially differ from each other; so I shall not enumerate them as distinct species, nor join these to the Horse Bean, as some have done, who have supposed them to be but one species; for, from having cultivated them more than forty years, without finding the Garden Bean degenerate to the Horse Bean, or the latter improving to the former, I conclude they are distinct species.

There is a great variety of the Garden Beans, now cultivated in the kitchen-gardens in England, which differ in size and shape; some of them producing their pods much earlier in the year than others, for which they are greatly esteemed by the gardeners, whose profit arises from their early crops of most esculent plants; therefore they are very careful to improve all those varieties which have a tendency to be fit for the markets first; but as many sorts of seeds, when cultivated long in the same land, are apt to degenerate, so new seeds should be annually procured, either from abroad, or some distant situation, where the soil is of a different nature, by which change many of the varieties may be continued in perfection.

I shall begin with the Garden Bean, called by the botanists, Faba major to distinguish it from the Horse Bean, which they have titled Faba minor seu Equina; and I shall only mention the names of each, by which they are known among the gardeners, placing them according to their time of ripening for the table.

The Mazagan Bean is the first and best sort of early Beans at present known; these are brought from a settlement

tlement of the Portugueſe on the coaſt of Africa, juſt without the Streights of Gibraltar; the ſeeds of this ſort are ſmaller than thoſe of the Horſe Bean; and as the Portugueſe are but ſlovenly gardeners, there is commonly a great number of bad ſeeds among them. If this ſort is ſown in October, under a warm hedge, pale, or wall, and carefully earthed up when the plants are advanced, they will be fit for the table by the middle of May. The ſtems of this ſort are very ſlender, therefore, if they are ſupported by ſtrings cloſe to the hedge, or pale, it will preſerve them from the morning froſts, which are ſometimes ſevere in the ſpring, and retard their growth; ſo by keeping them cloſe to the fence it will cauſe them to come forwarder than if this is neglected; theſe Beans bear plentifully, but they ripen nearly together, ſo that there are never more than two gatherings from the ſame plants; if the ſeeds of this ſort are ſaved two years in England, the Beans will become much larger, and not ripen ſo ſoon, which is called a degeneracy.

The next ſort is the early Portugal Bean, which appears to be the Mazagan ſort ſaved in Portugal, for it is very like thoſe which are the firſt year ſaved in England; this is the moſt common ſort uſed by the gardeners for their firſt crop, but they are not near ſo well taſted as the Mazagan; therefore when the Mazagan Bean can be procured, no perſon would plant the other.

The next is the ſmall Spaniſh Bean; this will come in ſoon after the Portugal ſort, and is rather a ſweeter Bean, therefore ſhould be preferred to it.

Then comes the broad Spaniſh, which is a little later than the other, but comes in before the common ſorts, and is a good bearer, therefore is frequently planted.

The Sandwich Bean comes ſoon after the Spaniſh, and is almoſt as large as the Windſor Bean; but, being hardier, is commonly ſown a month ſooner; this is a plentiful bearer, but not very delicate for the table.

The Toker Bean, as it is generally called, comes about the ſame time with the Sandwich, and is a great bearer; therefore is now much planted, though it is a coarſe Bean.

The white and black Bloſſom Beans are alſo by ſome perſons much eſteemed; the Beans of the former are, when boiled, almoſt as green as Peas; and being a tolerable ſweet Bean, renders it more valuable; theſe ſorts are very apt to degenerate, if their ſeeds are not ſaved with great care.

The Windſor Bean is allowed to be the beſt of all the ſorts for the table; when theſe are planted on a good ſoil, and are allowed ſufficient room, their ſeeds will be very large, and in great plenty; and when they are gathered young, are the ſweeteſt and beſt taſted of all the ſorts; but theſe ſhould be carefully ſaved, by pulling out ſuch of the plants as are not perfectly right, and afterward by ſorting out all the good from the bad Beans.

This ſort of Bean is ſeldom planted before Chriſtmas, becauſe it will not bear the froſt ſo well as many of the other ſorts; ſo it is generally planted for the great crop, to come in June and July.

All the early Beans are generally planted on warm borders under walls, pales, and hedges; and thoſe which are deſigned to come firſt, are uſually planted in a ſingle row pretty cloſe to the fence: and here I cannot help taking notice of a very bad cuſtom, which too generally prevails in gentlemens kitchen-gardens, which is that of planting Beans cloſe to the garden-walls, on the beſt aſpects, immediately before the fruit-trees, which is certainly a greater prejudice to the trees, than the value of the Beans, or any other early crop; therefore this practice ſhould be everywhere diſcouraged; for it is much better to run ſome low Reed hedges acroſs the quarters of the kitchen-garden, where early Beans and Peas may be planted, in which places they may with more conveniency be covered in ſevere froſt; and to theſe hedges they may both be cloſely faſtened, as they advance in their growth; which, if practiſed againſt the walls where good fruit-trees are planted, will greatly prejudice the trees, by overſhadowing them, and the growth of theſe legumes will draw off the nouriſhment from the roots of the trees, whereby they will be greatly weakened.

But to return to the culture of the Beans. Thoſe which are planted early in October, will come up by the beginning of November; and as ſoon as they are an inch above ground, the earth ſhould be carefully drawn up with a hoe to their ſtems; and this muſt be two or three times repeated, as the Beans advance in height; which will protect their ſtems from the froſt, and encourage their ſtrength. If the winter ſhould prove ſevere, it will be very proper to cover the Beans with Peas-haulm, Fern, or ſome other light covering, which will ſecure them from the injury of froſt; but this covering muſt be conſtantly taken off in mild weather, otherwiſe they will draw up tall and weak, and come to little; and if the ſurface of the border is covered with tanners bark, it will prevent the froſt penetrating the ground to the roots of both, and be of great ſervice to protect them from the injury which they might otherwiſe receive.

In the ſpring, when the Beans are advanced to be a foot high, they ſhould be faſtened up to the hedge with packthread or a ſmall line, ſo as to draw them as cloſe as poſſible; which will ſecure them from being injured by the morning froſts, which are often ſo ſevere in March and April, as to lay thoſe Beans flat on the ground, which are not thus guarded; at this time all ſuckers which come out from the roots ſhould be very carefully taken off; for theſe will retard the growth of the Beans, and prevent their coming early; and when the bloſſoms begin to open toward the bottom of the ſtalks, the top of the ſtems ſhould be pinched off, which will cauſe thoſe firſt pods to ſtand, and thereby bring them forward. If theſe rules are obſerved, and the ground kept clean from weeds, or other plants, there will be little danger of their failing.

But leſt this firſt crop ſhould be deſtroyed by froſt, it will be abſolutely neceſſary to plant more about three weeks after the firſt, and ſo to repeat planting more every three weeks, or a month, till February; but thoſe which are planted toward the end of November, or the beginning of December, may be planted on ſloping banks, at a ſmall diſtance from the hedges; for if the weather is mild, theſe will not appear above ground before Chriſtmas; therefore will not be in ſo much danger as the firſt and ſecond planting, eſpecially if the ſurface of the ground is covered with tan to keep the froſt out of the ground as is before directed; for the firſt planting will, by that time, be a conſiderable height: the ſame directions which are before given will be ſufficient for the management of theſe; but only it muſt be obſerved, that the larger Beans ſhould be planted at a greater diſtance than the ſmall ones; as alſo, that thoſe which are firſt planted muſt be put cloſer together, to allow for ſome miſcarrying; therefore, when a ſingle row is planted, the Beans may be put two inches aſunder, and thoſe of the third and fourth planting may be allowed three inches; and when they are planted in rows acroſs a bank, the rows ſhould be two feet and a half aſunder; but the Windſor Beans ſhould have a foot more ſpace between the rows, and the Beans in the rows ſhould be planted five or ſix inches aſunder. This diſtance may, by ſome perſons, be thought too great; but from many years experience, I can affirm, that the ſame ſpace of ground will produce a greater quantity of Beans when planted at this diſtance, than if double the quantity of ſeeds are put on it. In the management of theſe later crops of Beans, the principal care ſhould be to keep them clear from weeds, and any other plants which would draw away their nouriſhment; to keep earthing them up, and, when they are in bloſſom, to pinch off their tops; which, if ſuffered to grow, will draw the nouriſhment from the lower bloſſoms, which will prevent the pods from ſetting, and ſo only the upper parts of the ſtems will be fruitful;

fruitful; and another thing ſhould be obſerved in planting of the ſucceeding crops, which is, to make choice of moiſt ſtrong land for the later crops; for if they are planted on dry ground, they rarely produce a crop.

Theſe after-crops ſhould be planted at about a fortnight diſtance from each other, from the middle of February to the middle of May; after which time it is generally too late to plant, unleſs the land is very ſtrong and moiſt; for in warm dry light land all the late crops of Beans are generally attacked by the black inſects, which cover all the upper part of their ſtems, and ſoon cauſe them to decay.

Where the ſeeds of theſe Beans are deſigned to be ſaved, a ſufficient number of rows ſhould be ſet apart for that purpoſe, according to the quantity deſired; theſe ſhould be managed in the ſame way as thoſe which are deſigned for the table; but none of the Beans ſhould be gathered, though there are ſome covetous perſons, who will gather all the firſt ripe for the table, and are contented to ſave the after-crop for ſeed, but theſe are never ſo large and fair as the firſt; ſo that if theſe are for ſale, they will not bring near the price as the other; therefore, what is gained to the table is loſt in the value of the ſeed; but thoſe who are deſirous to preſerve the ſeveral varieties as pure as poſſible, ſhould never ſuffer two of the varieties to grow for ſeeds in the ſame place; for by their farina mixing with each other they will not continue ſo pure, but be apt to vary; and in order to keep the early kinds perfect, thoſe which come the earlieſt ſhould be ſaved for ſeeds; but this is what few people chuſe to do, becauſe they are then the moſt valuable.

When the ſeed is ripe, the ſtalks ſhould be pulled up, and ſet upright againſt a hedge to dry, obſerving to turn them every third day, that they may dry equally; then they may be threſhed out, and cleaned for uſe, or otherwiſe ſtacked up in a barn, till there is more leiſure for threſhing them out; and afterward the ſeed ſhould be drawn over to take out all thoſe that are not fair, preſerving the beſt for uſe or ſale.

It is a very good method to change the ſeeds of all ſorts of Beans, and not to ſow and ſave the ſeeds long in the ſame ground, for they do not ſucceed ſo well; therefore, if the land is ſtrong where they are to be planted, it will be the beſt way to procure the ſeeds from a lighter ground, and ſo vice verſa; and by this method the crops will be larger, and the Beans fairer, and not ſo liable to degenerate.

Having given directions for the culture of the Garden Beans, I ſhall next proceed to that of the Horſe Bean, which is cultivated in the fields: there are two or three varieties of theſe Beans, which differ in their ſize and colour; but that which is now in the greateſt eſteem, is called the Tick Bean; this doth not grow ſo high as the other, is a more plentiful bearer, and ſucceeds better on light land than the common Horſe Bean, ſo preferred to it.

The Horſe Bean delights in a ſtrong moiſt ſoil, and an open expoſure, for they never thrive well on dry warm land, or in ſmall incloſures, where they are very ſubject to blight, and are frequently attacked by a black inſect, which the farmers call the black dolphin; theſe inſects are often in ſuch quantities as to cover the ſtems of the Beans entirely, eſpecially all the upper part of them; and whenever this happens, the Beans ſeldom come to good; but in the open fields, where the ſoil is ſtrong, this rarely happens.

Theſe Beans are uſually ſown on land which is freſh broken up, becauſe they are of uſe to break and pulverize the ground, as alſo to deſtroy weeds; ſo that the land is rendered much better for corn, after a crop of Beans, than it would have been before, eſpecially if they are ſown and managed according to the new huſbandry, with a drill plough, and the horſe hoe, uſed to ſtir the ground between the rows of Beans, which will prevent the growth of weeds, and pulverize the ground, whereby a much greater crop of Beans may, with more certainty, be expected, and the land will be better prepared for whatever crop it is deſigned for after.

The ſeaſon for ſowing of theſe Beans is from the middle of February to the end of March, according to the nature of the ſoil; the ſtrongeſt and wet land ſhould always be laſt ſown; the uſual quantity of Beans ſown on an acre of land is about three buſhels; but this is double the quantity which need be ſown, eſpecially according to the new huſbandry; but I ſhall firſt ſet down the practice according to the old huſbandry, and then give directions for their management according to the new. The method of ſowing is after the plough, in the bottom of the furrows; but then the furrows ſhould not be more than five, or at moſt ſix inches deep. If the land is new broken up, it is uſual to plough it early in autumn, and let it lie in ridges till after Chriſtmas; then plough it in ſmall furrows, and lay the ground ſmooth; theſe two ploughings will break the ground fine enough for Beans, and the third ploughing is to ſow the Beans, when the furrows ſhould be made ſhallow, as was before mentioned.

Moſt people ſet their Beans too cloſe; for, as ſome lay the Beans in the furrows after the plough, and others lay them before the plough, and plough them in; ſo, by both methods the Beans are ſet as cloſe as the furrows are made, which is much too near; for when they are on ſtrong good land, they generally are drawn up to a very great height, and are not ſo apt to pod as when they have more room, and are of lower growth; therefore I am convinced by many late trials, that the better way is to make the furrows two feet and a half aſunder, or more; which will cauſe them to branch out into many ſtalks, and bear in greater plenty than when they are cloſer; by this method, half the quantity of Beans will be ſufficient for an acre of land; and by the ſun and air being admitted between the rows, the Beans will ripen much earlier and more equally than in the common way.

What has been mentioned muſt be underſtood as relating to the old huſbandry; but where Beans are planted according to the new, the ground ſhould be four times ploughed before the Beans are ſet, which will break the clods, and render it much better for planting; then with a drill plough, to which a hopper is fixed for ſetting of the Beans, the drills ſhould be made at three feet aſunder, and the ſpring of the hopper ſet ſo as to ſcatter the Beans at three inches diſtance in the drills. By this method leſs than one buſhel of ſeed will plant an acre of land. When the Beans are up, if the ground is ſtirred between the rows with a horſe plough, it will deſtroy all the young weeds; and when the Beans are advanced about three or four inches high, the ground ſhould be again ploughed between the rows, and the earth laid up to the Beans; and if a third ploughing, at about five or ſix weeks after is given, the ground will be kept clean from weeds, and the Beans will ſtalk out, and produce a much greater crop than in the common way.

When the Beans are ripe, they are reaped with a hook, as is uſually practiſed for Peas; and after having lain a few days on the ground they are turned, and this muſt be repeated ſeveral times, until they are dry enough to ſtack; but the beſt method is to tie them in ſmall bundles, and ſet them upright; for then they will not be in ſo much danger to ſuffer by wet, as when they lie on the ground; and they will be more handy to carry and ſtack, than if they are looſe. The common produce is from twenty to twenty-five buſhels on an acre of land; but I have known thirty-ſix on an acre.

The Beans ſhould lie in the mow to ſweat, before they are threſhed out; for as the haulm is very large and ſucculent, ſo it is very apt to give and grow moiſt; but there is no danger of the Beans receiving damage, if they are ſtacked tolerably dry, becauſe the pods will preſerve the Beans from injury; and they will be much eaſier to threſh after they have ſweat in the

mow than before; and after they have once sweated and are dry again, they never after give.

By the new husbandry, the produce has exceeded the old by more than ten bushels on an acre; and if the Beans which are cultivated in the common method are observed, it will be found that more than half their stems have no Beans on them; for by standing close, they are drawn up very tall; so the tops of the stalks only produce, and all the lower part is naked; whereas in the new method, they bear almost to the ground; and as the joints of the stems are shorter, so the Beans grow closer together on the stalks.

In the year 1745 I made the following experiment, in planting a piece of eleven acres of Beans in Berkshire, viz. the gentleman's bailiff, who was wedded to the old practice of husbandry, was very unwilling to depart from it; and having been an old servant in the family, his master was inclinable to hear all he could say in favour of his opinion: however, at last I prevailed on the gentleman to let his bailiff plant one half of the land in his way, giving him the choice which half he would have: accordingly the land was divided and planted; but the summer proving wet, the Beans on that part of the field he had chosen grew so tall and rank, that they produced no pods but on the upper part of the stalks; and when they were threshed out, there was no more than twenty-two bushels on an acre, whereas the other half produced near forty.

FABA ÆGYPTIACA, is the Arum Ægyptiacum.

FABA CRASSA, is Anacampseros.

FABAGO. See ZYGOPHYLLUM.

FAGARA. Brown. Hist. Jam. tab. 5. f. 1. Ironwood.

The CHARACTERS are,

*It hath male and hermaphrodite flowers upon different plants; the male flowers have a small empalement, slightly cut into four segments, but have no petals, and six stamina, terminated by roundish summits: these are barren. The female flowers have a larger concave permanent empalement with four spreading petals, and four stamina, crowned with oval summits, and an oval germen, supporting a slender style, terminated by an obtuse stigma; the germen afterward becomes a globular capsule with two lobes, inclosing two seeds.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia; whereas it should be put into his sixth section of the twenty-third class, as the flowers are male and hermaphrodite on different plants, and the flowers have six stamina: but this mistake he was led into by Jacquin, who had seen and described the hermaphrodite flowers only.

The SPECIES are,

1. FAGARA (*Pterota*) foliolis emarginatis. Amœn. Acad. 5. p. 393. *Fagara, whose lobes (or small leaves) are indented at the top.* Lauro affinis jasmini alato folio, costa media membranulis utrinque extantibus alata, ligno duritie ferro vix cedens. Sloan. Hist. Jam. 2. p. 25. *Ironwood.*
2. FAGARA (*Tragodes*) articulis pinnarum subtus aculeatus. Jacq. Amer. 13. *Fagara with spines under the leaves at the joints.* Schinoides petiolis subtus aculeatis. Hort. Cliff. 489.

The first sort grows naturally in the warmest parts of America. The late Dr. Houstoun found it growing at Campeachy, from whence he sent me dried specimens of the plants in flower, by which I am convinced there are male trees which are barren. It rises with a woody stem upwards of twenty feet high, sending out branches great part of its length, garnished with small winged leaves, having three or five lobes to each. The flowers come from the side of the branches, standing four or five together upon short foot-stalks.

The second sort I have placed here after Linnæus, but am not sure it should be ranged with it; for although I have pretty strong plants of it growing in the Chelsea garden, they have not yet flowered; but by the external face of the plant, it seems to agree with the first.

These are both tender plants, so must be kept in the bark-stove constantly, and are propagated by seeds, and also by cuttings, if properly managed.

FAGONIA. Tourn. Inst. R. H. 265. tab. 141. Lin. Gen. Plant. 475. This plant was so named by Dr. Tournefort, in honour of Dr. Fagon, who was superintendant of the royal garden at Paris.

The CHARACTERS are,

*The flower hath a spreading empalement, composed of five small leaves; it hath five heart-shaped petals, which spread open, aud are narrow at their base, where they are inserted in the empalement. It hath ten stamina which are erect, terminated by roundish summits. In the center is situated a five-cornered germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes a roundish capsule having five lobes, ending in a point, and five cells, each having a single roundish seed.*

Linnæus ranges this plant in the first section of his tenth class, intitled Decandria Monogynia, from the flower having ten stamina and one style.

The SPECIES are,

1. FAGONIA (*Erecta*) spinosa, foliolis lanceolatis planis lævibus. Hort. Upsal. 103. *Prickly Fagonia, whose leaves are spear-shaped, plain, and smooth.* Fagonia Cretica spinosa. Tourn. *Thorny Trefoil of Candia.*
2. FAGONIA (*Hispanica*) inermis. Lin. Sp. Plant. 386. *Fagonia without spines.* Fagonia Hispanica non spinosa. Tourn. *Spanish Fagonia without thorns.*
3. FAGONIA (*Arabica*) spinosa, foliolis linearibus convexis. Lin. Sp. Plant. 386. *Prickly Fagonia with narrow convex leaves.* Fagonia Arabica, longissimis aculeis armato. Shaw. Pl. Afr. 229. *Arabian Fagonia, armed with very long spines.*

The first sort is a native of the island of Candia: this has been described by some botanists under the title of Trifolium spinosum Creticum, which occasioned my giving it the English name of Thorny Trefoil of Crete; though there is no other affinity between this and the Trefoil, than that of this having three leaves or lobes on the same foot-stalk.

This is a low plant, which spreads its branches close to the ground, which are extended to the length of a foot or more every way, garnished with small trifoliate oval leaves, placed opposite; and at each joint, immediately below the leaves, come out two pair of spines, one on each side the stalk; and at the same places come out a single blue flower, standing upon a short foot-stalk, composed of five spear-shaped petals, which are narrow at their base, where they are inserted into the empalement; after these fall away, the germen turns to a roundish five-lobed capsule, ending in an acute point, having five cells, each containing one roundish seed. It flowers in July and August, but unless the season proves warm, the seeds do not ripen in England.

The second sort grows naturally in Spain; this differs from the first in being smooth, the branches of this having no thorns; and the plant will live two years, whereas the first is annual.

The third sort was discovered by the late Dr. Shaw in Arabia; this is a low plant with a shrubby stalk, from which come out several weak branches armed with long thorns; the leaves of this are thick, narrow, and convex on their lower side; the flowers come out in the same manner as in the first sort.

These plants are propagated by seeds, which should be sown upon a border of fresh light earth, where the plants are designed to remain, for they do not bear transplanting well; when the plants come up, they may be thinned out to the distance of ten inches or a foot; and if they are kept clean from weeds, they will require no other care.

The first sort is an annual p'ant, which seldom perfects its seeds in England, unless the seasons prove very warm; therefore the best way is to sow the seeds upon a warm border in the autumn, and in frosty weather shelter the plants with mats, or some covering to secure them; or if they are sown in pots

pots and placed under a frame in the winter, and the following ſpring ſhaken out of the pots, and planted in a warm border, they will come early to flower, and thereby ripe ſeeds may be more certainly obtained.

The other two ſorts may be treated in the ſame way; for as theſe ſeldom flower the firſt year from ſeeds, ſo the plants ſhould be either kept in pots, and ſheltered under a frame in winter, or placed in a warm border, where they may be ſheltered with mats, or ſome other covering, to preſerve them from the froſt; and the following ſummer the ſecond ſort will flower and produce ripe ſeeds, but the third has not perfected any ſeeds as yet in England.

FAGOPYRUM. See Helxine.

FAGUS. Tourn. Inſt. R. H. 584. tab. 351. Lin. Gen. Plant. 951. [ſo called from φάγω, *Gr.* becauſe ſuppoſed to be the food of the firſt race of mankind.] The Beech-tree; in French, *Hêtre.*

The Characters are,

*It hath male and female flowers on the ſame tree; the male flowers are collected into globular heads; theſe have no petals, but have ſeveral ſtamina included in an empalement of one leaf, which are terminated by oblong ſummits. The female flowers have a one-leaved empalement cut into four parts, but have no petals; the germen is fixed to the empalement, ſupporting three ſtyles, crowned by reflexed ſtigmas. The germen afterward becomes a roundiſh capſule, armed with ſoft ſpines, opening in three cells, each containing a triangular nut.*

This genus of plants is ranged in the eighth ſection of Linnæus's twenty-firſt claſs, which includes thoſe plants that have male and female flowers on the ſame plant, and the male flowers have many ſtamina. To this genus he has joined the Cheſnut; but as the male flowers of the Cheſnut are collected in long katkins, and thoſe of the Beech are globular, and the fruit of the latter being triangular, there is ſufficient reaſon for keeping them ſeparate.

We know but one Species of this genus, viz.

Fagus (*Sylvatica*) foliis ovatis obſolete ſerratis. Hort. Cliff. 447. Fagus. Dod. Pempt. 832. *The Beech-tree with oval ſawed leaves.*

There are ſome planters, who ſuppoſe there are two diſtinct ſpecies of this tree; one they call the Mountain Beech, which they ſay is a whiter wood than the other, which they diſtinguiſh by the title of Wild Beech; but it is certain, that this difference in the colour of the wood ariſes from the difference of the ſoils in which they grew, for I have not ſeen any ſpecific difference in the trees. There have been ſeeds of a Beech-tree brought from North-America, by the title of Broad-leaved Beech, but the plants which were raiſed from them proved to be the common ſort; ſo that we know of no other variety, excepting thoſe with ſtriped leaves, which is accidental; and when the trees are in vigour, the leaves become plain again.

This tree is propagated by ſowing the maſt; the ſeaſon for which is any time from October to February, only obſerving to ſecure the ſeeds from vermin when early ſowed; which, if carefully done, the ſooner they are ſown the better, after they are full ripe: a ſmall ſpot of ground will be ſufficient for raiſing a great number of theſe trees from ſeed, but you muſt be very careful to keep them clear from weeds; and if the plants come up very thick, you ſhould not fail to draw out the ſtrongeſt of them the autumn following, that thoſe left may have room to grow; ſo that if you huſband a ſeed-bed carefully, it will afford a three years draught of young plants, which ſhould be planted in a nurſery; and, if deſigned for timber trees, at three feet diſtance row from row, and eighteen inches aſunder in the rows.

But if they are deſigned for hedges (to which the tree is very well adapted) the diſtance need not be ſo great; two feet row from row, and one foot in the rows will be ſufficient. In this nurſery they may remain two or three years, obſerving to clear them from weeds, as alſo to dig up the ground between the rows, at leaſt once a year, that their tender roots may the better extend themſelves each way: but be careful not to cut or bruiſe their roots, which is injurious to all young trees; and never dig the ground in ſummer, when the earth is hot and dry; which, by letting in the rays of the ſun to the roots, is often the deſtruction of young trees.

This tree will grow to a conſiderable ſtature, though the ſoil be ſtony and barren; as alſo upon the declivities of hills, and chalky mountains, where they will reſiſt the winds better than moſt other trees; but then the nurſeries for the young plants ought to be upon the ſame ſoil; for if they are raiſed in good ſoil and a warm expoſure, and afterwards tranſplanted into a bleak barren ſituation, they ſeldom thrive, which holds true in moſt other trees; therefore I would adviſe the nurſery to be made upon the ſame ſoil where the plantation is intended, but of this I ſhall ſay more under the article of Nursery.

The tree is very proper to form large hedges to ſurround plantations, or large wilderneſs quarters; and may be kept in a regular figure, if ſheared twice a year, eſpecially if they ſhoot ſtrong; in which caſe, if they are neglected but a ſeaſon or two, it will be difficult to reduce them again. The ſhade of this tree is very injurious to moſt ſorts of plants which grow near it, but is generally believed to be very ſalubrious to human bodies.

The timber is of great uſe to turners for making trenchers, diſhes, trays, buckets; and likewiſe to the joiner for ſtools, bedſteads, coffins, &c. The maſt is very good to fat ſwine and deer; it alſo affords a ſweet oil, and the nuts have in ſcarce times ſupported ſome families with bread.

This tree delights in a chalky or ſtony ground, where it generally grows very faſt; and the bark of the trees in ſuch land is clear and ſmooth; and although the timber is not ſo valuable as that of many other trees, yet as it will thrive on ſuch ſoils and in ſuch ſituations where few better trees will ſcarce grow, the planting of them ſhould be encouraged; eſpecially as the trees afford an agreeable ſhade, and the leaves make a fine appearance in ſummer, and continue green as long in autumn as any of the deciduous trees: therefore in parks, and other plantations for pleaſure, this tree deſerves to be cultivated among thoſe of the firſt claſs, eſpecially where the ſoil is adapted to it.

The two ſorts with variegated leaves may be propagated by budding or grafting them upon the common Beech, obſerving not to plant them in a good earth; which will cauſe the buds or cyons to ſhoot vigorouſly, whereby the leaves will become plain, which often happens to moſt variegated plants.

FARINA FŒCUNDANS is the impregnating meal or duſt on the apices or ſummits of flowers; which, being conveyed into the uterus or vaſculum ſeminale of plants, fecundates the rudiments of the ſeeds in the ovary, which otherwiſe would decay and come to nothing. See Generation of Plants.

FEATHERFEW, or FEAVERFEW. See Matricaria.

FENCES. In hotter climates than England, where they have not occaſion for walls to ripen their fruit, their gardens lie open, where they can have water fence and proſpects; or elſe they bound their gardens with groves, in which are fountains, walks, &c. which are much more pleaſing to the ſight than a dead wall: but in colder countries, and in England, we are obliged to have walls to ſhelter and ripen our fruit, although they take away much from the pleaſant proſpect of the garden.

Since therefore we are under a neceſſity to have walls to ſecure our gardens from the injury of winds, as well as for the conveniency of partitions or incloſures, and alſo to ripen our fruit, brick walls are accounted the warmeſt and beſt for this purpoſe: and theſe walls being built pannel-ways, with pillars at equal diſtances, will ſave a great deal of charge, in that

the

the walls may be built thinner, than if they were built plain without these pannels, for then it would be necessary to build them thicker every where: and besides, these pannels make the walls look the handsomer.

Stone walls are by some preferred to those of brick, especially those of square hewn stones; but where they are designed for fruit, they should be faced with brick. Those that are made of rough stones, though they are very dry and warm, yet, by reason of their unevenness, are inconvenient to nail up trees to, except pieces of timber be laid in them here and there for to fasten a trellis to them.

But in large gardens it is better to have the prospect open to the pleasure-garden, which should be surrounded with a fosse, that from the garden the adjacent country may be viewed, but this must depend on the situation of the place; for if the prospect from the garden is not good, it had better be shut out from the sight by a wall, or any other fence, than to be open. As also, where a garden lies near a populous town, and the adjoining grounds are open to the inhabitants, if the garden is open, there will be no walking there in good weather, without being exposed to the view of all passengers, which is very disagreeable.

Where these fosses are made round a garden which is situated in a park, they are extremely proper; because hereby the prospect of the park will be obtained in the garden, which renders these gardens much more agreeable than those which are confined.

In the making these fosses there have been many inventions; but, upon the whole, I have not seen any which are in all respects preferable to those which have an upright wall next the garden; which (where the soil will admit of a deep trench) should be six or seven feet high, so as to be above the reach of boys; and from the foot of this wall, the ground on the outside should rise with a gradual easy slope to the distance of eighteen or twenty feet; and where it can be allowed, if it slopes much farther, it will be easier and less perceptible as a ditch to the eye, when viewed at a distance. But if the ground is naturally wet, so as not to admit of a deep fosse, then, in order to make a fence against cattle, if the wall be four feet high, and slight posts of three feet and a half high are placed just behind the wall, with a small chain carried on from post to post, no cattle or deer will ever attempt to jump against it, therefore it will be a secure fence against them; and if these are painted of a dark lead colour, they will not be discerned at a distance; and at the same time the chain will secure persons walking in the garden from tumbling over: and if another chain is carried through the posts at one foot from the ground, it will more effectually prevent cattle from creeping under.

In such places where there are no good prospects to be obtained from a garden, it is common to make the inclosure of park-paling; which, if well performed, will last many years, and has a much better appearance than a wall: and this pale may be hid from the sight within, by plantations of shrubs and Evergreens; or there may be a quick hedge planted within the pale, which may be trained up, so as to be an excellent fence by the time the pales begin to decay.

There are some persons who make stuckade fences round their gardens to keep out cattle, &c. which, when well made, will answer the purpose of a fence; but this being very expensive in the making, and not of very long duration, has occasioned their not being more commonly in use.

As to fences round parks, they are generally of paling; which, if well made of winter-fallen Oak, will last many years; but a principal thing to be observed in making these pales, is not to make them too heavy; for when they are so, their own weight will cause them to decay; therefore the pale should be cleft thin, and the rails should be cut triangular, to prevent the wet lodging upon them; and the posts should be good, and not placed too far asunder, burning that part of them as goes into the ground. If these things are observed, one of these pales will last, with a little care, upward of forty years very well. The common way of making these fences is, to have every other pale nine or ten inches above the intermediate ones; so that the fence may be six feet and a half high, which is enough for fallow deer; but where there are red deer, the fence should be one foot higher, otherwise they will leap over.

Some inclose their parks with brick walls; and in countries where stone is cheap, the walls are built with this material; some with, and others without mortar.

A kitchen-garden, if rightly contrived, will contain walling enough to afford a supply of such fruits as require the assistance of a wall for any family; and this garden being situated on one side, and quite out of sight of the house, may be surrounded with walls, which will screen the kitchen-garden from the sight of persons in the pleasure-garden; and being locked up, the fruit will be much better preserved than it can be in the public garden: and the having too great a quantity of walling is often the occasion that so many scandalous trees are frequently to be seen in large gardens, where there is not due care observed in their management.

And besides, the borders of pleasure-gardens are generally too narrow for the roots of fruit-trees, as will be shewn in its proper place, therefore it is in vain to plant them there.

The height of garden-walls should be from ten to twelve feet, which is a moderate proportion; and if the soil be good, it may in time be well furnished with bearing wood in every part, especially those parts planted with Pears, notwithstanding the branches being trained horizontally from the bottom of the walls.

I would recommend the White Thorn, the Holly, the Black Thorn and Crab, for outward fences to a good ground, but I do not approve of the intermixing them.

The White Thorn is the best quick to plant, because it is the most common, and may be clipped so as to render it the closest and hardiest fence of any other tree; and being very durable, is preferred to all others for outward fences, or for the division of fields, where they are exposed to cattle, &c.

The Black Thorn and Crab make very good fences, and are to be raised as the White Thorn; but if the kernels of Apples or Crabs be sown, it is best to sow the pommace with them, and they will come up the sooner, i. e. the first year, if sown in the autumn, soon after the fruit is ripe.

If Crab-stocks be planted while young, in the same manner as quick, they make excellent hedges soon, and so will some sorts of Plumbs, I mean such as have thorns.

The Black Thorn is not accounted so good for fences as the White Thorn, because it is apt to run more into the ground, and is not certain as to the growing, especially if the plants are not set very young; but then on the other hand, the bushes are by much the better, and are also more lasting than the White Thorn, or any other, for dead hedges, or to mend gaps; nor are they subject to be cropt by cattle, as the others are. The richer the mould is, the better they will prosper, but yet they will grow on the same sort of soil that the White Thorn does.

The Holly will make an excellent fence, and is preferable to all the rest, but is a slow grower; but when once it does grow, it makes amends by its height, strength, and thickness.

It is raised of young seedling plants or berries, as the White Thorn is, and the berries will lie as long in the ground before they come up. It delights most in strong grounds, but will grow upon the driest gravel, amongst rocks and stones.

The berries lie till the second spring before they come up, therefore they should be prepared before they are sown (for this see the article Aquifolium.) It will be best to sow them in the place where you design they

they should grow, but they should be well weeded both before they come up and afterwards.

French Furz will also do well upon dry sandy banks, where few other plants will grow; but they must be kept very clean at the bottom, and cut thin, and never suffered to grow too high: nor should they be cut in dry weather, or late in autumn, nor early in the spring; the doing either of which is subject to make it die in patches, which is irrecoverable; nor will it ever break out again from old wood, if cut close in, after it has been suffered long to grow out.

Fences may likewise be made of Elder: if the soil be any thing good, you may put sticks of Elder, or truncheons ten or twelve feet long, slopeways in your banks, so as to make a chequer-work; and they will make a fence for a garden the quickest of any thing, and be a good shelter. But these fences are improper for a fine garden, because they shoot very irregular, and are ungovernable; as likewise the roots of these trees spread very far, and draw away all the heart of the ground, so as to starve whatever plants grow near them: and add to this the scattering of the berries, which will fill the ground near them with young plants; which, if not timely weeded out, will get the better of whatever grows near them; therefore this sort of fence is seldom planted, where a hedge of White Thorn can be had.

Elder planted on a bank, the side of which is washed with a river or stream, will make an extraordinary fence, and will preserve the bank from being undermined by the water, because it is continually sending suckers from the roots and lower branches, which is of great advantage where the stream washes away the bank.

For middle fences in a garden, the Yew is the most tonsile, governable, and durable plant.

For surrounding wilderness quarters, Elm, Lime, Hornbeam and Beech, are very proper.

FENNEL. See FOENICULUM.

FENNEL-FLOWER. See NIGELLA.

FERRUM EQUINUM. See HIPPOCREPIS.

FERULA. Lin. Gen. Plant. 305. Tourn. Inst. R. H. 321. tab. 170. [takes its name of Ferendo, *Lat.* because the stalks of this plant are made use of in supporting the branches of trees; or of Feriendo, because in old time sticks were made of them, with which school-masters used to correct their scholars.] Fennel Giant; in French, *Ferule.*

The CHARACTERS are,

*It hath an umbellated flower; the principal umbel is globular, and is composed of several smaller called rays, of the same form; the involucrum is composed of several narrow leaves which fall off; the principal umbel is uniform. The flowers have five oblong erect petals which are equal, and five stamina of the same length, terminated by single summits; under the flower is situated a turbinated germen, supporting two reflexed styles, crowned by obtuse stigmas. The germen afterward becomes an elliptical, compressed, plain fruit, dividing in two parts, each having a large elliptical plain seed, marked with three lines on each side.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, which contains those plants whose flowers have five stamina and two styles.

The SPECIES are,

1. FERULA (*Communis*) foliolis linearibus longissimis simplicibus. Hort. Cliff. 95. *Ferula with the smaller leaves, very narrow, long, and single.* Ferula major, seu fæmina Plinii. M. Umb. *Pliny's Female Fennel Giant.*
2. FERULA (*Galbanifera*) foliolis multipartitis, laciniis linearibus planis. Hort. Cliff. 95. *Ferula whose smaller leaves are divided into many narrow parts which are plain.* Ferula galbanifera. Lob. Obs. *Galbanum-bearing Fennel Giant.*
3. FERULA (*Tingitana*) foliolis laciniatis, lacinulis tridentatis inæqualibus. Hort. Cliff. 95. *Ferula whose smaller leaves are cut, and segments ending in three unequal parts.* Ferula Tingitana, folio latissimo lucido. H. Edin. *Broad-leaved shining Fennel Giant from Tangier.*
4. FERULA (*Ferulago*) foliis pinnatifidis, pinnis linearibus planis trifidis. Hort. Cliff. 95. *Ferula with wing-pointed leaves, whose pinnæ are narrow, plain, and trifid.* Ferula latiore folio. Mor. Hist. 3. p. 309. *Fennel Giant with a broader leaf.*
5. FERULA (*Orientalis*) foliorum pinnis basi nudis, foliolis setaceis. Hort. Cliff. 95. *Ferula with the wings of the leaves naked at the base, and the smaller leaves bristly.* Ferula Orientalis, Cachyros folio & facie. Tourn. Cor. 22. *Eastern Fennel Giant with the leaf and appearance of Cachrys.*
6. FERULA (*Meoides*) foliorum pinnis utrinque basi acutis, foliolis setaceis. Hort. Cliff. 95. *Ferula with the wings of the leaves pointed at their base on every side.* Laserpitium Orientale mei folio, flore luteo. Tourn. Cor. 23. *Eastern Laserwort with a Spignel leaf and yellow flower.*
7. FERULA (*Nodiflora*) foliolis appendiculatis, umbellis subsessilibus. Lin. Sp. Plant. 247. *Ferula with appendages to the smaller leaves, and umbels sitting close to the stalks.* Libanotis ferulæ folio & semine. C. B. P. 158. *Libanotis with a Fennel Giant leaf and seed.*
8. FERULA (*Glauca*) foliis supradecompositis, foliolis lanceolato-linearibus planis. Hort. Cliff. 95. *Fennel Giant with linear, spear-shaped, decompounded leaves.* Ferula folio glauco, semine lato oblongo. J. B. 3. p. 45.

The first of these plants is pretty common in the English gardens: this, if planted in a good soil, will grow to a great height, and divide into many branches: the lower leaves of this sort spread more than two feet every way, and branch out into many divisions, which are again subdivided into many smaller, garnished with very long, narrow, small leaves that are single; they are of a lucid green, and spread near the ground. From the center of the plant comes out the flower-stalk, which, when the plants are strong, will be near as large as a common broomstick, and will rise ten or twelve feet high, having many joints; if the stalks are cut, there issues from the vessels a fœtid yellowish liquor, which will concrete on the surface of the wound. The stalks are terminated by large umbels of yellow flowers, which come out the latter end of June, or in the beginning of July; these are succeeded by oval compressed seeds, which have three lines running longitudinally on each side. These ripen in September, and the stalks decay soon after. When the stalks are dry, they are full of a light dry pith, which will soon take fire.

Mr. Ray says, that the people of Sicily use the pith of this plant for tinder to light their fires. And if this was practised by the ancients, we may easily guess why the poets feigned, that Prometheus stole fire from heaven, and carried it to the earth in a hollow Ferula.

The leaves of these plants decay soon after the seeds are formed, so that before they are ripe, there are seldom any leaves remaining, and the stalks afterward dry and become very tough; so it is not unlikely these may have been used for correction in the schools, as they are very light, and cannot do much injury. The roots of this sort will continue several years, especially on a dry soil, and will annually produce flowers and seeds.

The second sort doth not grow quite so large as the first, but the stalks of this will rise seven or eight feet high; the lower leaves are large, and greatly divided; the small leaves are flat, and not so long as those of the former, and are of a lucid green colour; the umbels of flowers are smaller, and the seeds are less. This flowers and ripens its seeds about the same time as the former sort.

The third sort hath large spreading leaves near the root, which are divided and subdivided into many parts; the small leaves of this are much broader than in any of the other sorts, and these are divided at their end into three unequal segments; the leaves are of a very lucid green. The stalks are strong, and rise to the height of eight or ten feet, and are terminated by large umbels of yellow flowers, which are

succeeded by large, oval, compressed seeds, like those of the first sort. This flowers and ripens its seeds about the same time as the former sort; it grows naturally in Spain and Barbary.

The fourth sort grows to much the same height as the second; the leaves of this branch out on every side pretty wide, and the smaller leaves on the divisions of the leaves, are broader than those of the others (excepting the third) but they are longer than those, and are of a darker green colour, ending in three points. The umbels of flowers are large, the flowers are yellow, and are succeeded by oval compressed seeds, like those of the other species. This grows naturally in Sicily.

The fifth sort is of much humbler growth than either of the former; the stalks of this seldom rise much more than three feet high; the lower leaves branch into many divisions, which are closely garnished with very fine bristly leaves; the umbel of flowers is but small, when compared with the others, and the seeds are smaller. It grows naturally in the Levant.

The sixth sort hath very branching leaves, the footstalks are angular and channelled; this sends out at every joint two side branches opposite; those toward the bottom are nine or ten inches long, and the others are diminished gradually to the top; these side branches send out smaller at each joint in the same manner, which are garnished with very fine leaves like those of Spignel, which stand quite round the stalks in shape of whorls; the flower-stalks grow three feet high, having a pretty large umbel of yellow flowers at the top; these are succeeded by oval flat seeds, which ripen in the autumn. It grows naturally in the Levant.

The seventh sort rises about three feet high; the leaves of this sort are much divided, and the small leaves on the divisions are very narrow and entire; the umbels of flowers are small, and are situated close to the stalks between the leaves at the joints; these are like those of the other sorts. It grows naturally in Istria and Carniola.

The eighth sort grows naturally in Italy and Sicily. The leaves of this are composed of many narrow flat segments, of a gray colour, and are divided into many parts: the stalk rises from three to four feet high, and is terminated by an umbel of yellow flowers in July, which are succeeded by oval compressed seeds which ripen in autumn.

All these sorts have perennial roots, which will continue several years; these have thick strong fibres, which run deep in the ground, and divide into many smaller, spreading to a considerable distance every way: the stalks are annual, and decay soon after they have perfected their seeds. As these plants spread very wide, so they should have each four or five feet room; nor should they stand near to other plants, for their roots will rob whatever plants grow near them of their nourishment.

They are all propagated by seeds, which should be sown in the autumn; for if they are kept out of the ground till the spring, they frequently fail, and those which succeed remain a year in the ground, so that much time is lost. The seeds may be sown in drills, by which method the ground may be easier kept clean; they must not be nearer than a foot row from row, and the seeds may be scattered two or three inches asunder in the drills; when the plants come up, they must be kept clean from weeds; and where they are too close together, they should be thinned, to allow them room to grow, for they will not be strong enough to remove till they have had two years growth; then in the autumn so soon as their leaves decay, the roots should be taken up with great care, so as not to cut or injure the tap or downright root, and then planted in the places where they are designed to remain, for after this transplanting they should not be removed. They delight in a soft, gentle, loamy soil, not too wet, and are very rarely injured by the hardest frost.

FERRARIA. Burman. Lin. Gen. 1018.

The CHARACTERS are,

*It hath two keel-shaped spathæ (or sheaths) which alternately inclose the flowers, which have six oblong pointed petals curled at their borders, revolving, and are alternately larger; and three stamina sitting on the style, terminated by twin roundish summits; and a roundish three-cornered germen under the flower, supporting a simple erect stigma, crowned by three bifid, hooded, curled stigma; the germen afterward becomes an oblong three-cornered capsule, having three cells, filled with roundish seeds.*

This genus of plants is ranged in the second section of Linnæus's twentieth class, intitled Gynandria triandria, the flower having three stamina which sit upon the style.

The SPECIES are,

1. FERRARIA (*Undulata*) foliis lanceolatis. Burm. Icon. *Ferraria with spear-shaped leaves.* Iris stellata, Cyclaminis radice, pullo flore. Barrel. Icon. 1216. *Starry Iris with a root like the Sowbread.*
2. FERRARIA (*Ensiformi*) foliis ensiformibus. Burm. Icon. *Ferraria with sword-shaped leaves.*

These plants grow naturally at the Cape of Good Hope; the roots of the first sort were sent me by Dr. Job Baster, of Zirkzee, who received them from the Cape. The root of this is shaped like that of the Bizantine Cornflag; it has a bright brown skin or cover; on the upper side is a hollow like a navel, from whence the flower-stalk arises. The stalk rises a foot and a half high, and is about the size of a man's middle finger, garnished with leaves the whole length; these are keel-shaped, embracing the stalks with their base. The upper part of the stalk divides into two or three branches, which are garnished with the same shaped leaves, but they are smaller; each of the branches are terminated by a large spathæ or sheath of the same colour with the leaves, but this afterward withers and decays; these sheaths are double, and split at the top, where the flower peeps out its petals; these six petals are three alternately larger than the other, and are curiously fringed on their borders; they are of a pale greenish colour on their outside, but of a tawney purple within, and are of a short duration; in the centre of the flower is situated the style, having the three stamina fixed on the side, and is terminated by twin stigmas; the germen is situated under the flower, which afterward becomes an oblong smooth capsule with three cells, filled with roundish seeds.

The second sort is rare in England; this differs from the former in having smaller roots, and longer sword-shaped leaves, which have deeper veins; the stalk also does not divide so much, and the flowers are smaller, and less fringed on their borders.

They are both progagated by offsets sent out from the roots, in the same way as the Ixia, and should be cultivated in the same manner as is directed for those and the African Gladiolus, being too tender to thrive in the open air in England, nor do they succeed well in a green-house; therefore the best method is, to make a border four feet wide, either in the front of the green-house or stoves, covering it with a proper frame and glasses, so that the plants may enjoy the free air in mild weather, but be protected from frost. In such a frame, most of the African bulbous and tuberous rooted plants may be brought to great perfection.

There is a great singularity in the root of the first species, which is in its vegetating only every other year, and the intermediate years it remains at rest.

FICOIDES. See MESEMBRYANTHEMUM.

FICUS. Lin. Gen. Plant. 1032. Tourn. Inst. R. H. 662. tab. 420. The Fig-tree; in French, *Figuier.*

The CHARACTERS are,

*It hath male and female flowers, which are included within the covering, or skin of the fruit, so do not appear unless the covering is opened; the male flowers are but few in number, and are situated in the upper part of the fruit; the female flowers are numerous, and situated in the lower part.*

*part. The male flowers sit each upon a separate foot-stalk, and have an empalement divided into three parts; they have no petals, but three bristly stamina as long as the empalement, terminated by twin summits; the female flowers sit upon distinct foot-stalks; their empalements are divided into five parts; they have no petals, but a germen as the empalement, supporting an inflexed style, crowned by two reflexed pointed stigmas. The germen afterward becomes a large seed, sitting in the empalement.*

This genus of plants is ranged in the third section of Linnæus's twenty-third class, intitled Polygamia Polyœcia; the male and hermaphrodite flowers being situated in the same common covering, but in the wild Fig they are in distinct plants.

The Species are,

1. Ficus (*Carica*) foliis palmatis. Hort. Cliff. 471. *Fig-tree with hand-shaped leaves.* Ficus communis. C. B. P. 457. *The common Fig-tree.*

2. Ficus (*Sycomorous*) foliis cordatis subrotundis integerrimis. Hort. Cliff. 471. *Fig-tree with roundish heart-shaped leaves, which are entire.* Ficus folio mori, fructum in caudice ferens. C. B. P. 459. *Fig-tree with a Mulberry leaf, bearing fruit on the body or stem, commonly called Sycamore.*

3. Ficus (*Religiosa*) foliis cordatis oblongis integerrimis acuminatis. Hort. Cliff. 471. *Fig-tree with entire heart-shaped leaves, ending in acute points.* Ficus Malabariensis, folio cuspidato, fructu rotundo parvo gemino. Pluk. Alm. 144. *Malabar Fig with a long pointed leaf, and small double round fruit.*

4. Ficus (*Benghalensis*) foliis ovatis integerrimis obtusis, caule inferne radicato. Hort. Cliff. 471. *Fig-tree with oval, obtuse, entire leaves, and the lower part of the stalk putting out roots.* Ficus Benghalensis, folio subrotundo, fructu orbiculato. Hort. Amst. 1. p. 119. *Bengal Fig with a roundish leaf, and orbicular fruit.*

5. Ficus (*Indica*) foliis lanceolatis petiolatis, pedunculis aggregatis, ramis radicantibus. Lin. Sp. Plant. 1060. *Fig-tree with spear-shaped leaves having petals, the foot-stalks of the fruit growing in clusters, and branches sending out roots.* Ficus Indica Theophrasti. Tabern. Hist. 1370. *Indian Fig of Theophrastus.*

6. Ficus (*Maximus*) foliis lanceolatis integerrimis. Hort. Cliff. 471. *Fig-tree with entire spear-shaped leaves.* Ficus Indica maxima, folio oblongo, funiculis è summis ramis dimissis radices agentibus se propagans, fructu minori sphærico sanguineo. Sloan. Cat. Jam. 189. *The largest Indian Fig with an oblong leaf, sending out roots from the tops of the branches, and a small spherical blood-coloured fruit.*

7. Ficus (*Racemosa*) foliis ovatis acutis integerrimis, caule arboreo, fructu racemosa. Lin. Sp. Plant. 1060. Amœn. Acad. 1. p. 30. *Fig-tree with oval, entire, acute leaves, tree-like stalk, and branching fruit.* Alty-alu. Hort. Mal. 1. p. 43.

8. Ficus (*Pumila*) foliis ovatis acutis integerrimis, caule repente. Lin. Sp. Plant. 1060. Amœn. Acad. 1. p. 30. *Fig-tree with oval, acute, entire leaves, and a creeping stalk.* Ficus sylvestris procumbens, folio simplici. Kœmpf. Amœn. 803. *Trailing wild Fig-tree having single leaves.*

9. Ficus (*Nymphææfolia*) foliis ovato-cordatis integerrimis glabris. *Fig-tree with oval, heart-shaped, entire, smooth leaves,* vulgarly called Ficus nymphææ folio. *Fig-tree with a Water Lily leaf.*

10. Ficus (*Citrifolia*) foliis oblongo-cordatis acuminatis, petiolis longissimis. *Fig-tree with oblong, heart-shaped, pointed leaves, and very long foot-stalks.* Ficus citrii folio, fructu parvo purpureo. Catesb. Hist. Carol. 3. p. 18. *Fig-tree with a Citron-leaf, and small purple fruit.*

11. Ficus (*Calyculata*) foliis ovatis integerrimis obtusis, oppositis, fructu globoso calyculato. *Fig-tree with oval, obtuse, entire leaves placed opposite, and a globular fruit having a calyx.* Ficus folio lato subrotundo, fructu globoso, magnitudine nuces moschatæ. Houst. MSS. *Fig-tree with broad roundish leaves, and a globular fruit about the bigness of a nutmeg.*

The first sort, which is the Fig whose fruit is valuable, is cultivated in most parts of Europe; of this there are great varieties in the warm countries, which have been obtained from seeds, therefore may be increased annually, if the inhabitants were careful in propagating the trees from the seeds of their best sorts. In England we had not more than four or five sorts till within a few years past; for as the generality of the English were not lovers of this fruit, so there were few who troubled themselves with the culture of it. But some years past I had a large collection of these trees sent me from Venice, by my honoured friend the Chevalier Rathgeb, which I planted and preserved to taste of their fruits, several of which proved excellent; these I have preserved and propagated, and those whose fruit were inferior have been neglected. And as the variety of them is very great, so I shall here mention only such of them as are the best worth cultivating, placing them in the order of their ripening.

1. The brown or Chesnut-coloured Ischia Fig. This is the largest fruit of any I have yet seen, it is short, globular, with a pretty large eye, pinched in near the foot-stalk, of a brown or Chesnut colour on the outside, and purple within; the grains are large, and the pulp sweet and high-flavoured; this sort very often bursts open when it ripens. It ripens the latter end of July, or the beginning of August. I have had this fruit ripen well on standards, in a warm soil. If this sort is planted against hot walls, two plentiful crops of fruit may be annually ripened.

2. The black Genoa Fig. This is a long fruit, which swells pretty large at the top where it is obtuse, but the lower part is very slender toward the stalk; the skin is of a dark purple colour, almost black, and hath a purple farina over it like that on some Plumbs; the inside is of a bright red, and the flesh is very high flavoured. It ripens early in August.

3. The small white early Fig. This hath a roundish fruit a little flatted at the crown, with a very short foot-stalk; the skin, when fully ripe, is of a pale yellowish white colour; the skin is thin, the inside white, and the flesh sweet, but not high-flavoured. This ripens in August.

4. The large white Genoa Fig. This is a large globular fruit, a little lengthened toward the stalk; the skin is thin, of a yellowish colour when fully ripe, and red within. This is a good fruit, but the trees are not good bearers.

5. The black Ischia Fig. This is a short fruit, of a middling size, a little flatted at the crown; the skin is almost black when ripe, and the inside is of a deep red; the flesh is very high flavoured, and the trees produce a good crop of fruit, but the birds are great devourers of them if they are not protected from them. This ripens in August.

6. The Malta Fig. This is a small brown fruit, much compressed at the top, and greatly pinched toward the foot-stalk; the skin is of a pale brown colour, as is also the inside; the flesh is very sweet, and well flavoured. If this sort is permitted to hang upon the trees till the fruit is shrivelled, it becomes a fine sweetmeat.

7. The Murrey, or brown Naples Fig. This is a pretty large globular fruit, of a light brown colour on the outside, with some faint marks of a dirty white, the inside is nearly of the same colour; the grains are pretty large, and the flesh is well flavoured. It ripens the latter end of August.

8. The green Ischia Fig. This is an oblong fruit, almost globular at the crown; the skin is thin, of a green colour, but when it is fully ripe, it is stained through by the pulp to a brownish cast; the inside is purple, and will stain linen, or paper; the flesh is high flavoured, especially in warm seasons. It ripens toward the end of August.

9. The Madonna Fig, commonly called here the Brunswick, or Hanover Fig, is a long pyramidal fruit of a large size; the skin is brown; the flesh is of a lighter brown colour, coarse, and hath little flavour. This ripens the end of August and the beginning of September;

September; the leaves of this sort are much more divided than of most other.

10. The common blue, or purple Fig is so well known, as to need no description.

11. The long brown Naples Fig. The leaves of this tree are deeply divided. The fruit is long, somewhat compressed at the crown. The foot-stalks are pretty long; the skin is of a dark brown when fully ripe, the flesh inclining to red; the grains are large, and the flesh well flavoured. It ripens in September.

12. The yellow Ischia Fig. This is a large fruit, of a pyramidal form; the skin is yellow when ripe, and the flesh is purple and well flavoured, but the trees do not produce much fruit here; they grow very luxuriant in branches, the leaves are very large, and not much divided. This ripens in September.

13. The small Brown Ischia Fig. This is a small pyramidal fruit with a very short foot-stalk; the skin is of a light brown, the flesh inclining to purple, of a very high flavour; it ripens late in September; the leaves of this tree are less divided than any of the other sorts. This is not a good bearer.

14. The Gentile Fig. This is a middle sized globular fruit; the skin, when ripe, is yellow; the flesh also inclines to the same colour; the grains are large, and the flesh is well flavoured, but it ripens very late, and the trees are bad bearers, so that it is not propagated much in England.

There are several other sorts which have been lately introduced from Italy, but all those which I have yet tasted, are inferior to those above-mentioned; some of them rarely ripen their fruit, and others are very ill bearers, not worth propagating, therefore I have omitted the mentioning of them here; for as those which are enumerated, continue in succession during the season for these fruits, and being preferable to the other, few persons will care to fill their gardens with a greater variety of these trees than are of real use, especially as they require good walls, and a very large share of room.

The first, second, third, ninth, and tenth sorts will ripen their fruits on standards, where they are in a warm situation; but the others require the assistance of walls exposed to good aspects, otherwise their fruit will not ripen in England.

Fig-trees generally thrive in all soils, and in every situation; but they produce a greater quantity of fruit upon a strong loamy soil, than on dry ground; for if the season proves dry in May and June, those trees which grow upon very warm dry ground, are very subject to cast their fruit; therefore, whenever this happens, such trees should be well watered and mulched, which will prevent the fruit from dropping off; and the fruit upon these trees are better flavoured, than any of those which grow upon cold moist land. I have always observed those Fig-trees to bear the greatest quantity of well-flavoured fruit, which were growing upon chalky land, where there has been a foot or more of a gentle loamy soil on the top. They also love a free open air; for although they will shoot and thrive very wlll in close places, yet they seldom produce any fruit in such situations; and all those which are planted in small gardens in London, will be well furnished with leaves, but I have never seen any fruit upon them which have grown to maturity.

These trees are always planted as standards in all warm countries, but in England they are generally planted against walls, there being but few standard Fig-trees at present in the English gardens; however, since some of the sorts are found to ripen their fruit well upon the standards, and the crop of Figs is often greater upon them, than upon those trees against walls, it is worthy of our care, to plant them either in standards or espaliers; the latter, I think, will succeed best in England, if they were managed as in Germany, where they untie the Fig-trees from the espalier, and lay them down, covering them in winter with straw or litter, which prevents their shoots being injured by the frost; and this covering is taken away gradually in the spring, and not wholly removed until all the danger of frost is over, by which management they generally have a very great crop of Figs; whereas in England, where the trees grow against warm walls, if the spring proves warm, the young Figs are pushed out early, and the cold, which frequently returns in April and May, causes the greatest part of the fruit to drop off; so that our crop of Figs is generally more uncertain than most other sorts of fruit: and it frequently happens, that trees which are planted against north and east-aspected walls, produce a greater quantity of fruit in England, than those which are planted against south and south-east aspects; which must happen from the latter putting out their fruit so much earlier in the spring than the former; and if there happen cold frosty nights after the Figs are come out (which is frequently the case in this country) the forwardest of the Figs are generally so injured as to drop off from the trees soon after. In Italy, and the other warm countries, this first crop of Figs is little regarded, being few in number; for it is the second crop of Figs which are produced from the shoots of the same year, which is their principal crop, but these rarely ripen in England; nor are there above three or four sorts which ever ripen their second crop, let the summer prove ever so good, therefore it is the first crop which we must attend to in England; so that when these trees are growing against the best aspected walls, it will be a good method to loosen them from the wall in autumn; and after having divested the branches of all the latter fruit, to lay the branches down from the wall, fastening them together in small bundles, so that they may be tied to stakes, to keep them from lying upon the ground; the damp whereof, when covered in frosty weather, might cause them to grow mouldy, and hereby they will be secured from being broken by the wind. When they are thus managed in autumn, if the winter should prove very severe, the branches may be easily covered with Peas-haulm, straw, or any other light covering, which will guard the tender fruit-bearing branches from the injury of frost; and when the weather is mild, the covering must be removed, otherwise the Figs will come out too early; for the intention of this management is, to keep them as backward as possible: then in the spring, when the Figs are beginning to push out, the trees may be fastened up to the wall again. By this management I have seen very great crops of Figs produced in two or three places.

I have also seen great crops of Figs in some particular gardens, after very sharp winters, when they have, in general, failed in other places, by covering up the trees with Reeds made into pannels, and fixed up against the walls.

In the pruning of Fig-trees, the branches must never be shortened, because the fruit are all produced at the upper part of the shoots of the former year; if these are cut off, there can be no fruit expected, beside the branches are very apt to die after the knife; so that when the branches are too close together, the best way is to cut out all the naked branches quite to the bottom, leaving those which are best furnished with lateral branches at a proper distance from each other, which should not be nearer than a foot; and when they are well furnished with lateral branches, if they are laid four or five inches farther asunder, it will be better.

The best season for pruning of Fig-trees is in autumn, because at that time the branches are not so full of sap, and will not bleed so much, as when they are pruned in the spring; and at this season, the branches should be divested of all the autumnal Figs, and the sooner this is done, when the leaves begin to fall off, the better will the young shoots resist the cold of the winter. There are some seasons so cold and moist, that the young shoots of the Fig-trees will not harden, but are soft, and full of juice; when this happens, there is little hope of a crop of Figs the succeeding year, for the first frost in autumn will kill the upper part of these shoots, for a considerable length downward; whenever this happens, it is the best way to cut off all the decayed part of the shoots, which will prevent

prevent the infection from destroying all the lower part of the branches; and, by this method, I have seen a moderate crop of Figs put out from the lower part of the shoots; where, if the shoots had not been injured, there would have been no fruit produced, because it is chiefly from the four or five uppermost joints of the shoots that the fruit comes out; and it is for this reason, that as many of the short lateral branches should be preserved as possible, those being the most productive of fruit; for where the long strait shoots are fastened up, there will be no fruit, but at their extremities, so that all the lower part of the trees will be naked, if there is not a particular regard had to supply young shoots in every part of the trees.

Those trees which are laid down from the espaliers, should not be fastened up again till the end of March, for the reasons before given, and those against walls may remain some time longer; and when the large shoots of these are nailed up, if the small lateral branches are thrust behind these, to keep them close to the wall, it will secure the young Figs from being injured by the morning frosts; and when this danger is over, they may be brought forward to their natural position again: during the summer season these trees will require no other pruning, but to stop the shoots in the spring, where lateral branches are wanting; and as the branches are often blown down by wind, therefore, whenever this happens, they should be immediately fastened up again, otherwise they will be in danger of breaking; for the leaves of these trees being very large and stiff, the wind has great power on them; so that where the branches are not well secured, they are frequently torn down.

Those trees which are planted against espaliers may be protected from the injury of frost in the spring, by placing Reeds on each side the espalier, which may be taken down every day, and put up again at night; but this need not be practised in warm weather, but only at such times as there are cold winds and frosty mornings; and although there is some trouble and expence attending this management, yet the plentiful crop of Figs which may this way be obtained, will sufficiently recompense for both: the best way of making this covering is, to fasten the Reeds with rope yarn in such a manner as that it may be rolled up like a mat, that the whole may with great facility be put up or taken down; and if these Reeds are carefully rolled up, after the season for using them is over, and put up in a dry shed, they will last several years.

There are several persons who of late have planted Fig-trees in standards, which have succeeded very well; this practice was revived, by observing some old standard Fig-trees in some gardens, which had been growing many years, and generally produced a much greater plenty of fruit than any of those trees which were growing against warm walls; indeed, these standard Fig-trees are in much greater danger of having their branches killed by severe frost, but in mild winters they generally do better than those against walls; so that where these trees can be covered in very hard winters, there will always be plenty of fruit; and these may be covered by fastening as many of the branches together as can be conveniently brought into a bundle, and winding some Hay-bands, Straw, Peas-haulm, or any such light covering as can be readily procured, which in the spring may be gradually taken off, so as not to expose the shoots all at once to the open air; and if there is some such light covering laid round the stems, and upon the surface of the ground about their roots, it will more effectually secure them from the danger of frost; but when this is practised, great care should be taken that no mice or rats harbour in this covering, for these will eat off the bark from their shoots, and kill them: and I have often observed those trees which were against walls, have suffered greatly by these vermin, by having many of their largest branches disbarked near the ground, which has absolutely killed them; and it is in the winter that these vermin do this mischief to them, therefore they should be carefully watched at that season.

The common blue and white Figs, which are the sorts which have been the most generally cultivated in England, are not so proper to plant for standards, as some other sorts which have been lately introduced; for they are much tenderer, and are often killed almost to the root, when some of the other sorts, which have been growing in the same situation, have received very little injury from the frost; indeed the white sort is generally a great bearer, and the fruit is very sweet; but to those palates which are accustomed to Figs, that sort is not much in esteem, from its want of flavour: those which have succeeded best with me, are the first and third sorts. Their branches are rarely hurt by frost in winter, and their fruit will always ripen well; for in favourable seasons, many of these sorts, which were growing against walls, have ripened their second crop of fruit tolerably well. I have also planted many of these sorts of Fig-trees against north-east and north-west aspects; some of those which were first planted, have produced a good quantity of well tasted fruit, but were ripe much later, which has encouraged me to plant many more of these trees to the same aspects, and also to increase my number of standard trees.

I am aware, that what I have here advanced, in relation to the pruning and dressing of Fig-trees, will be condemned by great numbers of people, who will not give themselves time to consider and examine the reasons upon which I have founded this practice, nor to make one single experiment to try the truth of it, as being vastly different from the general practice of most gardeners, who always imagine, that Fig-trees should never have much pruning; or, at least, that they should always be suffered to grow very rude from the wall, to some distance. That by this management I have often seen great quantities of fruit I cannot deny, but then this has been only after mild winters; for it is very certain, that in sharp frosts few of these outside shoots escape being greatly injured where they are not covered; whereas it rarely happens that those shoots which are closely nailed to the wall in autumn, or laid down and covered, suffer the least damage; and the fruits are always produced a fortnight sooner upon these branches, than they are upon those which grow from the wall: but although the trees which are suffered to grow rude from the walls may produce a good quantity of fruit for a year or two, yet afterward the trees will only bear at the ends of the shoots, which will then be so far from the wall, as to receive little benefit from it; nor can the trees be reduced again to any regularity, without cutting away the greatest number of their branches, by which a year or two will be lost before they will come to bear again.

The season also for pruning, which I have laid down, being vastly different from the common practice and opinion of most gardeners, will also be objected against; but I am sure, if any one will but make trial of it, I doubt not his experience will confirm what I have here advanced; for as one great injury to this tree proceeds from the too great effusion of sap at the wounded parts, by this autumn pruning this is prevented; for, at that season, all the parts of European trees which cast their leaves, are less replete with moisture than at any other time of the year; for by the long continuance of the summer's heat, the juices of plants having been exhausted in the nourishment and augmentation of wood, leaves, fruits, &c. and also great quantities being evaporated by perspiration, the root not being able to send up a supply equivalent to this great consumption, the branches must contain a much less quantity of sap than in the spring, when it has had several months supply from the root; which, though but small in proportion to what is sent up when the heat is greater, yet there being little or no waste, either by perspiration or augmentation, there must be a greater quantity contained in the branches; which also is easily to be observed, by breaking or cutting off a vigorous branch of a Fig-tree at both seasons (the sap, being milky, may be readily discerned) when that cut in au-

tumn ſhall be found to ſtop its bleeding in one day's time, or leſs; whereas that cut in the ſpring will often flow a week or more, and the wound will be proportionably longer before it heals.

Of late years there has been ſome of theſe trees planted againſt fire-walls, which have ſucceeded very well where they have been properly managed; but where they have been kept too cloſe, and drawn by glaſſes, they have not produced much fruit; therefore whenever this is practiſed, the heat ſhould not be too great, nor the glaſſes, or other covering, kept too cloſe, but at all times, when the weather is favourable, a good ſhare of free air ſhould be admitted; and if the trees are young, that their roots are not extended beyond the reach of the covering, they muſt be frequently watered when they begin to ſhew fruit, otherwiſe it will drop off; but old trees, whoſe roots are extended to a great diſtance, will only require to have their branches now and then ſprinkled over with water. If theſe trees are properly managed, the firſt crop of fruit will be greater than upon thoſe which are expoſed to the open air, and will ripen ſix weeks or two months earlier, and a plentiful ſecond crop may alſo be obtained, which will ripen early in September, and ſometimes in Auguſt, which is about the ſeaſon of their ripening in the warmer parts of Europe; but the fires ſhould not be uſed to theſe trees till the beginning of February; becauſe when they are forced too early, the weather is frequently too cold to admit a ſufficient quantity of freſh air to ſet the fruit; but the covers ſhould be put over the trees a month before, to prevent the ſhoots from being injured by the froſt.

It may not be improper in this place to mention the great pains which the inhabitants of the Levant are at in the culture of their Figs; and without which (it is generally ſaid by all the travellers who have written on this ſubject, as alſo by Pliny, and other old naturaliſts) their fruit will fall off, and be good for nothing. I ſhall here ſet it down, as I find it in the travels of Monſ. Tournefort, chief botaniſt to the late king of France.

"Pliny, ſays he, obſerved, That in Zia they uſed to dreſs the Fig-trees with much care; they ſtill continue to do ſo. To underſtand aright this huſbandry of Figs (called in Latin, Caprificatio) we are to obſerve, that in moſt of the iſlands of the Archipelago, they have two ſorts of Fig-trees to manage; the firſt is called Ornos, from the old Greek, Erinos, a wild Fig-tree; or Caprificus, in Latin; the ſecond is the domeſtic, or garden Fig-tree; the wild ſort bears three kinds of fruit, Fornites, Cratitires, and Orni, of abſolute neceſſity towards ripening thoſe of the garden Fig.

"The Fornites appear in Auguſt, and continue to November, without ripening; in theſe breed ſmall worms, which turn to a ſort of gnats, no where to be ſeen but about theſe trees. In October and November theſe gnats of themſelves make a puncture into the ſecond fruit, which is called Cratitires, and do not ſhew themſelves till towards the end of September; and the Fornites gradually fall away after the gnats are gone; the Cratitires, on the contrary, remain on the tree till May, and incloſe the eggs, depoſited by the Fornites, when they pricked them. In May the third ſort of fruit begins to put forth from the ſame wild Fig-trees which produced the other two; this is much bigger, and is called Orni; when it grows to a certain ſize, and its bud begins to open, it is pricked in that part by the gnats of the Cratitires, which are ſtrong enough to go from one fruit to the other, to diſcharge their eggs.

"It ſometimes happens, that the gnats of the Cratitires are ſlow to come forth in certain parts, while the Orni in thoſe very parts are diſpoſed to receive them; in which caſe the huſbandman is obliged to look for the Cratitires in another part, and fix them at the end of the branches of thoſe Fig-trees, whoſe Orni are in fit diſpoſition to be pricked by the gnats; if they miſs the opportunity the Orni fall, and the gnats of the Cratitires fly away. None but thoſe that are well acquainted with this ſort of culture, know the critical minutes of doing this; and in order to it, their eye is perpetually fixed on the bud of the Fig; for that part not only indicates the time that the prickers are to iſſue forth, but alſo when the Fig is to be ſucceſsfully pricked; if the bud be too hard, and too compact, the gnat cannot lay its eggs, and the Fig drops when this bud is too open.

"Theſe three ſorts of fruit are not good to eat; their office is to help to ripen the fruit of the garden Fig-trees, in manner following: during the months of June and July, the peaſants take the Orni at a time that their gnats are ready to break out, and carry them to the garden Fig-trees; if they do not nick the moment, the Orni fall, and the fruit of the domeſtic or garden Fig-tree not ripening, will, in a very little time, fall in like manner. The peaſants are ſo well acquainted with theſe precious moments, that every morning, in making their inſpection, they only transfer to their garden Fig-trees ſuch Orni as are well conditioned, otherwiſe they loſe their crop. It is true, they have one remedy, though an indifferent one, which is, to ſtrew over the garden Fig-trees the Aſcolimbros, a very common plant there, and in whoſe fruit there is a ſort of gnats proper for pricking; perhaps they are the gnats of the Orni, which are uſed to hover about and plunder the flowers of this plant.

"To ſum up all in one word, The peaſants ſo well order the Orni, that their gnats cauſe the fruit of the garden Fig-tree to ripen in the compaſs of forty days. Theſe Figs are very good green; when they would dry them, they lay them in the ſun for ſome time, then put them in an oven to keep them the reſt of the year. Barley bread and dried figs are the principal ſubſiſtence of the boors and monks of the Archipelago; but theſe Figs are very far from being ſo good as thoſe dried in Provence, Italy, and Spain; the heat of the oven deſtroys all their delicacy and good taſte; but then, on the other hand, this heat kills the eggs which the prickers of the Orni diſcharged therein, which eggs would infallibly produce ſmall worms that would prejudice theſe fruits.

"What an expence of time and pains is here for a Fig, and that but an indifferent one at laſt! I could not ſufficiently admire the patience of the Greeks, buſied above two months in carrying theſe prickers from one tree to another. I was ſoon told the reaſon, one of their Fig-trees uſually produces between two and three hundred pounds of Figs, and ours in Provence ſeldom above twenty-five.

"The prickers contribute, perhaps, to the maturity of the fruit of the garden Fig-tree, by cauſing them to extravaſate the nutritious juice, whoſe veſſels they tear aſunder in depoſiting their eggs; perhaps too, beſides their eggs, they leave behind them ſome ſort of liquor proper to ferment gently with the milk of the Fig, and to make their fleſh tender. Our Figs in Provence, and even at Paris, ripen much ſooner for having their buds pricked with a Straw dipped in olive oil. Plumbs and Pears, pricked by ſome inſects likewiſe ripen much the faſter for it; and the fleſh round ſuch puncture is better taſted than the reſt. It is not to be diſputed but that conſiderable change happens to the contexture of fruits ſo pricked, juſt the ſame as to parts of animals pierced with any ſharp inſtrument.

"It is ſcarce poſſible well to underſtand the antient authors who have treated of caprification (or huſbanding and dreſſing the wild Fig-tree) if one is not well appriſed of the circumſtances, the particulars whereof were confirmed to us not only at Zia, Tinos, Mycone, and Scio, but in moſt of the other iſlands."

Fig-

Fig-trees are propagated in England, either by the suckers, which are sent out from their roots, and by layers made, by laying down of their branches, which in one year will put out roots sufficient to be removed, or by planting of cuttings, which, if properly managed, will take root; the first of these is a bad method, because all those trees which are raised from suckers, are very subject to send out great quantities of suckers again from their roots; and the branches of the suckers are not so compact, as those of the layers, but are fuller of sap, so in greater danger of being injured by the frost; those plants which are propagated by layers, are the best, provided the layers are made from the branches of fruitful trees; for those which are made from the suckers, or shoots, produced from old stools, are very soft, and full of sap, so are in danger of suffering by the frost, and these will shoot greatly into wood, but will not be very fruitful; for, when trees have acquired a vicious habit while young, it is seldom they are ever brought to be fruitful afterward; therefore the shoots which are laid down, should be such as are woody, compact, and well ripened, not young shoots, full of sap, whose vessels are large and open. The best time for laying down of the branches is in autumn; and if the winter should prove very severe, if they are covered with some old tan, or any other mulch, to keep the frost from penetrating the ground, it will be of great service to them; by the autumn following, these will be sufficiently rooted for removing, when they should be cut off from the old plants, because at that season the branches are not so full of sap as in the spring, so will not bleed so much as when cut off in the spring. If the place is ready to receive them, the layers should be transplanted in autumn, where they are to remain; but if it is not, then the layers may remain till the spring, provided they are separated from the old plants in autumn. As these plants do not bear transplanting well when they are large, it is the better way to plant them at first in places where they are to remain; and after they are planted, the surface of the ground about their roots should be covered with mulch to keep out the frost; and if the winter should prove very severe, it will be proper to cover the branches with Reeds, Peas-haulm, Straw, or some other light covering, which will prevent their tender ends being killed by the frost, which frequently happens where this care is wanting.

The other method of propagating these trees, is by cuttings, which should be taken from the trees in autumn, for the reason before given: these must be chosen from such branches as are compact, whose joints are near each other; and they should have a part of the former year's wood at their bottom, and the top of each should be left entire, not shortened as is usually practised with other cuttings; then they should be planted eight or nine inches deep, in a bed of loamy earth, in a warm situation, covering the surface of the ground, three or four inches thick, with old tanner's bark, to keep out the frost; and in severe frost their tops should be covered with Straw, Peas-haulm, Fern, or other light covering, to protect them from frost, which should be removed in the spring; but the tan may remain, for that will prevent the drying winds of the spring, and the sun in summer, from penetrating the ground, and will be of great use to secure the cuttings from injury; these cuttings will be rooted sufficiently by the following autumn, when they should be transplanted, and treated in the same manner as the layers.

If fruitful branches of these trees are cut off, and planted in pots, or tubs, filled with good earth, and these are plunged into a good hot-bed of tanners bark in the stove, they will put out fruit early in the spring, which will ripen in the middle of May.

We shall now return to the other sorts of Figs, which grow naturally in warm countries, but are preserved in the gardens of those who are curious in collecting rare exotic plants, for these do not bear eatable fruit in their native soil; but their leaves being large and beautiful, the plants make a pleasing variety in the stove.

The second sort grows naturally in the Levant, where it becomes a large tree, dividing into many branches, which are garnished with leaves shaped like those of the Mulberry, and affords a friendly shade in those hot countries. The fruit is produced from the trunk and larger branches of the tree, and not on the smaller shoots, as in most other trees; the shape is like the common Fig, but is little esteemed. This is called the Sycamore, or Pharaoh's Fig-tree.

The third sort grows naturally in India, where it is sacred, so that none dare destroy them; it is called by some the Indian God-tree; this rises with a woody stem to a great height, sending out many slender branches, which are garnished with smooth heart-shaped leaves, ending in a long tail, or point; they are entire, smooth, and of a light green, having pretty long foot-stalks; they are between six and seven inches long, and three inches and a half broad toward their base, diminishing gradually to the top, where they run out in a narrow point, an inch and a half long. The fruit comes out on the branches, which are small, round, and of no value.

The fourth sort rises with many stalks, which grow to the height of thirty or forty feet, dividing into a great number of branches, which send out roots from their under branches, many of which reach to the ground; so that in such places where the trees grow naturally, their roots and branches are so interwoven with each other, as to render the places impassable. In India, the Banyans trail the branches of these trees into regular archades, and set up their pagods under them, these being the places of their devotion. In America, where these trees are equally plenty, they form such thickets, as neither man nor beast can pass through. The leaves of this sort are of a thick substance, smooth, and oval; they are six inches long, and four inches broad, with obtuse ends. The fruit is the size of a marble, and round, but of no use.

The fifth sort grows naturally in both Indies; this rises with a woody stalk to the height of thirty feet, sending out many branches, which are garnished with oblong leaves standing upon pretty long foot-stalks; they are about six or eight inches long, and two inches and a half broad, ending in an obtuse point, of a dark green, and smooth on their upper side, but of a light green, and veined on their under side. The fruit is small, and of no value. The branches of these trees send out roots from their lower side, which sometimes reach the ground.

The sixth sort grows naturally in the West-Indies, where it rises to the height of thirty or forty feet, sending ont many slender branches, which put out roots in the same manner as the former. The leaves of this are eight or nine inches long, and two inches broad, ending in points. The fruit is small, round, and of a blood colour when ripe, but is not eatable.

The seventh sort grows naturally in India, where it rises to the height of twenty-five feet, and divides into many branches, which are garnished with oval-pointed leaves, which are smooth, and of a lucid green. The fruit is small, and grows in clusters from the side of the branches; these are not eatable.

The eighth sort grows naturally in India; this is a low trailing shrub, whose stalks put out roots at their joints, which strike into the ground, so is propagated plentifully where it naturally grows. The leaves are two inches and a half long, and near two inches broad, ending in points; they are of a lucid green, and are placed without order on the branches; the fruit is small, and not eatable.

The ninth sort rises with a strong, upright, woody stalk twenty feet high, sending out several side branches, which are garnished with large, oval, stiff leaves, about fourteen inches long, and near a foot broad, and are rounded at the ends; they have several transverse veins, which run from the midrib to the sides. The foot-stalks are long, and frequently turned next to the branches; the upper side of the leaves

leaves are of a lucid green, and the under side is of a gray, or sea-green colour, they are of a thick substance, and very smooth; this grows naturally in India, from whence it was brought to the gardens in Holland.

The tenth sort grows naturally in the West-Indies, where it rises twenty feet high, sending out many side branches, which are covered with a white bark, and garnished with oblong heart-shaped leaves, ending in acute points; they are about three inches long, and one inch and a half broad, near the base; of a lucid green on their upper side, but of a pale green on their under, standing upon very long foot-stalks. The fruit comes out from the side of the branches, toward their ends; they are about the size of large gray Peas, and of a deep purple colour, sitting close to the branches; these are not eatable.

The eleventh sort grows naturally at La Vera Cruz, from whence it was sent me by the late Dr. Houstoun; this rises with many shrubby stalks to the height of twelve or fourteen feet, and divides into many smaller branches, which are garnished with oval stiff leaves, which are obtuse; they are four inches long, and three broad, of a light green, and stand upon very short foot-stalks, which are joined to a cup, in which the fruit sits; this is globular, and the size of a middling nutmeg, of a deep yellow, when ripe, but is not eatable.

The second sort, I believe, is not in England at present; I raised two or three of these plants from seeds in the year 1736, which were destroyed by the severe frost in 1740, since which time I have not been able to procure any of the seeds. The other sorts are preserved in several curious gardens; they are easily propagated by cuttings during the summer season. When the cuttings are taken from the plants, they should be laid in a dry shady place for two or three days, that the wounds may be healed over, otherwise they are apt to rot; for all these plants abound with a milky juice, which flows out whenever they are wounded; for which reason, the cuttings should have their wounded part healed over and hardened before they are planted; after which they should be planted in pots filled with sandy light earth, and plunged into a moderate hot-bed, where they should be shaded from the sun, and two or three times a week gently refreshed with water, if the season is warm; but they must not have too much moisture, for that will infallibly destroy them. When the cuttings have taken root sufficient to transplant, they should be each planted into a separate small pot filled with light undunged earth, and plunged into the hot-bed again, being careful to shade them until they have taken fresh root; then they should have a large share of free air admitted to them at all times when the weather is favourable, to prevent their drawing up weak, and to give them strength before the cold comes on. In autumn the pots should be removed into the stove, and plunged into the tan-bed, where they should constantly remain, and must be treated in the same manner as other tender plants from the same countries; for although two or three of the sorts may be treated in a hardier manner, yet they will not make much progress.

FICUS INDICA. See Opuntia.

FILAGO. There are several species of this genus, some of which grow naturally upon barren land in most parts of England. They are called by some Cottonweed, by others Cudweed, their leaves being white, and, when broken, have cottony threads. These have been ranged under the genus of Gnaphalium by most botanists, and one of the species which is used in medicine, stands in the list of simples by that appellation. As these plants are not cultivated in gardens, I shall not trouble the reader with a farther account of them.

FILBERT. See Corylus.

FILIPENDULA. See Spiræa.

FILIUS ANTE PATREM [i. e. the son before the father] an expression which botanists apply to plants, whose flower comes out before their leaves; or those plants which send forth side branches of flowers, which advance above the middle.



FILIX, Fern. There are great varieties of this plant in the different parts of the world, but particularly in America, as may be seen in the Natural History of Jamaica, published by Sir Hans Sloane, Bart. and in Plumier's American Ferns: but as they are plants which are seldom propagated in gardens, I shall pass them over in this place.

FILM, that woody skin which separates the seeds in the pods of plants.

FIMBRIATED [of Fimbria, *Lat.* a fringe] a term relating to the leaves of plants when they are jagged on the edges, having, as it were, a fringe about them; these are often called furbelowed leaves.

FIRE. However foreign, at the first view, this article may seem to our present purpose, yet I am of opinion, that a tolerable acquaintance with its nature, as far as it can be attained, and its effects, will contribute no small assistance in forwarding the work of vegetation. And though the theory of fire is indeed philosophical, yet the consideration of its effects, and how it operates on vegetables, will be of no small use in the culture of them.

That which best defines and distinguishes fire from every thing else, is its heating; and so it may be defined, Whatsoever warms or heats bodies.

Heat is something, the presence of which is best perceived by the dilatation of the air or spirit in the thermometer. So then, fire is a body, and a body in motion too. The motion of it is proved by its expanding the air, and that it is a body by experiment. Pure mercury, being inclosed in a phial with a long neck, and kept in a gentle heat for the space of a year, will be reduced into a solid, and the weight also will be increased considerably; which increase cannot proceed from any thing else but the accession of fire.

The nature of fire is so obscure and wonderful, that it was held by many of the ancients as a deity; and several authors of prime note have taken great pains to discover the mystery of it, without having been able to explain many of the principal effects thereof. The learned Herman Boerhaave has used no less industry in making a new set of experiments, in order to come to a clearer knowledge of them; and having laid down a new doctrine of fire, in a course of public lectures, I shall briefly take notice of such of them as I apprehend may be of use.

" Fire (says he) in effect, appears to be the general " instrument of all the motion in the universe. The " constant tenor of a great number of experiments " leaves no room to doubt, but that, if there were no " fire, all things would instantly become fixed and " immoveable. Of this there are instances every win- " ter; for while frost prevails, the water, which be- " fore was fluid, by a mere privation of heat, becomes " solid, i. e. hardens into ice, and so remains till dis- " solved again by fire. Thus, were a man entirely " destitute of heat, he would immediately freeze into " a statue; and thus the air itself, which is found in " continual motion, being always either expanding " or condensing, would, upon the absence of fire, con- " tract itself, and cohere into a firm rigid mass; so " also animals and vegetables, all oils, salts, &c. " would, upon the like occasion, immediately con- " geal."

Although this doctrine of fire, here laid down by Boerhaave, seems new and extraordinary, at least to those who have been used to consider fire in the light that it has been set in by the Lord Bacon, Mr. Boyle, and Sir Isaac Newton; and though we ought to pay great veneration to those illustrious authors, yet, in the judgment of themselves, we should be in excusable, if we should absolutely acquiesce in what they have done, and shut the door against farther and better information.

It may reasonably be supposed, that Dr. Boerhaave has had an opportunity of going beyond them; in that, besides all the experiments and observations that they have

have had to build upon, he has had the advantage of a new set, which they were unacquainted with.

As to the nature of fire, the great and fundamental difference is, whether it be originally such, formed thus by the great Creator himself, at the beginning of things? or, whether it be mechanically producible from other bodies, by inducing some alteration in the particles of it?

Among the modern writers, Homberg, Boerhaave, the younger Lemery, and Dr. Gravesande, maintain the former, and the English authors chiefly maintain the latter.

Monf. Homberg holds, That the chymical principle or element, sulphur, which is supposed one of the simple, primary, pre-existent ingredients of all natural bodies, is real fire; and, of consequence, fire is coeval with all bodies. Essai de Souffre Principe, Mem. de l'Academie, anno 1705.

Dr. Gravesande proceeds much on the same principle: according to him, fire enters the composition of all bodies, is contained in all bodies, and may be separated or procured from all bodies, by rubbing them against each other, and thus putting their fire in motion: and he adds, That fire is by no means generated by such motion. Elem. Phys. Tom. II. cap. 1.

Mr. Lemery the younger, asserts the absolute and ingenerable nature of fire, and also extends it farther; not contented to confine it, as an element, to bodies, he endeavours to shew, that it is "Equably diffused "through all space; is present in all places; in the "void space between bodies, as well as the insensible "interstices between their parts." Mem. de l'Acad. anno 1713.

This last sentiment falls in with that of Boerhaave.

Of the contrary opinion is the Lord Bacon, who, in his treatise de Forma Calidi, deduces from a great number of particulars, that heat in bodies is no other than motion, only a motion so and so circumstantiated; so that to produce heat in a body, nothing is required but to excite such motion in the parts of it.

His opinion is seconded by Mr. Boyle, in his treatise of the Mechanical Origin of Heat and Cold; where he maintains the same doctrine, with new observations and experiments, of which two are as follow:

He says, "In the production of heat there appears "nothing on the part either of the agent or patient "but motion, and its natural effects. When a smith "briskly hammers a small piece of iron, the metal "thereby becomes exceedingly hot; yet there is no-"thing to make it so, except the forcible motion of "the hammer, impressing a vehement and variously "determined agitation on the small parts of the iron; "which, being a cold body before, becomes by that "superinduced commotion of its small parts hot; "first, in a more loose acceptation of the word, with "regard to some other bodies, compared with which "it was cold before; then sensibly hot, because this "agitation sensibly surpasses that of the parts of our "fingers. And in this instance oftentimes the ham-"mer and anvil continue cold after the operation; "which shews, that the heat acquired by the iron "was not communicated by either of these imple-"ments, as heat, but produced in it, by a motion "great enough strongly to agitate the parts of so "small a body as the piece of iron, without being "able to have the like effect upon so much greater "masses of metal as the hammer and anvil; though "if the percussions were often and briskly renewed, "and the hammer were small, this also might be "heated; whence it is not necessary, that a body it-"self should be hot to give heat.

"If a large nail be driven by a hammer into a "plank of wood, it will receive several strokes on its "head, ere it grows hot; but when it is once driven "to the head, a few strokes suffice to give it a con-"siderable heat; for while at every blow with the "hammer the nail enters farther into the wood, the "motion produced is chiefly progressive, and is of the "whole nail tending one way; but, when the mo-"tion ceases, the impulse given by the stroke being "unable to drive the nail farther on or break it, must "be spent in making a various, vehement, and in-"testine commotion of the parts among themselves, "wherein the nature of heat consists."

That fire is the real cause of all the changes in nature, will appear from the following consideration.

All bodies are either solid or fluid; the solid of themselves are either commonly supposed to be inactive or motionless; the fluid both move and are moved.

And all solids are found to be so much the more firm and contracted, as they have the less fire in them. This is evident in iron, which, when heated, expands itself into a much greater space than when it was cold; so that any solid and hard body, by being freed from all fire, would sink into a much less bulk, and its parts would cohere more nearly, and with greater force than before.

As to fluids, they all harden, so as to be visible to the eye upon the absence of fire; as water, by the cold of a severe winter, will form itself into a solid globe, and yet even then contains a great deal of fire, as appears evidently upon applying a thermometer to it, which is capable of falling twenty divisions lower before it arrive at the point of the most intense cold: and hence it is, that the spirit of wine is kept from freezing in the thermometer, which would undergo the common fate of other things, were there not abundantly more fire in it.

The air itself expands by a greater quantity of fire, and condenses by a less; but it still contains a large quantity of fire, where it is most of all contracted; this is evident from the striking of a flint against a steel, which is followed by sparks of fire.

Likewise if this fire could be taken from the air, it would become solid and perfectly at rest, and, by consequence, uncapable of change.

"Fire (says Dr. Gravesande, in Element. Phys.) na-"turally unites itself with bodies; and hence it is, "that a body brought near to the fire grows hot, "in which case it also expands or swells; which ex-"pansion is not only observed in very solid bodies, "but in those whose parts do not cohere; in which "case they likewise acquire a great degree of elas-"ticity, as is observed in air and vapours."

Fire being thus acknowledged the instrumental cause of all motion, it remains that itself be moved; nay, to move, must be more natural and immediate to fire, than to any other body; and hence some have ventured to make motion essential to fire: but as this is inconsistent with the notion of matter, which is defined to be inert and passive, and as fire is capable of being proved material, we ought rather to agree, that the motion of fire itself is derived from some higher and metaphysical cause. A property of perpetual mobility may indeed be superadded to the other properties of fire, but it has no natural necessary connexion with them; nor can it be maintained with them otherwise than by some extrinsic efficacy of a superior cause.

However, that it is by motion that fire produces its effects, is evident; and hence the action of fire cannot make any alteration in the elementary substance of bodies; for it is necessary, that what acts upon an object, be without that object, i. e. the fire must not penetrate the elementary parts, but only enter the pores and interstices of bodies; so that it does not seem capable of making those transmutations, which Sir Isaac Newton ascribes to it.

In effect, as to all our purposes, it may perhaps be said, that fire is always in motion. For instance, take six several sorts of thermometers, and two vessels of water with sal armoniac mixed therein, and apply the thermometers to it; and the consequence will be, that the air being condensed in them, the spirit will descend in all of them: remove the vessels of water, and the air growing warmer, and rarefying, the spirit will ascend again; so that the active force in air, which produces so many effects, does really all arise from the fire contained in it.

Again: As all bodies placed in a very solid air, do, by degrees, grow cold, motionless, rigid, &c. i. e. though there be still some remains of fire, and in proportion as that is diminished, the effect is accelerated; it follows, that cold, a less degree of heat, is the effect of a lesser action of fire: and all action rises apparently from the same source.

Then, as fire can render the most solid bodies, as stone, metals, &c. (as appears very evident in large burning-glasses, in which gold itself immediately calcines, and emits fumes, i. e. becomes fluid) so the want of fire would convert the most fluid bodies, as spirits of wine, &c. into solids.

Fire is distinguished into two kinds, called elementary or pure fire, which is such as exists in itself, and alone is properly called fire; or common or culinary fire, which is raised and kindled from the former, and is that which agitates and affects ignited, combustible, and moveable bodies, the particles of which, joining with those of the pure fire, constitute pure flame.

This latter is improperly called fire, in that not only a small part of it is real or pure fire; and in ignited bodies, that which flames, smokes, &c. is not simply fire; whereas pure fire, such as is collected in a burning-glass, yields no flame, smoke, ashes, or the like.

Fire may be present in the greatest abundance, yet without any heat: this is evident in the tops of the highest mountains, illuminated by the sun, where the cold is always extremely pinching, and this even under the equator, there being mountains there which are perpetually covered with snow, though there can be no want of fire.

So a large burning-glass has no effect: the smallest warmth cannot be felt in its focus in a place where the sun does not shine, or when the sun is covered with a cloud, but a piece of metal may be seen to melt the very moment the sun emerges.

Fire may be in exceeding small quantity, and yet burn with great violence: thus spirit of wine when set on fire, does not burn the hands; and though poured on a piece of red-hot iron, does not take fire; so that the fire that is in, should not appear very great: yet if it meet with some harder body while it is burning, the particles of which body it is capable to agitate by the attrition of its own, it will yield a fierce flame, capable of burning a harder body than the hand.

From this it appears, that the relation of heterogeneous particles, agitated by the fire, has more effect in respect to heat than the action of the fire itself: nor need we be far to seek for the mechanical reason of this, for the particles of fire, being all equal and spherical, must of themselves be harmless; but if they carry certain spicula, or any other bodies along with them, then they become capable of doing much harm.

Hence, though the flame of a piece of wood may give a sense of heat, and burn such things as are applied to it, it does not therefore necessarily follow, that there is any pure fire in it, so that the distinction of pure and common fire is absolutely necessary: though this distinction has been overlooked by most or all the authors before Dr. Boerhaave, who have written on fire; which has led them into egregious mistakes, insomuch that most of them have held, that the flame of a piece of wood is all fire, which appears to be false from what has been already said, and also what follows.

Elementary or pure fire is of itself imperceptible, and only discovers itself by certain effects that it produces in bodies, and these effects are only to be learnt by the changes which arise in bodies. These effects are three; 1st, heat; 2dly, dilatation in all solid bodies, and rarefaction in all fluids; 3dly, motion.

The first effect of elementary fire on bodies is heat: heat arises wholly from fire, and in such a manner, that the measure of heat is always the measure of fire; and that of fire, of heat; so the heat is inseparable from the fire.

The second effect of elementary fire is dilatation in all solid bodies, and rarefaction in all fluids.

Numerous experiments make it evident, that both these are inseparable from heat. If you heat an iron rod, it will increase in all its dimensions; and the more it is heated, the farther it will be increased; and being again exposed to the cold, it will contract, and successively return through all degrees of its dilatation, till it arrive at its first bulk, being never two minutes successively of the same magnitude.

The like may be observed in gold, the heaviest of all bodies, which takes up more space when it is fused than it did before; nay, even mercury, the heaviest of all fluids, has been known to ascend above thirty times its height, being placed over the fire in a tube.

The laws of this expansion are;

1st, That the same degree of fire rarefies fluids sooner, and in a greater degree than it does solids. Without this, the thermometer would be of no use; since, if it were otherwise, the cavity of the tube would be dilated in the same proportion as the fluid is rarefied.

2dly, By how much the liquor is lighter, by so much the more it is dilated by fire: thus air, which is the lightest of all fluids, expands the most, and spirit of wine the next after air.

The third effect of fire on bodies is motion; for fire, in warming and dilating bodies, must necessarily move their parts. And in effect, all the motion of nature arises from fire alone; and if this were taken away, all things would become immoveable. All oils, fats, waters, wines, ales, spirits of wine, vegetables, animals, &c. become hard, rigid, and inert, upon the absence of only a certain degree of fire; and this induration will be both the sooner, and the more violent, the less the degree of fire is.

Hence, if the fire was absolutely taken away, and there were the greatest degree of cold, all nature would grow into one concrete body, solid as gold, and hard as a diamond; but, upon the application of fire, it would recover its former mobility.

And, of consequence, every diminution of fire is attended with a proportionable diminution of motion.

Pure fire is found in two different manners, either as it exists every where, and is diffused equally in all places; or as it exists in certain bodies, in which it makes no great alteration.

That fire should exist in the same quantity in all places, will seem a strange paradox; and yet that it does so, is demonstrable from innumerable experiments.

This elementary fire is present every where, in all bodies, all space, and at all times, and that in equal quantities; for let a person go where he will, to the top of the highest mountains, or descend into the lowest cavern, whether the sun shine or not; either in the most scorching summer, or the sharpest winter; fire may be collected by several methods, as attrition or otherwise. In a word, there is no physical point assignable without fire, no place in nature where the attrition of two sticks will not render it sensible.

The Cartesians, as Marriotte, Perrault, &c. hold, That there is a large stock of fire in a perfect vacuum, i. e. a space out of which all the air has been exhausted, as supposing an absolute vacuum impossible: now, the most perfect vacuum that we can arrive at, is that of Mr. Hugyens's contrivance, which is as follows: heat a quantity of the purest mercury to the heat of boiling water, and pour it into a hot tube of about forty inches long; and when the tube is filled, apply a finger upon the orifice of it, and thus invert it into a bason full of mercury: the mercury will now be suspended in the tube to the whole height; but then, if you give it but a little shake, it will sink down to the height of about twenty-nine inches, and thus leave a vacuity of eleven inches.

Yet here the philosophers above-mentioned deny there is any vacuum, and urge, that now so much the more fire is entered into the space as there was of other

matter;

matter; but this is contrary to experience; at least, the fire contained there is no hotter than the mercury itself; for if a drop or two of water be in a frosty season sprinkled both upon the upper part of the tube, supposed to be full of fire, and on the lower that is full of mercury, they will in each place freeze alike; so that there is no more pure fire in a perfect vacuum, than in any other place.

But whereas it has been said, that fire is found in all bodies, to prove this, set gold against the vacuum before-mentioned, and this gold, though the most ponderous of all bodies, will not contain more fire than Huygens's vacuum, as appears from the thermometer.

But the fire in gold, when ready to fuse, is pure fire; for a mass of this being once heated red hot, will retain this fire perfectly for three days; nay, the prince of Mirandola and others, have kept gold ignited for two months, without any diminution of weight.

Mr. Gravesande, Phys. Element, says, That bodies of any kind, being violently moved against one another, will grow hot by such friction; and this to a considerable degree, which shews that all bodies have fire in them; for fire may be put in motion, and separated from a body by such rubbing, but can never be generated that way.

Mr. Boyle, Mech. Prod. of Heat, says, That although quicksilver is allowed to be the coldest of all fluids, insomuch that many deny, that it will produce any heat by its immediate action on any other body, and particularly on gold; yet several trials have assured him, that a particular mercury may by preparation be enabled suddenly to insinuate itself into the body of gold, whether calcined or crude, and become manifestly hot with it in less than two or three minutes.

Mr. Gravesande says, That quicksilver contains fire, is evident hence, that if you shake it about in an exhausted glass, it will appear all luminous.

Elementary fire of itself always lies concealed; nay, it may be perfectly undiscoverable, where it is in the greatest quantity; as is evident in the torrid zone, where the snow never melts, notwithstanding the great abundance of fire.

This fire, in itself thus perfectly latent, may discover itself to be present by five effects; 1st, by rarefying bodies, and particularly air; 2dly, by light; 3dly, by colour; 4thly, by heat; and 5thly, by burning.

That there is a good quantity of fire even in the coldest places, and in the coldest bodies, is confirmed by the following experiment: if you take two large iron plates, and rub them briskly together in Iceland, which is only twelve degrees short of the north pole, in the most frosty season, and at midnight, they will grow warm, glow, shine, and heat to such a pitch as not only to rarefy the spirit in the thermometer, but even to ignite, and at last to fuse.

Now the fire here found is either created de novo, or it was there before, but nobody will assert its creation; and accordingly, unless it be furnished with a proper fuel, it will be soon dissipated again, but not annihilated; and of consequence it pre-existed, and it appears to be true fire by its rarefying the spirit in the thermometer.

From this, and many other experiments, it is evident, that fire is always found in all parts of space, and in all bodies equally spread on the utmost top of the highest mountain, as in the subject valley, or in the deepest cavern under ground, and in every climate, and at every season.

The equable distribution of fire in all places being proved, it should thence follow, that there is the same degree thereof every where; which would really be so, were it not that fire happens by one means or other to be more collected in one place than another.

But, notwithstanding the equable difference, &c. of fire through all the mundane space does not hinder, but that, to our senses, it appears very unequal in different places; and hence we have two vulgarly reputed sources or funds of fire, viz. in the sun, and the center of the earth.

As for the first, we have the concurrent opinions of the philosophers of all ages, but one excepted, who held the sun to be cold.

As to the second, the central fire, it is manifest that there is an ample proportion of fire under ground; and even, that fire appears much more abundant there than on the surface; so that at least, a subterraneous fire must be granted.

Thus they who dig mines, wells, &c. constantly observe, that while they are but a little below the surface, they find it a little cool; and as they proceed lower, it proves much colder, as being beyond the reach of the sun's heat, insomuch that water will freeze almost instantaneously, and hence is the use of houses.

But a little lower, about forty or fifty feet deep, it begins to grow warmer, so that no ice can bear it; and then the deeper they go, still the greater heat; till at length it endangers the stoppage of respiration, and puts out their candles. If they venture yet farther with a lighted candle, the place shall be immediately found full of flame, as once happened in the coal-pits in Scotland, where a hardy digger, descending to an unusual depth, with a light in his hand, the fumes, which were there found very copious, caught fire thereby, and burnt the whole mountain down.

Therefore it seems as if nature had lodged another sun in the center of the earth, to contribute on its part to the giving motion to bodies, and for the promoting of generation, nutrition, vegetation, germination, &c. of animals, vegetables, and fossils.

As to the origin of this subterraneous sun, some doubt whether it were formed there in the beginning, like the sun in the firmament, or gradually produced by a secondary collection of vague fire into this place.

What makes in favour of the former opinion, are volcanos or burning mountains, which seem to have existed from the first ages; for the flames of mount Ætna are mentioned as of great antiquity, and there are likewise such mountains found in the coldest regions, viz. Nova Zembla and Iceland, as well as the hottest, as Borneo, &c.

It cannot be reasonably pretended, says Mr. Boyle, that the subterraneous heat proceeds from the rays of the sun, since they heat not the earth above six or seven feet deep, even in the southern countries; and if the lower part of the earth were of its own nature cold, and received the heat it affords only from the sun and stars, the deeper men descend therein, the less degree of heat and steams they would meet with.

The sun contributes much in bringing fire to light, by reason of his rapid motion round his axis; whereby the fiery particles, every where diffused, are directed and determined in parallel lines toward certain places where its effects become apparent.

And from thence it is, that the fire is perceived by us when the sun is above; but that when he disappears, his impulse or pression being then taken away, the fire continues dispersed at large through the ethereal space.

There is not, in effect, less fire in our hemisphere in the night time, than there is in the day time; only it wants the proper determination to cause it to be perceived.

The effects of elemental fire may be increased divers ways, viz. first, by attrition, or a swift rubbing or agitating one body against another. This is very manifest in solids. The attrition of a flint against a steel produces sparks of fire; and likewise in fluids, the violent agitation of cream, by churning, will produce a sensible warmth, and separate it into butter; and this effect is rendered still more discernible by a thermometer.

And the heat of animal bodies is owing to the agitation and attrition of the parts of these juices against each other, and the sides of the vessels.

The second manner of increasing the effect of elementary fire is, by throwing a quantity of moist or green

green vegetables, cut down while full of ſap, into a large heap, and preſſing them cloſe down; by which they grow warm, hot, ſmoke, and break out into flame,

A third way is by mixing certain cold bodies: thus water, and ſpirit of wine, being firſt warmed, grow much hotter by being mixed; alſo oil of cloves, cinnamon, &c. being mixed with ſpirit of wine, become exceeding hot, and burſt forth like volcanos.

The like effects may be had from ſeveral hard and dry bodies, as ſulphur and ſteel filings.

To conclude: on fire and the effects thereof, depend all fluidity of humours, juices, &c. all vegetation, putrefaction, fermentation, animal heat, &c.

As all the four elements, water, air, earth, and fire, are very conducive to the work of vegetation, and no one of them more than this of fire; I conclude, that theſe few hints, which I have collected from the moſt approved authors, concerning the nature and properties of it, as they may be uſeful, would not be unacceptable to the ingenious and ſtudious practiſers of horticulture, which induced me to inſert them here.

FIR-TREE. See Abies.

FISTULAR FLOWERS [Flores Fiſtulares, of Fiſtula, *Lat.* a pipe] ſuch as are compounded of many long, hollow, ſmall flowers, like pipes.

FLAMMULA JOVIS. See Clematis.

FLESH, among botaniſts, is all the ſubſtance of any fruit that is between the outer rind and the ſtone, or that part of any root that is fit to be eaten.

FLORIFEROUS [florifer, *Lat.*] bearing flowers.

FLORIST, one who is converſant with, or ſkilled in flowers.

FLORULENT, FLORULOUS [florentulus, florulus, *Lat.*] Flowery, full of flowers; alſo bloſſoming.

FLOS AFRICANUS. See Tagetes.

FLOS PASSIONIS. See Passiflora.

FLOS SOLIS. See Helianthus.

FLOS TRINITATIS. See Viola.

FLOWER: a flower is a natural production which precedes the fruit, which includes the grain or ſeed. Though a flower is a thing ſo well known, yet the definition of this part of a plant is as various almoſt as the authors who define it. Jungius defines it to be the more tender part of a plant, remarkable for its colour, or form, or both, cohering with the fruit. Yet this author himſelf confeſſes, that this definition is too narrow; for ſome of thoſe bodies which he allows to be flowers are remote from the fruit.

Mr. Ray ſays, it coheres, for the moſt part, with the rudiments of the fruit. Thus the words, for the moſt part are hardly to be admitted into definitions.

Tournefort defines it to be a part of a plant very often remarkable for its peculiar colours, for the moſt part adhering to the young fruit, to which it ſeems to afford the firſt nouriſhment, in order to explicate its moſt tender parts. Which definition is ſtill more deficient than the former, by this uncertain mode of expreſſion.

Pontedera, the profeſſor of botany at Padua, defines it to be a part of a plant unlike the reſt in form and nature; if the flower has a tube, it always adheres to the embryo, or is very near it, for whoſe uſe it is ſubſervient; but if it wants a tube, there is no embryo adhering.

This definition is far from being clear, for it is ſcarce intelligible, and is liable to this objection, that it may include ſome parts of a plant which no perſon ever called by that name; for a root, a ſtalk, or a leaf, are parts of a plant unlike the reſt in form and nature, having no tube, and ſo do not adhere to any embryo, and thus by Pontedera's definition are flowers.

Monſ. Juſſieu, the Paris profeſſor, ſeems not to have ſucceeded much better in this affair: he ſays, That is properly called a flower, which is compoſed of chives, and a piſtillum, and is of uſe in generation. But this is too defective; for there are many plants in which the piſtillium or ſtyle is found a conſiderable diſtance from the chives; there are many flowers that have no piſtillum, whether that word be taken to ſignify the embryo of the fruit, or its appendix, and many which have no chives.

But the late Monſieur Vaillant ſeems to be happier, in forming a clearer idea of this part of a plant. We find in the lecture he read in the Royal Garden at Paris, that the flowers, ſtrictly ſpeaking, ought to be reckoned the organs which conſtitute the different ſexes in plants; ſeeing they are ſometimes found without any covering, and that the coats or petals, which immediately encompaſs them, are deſigned only to cover and defend them: but (ſays he) as theſe coats are the moſt conſpicuous and moſt beautiful part of the compoſition, which is called by the name of flower; to theſe coats therefore I give the name of flower, of whatſoever ſtructure or colour they be; whether they encompaſs the organs of both ſexes together, or contain only one of them, or only ſome parts depending on one of them, provided always that they be not of the ſame figure of the leaves of the plant.

But, in my opinion, Dr. Martyn has been happier, in his definition of a flower, than all thoſe above-mentioned: he defines a flower to be the organs of generation of both ſexes adhering to a common placenta, together with their common coverings; or of either ſex ſeparately, with its proper coverings, if it have any.

The parts of a flower are, 1. The germen or ovary; which is the rudiment of the fruit, and ſo is properly the female organ of generation.

2. The ſtyle, which is a body accompanying the ovary, either ariſing from the top of it, or ſtanding as an axis in the middle, with the embryos of the ſeeds round it.

3. The ſummits, or apices, which are thoſe bodies that contain the prolific powder, analogous to the male ſperm in animals; and generally hang upon ſlender threads, which are called the chives or ſtamina.

The petals are thoſe tender fine coloured leaves, which are generally the moſt conſpicuous parts of a flower.

The empalement, or calyx, is thoſe tender leaves which cover the other parts of a flower.

Flowers, according to the number of their petals, are called monopetalous, dipetalous, tripetalous, tetrapetalous, &c.

The ſtructure of flowers is indeed very various; but, according to Dr. Grew, the generality have theſe three parts in common, viz. the empalement, the foliation, and the attire.

Mr. Ray reckons, that every perfect flower has the petals, ſtamina, apices, and ſtylus or piſtil; and ſuch as want any of theſe parts, he accounts imperfect flowers.

In moſt plants there is a perianthum, calyx, or flower-cup; which is of a ſtronger conſiſtence than the flower itſelf, and deſigned to ſtrengthen or preſerve it.

Flowers are diſtinguiſhed into male, female, or hermaphrodite.

The male flowers are thoſe in which are the ſtamina, but have no germen or ſtyle, the ſame which botaniſts call ſtamineous flowers; theſe have no fruit.

The female flowers are ſuch as contain the germen and ſtyle, or piſtil, which is ſucceeded with fruit, and are called fruitful, or knitting flowers.

The hermaphrodite flowers are ſuch in which the two ſexes are contained, i. e. the male and female parts are found in the ſame flower, which are the moſt general kind; ſuch are the Daffodil, Lily, Tulip, Althæa, Geranium, Roſemary, Sage, Thyme.

The ſtructure of parts is much the ſame in thoſe where the ſexes are divided; the difference between them conſiſting in this, that the ſtamina and ſummits or apices, i. e. the male parts in theſe are ſeparate from the ſtyles or piſtils; being ſometimes on the ſame plants, and ſometimes on different ones.

Among the plants which bear both male and female parts, but at a diſtance from each other are reckoned the

the Cucumber, Melon, Gourd, Turky-Wheat, Walnut, Oak, Beech, &c.

FLUIDITY. [Fluiditas, of fluere, *Lat.* to flow.] Having occasion to mention fluids and fluidity, in speaking of the properties of the elements air, water, fire, &c. I thought it necessary, in this place, to give the following account of that property, which I have extracted from the most approved authors.

A fluid, or fluid body, is by some defined to be a body, whose particles are but weakly connected, their mutual cohesion being, in a great measure, prevented from some external cause: in which sense, a fluid stands opposed to a solid; and is, by the excellent Sir Isaac Newton, defined to be one whose parts easily give place, or move out of the way, on any force impelled upon them, and by that means do so easily move one over another. Which definition is much better than that of Descartes, That a fluid is a body whose parts are in continual motion, because it is neither apparent that the parts of all fluids are so, nor that the parts of some solid bodies are not so.

Fluidity is the state or affection of bodies, which denominates or renders them fluid, and stands in direct opposition to firmness and solidity.

It is distinguished from liquidity and humidity, in that the idea of fluidity is absolute, and the property contained within the thing itself; whereas that of humidity is relative, and implies wetting, or adhering, i. e. something that gives us the sensation of wetness or moisture, and would have no existence, but for our senses.

Thus melted metals, air, æther, and even smoke, and flame itself, are fluid bodies, and not liquid ones; the parts of them being actually dry, and not leaving any sense of moisture.

Fluidity seems to consist in this, that the parts of any body, being fine and small, are so disposed by motion and figure, as that they can easily slide over one another's surfaces all manner of ways. Mr. Boyle also observes, That it is requisite they should be variously and separately agitated to and fro, and that they should touch one another but in some parts only of their surfaces. And the same gentleman says, in his History of Fluidity, That the conditions requisite to constitute a fluid body, are chiefly the three following.

1st, The minuteness or smallness of its parts: thus we see the fire, by dividing metals into parts very fine and small, will melt them, and make them fluid; and after the same manner do acid menstruums dissolve them, suspend their liquor, and render them fluid; and that fire turns the hard body of common salt almost wholly into a liquor by distillation: though it is not improbable, but that the shape and figure of these small parts may conduce much towards producing this quality of fluidity; for it is found in the distillation of Olive oil (which is a fluid made only by pressure) that most of the oil will, by the action of the parts of the fire (if it be done in a retort) be turned into a kind of consistent substance like butter.

Likewise mercury, whose parts are, without doubt, much grosser than those of oil and water, is yet more fluid than either of them.

2dly, It seems requisite to fluidity, that there be store of vacuities, or vacant spaces, interspersed between the corpuscles of the fluid body; for else there will not be room for each particle to continue its motion and agitation on the surfaces of the neighbouring ones. For,

3dly, The chief condition requisite to constitute a fluid body is, that its particles be agitated variously and apart, either by their own proper motion, or by something of substance, that tumbles them up and down by its passage through them.

That this qualification is chiefly requisite to fluidity, you may gather from that common experiment of putting a little dry powder of alabaster, or plaster of Paris, finely sifted, in a flat-bottomed vessel over the fire; for in a little time it will boil like water, and imitate all the motions of a boiling liquor; it will tumble variously over in great waves like that; it will bear stirring with a stick or ladle without resisting, as it will do when cold; nay, if it be stirred strongly near the side of the vessel, its waves will apparently dash up against the sides: yet if any of it be speedily taken out, and laid on a piece of paper, you will see nothing but a dry powder.

So that it is evident from hence, that there is a real difference between a fluid body and a wetting liquor; for not only this boiling powder and melted metals, but the air and æther, and even flame itself, are properly fluid bodies, though not moist liquors.

This ingenious gentleman found also, that by blowing the smoke of Rosemary into a glass pipe, and then holding the pipe (when filled) upright, the surface of the smoke would accommodate itself to a level situation; and which way soever the tube was inclined, the superficies of the smoke would be parallel to the horizon; and when the glass was much inclined, would run along it like water.

From whence he infers, that, in order to the rendering a body fluid, there is no need that its parts should be closely condensed, as those of water are.

And Dr. Hook, in his Micrograph. p. 12. presents us with a very pretty experiment or two, to prove this account of fluidity, viz. That a dish of sand being set on a drum head, briskly beaten by the sticks, or on the upper stone of a mill, turning swiftly round on the (empty) lower one, it in all respects, emulate the properties of a fluid body; for a heavy body will immediately sink in it to the bottom, and a light one emerge to the top; each grain of sand hath a constant vibrating, dancing motion; and if a hole be made in the side of the dish, the sand will spin out like water.

The corpuscular philosophy, before it was wonderfully improved by Sir Isaac Newton, did not go to the bottom of this matter; for it gave no account of the cause of the chief condition requisite to constitute a fluid body, viz. the various motions and agitations of its particles: but this may, in a great measure, be accounted for, if it be supposed to be one of the primary laws of nature, That as all particles of matter attract one another when they come within a certain distance, so likewise they fly away from, and avoid one another, at all greater distances from one another.

For then, though their common gravity may keep them together in a mass (it may sometimes be) together with the pressure of other bodies upon them; yet their continual endeavour to avoid one another singly, and the adventitious impulses of light, heat, or other external causes, may make the particles of fluids continually move round about one another, and so produce this quality.

It is indeed a difficulty not easily got over, to account for the particles of fluids always keeping at such a distance from one another, as not to come within the sphere of one another's attraction.

The fabric and constitution of that fluid body, water, is amazing; that a body so very rare, and which has a vast over-proportion of pores, or interspersed vacuity, to solid matter, should yet be perfectly incompressible by the greatest force; and yet this fluid is easily reducible into that firm, transparent, friable body which we call ice, by being only exposed to a certain degree of cold.

One would think, that though the particles of water cannot come near enough to attract each other, yet the intervening frigorific matter doth, by being mingled per minima, strongly attract them, and is itself likewise strongly attracted by them, and wedges or fixes all the mass into a firm body; which solid body loses its solidity again, when by heat the vinculum is solved, and these frigorific particles are disjoined from those of the water, and are forced to fly out of it; and, perhaps, just thus may the fumes of lead fix quicksilver.

When a firm solid body, such as a metal, is by heat reduced into a fluid, doth not the fire disjoin and separate

parate its constituent particles, which mutual attraction caused to cohere before, and keep them at such a distance from each other, as that they are without the sphere of one anothers attraction as long as that violent motion lasts? And do not they, when that is over, and the heat is flown out, come nearer to, attract one another, and coalesce again?

As therefore the cause of cohesion of the parts of solid bodies appears to be their mutual attraction, so the chief cause of fluidity seems to be a contrary motion impressed on the particles of fluids, by which they avoid and fly one another, as soon as they come at, and as long as they keep at, such a distance from each other.

It is observed also in fluids, that the direction of their pressure against the vessels which contain them, is in lines perpendicular to the sides of such vessels; which property being the necessary result of the particles of any fluid's being spherical, it shews that the parts of all fluids are so, or of a figure nearly approaching thereto.

Dr. Clarke says, That if the parts of a body do not touch each other, or easily slide over one another, and are of such a magnitude as that they may be easily agitated by heat, and the heat be sufficiently great to agitate them; though perhaps it may be less than suffices to prevent water from freezing; or even though the parts be not actually moved, yet if they be small, smooth, slippery, and of such a figure and magnitude as disposes them to move and give way, that body is fluid.

And yet the particles of such fluid bodies do, in some measure, cohere; as is evident hence, that mercury, when well purged of air, will be sustained in the barometer to the height of sixty or seventy inches; that water will ascend in capillary tubes, even in vacuo; and that the drops of liquors in vacuo run into a spherical form, as adhering by some mutual cohesion, like that between polished marble planes.

To this may be added, that these said bodies, if they consist of particles which are easily entangled with each other, as oil; or if they be capable of being stiffened by cold, and joined by the interposition of certain cunei or wedges, as water, they are easily rendered hard; but if their particles are such as can neither be entangled as air, nor stiffened by cold, as quicksilver, then they never grow hard and fixed.

In short, the Cartesians define a fluid to be a body, the parts of which are in continual intestine motion; and Dr. Hook, Mr. Boyle, and Dr. Boerhaave, tho' they differ in opinion widely from Cartesianism, subscribe to the definition, and alledge arguments to prove, that the parts of fluids are in continual motion, and even that it is this motion which constitutes fluidity; and the latter of them ascribes this, and all motion, to fire. See Fire.

Fluids then are either natural, as water and mercury; or animal, as blood, milk, bile, lympha, urine, &c. or factitious, as wines, spirits, oils, &c.

FŒNICULUM. Tourn. Inst. R. H. 311. tab. 164. Anethum. Lin. Gen. Plant. 326. *Fennel*; in French, *Fenouil.*

The Characters are,

*It hath an umbellated flower; the great umbel is composed of many smaller, which have no involucrum; the umbel is uniform; the flowers have five incurved petals, and five stamina, terminated by roundish summits: the germen is situated under the flower, supporting two small styles, crowned by roundish stigmas. The germen afterward turns to an oblong fruit, deeply channelled, dividing into two parts, each containing a single seed, flat on one side, but convex and channelled on the other.*

This genus of plants is ranged in the second section of Tournefort's seventh class, which includes the herbs with umbellated flowers disposed circularly, whose empalement turns to two narrow, oblong, thick seeds. Dr. Linnæus has joined this genus to Anethum, which is placed in the second section of his fifth class, with those plants whose flowers have five stamina and two styles. But as the seeds of Fennel are oblong, thick, and channelled, and those of Dill flat and bordered, it is much better to keep them separate, than to join them in the same genus.

The Species are,

1. Foeniculum (*Vulgare*) foliis decompositis, foliolis brevioribus multifidis, semine breviore. *Fennel with decompounded leaves, whose small leaves are shorter and end in many points, and a shorter seed.* Fœniculum vulgare Germanicum. C. B. P. 147. *Common Fennel.*
2. Foeniculum (*Dulce*) foliis decompositis, foliolis longioribus, semine longiori. *Fennel with decompounded leaves, whose small leaves are very long, and a longer seed.* Fœniculum dulce, majore & albo semine. J. B. 3. p. 2, 4. *Sweet Fennel having a larger white seed.*
3. Foeniculum (*Azoricum*) humilius, radice caulescente carnoso, seminibus recurvis, radice annuâ. *Dwarf Fennel with a fleshy stalk, recurved seeds, and an annual root.* Fœniculum dulce Azoricum. Pluk. Alm. *Sweet Azorian Fennel, called Finochio.*

The first sort is the common Fennel, which is cultivated in the gardens, and has sown itself in many places, where it has been introduced in such plenty, as to appear as if it were a native in England; but it is no where found at a great distance from gardens, so has been undoubtedly brought into England. There are two varieties of this, one with light green leaves, and the other with very dark leaves; but these I believe are only varieties which arise from the same seeds; but this is very difficult to ascertain; for unless the seeds were sown separately in some place where neither of these plants have been growing before, it cannot be done; for the seeds of these plants which have scattered, will remain in the ground some years, and when exposed near the surface will grow; so that the plants become troublesome weeds, wherever their seeds have been suffered to scatter; and they frequently come up where other seeds are sown, and thereby the two sorts may accidentally mix.

The common Fennel is so well known, as to need no description. This hath a strong fleshy root, which penetrates deep into the ground, and will continue several years. It flowers in July, and the seeds ripen in autumn. The best time to sow the seeds, is soon after they are ripe; the plants will come up in the autumn or the following spring, and require no other care but to keep them clean from weeds, and thin the plants where they are too close; it will grow in any soil or situation. The leaves, seeds, and roots of this, are used in medicine; the root is one of the five opening roots, and the seed one of the greater carminative seeds. There is a simple water made from the leaves, and a distilled oil from the seed.

The sweet Fennel has been by many supposed only a variety of the common sort, but I have cultivated it in the same ground with that, where it has always retained its differences. The leaves of this are very long and slender, growing more sparsedly, and do not end in so many points as those of the common sort; the stalks do not rise so high, and the seeds are longer, narrower, and of a lighter colour. These seeds are generally imported from Germany or Italy, and are by some preferred to those of the common sort for use, being much sweeter.

This may be propagated in the same manner as the former sort, being very hardy, but the roots are not of so long duration.

The third sort is supposed to have been originally brought from the Azorian Islands; it has been long cultivated in Italy as a sallad herb, under the title of Finochio; and there are some few gardens in England, where it is now cultivated, but in small quantities, for there are not many English palates which relish it, nor is it easy to be furnished with good seeds; those which are annually brought from Italy seldom prove good; and it is difficult to save it in England, because the winter frequently kills those plants which are left for seeds; and when any good plants of the early sowing are left for seeds, they do not ripen, unless the winter proves very favourable.

This sort hath very short stalks, which swell just above the surface of the ground, to four or five inches in breadth, and almost two thick, being fleshy and tender: this is the part which is eaten when blanched, with oil, vinegar, and pepper, as a cold sallad. When these plants are permitted to run for seeds, the stalks do not rise more than a foot and a half high, having a large spreading umbel standing on the top. The seeds of this sort are narrow, crooked, and of a bright yellow colour; they have a very strong smell like Aniseed, and are very sweet to the taste.

The manner of cultivating this plant is as follows: Your first care must be to procure good seeds from some person who has been careful in the choice of the plants, otherwise there will be little hope of having it good; for the plants will run up to seeds before they swell to any size, so will not be fit for use: then make choice of a good spot of light rich earth, not dry nor very wet, for in either extreme this plant will not thrive. The first crop may be sown about a fortnight in March, which, if it succeeds, will be fit for use in July; and by sowing at several times, there may be a supply for the table till the frost puts a stop to it. After having well dug and levelled the ground smooth, you must make a shallow drill by a line, into which you must scatter your seeds pretty thin; for if your plants are six inches asunder in the rows, it will be full near enough; but however, you must expect some of your seeds to fail, and therefore you should scatter them about two inches distance; then cover the seeds about half an inch thick with earth, laying it smooth: these drills should be made eighteen inches asunder, or more, that there may be room to clean the ground, as also to earth up the plants when they are full grown. When the plants come up, which will be in about three weeks or a month after sowing, you must with a small hoe cut up all the weeds between them, and where the plants are too close, they should be thinned to about three inches distance; and as they advance, and the weeds spring again, they should, from time to time, be hoed; and at the last time of thinning them, they should be left seven or eight inches asunder at least. If your kind be good, the stems of the plants will increase to a considerable bulk just above the surface of the ground; which part should be earthed up in the manner of Celery, to blanch, about a fortnight or three weeks before it is used, and this will cause it to be very tender and crisp.

Your second crop should be sown about three weeks after the first, and so continue sowing every three weeks or a month till the end of July, after which time it will be too late for the plants to come to any perfection. But you should observe to sow in April, May, and June, on a moister soil than that which you sowed the first on; as also what you sow in the latter part of July, should be sown on a drier soil, and in a warmer situation; because this crop will not be fit for use till late in autumn, and therefore will be subject to injuries from too much wet or cold weather, if on a moist soil. But as the ground is often extreme dry in June and July, and the seeds more apt to miscarry and not come up, you should therefore observe to water and shade the beds where this seed is sown at that season, until the plants come up. And if the season should prove dry, the plants must be duly watered, otherwise they will run up to seed before they are of any size; therefore there should be a channel made where every row of plants grow, to detain the water which is poured on them, to prevent its running off. In the autumn, if there should happen sharp frosts, it will be very proper to cover the plants with some Peas-haulm, or other light covering, to prevent their being pinched; by which method they may be continued for use till the middle of winter.

A small bed of this plant will be sufficient at each sowing for a middling family; and for a large family, a bed of about twenty feet long, and four feet broad, will be full enough at a time.

FŒNUM BURGUNDIACUM. See Medica Sativa.

FŒNUM GRÆCUM. See Trigonella.

FOOT-STALKS, are those small stalks which immediately sustain the leaves, flowers, or fruit.

FOUNTAINS are sources or springs of living water, arising out of the ground. As to the original of them, see under the article Springs.

Of artificial fountains there are great variety, the mechanism of which not being to my purpose, I will not dwell upon it; though I may assert, that they are not only great ornaments to a fine garden, but also of great use. But they ought not to be placed too near the house by reason of the vapours that arise from the water, which may be apt to strike a damp to the wall, and spoil the paintings, &c. and the summer vapours may cause a malignity in the air, and so be prejudicial to the health of the family; and likewise the noise may be incommodious in the night.

Fountains in a garden should be so distributed, that they may be seen almost all at one time, and that the water-spouts may range all in a line one with another, which is the beauty of them; for this occasions an agreeable confusion to the eye, making them appear to be more in number than they really are. See Jet d'Eau, Springs, Vapours, Water, &c.

FRAGARIA. Lin. Gen. Plant. 558. Tourn. Inst. R. H. 295. tab. 152. [is so called for its fragrant aromatic scent.] Strawberries; in French, *Frasier*.

The Characters are,

*The empalement of the flower is of one leaf, which is cut into ten parts at the top. The flower hath five roundish petals, which are inserted in the empalement, and spread open. It hath twenty stamina, which are inserted in the empalement, terminated by moon-shaped summits. It hath a great number of germem collected into a head, each having a single style, inserted in the side of the germen, crowned by single stigmas; this head afterward becomes a large, soft, pulpy fruit, which, if left, falls away, leaving many small angular seeds in the empalement.*

This genus of plants is ranged in the fifth section of Linnæus's twelfth class, which includes those plants whose flowers have at least twenty stamina and many styles, which are inserted to the empalement.

The Species are,

1. Fragaria (*Vesca*) foliis ovatis serratis, calycibus brevibus, fructu parvo. *Strawberry with oval sawed leaves, short empalements, and a small fruit.* Fragaria vulgaris. C. B. P. 226. *The common or Wood Strawberry.*
2. Fragaria (*Virginiana*) foliis oblongo-ovatis serratis, infernè incanis, calycibus longioribus, fructu subrotundo. *Strawberry with oblong, oval, sawed leaves, hoary on their under side, longer empalements, and a roundish fruit.* Fragaria Virginiana fructu Coccineo. Hist. Ox. 2. 186. *Virginia Strawberry with a scarlet fruit, commonly called the Scarlet Strawberry.*
3. Fragaria (*Muricata*) foliis ovato-lanceolatis rugosis, fructu ovato. *Strawberry with oval, spear-shaped, rough leaves, and an oval fruit.* Fragaria fructu parvi pruni magnitudine. C. B. P. 327. *Strawberry with fruit as large as a small Plumb, commonly called Hautboy Strawberry.*
4. Fragaria (*Chiloensis*) foliis ovatis carnosis hirsutis fructu maximo. *Strawberry with oval, fleshy, hairy leaves, and a large fruit.* Fragaria Chiloensis, fructu maximo foliis carnosis hirsutis. Hort. Elth. 145. tab. 120. *Strawberry of Chili with a large fruit, and hairy fleshy leaves, called Frutilla, in America.*

There are some other varieties of this fruit, which are now cultivated in England; but I have not seen any other which can be called a distinct species, than are here enumerated, and these, I think, may be allowed to be so, for they never alter from one to the other, by any cultivation, though the fruit is frequently improved, so as to be of a larger size thereby; therefore those who have supposed them but one species, have greatly erred in so doing; I shall therefore mention the several varieties of Strawberry, which are

at present to be found in the gardens under the species to which they naturally belong.

The first sort is the common Wood Strawberry, which grows naturally in the woods in many parts of England, and is so well known as to need no description; of this there are three varieties, 1. The common sort with red fruit. 2. The white Wood Strawberry, which ripens a little later in the season, and is by many persons preferred to it for its quick flavour, but as it seldom produces so large crops of fruit as the red sort, it is not very generally cultivated. 3. The green Strawberry, by some called the Pine Apple Strawberry, from its rich flavour. The fruit of this is greenish when ripe; it is very firm, and hath a very high flavour; this is a late ripe fruit, but unless it is planted in a moist loamy soil, it is a very bad bearer; but in such land where it does succeed, it merits cultivation as much as any of the sorts.

The Scarlet Strawberry is the sort which is first ripe, for which reason it merits esteem, had it nothing else to recommend it; but the fruit is so good, as by many persons of good taste to be preferred to most other sorts. This was brought from Virginia, where it grows naturally in the woods, and is so different from the Wood Strawberry in leaf, flower, and fruit, that there need be no doubt of their being distinct species.

There is a variety of this which hath been of late years introduced from the northern parts of America, which has the appearance of a distinct species. The leaves of this are rounder, and not so deeply veined; the crenatures on their edges are broader and more obtuse. The leaves which compose the empalement are much longer, and are hairy, and the fruit is larger; but as in other respects it approaches near to the Scarlet Strawberry, I have chosen to join it to that, rather than make a distinct species of it; this I have been informed grows naturally in Louisiana.

There has also been another variety of this (if not a distinct species) lately introduced to our gardens, which is commonly known by the title of Alpine Strawberry; the plants of this greatly resemble those of the Scarlet Strawberry, but the fruit is more pointed; it is a well flavoured fruit, and continues bearing from the common season of Strawberries, until the frost in autumn puts a stop to it, which renders the sort very valuable: I have frequently gathered the fruit in the beginning of November; this has occasioned the Dutch gardeners titling it Everlasting Strawberry.

The Hautboy Strawberry, which the French call Capitons, came originally from America, but it has been long cultivated in the English gardens, and is very different from the other sorts in leaf, flower, and fruit, as that no one can doubt of their being different species; there is an improvement of this sort, which is commonly called the Globe Hautboy. The fruit of this is larger, and of a globular form, but this difference has certainly arisen from culture; for where these have been neglected a year or two, they have degenerated to the common Hautboy again; where the ground is proper for this plant, and their culture is well managed, the plants will produce great plenty of fruit, which will be large, and well flavoured, and by some persons are preferred to all the other sorts.

The Chili Strawberry was brought to Europe by Mons. Frazier, an engineer, who was sent to America by the late king of France, and was first planted in the Royal Garden at Paris, from whence it was communicated to several curious persons in Holland, and in the year 1727, I brought a parcel of the plants to England, which were communicated to me by Mr. George Clifford, of Amsterdam, who had large beds of this sort growing in his curious gardens at Hartecamp. The leaves of this sort are hairy, oval, and of a much thicker substance than any sort yet known, and stand upon very strong hairy foot-stalks; the runners from the plants are very large, hairy, and extend to a great length, putting out plants at several distances. The foot-stalks which sustain the flowers are very strong; the leaves of the empalement are long and hairy. The flowers are large, and are often deformed; and so is the fruit, which is very large, and when cultivated in very strong land, the plants produce plenty of fruit, which is firm, and very well flavoured; but as it is a bad bearer in most places where it has been cultivated, it has generally been neglected.

The Strawberries in general love a gentle hazelly loam, in which they will thrive and bear greater plenty of fruit than in a light rich soil. The ground should also be moist, for if it is very dry, all the watering which is given to the plants in warm dry seasons, will not be sufficient to procure plenty of fruit; nor should the ground be much dunged, for that will cause the plants to run into suckers, and grow luxuriant, and render them less fruitful.

The best time to remove these plants is in October, that they may get new roots before the hard frost sets in, which loosens the ground; so that if the roots of the plants are not pretty well established in the ground, the plants are frequently turned out of the ground by the first thaw; therefore the sooner they are planted when the autumnal rains begin, the better will their roots be established, so there will be less danger of their miscarrying, and sometimes those which are well rooted, will produce a few fruit the first year; there are some who transplant their plants in the spring; but where that is done, they must be duly supplied with water in the dry weather, otherwise they will not succeed.

The ground in which these are planted should be thoroughly cleaned from the roots of Couch, and all other bad weeds; for as the Strawberry plants are to remain three years before they are taken up, so if any of the roots of those bad weeds are left in the ground, they will have time to multiply so greatly as to fill the ground, and overbear the Strawberry plants. The ground should also be well trenched and made level; then the usual method is to lay it out into beds of four feet broad, with paths two feet or two feet and a half broad between each; these paths are necessary for the convenience of gathering the fruit, and for weeding and dressing of the beds, and also for watering the plants; after the beds are marked out, there should be four lines drawn in each, at a foot distance, which will leave six inches space on each side, between the outside rows and the paths; then the plants should be planted at about a foot distance from each other in the rows, in a quincunx order, being careful to close the ground to the roots of the plants when they are planted; and if there should not happen rain soon after, the plants should be well watered to settle the earth to their roots.

The distance here mentioned for the plants to be placed must be understood for the Wood Strawberries only, for as the other sorts grow much larger, their distances must be proportioned to their several growths; therefore the Scarlets and Hautboys should have but three rows of plants in each bed, which should be at fifteen inches distance, and the plants in the rows should be allowed the same space from each other, and the Chili Strawberry must have but two rows of plants in each bed, which should also be two feet apart in the rows; for as these grow very strong, if they have not room to spread, they will not be very fruitful.

In chusing proper plants of any of the sorts, depends the whole success; for if they are promiscuously taken from beds without care, great part of the plants will become barren; these are generally called blind, which is when there are plenty of flowers, but no fruit produced; if these flowers are well examined, they will be found to want the female organs of generation, most of them abounding with stamina, but there are few, if any styles; so that it frequently happens among these barren plants, that some of them will have a part of an imperfect fruit formed, which will

will sometimes ripen; this barrenness is not peculiar to Strawberries, but is general to all those plants which have creeping roots, or stalks; and the more they increase from either, the sooner they become barren, and this in some degree runs through the vegetable kingdom; for trees and shrubs which are propagated by cuttings, are generally barren of seeds in two generations, that is, when they are propagated by cuttings, which were taken from plants raised by cuttings; this I have constantly found to hold in great numbers of plants, and in fruit-trees it often happens, that those sorts which have been long propagated by grafts and buds, have no kernels. But to return to the choice of the Strawberry plants; these should never be taken from old neglected beds, where the plants have been suffered to spread or run into a multitude of suckers, nor from any plants which are not very fruitful; and those offsets which stand nearest to the old plants, should always be preferred to those which are produced from the trailing stalks at a farther distance; and the Wood Strawberry is best when the plants are taken fresh from the woods, provided they are taken from fruitful plants, because they are not so liable to ramble and spread, as those which are taken from plants, which have been long cultivated in gardens; therefore those who are curious in cultivating this fruit, should be very careful in the choice of their plants.

When the plants have taken new root, the next care is if the winter prove severe, to lay some old tanners bark over the surface of the bed between the plants, to keep out the frost: this care is absolutely necessary to the Chili Strawberry, which is frequently killed in hard winters, where they are exposed without any covering; therefore where tanners bark cannot easily be procured, saw-dust, or sea-coal ashes may be used; or in want of these, if decayed leaves of trees, or the branches of Evergreen-trees with their leaves upon them, are laid over the beds, to prevent the frost from penetrating deep into the ground, it will secure the plants from injury.

The following summer the plants should be constantly kept clean from weeds, and all the runners should be pulled off as fast as they are produced; if this is constantly practised, the plants will become very strong by the following autumn; whereas when this is neglected (as is too frequently seen) and all the runners permitted to stand during the summer season, and then pulled off in the autumn, the plants will not be half so strong as those where that care has been taken; therefore there will not be near the same quantity of fruit upon them the following spring, nor will the fruit be near so large and fair; and where proper care is taken of the plants the first summer, there is generally a plentiful crop of fruit the second spring; whereas when this is neglected, the crop will be thin and the fruit small.

As this fruit is very common, there are but few persons who cultivate it with proper care; therefore I shall give some directions for the doing of it, which, if carefully practised, will be attended with success.

The old plants of Strawberries are those which produce the fruit, for the suckers seldom produce any till they have grown a full year; therefore it appears how necessary it is to divest the old plants of them; for wherever they are suffered to remain, they rob the fruitful plants of their nourishment in proportion to their number; for each of these suckers send out a quantity of roots, which interfere, and are so closely matted together, as to draw away the greatest part of the nourishment from the old roots, whereby they are greatly weakened; and these suckers also render each other very weak, so that from hence the cause of barrenness arises; for I have known where the old plants have been constantly kept clear from suckers, they have continued very fruitful four or five years without being transplanted; however, it is the best way to have a succession of beds, that after three years standing they may be taken up; because by that time they will have exhausted the ground of those vegetable salts, necessary for the nourishment of that species of plants; for it is always observed, that Strawberries planted on fresh land are the most fruitful.

The next thing to be observed, is in autumn to divest the plants of any strings, or runners, which may have been produced, and also of all the decayed leaves, and the beds cleared from weeds; then the paths should be dug up, and the weeds buried which were taken from the beds, and some earth laid over the surface of the beds between the plants; this will strengthen the plants, and prepare them for the following spring; and if after this, there is some old tanners bark laid over the surface of the ground between the plants, it will be of great service to them. In the spring, after the danger of hard frost is over, the ground between the plants in the beds should be forked with a narrow three-pronged fork, to loosen it, and break the clods; and in this operation, the tan which was laid over the surface of the ground in autumn will be buried, which will be a good dressing to the Strawberries, especially in strong land; then about the end of March, or the beginning of April, if the surface of the beds is covered with moss, it will keep the ground moist, and prevent the drying winds from penetrating the ground, and thereby secure a good crop of fruit; and the moss will preserve the fruit clean, that when heavy rains may fall after the fruit is full grown, there will be no dirt washed over them, which frequently happens, so that the fruit must be washed before it is fit for the table, which greatly diminishes its flavour; therefore where this method is practised, the fruit may be had in perfection.

The soil in which the Chili Strawberry is found to succeed best, is a very strong brick earth, approaching near to clay; in this soil I have seen them produce a tolerable good crop, and the fruit has been extremely well flavoured; and if some care be taken to pull off the runners as they are produced, so as to leave only the old plants, I make no doubt but these plants may be as fruitful as the common Hautboy: this I mention from one or two experiments, which have been made by my direction, and not from theory.

There are some persons who are so fond of Strawberries, as to be at any expence to obtain them early in the year, and to continue them as late in the season as possible; and should I omit to give some directions for both these managements, they would suppose the book very defective; therefore I shall mention the practice of some few, who have succeeded best in the management of these fruits; I shall begin with directions for obtaining these fruits early in the spring.

Where there are any hot walls erected in gardens for the producing early fruit, it is very common to see Strawberries planted in the borders, that the fire which is applied for ripening the fruit against the walls, may also serve the purpose of bringing forward the Strawberries; but where this is practised, the Strawberry plants should be annually renewed, taking up the plants as soon as their fruit is over, and all the earth of the borders should be taken out, at least two feet deep, and fresh earth brought in, which will be equally good for the wall trees; but, as was before observed, that the old plants of Strawberries only are those which produce the fruit, there should be a sufficient number of plants brought up in pots, to supply the border annually; and the same must be done if they are to be raised in a common hot-bed, or in stoves; therefore I shall begin with giving directions for raising and preparing plants for those purposes.

The sorts which are the most proper for forcing early, are the Scarlet, the Alpine, and the Wood Strawberries, for the Hautboy grows too large for this purpose. In the choice of the plants, there should be an especial care taken to have them from the most fruitful plants, and those which grow immediately to the old plants; they should be taken off in autumn, and each planted in a separate small pot filled with loamy soil, and placed in a shady situation till they have taken root; after which they may be removed to an open situation, where they may remain till the middle or

end of November, when the pots ſhould be plunged into the ground up to their rims, to prevent the froſt from penetrating through the ſide of the pots; if theſe are placed near a wall, pale, or hedge, expoſed to an eaſt aſpect, or north-eaſt, they will ſucceed better than in a warm ſituation, becauſe they will not be forced too forward; the only care they require, is to ſecure them from being turned out of the pots after froſt. The ſpring following the plants will be ſo far advanced as to have filled the pots with their roots by the end of April, when they ſhould be turned out of the pots, and their roots pared; then planted into penny pots filled with the like loamy ſoil, and plunged into the ground in a ſhady ſituation, where they ſhould remain the following ſummer; during which time they muſt be duly kept clean from weeds, and all the runners muſt be taken off as faſt as they are produced; likewiſe if there ſhould be any flowers come out, they ſhould alſo be pinched off, and not ſuffered to bear fruit, which would weaken the plants, for there cannot be too much care taken to have the plants as ſtrong as poſſible, that they may produce plenty of fruit, without which they are not worth the trouble of forcing.

About the middle of October, or earlier, if the autumn proves cold, the pots ſhould be removed into a warmer ſituation, to prepare them for forcing; for they ſhould not be ſuddenly removed from a very cold ſituation immediately into the ſtove or hot-bed, but be gradually prepared for it; but where they are deſigned for the borders near a hot wall, they may then be turned out of the pots, and planted into the borders, that they may have time to get freſh rooting, before the fires are made to heat the walls; when theſe are planted, they may be placed very cloſe to each other; for as they are deſigned to remain there no longer than till they have ripened their fruit, they will not require much room, as their roots will find ſufficient nouriſhment below, and alſo from the earth which is filled into the ſpaces between the balls of earth, about their roots; and it is of conſequence to get as much fruit as poſſible in a ſmall ſpace, where there is an expence to force them early. If the fires are lighted about Chriſtmas, the Strawberries in theſe borders will be ripe the end of March; or if the ſeaſon ſhould prove very cold, it may be the middle of April before they will be fit for the table.

In the management of the plants there muſt be care taken to ſupply them with water when they begin to ſhew their flowers, otherwiſe they will fall off without producing any fruit; and, in mild weather, there ſhould be freſh air admitted to them every day; but as fruit-trees againſt the wall muſt be ſo treated, the ſame management will agree with the Strawberries.

If the Strawberries are intended to be forced in a ſtove, where there are Pine-apples, and no room to plunge them in the tan-bed, then the plants ſhould be tranſplanted into larger pots in September, that they may be well rooted before they are removed into the ſtove, which ſhould not be till December; but if they are placed under a frame the beginning of November, where they may be ſcreened from the froſt, it will prepare the plants better for forcing; and thoſe who are deſirous to have them very early, make a hot-bed under frames, upon which they place their plants the latter end of October, which will bring them forward to flower, and then they remove the plants into the ſtove; when theſe plants are removed into the ſtove, they ſhould be placed as near to the glaſſes as poſſible, that they may enjoy the full ſun and air; for when they are placed backward, the plants will draw up weak, and the flowers will drop without producing fruit. As the earth in the pots will dry pretty faſt when they ſtand dry upon the pavement of the hot-houſe, or on ſhelves, ſo the plants muſt be duly watered; but it muſt be done with diſcretion, and not too much given to them, which will be equally hurtful to them; if theſe plants are properly managed, they will produce ripe fruit in February, which is as early as moſt people will chuſe to eat them. When the fruit is all gathered from the plants, they ſhould be turned out of the ſtove; for as they will be of no farther ſervice, they ſhould not remain to take up the room; nor ſhould thoſe plants which are planted in the borders near the hot walls be left there after their fruit is gathered, but immediately taken up, that they may rob the fruit-trees of their nouriſhment as little as poſſible.

Where there is no conveniency of ſtoves, or hot-walls for this purpoſe, the fruit may be ripened upon common hot-beds; and though they may not be quite ſo early as with the other advantages, yet I have ſeen great crops of the fruit ripe in April, which were upon common hot-beds under frames, and executed at a ſmall expence in the following manner.

The plants were prepared in pots after the manner before directed, which were placed in a warm ſituation in the beginning of October, and about Chriſtmas the hot-bed was made in the ſame manner as for Cucumbers, but not ſo ſtrong; and as ſoon as the firſt violent ſteam of the dung was over, ſome old rotten dung laid over the hot-bed to keep down the heat, or where it can be eaſily procured, neats dung is preferable for this purpoſe; then the plants ſhould be turned out of the pots, and placed upon the bed as cloſe together as poſſible, filling up the interſtices between the plants with earth; afterward the plants muſt have air admitted to them every day; and if the heat of the bed is too great, the plants ſhould be raiſed up, to prevent their roots being ſcorched; and if the bed is too cold, the ſides of it ſhould be lined with ſome hot dung: this firſt bed will bring the plants to flower by the latter end of February, or the beginning of March, by which time the heat of the bed will be ſpent, therefore another hot-bed ſhould be prepared to receive the plants, which need not be ſo ſtrong as the firſt; but upon the hot dung ſhould be laid ſome neats dung about two inches thick, which ſhould be equally ſpread and ſmoothed; this will prevent the heat of the bed from injuring the roots of the plants, upon this ſhould be laid two inches of a loamy ſoil; when this has laid two days to warm, the plants ſhould be taken out of the firſt hot-bed, and turned carefully out of the pots, preſerving all the earth to their roots, and placed cloſe together upon this new hot-bed, filling up the vacuities between the balls with loamy earth: the roots of the plants will ſoon ſtrike out into this freſh earth, which will ſtrengthen their flowers, and cauſe their fruit to ſet in plenty; and if proper care is taken to admit freſh air to the plants, and ſupply them properly with water, they will have plenty of ripe fruit in April, which will be full two months before their natural ſeaſon.

The methods practiſed to retard this fruit, is firſt by planting them in the coldeſt part of the garden, where they may be as much in ſhade as poſſible, and the ſoil ſhould be ſtrong and cold; when there are ſuch places in a garden, the fruit will be near a month later than in a warm ſituation; the next is to cut off all the flowers when they firſt appear, and if the ſeaſon proves dry, to water them plentifully, which will cauſe them to put out a freſh crop of flowers; and if they are ſupplied with water, there will be a late crop of fruit, but theſe are not ſo well flavoured as thoſe which ripen in their natural ſeaſon.

But ſince the Alpine Strawberry has been introduced in the Engliſh gardens, there is little occaſion for practiſing this method of retarding the fruit; becauſe this ſort will ſupply the table the whole ſummer, eſpecially if care is taken to pull off the runners; and in dry ſeaſons to water the plants, without which the bloſſoms will fall off, without producing fruit.

There are ſome perſons ſo curious as to raiſe the plants from ſeeds, by which they have greatly improved ſome of the ſorts; and if this was more practiſed, I am certain it would be found of ſingular ſervice, where the faireſt of the fruit of each kind are choſen. The ſeeds ſhould be immediately ſown when the fruit is eaten; the beſt way is to ſow the ſeeds in pots, placing them in the ſhade.

In the spring of the year 1724, there was scarce any rain from February till about the middle of July, so that most of the Strawberries and Raspberries in the gardens near London, were burnt up, and came to no perfection; but upon plenty of rain falling in July, they recovered and put out plenty of flowers, which were succeeded by fruit, which ripened in September, when the markets of London were supplied with a great plenty of both those fruits at that season of the year.

FRANGULA. Tourn. Inst. R. H. 612. tab. 383. Rhamnus. Lin. Gen. Plant. 235. [is so called of frangendo, breaking, because of the brittleness of its wood.] Berry-bearing Alder.

The Characters are,

*The empalement of the flower is of one leaf, cut at the top into five segments, which are erect. The flower hath one petal, which is cut into five acute segments; these are placed between the segments of the empalement, into which they are inserted, but are shorter, and stand erect. It hath five stamina, which are the length of the petal, terminated by obtuse summits; in the center is situated a globular germen, supporting a slender style, crowned by an obtuse stigma. The germen afterward becomes a round berry, inclosing two plain roundish seeds.*

This genus of plants is ranged in the second section of Tournefort's twenty-first class, which includes the trees and shrubs with a Rose flower, whose pointal turns to a berry. Dr. Linnæus has joined this genus with the Paliurus, Alaternus, and Ziziphus, to the Rhamnus, making them only species of one genus; but according to his own system, they should be separated to a great distance from Rhamnus, and be placed in his twenty-second class, because it hath male and female flowers on different plants; whereas it is placed in the first section of his fifth class, from the flower having five stamina and but one style.

The Species are,

1. Frangula (*Alnus*) foliis ovato-lanceolatis glabris. *Frangula with oval, spear-shaped, smooth leaves.* Frangula, sive alnus, nigra baccifera. Park. Theat. Black Berry-bearing Alder.
2. Frangula (*Latifolia*) foliis lanceolatis rugosis. *Frangula with rough spear-shaped leaves.* Frangula rugosiore & ampliore folio. Tourn. Berry-bearing Alder with a larger and rougher leaf.
3. Frangula (*Rotundifolia*) foliis ovatis nervosis. *Frangula with oval veined leaves.* Frangula montana pumila saxatilis, folio subrotundo. Tourn. Low mountain, rocky, berry-bearing Alder, with a round leaf.
4. Frangula (*Americana*) foliis oblongo-ovatis nervosis, glabris. *Frangula with oblong, oval, smooth veined leaves.* Frangula Americana foliis glabris. Dale. *American Berry-bearing Alder with smooth leaves.*

The first sort grows naturally in the woods in many parts of England, so is seldom planted in gardens; this rises with a woody stem to the height of ten or twelve feet, sending out many irregular branches, which are covered with a dark bark, and garnished with oval spear-shaped leaves, about two inches long, and one inch broad, having several transverse veins from the midrib to the sides, and stand upon short foot-stalks. The flowers are produced in clusters at the end of the former year's shoots, and also upon the first and second joints of the same year's shoot, each standing upon a short separate foot-stalk, on every side the branches; these are very small, of an herbaceous colour, and do not expand; they are succeeded by small round berries, which turn first red, but afterward black when ripe. The flowers appear in June, and the berries ripen in September; this stands in the Dispensary as a medicinal plant, but is seldom used.

The second sort hath larger rough leaves than the first. It grows naturally on the Alps and other mountainous parts of Europe, and is preserved in some gardens for the sake of variety.

The third sort is of humble growth, seldom rising above two feet high; this grows on the Pyrenean Mountains, and is seldom preserved unless in botanic gardens for variety; it may be increased by laying down the branches, but must have a strong soil.

The fourth sort grows naturally in North America, from whence I received the seeds; this is pretty like the first sort, but the leaves are longer and broader; they are smooth, of a lucid green, and have many veins. The flowers are very like those of the first sort.

These shrubs are easily propagated by seeds, which should be sown as soon as they are ripe, and then the plants will come up the spring following; but if they are kept out of the ground till spring, the plants will not come up till the year after. When the plants come up, they must be kept clean from weeds till autumn, then they may be taken up and planted in a nursery in rows, two feet asunder, and at one foot distance in the rows; in this nursery they may remain two years, and may then be planted where they are to remain; they may also be propapated by layers and cuttings, but the seedling plants are best.

The fruit of the first sort is often brought into the markets of London, and sold for Buckthorn berries; of which cheat, all such as make syrup of Buckthorn should be particularly careful; they may be easily distinguished by breaking the berries, and observing how many seeds are contained in each, the berries of this tree having but two, and those of Buckthorn generally four seeds in each berry, and the juice of the latter dies paper of a green colour.

FRAXINELLA. See Dictamnus.

FRAXINUS. Lin. Gen. Plant. 1026. Tourn. Inst. R. H. 577. tab. 343. The Ash-tree; in French, *Frêne.*

The Characters are,

*It hath hermaphrodite and female flowers on the same tree, and sometimes on different trees. The hermaphrodite flowers have no petals, but a small four-pointed empalement, including two erect stamina, which are terminated by oblong summits, having four furrows. In the center is situated an oval compressed germen, supporting a cylindrical style, crowned by a bifid stigma. The germen afterward becomes a compressed bordered fruit, shaped like a bird's tongue, having one cell, inclosing a seed of the same form. The female flowers are the same, but have no stamina.*

This genus of plants is ranged in the second section of Linnæus's twenty-third class, which includes the plants which have flowers of different sexes on the same or different plants, which are fruitful.

The Species are,

1. Fraxinus (*Excelsior*) foliolis serratis, floribus apetalis. Lin. Sp. Plant. 1057. *Ash-tree whose smaller leaves are serrated, and flowers having no petals.* Fraxinus excelsior. C. B. P. 416. *The common Ash.*
2. Fraxinus (*Rotundifolia*) foliolis ovato-lanceolatis serratis, floribus coloratis. *Ash-tree whose smaller leaves are oval, spear-shaped, and sawed, and the flowers coloured.* Fraxinus rotundiore folio. C. B. P. 416. *Ash-tree with a rounder leaf, commonly called Manna Ash.*
3. Fraxinus (*Ornus*) foliolis serratis, floribus coloratis. Lin. Sp. Plant. 1057. *Ash-tree whose smaller leaves are sawed, and flowers having petals.* Fraxinus humilior sive altera Theophrasti, minore & tenuiore folio. C. B. P. 416. *Dwarf Ash of Theophrastus with smaller and narrower leaves.*
4. Fraxinus (*Paniculata*) foliolis lanceolatis glabris, floribus paniculatis terminatricibus. *Ash-tree with smooth spear-shaped leaves, and flowers growing in panicles at the ends of the branches.* Fraxinus florifera botryoides. Mor. Præl. 265. *The flowering Ash.*
5. Fraxinus (*Nova Anglia*) foliolis integerrimis, petiolis teretibus. Flor. Virg. 122. *Ash-tree with the small leaves entire, and taper foot-stalks.* Fraxinus ex Novâ Angliâ, pinnis foliorum in mucronem productioribus. Rand. Cat. Hort. Chelf. *New England Ash with long acute points to the wings of the leaves.*
6. Fraxinus (*Caroliniana*) integerrimis petiolis teretibus fructu latiore. Prod. Leyd. 533. *Ash-tree with entire leaves and taper foot-stalks.* Fraxinus Caroliniana, latiore fructu. Rand. Cat. H. Chelf. *Carolina Ash with a broad fruit.*

The first sort is the common Ash-tree, which grows naturally in most parts of England, and is so well known as to need no description. The leaves of this sort have generally five pair of lobes, and are terminated by an odd one; they are of a very dark green, and their edges are slightly sawed. The flowers are produced in loose spikes from the side of the branches, which are succeeded by flat seeds, which ripen in autumn; there is a variety of this with variegated leaves, which is preserved in some gardens.

The second sort grows naturally in Calabria, and is generally supposed to be the tree from whence the manna is collected, which is an exsudation from the leaves of the tree. The shoots of this tree are much shorter, and the joints closer together than those of the first sort; the small leaves are shorter, and deeper sawed on their edges, and are of a lighter green. The flowers come out from the side of the branches, which are of a purple colour, and appear in the spring before the leaves come out. This tree is of humble growth, seldom rising more than fifteen or sixteen feet high in England.

The third sort is a low tree, which rises about the same height as the second; the leaves of this sort are much smaller and narrower than those of the first, but are sawed on their edges, and are of the same dark colour. The flowers of this sort have petals, which are wanting in the common Ash.

The fourth sort was raised by the late Dr. Uvedale at Enfield, from seeds which were brought from Italy by Dr. William Sherard, where the trees grow naturally; but it was supposed to be a different sort from that mentioned by Dr. Morrison, in his Præludia Botanica, but by comparing them together they appear to be the same.

The leaves of this sort have but three or four pair of lobes (or small leaves) which are short, broad, and smooth, of a lucid green, and irregularly sawed on the edges; the midrib of the great leaf is jointed, and swelling where the leaves come out. The flowers grow in loose panicles at the end of the branches; these are most of them male, having two stamina in each, but no germen or style; they are of a white herbaceous colour, and appear in May. As this sort very rarely produces seeds in England, it is propagated by grafting or budding it upon the common Ash.

The fifth sort was raised from seeds, which were sent from New England in the year 1724, by Mr. Moore. The leaves of this tree have but three, or at most but four pair of lobes (or small leaves) which are placed far distant from each other, and are terminated by an odd lobe, which runs out into a very long point; they are of a light green and entire, having no serratures on their edges: this tree shoots into strong irregular branches, but doth not grow to a large size in the trunk. It is propagated by grafting it upon the common Ash.

The sixth sort was raised from seeds which were sent from Carolina in the year 1724, by Mr. Catesby. The leaves of this sort hath seldom more than three pair of lobes, the lower being the least, and the upper the largest; these are about five inches long and two broad, of a light green colour, and slightly sawed on their edges; the foot-stalk, or rather the midrib, of the leaves is taper, and has short downy hairs; the seeds are broader than those of the common Ash, and are of a very light colour. As this sort hath not yet produced seeds in England, it is propagated by grafting it upon the common Ash.

These trees are now propagated in plenty in the nurseries for sale, as there has been of late years a great demand for all the hardy sorts of trees and shrubs, which will live in the open air; but all those trees which are grafted upon the common Ash, are not so valuable as those which are raised from seeds, because the stock grows much faster than the grafts; so that the lower part of the trunk, so far as the stock rises, will often be twice the size of the upper; and if the trees stand much exposed to the wind, the grafts are frequently broken off to the stock, after they are grown to a large size, which is a great disappointment to a person after having waited several years, to see their trees suddenly destroyed. Beside, if the wood of either of the sorts is valuable, it can be of little use when the trees are so raised.

The fourth sort is generally planted for ornament, the flowers making a fine appearance when they are in beauty, for almost every branch is terminated by a large loose panicle; so that when the trees are large, and covered with flowers, they are distinguishable at a great distance.

All the other sorts serve to make a variety in plantations, but have little beauty to recommend them; and as their wood seems to be greatly inferior to that of the common Ash, so there should be few of these planted, because they will only fill up the space where better trees might grow.

The common Ash propagates itself in plenty by the seeds which scatter in the autumn, so that where the seeds happen to fall in places where cattle do not come, there will be plenty of the plants come up in the spring; but where any person is desirous to raise a quantity of the trees, the seeds should be sown as soon as they are ripe, and then the plants will come up the following spring; but if the seeds are kept out of the ground till the spring, the plants will not come up till the year after, which is the same with all the sorts of Ash; that when any of their seeds are brought from abroad, as they seldom arrive here before the spring, the plants must not be expected to appear till the next year; therefore the ground should be kept clean all the summer where they are sown, and not disturbed, lest the seeds should be turned out of the ground, or buried too deep to grow; for many persons are too impatient to wait a year for the growth of seeds, so that if they do not come up the first year, they dig up the ground, and thereby destroy the seeds.

When the plants come up, they must be kept clean from weeds during the summer; and if they make good progress in the seed-bed, they will be fit to transplant by the autumn; therefore there should be some ground prepared to receive them, and as soon as their leaves begin to fall, they may be transplanted. In taking them up, there should be care taken not to break or tear off their roots; to prevent which, they should be taken up with a spade, and not drawn up, as is frequently practised; for as many of the plants which rise from seeds will out-strip the others in their growth, so it is frequently practised, to draw up the largest plants, and leave the smaller to grow a year longer before they are transplanted; and to avoid hurting those which are left, the others are drawn out by hand, and thereby many of their roots are torn off or broken; therefore it is much the better way to take all up, little or big together, and transplant them out, placing the larger ones together in rows, and the smaller by themselves. The rows should be three feet asunder, and the plants a foot and a half distance in the rows; in this nursery they may remain two years, by which time they will be strong enough to plant where they are to remain; for the younger they are planted out, the larger they will grow; so that where they are designed to grow large, they should be planted very young; and the ground where the plants are raised, should not be better than that where they are designed to grow; for when the plants are raised in good land, and afterward transplanted into worse, they very rarely thrive; so that it is much the best method to make the nursery upon a part of the same land, where the trees are designed to be planted, and then a sufficient number of trees may be left standing upon the ground, and these will outstrip those which are removed, and will grow to a larger size.

Where people live in the neighbourhood of Ash-trees, they may supply themselves with plenty of self-sown plants, provided cattle are not suffered to graze on the land, for they will eat off the young plants, and not suffer them to grow; but where the seeds fall in hedges, or where they are protected by bushes, the plants

plants will come up and thrive; and in theſe hedges the trees frequently are permitted to grow till they have deſtroyed the hedge, for there is ſcarce any tree ſo hurtful to all kinds of vegetables as the Aſh, which robs every plant of its nouriſhment within the reach of its roots, therefore ſhould never be ſuffered to grow in hedge rows; for they not only kill the hedge, but impoveriſh Corn, or whatſoever is ſown near them. Nor ſhould Aſh-trees be permitted to grow near paſture grounds, for if any of the cows eat of the leaves or ſhoots of the Aſh, all the butter which is made of their milk will be rank and of no value; which is always the quality of the butter which is made about Guildford, Godalmin, and ſome other parts of Surry, where there are Aſh-trees growing about all their paſtures, ſo that it is very rare to meet with any butter in thoſe places which is fit to eat; but in all the good dairy countries, they never ſuffer an Aſh-tree to grow.

If a wood of theſe trees is rightly managed, it will turn greatly to the advantage of its owner; for by the under-wood, which will be fit to cut every ſeven or eight years, for poles or hoops, there will be a continual income more than ſufficient to pay the rent of the ground, and all other charges; and ſtill there will be a ſtock preſerved for timber, which in a few years will be worth forty or fifty ſhillings per tree.

This timber is of excellent uſe to the wheelwright and cartwright, for ploughs, axle-trees, wheel-rings, harrows, bulls, oars, blocks for pullies, and many other purpoſes.

The beſt ſeaſon for felling of theſe trees is from November to February; for if it be done either too early in autumn, or too late in the ſpring, the timber will be ſubject to be infeſted with worms, and other inſects; but for lopping pollards, the ſpring is preferable for all ſoft woods.

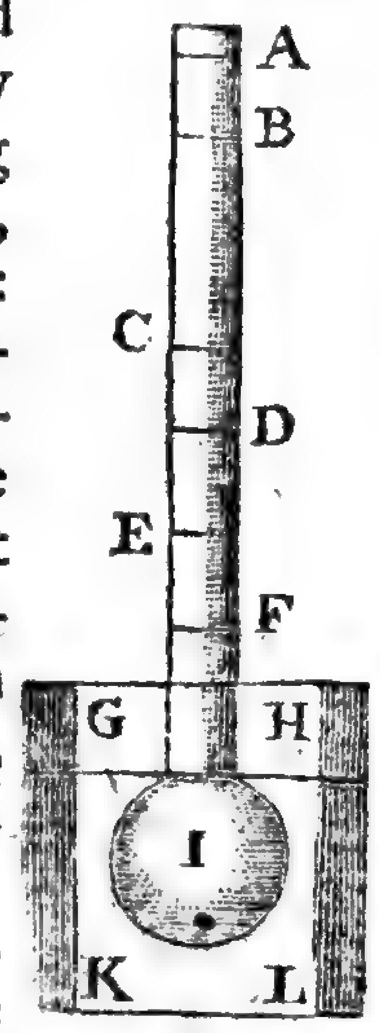
**FREEZING** is the fixing of a fluid, or the depriving it of its natural mobility by the action of cold; or it is the act of converting a fluid ſubſtance into a firm, coherent, rigid one, called ice.

The principal phænomena of freezing are,

1ſt, That Water being dilated or rarefied, and all fluids, oil excepted, i. e. in freezing, take up more ſpace, and are ſpecifically lighter than they were before.

That the bulk and dimenſions of water are increaſed by freezing, is found by many experiments, and it may not be improper here to take notice of the proceſs of nature.

A glaſs veſſel then, I A, full of water to A, being immerged in a veſſel of water mixed with ſalt G H K L, the water preſently riſes from D to C; which ſeems owing to the ſudden conſtriction of the veſſel, haſtily plunged into ſo cold a medium: ſoon after, from the point C, it continually deſcends condenſing, till it arrives at the point F; where, for ſome time, it ſeems to remain at reſt: but it ſoon recovers itſelf, and begins to expand, riſing from F to E, and from thence ſoon after, by one violent leap, mounts to B; and here the water in I is immediately ſeen all thick and cloudy, and, in the very inſtant of this leap, is converted into ice. Add, that while the ice is growing harder, and ſome of the water near the neck of the veſſel I is freezing, the flux of the water is continued above B towards A, and at length runs out at the veſſel.




2dly, That they loſe not only of the ſpecific, but alſo of their abſolute gravity, by freezing; ſo that when they are thawed again, they are found conſiderably lighter than before.

3dly, That frozen water is not quite ſo tranſparent as when it was liquid, and that bodies do not perſpire ſo freely through it.

4thly, That water, when frozen, evaporates almoſt as much as when fluid.

5thly, That water does not freeze in vacuo, but requires the preſence and contiguity of air.

6thly, That water which has been boiled, does not freeze ſo readily as that which has not.

7thly, That water, being covered over with a ſurface of oil of Olives, does not freeze ſo readily as it does without it; and that nut oil abſolutely preſerves it under a ſtrong froſt, when Olive oil will not.

8thly, That ſpirit of wine, nut oil, and oil of turpentine, do not freeze at all.

9thly, That the ſurface of the water, in freezing, appears all wrinkled; the wrinkles being ſometimes in parallel lines, and ſometimes like rays proceeding from a center to the circumference.

The theories of freezing, or the method of accounting for theſe phænomena, are very many.

The chief principles that different authors have gone upon, are, either that ſome foreign matter is introduced within the pores of the fluid, by means of which it is fixed, its bulk increaſed, &c.

Or that ſome matter which was naturally contained in the fluid is now expelled, by reaſon of the abſence of which, the body becomes fixed.

Or that there is ſome alteration produced in the texture or form, either of the particles of the fluid itſelf, or of ſomething that is contained within it.

To ſome one of theſe principles all the ſyſtems of freezing are reducible.

The Carteſians explicate freezing by the receſs or going out of the ethereal matter from the pores of the water, or other liquor; which being once done, the finer parts are too ſmall and flexible to keep the long, ſlender, and eel-like particles of water fluent, or in the form of a liquor.

But the Corpuſcularians, or Gaſſendiſts, aſcribe the freezing of water, with more probability, to the ingreſs of multitudes of cold or frigorific particles, as they call them; which, entering the liquor in ſwarms, and diſperſing themſelves every way through it, croud into the pores of the water, and hinder the wonted agitation of its parts, and wedge it up, as it were, into the hard or conſiſtent body of ice; and from hence proceeds its increaſe of dimenſions, coldneſs, &c.

That ice is ſpecifically lighter than the water out of which it is by freezing made, is certain by its ſwimming in it; and that this lightneſs of ice proceeds from thoſe numerous bubbles which are produced in it by its congelation, is equally plain; but how thoſe bubbles come to be generated in freezing, and what ſubſtance they contain in them, if they are not quite empty, is an inquiry of great importance; and, perhaps, if diſcovered, may contribute much to the underſtanding the nature of cold.

Mr. Hobbes will have it common air, which, intruding into the water in congelation, entangles itſelf with the particles of the fluid, prevents their motion, and produces thoſe numerous bubbles, thus expanding its bulk, and rendering it ſpecifically lighter.

But, in anſwer to this, no ſuch ingreſs of air into water appears in its coagulation; and that it does not get into frozen oil is plain, becauſe that body is condenſed by being frozen.

And Mr. Boyle has alſo ſhewn, by undoubted experiments, that water will freeze in veſſels hermetically ſealed; and in braſs bodies or veſſels cloſely ſtopped, and into which the air can have no ingreſs, hath yet been turned into ice, abounding with theſe bubbles as numerous as thoſe frozen in the open air.

He alſo has proved by experiment, that water kept a while in the exhauſted receiver, till all its bubbles were emerged and gone, being afterwards turned into ice by a freezing mixture, the ice had ſcarce any bubbles in it; whence it is plain, that theſe bubbles are filled with ſome matter which is within the water, if they are filled with any thing. But he proves alſo, by plain experiments, that they have none, or exceedingly little, true elaſtic air contained in them.

Others, and thoſe of the greateſt number, are of opinion, that the freezing matter is a ſalt; and they argue that an exceſs of cold will render water torpid, but never congeal it without ſalt: they ſay that thoſe

particles that are the chief cause of freezing are saline, mixed in a due proportion, congelation bearing a near relation to crystallization.

This salt is supposed to be of the nitrous kind, and to be furnished by the air, which is generally found to abound in nitre.

It is indeed no difficult matter, to account for the particles of nitre preventing the fluidity of water. These particles are supposed to be so many rigid pointed spicula, which are easily impelled or driven into the stamina or globules of water; which, by this means, becoming variously mingled and entangled with it, do, by degrees, weaken and destroy the motion of it.

The reason that this effect arises only in severe winter weather, is, that it is then only that the retracting action of the nitrous spicula is more than equal to the power or principle by which the fluid is otherwise kept in motion, or disposed for motion.

Several experiments of artificial freezing support this opinion.

For if you mix a quantity of common saltpetre with snow, or ice pulverized, and dissolve the mixture in the fire, and then immerge a tube full of water in the solution; the water, that part of it next the mixture, will freeze presently, even in a warm air.

Whence they argue, that the spicula of the salt are driven through the pores of the glass, and mixed with the water, by the gravity of the mixture, and of the incumbent air; for that it is evident, that the salt has this effect, inasmuch as it is certainly known, that the particles of water cannot find their way through the pores of the glass.

In these artificial freezings, in whatever part the mixture is applied, there is presently a skin or lamina of ice produced, whether at the top, bottom, or sides, by reason that there is always a stock of saline corpuscles, sufficient to overpower the particles of fire; but natural congelations are confined to the top of the water, where the last most abounds.

But this system is opposed by the author of the Nouvelle Conjecture pour expliquer la Nature de la Glace, who objects, that it does not appear, that the nitre always enters the composition of ice; but if it did, it would fall short of accounting for some of the principal effects; as,

How should the particles of nitre, by entering the pores of the water, and fixing the parts, cause the water to dilate, and render it specifically lighter? They should naturally augment its weight.

This and some other difficulties, shew the necessity of a new theory; and therefore the ingenious author advances this which follows, which seems to solve the phænomena in a manner that is more easy and simple, as not depending upon the admission or extrusion of any heterogeneous matter.

The water freezes in the winter only, because its parts, then being more closely joined together, mutually embarrass one another, and lose all the motion they had; and that the air, or rather an alteration in the spring and force of the air, is the cause of this closer union of water.

It is evident from experiment, that there are an infinite number of particles of gross air interspersed among the globules of water; and it is allowed, that each particle of air has the virtue of a spring; and hence this author argues, that the small springs of gross air, mixed with water, have more force in cold winter weather, and do then unbend themselves more, than at other times. Hence those springs thus unbending themselves on one side, and the external air continuing to press the surface of the water on the other, the particles of the water, being thus constringed and locked up together, must lose their motion and fluidity, and form a hard, consistent body, till a relaxation of the spring of the air, from an increase of heat, reduce the particles to their old dimensions, and leave room for the globules to flow again.

But this system seems to be built upon a false principle, for the spring or elasticity of the air is not increased by cold, but diminished; air condenses by cold, and expands itself by heat; and it is demonstrable in pneumatics, that the elastic force of expanded air is to that of the same air condensed, as the bulk when rarefied is to its bulk when condensed. Indeed, some authors, in order to account for the increase of the bulk and dimension of the specific gravity of frozen water, have advanced as follows, viz. That the aqueous particles, in their natural state, were nearly cubes, and so filled their space without the interposition of many pores; but that they are changed from cubes to spheres, by congelation; from whence it will necessarily follow, that there must be a great deal of empty space between them.

But, in opposition to this hypothesis, the nature of fluidity and firmness easily suggests, that spherical particles are much properer to constitute a fluid than cubical ones, and less disposed to form a fixed than cubic one.

But after all, in order to come to a consistent theory of freezing, we must either have recourse to the frigorific matter of the Corpuscularians, considered under the new light and advantages of the Newtonian philosophy, or to the ethereal matter of the Cartesians, under the improvements of Monf. Gauteron.

The true cause of freezing, or the congelation of water into ice, say the former, seems plainly to be the introduction of the frigorific particles into the pores or interstices between the particles of the water, and by that means getting so near them, as to be just within the spheres of one another's attracting force, and then they must cohere into one solid or firm body; but heat afterwards separating them, and putting them into various motions, breaks this union, and separates the particles so far from one another, that they get out of the distance of the attracting force, and into the verge of the repelling force, and then the water re-assumes its fluid form.

Now, that cold and freezing proceed from some substance of a saline nature floating in the air, seems probable from hence:

That all salts, and more eminently some particular ones, do prodigiously increase the force and effects of cold, when mixed with snow or ice. It is also evident, that all saline bodies produce a stiffness and rigidity in the parts of those bodies into which they enter.

It appears, by microscopical observations upon salts, that the figure of some salts, before they shoot into masses, are thin, double wedged, like particles which have abundance of surface, in respect to their solidity; and is the reason why they swim in water, when once raised in it, though specifically heavier.

These small points, getting into the pores of the water, whereby they are also, in some measure, suspended in the winter time, when the heat of the sun is not ordinarily strong enough to dissolve the salts into a fluid, to break their points, and to keep them in perpetual motion, being less disturbed, are at more liberty to approach one another; and, by shooting into crystals of the form above-mentioned, do, by both their extremities, insinuate themselves into the pores of the water, and by that means freeze it into a solid form. And it is apparent, that the dimensions of water are increased by freezing, the particles of it being kept at some distance from one another, by the intervention of the frigorific matter.

But besides this, there are many little volumes, or small particles of air, included at several distances, both in the pores of the watery particles, and in the interstices formed by their spherical figure. Now, by the insinuation of the crystals, the volumes of air are driven out of the watery particles, and many of them uniting, form larger volumes, which thereby have a greater force to expand themselves than when they are dispersed; and so both enlarge the dimensions, and lessen the specific gravity of water thus congealed into ice.

And hence (says Dr. Cheyne, from whom this last account is taken) we may guess at the manner how water,

ter, impregnated with salts, sulphurs, or earths, which are not easily dissolvable, may form itself into metals, minerals, gums, and other fossils; the parts of these mixtures becoming a cement to the particles of water, or getting into their pores, change them into these different substances.

For the second: as an ethereal matter or medium is generally allowed to be the cause of the motion of fluids, and as the air itself has all its motion from the same principle, it follows, that all fluids must remain in a state of rest or fixity, when that matter loses of its necessary force. And consequently, the air being less warmed in the winter time, by reason of the obliquity of the sun's rays, is more dense and fixed in winter than any other season of the year.

But farther: it is evident, from divers experiments, that the air does contain a salt which is supposed to be of the nature of nitre. If this be granted, and the density of the air allowed, it will follow, that the particles of this nitre must likewise be brought nearer together, and thickened by the condensation of the air; as on the contrary, a rarefaction of the air, and an augmentation of its fluidity, must divide and separate them.

And if the same happens to all liquors that have imbibed or dissolved any salt, if the warmth of the liquid keep the salt exactly divided, and if the coolness of a cellar, or of ice, cause the particles of the dissolved salt to approach, run into each other, and shoot into crystals; why should the air, which is allowed to be a fluid, be exempt from the general law of fluids?

It is true, that the nitre of the air, being grosser in cold weather than in hot, must have a less velocity; but still the product of its augmented mass into the velocity that remains, will give it a greater momentum, or quantity of motion. Nor is there any thing farther required to make this salt act with greater force against the parts of fluids, and this may probably be the cause of the great evaporation in frosty weather.

This aereal nitre must necessarily promote the concretion of liquids; for it is not the air, nor yet the nitre that it contains, which gives the motion to fluids; it is the ethereal medium, therefore a diminution of the motion of rest arises from the diminution of that force.

Now the ethereal matter, which in the winter time is weak enough, must still lose more of its force by its action against air condensed, and loaded with large particles of salt. It must therefore lose of its force in cold weather, and become less disposed to maintain the motion of the fluids.

In fine, the air, during frost, may be esteemed like the ice impregnated with salt wherewith liquors are iced in summer time. It is very probable that these liquors freeze by reason of a diminution of the motion of the ethereal medium, by its acting against the ice and salt together, and the air is not able to prevent its concretion by all its scorching heat.

The air (says Mr. Boyle) being a fluid as well as water, and impregnated with salts of different kinds, it is not improbable, that what happens in water impregnated with such salts, may also happen in the air. Two proper quantities of different salts being dissolved in hot water, they floated undistinguishably in it, and retained a capacity to act in conjunction upon several occasions; yet when the liquor becomes cold, the saline particles of one kind being no longer agitated by a due degree of heat, shot into crystals; and, losing their fluidity and motion, visibly separated themselves from the other, which still continued fluid in the liquor, and capable of acting separately.

We have divers accounts in the Philosophical Transactions, of a freezing rain which fell in the west of England in December 1672. This rain, as soon as it touched any thing above the ground, as a bough, or the like, immediately settled into ice; and, by multiplying and enlarging the icicles broke all down with its weight; the rain that fell on the snow immediately froze into ice, without sinking into the snow at all.

It made an incredible destruction of trees beyond any thing in all history. A certain gentleman weighed a sprig of an Ash-tree of just three quarters of a pound, the ice which was on it weighed 16 pounds; that some persons were frighted with the noise in the air, till they understood that it was the clatter of icy boughs dashed against each other.

Dr. Beale remarks, that there was no considerable frost observed on the ground during the whole time; whence he concludes, that a frost may be very fierce and dangerous on the tops of some hills and plains, while in other places it keeps at two, three, or four feet distance above the ground, rivers, lakes, &c. and may wander about very furious in some places, and remiss in others not far off. The frost was followed by glowing heats, and a wonderful forwardness of flowers and fruits. The effects of freezing vegetables, is farther explained under the article of Frost.

FRITILLARIA. Lin. Gen. Plant. 372. Tourn. Inst. R. H. 376. tab. 201. Corona Imperialis. Tourn. Inst. R. H. 372. tab. 197, 198. Fritillary, or Chequered Tulip and Crown Imperial.

The Characters are,

*The flower hath no empalement; it hath six oblong petals, is bell-shaped, and spreading at the base; in the hollow, at the base of each petal, is situated a nectarium; the flower hath six stamina standing near the style, which are terminated by oblong four-cornered summits. In the center is situated an oblong three-cornered germen, supporting a single style which is longer than the stamina, crowned by a spreading obtuse stigma. The germen afterward becomes an oblong capsule with three lobes having three cells, which are filled with flat seeds, ranged in a double order.*

The capsule of Fritillaria is oblong and smooth, but that of Corona Imperialis hath acute borders, or membranaceous wings.

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes the plants which have six stamina in their flowers, and but one style.

These two genera of Fritillary and Crown Imperial, have been always separated, till Dr. Linnæus joined them together; indeed by their flowers they may be properly enough placed in the same genus; but, if their fruit may be allowed as a characteristic note, they should be separate; however, as this new system is generally received, I shall, in compliance with the present taste, join them together.

The Species are,

1. Fritillaria (*Melagris*) foliis linearibus alternis, floribus terminalibus. *Fritillary with narrow leaves placed alternate, and flowers terminating the stalk.* Fritillaria præcox, purpurea, variegata. C. B. P. 64. *Early, purple, variegated, chequered Tulip.*
2. Fritillaria (*Aquitanica*) foliis infimis oppositis. Hort. Cliff. 81. *Fritillary whose lower leaves are opposite.* Fritillaria Aquitanica, flore luteo obscuro. Swert. Floril. *Aquitain chequered Tulip, with an obscure yellow flower.*
3. Fritillaria (*Nigra*) floribus adscendentibus. *Fritillary with flowers growing above each other.* Fritillaria nigra. Lob. Adver. 2. 496. *Black chequered Tulip.*
4. Fritillaria (*Lutea*) foliis lanceolatis, caule unifloro maximo. *Fritillary with spear-shaped leaves, and one large flower on each stalk.* Fritillaria lutea maxima Italica. Park. Parad. 43. *Largest yellow Italian Fritillary.*
5. Fritillaria (*Umbellata*) floribus umbellatis. *Fritillary with flowers growing in umbels.* Fritillaria umbellifera. C. B. P. 64. *Umbellated chequered Tulip.*
6. Fritillaria (*Persica*) racemo nudiusculo, foliis obliquis. Hort. Upsal. 82. *Fritillary with a naked spike of flowers and oblique leaves.* Lilium Persicum. Dod. Pempt. 220. *The Persian Lily.*
7. Fritillaria (*Racemosa*) floribus racemosis. *Fritillary with flowers growing in bunches.* Fritillaria ramosa, seu lilium Persicum minus. Mor. Hort. Reg. Blef. *Branching Fritillary, or smaller Persian Lily.*

8. Fri-

8. Fritillaria (*Imperialis*) racemo comoso infernè nudo, foliis integerrimis. Lin. Hort. Upsal. 82. *Fritillary with a tufted bunch of leaves over the flowers, which is naked below, and entire leaves.* Corona Imperialis. Dod. Pempt. 202. *Crown Imperial.*

9. Fritillaria (*Regia*) racemo comoso infernè nudo, foliis crenatis. Lin. Sp. Plant. 303. *Fritillary with a tufted bunch of leaves over the flowers, which is naked below, and crenated leaves.* Corona regalis lilii folio crenato. Hort. Elth. 110. *Royal Crown with a crenated Lily leaf.*

10. Fritillaria (*Autumnalis*) racemo infernè nudo, foliis oblongis mucronatis. *Fritillary with a naked stalk, and oblong pointed leaves.*

The first sort grows naturally in Italy, and other warm parts of Europe; and from the seeds of this there have been great varieties raised in the gardens of the florists, which differ in the size and colour of their flowers; and as there are frequently new varieties produced, so it would be to little purpose to enumerate those which are at present in the English and Dutch gardens, which amount to a great number in the catalogues of the Dutch florists, who are very fond of any little distinction, either in the colour or shape, to enlarge their lists.

The sorts which are here enumerated, I think may be allowed as distinct species, notwithstanding Dr. Linnæus has reduced them to five; for I have raised many of all the sorts from seed, which have constantly produced the same as the seeds were taken from, and have only differed in the colour or size of the flowers; for the sort with broad leaves produced the same sort again, and the umbellated and spiked sorts produced the same, though there are several varieties in the colours of their flowers.

The first hath a round compressed root, in shape like that of Cornflag, but is of a yellowish white colour; the stalk rises about fifteen inches high, having three or four narrow long leaves placed alternately, and the top is divided into two slender foot-stalks which turn downward, each sustaining one bell-shaped inverted flower, composed of six petals, which are chequered with purple and white like a chess-board; and in the center is situated a germen supporting one style, crowned by a trifid stigma; the six stamina stand about the style, but are shorter. At the bottom of each petal there is a cavity, in which is situated a nectarium, filled with a sweet liquor; after the flower is fallen, the germen swells to a pretty large three-cornered blunt capsule, and then the foot-stalk is turned and stands erect; when the seeds are ripe, the capsule opens in three parts and lets out the flat seeds, which were ranged in a double order. The flowers of this appear the latter end of March or beginning of April, and the seeds are ripe in July. There is a variety of this with a double flower.

The second sort grows naturally in France; the leaves of this are broader, and of a deeper green than the former; the lower leaves are placed opposite, but those above are alternate; the stalk rises a foot and a half high, and is terminated by two flowers of an obscure yellow colour, which spread more at the brim than those of the first sort, but are turned downward in the same manner. This flowers three weeks after the first. There is a variety of this with greenish flowers, which grows naturally in some parts of England.

The third sort seldom rises more than a foot high, the leaves are narrow like those of the first sort, but are shorter; each stalk is terminated by three or four flowers, which arise above each other; they are of a very dark purple, chequered with yellowish spots. This flowers in April, about the same time with the second.

The fourth sort rises about a foot high, the stalk is garnished with spear-shaped leaves four inches long and one broad, of a grass-green colour; these are sometimes placed opposite, but are generally alternate; the stalk is terminated by one large bell-shaped flower of a yellowish colour, chequered with light purple. This sort flowers about the same time as the first. There are two or three varieties of this, which differ in the size and colour of their flowers and the breadth of their leaves, but retain their specific difference, so as to be easily distinguished from the other sorts.

The fifth sort rises a foot and a half high; the stalk is garnished with shorter and broader leaves than the first sort, which are of a grayish colour; the flowers are produced round the stalks like those of the Crown Imperial; they are of a dark purple colour, chequered with a yellowish green. This flowers about the same time with the second sort.

The sixth sort is commonly called the Persian Lily, and is supposed to grow naturally in Persia, but has been long cultivated in the English gardens; the root of this sort is round and large, the stalk rises three feet high; the lower part of it is closely garnished with leaves which are three inches long, and half an inch broad, of a gray colour, standing on every side of the stalks, but are twisted obliquely; the flowers grow in a loose spike at the top of the stalk, forming a pyramid; they are shaped like those of the other species, but are much shorter, and spread wider at their brims, and are not bent downward like those. They are of a dark purple colour, and appear in May, but are seldom succeeded by seeds in England, so are only propagated by offsets.

The seventh sort hath a much shorter stalk than the last, but is garnished with leaves like those, only they are smaller; the stalks branch out at the top into several small foot-stalks, each sustaining one dark coloured flower. This is commonly called the small Persian Lily, from its resemblance to the former sort.

These plants are propagated either by seeds, or offsets from the old roots; by the first of which methods new varieties will be obtained, as also a larger stock of roots in three years, than can be obtained in twenty or thirty years in the latter method: I shall therefore first treat of their propagation by seeds.

Having provided yourself with some good seeds, saved from the fairest flowers, you must procure some shallow pans or boxes, which must have some holes in their bottoms to let out the moisture; these you should fill with light fresh earth, laying a few potsheards over the holes, to prevent the earth from stopping them; then, having laid the earth very level in the boxes, &c. you must sow the seeds thereon pretty thick, covering it with fine sifted earth a quarter of an inch thick. The time for sowing the seed is about the beginning of August, for if it be kept much longer out of the ground it will not grow; then place the boxes or pans where they may have the morning sun until eleven o'clock, observing, if the season proves dry, to water them gently, as also to pull up all weeds as soon as they appear; for if they are suffered to remain until they have taken deep root into the earth, they would draw the seeds out of the ground whenever they are pulled up. Toward the latter end of September you should remove the boxes, &c. into a warmer situation, placing them close to a hedge or wall exposed to the south; if they are sown in pots, these should be plunged into the ground, but they are best in tubs; these should be covered in severe frost. In this situation they may remain until the middle of March, by which time the plants will be come up an inch high; you must therefore remove the boxes, as the weather increases hot, into a more shady situation; for while the plants are young, they are liable to suffer by being too much exposed to the sun: and in this shady situation they may remain during the heat of the summer, observing to keep them clear from weeds, and to refresh them now and then with a little moisture; but be careful not to give them much water after their leaves are decayed, which would rot their roots. About the beginning of August, if the roots are very thick in the boxes, you should prepare a bed of good light fresh earth, which must be levelled very even, upon which you should spread the earth in the boxes in which

which the ſmall roots are contained, equally covering it about one fourth of an inch thick with the ſame freſh earth: this bed ſhould be ſituated in a warm poſition, but not too cloſe to hedges, walls, or pales, which would cauſe their leaves to be long and ſlender, and make the roots weaker than if placed in a more open expoſure.

In this bed they may remain until they flower, which is generally the third year from ſowing; at which time you ſhould put down a mark to the roots of all ſuch as produce fair flowers, that at the time of taking them out of the ground (which ought to be ſoon after their green leaves are decayed) they may be ſelected into a bed amongſt your old roots of this flower, which, for their beauty, are preſerved in the beſt gardens; but the other leſs valuable flowers may be planted in the borders of the parterre-garden for their variety, where, being intermixed with other flowers of different ſeaſons, they will make a good appearance.

The fine ſorts of this flower ſhould remain undiſturbed three years, by which time they will have produced many offſets; and ſhould be taken up when their leaves are decayed, and planted into a freſh bed, taking ſuch of their offſets as are large enough to produce flowers to plant in the flower-garden; but the ſmaller roots may be planted into a nurſery-bed, until they have obtained ſtrength enough to flower; but you muſt never ſuffer theſe roots to lie out of the ground when you remove them, but plant them again immediately, otherwiſe they will periſh.

During theſe three years which I have adviſed the roots to remain in the beds, the ſurface of the earth ſhould be ſtirred every autumn with a trowel, obſerving not to go ſo deep as to bruiſe the root, and at the ſame time lay a thin cover of very rotten dung or tanners bark upon the ſurface of the beds; which, being waſhed into the ground, will cauſe the flowers to be larger, as alſo the roots to make a greater increaſe: you muſt alſo obſerve to keep them conſtantly clear from weeds, and thoſe roots which you would preſerve with care, ſhould not be ſuffered to ſeed.

When a ſtock of good flowers are obtained, they may be preſerved and increaſed in the ſame manner as other bulbous rooted flowers, which is by offſets ſent out from their roots, which ſhould be taken off every other year from the fineſt ſorts; but the ordinary flowers may remain three years undiſturbed, in which time they will have multiplied ſo much, as that each root will have formed a cluſter; ſo that if they are left longer together, the roots will be ſmall, and the flowers very weak; therefore, if theſe are taken up every other year, the roots will be the ſtronger. Theſe roots may be treated in the ſame manner as Tulips, and other bulbous rooted flowers, with this difference only, that the roots will not bear to be kept out of the ground ſo long; therefore, if there ſhould be a neceſſity for keeping them out of the ground any time, it will be beſt to put the roots into ſand to prevent their ſhrinking.

As theſe flowers come out early in the ſpring, they make a pretty appearance in the borders of the pleaſure-garden, where they are planted in ſmall clumps; for when they ſtand ſingle in the borders, they make but a poor figure.

The eighth ſort is the Crown Imperial, which is now very common in the Engliſh gardens. This grows naturally in Perſia, from whence it was firſt brought to Conſtantinople, and about the year 1570, was introduced to theſe parts of Europe; of this flower there are a great variety now preſerved in the gardens of floriſts, but as they have been produced accidentally from ſeeds, they are but one ſpecies; however, for the ſatisfaction of the curious, I ſhall here mention all the varieties which have come to my knowledge.

1. The common Crown Imperial; this is of a dirty red colour.
2. The yellow Crown Imperial; this is of a bright yellow.
3. The bright red Crown Imperial, called Fuſai.
4. The pale yellow Crown Imperial.
5. The yellow ſtriped Crown Imperial.
6. The large flowering Crown Imperial.
7. The broad leaved late red Crown Imperial.
8. The double and triple crowned Imperial Crown.
9. The double red Crown Imperial.
10. The double yellow Crown Imperial.
11. The ſilver ſtriped leaved Crown Imperial.
12. The yellow ſtriped leaved Crown Imperial.

There are ſome few other varieties which are mentioned in the catalogues of the Dutch floriſts, but their diſtinctions are ſo minute, that they are not diſtinguiſhable, ſo I ſhall paſs them over, as thoſe here inſerted are all that I have ſeen growing either in England or Holland, which deſerved any diſtinction.

The Crown Imperial hath a large round ſcaly root of a yellow colour, and a ſtrong odour of a fox; the ſtalk riſes to the height of four feet or upward; it is ſtrong, ſucculent, and garniſhed two-thirds of the length on every ſide, with long narrow leaves ending in points, which are ſmooth and entire; the upper part of the ſtalk is naked, a foot in length; then the flowers come out all round the ſtalk upon ſhort foot-ſtalks, which turn downward, each ſuſtaining one large, ſpreading, bell-ſhaped flower, compoſed of ſix ſpear-ſhaped petals; at the baſe of each petal is a pretty large cavity, in which is ſituated a large white nectarium, filled with a mellous liquor. In the center of the flower is fixed a three-cornered oblong germen, upon which reſts the ſingle ſtyle, which is the length of the petals, and is crowned by a ſpreading obtuſe ſtigma; round the ſtyle there are ſix awl-ſhaped ſtamina which are ſhorter than the ſtyle, and are terminated by oblong four-cornered ſummits. Theſe flowers hang downward, and above them riſes a ſpreading tuft of green leaves, which are erect, and from between theſe come out the foot-ſtalks of the flowers: when the flowers decay, the germen ſwells to a large hexagonal capſule, ſhaped like a water-mill, having ſix cells, which are filled with flat ſeeds. This plant flowers the beginning of April, and the ſeeds are ripe in July.

The ſort with yellow flowers, that with large flowers, and thoſe with double flowers, are the moſt valuable; but that which hath two or three whorls of flowers above each other, makes the fineſt appearance; though this ſeldom produces its flowers after this manner the firſt year after removing, but the ſecond and third year after planting, the ſtalks will be taller, and frequently have three tier of flowers, one above another, which is called the Triple Crown. The ſtalks of this ſort frequently run flat and broad, when they produce a greater number of flowers than uſual; but this is only a luxuriancy of nature, not conſtant, though many of the writers have mentioned it as a particular variety.

As this is one of the earlieſt tall flowers of the ſpring, it makes a fine appearance in the middle of large borders, at a ſeaſon when ſuch flowers are much wanted to decorate the pleaſure-garden: but the rank fox-like odour which they emit, is too ſtrong for moſt people, ſo hath rendered the flowers leſs valuable than they would have been; for there is ſomething very pleaſing in the ſight of them at a diſtance, ſo that were it not for the offenſive ſmell of the leaves and flowers, it would be more frequently ſeen in all gardens for pleaſure.

This may be propagated by ſeeds, or offſets from the root; the firſt is too tedious for moſt of the Engliſh floriſts, becauſe the plants ſo raiſed, are ſix or ſeven years before they flower; but the Dutch and Flemiſh gardeners, who have more patience, frequently raiſe them from ſeeds, ſo get ſome new varieties, which rewards their labour. The method of propagating theſe flowers from ſeeds, being nearly the ſame as for the Tulip, the reader is deſired to turn to that article, where there are full directions for performing it.

The common method of propagating them here, is by offſets ſent out from the old roots, which will

flower ſtrong the ſecond year after they are taken from the roots; but in order to have plenty of theſe, the roots ſhould not be tranſplanted oftener than every third year, by which time each root will have put out ſeveral offsets, ſome of which will be large enough to flower the following year, ſo may be planted in the borders of the flower-garden, where they are to remain; and the ſmaller roots may be planted in a nurſery-bed, to grow a year or two according to their ſize; therefore they ſhould be ſorted, and the ſmalleſt roots planted in a bed together, which ſhould remain there two years, and the larger by themſelves to ſtand one year, by which time they will have acquired ſtrength enough to flower, ſo may then be removed into the pleaſure-garden.

The time for taking up theſe roots is in the beginning of July, when their ſtalks will be decayed; and they may be kept out of the ground two months, but they ſhould be laid ſingle in a dry ſhady room, but not in heaps, or in a moiſt place, which will cauſe them to grow mouldy and rot. The offsets ſhould be firſt planted, for as theſe are ſmall, they will be apt to ſhrink if they are kept long out of the ground.

As the roots are large, they muſt not be planted too near other flowers; and when they are planted in beds by themſelves, they ſhould not be nearer than a foot and a half in the rows, and two feet row from row; they ſhould be planted ſix inches deep at leaſt, eſpecially the ſtrong roots: they delight in a light ſoil, not too wet, nor very full of dung; therefore, if any dung is laid upon the borders where they are planted, it ſhould be buried pretty deep, ſo as to be two or three inches below the roots.

The ninth and tenth ſorts grow naturally at the Cape of Good Hope, from whence they were brought into the European gardens. The ninth has been many years an inhabitant, where it has been uſually titled Corona Regalis. This has a tuberoſe root, from which ariſe in the autumn ſix or eight obtuſe leaves, near five inches long and two broad toward the top, growing narrower at their baſe, and are crenated on their borders, lying flat on the ground; theſe continue all the winter: in the ſpring ariſes the flower-ſtalk in the center of the leaves, about ſix inches high, naked at the bottom; but the upper part is ſurrounded by bell-ſhaped flowers, compoſed of ſix greeniſh petals, with an oval germen ſituate at the bottom, ſurrounded by ſix ſtamina, ſupporting a triangular ſtyle, crowned by a trifid ſtigma; the germen afterwards becomes a roundiſh capſule, but rarely perfects ſeeds in England. This flowers in April, and the leaves decay in June.

The ſecond ſort I raiſed from ſeeds, which were ſent me from the Cape of Good Hope: the root of this is like that of the ninth ſort, but the leaves are more than a foot long, broad at their baſe, but are narrowed to the top, where they end in acute points; the flower-ſtalk riſes rather higher than that of the ninth, but the flowers are of the ſame ſhape and colour: this ſeldom flowers till Auguſt. The roots of this ſort were ſtolen out of the Chelſea garden the following ſpring after it had flowered, and were ſold to ſome perſons whoſe love for rare plants exceeded their honeſty.

FRITILLARIA CRASSA. See Asclepias.

FRONDOSE [frondoſus, *Lat.*] full of leaves, or ſhoots.

FROST may be defined to be an exceſſive cold ſtate of the weather, whereby the motion and fluidity of the liquors are ſuſpended; or, it is that ſtate of the air, &c. whereby fluids are converted into ice.

By froſt metals contract, or are ſhortened. Monſ. Auzout found by an experiment, that an iron tube twelve feet long, upon being expoſed to the air in a froſty night, loſt two lines of its length; but this may be ſuppoſed to be wholly the effect of cold.

On the contrary, froſt does not contract fluids, but, on the other hand, ſwells or dilates them near one tenth of their bulk.

Mr. Boyle gives us ſeveral experiments of veſſels made of metals exceeding thick and ſtrong, which being filled with water, cloſe ſtopped, and expoſed to the cold, the water, being expanded by freezing, and not finding either room or vent, burſt the veſſels.

A ſtrong barrel of a gun, with water in it, being ſtopped cloſe, and frozen, was rent the whole length; and a ſmall braſs veſſel, five inches deep, and two in diameter, filled with water, &c. and frozen, lifted up its lid, which was preſſed with a weight of fifty-ſix pounds.

There are alſo related many remarkable effects of froſt on vegetables. Morery, Hiſt. de France, ſays, That trees are frequently ſcorched and burnt up with froſt, as with the moſt exceſſive heat, and that even in ſo warm a climate as Provence.

Mr. Bobart relates, That in the great froſt anno 1683, Oaks, Aſhes, Walnut-trees, &c. were miſerably ſplit and cleft, ſo as they might be ſeen through, and this too with terrible noiſes like the exploſion of fire arms; that the clifts were not only in the bodies, but continued to the larger boughs, roots, &c. Philoſ. Tranſact. N° 105.

Dr. Derham ſays, That the froſt in 1708, was remarkable through the greateſt part of Europe; and the greateſt in degree, if not the moſt univerſal, in the memory of man; that it extended throughout England, France, Germany, Denmark, Italy, &c. but was ſcarce felt in Scotland and Ireland. All the Orange-trees and Olives in Italy, Provence, &c. and all the Walnut-trees throughout France, with an infinity of other trees, periſhed by the froſt.

Monſ. Gouteron ſays, They had a gangrene on them, which he takes to be the effect of a corroſive ſalt, which corrupted and deſtroyed their texture. He adds, That there is ſo much reſemblance between the gangrene befalling plants through froſt, and that which the parts of animals are liable to, that they muſt have ſome analogous cauſe. Corroſive humours burn the parts of animals, and the aëreal nitre, condenſed, has the ſame effects on the parts of plants. Memoires de l' Academie Royale de Sciences, an. 1709.

Dr. Derham ſays, That the greateſt ſufferers in the animal kingdom were birds and inſects, but vegetables were much the greateſt ſufferers; that few of the tender ſorts of vegetables eſcaped the ſeverity of the froſt; Bays, Laurels, Roſemary, Cypreſs, Alaternuſes, Phillyreas, Arbutuſes, Lauruſtinuſes, and even Furz, with moſt ſort of the fruteſcent herbs, as Lavenders, Abrotanums, Rue, Thyme, &c. were generally deſtroyed. He adds, that the ſap of the finer wall-fruit was ſo congealed and deſtroyed, that it ſtagnated in the limbs and branches, and produced diſorders like to chilblains in human bodies, which would turn to mortifications in many parts of the trees; that the very buds of the finer trees, both in the leaf, buds, and bloſſom buds, were quite killed, and dried into a farinacious matter.

Dr. Derham relates it as a common obſervation, That vegetables ſuffered more from the ſun than from the froſt, in that the ſun-ſhine, melting the ſnow, and opening the ground, left it more expoſed to the rigour of the enſuing night. It was likewiſe obſerved, at a meeting of the Royal Society, That the calamities which befel trees, aroſe not purely from their being frozen, but principally from the winds ſhaking and rocking them when they are frozen, which rent and parted their fibres. Philoſ. Tranſact. N° 324.

Hoar froſt, or white froſt, is the dew frozen, or congealed early in cold mornings, chiefly in autumn. This (as Mr. Regis obſerves) is an aſſemblage of little parcels of ice or cryſtals, which are of various figures, according to the diſpoſition of the vapours which meet and are condenſed by cold.

Dew is, to all appearance, the matter of hoar froſt, though many of the Carteſians ſuppoſe it to be formed of a cloud, and either congealed in the cloud, and ſo let fall, or ready to be congealed as ſoon as it arrives at the earth.

In the year 1728-9, there was a remakable froſt, which continued for ſome months, and deſtroyed a great number of trees and plants in ſeveral parts of Europe, a brief

a brief account of which may not be improper to be here inserted.

The autumn began with cold north and east winds, and early in November the nights were generally frosty, though the frost did not enter the ground deeper than the sun thawed the following day; but toward the end of November the winds blew extremely cold from the north, which was succeeded by a great snow, which fell in such quantities in one night, as to break off large arms, as also the tops of many Evergreen-trees, on which it lodged. After the snow had fallen, it began to freeze again, the wind continuing to blow from the north; the days were dark and cloudy for some time, but afterwards it cleared up, and the sun appeared almost every day, which melted the snow where exposed to it, whereby the frost penetrated deeper into the ground. It was observable, that, during these clear days, a great mist or vapour, appeared in the evenings, floating near the surface of the ground until the cold of the night came on, when it was suddenly condensed, and disappeared. About the 8th of December, the nights were extremely cold; the spirits in the thermomoter fell 18 degrees below the freezing point, and on the 10th of the same month the frost was as severe as had been known in the memory of man; the spirits of the thermometer fell to 20 degrees below the freezing point. At this time vast numbers of Laurustinuses, Phillyreas, Alaternuses, Rosemary, Arbutus, and other Evergreen-trees and shrubs began to suffer; especially such as had been trimmed up to heads with naked stems, or had been clipped late in autumn. At this time also there were great numbers of large deciduous trees disbarked by the frost, as Pear-trees, Plane-trees, Walnut-trees, with many other sorts, and it was chiefly on the west and south-west side of the trees, that the bark came off.

About the middle of December the frost abated of its intenseness, and seemed to be at a stand till the 23d of the same month, when the wind blew extremely sharp and cold from the east, and the frost increased again, continuing very sharp till the 28th day, when it began to abate again, and seemed to be going off, the wind changing to the south; but it did not continue long in this point, before it changed to the east again, and the frost returned, though it was not so violent as before.

Thus the weather continued for the most part frosty, till the middle of March, with a few intervals of mild weather, which brought forward some of the early flowers; but the cold returning, soon destroyed them: so that those plants which usually flower in January and February, did not this year appear till March, and before they were fully blown, were cut off by the frost; of this number were all the Spring Crocuses, Hepaticas, Persian Irises, Black Hellebores, Mezereons, with some others.

The Cauliflower plants, which were planted out of the beds in the open ground, during the intervals between the frost, were most of them destroyed, or so much cut, that they lost most of their leaves; the early Beans and Peas were most of them killed, and many fruit and forest trees, which had been lately removed, were quite destroyed. The loss was very great to some curious persons, who had been many years endeavouring to naturalize great numbers of exotic trees and shrubs, abundance of which were either totally killed, or destroyed to the surface of the ground; amongst this number there were many sorts destroyed, which had endured the open air many years, without receiving the least injury from the cold, such as Passion Flowers, Cork-trees, Cistuses, Rosemary, Stœchas, Sage, Mastich, and some others. In some places the young Ash and Walnut-trees were killed; but when the frost went off, there appeared to have been much more damage done in the gardens, than there really was, which occasioned many people to dig up and destroy large quantities of trees and shrubs, which they supposed were killed; whereas those who had more patience, and suffered them to remain, fared better; for great numbers of them shot out again, some from their stems and branches, and others from their roots, the following summer.

Nor was the frost more severe in England, than in other parts of Europe; but, on the contrary, in comparison, favourable; for in the southern parts of France, the Olives, Myrtles, Cistuses, Alaternuses, and several other trees and shrubs, which grow there almost spontaneously, were either destroyed, or at least were killed to their roots; and about Paris, and the northern parts of France, the buds of their fruit-trees were destroyed, although they remained closed, so that there were very few blossoms which opened that spring. The Fig-trees were in several parts of France quite killed, and in England their tender branches were destroyed, so that there was very little fruit on those trees the following summer, except where they were protected from the frost.

In Holland the Pines and Firs, with several other trees, which are natives of cold countries, were greatly injured by the cold; and most of the trees and shrubs, which were brought from Italy, Spain, or the south parts of France, which had been planted in the full ground, in that country, were entirely killed, though many other sorts, which had been brought from Virginia and Carolina, escaped very well in the same gardens; but the person who suffered most in that country, was the learned Dr. Boerhaave, who had been several years endeavouring to naturalize as many exotic trees and shrubs as he could possibly obtain from the several parts of the world, great numbers of which were entirely destroyed by the frost this winter.

In some parts of Scotland they not only lost many of their curious flowers, plants, and trees, but great numbers of sheep, and other cattle, were buried under the snow, where they perished; and many poor people, who went to look after their cattle, were equal sufferers with them, being buried in the snow, which in some places fell eight or nine feet deep in one night.

It has been observed by thermometers, when that kind of hovering lambent fog arises (either mornings or evenings) which frequently betokens fair weather, that the air, which in the preceding day was much warmer, has, upon the absence of the sun become many degrees cooler than the surface of the earth, which being near 1500 times denser than the air, cannot be so soon affected with the alteration of heat and cold; whence it is probable, that those vapours which are raised by the warmth of the earth, are by the cooler air soon condensed into a visible form. The same difference has been observed between the coolness of the air, and the warmth of water in a pond, by putting a thermometer, which hung all night in the open air in summer time, into the water, just before the rising of the sun, when the like reek, or fog, was rising on the surface of the water.

In the year 1739-40, we had another severe winter, which did great mischief to the gardens, fields, and woods, the effects of which are yet, and will be many years, felt in Europe. Some particulars of these depredations, may not, perhaps, be unacceptable to the reader, if they are here mentioned.

The wind set in blowing from the north and north-east, about the autumnal equinox, and continued to blow from the same quarter, with little variation, upward of six months. Early in November, there was a continued sharp frost for nine days, in which time the ice upon large ponds, and other standing waters, was frozen so hard as to bear persons who skated thereon; but toward the end of November the frost abated, and there was little more than slight morning frosts until Christmas day, when it froze pretty hard that morning, and continued every morning so to do; but on the 28th day of December, the wind blew with great strength from the north-east, and brought on severe cold; that night the frost penetrated very deep into the ground, and the next day, viz. the 29th, the wind changed to the southward of the east, and blew with great fury; the thermometer fell this day to

twenty-

twenty-five degrees below froſt; in the morning ſome little ſnow fell, but the violence of the wind carried it off; but cold ſtill increaſing, the waters were all frozen over, and that day it was ſo intenſe, as to freeze the water of the river, which was raiſed by the force of the wind into ice, before it fell down again. The wind continued to blow with the ſame force, and from the ſame quarter, all the 30th day, the cold ſtill increaſing, ſo that at this time the froſt penetrated into moſt of the green-houſes in England, but eſpecially into all thoſe whoſe fronts had the leaſt inclination to the eaſt; and ſuch of them as fronted the ſouth-weſt eſcaped beſt, where the back walls were of a ſufficient thickneſs to keep out the froſt; the ſpirits in the thermometer fell in the night of the 30th day to thirty-two degrees below the freezing point, which was lower than it had been known in England before; the violence of the wind made it very troubleſome for perſons of the moſt robuſt conſtitutions to be abroad, and this alſo cauſed the froſt to penetrate through thick walls, and in the ſpace of two days, the Evergreen-trees and ſhrubs appeared as if they had been ſcorched by fire, ſo that they ſeemed to have no life; the only trees of all the ſorts of Evergreens which retained their verdure at this time, were the Portugal Laurel, Savin, and ſhrubby Hartwood; theſe in the midſt of this ſevere froſt remained unhurt, when all the others were as brown as if they had been dead a year; and it was very late in the ſpring, before any of them reſumed their uſual verdure: during theſe ſevere days there had but little ſnow fallen, ſo that the froſt penetrated deep in the ground, and deſtroyed the roots of great part of the vegetables, where they were not well ſecured; the Artichoke roots were moſt of them killed in all the kitchen-gardens, ſome few only eſcaped, theſe were ſuch as were not intended to be preſerved. A ſingle row of theſe roots, which were growing in a place where a great quantity of dung had been wheeled over them, whereby the ground was rendered as hard as that of a common foot-way, though there was no covering upon theſe roots, yet they ſurvived the froſt and did well; another parcel which was growing near a tan-yard, where, by accident, ſome tan had been thrown, were preſerved, ſo that from ſome of theſe accidents we were ſo lucky as to retrieve the good kind of Artichoke, which the Engliſh gardens were ſo famous for being ſtocked with.

By the ſharp piercing winds the Graſs was almoſt totally burned up, ſo that there was not the leaſt verdure to be ſeen in the fields, and in many places the ſweeteſt and beſt kinds of the herbage were entirely killed, ſo that there remained only the ſtrong rough kinds of graſs, whereby the paſtures were in general much damaged; but on the 31ſt day in the evening, the wind being much abated, the ſeverity of the froſt was not ſo great, and there ſeemed an appearance of a thaw on the firſt and ſecond of January, but on the third in the evening the froſt ſet in again with great violence; and on the fourth of January in the morning, the thermometer was fallen one degree lower than it had been before. The ſame morning there was the greateſt hoary froſt which had been ſeen, the woods, trees, and hedges, appeared as if they had been covered with ſnow; and although there was no wind ſtirring, yet the air was ſo ſharp and penetrating, as to render it difficult to endure the cold, even with great exerciſe.

The timber-trees ſuffered greatly that morning, eſpecially the Oaks, which were ſplit with great violence; and the noiſe in the woods that morning, reſembled that of great branches breaking down in every part of the woods, and when heard at a diſtance, like the firing of guns. This was little attended to at the time, but the timber which has been ſince fallen, ſufficiently proves the great damage which the woods then ſuſtained; nor was it here the calamity ſtopped, for the Oaks in general had received ſo much injury from the froſt, as to occaſion ſuch a weakneſs and diſtemper among them, that the following ſpring they were infeſted with inſects to ſuch a degree, as that their leaves were eaten and entirely deſtroyed by them; ſo that at Midſummer the trees were as naked as if it had been the beginning of April; and this diſtemper continued for two years after, almoſt as bad as at firſt, and has leſſened by degrees, as the trees have recovered their ſtrength; and where the trees were old and weak, they have not yet gotten the better of this diſtemper.

The herbage was alſo ſo much weakened by the ſeverity of the froſt, as not to be able to reſiſt the attack made upon it by inſects, ſo that innumerable quantities of them were diſcovered in the paſtures in many parts of Europe, beginning firſt in the northern countries, and afterward ſpreading to the ſouth; and theſe inſects in many places were ſo numerous, as to deſtroy the ſward of Graſs, and it is to be feared the diſtemper which ſo long raged among the cattle may have been owing to this cauſe; for wherever the diſtemper ſpread, it has been obſerved, that numbers of theſe inſects have harboured about the roots of the Graſs: and as a farther proof of this, it has conſtantly been remarked, that, when theſe grubs are changed into a ſort of beetle, and take their flight (which is commonly about the beginning of May,) the diſtemper ceaſes; and when theſe beetles have depoſited their eggs in autumn, the diſtemper has raged again. Another remark has been made, that theſe beetles always chuſe to depoſit their eggs not at a great diſtance from rivers, or large pieces of water, and in ſuch places the cattle have been moſt attacked. There might be many other circumſtances mentioned in favour of this opinion, as alſo the ſeveral experiments which have been made by ſome of the members of the Academy of Sciences at Paris, which are ſufficient to prove, that the diſtemper was not infectious, nor can be communicated by the cattle, notwithſtanding it has been treated as ſuch in many countries, where has been an immenſe loſs to the public of ſuch numbers of cattle and their hides; but this may require a particular treatiſe, therefore I ſhall not enlarge farther on this head at preſent.

The froſt ſtill continued very hard till toward the end of January, but not ſo violent as at the beginning; for had the wind continued to blow with ſo much force as it had done the three firſt days of the froſt, for any conſiderable time longer, there would have been few vegetables able to have reſiſted the cold, nor would the animal kingdom have fared much better; for the cold was ſo intenſe during thoſe few days, as to kill ſeveral of the weaker ſort of cattle, where they were much expoſed to the wind.

The Walnut-trees, Aſh, and ſeveral other trees, had moſt of their ſhoots of the former year deſtroyed, which cauſed them to be very late before they put out their new ſhoots the following ſpring, and theſe ſhoots were produced from the two and three years branches. The Fig-trees in many places were killed almoſt to the ground, eſpecially thoſe which were growing againſt the beſt aſpected walls, for thoſe on the north and north-weſt aſpects, as alſo the old ſtandard Fig-trees eſcaped better; but all thoſe ſtools and layers of theſe trees, which were growing in the nurſery-gardens, were ſo much injured by the froſt, as not to be recovered under three years, during which time there were ſcarce any of theſe plants to be ſold. The layers of Vines, as alſo of the Oriental Plane-tree, in the nurſeries, were likewiſe killed to the ground, and the old ſtools ſo much injured, that they had better have been dug up and thrown away, than to have continued them; for in ten years after they did not recover their former vigour, making their ſhoots ſo late in the ſummer, that their wood had not time to harden, and the firſt froſt in autumn frequently killed them half way to the ground.

Many other deciduous trees were equal ſufferers by this ſevere froſt, and the Evergreens were more generally injured, and abundance of them killed. The Pine and Pinaſter were ſo much hurt, as to loſe all their verdure, and in ſome places the young plants of the

the former sort were entirely killed. The Rosemary, Lavender, Stœchas, Sage, and many other aromatic plants, were in many places quite destroyed, so that it was two or three years before the markets could be supplied with these; and in general the esculent plants in the kitchen-gardens were killed, so that for some months the markets were not supplied with any quantity of garden stuff. The flower-gardens also were great sufferers by this winter; for as the seasons for some years before had been very temperate, few persons had made any provision for a hard winter; and the cold setting in so very intense at the beginning, the mischief was done before people could be provided with covering.

The Wheat in many parts of England, but especially in the open common fields, was very much hurt, particularly on the top of the ridges, where, in several places there were broad naked spaces on the middle of the ridges, which in the spring appeared like so many foot-paths. And as the spring following was very dry, and the wind continuing to blow from the north and east; these piercing winds entered the ground, which had been loosened by the frost, and dried up the tender roots of the Corn, to the great prejudice of it; but some of the more expert farmers, who rolled their Wheat after the frost was over, were well repaid by the great crops which their land produced them.

Were I to enter into all the particulars of the damages sustained by this severe frost in the gardens and fields, it would swell this work beyond the limits intended; so I hope, on the other hand, I shall not be condemned for having inserted thus much, since, by the mention of these things, persons may be instructed how to save many of their valuable plants in future winters, as also what sorts are more liable to danger from frosts than others.

FRUCTIFEROUS [fructifer, *Lat.*] fruit-bearing, fruitful.

FRUCTUS. See FRUIT.

FRUIT is the production of a tree or plant, for the propagation or multiplication of its kind; in which sense fruit includes all kinds of seeds, with their furniture, &c. botanists use it to signify properly, that part of a plant wherein the seed is contained, which the Latins call Fructus, and the Greeks Καρπός.

The fruit of some plants are produced singly, as are their flowers, and sometimes they are produced in clusters, as in most fruit-trees, which are also fleshy, but in many plants they are dry.

The word fruit is also used to signify an assemblage of seeds in a plant; as in a Pea, Bean, Ranunculus, &c. and in its general signification, for all kinds of grain, whether naked, or inclosed in cover, capsula, or pod, whether bony, fleshy, skinny, membranous, or the like.

Fruit is the product or result of the flower, or that for whose production, nutrition, &c. the flower is intended.

The structure and parts of different fruits are different in some things, but in all the species the essential parts of the fruit appear to be only continuations or expansions of those which are seen in the other parts of the tree.

Dr. Beale suggests some very good reasons for a direct communication between the remotest parts of the tree and the fruit; so that the same fibres which constitute the root, trunk, and boughs, are extended into the very fruit.

Thus, if you cut open an Apple transversly, you will find it to consist chiefly of four parts, viz. 1st, a skin, or cortex, which is only a production of the skin or outer bark of the tree. 2dly, A parenchyma or pulp, which is an expansion and intumescence of the inner bark of the tree. 3dly, The fibres, or ramifications of the woody part of the tree. 4thly, The core, which is the produce of the pith, or medulla of the plant, indurated or strengthened by twigs of the wood and fibres inosculated therewith. This serves to furnish a cell, or lodge, for the kernels, filtrates the juice of the parenchyma, and conveys it thus prepared to the kernel.

Of the fibres, authors generally reckon fifteen branches, of which ten penetrate the parenchyma, and incline to the basis of the flower; the other five ascend more particularly from the pedicle or stalk, and meet with the former at the base of the flower, to which branches the capsulæ, or coats of the kernels are fastened.

These branches being first extended through the parenchyma to the flower, furnish the necessary matter for the vegetation of it; but as the fruit increases, it intercepts the aliment, and thus the flower is starved, and falls off.

In a Pear there are five parts to be distinguished, viz. the skin, parenchyma, ramification, kernel, and acetarium.

The three first parts are common to the Apple. The kernel, observed chiefly in Choke Pears, or Breaking Pears, is a congeries of strong corpuscles, that are dispersed throughout the whole parenchyma, but in the greatest plenty, and closest together about the center, or acetarium; it is formed of the stony or calculous part of the nutritious juice.

The acetarium is a substance of a tart acid taste, of a globular figure, inclosed in an assemblage of several of the stony parts before-mentioned.

In a Plumb, Cherry, &c. there are four parts, viz. a coat, parenchyma, ramification, and nucleus, or stone. The stone consists of two very different parts; the external or harder part, called the stone, or shell, is a concretion of the stony, or calculous parts of the nutritious juice, like the kernel in Pears, within it. The inner, called the kernel, is soft, tender, and light, being derived from the pith, or medulla of the tree by seminal branches, which penetrate the base of the kernel.

The nut, or acorn, consists of a shell, cortex, and medulla; the shell consists of a coat and parenchyma, derived from the bark and wood of a tree.

The cortex consists of an inner and outer part, the first is a duplicature of the inner tunic of the shell; the second is a mossy substance, derived from the same source as the parenchyma of the shell. But authors are not agreed, whether the medulla, or pulp of the kernel does arise from the pith of the tree, or the cortical part thereof.

Berries, as the Grape, &c. contain (besides three general parts, viz. coat, parenchyma, and ramification) grains of a stony nature, to do the offices of seeds.

Fruits in general are serviceable in guarding, preserving, and feeding the inclosed seed, in filtrating the coarser more earthy, and strong parts of the nutritious juice of the plant, and retaining it to themselves, sending none but the most pure, elaborated, and spirituous parts to the seed, for the support and growth of the tender delicate embryo or plantule, which is therein contained.

FRUMENTACEOUS [Frumentaceous, *Lat.*] a term applied by botanists to all such plants as have a conformity with Wheat (called in *Latin* Frumentum,) in respect either of their fruits, leaves, ears, or the like.

FRUMENTUM INDICUM. See ZEA.

FRUTEX, a shrub; a vegetable of a genus between a tree and an herb, but of a woody substance. It is pretty difficult to determine wherein most of the writers on gardening and agriculture have made the distinction between trees and shrubs, or where to fix the difference or boundary, between the trees and shrubs, to say where one ends, and the other begins, for that cannot be determined by their growth; therefore the best definition which can be made of a shrub, to distinguish it from a tree, is its sending forth many stems from the roots, whereas the trees have a single trunk or body.

FRUTEX PAVONIUS. See POINCIANA.

FRUTICOSE [Fruticosus, *Lat.* shrubby,] are those plants which are of a hard woody substance, and do not rise to the height of trees.

FUCHSIA. Plum. Nov. Gen. 14. Lin. Gen. Plant. 1097. This plant was so named by Father Plumier, who discovered it in America, in honour of the memory of Leonard Fuchsius, a learned botanist.

The Characters are,

*The flower hath no empalement; it hath one petal, with a closed tube, which is slightly cut into eight parts at the brim, ending in acute points; it hath four stamina the length of the tube, which are terminated by obtuse summits. The oval germen is situated under the flower, supporting a single style, crowned by an obtuse stigma. The germen afterward becomes a succulent berry with four furrows, having four cells, containing several small oval seeds.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia, the flower having four stamina and one style.

We know but one Species of this genus at present, viz.

Fuchsia (*Triphylla.*) Lin. Sp. Plant. 1191. *Three-leaved Fuchsia.* Fuchsia triphylla, flore coccineo. Plum. Nov. Gen. *Three-leaved Fuchsia with a scarlet flower.*

This plant is a native in the warmest parts of America; it was discovered by Father Plumier, in some of the French Islands in America, and was since found by the late Dr. William Houstoun, at Carthagena in New Spain, from whence he sent the seeds into England.

This is propagated by seeds, which must be sown in pots filled with rich light earth, and plunged into a hot-bed of tanners bark, and treated in the same way as other seeds from warm countries. In about a month or six weeks after the seeds are sown, the plants will begin to appear, when they should be carefully cleared from weeds, and frequently refreshed with water to promote their growth; and when they are about two inches high, they should be shaken out of the pot, and separated carefully; then plant each into a small pot filled with light rich earth, and plunge them again into a hot-bed of tanners bark, being careful to screen them from the sun until they have taken new root; after which time they must have fresh air admitted to them every day in proportion to the warmth of the season, and should be frequently watered. As the season advances and becomes warm, the glasses of the hot-bed should be raised higher, to admit a greater share of air to the plants, to prevent their drawing up weak; and when the plants are grown so tall as to reach the glasses, they should be removed into the bark-stove, and plunged into the tan-bed. In winter these plants require to be kept very warm, and at that season they must not have much water, but in summer it must be often repeated.

These plants are too tender to thrive in the open air in this country, even in the hottest part of the year; therefore they should constantly remain in the stove, observing to let in a large share of fresh air in summer, but in winter they must be kept warm; with this management the plants will produce their flowers, and make a beautiful appearance in the stove, amongst other tender exotic plants.

FUMARIA. Lin. Gen. Plant. 760. Tourn. Inst. R. H. 421. tab. 237. Fumatory; in French, *Fumeterre.*

The Characters are,

*The empalement of the flower is composed of two equal leaves placed opposite. The flower is of the ringent kind, approaching near to the butterfly flowers. The upper lip is plain, obtuse, indented at the top, and reflexed; the nectarium at the base of this is obtuse, and a little prominent. The under lip is like the upper in all its parts, but the base is keel-shaped; the nectarium at the base is less prominent. The chaps of the flower is four-cornered, obtuse, and perfectly bifid; there are six equal broad stamina in each flower, divided in two bodies, included in the two lips, each being terminated by three summits. In the center is situated an oblong germen, supporting a short style, crowned by an orbicular compressed stigma. The germen afterward becomes a short pod with one cell, including roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's seventeenth class, intitled Diadelphia Hexandria, which includes the plants whose flowers have their stamina in two bodies, and have six stamina. To this genus Dr. Linnæus has joined the Capnoides of Tournefort, the Cysticapnos of Boerhaave, the Corydalis of Dillenius, and the Cucularia of Jussieu, making them only species of the same genus.

The Species are,

1. Fumaria (*Officinalis*) pericarpis monospermis racemosis, caule diffuso. Lin. Sp. Plant. 700. *Fumatory with seed-vessels growing in a racemus, with a single seed and a diffused stalk.* Fumaria officinarum & Dioscoridis, flore purpureo. C. B. 143. *The common Fumatory with a purple flower.*
2. Fumaria (*Spicata*) pericarpiis monospermiis spicatis, caule erecto, folioliis filiformibus. Sauv. Monsp. 263. *Fumatory with seed-vessels growing in a spike, with one seed, an upright stalk, and thread-like leaves.* Fumaria minor tenuifolia. C. B. 143. *Lesser narrow-leaved Fumatory.*
3. Fumaria (*Alba*) siliquis linearibus tetragonis, caulibus diffusis acutangulis. Lin. Sp. Plant. 700. *Fumatory with narrow four-cornered pods, and diffused stalks, having acute angles.* Fumaria sempervirens & floreas, flore albo. Flor. Bat. *Evergreen Fumatory with a white flower.*
4. Fumaria (*Capnoides*) siliquis teretibus, caulibus diffusis, angulis obtusis. *Fumatory with taper pods and diffused stalks, having obtuse angles.* Fumaria lutea. C. B. 143. *Yellow Fumatory.*
5. Fumaria (*Claviculata*) siliquis linearibus, foliis cirrhiferis. Lin. Sp. Plant. 701. *Fumatory with narrow pods, and leaves having claspers.* Fumaria claviculis donata. C. B. P. 143. *Fumatory with tendrils.*
6. Fumaria (*Capreolata*) pericarpiis monospermis racemosis, foliis scandentibus subcirrhosis. Lin. Sp. Plant. 701. *Fumatory with seed-vessels growing in a racemus, with one seed, and climbing leaves having short tendrils.* Fumaria major scandens, flore pallidiore. Raii Hist. 405. *Greater climbing Fumatory with a paler flower.*
7. Fumaria (*Cava*) caule simplici, bracteis longitudine florum. Lin. Sp. Plant. 699. *Fumatory with a single stalk, and bracteæ as long as the flowers.* Fumaria bulbosa, radice cavâ, major. C. B. P. 143. *Greater bulbous Fumatory with a hollow root.*
8. Fumaria (*Bulbosa*) caule simplici, bracteis brevioribus multifidis, radice solida. *Fumatory with a single stalk, shorter many pointed bracteæ, and a solid root.* Fumaria bulbosa, radice non cavâ, major. C. B. P. 144. *Greater bulbous Fumatory with a solid root.*
9. Fumaria (*Cucularia*) scapo nudo. Hort. Cliff. 351. *Fumatory with a naked stalk.* Capnorchis Americana. Boerh. Ind. alt. 1. 309. and the Fumaria tuberosa insipida. Cornut. 129. *Tuberous insipid Fumatory.*
10. Fumaria (*Vesicaria*) siliquis globosis inflatis. Hort. Upsal. 207. *Fumatory with globular inflated pods.* Cysticapnos Africana scandens. Boerh. Ind. alt. 1. 310. *Climbing African Cysticapnos.*
11. Fumaria (*Eneaphylla*) foliis triternatis, foliolis cordatis. Lin. Sp. Plant. 700. *Fumatory with leaves composed of three trifoliate small leaves, which are heart-shaped.* Fumaria enneaphyllos Hispanica saxatilis. Bocc. Mus. 2. p. 83. *Five-leaved Rock Fumatory of Spain.*
12. Fumaria (*Sempervirens*) siliquis linearibus paniculatis, caule erecto. Hort. Upsal. 207. *Fumatory with narrow pods growing in panicles, and an upright stalk.* Capnoides. Tourn. Inst. R. H. 423. *Bastard Fumatory.*

The first sort is the common Fumatory which is used in medicine. This grows naturally on arable land in most parts of England; it is a low annual plant, and flowers in April, May, and June; and very often from plants which rise late in the summer, there will be a second crop in autumn. The juice of this plant is greatly commended for bilious cholics. It is never cultivated in gardens.

The second sort grows naturally in the south of France, Spain, and Portugal, but is preserved in botanic gardens for the sake of variety. It is an annual plant,

plant, which riſes from the ſcattered ſeeds better than when it is ſown with care; the ſtalks of this grow more erect, the leaves are very finely divided, and the flowers grow in a cloſe ſpike; they are of a deep red colour, and flower about the ſame time as the common ſort.

The third ſort grows naturally on the borders of the Mediterranean Sea; it was firſt brought to England from Tangier. This is a perennial plant, which ſends out from the root many branching ſtalks, which riſe about ſix or eight inches high, growing in tufts or bunches; the leaves are very much divided, the ſtalks are angular, and the flowers grow in looſe panicles upon naked foot-ſtalks, which come out from the diviſions of the branches; they are of a whitiſh yellow colour, and there is a ſucceſſion of them moſt part of the year.

The fourth ſort hath an appearance very like the third, and by ſome it is ſuppoſed to be only a variety of that, but is undoubtedly a diſtinct ſpecies; for I have cultivated both more than forty years, and never yet found either of them to vary. The ſtalks of this ſort have blunt angles, whereas thoſe of the third are acute; they are of a purpliſh colour, and the flowers grow in looſer panicles, each having a longer foot-ſtalk than thoſe of the other; they are of a bright yellow colour, and there is a ſucceſſion of them great part of the year.

Theſe two ſorts continue green all the year, and except in very ſevere froſt, are always in flower, which make a pretty appearance; they grow beſt on walls or rocks, and are very proper for the joints of grottos, or any rock-work; where, if a few plants are planted, or the ſeeds ſcattered, they will multiply faſt enough from their ſcattering ſeeds, which are caſt out of the pods by the elaſtic ſpring of the valves when ripe, to a conſiderable diſtance; and as the plants will require no care to cultivate them, they ſhould not be wanting in gardens.

The fifth ſort grows in ſtony and ſandy places in ſome parts of England; it is an annual plant with trailing ſtalks, ſending out claſpers from the leaves, which faſten to any of the neighbouring plants. It flowers in May and June, but is never cultivated in gardens.

The ſixth ſort is an annual plant with many trailing ſtalks, which grow about a foot long, ſending out a few ſhort tendrils, whereby they faſten to any neighbouring ſupport; the flowers come out from the ſide of the ſtalks in looſe bunches; they are of a whitiſh herbaceous colour, with a purple ſpot on the upper lip. This flowers in May and June. It grows in France and Italy, on ſtony places in the ſhade.

The ſeventh ſort grows naturally in the ſouth of France and Italy, and was ſome years paſt preſerved in the Engliſh gardens by way of ornament, but is now rarely to be found here; it was titled Radix cava, or hollow root, from its having a pretty large tuberous root hollowed in the middle. The ſtalk of this ſort riſes about ſix inches high, and does not divide, but is garniſhed toward the bottom with one ramous leaf, ſomewhat like the common Fumatory, but the lobes are broader; the flowers grow in a ſpike at the top of the ſtalk; they are of a pale herbaceous colour, and appear in April. This plant delights in the ſhade, and is multiplied by offſets, for it rarely ripens ſeeds in England.

The eighth ſort is pretty common in many of the old gardens in England; it grows naturally in the ſouth of France, in Germany and Italy. This hath a pretty large round ſolid root of a yellowiſh colour, from which come out branching leaves like thoſe of the laſt ſort, but the lobes are longer; the flowers grow in ſpikes on the top of the ſtalks; they are of a purple colour, and come out early in April. The ſtalks of this ſort are ſingle, and riſe about four or five inches high.

There is a variety of this with green flowers, which is mentioned in moſt of the books; but all the plants of this ſort which I have yet ſeen, are only abortive, having no real flower, only a green bractea, which has been generally taken for the flowers: there is alſo mentioned a larger ſort; but if there is one which is really different from the common ſort, I have not ſeen it in the Engliſh gardens, nor the yellow and white flowering ſorts, which are alſo mentioned in many of the books.

The ninth ſort grows naturally in North America; this hath a ſcaly root about the ſize of a large Hazel Nut, from which come out three or four leaves upon ſlender foot-ſtalks; theſe are divided into three parts, each of theſe parts is compoſed of many ſmaller diviſions, which have narrow lobes, divided into three parts almoſt to the bottom; the flower-ſtalk is naked, and eight or nine inches long; this is terminated by four or five flowers, growing in a looſe ſpike; theſe have two petals, which are reflexed backward, and form a ſort of fork toward the foot-ſtalk, and at their baſe are two horned nectariums, which ſtand horizantal. The flowers are of a dirty white colour and appear in May, but rarely produce ſeeds here.

This is propagated by offsets from the root; it loves a ſhady ſituation and a light ſoil; the beſt time to tranſplant the roots is in autumn, when the leaves are decayed, for it ſhoots pretty early in the ſpring, therefore it would not be ſafe to remove them at that ſeaſon.

The tenth ſort grows naturally at the Cape of Good Hope; this is an annual plant, with trailing ſtalks which are two or three feet long, dividing into many ſmaller, which are garniſhed with ſmall branching leaves ſhaped like thoſe of the common Fumatory, but end with tendrils, which claſp to any neighbouring plants, and thereby the ſtalks are ſupported; the flowers are produced in looſe panicles, which proceed from the ſide of the ſtalks; they are of a whitiſh yellow colour, and are ſucceeded by globular ſwollen pods, in which are contained a row of ſmall ſhining ſeeds.

This is propagated by ſeeds, which ſhould be ſown upon a moderate hot-bed in the ſpring; and when the plants are fit to remove, they muſt be each planted in a ſmall pot filled with light earth, and plunged again into the hot-bed, where they muſt be ſhaded from the ſun till they have taken new root; after which they ſhould have a large ſhare of air admitted to them at all times in mild weather, to prevent their drawing up weak; and as ſoon as the ſeaſon is favourable, they ſhould be inured to bear the open air, to which they may be removed the beginning of June, when they may be ſhaken out of the pots, preſerving all the earth to their roots, and planted in a warm border, where their ſtalks ſhould be ſupported with ſticks to prevent their trailing on the ground; and in July the plants will flower, and continue a ſucceſſion of flowers till the froſt deſtroys the plants; the ſeeds ripen in autumn.

The eleventh ſort grows naturally upon old walls, or rocky places in Spain and Italy; this hath weak trailing ſtalks which are much divided, and are garniſhed with ſmall leaves divided into three parts, each of which hath three heart-ſhaped lobes; the flowers are produced in ſmall looſe panicles from the ſide of the ſtalks, they are of a greeniſh white, and appear moſt of the ſummer months. It is an abiding plant, which propagates itſelf by the ſeeds that ſcatter, and thrives beſt in a ſhady ſituation, and on old walls or buildings.

The twelfth ſort is an annual plant with an upright ſtalk, which grows a foot and a half high, round and very ſmooth, ſending out ſeveral branches upward; theſe are garniſhed with ſmooth branching leaves, of a pale colour, which are divided like the common ſort, but the ſmall leaves are larger and more obtuſe; the flowers are produced in looſe panicles from the ſides of the ſtalks, and at the extremity of the branches; they are of a pale purple colour, with yellow chaps (or lips); theſe are ſucceeded by taper narrow pods an inch and a half long, which contain many ſmall ſhining black ſeeds. This flowers during moſt of the ſummer months, and the ſeeds ripen in July, Auguſt,

gust, and September. If the seeds of this plant are permitted to scatter, the plants will come up without any trouble, and require no other care but to thin them where they are too close, and keep them clean from weeds.

These plants may be suffered to grow on walls, and in some abject part of the garden; for if they are admitted into the borders of the pleasure-garden, they will scatter their seeds, and become troublesome weeds; but they are very proper plants to grow on ruins, or on the sides of grottos or rock-work, where, by their long continuance in flower, they will have a good effect.

The fifth, sixth, seventh, and eighth sorts are propagated by offsets, as other bulbous-rooted flowers; these produce their flowers in the beginning of April, and are very pretty ornaments to borders in a small flower-garden. They are extreme hardy, but do not increase very fast, seldom producing seeds with us; and their bulbs do not multiply very much, especially if they are often transplanted. They love a light sandy soil, and should be suffered to remain three years undisturbed, in which time they will produce several offsets. The best season for transplanting them is from May to August, when the leaves begin to die off; for if they are taken up when their leaves are fresh, it will greatly weaken their roots.

FURZ. See Genista.

# G.



GALANTHUS. Lin. Gen. Plant. 362. Narcisso-leucoium. Tourn. Inst. R. H. 387. tab. 208. The Snow-drop; in French, *Perce-neige*.

The Characters are,

*The spatha or sheath of the flower is oblong, blunt, and compressed. This opens sideways, and becomes a dry skin; the flower has three oblong concave petals, which spread open, and are equal; in the bottom is situated the three-leaved nectarium, which is cylindrical, obtuse, and indented at the top; under the flower is situated the oval germen, supporting a slender style, which is longer than the stamina, crowned by single stigma; this is attended by six short hairy stamina, terminated by oblong pointed summits, which are gathered together. The germen afterward becomes an oval capsule which is obtuse and three-cornered, opening in three cells, which are filled with roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, intitled Hexandria Monogynia, which includes the plants whose flowers have six stamina and one style.

This plant, as also the great Snow-drop, was by Dr. Tournefort ranged together under the title of Narcisso-leucoium; which being a compound name, Dr. Linnæus has altered it to this of Galanthus; and has separated the great Snow-drop from this, and given the simple name of Leucoium to that genus.

We know but one Species of this genus, viz.

Galanthus (*Nivalis.*) Lin. Hort. Cliff. 134. The common Snow-drop. *Leucoium bulbosum trifolium minus.* C. B. P. The least bulbous Snow-drop with three leaves.

There is a variety of this with double flowers.

These flowers are valued for their early appearance in the spring, for they usually flower in February when the ground is often covered with snow. The single sort comes out the first, and though the flowers are but small, yet when they are in bunches, they make a very pretty appearance; therefore these roots should not be planted single, as is sometimes practised by way of edging to borders; for when they are so disposed, they make very little appearance. But when there are twenty or more roots growing in a close bunch, the flowers have a very good effect; and as these flowers thrive well under trees or hedges, they are very proper to plant on the sides of the wood-walks, and in wilderness-quarters; where, if they are suffered to remain undisturbed, the roots will multiply exceedingly. The roots may be taken up the latter end of June, when their leaves decay, and may be kept out of the ground till the end of August, but they must not be removed oftener than every third year.

GALE. See Myrica.

GALEGA. Lin. Gen. Plant. 770. Tourn. Inst. R. H. 398. tab. 222. Goat's-rue.

The Characters are,

*The empalement of the flower is short, tubulous, and of one leaf, indented in five parts. The flower is of the butterfly kind; the standard is oval, large, and reflexed; the wings are near the length of the standard; the keel is erect, oblong, and compressed; the under side toward the point is rounded, but the upper is acute; there are ten stamina, which join above their middle, and are terminated by small summits. In the center is situated a narrow, cylindrical, oblong germen, supporting a slender style, crowned by a stigma terminated by a puncture. The germen afterward becomes a long pointed pod, inclosing several oblong kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, which includes those plants whose flowers have ten stamina joined in two bodies.

The Species are,

1. Galega (*Officinalis*) leguminibus strictis erectis, foliolis lanceolatis strictis nudis. Lin. Sp. Plant. 1062. *Goat's-rue with erect close pods, and spear-shaped naked leaves.* Galega vulgaris, floribus cæruleis. C. B. P. 352. *Common Goat's-rue with blue flowers.*
2. Galega (*Africana*) foliolis lanceolatis obtusis, floribus spicatis longioribus, siliquis crassioribus. *Goat's-rue with obtuse spear-shaped leaves, flowers growing in longer spikes, and thicker pods.* Galega Africana, floribus majoribus siliquis crassioribus. Tourn. Inst. R. H. 399. *African Goat's-rue, with larger flowers and thicker pods.*
3. Galega (*Frutescens*) foliis ovatis, floribus paniculatis alaribus, caule fruticoso. *Goat's-rue with oval leaves, and flowers growing in panicles from the sides of the stalks, which are shrubby.* Galega Americana, foliis subrotundis, floribus coccineis. Houst. MSS. *American Goat's-rue with roundish leaves and scarlet flowers.*
4. Galega (*Virginiana*) leguminibus retrofalcatis compressis villosis spicatis, calycibus lanatis, foliolis ovali-oblongis acuminatis. Amoen. Acad. 3. p. 18. *Goat's-rue with hairy, compressed, sickle-shaped pods, oblong oval-*

*oval-pointed leaves, and woolly empalements.* Orobus Virginianus, foliis fulva lanugine incanis, foliorum nervo in ſpinam aberunte. Pluk. Mant. 142.

5. GALEGA (*Purpurea*) leguminibus ſtrictis adſcendentibus glabris racemoſis terminalibus, ſtipulis ſubulatis, foliis oblongis glabris. Flor. Zeyl. 301. *Goats-rue with cloſe, ſmooth, aſcending pods, terminating the ſtalks in an oblong bunch, awl-ſhaped ſtipulæ, and oblong ſmooth leaves.* Coronilla Zelanica herbacea, flore purpuraſcente. Burm. Zeyl. 77.

The firſt ſort grows naturally in Italy and Spain, but is propagated in the Engliſh gardens for medicinal uſe. This hath a perennial root, compoſed of many ſtrong fibres, which are frequently jointed, from which ariſe many channelled hollow ſtalks, from two to three feet high, which are garniſhed with winged leaves, compoſed of ſix or ſeven pair of narrow ſpear-ſhaped lobes, terminated by an odd one, which are ſmooth and entire; the flowers terminate the ſtalks growing in ſpikes, they are of the Pea-bloſſom ſhape, and of a pale blue colour, and are diſpoſed in looſe ſpikes. They appear in June, and are ſucceeded by taper pods about one inch and a half in length, having one row of kidney-ſhaped ſeeds, which ripen toward the end of Auguſt.

There is a variety of this with white flowers, and another with variegated flowers, which have accidentally been produced from ſeeds, ſo are not conſtant, therefore are only mentioned here.

The ſecond ſort grows naturally in Africa; this differs from the former, in having larger leaves, which are compoſed of eight or ten pair of lobes, broader and blunter at their ends than thoſe of the common ſort; the flowers are larger, and the ſpikes are longer; the ſeed-pods are alſo much thicker than thoſe of the common ſort, but in other reſpects are very like it.

Theſe plants are propagated by ſeeds, which may be ſown either in the ſpring or autumn, upon a bed of ground in an open ſituation; and when the plants come up, they muſt be kept clean from weeds till they are ſtrong enough to remove; then a ſpot of ground ſhould be prepared, in ſize proportionable to the quantity of plants deſigned; this ſhould be well dug, and cleared from the roots of all noxious weeds; then the plants ſhould be carefully taken up, and planted in rows at a foot and a half diſtance, and in the rows one foot aſunder, obſerving to water them till they have taken new root; after which they will require no farther care to keep them clean from weeds, which may be eaſily done by hoeing of the ground frequently between the plants, and in the ſpring the ground between the rows ſhould be dug, which will encourage their roots, and cauſe them to ſhoot out vigorous ſtalks; and if their ſtalks are cut down before the ſeeds are formed every year, the roots will continue the longer, eſpecially if they grow on a light dry ſoil. The ſeeds of theſe will grow whereever they are permitted to ſcatter, ſo that plenty of the plants will come up without any care, and theſe may be tranſplanted and managed in the ſame manner as is before directed.

The firſt ſort is uſed in medicine; it is accounted cordial, ſudorific, and alexipharmic, ſo very good againſt peſtilential diſtempers, expelling the venom through the pores of the ſkin, and is of uſe in all kinds of fevers. Mr. Boyle, in his treatiſe of the Wholſomeneſs and Unwholſomeneſs of the Air, beſtows three or four pages, in celebrating the virtues of Goats-rue in peſtilential and malignant diſeaſes, from his own obſervation and experience.

The third ſort was diſcovered by the late curious botaniſt Dr. William Houſtoun, at Campeachy, from whence he ſent the ſeeds into Europe. This plant is propagated by ſeeds, which muſt be ſown on a hot-bed early in the ſpring; and when the plants come up, and are fit to tranſplant, they muſt be tranſplanted each into a ſeparate ſmall pot, and plunged into a hot-bed of tanners bark, ſhading them from the ſun till they have taken new root; then they muſt be treated as hath been directed for other tender plants, which are kept in the bark-ſtove. With this management they will flower in July, and in September they will perfect their ſeeds, but the plants may be preſerved through the winter in the bark-ſtove.

The fourth ſort grows naturaly in Virginia and Carolina; this hath a perennial root, and an annual ſtalk which riſes three feet high; the lobes of the leaves are oblong and oval, generally ſeven or nine to each leaf: the whole plant is covered with a ſilvery down. The flowers are of a red colour, and are produced in ſpikes at the end of the branches: theſe are ſucceeded by ſickle-ſhaped compreſſed pods of a ſilvery colour, containing one row of kidney-ſhaped ſeeds.

This plant, although it is tolerable hardy, yet it is with difficulty preſerved in gardens; for the ſeeds rarely ripen in England, and the plants are often deſtroyed by froſt in winter. The only method in which I have been able to keep the plant, has been by potting them, and placing them in a common frame in winter, where they enjoyed the free air in mild weather, but were protected from froſt; in this way I have kept the plant three years, but it has not ripened ſeeds here.

The fifth ſort grows naturally in Ceylon, and in many parts of India, from whence I have received the ſeeds. This ſort was annual here, and decayed before the ſeeds were ripe. It hath an herbaceous ſtalk, which riſes two feet high, garniſhed with winged leaves, compoſed of eight or nine pair of oval lobes, terminated by an odd one; the foot-ſtalks of the flowers come out oppoſite to the leaves; theſe ſuſtain a long looſe ſpike or thyrſe of ſmall purple flowers, which are ſucceeded by ſlender erect pods.

This may be cultivated in the ſame way as the third ſort; and if the plants are brought forward early in the ſpring, if the ſummer proves warm, the ſeeds may ripen.

GALENIA. Lin. Gen. Plant. 443. Sherardia. Ponted. Epiſt. 14.

The title of this genus was given to it by Dr. Linnæus, from the famous phyſician Galen.

The CHARACTERS are,

*The flower hath a ſmall quadrifid empalement of one leaf; it hath no petals, but hath eight hairy ſtamina the length of the empalement, terminated by double ſummits. In the center is ſituated a roundiſh germen, ſupporting two reflexed ſtyles, crowned by ſimple ſtigmas. The empalement afterward becomes a roundiſh capſule with two cells, containing two oblong angular ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's eighth claſs, intitled Octandria Digynia, which includes thoſe plants whoſe flowers have eight ſtamina and two ſtyles.

We know but one SPECIES of this genus, viz.

GALENIA (*Africana.*) Hort. Cliff. 150. *Shrubby Galenia.* Sherardia. Ponted. Epiſt. 14. and the Atriplex Africana, lignoſa fruteſcens, roſmarini foliis. Hort. Piſ. 20. *Shrubby African woody Atriplex, with Roſemary leaves.*

This ſhrub grows naturally at the Cape of Good Hope, and in other parts of Africa; it riſes with a ſhrubby ſtalk about four or five feet high, ſending out many weak branches, garniſhed with very narrow leaves, which are placed irregularly on every ſide the branches; they are of a light green, with a furrow running longitudinally through the middle; the flowers are produced in looſe panicles from the ſide and at the end of the branches; they are very ſmall, and have no petals, ſo make little appearance. The flowers come out in July and Auguſt, but are not ſucceeded by ſeeds in England.

This plant will not live through the winter in the open air in England, ſo muſt be placed in the greenhouſe, or under a frame, with other hardy exotic plants, where it may have a large ſhare of air in mild weather, for it only requires to be protected from froſt. In the ſummer it may be expoſed in the open air, with other plants of the ſame country, and in dry weather it muſt be frequently watered. This may be

propagated by cuttings, which, if planted during any of the summer months, and watered frequently, will take root in about five or six weeks, and may then be treated as is directed for the old plants.

GALEOPSIS. Lin. Gen. Plant. 637. Tourn. Inst. R. H. 185. tab. 86. Stinking Dead Nettle.

The CHARACTERS are,

*The empalement of the flower is tubulous, of one leaf, cut into five segments, which end in acute points. The flower is of the lip kind, having a short tube; the chaps are a little broader, but the length of the empalement; from the base to the under lip, it is on both sides sharply indented; the upper lip is concave, roundish, and sawed at the top; the under lip is trifid, the middle segment being the largest, which is crenated. It hath four stamina inclosed in the upper lip, two being shorter than the other, terminated by roundish bifid summits. In the center is situated a quadrifid germen, supporting a slender style, crowned by a bifid acute stigma. The germen afterward become four naked seeds, sitting in the rigid empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, intitled Didynamia Gymnospermia, which includes those plants whose flowers have two long and two short stamina, and the seeds are naked.

The SPECIES are,

1. GALEOPSIS (*Ladanum*) internodiis caulinis æqualibus, verticillis omnibus remotis. Lin. Sp. Plant. 579. *Stinking Hedge Nettle, with equal distances between the joints, and whorls growing at a distance.* Sideritis arvensis angustifolia rubra. C. B. P. 233. *Red narrow-leaved Field Ironwort.*
2. GALEOPSIS (*Tetrahit*) internodiis supernè incrassatis, verticillis summis subcontiguis. Lin. Sp. Plant. 579. *Stinking Hedge Nettle, whose joints are thicker above, and the whorls at the top growing near each other.* Lamium cannabino folio vulgare. Raii Syn. Ed. 3. p. 240. *Common Dead Nettle with a Hemp leaf.*
3. GALEOPSIS (*Speciosa*) corollâ flavâ, labio inferiore maculato. Flor Lapp. 193. *Stinking Hedge Nettle with a yellow flower, whose under lip is spotted.* Lamium cannabinum aculeatum flore luteo speciosо, labiis purpureis. Pluk. Alm. 204. *Prickly Hemp Dead Nettle, with a beautiful yellow flower and purple lips.*
4. GALEOPSIS (*Galeobdolon*) verticillis sexfloris, involucro tetraphyllo. Lin. Sp. Plant. 780. *Stinking Hedge Nettle with six flowers in each whorl, and a four-leaved involucrum.* Galeopsis sive urtica iners flore luteo. J. B. 3. 323. *Stinking or Dead Nettle with a yellow flower.*
5. GALEOPSIS (*Orientale*) verticillis bifloris, foliis oblongo-cordatis. *Stinking Hedge Nettle with two flowers in each whorl, and oblong heart-shaped leaves.* Galeopsis Orientalis ocimastri folio, flore majore flavescente. H. R. Par. *Eastern stinking Hedge Nettle, with an Ocimastrum leaf, and a larger yellowish flower.*
6. GALEOPSIS (*Hispanica*) caule piloso, calycibus labio corollæ superiore longioribus. Lin. Sp. Plant. 580. *Stinking Hedge Nettle with a hairy stalk, and the empalement longer than the upper lip of the petal.* Galeopsis annua Hispanica, rotundiore folio. Inst. R. H. 186. *Annual Spanish stinking Hedge Nettle, with a rounder leaf.*

These are all of them annual plants, except the fourth sort; the three first grow naturally in England. The first is found upon arable land in many places; the second grows upon dunghills, and by the side of paths, in many parts of England. The third sort grows chiefly in the northern counties, but I have found it growing wild in Essex, within ten miles of London. These plants are seldom cultivated in gardens, for if their seeds are permitted to scatter, the plants will come up as weeds wherever they are allowed a place.

The fourth is a perennial plant with a creeping root; this grows in the woods and under hedges in most parts of England. The fifth grows in the Levant; this is a biennial plant, which perishes soon after the seeds are ripe. It is preserved in botanic gardens for the sake of variety, but hath no great beauty.

GALEOPSIS FRUTESCENS. See PRASIUM.

GALIUM. Lin. Gen. Plant. 117. Tourn. Inst. R. H. 114. tab. 39. Ladies Bedstraw, or Cheese-rennet; in French, *Caillelait.*

The CHARACTERS are,

*The flower hath a small empalement indented in four parts, sitting upon the germen. It hath one petal, divided into four segments almost to the bottom; and four awl-shaped stamina which are shorter than the petal, terminated by single summits. It hath a twin germen situated under the flower, supporting a slender half bifid style, crowned by a globular stigma. The germen afterward become two dry berries, which are joined together, each inclosing a large kidney-shaped seed.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia, which includes those plants whose flowers have four stamina and one style.

The SPECIES are,

1. GALIUM (*Verum*) foliis octonis linearibus sulcatis, ramis floriferis brevibus. Hort. Cliff. 34. *Ladies Bedstraw with eight narrow furrowed leaves, and short flowering branches.* Galium luteum. C. B. P. 335. *Yellow Ladies Bedstraw.*
2. GALIUM (*Mollugo*) foliis octonis ovato-linearibus subserratis patentissimis mucronatis, caule flaccido, ramis patentibus. Lin. Sp. Plant. 107. *Ladies Bedstraw with eight oval narrow leaves, which are spread open, sawed, and pointed, a weak stalk, and spreading branches.* Mollugo montana latifolia ramosa. C. B. P. 333. *Branching broad-leaved Mountain Mollugo.*
3. GALIUM (*Purpureum*) foliis verticillatis lineari-setaceis, pedunculis folio longioribus. Hort. Cliff. 34. *Ladies Bedstraw with narrow bristly leaves growing in whorls, and foot-stalks of the flowers longer than the leaves.* Galium nigro-purpureum montanum tenuifolium. Col. Ecphr. 1. p. 298. C. B. P. 335. *Narrow-leaved Mountain Ladies Bedstraw, with a black purple flower.*
4. GALIUM (*Glaucum*) foliis verticillatis linearibus pedunculis dichotomis, summo caule floriferis. Prod. Leyd. 256. *Ladies Bedstraw with narrow leaves growing in whorls, foot-stalks divided by pairs, and flowers growing at the top of the stalk.* Galium saxatile glauco folio. Bocc. Mus. 2. p. 172. *Rock Ladies Bedstraw with a gray leaf.*
5. GALIUM (*Rubrum*) foliis verticillatis linearibus patulis, pedunculis brevissimis. Hort. Cliff. 34. *Ladies Bedstraw with narrow leaves growing in whorls, and short foot-stalks.* Galium rubrum. C. B. P. 335. *Red Ladies Bedstraw.*
6. GALIUM (*Boreale*) foliis quaternis lanceolatis trinerviis glabris, caule erecto, seminibus hispidis. Flor. Lappon. 60. *Ladies Bedstraw with four smooth spear-shaped leaves having three veins, an upright stalk, and rough seeds.* Rubia pratensis lævis acuto folio. C. B. P. 333. *Smooth Meadow Madder with an acute leaf.*
7. GALIUM (*Album*) foliis verticillatis, lineari-lanceolatis, ramis floriferis longioribus. *Ladies Bedstraw with narrow spear-shaped leaves growing in whorls, and longer branches of flowers.* Galium album vulgare. Tourn. Inst. R. H. 113. *Common white Ladies Bedstraw.*
8. GALIUM (*Linifolium*) foliis lineari-lanceolatis glabris, caule erecto ramosissimo. *Ladies Bedstraw with seven narrow, smooth, spear-shaped leaves, and an upright branching stalk.* Galium album linifolium. Barrel. Obser. 99. *White Ladies Bedstraw with a Flax leaf.*
9. GALIUM (*Palustre*) foliis quaternis obovatis inæqualibus, caulibus diffusis. Flor. Suec. 119. *Ladies Bedstraw with four unequal oval leaves, and a diffused stalk.* Galium palustre album. C. B. P. 335. *White Marsh Ladies Bedstraw.*

The first of these plants (which is the sort commonly used in medicine) is very common in moist meadows, and in pasture grounds, in several parts of England. The other varieties are preserved in curious botanic gardens, but as they are plants of very little beauty, and are subject to spread very far, and over-run whatever plants grow near them, they are seldom cultivated in other gardens.

These sorts may any of them be propagated by parting their roots, which spread and increase very fast, either in

in the spring or autumn, and will grow almost in any soil or situation, especially the first sort; the other sorts require a drier soil, but will all grow in any situation.

GALLERIES, are ornaments made with trees of various kinds, which are very common in all the French gardens, but are seldom introduced into the English gardens, especially since the taste for clipped trees has been exploded; but as there may be some who yet fancy these obsolete ornaments, I shall just mention the way of constructing them.

In order to make a gallery in a garden with porticoes and arches, a line must first be drawn of the length you design the gallery to be; which being done, it is to be planted with Hornbeam, as directed under the article HORNBEAM; which Hornbeam thus planted, is to be the foundation of the gallery.

The management of them is not very difficult; they require only to be digged about, and sheared a little when there is occasion.

The chief curiosity required is in the ordering the fore-part of the gallery, and in forming the arches.

Each pillar of the porticoes or arches ought to be four feet distant one from the other; the gallery twelve feet high, and ten feet wide, that there may be room for two or three persons to walk a-breast.

When the Hornbeams are grown to the height of three feet, the distance of the pillars well regulated, and the ground-work of the gallery finished, the next thing to be done is to form the frontispiece: to perform which you must stop the Hornbeam between two pillars at the height, and run up a trellis made for that purpose, which forms the arch.

As it grows up you must with your shears even those boughs that outshoot the others; in time they will grow strong, and may be kept in form by the shears.

Portico galleries may be covered with Lime-trees.

GARCINIA. Lin. Gen. Plant. 526. The Mangosteen.

The CHARACTERS are,

*The flower hath a one-leaved empalement, which is permanent. It hath four roundish concave petals, which spread open, and are larger than the empalement. It hath sixteen stamina which are erect, and form a cylinder, terminated by roundish summits. In the center is situated an oval germen, with scarce any style, but is crowned by a buckler-shaped plain stigma divided into eight parts, and is permanent. The germen afterward becomes a thick globular berry with one cell, including eight hairy fleshy seeds, which are convex and angular.*

This genus of plants is ranged in the first section of Linnæus's eleventh class, intitled Dodecandria Monogynia, which includes those plants whose flowers have twelve stamina and one style.

We have but one SPECIES of this genus, viz.

GARCINIA (*Mangostana.*) Hort. Cliff. 182. *The Mangostan, or Mangosteen.* Arbor peregrina aurantio simili fructu. Clus. Exot. 12. *Foreign Tree with a fruit like the Orange.*

This tree grows naturally in the Molucca Islands, and also in the inland parts of New Spain, from whence I received perfect specimens, which were sent me by Mr. Robert Millar, who gathered them near Tolu, but did not know the tree. It rises with an upright stem near twenty feet high, sending out many branches on every side, which are placed opposite, and stand oblique to each other, and not at right angles; the bark of the branches is smooth, of a gray colour, but on the tender shoots it is green, and that of the trunk is of a darker colour and full of cracks: the leaves are of the spear-shape, and entire; they are seven or eight inches long, and about half so much in breadth in the middle, gradually diminishing to both ends, of a lucid green on their upper side, and of an Olive colour on their under, having a prominent midrib through the middle, with several small veins running from that to both sides of the leaf. The flower is like that of a single Rose, composed of four roundish petals, which are thick at their base, but are thinner toward their ends; they are of a dark red colour. The fruit which succeeds the flower is round, the size of a middling Orange; the top is covered by a cap, which was the stigma on the top of the style, and remains to the top of the fruit, and is indented in rays to the number of six or seven, which are obtuse. The shell of the fruit is like that of the Pomegranate, but softer, thicker, and fuller of juice; it is green at first, but changes to a dark brown with some yellowish spots; the inside of the fruit is of a Rose colour, and divided into several parts by thin partitions, as in Oranges, in which the seeds are lodged, surrounded by a soft juicy pulp of a delicious flavour, partaking of the Strawberry and the Grape, and is esteemed one of the richest fruits in the world; the trees naturally growing in the form of Pyrabolas, whose branches are well garnished with large shining green leaves: they have an elegant appearance, and afford a kindly shade in hot countries, therefore are worthy of cultivation, in all those countries where there is warmth enough to ripen the fruit.

As there are but few of the seeds in these fruit which come to perfection (for the greatest part of them are abortive) so most of those which have been brought to Europe have failed; therefore the surest way to obtain the plants, is to sow their seeds in tubs of earth in the country, and when the plants have obtained strength, they may be brought to Europe; but there should be great care taken in their passage, to screen them from salt water and the spray of the sea, as also not to give them much water, especially when they are in a cool or temperate climate, for these plants are very impatient of wet. When the plants arrive in Europe, they should be carefully transplanted, each into a separate pot, filled with light kitchen-garden earth, and plunged into the tan-bed, observing to shade them from the sun till they have taken new root; then they must be treated in the same manner as other tender plants from hot countries.

GARDENS are distinguished into flower-gardens, fruit-gardens, and kitchen-gardens: the first, being designed for pleasure and ornament, are to be placed in the most conspicuous parts, i. e. next to, or just against the back front of the house; the two latter being principally intended for use and service, are placed less in sight.

Though the fruit and kitchen-gardens are here mentioned as two distinct gardens, and have by the French gardeners, as also by some of our own countrymen been contrived as such, yet they are now usually in one; and with good reason, since they both require a good soil and exposure, and will equally require to be placed out of the view of the house. And as it will be proper to inclose the kitchen-garden with walls, and to secure the gates, that no persons may have access to it, who have no business in it, for the sake of preserving the product, so these walls will answer the purposes of both. Moreover, in the disposition of the kitchen-garden, when it is properly divided into quarters, the planting of espaliers of fruit-trees round each of the quarters, will be of use in screening from the view the kitchen-herbs growing in the quarters; and, by that means, give an elegancy to both parts, and save besides a great expence. The only objection which has been made to this of any consequence is, that the gardeners are too apt to crowd the borders near the walls with kitchen-herbs, whereby the trees are deprived of their nourishment; but this is in every gentleman's power to redress, by not suffering the borders to be thus crowded. But I shall treat more fully of this under the article of KITCHEN-GARDEN.

In the choice of a place to plan a garden in, the situation and exposure of the ground are the most essential points to be regarded; since, if a failure be made in that point, all the care and expence will in a manner be lost.

In a garden for pleasure, the principal things to be considered, are, 1st, the situation; 2dly, the soil, aspect, or exposure; 3dly, water; 4thly, prospect.

1st, Situation: this ought to be such an one as is wholsome, in a place that is neither too high nor too low; for if a garden be too high, it will be exposed to the winds, which are very prejudicial to trees; if it be too low, the dampness of the ground, the vermin, and venomous creatures that breed in ponds and marshy places, add much to their insalubrity.

A situation on a rising ground, or on the side of a hill, is most happy, especially if the ground be not too steep; if the slope be easy, and in a manner imperceptible; if a good deal of level may be had near the house; and if it abounds with springs of water; for, being sheltered from the fury of the winds, and the violent heat of the sun, a temperate air will be there enjoyed; and the water that descends from the top of the hills, either from springs or rain, will not only supply fountains, canals, and cascades, for ornament, but when it has performed its office, will water the adjacent valleys, and render them fertile and wholsome, if it be not suffered to stagnate in them.

Indeed, if the declivity of the hill be too steep, and if the water be too abundant, a garden on the side of it may often suffer, by having the trees torn up by the torrents and floods; and the earth above tumbling down, the walls may be demolished, and the walks spoiled.

It cannot however be denied, that the situation on a plain or flat, has several advantages that the higher situation has not: floods and rains make no spoil; there is a continued prospect of champaigns, intersected by rivers, ponds, brooks, meadows and hills, covered with buildings or woods; and the level surface is less tiresome to walk on, and less chargeable, than that on the side of a hill; the terrace-walks and steps are not necessary; but the greatest disadvantage of flat gardens is the want of an extensive prospect, which rising grounds afford.

2dly, The second thing to be considered in chusing a plat for a garden, is a good earth or soil.

It is scarce possible to make a fine garden in a bad soil; there are indeed ways to meliorate ground, but they are very expensive; and sometimes, when the expence has been bestowed of laying good earth two feet deep over the whole surface, which for a large garden is an expence too great for most persons; and after this a whole garden has been ruined, notwithstanding the exposure has been southerly and healthful, when the roots of the trees have come to reach the natural bottom.

To judge of the quality of the soil, observe whether there be any Heath, Thistles, or such like weeds, growing spontaneously in it, for they are certain signs that the ground is poor. Likewise if there be large trees growing thereabouts, observe whether they grow crooked, ill-shaped, of a faded green, and full of moss, or infested with vermin; if so, the place is to be rejected: but on the contrary, if it be covered with good Grass fit for pasture, then you may be encouraged to try the depth of the soil.

To know this dig holes in several places, six feet wide and four feet deep; if you find three feet of good earth it will do well, but less than two will not be sufficient.

The quality of good ground is neither to be stony, nor too hard to work; neither too dry, nor too moist; nor too sandy and light, nor too strong and clayey, which is the worst of all for gardens.

3dly, The third requisite is water. The want of this is one of the greatest inconveniencies that can attend a garden, and will bring a certain mortality upon whatever is planted in it, especially in the greater droughts that often happen in a hot and dry situation in summer; besides the usefulness of it in fine gardens, for making jets d'eau, canals, cascades, &c. which are the greatest ornaments of a garden.

4thly, The fourth thing required in a good situation is, the view and prospect of a fine country; and though this is not so absolutely necessary as water, yet it is one of the most agreeable beauties of a fine garden: besides, if a garden be planted in a low place that is buried, as I may say, and has no kind of prospect, it will be not only disagreeable but unwholsome, by being too much shaded and obscured; as the trees will rather retain insalubrious damps, than communicate the refreshing air, that is so purifying to vegetable nature.

In short, a garden necessarily requires (besides the care of the gardener) the sun, a good soil, a full, or at least an open prospect, and water, the last above all; and it would be egregious folly to plant a garden where any of these are wanting.

### Of the Designing or Manner of Laying out a Pleasure Garden.

The area of a handsome garden may take up thirty or forty acres, not more.

And as for the disposition and distribution of this garden, the following directions may be observed.

1st, There ought always to be a descent from the house to the garden not fewer than three steps, but if there are six or seven it will be better. This elevation of the building will make it more dry and wholsome, also from the head of these steps there will be a farther prospect or view of the garden.

In a fine garden, the first thing that should present itself to the sight, should be an open lawn of Grass, which, in size, should be proportionable to the garden; in a large garden it should not be less than six or eight acres; but in middling or small gardens, the width of it should be considerably more than the front of the house; and if the depth be one half more than the width, it will have a better effect. The figure of this lawn need not be regular, and if on the sides there are trees planted irregularly, by way of open grove, some of which may be planted forwarder upon the lawn than the others, whereby the regularity of the lawn will be broken, it will render it more like nature, the beauties of which should always be studied in the laying out and planting of gardens; for the nearer these gardens approach to nature, the longer they will please; for what is a garden, but a natural spot of ground dressed and properly ornamented? there are those who have erred in copying of what they call nature, as much as those who have drawn a whole garden into strait lines, great alleys, stars, &c. by bringing the roughest and most deformed part of nature into their compositions of gardens: as for instance, where the ground has been naturally level, they have at great expence, made hollows and raised mole-hills; so that the turf has been rendered not only more unpleasant to walk upon, but much worse to keep: and after all the pains that have been taken to ape nature, the whole is as easily discovered to be the work of art, as the stiffest slopes and the most finished parterres.

The great art in laying out of gardens, is to adapt the several parts to the natural position of the ground, so as to have as little earth to remove as possible; for this is often one of the greatest expences in making of gardens; and it may with truth be affirmed, that wherever this has been practised, nine times in ten it has proved for the worse; so that if instead of levelling hills to form large terraces, stiff slopes, and even parterres, as have been too often practised; or the sinking of hollows, and raising of hills, as hath by others been done; if the surface of the ground had only been smoothed and well turfed, it would have had a much better effect, and been more generally approved than the greatest number of these gardens, which have been made with an infinite expence both of time and money.

The next thing to be observed is, to contrive a dry walk, which should lead quite round the whole garden; for as gardens are designed to promote the exercise of walking, the greater the extent of this dry walk, the better it will answer the intent; since in bad weather, or in dewy mornings and evenings,

when the fields are unpleasant or unsafe to walk over, these dry walks in gardens become useful and pleasant; and such walks, if laid either with gravel or sand, may lead through the different plantations, gently winding about in an easy natural way, which will be more agreeable than those long strait walks, which are too frequently seen in gardens.

But as the taste of designing gardens has of late altered from the former method, there are many persons who have gone into the opposite extreme; and in the forming of what they term serpentine walks, have twisted them about in so many short turns, as to render it very disagreeable to walk on them; and at the same time they strike the sight with as much stiffness and appearance of art, as any of the methods formerly practised. In short, the fewer turns there are in these walks, and the more they are concealed, the better they will please; and yet the turns being easy, and at great distances, will take off all the appearance of straitness. And here let me observe, that there can be no better, or more easy or natural method of laying out these walks, than by tracing the easy turns made on a road, where it bends by the track of the coach wheels.

These walks should be so contrived, as to lead into shade as soon as possible; as also into some plantations of shrubs, where persons may walk in private, and be sheltered from the wind; for no garden can be pleasing where there is want of shade and shelter.

Another thing absolutely necessary is, where the boundaries of the garden are fenced with walls or pales, they should be hid by plantations of flowering shrubs, intermixed with Laurels, and some other Evergreens, which will have a good effect, and at the same time conceal the fences, which are disagreeable, when left naked and exposed to the sight.

In situations where there is a good supply of water, the designer has room for adding one of the greatest beauties to the garden, especially if it will admit of a constant stream; for in such places, if the water is properly conducted through the garden, it will afford infinite pleasure; for although these streams may not be sufficient to supply a large surface, yet if these narrow rivulets are judiciously led about the garden, they will have a better effect than many of the large stagnating ponds or canals, so frequently made in large gardens; for where these pieces of water are large, if all the boundaries can be seen from one point of view, they cannot be esteemed by persons of judgment; and frequently these standing waters are brought so near the house, as to render the air damp and unhealthy; and many times they are so situated, as to occasion this inconvenience, and at the same time are not seen to any advantage from the house.

Where wildernesses are intended, these should not be cut into stars, and other ridiculous figures, nor formed into mazes or labyrinths, which in a great design is trifling, but the walks should be noble, and shaded by tall trees; and the spaces of the quarters planted with flowering shrubs and Evergreens, whereby they will be rendered pleasant at all seasons of the year; and if there are hardy sorts of flowers (which will thrive with little care) scattered about near the sides of the walks, they will have a very good effect, in making a variety of natural beauties almost through the year.

The situation of these wildernesses should not be too near the house, lest they should occasion damps; therefore it is much better to contrive some open groves, through which there may be a communication under shade, from the house to these wildernesses; which are much the best when they are planted at the farthest part of the garden, provided they do not obstruct the view of fine objects.

Buildings are also very great ornaments to a garden, if they are well designed and properly placed; but the modern taste of crowding gardens with large useless buildings, I presume to think is censurable, with regard as well to propriety as expence.

Statues and vases are also very beautiful objects, but these should by no means be placed too near each other; for when several of them appear at once, they fill and confound the eye, and lose the beautiful effect which they would have, if now and then one properly situated engages the sight.

What an expence might be spared, and applied to nobler purposes, if nature only were to be imitated, if simplicity were studied in this delightful art, rather than ostentation! for any thing may be said to be more of nature, than what we miscall grandeur.

Fountains are also very ornamental to a garden, if they are magnificently built, and where a constant supply of water can be obtained; but if they are meanly erected, or have not water to keep them constantly running, they should never be introduced into gardens, for nothing can be more ridiculous than to see a dry fountain; which, perhaps, at a great expence, may have water forced up, to supply it for an hour or two, and no more; and this perhaps not in dry seasons, when there is a general scarcity of water.

The same may also be observed of cascades, and other falls of water, which ought never to be contrived in gardens, where there cannot be a constant run of water; but where the situation of a garden is so happy, as to be naturally supplied with water, these falls and jet's d'eau, may be rendered very great beauties, especially if they are well designed, and not made in the low mean taste, in which too many of those now in being appear, and where the water is made to fall over a parcel of regular steps of stone; but the fall should be in one sheet from top to bottom, where should be placed many large rough stones to break and disperse the water, and to increase the noise of the fall.

Where the ground is naturally uneven, and has gentle rises and falls, these may be so humoured in the laying out of the ground, as to be rendered very great beauties; but these inequalities of the ground must by no means be cut into regular stiff slopes, nor amphitheatres, as has been too much the practice: but if the knolls are properly planted with clumps of trees or shrubs, and the sloping sides smoothed and left in their natural position, they will have a much better effect, than can be given them by all the regular angles, lines, and flat slopes, which have been till of late, introduced by all the designers of gardens.

The taste in laying out of gardens has greatly altered, and has been as greatly improved in England, in the compass of a few years; for, with the revolution, the Dutch taste of laying out gardens was introduced, which consisted of little more than flower-borders laid out in several scrolls of Box-work, clipped Evergreens, and such low expensive things; as also the walling round, and dividing the several parts of gardens by cross walls; so that a garden consisting of eight or ten acres, was generally divided by brick walls, into three or four separate gardens; and these were reduced to exact levels, having many gravel-walks, and the borders on each side crowded with clipped trees and Evergreen hedges, dividing these small inclosures again; so that the first making and planting of these small gardens was attended with a greater expence, as was the keeping of them afterward, than gardens of six times the extent, when designed after nature.

Whether this taste so universally prevailed in England, in complaisance to his late Majesty King William, or was owing to the low grovelling taste of those persons, who had the designing of most of the English gardens, it is difficult to determine; but it is very certain, that the gentlemen, at that time, attended very little themselves, to the disposition of their gardens, but were contented to leave the whole direction of them to persons of the meanest talents that ever professed the art; so that soon after, when another taste prevailed, these gardens were almost totally demolished, and it would have been well, if a good, that is to say, a natural taste had succeeded the other; but this was not the case; for though a more open and extensive way of laying out gardens was introduced, yet this was lit-

tle more than copying after the French, whose taste was in making long avenues, strait walks, stiff regular slopes, cabinets, fret-work, tall hedges cut into various shapes, jets d'eau, fountains, &c. so that there was little of nature studied; but, on the contrary, all the geometrical figures introduced in wilderness-work, as also in the parterres, and other compartments of the garden: nor is it so much to be wondered at, that this taste prevailed in France, when the designs of all the principal gardens were there formed by architects, who were as studious to have the symmetry of the opposite, or corresponding part of the garden, as exact as the apartments of a habitation; nor has length of time, nor the improvements already made in other countries, amended their taste, or convinced them of its absurdity.

As the gardens of Versailles, Marli, and others, were extolled for their magnificence, so the plans of them were almost universally copied; the designers, or imitators rather, only varying the parts according to the situation or figure of the ground; and this was practised for several years, at a time, when great sums of money were expended in gardens, which might have rendered this country the most beautiful of any in Europe, had a natural taste then prevailed in the designing of gardens; which is the more to be lamented, as the plantations then made, have been many of them rooted out, to make way for the alterations and improvements which have been since introduced.

Many persons, I am sensible, will have it, that, in the designs of gardens, the taste should alter from time to time, as much as the fashion of apparel; but these cannot be persons of judgment; for wherever there are natural beauties in a country, they will always please persons of real knowledge; and frequently it is observed, that persons of but little skill in the art of gardening, are struck with these beauties without knowing the cause; therefore where the beautiful parts of nature are justly imitated in gardens, they will always be approved by judicious persons, let the taste of gardening alter as it will.

When trees have been long growing in a garden, nothing can be more disagreeable than to have them destroyed, to alter the garden according to the fashion of the time, because it requires much time to bring up trees to such a height as to afford shade and shelter; and, as time is precious, so, where the disposition of the garden is altered, there should be great attention given to the preservation of all the good trees, wherever they can be either useful or ornamental.

There is another essential part of gardening, which cannot be too much considered by persons who design gardens, which is that of adapting the several sorts of trees and shrubs, to the situation and soil of the garden, as also to allow the trees a proper share of room; but, however necessary this will appear, yet very few persons have made this their study, insomuch that when one views many modern gardens, and sees the great number of trees and shrubs, which are crowded into them, one would be induced to believe, that private interest has had a greater influence than any other motive, with the designers. Indeed this fault may often be ascribed to the master, who, perhaps, is too much in haste for shade and shelter, so will have three or four times the number of trees and shrubs planted as should have been, or that can remain long without injury, where the plantations succeed; and to this over-haste are owing the miserable plantations of large trees, so often seen in gardens and parks, where trees of all sorts, and of any age are taken out of woods, hedge-rows, &c. and removed at a great expence to stand and decay annually, till they become so many dead sticks, than which nothing can be a more disagreeable sight to the owner; who, after an expectation for several years, attended with an expence of watering, digging, and cleaning, finds himself under a necessity either of replanting, or giving up the thoughts of having any. Numbers of persons have indeed amused themselves with the hopes of success, by seeing these new planted trees put out branches for a year or two, which they generally do; but in three or four years after, instead of making a progress, they begin to decay at the top, and continue to do so gradually, until they quite perish, which, perhaps, may not happen in eight or ten years, especially if no severe winter, or very dry summer, intervenes, either of which generally proves fatal to these plantations; so that persons may be led on with hopes, for so many years, in the best part of their lives, when there is a certainty of their failing, or at least of their never increasing in size; but of this I shall treat more fully in the article of PLANTING, and shall proceed.

In the business of designs, a mean and pitiful manner should be studiously avoided, and the aim should be always at that which is noble and great, not to bring too many little things into a garden, nor to make small pieces of water, narrow walks, &c. especially in large gardens; for it is much better to have a few great things, than four times the number of small ones, which are trifling. In small gardens there is more excuse for this, nor indeed would it be right, to have either large lawns, broad walks, or large pieces of water in such; but yet even in these there ought to be a medium, and persons should never attempt to crowd too many things in these, whereby the whole will appear only as a mean and trifling model of a large garden.

Before the design of a garden is entered upon, it ought to be considered, what it will be in twenty or thirty years time, when the trees and shrubs are grown up, and spread; for it often happens, that a design, which looks handsome when it is first planted, and in good proportion, in process of time becomes so small and ridiculous, that there is a necessity either of altering or totally destroying it.

The general distribution of a garden, and of its parts, ought to be accommodated to the different situations of the ground, for a design may be very proper for a garden on a perfect level, which will by no means do for one where there are great inequalities in the ground; so that, as I have before intimated, the great art of designing is, in properly adapting the design to the situation, and contriving to save the expence of removing earth, to humour the inequalities of the ground, to proportion the number and sorts of trees and shrubs to each part of the garden, and to shut out, from the view of the garden, no objects that may become ornamental.

There are, besides these, many other rules relating to the proportions, conformity, and disposition of the different parts and ornaments of gardens, of which more may be seen under their several articles.

GARDENIA. See JASMINUM.

GARIDELLA. Tourn. Inst. R. H. 655. tab. 430. Lin. Gen. Plant. 507. [This plant was so named by Dr. Tournefort, in honour of Dr. Garidel, who was professor of physic, at Aix, in Provence.]

The CHARACTERS are,

*The flower hath a small, oblong, erect empalement of five leaves; it hath no petals, but five oblong equal nectariums occupy their place; these are bilabiate. The outer part of the under lip is bifid and plain; the interior part of the upper lip is short and single. The flower hath eight or ten awl-shaped stamina, which are shorter than the empalement, and are terminated by obtuse erect summits. In the center is situated three germina, which are oblong, compressed, and sharp-pointed, having no styles, but crowned by simple stigmas; these become three oblong compressed capsules with two valves, inclosing several small seeds.*

This genus of plants is ranged in the third section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and three germen.

We know but one SPECIES of this genus, viz.

GARIDELLA (*Nigellastrum.*) Hort. Cliff. 170. Garidella foliis tenuissime divisis. Tourn. *Garidella with very narrow divided leaves*; and the Nigella Cretica folio Fœniculi. C. B. P. 146. *Fennel-flower of Crete with a Fennel leaf.*

This plant is very near akin to the Nigella, or Fennel-flower, to which genus it was placed by the writers on botany before Dr. Tournefort, and was by him

him separated from it, as differing in the form of the flower.

It grows wild in Candia, and on mount Baldus, in Italy, as also in Provence, where it was discovered by Dr. Garidel, who sent the seeds to Dr. Tournefort, for the Royal Garden at Paris.

This is an annual plant, which rises with an upright stalk a foot high, dividing into several slender branches, garnished at their joints with very slender leaves like those of Fennel. The stalks are terminated by one small flower, of a pale herbaceous colour, which is succeeded by three capsules, each containing two or three small seeds. It flowers in June and July, and the seeds ripen in September. It is propagated by seeds, which should be sown in autumn, on a bed or border of light fresh earth, where the plants are designed to remain (for they seldom thrive if they are transplanted;) when the plants are come up, they must be carefully cleared from weeds, and where they are too close, they must be thinned, leaving them about four or five inches apart; this is all the culture the plants require, and if the seeds are permitted to scatter, the plants will come up without any farther care.

GAULTHERIA.

The Characters are,

*It hath a double permanent empalement; the outer has two oval, concave, short leaves; the inner has one bell-shaped leaf cut into five segments; the flower has one oval petal, cut half-way into five segments, which are reflexed; it has ten awl-shaped nectarii, which are short, surrounding the germen and stamina, and ten awl-shaped incurved stamina inserted to the receptacle, terminated by bifid horned summits, and a roundish depressed germen, supporting a cylindrical style, crowned by an obtuse stigma; the germen afterward becomes an obtuse five-cornered capsule, having five cells, fastened to the interior empalement, which turns to a berry open at the top, filled with hard angular seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, the flower having ten stamina and one style.

We know but one Species of this genus, viz.

Gaultheria (*Procumbens.*) Amœn. Acad. 3. p. 14. *Trailing Gaultheria.* Vitis Idæa Canadensis, pyrolæ folio. Tourn. Inst. 608. *Canada Wortle-berry with a winter-green leaf.*

This plant grows naturally in several parts of North America upon swampy ground, so is with difficulty preserved in the English gardens. The branches of this trail upon the ground, and become ligneous, but never rise upward; they are garnished with oval entire leaves, placed alternate; the flowers are produced on the side of the branches; they are of an herbaceous colour, so make little appearance, and very rarely are succeeded by fruit in England.

The only method in which I have succeeded to keep this plant, was by planting of it in a pot, filled with loose undunged earth, placing it in the shade, and frequently watering it; with this management I have kept the plant alive three years, and have had flowers but no fruit.

GAURA.

The Characters are,

*It hath an empalement of one leaf, which falls off, with a long cylindrical tube, having four oblong glands fastened to it; the upper part is cut into four oblong segments, which are reflexed. The flower hath four oblong rising petals, which are broad at the top but narrow at their base, sitting upon the tube of the empalement; and eight upright slender stamina which are shorter than the petals, and a nectarious gland between the base of each, with oblong moveable summits. The oblong germen is situated under the flower, supporting a slender style the length of the stamina, crowned by four oval spreading stigmas; the flower is succeeded by an oval four-cornered compressed capsule, containing one oblong angular seed.*

This genus of plants is ranged in the first section of Linnæus's eighth class, intitled Octandria Monogynia, the flower having eight stamina and one style.

We know but one Species of this genus, viz.

Gaura (*Biennis.*) Amœn. Acad. 3. p. 26. *Gaura.* Lysimachia chamænerio similis floridana, foliis nigris punctis capsulis carinatis in ramulorum cymis. Pluk. Amalth. 139. tab. 428. f. 1.

This is a biennial plant, which grows naturally in Virginia and Pensylvania: the stalk rises four or five feet high, sending out several branches, which are garnished with oblong, smooth, pale, green leaves, sitting pretty close. The flowers are produced in close tufts at the end of the branches; they are composed of four oblong petals, of a pale Rose colour, irregularly placed, having eight stamina surrounding the style. The flowers appear in September, and when the autumn proves favourable, the seeds will ripen toward the end of October.

If the seeds of this plant are sown on open borders soon after they are ripe, they will more certainly succeed than when they are sown in the spring. When the plants come up, they must be kept clean from weeds; and if they are too close, some of them should be drawn out, and planted in a bed to allow room for the other to grow; in the autumn they should be all transplanted to the place where they are designed to stand for flowering and perfecting their seeds, and will require no other culture but to support their branches to prevent the autumnal winds from breaking them down.

GENERATION is, by naturalists, defined to be the act of procreating and producing a thing which before was not; or, according to the schoolmen, it is the total change or conversion of a body into a new one, which retains no sensible part or mark of its former state.

Thus we say, fire is generated, when we perceive it to be where before there was only wood, and other fuel, or when the wood is so changed, as to retain no sensible character of wood; in the like manner a chick is said to be generated, when we perceive a chick, where before was only an egg, or the egg is changed into the form of a chick.

In generation there is not properly any production of new parts, but only a new modification or manner of existence of the old ones, and thus generation is distinguished from creation.

Generation also differs from alteration, in that in alteration the subject remains apparently the same, and is only changed in its accidents or affections, as iron, which before was square, is now made round; or when the same body which is well to-day, is sick to-morrow.

Again: generation is the opposite to corruption, which is the utter extinction of a former thing; as, when that which before was an egg, or wood, is no longer either the one or the other; whence it appears, that the generation of one thing is the corruption of another.

The Peripateticks explain generation by a change or passage from a privation, or want of a substantial form, to the having such a form.

The moderns allow of no other change in generation, than what is local; and, according to their notion, it is only a transposition, or new arrangement of parts; and, in this sense, the same matter is capable of undergoing an infinite number of generations.

As for example: A grain of Wheat, being committed to the ground, imbibes the humidity of the soil, becomes turgid, and dilates to such a degree, that it becomes a plant; and, by a continual accession of matter, by degrees, ripens into an ear, and at length into a seed; this seed, when ground in a mill, appears in the form of a flour, which, being mixed up with water, makes a paste, of which bread is generated by the addition of yeast, and undergoing the operation of fire, i. e. by baking; and this bread being cominuted by the teeth, digested in the stomach, and conveyed through the canals of the body, becomes flesh, or, in other words, flesh is generated.

Now the only thing effected in all this series of generation, is a local motion of the parts of the matter, and their settling again in a different order; so that where-

wherever there is a new arrangement, or compoſition of the elements, there is, in reality, a new generation, and thus generation is reduced to motion.

Generation is more immediately underſtood of animal and vegetable bodies from ſeed, or the coition of others of different ſexes, but of the ſame genus or kind.

Monſ. Perrault, and ſome of the modern naturaliſts after him, maintained, That there is not properly any new generation, that God created all things at firſt, and that what is by us called generation, is no more than an augmentation and expanſion of the minute parts of the body of the ſeed; ſo that the whole ſpecies, which are afterwards produced, were, in reality, all formed at the firſt, and incloſed therein, to be brought forth and expoſed to view in time, and according to a certain order and œconomy.

And accordingly Dr. Garden ſays, It is moſt probable, that the ſtamina of all the plants and animals that have been formed, ab origine mundi, by the Almighty Creator, within the firſt of each reſpective kind; and he who conſiders the nature of viſion, that it does not give us the true magnitude, but only the proportion of things; and that which ſeems to our naked eye but a point, may truly be made up by as many parts as ſeem to be in the whole univerſe, will not think this an abſurd or impoſſible thing.

Dr. Blair, treating of the generation of plants, ſays, That when Almighty God created the world, he ſo ordered and diſpoſed of the materies mundi, that every thing produced from it ſhould continue ſo long as the world ſhould ſtand. Not that the ſame individual ſpecies ſhould always remain; for they were, in proceſs of time, to periſh, decay, and return to the earth, from whence they came; but that every like ſhould produce its like, every ſpecies ſhould produce its own kind, to prevent a final deſtruction of the ſpecies, or the neceſſity of a new creation, in order to continue the ſame ſpecies upon earth, or in the world.

For which end he laid down certain regulations, by which each ſpecies was to be propagated, preſerved, and ſupported, till, in order, or courſe of time, they were to be removed hence; for, without that, thoſe very beings, which were created at firſt, muſt have continued till the final diſſolution of all things, which Almighty God of his infinite wiſdom did not think fit.

But, that he might ſtill the more manifeſt his omnipotence, he ſet all the engines of his providence to work, by which one effect was to produce another by the means of certain laws, or rules laid down for the propagation, maintenance, and ſupport of all created beings; this his divine providence is called nature, and theſe regulations are called the laws, or rules of nature, by which it ever operates in its ordinary courſe, and whatever exceeds from that is ſaid to be preternatural, miraculous, or monſtrous.

Moſes, in his account of the creation, tells us, that plants have their ſeeds in themſelves, in theſe words: And God ſaid, Let the earth bring forth graſs, the herb yielding ſeed, and the fruit-tree yielding fruit, after his kind, whoſe ſeed is in itſelf upon the earth.

The antients, indeed, diſtinguiſhed the generation of animals into two kinds, i. e. into regular, called univocal; and anamolous, called alſo equivocal, or ſpontaneous.

The firſt was effected by parent animals of the ſame kind, as that of men, birds, beaſts, &c. The ſecond they ſuppoſed to be effected by corruption, the ſun, &c. as that of inſects, frogs, &c. but this latter is now generally exploded.

Many, indeed, have eſſayed to treat of the generation of animals, but few have been able to give that ſatisfactory account of it that were to be wiſhed for, and far fewer yet have been able to treat of the generation of plants as it ought to be; for that which ſtill kept them in the dark, was,

Firſt, That though there were two different ſexes in animals, by whoſe mutual aſſiſtance the ſpecies was propagated, yet there was no ſuch thing then known in plants.

Secondly, That though it can now be made appear, that every animal is produced by univocal generation, i. e. from an egg, and not by corruption, &c. as moſt of the antients imagined the inſects were; yet there are ſtill thoſe who maintain, that thoſe which they call imperfect plants, are the product of a certain rottenneſs in the earth.

The generation of plants bears a cloſe analogy to that of ſome animals, eſpecially ſuch as want local motion, as muſcles, and other immoveable ſhell-fiſh, which are hermaphrodite, and contain both the male [illegible] female organs of generation.

[illegible] flower of a plant is found to be the pudendum, [illegible]ncipal organ of generation; but the uſe of ſo [illegible] mechaniſm, and ſo many parts, has been but [illegible] known till of late years.

The flower of a Lily conſiſts of ſix petala, or flower-leaves, from the bottom of which, in the middle, ariſes a kind of tube, called by Tournefort, the piſtillum, and by Dr. Linnæus the ſtyle; this reſts upon the germen, which is the female organ of generation; round this are placed pretty fine threads, called the ſtamina, or filaments; theſe ſtamina ariſe likewiſe from the bottom of the flower, and terminate at the top in little ſummits, called by ſome apices, which are replete with a fine duſt, called farina; theſe are the male organs of plants.

This is the general ſtructure of the flowers of plants, although they are infinite ways diverſified, and to ſuch a degree, that ſome have no ſenſible piſtil, and others want the ſtamina; others again have the ſtamina, but want the apices, and ſome plants exceed all others in this, that they have no viſible flowers; but if it be allowed, that this before-mentioned is the moſt common ſtructure of flowers, it will follow, that theſe parts that ſeem wanting are uſually only leſs apparent, or are ſituated in different plants, or in different parts of the ſame plant.

The fruit is uſually at the baſe of the piſtillum, ſo that when the piſtillum falls with the reſt of the flower, the fruit appears in the ſtead of it; but oftentimes the piſtillum is the fruit itſelf, but ſtill they have both the ſame ſituation in the center of the flower, and the petala, or flower-leaves, which are diſpoſed around the little embryo, ſeem to be deſigned only to prepare a fine juice in the little veſſels, for the ſupport of it during the little time that they laſt, and it requires; but ſome ſuppoſe the chief uſe of them to be to defend the piſtillum, &c.

The apices of the ſtamina are ſmall capſulæ, or bags, full of a farina, or duſt, which falls out when the capſula grows ripe, and burſts.

Monſ. Tournefort ſuppoſed this duſt to be only an excrement of the food of the fruit, and the ſtamina to be nothing but excretory ducts, which filtrated this uſeleſs matter, and thus diſcharged the embryo; but Mr. Morland, Mr. Geoffroy, and others, find nobler uſes for this duſt; on their principle the ſtamina, with the apices and farina, make the male part of the plant, and the piſtil, the female.

Mr. Morland ſays, It hath been long ago obſerved, that there is in every particular ſeed a ſeminal plant conveniently lodged between the two lobes, which conſtitute the bulk of the ſeed, and are deſigned for the firſt nouriſhment of the tender plant.

But the admirable Dr. Grew, to whoſe generous induſtry, and happy ſagacity, we are indebted for the beſt improvements of this part of knowledge, is the only author I can find, who hath obſerved that the farina, or fine powder, which is, at its proper ſeaſon, ſhed out of thoſe thecæ, or apices ſeminiformes [i. e. ſeed-forming caſes] which grow at the top of the ſtamina, doth ſome way perform the office of male ſperm. But herein, I think, he falls ſhort, in that he ſuppoſes them only to drop upon the outſide the uterus, or vaſculum ſeminale, and to impregnate the included ſeed by ſome ſpirituous emanations, or energetical impreſs.



That

That which is now ſubjected to the diſquiſitions and cenſure of ſuch whoſe exquiſite ſkill conſtitutes them judges of ſuch performances, is, Whether it may not be more proper to ſuppoſe, that the ſeeds which are lodged in the proper involucra, are at the firſt unimpregnated ova (or eggs) as of animals; that this farina is a congeries of ſeminal plants, one of which muſt be conveyed into every ovum before it can become prolific; that the ſtylus, in Mr. Ray's language, or the upper part of the piſtillum, in Mr. Tournefort's, is a tube deſigned to convey theſe ſeminal plants into their neſts in the ova; that there is ſo vaſt a proviſion made, becauſe of the odds there are, whether one, of ſo many, ſhall ever find its way into, and through ſo narrow a conveyance.

To make this ſuppoſition the more credible, I ſhall lay down the obſervations I have made upon the ſituation of theſe ſtamina, and the ſtylus, in ſome few ſpecies of plants.

Firſt, In the Corona Imperialis, where the uterus, or vaſculum ſeminale of the plant ſtands upon the center of the flower; and from the top of this ariſeth the ſtylus, the vaſculum ſeminale and ſtylus together repreſenting a piſtillum.

Round this are placed ſix ſtamina; upon the ends of each of theſe are apices, ſo artfully fixed, that they turn every way with the leaſt wind, being in height almoſt equal to the ſtyles about which they play, and which in this plant is manifeſtly open at the top, as it is hollow all the way; to which we muſt add, that upon the top of the ſtylus there is a ſort of tuft, conſiſting of pinguid villi, which I imagined to be placed there to catch and detain the farina, as it flies out of the thecæ; from hence, I ſuppoſe, the wind ſhakes it down the tube, till it reach the vaſculum ſeminale.

In the Caprifolium, or Honeyſuckle, there riſes a ſtylus from the rudiments of a berry, into which it is inſerted to the top of the monopetalous flower; from the middle of which flower are ſent forth ſeveral ſtamina, that ſhed their farina out of the caſes upon the orifice of the ſtylus, which, in this plant, is villous or tufted, upon the ſame account as in the former.

In Allium, or common Garlic, there ariſes a tricoccous uterus, or ſeed-veſſel; in the center of which is inſerted a ſhort ſtylus, not ſo high as the apices, which thus over-topping it, have the opportunity of ſhedding their globules into an orifice more eaſily; for which reaſon, I can diſcern no tuft upon this (as in the former) to inſure their entrance, that being provided for by its ſituation juſt under them.

The reader, I hope, will excuſe me, if I preſent him now with ſome ſuch reaſonings or reflections as the foregoing account doth ſuggeſt, and will ſupport; and I cannot but hope to perſuade thoſe that are candid, that I have aſſigned to the ſeveral parts of the flowers I have mentioned, their true and real uſe.

For nothing can be more natural than to conclude, that where a fine powder is curiouſly prepared, carefully repoſited, and ſhed abroad at a peculiar ſeaſon, where there is a tube ſo placed as to be fit to receive it, and ſuch care in diſpoſing this tube, where it doth not lie directly under the caſes that ſhed the powder, it hath a particular apparatus at the end, to inſure its entrance.

Nothing can be more genuinely deduced from any premiſes, than it may from this, that this powder, or ſome of it, was deſigned to enter this tube. If theſe ſtamina had been only excretory ducts, as has been hitherto ſuppoſed, to ſeparate the groſſer parts, and leave the juice deſigned for the nouriſhment of the ſeed more reſerved, what need was there to lodge theſe excrements in ſuch curious repoſitories? They would have been conveyed any where, rather than where there was ſo much danger of their dropping into the ſeed-veſſel again, as there is here.

Again: the tube, over the mouth of which they are ſhed, and into which they enter, leads always directly into the ſeed-veſſel.

To which we muſt add, that the tube always begins to die when theſe thecæ are emptied of their contents; if they laſt any longer, it is only whilſt the globules, which enter at their orifice, may be ſuppoſed to have finiſhed their paſſage. Now, can we well expect a more convincing proof of theſe tubes being deſigned to convey theſe globules, than that they wither when there are not more globules to convey.

If I could now ſhew, that the ova, or unimpregnated ſeeds, are ever to be obſerved without this ſeminal plant, the proof would ariſe to a demonſtration; but having not been ſo happy as to obſerve this, I ſhall content myſelf at preſent with ſuggeſting, that hence one would conclude, that the petala of the flower were rather deſigned to ſever ſuperfluous juices from what was left to aſcend in the ſtamina, than the ſtamina to perform this office, either for them, or the unimpregnated ſemina, and obſerve the analogy between animal and vegetable generation, as far as was neceſſary there ſhould be an agreement between them. I ſhall recommend the enquiry to thoſe gentlemen who are maſters of the beſt microſcopes, and addreſs in uſing them; though, in the mean time, I have made ſome ſteps toward a proof of this ſort, and have met with ſome ſuch hints, as make me not deſpair of being able, in a ſhort time, to give the world even this ſatisfaction.

For, not to inſiſt upon this, that the ſeminal plant always lies in that part of the ſeed which is always neareſt to the inſertion of this ſtylus, or ſome propagation of it into the ſeed-veſſels, I have diſcovered in Beans, Peas, and Kidney-beans, juſt under one end of that we call the eye, a manifeſt perforation, (diſcernible by the groſſer ſort of magnifying glaſſes) which leads directly to the ſeminal plant, and at which I ſuppoſe the ſeminal plant did enter; and, I am apt to think, the Beans or Peas that do not thrive well, may be found deſtitute of it.

But I muſt now proceed to deſcribe ſome other plants, whereby it will appear, that there is a particular care always exerciſed to convey this powder, ſo often mentioned, into a tube, which may convey it to the ova.

Now, in leguminous plants, if we carefully take off the petala of the flower, we ſhall diſcover the pod, or ſiliqua, cloſely covered with an involving membrane, which, about the top, ſeparates into nine ſtamina, each fraught with its quantity of farina; and theſe ſtamina cloſely adhere to the ſtyle, which is obſervable at the end of that tube, which here alſo leads directly to the pod; it ſtands not upright, indeed, but ſo bent, as to make near a right angle with it.

In Roſes there ſtands a column, conſiſting of many tubes cloſely clung together, though eaſily ſeparable, each leading to their particular cell, the ſtamina in a great number placed all round about.

In Tithymalus, or Spurge, there riſes a tricoccous veſſel, that, whilſt it is ſmall, and not eaſily diſcernible, lies at the bottom till it is impregnated, but afterwards grows up, and ſtands ſo high upon a tall pedicle of its own, as would tempt one to think, that there were to be no communication betwixt this and the apices.

In the Strawberries and Raſpberries, the hairs which grow upon the ripe fruit (which, I ſuppoſe, may be ſurpriſing to ſome) are ſo many tubes leading each to their particular ſeed; and therefore we may obſerve, that in the firſt opening of the flower there ſtands a ring of ſtamina, within the petala, and the whole inward area appears like a little wood of theſe hairs or pulp, which, when they have received and conveyed their globules, the ſeeds ſwell, and riſe in a carneous pulp. Thus far Mr. Morland.

We may obſerve a veſſel at the bottom of the piſtil of the Lily, which veſſel we may call the uterus, or womb, in which are three ovaries filled with little eggs, or rudiments of ſeed found in the ovaria, which always decay, and come to nothing, unleſs impregnated with the farina of the ſame plant, or ſome other of the ſame kind; the ſtamina alſo ſerve for the conveyance of the male ſeed of the plant to be per-

fected in the apices, which, when ripe, burst forth in little particles like dust; some of them fall into the orifice of the pistil, and are either conveyed thence into the utricle, to fecundify the female ova, or lodged in the pistil, where, by their magnetic virtue, they draw the nourishment from the other parts of the plant into the embryos of the fruit, making them swell, grow, &c.

In flowers that turn down, as the Cyclamen, and the Imperial Crown, the pistil is much longer than the stamina, that their dust may fall from their apices in sufficient quantities on the pistil, for the business of impregnation.

Mr. Geoffroy assures us, That in all the observations he had made, the cutting off the pistil before it could be impregnated by the farina, actually rendered the plant barren for the season, and the fruit abortive.

In many kinds of plants, as the Oak, Pine, Willow, &c. the flowers, Mr. Geoffroy observes, have their stamina and apices, whose farina may easily impregnate the rudiments of the fruit, which are not far off.

Indeed there is some difficulty in reconciling this system with a certain species of plants, which bear flowers without fruit; and another species of the same kind and denomination, which bear fruit without flowers; such are the Palm, Hemp, Hop, Poplar, &c. which are hence distinguished into male and female; for how should the farina of the male here, come to impregnate the ova of the female?

This difficulty Mr. Geoffroy solves, by supposing the wind to be the vehicle that conveys the male dust to the female uterus, which is confirmed by an instance of Jovianus Potanus, of a single female Palm-tree growing in a forest, which never bore fruit, till, having risen above the other trees of the forest, and being then in a condition to receive the farina of the male by the wind, it began to bear fruit in abundance.

As to the manner wherein the farina fecundifies, Mr. Geoffroy advances two opinions:

First, That the farina being always found of a sulphureous composition, and full of subtil and penetrating parts (as appears from its sprightly odour) which, falling on the pistils of the flowers, there resolves, and the subtilest parts of it, penetrating the substance of the pistil, excite a fermentation, which putting the latent juices of the young fruit in motion, occasions the parts to unfold the young plant that is inclosed in the embryo of the seed.

In this hypothesis, the plant in miniature is supposed to be contained in the seed, and to want only a proper juice to unfold its parts, and to make them grow.

The second opinion is, That the farina of the male plant is the first germ or semen of the new plant, and stands in need of nothing to enable it to grow or unfold, but a suitable nidus with the juice it finds prepared in the embryo of the seed or ovary.

It may be observed, that these two theories of vegetable generation bear a strict analogy to those two of animal generation, viz. either that the young animal is in the semen masculinum, and only stands in need of the juice of the matrix to cherish and bring it forth; or that the female ovum contains the animal, and requires only the male seed to excite a fermentation.

Mr. Geoffroy rather makes the proper seed to be in the farina, inasmuch as the best microscopes do not discover the least appearance of any bud in the little embryos of the grains, when they are examined, before the apices have shed their dust.

In leguminous plants, if the petala and stamina be removed, and the pistil, or that part which becomes the pod, be viewed with the microscope before the flower be open, those little green transparent vesiculæ, which are to become grains, will appear in their natural order, yet still shewing nothing else but the mere coat, or skin of the grain.

If you continue to observe the flowers as they advance for several days successively, you will find them to swell, and, by degrees, to become replete with a limpid liquor; in which, when the farina comes to be shed, and the leaves of the flower to fall, there may be observed a little greenish speck, or globule, floating about at large.

There is not at first any appearance of an organization in this little body; but in time, as it grows, you may begin to distinguish two little leaves like two small horns; as the little body grows, the liquor diminishes insensibly, till at length the grain becomes quite opake; and upon opening it, the cavity will be found filled with a young plant in miniature, consisting of a little germ, or plantula, a little root, and the lobes of the Bean, or Pea.

The manner wherein this germ of the apex enters the vesicula of the grain, is not very difficult to determine: for, besides that the cavity of the pistil reaches from the top to the embryos of the grains, or those vesiculæ, have a little aperture corresponding to the extremity of the cavity of the pistil, so that the small dust, or farina, may easily fall, or find an easy passage in the aperture in the mouth of the vessels, which is the embryo of the grain.

The aperture, or cicatricula, is much the same in both grains; and it is easily observed in Peas, Beans, &c. without a microscope.

Dr. Patrick Blair, treating of the generation of plants, says, That a vegetative life is common to them, as well as animals; and that the propagation or production of the species is the effect of the vegetative, not the sensitive life in animals, as well as in plants; and that if there be a necessity of the concurrence of two different sexes in animals, at the beginning or generating of the species, the same necessity must be in plants too; for as a cow, a mare, a hen, a she-reptile, an insect, &c. cannot produce an animal without the male, no more can it be supposed, that a plant can produce fertile seed without the concurrence of the male plant, or the male parts of the plant.

Mr. Ray says, That he will not deny, that both trees and herbs may produce fruit, and even come to maturity, without the male seed being sprinkled upon them. For though most birds do not lay eggs without congress of the male, yet the hen often does it without copulating with the cock, but then these eggs are barren and wind eggs; just so, though a female plant may produce seed of itself, yet that seed is never fertile. For,

First, As the work of generation in animals does not proceed from their animal or sensitive life but from their vegitative, which being the same as in plants, that operation must be performed after the same manner in both; therefore, as there is a necessity of two different sexes in animals, it must be so too in plants.

Secondly, As passive seminal matter in female animals cannot be productive or fertile of itself, without being impregnated, animated, or its particles set in motion and dilated by the active principles of the male seminal matter; neither can the female seed in plants be rendered fertile, until it be impregnated by the farina fœcundans from the male parts of the plants.

As to the flowers of plants, if they were not assisting to, or if there were not some extraordinary use from them in the perfection of the seed, they would not be so often observed upon plants as they are. But since there is no fruit or seed without a previous flower; and since where the one is obvious the other is conspicuous, and since one is scarce to be observed with the naked eye, neither is the other; this implies a relation between them, that the one of them is not to be expected without the other.

It is true, there may be flowers upon a plant, where the fruit is seldom seen, especially in these northern climates; such as the Pervinca, the Nymphæa alba minima, and several others; where the plant exhausts the

the nutritious juice, in pushing forth tendrils or creeping roots, which so weaken the plants, as not to be able to bring the fruit to perfection; but there is no fruit or seed to be seen, unless a flower has been sent as a messenger before it, to give notice of its approach; though it is not always upon the same plant, yet it is still upon some other plant of the same species; for the flowers are to be seen upon distinct plants, different branches, or different parts of the branch from the fruit, in the Abies, Corylus, Nux Juglans, &c. the Mercurialis, Spinachia, &c.

But the fruit never appears, or never begins to increase upon these plants, till the flower is spent and gone; therefore they must serve for another use, than to be merely ornamental; for if that were their principal use, they would be always conspicuous, which they are not for the most part in apetalous flowers; and they would always be to be seen, and never be hid; which is not so in the Asarum, Hydrocotyle, &c. where, though the flower is large enough in proportion to the fruit, yet it is not to be seen, unless the leaf be turned up, and both flower and fruit be narrowly searched for.

The Frumenta and Gramina have their stamineous flowers; yet in some of them the flower is seldom to be seen, unless the spike be shaken; and then the apices will appear.

The Polypodium, and other capillary plants, have regular flowers, which precede the minute capsulæ or seed-vessels, but neither of them are conspicuous without a microscope.

From these instances it appears, that the flowers are not constantly a guard to preserve the tender embryos from the injuries of the air, for then the flowers must always have been upon the same pedicle with the fruit.

Therefore, since the appearance of the flower is the first step towards the production of the seed, whether both be upon the same pedicle or not, it necessarily follows, that the one must contribute towards the bringing of the other to perfection.

The antients taking notice, that several plants did produce flowers and had no seeds, and that other plants of the same species, and sown from the same seed, did produce the seed without a previous flower, they were ready to call the one male, and the other female, without any notion that the one was assisting to the other; for they looked upon such flowers to be only barren; and therefore they called those which had flowers female, and those that produced the fruits, male plants. Thus Mercurialis is called Spicata Fœmina, and Testiculata Mas. That which produces the fruit must needs be the female, as the female animal brings forth the fœtus; therefore the testiculata must needs be the female, and the spicata the male.

Wherever the plants are annual, these with the flowers, and such as have the seed, are always near to each other; but where the root is perennial, and where the plant is more frequently propagated by the root than the seed, the case alters; for there being no need of the seed to propagate the plant, there is the less need of the flower to be nearer to the plant which produces the seed.

So the Spinachia and the Lupulus are frequently seen to grow, to produce the seed, and the other the squamous fruit; when the plants which produce the male flowers of the one or the other, are at some distance. And this is so far from being an objection against the necessity of two sexes in plants as well as in animals, that it is an argument to confirm it; for it shews the wonderful contrivances in order to preserve the species, when the ordinary means of propagating it by the seed cannot be so conveniently attained.

These, and more that might be produced, being evident proofs of two sexes in plants, as well as in animals, we shall in the next place, give some experiments to confirm this in a negative way, as have been already done in a positive.

When plants have been deprived of their male flowers, or male parts in the flower, they either produced no seed at all, or if they did, they became abortive, dried up, or dwindled away; or though the seeds did come to perfection, they were barren, or did not produce.

Experiment 1. Mr. Geoffroy having cut off all the stamineous tufts of male flowers from the top of the stalk in the Maiz or Turky-wheat, as soon as they appeared, and before the spike loaded with the embryos of the semen had put forth from the alæ of the leaves, several of these embryos decayed and dried up after they were pretty big; but some grains upon their pedicles all along the spike swelled considerably, and seemed to be full of the bud, and were consequently fertile, while all the others miscarried, and there was not one spike where the whole seeds did not ripen to the full.

This experiment is a sufficient proof of the use of the male flowers of this plant; for whatsoever that is which flows from the racemi of these flowers, it seems it must be conducive not only for the impregnation of the seed, but also for the growth and impregnation of the fruit.

At present we shall shew, that what nourishment is usually furnished by the pedicle to the embryos, does not appear to be capable to dilate or expand itself, or contribute to the continual supply of nutritious particles, unless the embryos were animated or enlivened by the spirit which should have flowed from the male flowers; so that they were so debilitated and weakened, in ascending from the body of the plant towards the embryos, before they could arrive at them, that they which otherwise might have served for the augmentation and increase of all the embryos upon the spike, could not now do any thing more than contribute to the ripening of a few. And although Mr. Geoffroy might have imagined, that these few seeds which came to perfection were fertile also, because they were full of germs, yet he could not be sure of that, unless he had sown the same seeds next season, and tried whether they would chit or not.

Gardeners who buy Onion and Leek-seed brought from Strasburgh, commonly try the following experiment: they put a few of the seeds into a pot of water mixed with earth, and if they find they begin to spring, or send forth the seminal leaf or fibre of the root, after a few days, they judge of the product of it; and notwithstanding all the seeds without this trial may seem to be productive, being equally firm, hard, and solid, perhaps not more than one third of them will prove fertile.

And this barrenness may proceed, either because they had never been impregnated by the male parts of the flower, or that they had been too much exposed to the air; being some time or other too much moistened, and not afterwards been carefully dried, or have been kept too long, by which neglect they lose their spirit or life.

Now, if the fulness, solidity and firmness of a seed is not a sure sign of its fertility, then Mr. Geoffroy might have been mistaken in his opinion of the fertility of these seeds in the Maiz, since he did not make any trial of it, by committing it to the ground.

In like manner, as to his second experiment of the Mercurialis Dioscoridis, where he raised some plants which had the fruit, and others which had the stamineous flowers, and removed the floriferous plants before the flowers were blown, every one of the seeds upon the fructiferous plants, except five or six, miscarried; which seeds were so full, that he was persuaded they were capable of producing new plants; and the like was found by Camerarius in the Cannabis. Yet inasmuch as neither of them tried the experiment, by sowing the same seed the second year, they could not be sure but that they might have failed in their expectation.

Mr. Bobart, overseer of the physic-garden at Oxford, many years since, which was before the doctrine of the different sexes of plants was well understood, being herbarizing, found a plant of the Lychnis sylvestris simplex,

ſimplex, no apices; and taking notice that this was not only in one, but in all the flowers upon the ſame plant, he imagined it might be a new ſpecies; and therefore marked the plant, and took care to have it preſerved till the ſeeds were ripe; and then, they being full, hard, and firm, and to outward appearance full of germ, he ſowed them in a proper place in the garden the next ſeaſon, but not a plant ſprung up from them. Theſe and other inſtances, ſet the opinion of the different ſexes of plants upon another footing than has been received by moſt of our modern authors; for it imports, that it is not the nouriſhment of the groſs ſubſtance of the ſeed itſelf which is hereby meant, nor the increaſe of the ſeed-veſſel, which is thereby deſigned; for (as is already obſerved) a hen can lay an egg, without having before had congreſs with a cock; and this, when newly laid, ſhall be of the ſame bigneſs, colour, taſte, and ſmell, with another egg which has been cocked (as they call it;) i. e. which has been fecundated by the maſculine ſeminal materies: but the difference will appear, when both are put under the hen, in order to be hatched; for the one ſhall pullulate or chit, and the other ſhall become fetid and rot.

The caſe is juſt the ſame with the ſeed of a plant, it may be augmented and increaſed in its bulk; it may become firm, hard, and ſolid, and have all the tokens of a perfect ripeneſs; the ſeed-veſſels may be enlarged, and the pulp or parenchyma of the fruit may be augmented; and yet the particles of the ſeed may remain crude, indigeſted, and incapable to be explicated and dilated, or ſet in a ſuitable motion, whereby to protrude the fibrilla of the root at one end, and the ſeminal leaves at the other; except it has before received ſome extraneous matter, or ſome active particles from the male parts of the flower, or from the male flower itſelf.

In order to confirm the neceſſity of two ſexes of plants, as well as in animals, this familiar conſideration may be added: that the fertility or barrenneſs of any tree, in the more or leſs fruitful ſeaſons, may be known to ignorant or leſs curious perſons, by the quantity of the flowers which appear in the ſpring time; and that not only in trees alone, where the flower and fruit are upon one and the ſame foot-ſtalk, but alſo in ſuch trees, where the flowers are upon diſtinct trees, or ſeparate places upon the ſame tree; for it is eaſy to determine by the catkins or iuli upon the Walnut, Filbert, or Hazle-trees, whether ſuch or ſuch trees will be fertile or barren for the enſuing ſeaſon, before any of the embryos begin to break, be puſhed forth, or appear.

Having already treated of the male and female parts of flowers, we ſhall next conſider their uſe.

Flowers, in this reſpect, may aptly be divided into that of male flowers, which (as has been before obſerved) were formerly reputed barren; and the plants which produce them were alſo called female plants, becauſe thoſe perſons not having any notion of different ſexes in plants, they were called female, upon account of their weakneſs; or if they had any thought of ſexes in them, it was only illuſive.

The ancients were ignorant of thoſe which are now-a-days called hermaphrodite flowers; and they, not having a true notion of ſexes of plants, could not imagine that the parts of both ſexes ſhould be in one flower, upon one and the ſame foot-ſtalk.

And although hermaphrodite animals bear the leaſt proportion in the animal kingdom, yet hermaphrodites have the greateſt ſhare in the vegetable, though they are not ſo numerous as they have been ſuppoſed to be; for upon a ſtrict examination it will be found, that a great many more plants have diſtinct male and female flowers, than was formerly believed.

The neceſſity of different ſexes in plants having been demonſtrated, and that the female ſeed, though it ſhould ripen to the full, cannot be fertile, except it be impregnated by what it receives from the male parts of flowers, we ſhall next explain the organs of generation in both ſexes.

In the animal œconomy, there are, beſides thoſe veſſels that are deſtinated for nutrition, and the ſecretion of the ſeveral juices in the body, ſpermatic veſſels, which conſiſt of præparantia, deferentia, and continentia ſemen. The præparantia in males, are the blood-veſſels and the teſtes; the one conveys the blood, and the other ſeparates the ſemen from blood, and elaborates it.

So likewiſe in plants there are veſſels that receive the nutritious particles from the earth, and convey it to the extremity of the plant; ſome of which tend directly to the leaf, and others to the flowers.

Thoſe which go to the foot-ſtalk of the flower may not improperly be called ſpermatic-veſſels, for it is from them that the ſeminal particles in male, female, and hermaphrodite flowers are ſeparated; therefore the foot-ſtalks of the hermaphrodite flowers are proportionably larger than thoſe either of the male or female; they have a double office, and contribute ſucceſſively to both.

In thoſe where the calyx becomes the fruit, the greateſt ſupply is furniſhed to it firſt, and diſtributed in its cortical parts, as is viſible in the Roſe; in which the foot-ſtalk is ſo far enlarged at firſt, as to be of an equal bigneſs with the bud.

After the calyx is thus formed, the next diſtribution is to the inner or centrical part of the flower, which Dr. Grew calls attire, and where the piſtillum becomes the fruit; the piſtillum and ſtylus are formed at the ſame time with the ſtamina and apices.

The ſtylus at the very firſt acquires both its due length and bigneſs; for the nutritious particles aſcending in the center never ſtop till the ſtylus is ſtretched out to its full length; and in ſuch as are furniſhed with a peculiar apex, that is formed firſt; the neck of the ſtylus, or that part next to it, is the biggeſt; from thence it gradually decreaſes in its groſſneſs, till it comes to the piſtillum. This is eaſily perceived by thoſe who will take the pains to open the bud of a Lily, Tulip, &c. before they are half blown.

The ſtamen is furniſhed next with an extraordinary ſupply of the nutritious particles before the flower is blown; theſe, whether fewer or more, are at firſt brought to their proportional largeneſs, being round and juicy.

The apex is the third which receives this extraordinary ſupply of the nouriſhment, for after that the ſtylus is formed, that it may lean to it after the veſſels of the ſtamen and ſummit are extended to their full length, and ſo formed, that they can convey ſuch an extraordinary quantity of particles as may fill up the capacity of the apex, it is then more enlarged than ever after; for if the flower of a Lily be opened before it be blown, the apex will be found to be full as long as the ſtamen; for as the one half of the apex covers the ſtamen, fixed to its center, ſo the other half of it is ſo far extended above the ſtamen, as the ſtamen remained uncovered below it, towards the pedicle or foot-ſtalk.

The fourth part of a flower is the petala, which receives this extraordinary ſupply of nouriſhment before the blowing; theſe upon the reverſe, are firſt enlarged towards the pedicle, and are afterwards extended and ſtretched forth in proportion to the enlargement of the attire; at firſt they are all groſſer, and more ſucculent towards the origin, and gradually become thinner and broader. The ſtamina of monopetalous flowers do, for the moſt part, ariſe partly from the petalon itſelf, and partly from the calyx; eſpecially if the ſtamina correſpond in number to the petala, as in the Hexapetalæ, or Polypetalæ Liliaceæ of Tournefort, where every ſtamen ariſes oppoſite to the middle of the petalon.

This obſervation (how and when this more than ordinary ſupply of nouriſhment is carried to the flowers) eaſily demonſtrates wherein the analogy of the organs of generation in plants and animals conſiſts.

In animals, the ſeminal matter is received by proper veſſels from the ſame blood from whence the other ſecretions, fit for the preſervation of the animal œconomy

nomy proceed; so that the blood in animals being the same with the sap in plants, and both being conveyed after the same manner throughout the several bodies, it necessarily follows, that the one as well as the other, must have proper vessels for secretion of the seminal matter.

Let it then be considered, that the sap or nutritious juice ascends in common to the pedicle of the flower, as the blood flows by the aorta descendens; and that at the calyx or bottom of the flower, some share goes to one part of it, and some to another; as the aorta sends one branch to the spermatic vessels, and the remainder of it goes to perform the other functions; and as a part of the sap is separated by the pedicle of the flower, when the remainder is distributed throughout the remaining parts of the plant, so the arteria præparans goes directly to the testes in the males, and ovarium in the female: and in flowers some vessels tend directly to the calyx (if it becomes the fruit) or to the perianthium (if there be any,) some to the petala, some to the stamina, some to the pistillum or uterus, as it is called by Malpighius.

These things being seriously reflected on, we must of necessity conclude,

1. That the same due care is taken to elaborate and prepare the more subtile and impenetrable particles of the nutritious juice in plants, as of the blood in animals.

2. This substance so prepared, as it must be designed for some extraordinary use, so this use can be no other than that of being the means of fecundating the female seed in plants, as the other is of the feminine oval in animals.

If any one shall take a flower full blown, and pull one of the stamina from the pedicle, he will find a rough viscid liquor, like to the sperma, which remains here till its most subtle parts have ascended the stamen, or perhaps the more gross particles might have remained there, after the most subtile had ascended, before the flower was blown; this is as plain and demonstrable as can be in the Lilies, particularly in the Orange Lily, and most of the Martagon Lilies, there is a contrivance more obvious.

This viscid liquor ascending by parallel ducts to the apex, there this subtile matter is retained till it is farther elaborated by the evaporations of the more humid and aqueous particles, by the heat of the sun; and then it becomes a most subtile, fine, impalpable dust, which is then said to be ripe, and is called the farina.

Dr. Blair, after having given the sentiments of seven different authors upon the subject, proceeds to give his own, without subscribing to the sentiment of either the one or the other; and endeavours by a strict examination of the flowers themselves, to find out which of these two opinions, so diametrically opposite to each other, are most agreeable to fact.

But before he begins, he lays down this general maxim, which he takes for granted, that nature is uniform in all her operations, and never recedes from those rules laid down by the wise Disposer of all things at the creation, by performing the same thing after two different and contrary methods; and thence concludes, that if the farina be a congeries of seminal plants in one species, it must be so in all.

If there be an open and direct passage, or though it be not so direct, yet if by any direct passage, by which it can be demonstrated, that one single grain of the farina can enter every individual seed in one plant, it must be so in all; but if neither of these hold good, and if it can be proved by ocular inspection, without the assistance of a microscope, in those very plants exemplified by Mr. Morland, Mr. Geoffroy, and Mr. Bradley, that the farina in substance cannot enter the seminal vessel; or if it does, that there is no direct passage for it to enter each particular seed, after it has so got into the capsula or siliqua; then he hopes, both their queries, suppositions, and assertions, must fall.

As for the Corona Imperialis, the first example given by Mr. Morland, the flower of which hangs downwards, though he does not deny but its stylus may be hollow all the way, and that it may be open at the extremity, yet by its situation, and several other circumstances, it does not seem to him to favour this opinion.

For first, as there is a continual conflux of particles through the skin in animal bodies, it is also so in vegetables: this appears by the immediate fading of flowers, or any other part of the plant, after it has been plucked off; which proceeds from the evaporation of the particles in the little tubes, without any more succeeding in their place.

He thinks it as reasonable to suppose, that these particles flow out by the hollow stylus, as by any other part, and also more sensibly there than elsewhere, because of their being concentrated within such narrow bounds; and that if these particles descend by the stylus hanging downwards, the particles, or rather grains of the farina, can never ascend the same way.

2dly, That if it should be granted, that these grains did ascend by the stylus, how do they get into the seminal vessel; that being closely shut up, as will appear to any one who shall observe it.

3dly, Whereas Mr. Morland supposes, that the rain either washes it, or the wind shakes it down the tube, till it reaches the seminal vessel; Dr. Blair observes, that the extremity which is the upper part of the stylus in an erect flower, must be the lower in a dependent one; so that if either the rain or wind have access to it, it must necessarily either wash or drive it away from the seminal vessel, which is now the stylus.

But here the Doctor takes notice of another contrivance, for answering that purpose, i. e. a sort of a pelvis or cistern, called by Linnæus nectarium, situated at the origin or root of each petalon, filled with a viscous liquor which continues there, and never exceeds its bounds so long as the petalon is in health: for since the apices are here so artfully fixed, that they turn every way with the least wind, as Mr. Morland rightly observes, when they burst, and the farina is driven to and fro, though it cannot so easily enter the tube, yet it may conveniently be blown up towards the orifice of the petala surrounding the stylus, where it is stopped or staid by this viscosity, till it has performed its office.

To confirm this, he instances Mr. Fairchild, who, he says, being persuaded that this viscous liquor did some way or other contribute towards the fructifying of this plant, but not understanding how it did so, he tried the experiment, by wiping this liquor off as soon as it was deposited in the pelvis, and the flower which he so served did not bear any fruit.

And the way the doctor accounts for this is, that the humidity being removed, the farina is no sooner blown upwards, than it immediately falls down, without producing any effect; and that which he takes to be a confirmation of this is, that both Tulips and Fritillarias have this pelvis or bason, yet it is for the most part dry and empty; because the flowers of the former being erect, they have no such need of this liquor to retain the dust; for that the rain, having immediate access to them, may wash the dust towards the origin of the petala, where it can remain till it has performed its office; whereas the rain having no access to the inner surface of the flower of the Corona Imperialis, it is naturally endowed with this humidity, deposited there by several excretory ducts, in order to render it fit for the purpose: and Malpighius himself takes notice of this singularity in this flower, though he ascribes no use to it.

The next example proposed by Mr. Morland, is the Yellow Lily, which, according to his figure, is represented as having the apices equally high with the top of the stylus, and the petala over-topping each other; whereas he says, that by the narrowest inspection he ever could make, the top of the apices (they being then perpendicularly situated) reaches no higher than the neck of the button upon the top of the stylus, and that this is before the apices begin to burst and

 shed

shed the dust; but as soon as the flower begins to open, they depart from the stylus, and force the petala outwards, by a certain elasticity, and expand themselves; this being done, they immediately change their posture from a perpendicular to an oblique or horizontal one; nor do they ever pour out their dust or farina, till they can conveniently drop it upon the bottom of the flower, and towards the root of the pistillum.

But taking it for granted that it was so, the top of the stylus (which the Doctor calls the button, in opposition to the apices staminum,) he says, is so compact, and of so firm a substance, that it is next to impossible, that the farina in substance, or in integral parts, can pass through it.

If the integral parts, the complete grain, the minute globuli, in which the whole seminal plant is contained, cannot then enter, the whole compound must be dissolved, and the minute seminal particles in this small grain of dust must be disunited; and if so, how shall these again come to cement, so as to make up one continued body? or how shall this little body, so united, penetrate a second time the partition-wall betwixt the stylus and pistillum? and again, how shall it find out its way to its nest, in the proper embryo of the seed?

The Doctor takes notice of the White Lily, the Orange Lily, the Martagon Lily, &c. as objections to the opinions of Mr. Morland, Bradley, &c. and also mentions the Iris, as a most pregnant instance, that the farina cannot so much as come at the pistillum; for having six petals, the three stamina with long apices lie hid between the three petala which hang downwards, and three large expansions of the bifid stylus, and the upper part of the down-hanging petalon: the farina can never reach the center of the stylus, though it were hollow, which it is not, but must descend along its outside, to the top and outside of the rudiment of the fruit, there to emit its effluvia. These and other instances he concludes, are sufficient proof, that the farina cannot enter the stylus, penetrate into the pistillum, or inner part of the seminal vessel, nor have the least access to the embryo of the seed.

As to the objection, that there is not passage sufficient to admit the male seed into the uterus, or even into the ovaries, it is thus answered:

If it be considered how every flower, when it is prepared for the act of receiving the male seed, is so much under the influence of the sun, that the petals open at its approach, and shut up again at its departure, it very well explains how the pistillum, or female parts of generation, are relaxed at one time more than another, i. e. that the female parts are more relaxed at the opening of the flower, than when the flower is shut up; for the flower-leaves adhering to the bottom of the pistillum, must consequently, when they bend back, put every part of the pistillum into a different posture to that in which it was when the petals were shut.

And it is certain, that it is the presence of the sun that ripens the male dust in the apices, and opens the little cases in which it is contained, giving them a springiness that flings forth that dust as soon as it is ripe, so as to scatter it to a considerable distance. The female parts are at this time dilated by the opening of the flower-leaves, and the apices and chives, concurring at the same time in flinging forth their male dust, answer the same end in the generation of plants, that the act of copulation does among animals.

Having thus given several reasonings and arguments used by various authors, who have made it their study to investigate the mode of generation of vegetables, whether the impregnation of them proceeds from the farina fœcundans, or male dust, entering the uterus of plants in substances, or by effluvia, I shall not take upon me to determine the dispute; especially since Mr. Boyle has proved, that all effluvia are subtile particles of matter; so that it matters not how small or minute these particles are, since a body in its first state may be so minute as to be scarcely perceptible.

I shall therefore conclude with mentioning a few experiments of my own, which I communicated to Dr. Patrick Blair, which he improved as a proof of his opinion of effluvia; and Mr. Bradley also, as a proof of the farina entering the uterus in substance, and leave the curious enquirer to determine on that side of the question, to which reasoning and experiment shall influence him.

I separated the male plants of a bed of Spinach from the female; and the consequence was, that the seed did swell to the usual bigness, but when sown it did not grow afterwards; and searching into the seed, I found it wanted the punctum vitæ, or what Geoffroy calls the germen.

I set twelve Tulips by themselves, about six or seven yards from any other, and as soon as they blew, I took out the stamina with their summits so very carefully, that I scattered none of the male dust; and about two days afterwards I saw bees working on a bed of Tulips, where I did not take out the stamina; and when they came out, they were loaded with the farina or male dust on their bodies and legs; and I saw them fly into the Tulips, where I had taken out the stamina, and when they came out, I found they had left behind them sufficient to impregnate these flowers, for they bore good ripe seeds which afterward grew.

In a parcel of Savoys, which were planted for seed near white and red Cabbages, the seeds, when sown, produced half red, and some white Cabbages, and some Savoys with red ribs, and some neither one sort nor the other, but a mixture of all sorts together in one plant, which I suppose might happen by the effluvia of the different sorts impregnating the uterus of each other.

In a letter communicated by Paul Dudley, Esq; to the Royal Society, written from New England, he mentions the interchanging of the colours of the Indian Wheat, if the various colours are planted in rows near each other; but if they are planted separately, they constantly keep to their own colour; and this interchanging of colours has been observed, when the distance between the rows of Corn has been several yards, though he says, if there happens to be a high board fence between the different coloured Corns, the alteration of colours is entirely prevented.

It is from different flowers impregnating each other, that the several varieties have been produced; and this gives new light to the florists, for raising a much greater variety of flowers; for by planting the different coloured flowers near each other, so that the flowers when fully blown may be intermixed, their farina will impregnate each other, so that the seeds will produce variegated flowers partaking of both colours. But it must be observed, that flowers of different genera will not impregnate each other, therefore the plants must be of the same genus which are placed together.

Cucumbers and Melons always produce male and female flowers upon different parts of the same plant; the male flower (which appears upon a slender footstalk, and has a large style in the middle, covered with an Orange-coloured farina) is by the gardeners commonly called false blossoms, and are sometimes by unskilful persons pulled off soon after they appear, supposing that they weaken the plants, if suffered to remain, which is a very great mistake; for, in order to try this experiment, I planted four holes of Melons in a place pretty far distant from any other; and when the flowers began to appear, I constantly pulled off all the male flowers from time to time before they opened; the consequence was, that all the young fruit dropt off soon after they appeared, and not one single fruit remained to grow to any size, though the vines were equally strong with those which I had planted in another place, where I suffered all the flowers to remain upon them, from which I had a great quantity of fruit. But this doctrine is now so well established among the gardeners, being confirmed by experience, that they now carry the male flowers of the Cucumbers and Melons to the female, if there are none

situated very near them, and gently strike the farina o the male, into the bosom of the female flowers, and thereby set the young fruit, which would otherwise drop off.

There are some persons, who still object to this theory of the generation of plants, from having observed some plants, which were termed female, growing singly, and at a very great distance from any male plants of the same kind, which had for some years produced seeds which were perfect, and grew when sown; and indeed I was myself a little staggered in my opinion, on having observed a female plant of the white Briony, which grew singly in a garden, where there were no other plants of the same kind; which for several years produced berries, which grew and flourished perfectly well. This put me upon examining the plant more carefully than I had before done, when I found there were great numbers of male flowers intermixed with the female, on the same plant; and since then I have frequently found the same in many other plants, which are sometimes male and female in different plants, yet have sometimes both sexes on the same plant; so that the objections which have been made to this doctrine, may not have proper evidence for their support.

It is certain, that the female plants may produce fruit, without the impregnation of the male; but it is not certain, that this fruit or seed will, if sown, produce another plant. What has been so often related by travellers and historians, of the necessity of the male Palm-tree being near the female, in order to render it fruitful, hath been fully confirmed by Father Labat, in his account of Africa, where he has treated of the several sorts of Palms: he says, that he observed in Martinico a large Palm-tree, which grew by the side of a convent, which produced plenty of fruit, though there was no other Palm-tree growing within two leagues of this; but he also observed, that none of these fruit would grow, though they had made many trials of them; so that they were obliged to procure some fruit from Barbary, in order to propagate these trees. He likewise adds, that the fruit which grew on this female tree, never ripened so perfectly, nor was so well tasted, as those which came from trees which had stood near some of the male: therefore we may conclude, that the fruit or seed may be produced by the female plants of most kinds, without the assistance of the male sperm, which may appear to sight perfect, and fit to produce others; but if we examine the seeds, we shall find that most of them have not the germ or little plant inclosed, nor will grow if they are sown.

From these and many other experiments, it is very plain, that there is a necessity that the embryo of the female flower should be impregnated by the farina or male dust, in order to render the fruit perfect; but how, or in what manner it is performed, is what we can only guess at, since in the generation of animals, our greatest naturalists differ very much in their opinions; nor can any of them ascertain any particular method how it is performed. I shall therefore conclude with quoting the words of the Rev. Dr. Hales, which are a most ingenious summary of the whole doctrine of the generation of plants.

"If I (says he) may be allowed to indulge conjecture in a case in which the most diligent enquirers are, as yet, after all their laudable researches, advanced but little farther than mere conjecture, I would propose it to their consideration, whether from the manifest proof we have, that sulphur strongly attracts air, a hint may not be taken, to consider whether this may not be the primary use of the farina fœcundans, to attract or unite with elastic or other refined active particles. That this farina abounds with sulphur, and that a very refined sort, is probable from the subtile oil which chymists obtain from the chives of Saffron; and if this be the use of it, was it possible that it could be more aptly placed for the purpose on very moveable apices fixed on the slender points of the stamina, whereby it might easily, with the least breath of wind, be dispersed in the air, thereby surrounding the plant, as it were, with an atmosphere of sublimed sulphureous pounce? for many trees and plants abound with it, which uniting with the air particles, may, perhaps, be inspired at several parts of the plant, and especially at the pistillum, and be thence conveyed to the capsula seminalis, especially towards evening, and in the night, when the beautiful petala of the flowers are closed up, and they, with all the other parts of the vegetable, are in a strongly imbibing state. And if to these united, sulphureous and aereal particles, we suppose some particles of light to be joined (for Sir Isaac Newton has found, that sulphur attracts light strongly;) then the result of these three by far the most active principles in nature, will be a punctum saliens to invigorate the seminal plant; and thus we are at last conducted, by the regular analysis of vegetable nature, to the first enlivening principle of their minutest origin."

GENISTA. Lin. Gen. Plant. 766. Tourn. Inst. R. H. 643. tab. 412. Broom; in French, *Genêt*.

The CHARACTERS are,

*The empalement of the flower is of one leaf, tubulous, and divided into two lips; the upper lip is deeply cut into two, and the under into three equal parts. The flower is of the butterfly kind; the standard is oval, acute, and remote from the keel, being wholly reflexed; the wings are a little shorter than the standard, and are loose: the keel is erect, and longer than the standard, and is indented at the top. It hath ten stamina joined in two bodies, which are situated in the keel, terminated by single summits. In the center is an oblong germen, supporting an ascending style, crowned by an acute twisted stigma. The germen afterward becomes a roundish turgid pod with one cell, opening with two valves, inclosing kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes the plants with flowers having ten stamina, joined in two bodies; and to this he adds some of Tournefort's species of Spartium, and the Genistella of Tournefort.

The SPECIES are,

1. GENISTA (*Sagittalis*) ramis ancipitibus articulatis, foliis ovato-lanceolatis. Hort. Cliff. 355. *Jointed Broom, with two-edged branches, and jointed, oval, spear-shaped leaves.* Chamæ Genista sagittalis. C. B. P. 395. *Dwarf arrow-shaped Broom.*
2. GENISTA (*Florida*) foliis lanceolatis, ramis striatis teretibus racemis secundis. Hort. Cliff. 355. *Broom with spear-shaped leaves, and erect taper branches abounding with flowers.* Genista tinctoria Hispanica. C. B. P. 395. *Spanish Dyers Broom.*
3. GENISTA (*Tinctoria*) foliis lanceolatis glabris ramis striatis teretibus erectis. Hort. Cliff. 355. *Broom with spear-shaped leaves which are acute, and taper channelled branches proceeding from the side of the stalk.* Genista tinctoria Germanica. C. B. P. 395. *Common Dyers Broom, or Wood-waxen.*
4. GENISTA (*Purgans*) spinis terminalibus, ramis teretibus striatis, foliis lanceolatis simplicibus pubescentibus. Lin. Sp. 999. *Broom with taper-streaked branches terminated by spines, and simple, spear-shaped, hairy leaves.* Genista sive spartium purgans. J. B. 1. p. 404.
5. GENISTA (*Candicans*) foliis ternatis subtus villosis, pedunculis lateralibus subquinquefloris foliatis, leguminibus hirsutis. Amœn. Acad. 4. p. 284. *Trifoliate Broom with hairy leaves, foot-stalks from the side of the branches having five flowers, and hairy pods.* Cytisus Monspessulanus, medicæ folio, siliquis dense congestis & villosis. Tourn Inst. 648.
6. GENISTA (*Tridentata*) ramis triquetris subarticulatis, foliis tricuspidatis. Lin. Sp. Plant. 710. *Broom with three-cornered jointed branches, and leaves ending in three points.* Genistella fruticosa Lusitanica. Tourn. Inst. 646. *Shrubby Portugal Dyers Broom.*
7. GENISTA (*Pilosa*) foliis lanceolatis obtusis, caule tuberculato decumbente. Hort. Cliff. 355. *Broom with obtuse*

*obtuse spear-shaped leaves, and a declining stalk having tubercles.* This is the Genista ramosa, foliis Hyperici. C. B. P. 395. *Branching Broom with leaves like St. Johnswort.*

8. Genista (*Anglica*) spinis simplicibus, ramis floriferis inermibus, foliis lanceolatis. Hort. Cliff. 355. *Broom with single spines, flower-branches without spines, and spear-shaped leaves.* Genista spartium minus Anglicum. Tourn. Inst. R. H. 645. *Small English Broom, called Petty Whin.*

9. Genista (*Hispanica*) spinis decompositis, ramis floriferis, inermibus, foliis lanceolatis. Lin. Sp. Plant. 711. *Broom with decompounded spines, flower-branches without spines, and narrow hairy leaves.* Genista spinosa minor Hispanica villosissima. C. B. P. 395. *Most hairy, small, Spanish, prickly Broom.*

The first sort grows naturally in France, Italy, and Germany. This plant sends out several stalks from the root, which spread flat on the ground, and divide into many flat branches which are jointed, and their two sides are edged like a broad sword; these are green and herbaceous, but are perennial. At each of the joints is placed one small spear-shaped leaf, without any foot-stalk. The flowers are produced in close spikes at the end of the branches; they are yellow, and of the Pea-bloom kind, and are succeeded by short hairy pods, which contain three or four kidney-shaped seeds. The plants flower in June, and the seeds ripen in September.

This sort is propagated by seeds, which, if sown in the autumn, the plants will come up the following spring; but when they are sown in the spring, the plants rarely come up the same year: when the plants come up, they will require no other culture but to keep them clean from weeds, and thin them where they are too close; at Michaelmas they may be transplanted where they are designed to remain, and after that they will only require to be kept clean, for they are very hardy, and will live several years.

The second sort rises with ligneous stalks about two or three feet high, sending out many taper channelled branches which grow erect, garnished with small spear-shaped leaves placed alternate, and are terminated by several spikes of yellow flowers, which are of the Pea-bloom kind; these are succeeded by short pods, which turn black when ripe, and contain four or five kidney-shaped seeds. It flowers in June and July, and the seeds ripen in autumn.

The third sort grows naturally in England. This hath shrubby stalks, which rise about three feet high, garnished with spear-shaped leaves, which are broader, and end in sharper points than those of the former; the branches come out from the side of the stalks, almost their whole length, and do not grow so upright as those of the second; these are terminated by loose spikes of yellow flowers, which are succeeded by pods like those of the second sort. It flowers, and the seeds are ripe about the same time as the former. The branches of the plant are used by the dyers, to give a yellow colour, from whence it is called Dyers Broom, Green-wood, Wood-waxen, or Dyers-weed.

The fourth sort grows naturally about Montpelier. This rises with shrubby, striated, taper stalks four feet high, sending out several branches which are terminated by spines; the leaves are spear-shaped, single, and hairy; the flowers are produced in spikes at the end of the branches, they are larger than those of the other sorts, and are of a paler yellow colour. They appear in June and July, and are succeeded by pods like the former sorts.

This sort is tender, and in severe frosts is often killed in England, where the plants are not protected.

The fifth sort grows naturally about Montpelier. This rises with a woody stalk to the height of seven or eight feet, sending out many slender branches, garnished with trifoliate leaves, hairy on their under side; the upper part of these branches, for more than a foot in length, send out small flowering branches on their side, supporting five yellow flowers. These appear in June and July, and the seeds ripen in autumn.

The sixth sort hath a low shrubby stalk, which seldom is more than a foot high, sending out several weak branches which are jointed, garnished with small leaves ending in three acute parts. The flowers are produced in loose spikes at the top of the branches, they are of a pale yellow colour, and appear the latter end of June and in July, and the seeds ripen in September. This plant grows naturally in Portugal.

The seventh sort hath a shrubby stalk which declines toward the ground, and is set over with tubercles; it divides into a few small branches, which are garnished with small obtuse leaves. The flowers are disposed in small loose spikes at the end of the branches; they are small, of a pale yellow colour, and are succeeded by short pods filled with kidney-shaped seeds. It flowers in June, and the seeds ripen in autumn. This grows naturally in Germany and France.

The eighth sort grows naturally upon open heaths in many parts of England. It hath a shrubby stalk which rises about two feet high, sending out many slender branches, which are armed with long single spines, and garnished with very small spear-shaped leaves, placed alternate on every side the branches: the flower-branches have no spines; these are short, and have five or six yellow flowers growing in a cluster at the end. They come out in April and May, and are succeeded by short turgid pods, which contain four or five small kidney-shaped seeds. These ripen in July.

The ninth sort grows naturally in Spain. This hath a low shrubby stalk, which sends out many ligneous branches, armed with branching thorns, composed of several sharp thorns, which come out from each other, but the short branches which produce the flowers have no spines; these are garnished with small hairy leaves of different forms, some of them being as narrow as hairs, and others are of the spear-shape; the branches are terminated by clusters of yellow flowers, which are succeeded by short, compressed, hairy pods, filled with kidney-shaped seeds. The whole plant has much the appearance of the common Furz or Gorse, but is very hairy, and the flower-branches being without thorns, are the most obvious distinctions.

All these sorts of Brooms are propagated by seeds, which, if sown in the autumn, will succeed much better than if sown in the spring, and a year will be thereby saved; as these plants send out long, stringy, tough roots, which run deep into the ground, they do not bear transplanting well, especially if they are not removed young; therefore the best way is to sow a few seeds in those places where the plants are designed to remain, and to pull up all except the most promising plants as soon as they are past danger; after this the plants will require no other culture, but to keep them clean from weeds: but where this cannot be practised, the seeds may be sown thin upon a bed of light earth, and when the plants come up, they must be kept clean from weeds till the following autumn, when the plants should be carefully taken up and transplanted where they are designed to remain.

They are all very hardy plants except the fourth, fifth, and ninth sorts, which must have a warm sheltered situation and dry soil, otherwise they will not live through the winter, but the others will grow in almost any soil or situation.

GENISTA SPINOSA, the Furz, Whins, or Gorse. See Ulex.

GENTIANA. Lin. Gen. Plant. 285. Tourn. Inst. R. H. 80. tab. 40. [takes its name from Gentius, a king of Illyrium, who first discovered the virtues of this plant.] Gentian, or Fellwort; in French, *Gentiane.*

The Characters are,

*It hath a permanent empalement, which is cut into five acute segments. The flower hath one petal, which is tubulous, cut into five parts at the top, which are flat. It hath*

*hath five awl-shaped stamina, which are shorter than the petal, terminated by single summits. In the center is situated an oblong cylindrical germen, having no style, but is crowned by two oval stigmas. The germen afterward becomes an oblong taper-pointed capsule, with one cell, containing many small seeds fastened to the valves of the capsule.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, which includes the plants whose flowers have five stamina and two stigmas.

The Species are,

1. Gentiana (*Lutea*) corollis quinquefidis rotatis verticillatis, calycibus spathaceis. Hall. Helv. 479. *Gentian with quinquefid wheel-shaped petals growing in whorls, and hood-like empalements.* Gentiana major lutea. C. B. P. 187. *Greater yellow Gentian.*
2. Gentiana (*Pneumonathe*) corollis quinquefidis campanulatis oppositis pedunculatis, foliis linearibus. Lin. Sp. Plant. 228. *Gentian with bell-shaped quinquefid petals placed opposite upon foot-stalks, and very narrow leaves.* Gentiana augustifolia autumnalis major. C. B. P. 188. *Greater narrow-leaved autumnal Gentian.*
3. Gentiana (*Asclepiades*) corollis quinquefidis campanulatis oppositis sessilibus, foliis amplexicaulibus. Lin. Sp. Plant. 227. *Gentian with bell-shaped quinquefid petals sitting close to the stalk opposite, and leaves embracing the stalk.* Gentian Asclepiades folio. C. B. P. 187. *Gentian with a Swallow-wort leaf.*
4. Gentiana (*Acaulis*) corollâ quinquefidâ campanulatâ, caulem excedente. Lin. Sp. Plant. 228. *Gentian with a bell-shaped quinquefid petal exceeding the stalk.* Gentiana Alpina latifolia, magno flore. C. B. P. 187. *Broad-leaved Alpine Gentian with a large flower, commonly called Gentianella.*
5. Gentiana (*Nivalis*) corollis quinquefidis infundibuliformibus, ramis unifloris alternis. Lin. Sp. Plant. 229. *Gentian with funnel-shaped quinquefid petals, and alternate branches having one flower.* Gentiana annua, foliis Centaurii minoris. Tourn. Inst. 81. *Annual Gentian with lesser Centaury leaves.*
6. Gentiana (*Cruciata*) corollis quadrifidis imberbibus verticillatis sessilibus. Lin. Sp. Plant. 231. *Gentian with quadrifid petals without beards, growing in whorls close to the stalks.* Gentiana cruciata. C. B. P. 188. *Crosswort Gentian.*
7. Gentiana (*Cilliata*) corollis quadrifidis margine ciliatis. Lin. Sp. Plant. 231. *Gentian with a four-pointed petal, whose border is hairy.* Gentianella cærulea oris pilosis. C. B. P. 188. *Blue Gentian with hairy brims.*
8. Gentiana (*Utriculosa*) corollis quinquefidis hypocrateriformibus, calycibus plicatis alatis. Lin. Sp. Plant. 229. *Gentian with salver-shaped quinquefid petals, and winged plaited empalements.* Gentiana utriculis ventricosis. C. B. P. 188. *Gentian with a ventricose tube.*
9. Gentiana (*Centaureum*) corollis quinquefidis infundibuliformibus caule dichotomo. Lin. Sp. Plant. 229. *Gentian with a funnel-shaped, five-pointed petal, and a forked stalk.* Centaurium minus. C. B. P. 278. *Lesser Centaury.*
10. Gentiana (*Perfoliatum*) corollis octifidis, foliis perfoliatis. Lin. Sp. Plant. 232. *Gentian with an eight-pointed petal, and Thorough-wax leaves.* Centaurium luteum perfoliatum. C. B. P. 278. *Yellow perfoliate Centaury.*
11. Gentiana (*Spicata*) corollis quinquefidis floribus alternis sessilibus. Lin. Sp. Plant. 230. *Gentian with funnel-shaped five-pointed petals, flowers growing alternate, and sitting close to the stalks.* Centaurium minus spicatum album. C. B. P. 278. *Lesser Centaury with a white spiked flower.*
12. Gentiana (*Exaltata*) corollis quinquefidis coronatis crenatis, pedunculo terminali longissimo dichotomo. Lin. Sp. 331. *Gentian with a five-pointed petal, a very long foot-stalk, and forked branches.* Centaurium minus maritimum amplo flore cæruleo. Plum. Cat. 3. *Lesser maritime Centaury with a large blue flower.*

The first sort is the common Gentian of the shops, whose root is one of the principal ingredients in bitters.

This plant has a large thick root of a yellowish brown colour, and a very bitter taste; the lower leaves are of an oblong oval shape, a little pointed at the end, stiff, of a yellowish green, and have five large veins on the back of each, and are plaited. The stalk rises to the height of three or four feet, which is garnished with leaves, growing by pairs at each joint, almost embracing the stalk at their base; these are of the same form with the lower, but diminish gradually in their size to the top. The flowers come out in whorls at the joints, toward the upper part of the stalks, standing on short foot-stalks, whose origin is from the wings of the leaves; these are of a pale yellow, and have one petal, which is divided almost to the bottom, having an oblong cylindrical germen, which afterward swells to an oblong taper capsule, which is bifid at the point, and opens in two cells, filled with small seeds.

It grows naturally in the pastures in Switzerland, and in the mountainous parts of Germany, from whence the roots are brought to England for medicinal use; there is a compound water, and an extract made of them. The root of the Gentian is also one of the principal ingredients in bitters, and is frequently used in many disorders.

But a few years ago, there was a mixture of Henbane roots brought over with Gentian, which was unhappily used, and occasioned great disorders in the persons to whom it was administered; upon which great enquiry was then made to find out what that root could be, some suspecting it to be the root of Deadly Nightshade, and others believing it to be some of the poisonous umbelliferous roots, but on comparing it with some dried roots of the Henbane, I found they were the same. We have likewise an account of the noxious quality of these roots, printed in the Synopsis Stirpium Hibernicarum, which was communicated to the author by Dr. Thomas Molyneux, physician to the state; it was as follows:

The Dean of Clonfert was making some alterations in his garden, and, looking over his workmen, he observed them to dig up many roots, which he took for Skirrets, and therefore ordered some of them to be carried in and dressed for dinner, which was accordingly done; but all those who eat of them were in a short time seized with dizziness in their head, sickness at the stomach, attended with an unusual heat and driness in their throats; and two, who had eaten a larger share than the rest, lost the use of their reason, and became delirious, which continued for some days; and as it appeared evident these disorders were occasioned by the roots, the Dean caused some of them to be planted, that he might be assured what the plant was whose roots had this bad quality; and in the spring, when they put out their leaves, they proved to be the Henbane, which has been noticed by old writers to be possessed of these qualities. And as the disorders which were occasioned by these supposed Gentian roots, were nearly the same, as is above related, I thought it might be of use to insert it here, to caution others against eating of roots which they are unacquainted with.

This plant delights in a light loamy soil and a shady situation, where it will thrive much better than in a light dry soil, or in an open exposure. It is propagated by seeds, which should be sown in pots soon after it is ripe, for if it is kept till the spring, it will not succeed; these pots should be placed in a shady situation, and kept clean from weeds. In the spring the plants will appear, when they must be duly watered in dry weather, and kept clean from weeds till the following autumn; then they should be carefully shaken out of the pots, so as not to break or injure their roots; and a shady border of loamy earth should be well dug and prepared to receive them, into which the plants should be planted at about six inches distance each way, observing to let the top of the roots be a little below the surface of the

 ground,

ground, then preſs the earth cloſe to the roots; after this they will require no farther care, but to keep them conſtantly clean from weeds; and if the following ſpring ſhould prove dry, they ſhould be duly watered, which will greatly forward their growth. In this border the plants may ſtand two years, by which time they will be fit to tranſplant where they are deſigned to remain; therefore in autumn, ſo ſoon as their leaves decay, they may be removed; but as the roots of theſe plants run deep into the ground, like Carrots, there muſt be great care taken in digging them up, not to cut or break their roots, for that will greatly weaken, if it does not kill them. After the plants are well fixed in their places, they require no other culture, but to dig the ground about them early in the ſpring before they begin to ſhoot, and in the ſummer to keep them clean from weeds. The roots of theſe plants will continue many years, but the ſtalks decay every autumn; the ſame roots do not flower two years together, nor ſeldom oftener than every third year; but when they flower ſtrong, they make a fine appearance; and as theſe delight in ſhady moiſt ground, where but few ornamental plants will thrive, ſo they ſhould not be wanting in good gardens.

The ſecond ſort grows naturally in moiſt paſtures in many parts of England, but particularly in the north; this riſes with an upright ſtalk about a foot high, garniſhed with ſmooth leaves an inch and a half long, and leſs than a quarter of an inch broad; they are placed oppoſite, and have no foot-ſtalks. The flowers are produced on the top of the ſtalk, three or four in number, ſtanding upon foot-ſtalks alternately above each other; they are large, bell-ſhaped, and divided into five points at their brim, and are of a deep blue colour, ſo make a fine appearance; theſe come out the latter end of July in the warm parts of England, but in the north they are full a month later.

It may be propagated by ſeeds in the ſame manner as the firſt ſort, and the plants may be treated in the ſame way; but as this ſort does not ſhoot its roots deep into the ground, it may be tranſplanted with leſs hazard; however, if theſe are removed with a ball of earth to their roots, they will not feel their removal ſo much as when the earth is all taken from them. This ſort ſhould be planted in a ſtrong, moiſt, loamy ſoil, in which the plants will thrive and flower annually, but in a warm dry ſoil they will not thrive or flower.

The third ſort grows naturally upon the Helvetian mountains; this riſes with an upright ſtalk near a foot high, garniſhed with ſmooth leaves about two inches long, and three quarters of an inch broad at their baſe, where they embrace the ſtalk, but they end in acute points; they are placed oppoſite, and are of a fine green, and diminiſh in their ſize as they are nearer the top; they have five longitudinal veins, which join at both ends, but diverge from each other in the middle. The flowers come out by pairs oppoſite, from the bottoms of the leaves, ſtanding on ſhort foot-ſtalks; they are pretty large, bell-ſhaped, and of a fine blue colour, ſo make a fine appearance when they are open. This ſort flowers in June and July.

It may be propagated by ſeeds in the ſame manner as the firſt ſort, and the plants may be treated in the ſame way, but they muſt have a moiſt loamy ſoil, otherwiſe they will not thrive. It may alſo be propagated by offſets, which may be divided from the roots; theſe ſhould be taken off in autumn, which is the beſt ſeaſon for removing all theſe ſorts of plants; but theſe ſhould not be removed, or parted oftener than every third year, where they are expected to produce ſtrong flowers.

The fourth ſort grows naturally on the Alps and Helvetian mountains, but has been long cultivated in moſt of the curious gardens in Europe; this is commonly known by the title of Gentianella. It is a low plant, the ſtalks ſeldom growing more than three or four inches high; they are garniſhed with ſmooth leaves placed oppoſite, which are two inches long, and half an inch broad, ſitting cloſe to the ſtalk. The flowers grow erect on the top of the ſtalk, ſo ſtand quite above them; theſe are often ſingle, but ſometimes, when the plants are ſtrong, there will be four or five at the end of each ſtalk; they are large, bell-ſhaped, and of a deep azure blue, ſo is the fineſt of that colour of any flower yet known. It uſually flowers in May, but ſometimes the plants flower again in autumn.

This is commonly propagated by parting of the roots, in the ſame manner as is before directed for the third ſort, but theſe muſt not be often tranſplanted, or parted, if they are wanted to flower ſtrong; this ſort ſhould have a ſoft loamy ſoil and a ſhady ſituation, where the plants will thrive and flower well every year.

It may alſo be propagated by ſeeds, which, in a good ſoil, the plants will produce in plenty; theſe ſhould be ſown in autumn, in the ſame manner as is before directed for the firſt ſort; and if the plants are planted in a good ſoil, they will be ſtrong enough to flower the ſecond year after they come up, and theſe ſeedling plants will flower much ſtronger than thoſe which are propagated by offsets.

The fifth and eighth ſorts are low annual plants, which grow naturally upon the Alps and other mountainous places in Europe, and are very rarely cultivated in gardens. The fifth ſeldom riſes more than two inches high, branching out from the root into ſeveral ſlender ſtalks, garniſhed with very ſmall leaves placed by pairs, and each ſtalk is terminated by one ſmaller blue flower ſtanding erect. The eighth ſort grows about four inches high, with a ſingle upright ſtalk of a purple colour. The leaves at the root are oval, but thoſe upon the ſtalk are narrow, and ſtand oppoſite. The ſtalk is terminated by one blue flower, with a large bellied empalement, which is plaited, and the petal of the flower riſes but a little above the empalement, ſo does not make much appearance. After the top flower decays, there are frequently two ſmaller flowers which come out from the ſide of the ſtalk, at the two upper joints; theſe flower after each other, the upper one coming firſt, ſo that there is a ſucceſſion of flowers till autumn.

As theſe plants uſually grow upon moiſt ſpongy ground, it is very difficult to cultivate them in gardens; for unleſs they have a ſoil approaching near to that in which they naturally grow, they will not thrive; the only method to obtain them is, either to ſow their ſeeds in pots, or upon a moiſt boggy ground in autumn, but it muſt be in the ſhade; and when the plants come up, they may be thinned, and the ſurface of the ground about them covered with moſs, which ſhould be conſtantly kept moiſt; with this management I have ſeen the plants thrive and flower very well.

The ſixth ſort is a perennial plant, which grows naturally upon the Appenines and the Helvetian mountains; this riſes with an upright ſtalk about ſix inches high, garniſhed with ſmooth ſpear-ſhaped leaves about two inches long, and one broad in the middle, ſitting cloſe to the ſtalk; they are placed oppoſite, and each pair of leaves croſs one another, from whence it is called Croſſwort Gentian. The flowers are produced in whorls round the ſtalks at the upper joints, ſitting very cloſe to the ſtalks, and at the top there is a large cluſter growing in the ſame form; theſe are of a light blue colour, and appear in May. This may be propagated by ſeeds, or offsets, in the ſame manner as the third and fourth ſorts, and the plants muſt be treated in the ſame way.

The ſeventh ſort grows naturally upon the Alps, and other mountainous parts of Europe; this is a low perennial plant, whoſe ſtalks are very ſlender, and rarely riſe more than three or four inches high, garniſhed with ſmall, narrow, acute-pointed leaves, placed in pairs; each ſtalk is terminated by one large blue flower, which is hairy on the inſide at the brim. This

flowers

flowers in July and August, and may be propagated and treated in the same manner as the third and fourth sorts.

The ninth sort is the Lesser Centaury of the shops; this grows naturally upon dry pastures in most parts of England, where it rises in height proportionable to the goodness of the soil; for in good land it is frequently a foot high, but in poor soils not more than three or four inches. It is an annual plant, with upright branching stalks, garnished with small leaves placed by pairs. The flowers grow in form of an umbel at the top, and are of a bright purple colour; they come out in July, and the seeds ripen in autumn. This plant cannot be cultivated in the gardens.

The tenth sort grows naturally upon chalky grounds in many parts of England. It is an annual plant, rising with an upright stalk a foot high, garnished with oval-pointed leaves, whose base surrounds the stalk; they grow by pairs, and are of a gray colour; the stalks and leaves are very smooth. The flowers grow in form of an umbel on the top of the stalk; they are of a bright yellow colour, and are cut into eight parts at the top. These appear in July, and the seeds ripen in autumn.

The eleventh sort is an annual plant, which grows naturally in the south of France and in Italy; this rises with an upright stalk about a foot high, sending out several branches toward the top, which are garnished by small leaves placed opposite. The flowers are produced from the side and at the top of the stalk, in form of loose irregular umbels; they are white, and about the size of those of the common Centaury.

The twelfth sort grows naturally in the West-Indies, where it was discovered by Father Plumier, and the late Dr. Houstoun found it growing in plenty at La Vera Cruz, in low moist places where the water stagnates, but at a remoter distance from the sea. The seeds of this plant he sent to England, which succeeded in the Chelsea garden; this rises with an upright branching stalk near two feet high, garnished with oblong, smooth, acute-pointed leaves, placed opposite; the upper part of the stalk divides into several forks, between which are six or seven long naked foot-stalks, each sustaining one large blue flower, divided into five segments at the brim. The flowers are succeeded by oblong capsules with one cell, filled with small seeds.

This is propagated by seeds, which must be sown on a hot-bed soon after they are ripe, and the plants afterward treated in the same manner as other tender annual plants from warm countries, being too tender to thrive in the open air in England. If the seeds of this plant are sown in autumn, in pots placed in the tan-bed of the stove, they will succeed better than when they are sown in the spring, and the plants will flower early, so good seeds may be obtained.

GENTIANELLA. See Gentiana.

GERANIUM. Lin. Gen. Plant. 346. Tourn. Inst. R. H. 266. tab. 142. [takes its name from Γέρανος, *Gr.* a crane, or stork, because its fruit resembles the bill of a Crane.] *Crane's-bill*; in French, *Bec de Gruë*.

The Characters are,

*The flower hath a permanent empalement, composed of five small oval leaves. The flower hath five petals, which are oval, or heart-shaped, spreading open; these are in some species equal, and in others, the upper two are much larger than the three lower. It hath ten stamina, which are alternately longer, but are shorter than the petals, and are terminated by oblong summits. In the bottom of the flower is situated a five-cornered germen, supporting an awl-shaped style longer than the stamina, which is permanent, crowned by five reflexed stigmas. The flower is succeeded by five seeds, each being wrapped up in the husk of the beak, which is extended the length of the style, where they are twisted together at the point, so as to form the resemblance of a stork's beak.*

This genus of plants is ranged in the second section of Linnæus's sixteenth class, which includes those plants whose flowers have ten stamina, and the male and female organs are joined in one body. Tournefort places it in the sixth section of his sixth class, in which he ranges the herbs with a Rose flower, whose pointal becomes a fruit with several capsules.

The Species are,

1. Geranium (*Pratense*) pedunculis bifloris, foliis subpeltatis multipartitis pinnato laciniatis rugosis acutis, petalis integris. Hort. Cliff. 344. *Crane's-bill with two flowers on each foot-stalk, target-shaped leaves cut into many acute segments, and entire petals.* Geranium batrachiodes, Gratia Dei Germanorum. C. B. P. *Crane's-bill with a Crow-foot leaf, and large blue flowers.*
2. Geranium (*Macrorrhizum*) pedunculis bifloris, calycibus inflatis, pistillo longissimo. Hort. Cliff. 343. *Crane's-bill with two flowers on each foot-stalk, inflated empalements, and a very long pointal to the flower.* Geranium batrachioides, longius radicatum, odoratum. J. B. *Long-rooted sweet-smelling Crane's-bill, with a Crow-foot leaf.*
3. Geranium (*Sanguineum*) pedunculis unifloris, foliis quinquepartitis trifidis orbiculatis. Lin. Sp. Plant. 685. *Crane's-bill with one flower on each foot-stalk, and orbicular leaves, which are trifid and divided into five parts.* Geranium sanguineum, maximo flore. H. Ox. *Bloody Crane's-bill with a larger flower.*
4. Geranium (*Lancastrense*) pedunculis unifloris, foliis quinquepartitis laciniis obtusis brevibus, caulibus decumbentibus. *Crane's-bill with one flower upon each foot-stalk, leaves divided into five parts, whose segments are short, blunt, and declining stalks.* Geranium hæmatodes Lancastrense, flore eleganter striato. Raii Hist. *Bloody Crane's-bill with a variegated flower.*
5. Geranium (*Nodosum*) pedunculis bifloris, foliis caulinis trilobis integris serratis, summis subsessilibus. Hort. Cliff. 343. *Crane's-bill with two flowers on each foot-stalk, the leaves upon the stalks having three entire sawed lobes, the upper leaves sitting close to the stalk.* Geranium 5. nodosum. Plateau. Clus. Hist. *Knotty Crane's-bill.*
6. Geranium (*Phæum*) pedunculis bifloris, foliisque alternis, calycibus subaristatis, caule erecto, petalis undulatis. Lin. Sp. Plant. 681. *Crane's-bill with two flowers on each foot-stalk, alternate leaves, bearded empalements, an erect stalk, and waved petals to the flower.* Geranium phæum sive fuscum, petalis reflexis, folio non maculoso. H. L. *Brown Crane's-bill with reflexed petals, and leaves not spotted.*
7. Geranium (*Fuscum*) pedunculis bifloris, foliis quinquelobatis incisis, petalis reflexis. *Crane's-bill with two flowers upon each foot-stalk, leaves divided into five lobes, which are cut, and the petals of the flowers reflexed.* Geranium phæum sive fuscum, petalis rectis seu planis, folio maculato. H. L. *Brown Crane's-bill with plain petals, and spotted leaves.*
8. Geranium (*Striatum*) pedunculis bifloris, altero breviore, foliis quinquelobis medio dilatatis, petalis bilobis venoso-reticulatis. Burm. Ger. *Crane's-bill with two flowers upon each foot-stalk, one bigger than the other, leaves having five lobes, and flowers with two lobes.* Geranium Romanum, versicolor sive striatum. Park. Par. *Roman Crane's-bill with striped flowers.*
9. Geranium (*Sylvaticum*) pedunculis bifloris, foliis subpeltatis quinquelobis inciso-serratis, caule erecto, petalis emarginatis. Flor. Lapp. 266. *Crane's-bill with two flowers on each foot-stalk, target-shaped leaves with five lobes deeply sawed, an erect stalk, and indented petals to the flower.* Geranium batrachioides montanum nostras. Ger. *Mountain Crane's-bill with a Crow-foot leaf.*
10. Geranium (*Orientale*) pedunculis bifloris, foliisque oppositis, petalis integris, calycibus brevioribus. *Eastern Dove's-foot Crane's-bill, with opposite leaves, two flowers on each foot-stalk, and a short empalement.* Geranium Orientale columbinum, flore maximo, asphodeli radice. T. Cor. *Oriental Dove's-foot Crane's-bill, with an Asphodel root and large flowers.*
11. Geranium (*Perenne*) pedunculis bifloris, foliis inferioribus quinque-partito-multifidis rotundis, superioribus trilobis, caule erecto. Hudf. Flor. Ang. 265. *Crane's-bill with two flowers on each foot-stalk, the lower leaves having five many-pointed lobes, the upper three,*

*three, and an erect ſtalk.* Geranium Columbinum perenne Pyrenaicum maximum. Tourn. Inſt. R. H. 268. *Greateſt perennial Dove's-foot Crane's-bill of the Pyrennes.*

12. Geranium (*Alpinum*) pedunculis longiſſimis multifloris, calycibus ariſtatis, foliis bipinnatis. *Crane's-bill with very long foot-ſtalks ſuſtaining many flowers, bearded empalements, and double wing-pointed leaves.* Geranium Alpinum Coriandri folio, longius radicatum, flore majore purpureo. Michel. *Alpine Crane's-bill with a Coriander leaf, a long root, and a larger purple flower.*

13. Geranium (*Argenteum*) pedunculis bifloris, foliis ſubpeltatis ſeptempartitis trifidis tomentoſo-ſericeis, petalis emarginatis. Amœn. Acad. 4. p. 324. *Crane's-bill with two flowers on each foot-ſtalk, target-ſhaped leaves divided into ſeven parts, which are ſilvery, and the petals of the flower indented.* Geranium argenteum Alpinum. C. B. P. 318. *Silvery Alpine Crane's-bill.*

14. Geranium (*Maculatum*) pedunculis bifloris, caule dichotomo erecto, foliis quinquepartitis inciſis ſummis ſeſſilibus. Flor. Virg. 78. *Crane's-bill with two flowers on each foot-ſtalk, upright ſtalks divided by pairs, and cut leaves divided into five parts, the upper ſitting cloſe to the ſtalk.* Geranium batrachioides Americanum maculatum, floribus obſoletè cæruleis. Hort. Elth. 158. *American ſpotted Crane's-bill with obſolete blue flowers.*

15. Geranium (*Bohemicum*) pedunculis bifloris petalis emarginatis arillis hirtis cotyledonibus trifidis medio truncatis. Burm. Ger. 4. *Crane's-bill with two flowers on each foot-ſtalk, indented petals to the flower, hairy beards, and a trifid leaf.* Geranium annuum minus batrachiodes Bohemicum, purpuro-violaceum. Mor. Hiſt. 2. 511. *Leſſer annual Crane's-bill of Bohemia, with a purple Violet flower.*

16. Geranium (*Sibiricum*) pedunculis ſubunifloris, foliis quinquepartitis acutis foliolis pinnatifidis. Lin. Sp. Plant. 683. *Crane's-bill with one flower on a foot-ſtalk, leaves divided into five acute parts, and the ſmaller leaves wing-pointed.*

17. Geranium (*Moſchatum*) pedunculis multifloris, floribus pentandris foliis pinnatis inciſis cotyledonibus pinnatifidis. Burm. Ger. 22. *Crane's-bill with many flowers on each foot-ſtalk, having five ſtamina to the flowers, and cut winged leaves.* Geranium cicutæ folio, moſchatum. C. B. P. *Muſked Crane's-bill, frequently called Muſcovy.*

18. Geranium (*Gruinum*) pedunculis ſub multifloris, floribus pentandris, foliis ternatis lobatis. Burm. Ger. 32. *Crane's-bill with many flowers on a foot-ſtalk, five ſtamina to the flower, and ternate lobed leaves.* Geranium latifolium annuum, cæruleo flore, acu longiſſimâ. H. Ox. *Broad-leaved annual Crane's-bill with a blue flower, and a very long beak.*

19. Geranium (*Ciconium*) pedunculis multifloris, calycibus pentaphyllis, floribus pentandris, foliis pinnatis acutis ſinuatis. Lin. Sp. Plant. 680. *Crane's-bill with many flowers on each foot-ſtalk, having five-leaved empalements, five ſtamina to the flowers, and acute, ſinuated, winged leaves.* Geranium Cicutæ folio, acu longiſſimâ. C. B. P. 319. *Crane's-bill with a Hemlock leaf, and very long beaks to the ſeed.*

20. Geranium (*Viſcoſum*) pedunculis multifloris, calycibus pentaphyllis, floribus pentandris, foliis bipinnatis multifidis caule erecto. *Crane's-bill with many flowers on each foot-ſtalk, having five-leaved empalements, flowers with five ſtamina, and many-pointed winged leaves.* Geranium cicutæ folio viſcoſum erectum, acu longiſſimâ. Juſſieu. *Erect viſcous Crane's-bill with a Hemlock leaf, and very long beaks to the ſeed.*

21. Geranium (*Cucullatum*) calycibus monophyllis, foliis cuculatis dentatis. Hort. Cliff. 345. *Crane's-bill with an empalement of one leaf, and indented hooded leaves.* Geranium Africanum arboreſcens, ibiſci folio rotundo, carlinæ odore. H. L. *African-tree Crane's-bill with a round Marſhmallow leaf, and ſmell of the Carline Thiſtle.*

22. Geranium (*Anguloſum*) calycibus monophyllis, foliis cuculatis anguloſis, acutè dentatis. *Crane's-bill with a one-leaved empalement, and angular hooded leaves ſharply indented.* Geranium Africanum arboreſcens, ibiſci folio anguloſo, floribus amplis purpureis. Phil. Tranſ. 388. *African-tree Crane's-bill with an angular Marſhmallow leaf, and large purple flowers.*

23. Geranium (*Zonale*) calycibus monophyllis, foliis cordato-orbiculatis inciſis zona notatis. Hort. Upſal. 196. *Crane's-bill with a one-leaved empalement, and round heart-ſhaped leaves, which are cut, and marked with a circle.* Geranium Africanum arboreſcens, alchimillæ hirſuto folio, floribus rubicundis. Com. Præl. *African-tree Crane's-bill with an hairy Ladies Mantle leaf, and red flowers.*

24. Geranium (*Inquinans*) calycibus monophyllis, foliis orbiculato-reniformibus tomentoſis crenatis integriuſculis, caule fruticoſo. Hort. Upſal. 195. *Crane's-bill with a one-leaved empalement, and round kidney-ſhaped leaves which are woolly, crenated, entire, and a ſhrubby ſtalk.* Geranium Africanum arboreſcens, malvæ folio plano lucido, flore elegantiſſimè kermeſino. Di van Leur. Boerh. Ind. *African-tree Crane's-bill, with a plain, ſhining, Mallow leaf, and an elegant ſcarlet flower.*

25. Geranium (*Capitatum*) calycibus monophyllis, foliis lobatis undatis villoſis, caule fruticoſo. Hort. Upſal. 196. *Crane's bill with empalements of one leaf, leaves divided into lobes, which are waved and hairy, and a ſhrubby ſtalk.* Geranium Africanum fruteſcens, malvæ folio odorato laciniato. H. L. *African ſhrubby Crane's-bill with a jagged, ſweet ſmelling, Mallow leaf.*

26. Geranium (*Vitifolium*) calycibus monophyllis, foliis adſcendentibus lobatis pubeſcentibus, caule fruticoſo. Hort. Upſal. 196. *Crane's-bill with one-leaved empalements, aſcending leaves which have lobes, are covered with ſoft hairs, and a ſhrubby ſtalk.* Geranium Africanum fruteſcens, malvæ folio laciniato, odorato inſtar meliſſæ, flore purpuraſcente. Boerh. Ind. *African ſhrubby Crane's-bill, with a jagged Mallow leaf ſmelling like Balm, and a purpliſh coloured flower.*

27. Geranium (*Papileonaceum*) calycibus monophyllus, corollis papilionaceis, alis carinaque minutis, foliis angulatis, caule fruticoſo. Hort. Cliff. 345. *Crane's-bill with an empalement of one leaf, a butterfly flower, whoſe wings and keel are very ſmall, and a ſhrubby ſtalk.* Geranium Africanum arboreſcens, malvæ folio mucronato, petalis florum inferioribus vix conſpicuis. Phil. Tranſ. *African-tree Crane's-bill with a pointed Mallow leaf, and the under petals of the flower ſcarce diſcernible.*

28. Geranium (*Acetoſum*) calycibus monophyllis, foliis glabris obovatis carnoſis crenatis, caule fruticoſo. Hort. Cliff. 345. *Crane's-bill with empalements of one leaf, ſmooth, oval, fleſhy leaves, which are crenated, and a ſhrubby ſtalk.* Geranium Africanum fruteſcens, folio craſſo & glauco, acetoſæ ſapore. Com. Præl. *African ſhrubby Crane's-bill with a thick glacuous leaf, and an acid taſte like Sorrel.*

29. Geranium (*Carnoſum*) calycibus monophyllis, caule fruticoſo, articulis carnoſo gibboſis, foliis pinnatifidis laciniatis, petalis linearibus. Lin. Sp. Plant. 67. *Crane's-bill with an empalement of one leaf, a ſhrubby ſtalk with fleſhy knees, wing-pointed leaves, and very narrow petals to the flower.* Geranium Africanum fruteſcens, chelidonii folio, petalis florum anguſtis albidis, carnoſo caudice. Phil. Tranſ. Geranium Africanum, folio alceæ, flore albo. Boerh. Ind. alt. *African ſhrubby Crane's-bill with a leaf like the Alcea, the petals of the flower white and narrow, and a fleſhy ſtalk.*

30. Geranium (*Gibboſum*) calycibus monophyllis, caule fruticoſo, geniculis carnoſis gibboſis, foliis ſubpinnatis appoſitis. Lin. Sp. Plant. 677. *Crane's-bill with a one-leaved empalement, ſhrubby ſtalk with fleſhy knees, and winged leaves placed oppoſite.* Geranium Africanum noctu olens, tuberoſum & nodoſum, aquilegiæ foliis. H. L. *African Crane's-bill ſmelling ſweet in the night, with knotty tuberous ſtalks, and leaves like Columbine.*

31. Geranium (*Fulgidum*) calycibus monophyllis, foliis tripartitis inciſis, intermedia majore umbellis, geminis, caule fruticoſo carnoſa. Lin. Vir. 67. *Crane's-bill*

*bill with one-leaved empalements, leaves cut into three segments, the middle one being the largest, double foot-stalks with flowers growing in umbels, and a shrubby fleshy stalk.* Geranium Africanum, folio alceæ, flore coccineo fulgidissimo. Boerh. Ind. alt. 1. p. 264. *African Crane's-bill with a Vervain Mallow leaf, and a deep scarlet flower.*

32. Geranium (*Peltatum*) calycibus monophyllis, foliis, quinquelobis integerrimis glabris peltatis, caule fruticoso. Hort. Cliff. 345. *Crane's-bill with empalements of one leaf, and smooth target-shaped leaves, having five lobes, which are entire.* Geranium Africanum foliis inferioribus asari, superioribus staphidisagriæ, maculatis, splendentibus, & acetosæ sapore. Com. Præl. *African Crane's-bill with the under leaves like Asarabacca, and the upper leaves like Stavesacre, shining, spotted, and tasting like Sorrel.*

33. Geranium (*Alchimilloides*) calycibus monophyllis, foliis orbiculatis palmatis incisis pilosis, caule herbaceo. Lin. Vir. 67. *Crane's-bill with empalements of one leaf, roundish hand-shaped leaves, which are divided, hairy, and an herbaceous stalk.* Geranium Africanum, alchimillæ hirsuto folio, floribus albidis. H. L. *African Crane's-bill with a hairy Ladies Mantle leaf, and whitish flowers.*

34. Geranium (*Odoratissimum*) calycibus monophyllis, caule carnoso brevissimo, ramis herbaceis longis foliis cordatis. Hort. Cliff. 345. *Crane's-bill with empalements of one leaf, a very short fleshy stalk, long herbaceous branches, and heart-shaped leaves.* Geranium Africanum, folio malvæ crasso molli odoratissimo, flosculo pentapetalo albo. Boerh. Ind. alt. *African Crane's-bill with a thick, soft, sweet-smelling Mallow leaf, and a small white flower composed of five leaves.*

35. Geranium (*Triste*) calycibus monophyllis, sessilibus scapis bifidis monophyllis. Lin. Sp. 950. *Crane's-bill with sessile empalements of one leaf, a bifid stalk, and a roundish root.* Geranium Americanum, noctu olens, radice tuberosâ, triste. Corn. H. Ox. *American tuberous-rooted Crane's-bill, smelling sweet in the night.*

36. Geranium (*Myrrhifolium*) calycibus monophyllis, foliis bipinnatis, inferioribus cordatis lobatis, caule herbaceo, calycibus strigosis. Burm. Ger. 59. *Crane's-bill with empalements of one leaf, doubly wing-pointed leaves, the lower heart-shaped with lobes, and an herbaceous stalk.* Geranium Africanum tuberosum, anemones folio, incarnato flore. Par. Bat. *Tuberous-rooted African Crane's-bill with an Anemony leaf, and a pale, flesh-coloured flower.*

37. Geranium (*Pastinacæfolium*) calycibus monophyllis, foliis decompositis pinnatifidis, acutis pedunculis longissimis. *Crane's-bill with empalements of one leaf, decompounded leaves ending in acute winged points, and very long foot-stalks to the flower.* Geranium Africanum noctu olens, radice tuberosâ, foliis pastinacæ incanis lanuginosis latioribus, flore pallide flavescente. H. L. B. *Night-smelling Crane's-bill with a tuberous root, broad, woolly, hoary, Parsnep leaves, and a pale yellowish flower.*

38. Geranium (*Villosum*) calycibus monophyllis, foliis pinnatifidis villosis, laciniis linearibus. *Crane's-bill with empalements of one leaf, hairy wing-pointed leaves, having very narrow segments.* Geranium Æthiopicum, noctu olens, radice tuberosâ, foliis myrrhidus angustioribus. Breyn. Cent. *Night sweet-smelling Ethiopian Crane's-bill with a tuberous root, and narrow Cicely leaves.*

39. Geranium (*Lobatum*) calycibus monophyllis, caule truncato, scapis subradicalibus, umbella composita. Lin. Sp. 950. *Crane's-bill with empalements of one leaf, a truncated stalk, foot-stalks arising from the root, and a compound umbel of flowers.* Geranium Africanum noctu olens, folio vitis hirsuto, tuberosum. H. L. *Night sweet-smelling African Crane's-bill with a hairy Vine leaf, and a tuberous root.*

40. Geranium (*Coriandrifolium*) calycibus monophyllis, foliis bipinnatis linearibus squarrosis, caule herbaceo læviusculo. Lin. Sp. 949. *Crane's-bill with a one-leaved empalement, doubly winged rough leaves, and a very smooth stalk.* Geranium Africanum, folio coriandri, floribus incarnatis, minus. H. L. *Lesser African Crane's-bill with a Coriander leaf, and a flesh-coloured flower.*

41. Geranium (*Romanum*) pedunculis multifloris, floribus pentandris, foliis pinnatis incisis, scapis radicalibus. Burm. Ger. 30. *Crane's-bill with many flowers on each foot-stalk, cut winged leaves, and foot-stalks rising from the root.* Geranium myrrhinum tenuifolium, amplo flore purpureo. Barrel. rar. 563.

42. Geranium (*Grossularoides*) calycibus monophyllis, foliis cordatis subrotundis lobatis crenatis, caule herbaceo lævi. Burm. Ger. 53. *Crane's-bill with empalements of one leaf, roundish heart-shaped leaves which are crenated, and herbaceous smooth stalks.* Geranium Africanum, uvæ crispæ folio, floribus exiguis rubellis. H. L. *African Crane's-bill with a Gooseberry leaf, and small reddish flowers.*

43. Geranium (*Betulinum*) calycibus monophyllis, foliis ovatis inæqualiter serratis planis, caule fruticoso. Lin. Sp. Plant. 679. *Crane's-bill with one-leaved empalements, and oval plain leaves unequally sawed, and a shrubby stalk.* Geranium frutescens, folio lato dentato, flore magno rubente. Burm. Afr. 92. tab. 33. *Shrubby Crane's-bill with a broad indented leaf, and large reddish flower.*

44. Geranium (*Chium*) pedunculis multifloris, floribus pentandris, foliis cordatis incisis, superioribus lyrato-pinnatifidis. Burm. Ger. 35. *Crane's-bill with many flowers on each foot-stalk, heart-shaped cut leaves at bottom, the upper lyre-shaped and winged.* Geranium chium vernum Caryphyllatæ folio. Tourn. Cor. 20.

45. Geranium (*Malacoides*) pedunculis multifloris, floribus pentandris foliis cordatis sublobatis. Hort. Cliff. 344. *Crane's-bill with many flowers on each stalk, and heart-shaped lobed leaves.* Geranium folio Althææ. C. B. P. 318.

46. Geranium (*Glaucophyllum*) pedunculis multifloris, floribus pentandris, foliis ovatis serratis incanis linearis. Lin. Sp. 952. *Crane's-bill with many flowers on each stalk, and oval sawed leaves.* Geranium Ægyptiacum glaucophyllon, rostris longissimis plumosis.

47. Geraniun (*Carolinianum*) pedunculis bifloris, calycibus aristatis, foliis multifidis, arillis hirsutis. Prod. Leyd. 351. *Crane's-bill with two flowers on each stalk, bearded empalements, many pointed leaves, and hairy beaks.* Geranium columbinum Carolinum, capsulis nigris hirsutis. Hort. Elth. 162.

48. Geranium (*Althæoides*) calycibus monophyllis, foliis cordato-ovatis plicatis sinuatis crenatis, caule herbaceo prostrato. Hort. Cliff. 354. *Crane's-bill with a one-leaved empalement, oval heart-shaped plaited leaves, which are indented, and a prostrate herbaceous stalk.* Geranium folio Althææ. Africanum odore melissæ. Boerh. Ind. 1. p. 263.

The first sort grows naturally in moist meadows in many parts of England, but is frequently planted in gardens for the beauty of its large blue flowers; of this there is a variety with white flowers, and another with variegated flowers; but these are apt to degenerate to the common sort, if they are raised from seeds, but by parting of their roots they may be continued. It hath a perennial root, which sends up many stalks, which rise near three feet high, garnished with target-shaped leaves, divided into six or seven lobes; these are cut into several acute segments, after the manner of winged leaves, ending in many points. The flowers are produced at the top of the stalks, each foot-stalk sustaining two flowers, whose petals are large and equal; they are of a fine blue colour, and appear in May and June.

The varieties of this may be preserved by parting of their roots in autumn; they may be planted in almost any soil or situation, and require no other culture but to keep them clean from weeds. They may also be propagated by seeds, but by this method they are very apt to vary in the colour of their flowers. If the seeds of these plants are permitted to scatter, the plants will come up without any farther care.

The second sort grows naturally in Germany and Switzerland; this hath a thick, fleshy, perennial root, from

from which arife feveral branching ftalks, which grow about one foot high, garnifhed with leaves at each joint, which are divided into five lobes; and are divided at the top into many fhort fegments, which are crenated on their edges; they are of a light green, and fmooth. The flowers are produced at the end of the branches, many growing together in a bunch, but each fhort foot-ftalk fuftains two flowers. The flowers have fwollen empalements, refembling inflated bladders. The petals are pretty large, equal, and of a fine bright purple colour, and the ftamina and ftyle are much longer than the petals; the whole plant, when rubbed, emits an agreeable odour. This flowers about the fame time with the firft fort, and may be propagated and treated in the fame manner, the plant being equally hardy.

The third fort grows naturally in many parts of England, but is often admitted into gardens; this hath pretty thick, flefhy, fibrous roots, which grow to a large head, from which arife many ftalks, garnifhed with leaves, divided into five lobes, which are again divided almoft to the midrib. The flowers ftand upon long hairy foot-ftalks, which come out from the fide of the ftalk, each fuftaining one flower, compofed of five broad regular petals, which are of a deep purple colour. This fort flowers in June and July; there are two varieties mentioned of this fort as diftinct fpecies, one whofe ftalks grow more erect, and the other hath leaves more deeply divided; but the plants which I have raifed from feeds of thefe do not come up the fame as the parent plants, fo they are only feminal varieties.

This hath a perennial root, which may be parted in autumn, and thereby propagated; or it may be propagated by feeds, and the plants treated in the fame manner as the firft.

The fourth fort hath been fuppofed by fome to be only a variety of the third, but it is undoubtedly a diftinct fpecies; for I have frequently raifed the plants from feeds, which have always proved to be the fame. The ftalks of this plant are fhorter than thofe of the third, and fpread flat on the ground; the leaves are much lefs, and not fo deeply divided, and the flowers much fmaller and of a pale colour, marked with purple; it grows naturally in Lancafhire and Weftmoreland, where I faw it in plenty. This may be propagated and treated in the fame manner as the others.

The fifth fort is a perennial plant, of fmaller growth than either of the former. It rifes with branching ftalks about fix inches high, garnifhed with leaves, having three pretty broad lobes, which are undivided, and crenated on their edges: thofe on the lower part of the ftalks are placed oppofite, upon pretty long foot-ftalks, but the upper leaves fit clofe to the ftalks and are fingle. The flowers are produced at the end of the ftalks, ftanding together upon two fhort foot-ftalks; they are of a dirty purple colour, and appear in June. It grows naturally in France. This fort may be propagated and treated in the fame manner as the firft.

The fixth fort grows naturally on the Alps and Helvetian mountains, and is found in fome places in the North of England: this hath a perennial root, from which arife feveral ftalks near a foot high, with leaves which are divided into five or fix lobes, which are laciniated on their edges; thofe which grow near the root have long foot-ftalks, but thofe on the upper part of the ftalk fit clofe; the ftalk branches out at the top into three or four divifions, each being terminated by two or three foot-ftalks, fuftaining two flowers of a dark purple colour, with erect petals. This flowers in June, and may be propagated by feeds or parting of the roots, in the fame manner as the firft fort.

The feventh fort is very like the fixth, but the leaves are larger, the lobes fhorter, broader, and not fo much cut; they are ftriped with black; the ftalks rife higher, the flowers are larger, and the petals are reflexed. Thefe differences are permanent, fo are fufficient to conftitute a fpecific difference between them. This may be propagated and treated in the fame manner as the firft fort. It grows naturally on the Alps.

The eighth fort hath a perennial root, which fends up many branching ftalks a foot and a half high, garnifhed with light green leaves; thofe on the lower part of the ftalk hath five lobes, and ftand upon long foot-ftalks; but thofe on the upper part have but three lobes, fit clofer to the ftalks, and are fharply indented on the edges; the flowers ftand upon long flender foot-ftalks, each fuftaining two flowers, compofed of five obtufe petals, which are deeply indented at the top; they are of a dull white, with many purple ftripes running longitudnally thro' them. Thefe appear in June, and in cool feafons there will be a fucceffion of flowers a great part of July. This fort is very hardy, fo may be propagated by dividing of the roots, or from feeds, in the fame manner as the firft fort.

The ninth fort grows plentifully in the meadows in Lancafhire and Weftmoreland; this hath a perennial root, which fends out three or four upright ftalks about nine inches high, garnifhed with leaves, having five lobes, which are fawed on their edges; they are placed oppofite on the ftalks; thofe on the lower part have pretty long foot-ftalks, but thofe on the upper part fit clofer. The flowers are fituated on the top of the ftalks, ftanding upon fhort foot-ftalks, each fuftaining two pretty large blue flowers, with entire petals. This flowers in May and June, and may be propagated and treated in the fame way as the firft fort.

The tenth fort was difcovered by Dr. Tournefort in the Levant, from whence he fent the feeds to the Royal Garden at Paris; this hath a perennial root, from which arife a few weak ftalks about nine inches long, garnifhed with leaves which are round, and divided into five lobes, which are indented at the top, and placed oppofite on the ftalks. The flowers ftand upon pretty long foot-ftalks, which come fingle from the joints of the ftalks, each fuftaining two purplifh flowers with entire petals, having very fhort empalements. It flowers in June, and may be propagated either from feeds, or by parting of the roots in the fame manner as the firft fort, but the plants require a drier foil and a warmer fituation; for although in common winters it will live in the open air, yet in fevere froft thefe plants are fometimes killed, efpecially when they are planted in moift cold land.

The eleventh fort grows naturally on the Pyrenean mountains; this hath a perennial root, from which arife many branching ftalks a foot and a half high, garnifhed with round leaves, divided into many obtufe fegments at the top, placed oppofite. The flowers are produced upon fhort foot-ftalks, which come out at the divifions on the fides, and at the top of the ftalks; they are in fome of a pale purple colour, and in others white. The petals of the flowers are bifid, like thofe of the common Dove's-foot Crane's-bill, to which the whole plant bears fome refemblance; but the ftalks are erect, the leaves and flowers much larger, and the root is perennial; this will propagate itfelf faft enough by its fcattered feeds where it has once got poffeffion, and will thrive in any foil or fituation.

The twelfth fort grows naturally upon the Alps. The feeds of this were fent me by Sig. Micheli, of Florence; this hath a perennial root, which runs very deep into the ground. The lower leaves of the plant have very long foot-ftalks, they are doubly winged and fmooth. The ftalks rife a foot and a half high, which are garnifhed with leaves of the fame form as the lower, but fmaller, and ftand oppofite. The flowers grow many together upon very long foot-ftalks; they are purple. This flowers in June, but has never ripened any feeds in England. The plant is hardy, and lives in the open air, but as the root puts out no offsets, nor perfects feeds here, we have not been able to propagate it.

The

The thirteenth ſort grows naturally on the Alps; this hath a very thick perennial root, from which come out roundiſh leaves, divided into many parts, ſtanding upon pretty long foot-ſtalks; they are very ſilvery, and ſhining like ſilk. The flower-ſtalks riſe about four or five inches high, garniſhed with one or two ſmall leaves like thoſe below, which ſit cloſe to the ſtalk. The ſtalks are terminated by two pretty large pale flowers, whoſe petals are entire, and ſpread open flat. It flowers in June, but rarely ripens ſeeds here; it may be propagated by parting of the roots in the ſame manner as the firſt, and muſt have a ſhady ſituation.

The fourteenth ſort grows naturally in North America, from whence the ſeeds were ſent to England; this hath a perennial root, from which ariſe ſeveral ſtalks about one foot high, which divide by pairs, and from the middle of the diviſions come out the foot-ſtalks of the flowers, which are pretty long and naked, each ſuſtaining two pale purple flowers with entire petals. The leaves are divided into five parts, which are cut on their edges, and are placed oppoſite, the lower having pretty long foot-ſtalks, but the upper ſit cloſe to the ſtalks. It flowers in June, and frequently ripens ſeeds, from which the plant may be propagated; it thrives very well in the open air, and requires no other culture but to keep it clean from weeds.

The fifteenth ſort grows naturally in Bohemia; this is an annual plant, which ſends out many ſtalks, dividing into ſeveral ſmaller, which are garniſhed with leaves divided into five lobes, crenated on their edges; they ſtand upon long foot-ſtalks, and are for the moſt part oppoſite. The flowers ſtand by pairs upon pretty long ſlender foot-ſtalks, which come out from the ſide of the ſtalk; they are of a fine blue colour, and are ſucceeded by ſeeds, whoſe capſules and beaks are black. It flowers moſt part of ſummer, and the ſeeds ripen ſoon after, which, if permitted to ſcatter, there will be a ſupply of plants, which want no other care but to keep them clean from weeds.

The ſixteenth ſort grows naturally in Siberia. The ſeeds of this plant were ſent me by Sir Charles Linnæus, profeſſor of botany at Upſal; this ſort hath a perennial root. The leaves are divided into five acute lobes, which are cut into many ſharp wing-like ſegments on their edges; they are placed oppoſite, and have long ſlender foot-ſtalks. The foot-ſtalks of the flower come out from the wings of the ſtalk; they are pretty long, ſlender, and each ſuſtain one pale purpliſh flower. This ſort flowers in June, and perfects its ſeeds very well, ſo may be eaſily propagated; it will grow on any ſoil, or in any ſituation.

The ſeventeenth ſort is an annual plant, which is ſometimes found growing naturally in England, but is frequently preſerved in gardens for the muſky odour of the leaves, which in dry weather is very ſtrong. The leaves of this are irregularly winged, the lobes grow alternate, and are cut into many obtuſe ſegments on their edges. The ſtalks branch into many diviſions, and frequently decline to the ground. The flowers are produced in umbels upon long foot-ſtalks, which ariſe from the wings of the ſtalks; they are ſmall, blue, and have but five ſtamina in each, their empalements are compoſed of five leaves. It flowers in May, June, and July, and the ſeeds ripen ſoon after; which, if permitted to ſcatter, there will be a ſupply of plants without care, which will require no other culture but to keep them clean from weeds, and thin them where they are too cloſe; it will thrive on any ſoil, or in any ſituation.

The eighteenth ſort grows naturally in Crete; this is an annual plant with very broad leaves, which are cut on their ſides regularly, in form of winged leaves, and are crenated on their borders. The flowers are produced on pretty long foot-ſtalks, which come out from the wings of the ſtalk; they have five-leaved empalements, and are compoſed of five entire blue petals; theſe are ſucceeded by the largeſt and longeſt beaks of any ſpecies of this genus yet known. It flowers in June and July; this ripens ſeeds very well, and if they are permitted to ſcatter, the plants will come up without care; or they may be ſown in the ſpring where they are deſigned to remain, and will require no other culture but to thin them where they are too cloſe, and keep them clean from weeds.

The nineteenth ſort grows naturally in Germany and Italy; this is an annual plant, which hath ſeveral proſtrate ſtalks near a foot long, garniſhed with winged leaves, cut into ſeveral acute parts, placed oppoſite. The flowers come out from the wings of the ſtalk, upon foot-ſtalks about three inches long; ſome of theſe ſuſtain many flowers, but others have no more than two; they are of a pale blue colour, and are ſucceeded by very long beaks, but not ſo long or large as thoſe of the former ſort; but the ſeeds of this are frequently uſed for hygrometers, to ſhew the moiſture of the air: if the ſeeds of this are permitted to ſcatter, the plants will come up and thrive without any other care than to keep them clear from weeds, and the plants which come up in autumn will flower early in May, but thoſe which are ſown in the ſpring ſeldom flower till July. Dr. Linnæus ſuppoſes this and the former ſort to be the ſame, but whoever has ſeen the two plants, cannot doubt of their being diſtinct ſpecies.

The ſeeds of the twentieth ſort were ſent to the Chelſea garden by Dr. Juſſieu, profeſſor of botany at Paris; this is an annual plant, which hath upright ſtalks near two feet high, which are garniſhed with double winged leaves, ending in many points; theſe are very viſcous, and ſtand oppoſite. The flowers are produced on long naked foot-ſtalks, ſtanding many together upon each; they are of a pale blue colour, and have but five ſtamina; their empalements are compoſed of five leaves, which end with awns. It flowers in May, June, and July, according to the times when the ſeeds are ſown, and the ſeeds ripen a month after; this requires no other culture than the two former ſorts.

There are ſeveral other ſorts of annual Geraniums, ſome of which grow naturally in England, and are troubleſome weeds in a garden, others grow naturally in France, Spain, Italy, and Germany, and are preſerved in botanic gardens for the ſake of variety; but as they are plants of little beauty, they are rarely admitted into other gardens, therefore I ſhall not trouble the reader with an enumeration of the ſpecies, which would ſwell this article too much; ſo I ſhall next treat of the African Crane's-bills, which are preſerved in moſt of the curious gardens, where there is conveniency to ſcreen them from the froſt in winter.

The twenty-firſt ſort grows naturally near the Cape of Good Hope; this riſes with a ſhrubby ſtalk eight or ten feet high, ſending out ſeveral irregular branches, garniſhed with roundiſh leaves, whoſe ſides are erect, ſo form a ſort of hood by the hollow cavity made in the leaf. The baſe of the leaves are cut in form of a heart-ſhaped leaf, and from the foot-ſtalk run many nerves ariſing from a point, but diverge toward the ſides; the borders of the leaves are ſharply indented, thoſe on the lower part of the branches have long foot-ſtalks, and are placed without order on every ſide, but thoſe on the upper part have ſhorter foot-ſtalks, and ſtand oppoſite. The flowers are produced in large panicles on the top of the branches; their empalements are of one leaf, deeply cut into five ſegments, and cloſely covered with ſoft hairs. The petals are large, entire, and of a purple blue colour. It flowers in June, July, Auguſt, and September, and the flowers are ſucceeded by ſeeds, having ſhort hairy beaks.

The twenty-ſecond ſort has ſome appearance of the twenty-firſt, but the leaves are of a thicker ſubſtance, divided into many acute angles, having purple edges, which are acutely indented. The ſtalks and leaves are very hairy. The branches are not ſo irregular as thoſe of the former, nor are the bunches of flowers near ſo large; theſe differences are permanent in the plants which are raiſed from ſeeds, ſo it is undoubtedly a diſtinct

a diſtinct ſpecies, though Dr. Linnæus ſuppoſes them to be the ſame.

The twenty-third ſort comes from the Cape of Good Hope, but is one of the oldeſt, and the moſt common ſort in the Engliſh gardens; this riſes with a ſhrubby ſtalk four or five feet high, and divides into a great number of irregular branches, ſo as to form a large head, which is often eight or ten feet high. The branches are garniſhed with roundiſh heart-ſhaped leaves, indented on their edges in ſeveral obtuſe ſegments, which are cut into ſhort teeth at their brims; theſe have a purpliſh circle, or mark, like a horſe-ſhoe, through the leaf, going from one ſide of the baſe to the other, correſponding with the border of the leaf; theſe leaves when gently rubbed, have a ſcent like ſcalded Apples. The flowers are produced in pretty cloſe bunches, ſtanding upon foot-ſtalks about five or ſix inches in length, which come out from the wings of the ſtalk, toward the end of the branches; they are of a reddiſh purple colour, and continue in ſucceſſion great part of ſummer; there is a variety of this with fine variegated leaves, which is preſerved in moſt of the Engliſh gardens for the beauty of its leaves; but as this accidentally came from the other, it is not a diſtinct ſpecies, therefore I have not enumerated it.

The twenty-fourth ſort grows naturally at the Cape of Good Hope; this riſes with a ſoft ſhrubby ſtem to the height of eight or ten feet, ſending out ſeveral branches, which are generally erect; theſe are garniſhed with roundiſh kidney-ſhaped leaves, which are of a thick ſubſtance, and of a lucid green, ſtanding on pretty long foot-ſtalks; they are covered with ſoft hairs on their under ſide, and are placed without any order. The flowers grow in looſe bunches upon long ſtiff foot-ſtalks, which come out from the wings of the ſtalk; they are of a bright ſcarlet colour, ſo make a fine appearance, and there is a ſucceſſion of theſe flowers during all the ſummer months.

The twenty-fifth ſort grows naturally at the Cape of Good Hope, but has been many years an inhabitant of the Engliſh gardens; this riſes with a ſhrubby ſtalk four or five feet high, dividing into ſeveral weak irregular branches, garniſhed with leaves divided into three unequal lobes, which are hairy and waved on their edges; they are placed alternate on the branches, and ſtand upon hairy foot-ſtalks. The flowers grow in cloſe roundiſh heads on the top of the foot-ſtalks, forming a ſort of corymbus; they are of a purpliſh blue colour, and continue in ſucceſſion great part of the ſummer. The leaves of this ſort, when rubbed, have an odour like dried Roſes, from whence many have given it the title of Roſe Geranium.

The twenty-ſixth ſort is a native of the Cape of Good Hope; this riſes with an upright ſhrubby ſtalk to the height of ſeven or eight feet, ſending out many pretty ſtrong branches, garniſhed with leaves ſhaped ſomewhat like thoſe of the Vine; thoſe on the lower part ſtand upon long foot-ſtalks, but the upper have ſhort ones; when the leaves of this are rubbed, they have a ſcent of Balm. The flowers grow in compact cluſters on the top of long naked foot-ſtalks, which come out from the wings of the ſtalk, but riſe much higher than the branches; they are ſmall, and of a pale blue colour, ſo make no great figure, but there is a ſucceſſion of them moſt part of the ſummer.

The twenty-ſeventh ſort riſes with an upright ſhrubby ſtalk ſeven or eight feet high, ſending out ſeveral ſide branches, garniſhed with large, angular, rough leaves, ſtanding upon long foot-ſtalks. The flowers are produced in large panicles at the end of the branches; theſe are ſhaped ſomewhat like a Butterfly-flower, the two upper petals, which are pretty large, turn upward like a ſtandard in the leguminous flowers; theſe are finely variegated, but the three under petals are ſo ſmall, as not to appear at a ſmall diſtance; theſe are reflexed downward, ſo are ſcreened from ſight, unleſs the flowers are viewed near. This ſort flowers in May, at which time the plants make a fine appearance, but they are not ſucceeded by any more afterward, as moſt of the other ſorts are; this grows naturally at the Cape of Good Hope.

The twenty-eighth ſort is from the ſame country; this riſes with a ſhrubby ſtalk ſix or ſeven feet high, ſending out ſeveral ſide branches, garniſhed with oblong, oval, fleſhy, ſmooth leaves, of a gray colour, which are crenated on their edges, and have an acid taſte like Sorrel. The flowers ſtand upon pretty long foot-ſtalks, which ariſe from the wings of the ſtalks, each ſuſtaining three or four flowers, whoſe petals are narrow and unequal in ſize; they are of a pale bluſh colour, with ſome ſtripes of a light red; theſe continue in ſucceſſion moſt part of the ſummer. There is a variety of this with ſcarlet flowers, which is ſaid to have been raiſed from the ſeeds of this ſort. The leaves of it are larger, and ſeem to be an intermediate ſpecies between this and the twenty-fourth ſort, for the flowers are larger than thoſe of the twenty-eighth ſort, and are of a pale ſcarlet colour.

The twenty-ninth ſort hath a thick, fleſhy, knotted ſtalk, which riſes about two feet high, ſending out a few ſlender fleſhy branches, garniſhed thinly with double winged leaves, which, on the lower part of the ſtalk, ſtand upon foot-ſtalks, but thoſe above ſit cloſe to the branches. The flowers are produced in ſmall cluſters at the end of the branches; theſe have five narrow white petals, which make no appearance, and continue in ſucceſſion moſt part of the ſummer. It grows naturally at the Cape of Good Hope.

The thirtieth ſort hath a round fleſhy ſtalk with ſwelling knots at the joints, which riſe about three feet high, and ſend out ſeveral irregular branches, which are ſmooth; they are thinly garniſhed with ſmooth, fleſhy, winged leaves, ending in obtuſe points; they are of a gray colour, and ſtand upon ſhort foot-ſtalks. The flowers ſtand four or five upon each foot-ſtalk, which ariſes from the wings of the ſtalk, and are of a dark purple colour. The petals are broader than thoſe of the former ſort, and have a very agreeable ſcent in the evening, after the ſun has left them ſome time; this and the former ſort are ſuppoſed to be one ſpecies by Dr. Linnæus, but they are very different in many particulars, which are permanent in the plants which come up from ſeeds.

The thirty-firſt ſort hath a fleſhy ſtalk which ſeldom riſes a foot high, and puts out very few branches; theſe are garniſhed with ſmooth, light, green leaves, divided into three lobes, the middle ſegment being much larger than the others. The flowers ſtand upon ſhort foot-ſtalks, each ſuſtaining two or three flowers on the top, which are of a very deep ſcarlet colour, and have unequal petals; this ſort is not regular in its ſeaſon of flowering, ſometimes it is in ſpring, at other times in ſummer, and frequently in autumn. The leaves of this ſort fall off, ſo that the ſtalks are frequently deſtitute of them for three or four months in ſummer, and appear as if they were dead, but in autumn they put out freſh leaves again.

The thirty-ſecond ſort hath many weak ſhrubby ſtalks, which require ſupport to prevent their falling on the ground; theſe extend to the length of two or three feet, and are garniſhed with fleſhy leaves, divided into five obtuſe lobes, which are entire; theſe have ſlender foot-ſtalks, which are faſtened to the middle of the leaf like the handle of a target. The leaves are ſmooth, of a lucid green, and have a circular purple mark in their middle; they have an acid flavour, and are placed alternate on their branches. The flowers are produced upon pretty long foot-ſtalks, which come out from the wings of the ſtalk, each foot-ſtalk ſuſtaining four or five purple flowers, compoſed of five unequal petals. This ſort continues a ſucceſſion of flowers moſt of the ſummer months, and frequently ripen ſeeds here.

The thirty-third ſort ſends out ſeveral herbaceous ſtalks about a foot and a half in length, which trail upon the ground if they are not ſupported; theſe are garniſhed with roundiſh hand-ſhaped leaves, which are cut into many parts, and are very hairy. The flowers are of a pale bluſh colour, and ſtand ſeveral together

together upon very long foot-ſtalks; there is a ſucceſſion of theſe during all the ſummer months, and the ſeeds ripen accordingly about a month after the flowers are fallen: there is a variety of this ſort which has a dark circle in the middle of the leaves, which is mentioned as a diſtinct ſpecies, but I find it is apt to vary from ſeeds.

The thirty-fourth ſort hath a very ſhort fleſhy ſtalk, which divides near the ground into ſeveral heads, each having many leaves, which ariſe on ſeparate foot-ſtalks from the heads; theſe are heart-ſhaped, ſoft, and downy, and have a ſtrong ſcent like Aniſeed; from theſe heads come out ſeveral ſlender ſtalks near a foot in length, which lie proſtrate on the ground, and are garniſhed with rounder leaves than thoſe near the root, but are of the ſame texture, and have the like odour. The flowers are produced from the ſide of theſe ſtalks, three, four, or five ſtanding together upon ſlender foot-ſtalks; they are very ſmall and white, ſo make little appearance, but the plant is preſerved in gardens for the ſcent of its leaves.

The thirty-fifth ſort hath a thick, roundiſh, tuberous root, from which ariſe ſeveral hairy leaves, which are finely divided, almoſt like thoſe of the Garden Carrot; theſe ſpread near the ground, and between theſe come out the ſtalks, which riſe about a foot high, which are garniſhed with two or three leaves of the ſame ſort with thoſe below, but are ſmaller, and ſit cloſer to the ſtalks; from theſe ariſe two or three naked foot-ſtalks, which are terminated by a bunch of yellowiſh flowers, marked with dark purple ſpots, which ſmell very ſweet after the ſun hath left them; theſe are frequently ſucceeded by ſeeds, which ripen in autumn. This is the ſort which has been long cultivated in the gardens, and is known by the title of Geranium noctu olens, *or Night-ſcented Crane's-bill.*

The thirty-ſixth ſort hath a knobbed tuberous root like the laſt, from which come out ſeveral pretty large leaves, compoſed of many lobes, ſet along the mid-rib in the form of a winged leaf; theſe are narrow at their baſe, but are very much enlarged at their ends, which are rounded, and cut all along their ſide and top into many acute points; the ſtalks which ſuſtain the flowers ariſe immediately from the root, and ſometimes have one or two ſmall leaves toward the bottom, where they often divide into two naked foot-ſtalks, each being terminated by a bunch of pale reddiſh flowers, which ſmell ſweet at night.

The thirty-ſeventh ſort hath oblong tuberous roots, from which come out ſeveral decompounded winged leaves, ending in many acute points; the ſegments of theſe leaves are broader than thoſe of the thirty-fifth ſort, and the leaves are very hairy. The ſtalks riſe a foot and a half high, which are garniſhed with a ſingle leaf at the two lower joints; theſe are ſingly winged, and the lobes are narrow, ſtanding at a wider diſtance, and the ſegments are more acute than thoſe of the lower leaves; at the two lower knots or joints, ariſe two long naked foot-ſtalks, each being terminated by a bunch of yellowiſh flowers, which have long tubes, and ſmell ſweet in the evening when the ſun has left them. This grows naturally at the Cape of Good Hope.

The thirty-eighth ſort hath a tuberous root like the former, from which ſpring out many hairy leaves, which are finely divided like thoſe of the Pulſatilla, which have a hoary appearance, and riſe immediately from the root, ſpreading on every ſide near the ground. The foot-ſtalk of the flower is naked, and riſes from the root; this grows about nine inches high, and is terminated by a looſe bunch of flowers, which are of a very dark purple colour, and ſmell ſweet in the evening.

The thirty-ninth ſort hath fleſhy tuberous roots like thoſe of the former ſorts, from which come out three or four broad leaves, divided on their borders into ſeveral lobes, in form of a Vine leaf; theſe ſpread flat on the ground; they are hairy, and crenated on their edges, ſtanding upon ſhort foot-ſtalks. The foot-ſtalks of the flowers ariſe immediately from the root, and grow about a foot high; they are naked, and are terminated by a bunch of dark purple flowers, with long tubes, ſitting cloſe to the foot-ſtalks, which have a very agreeable odour in the evening.

The four firſt ſorts of tuberous-rooted Crane's-bill, are by Linnæus ſuppoſed to be but one ſpecies; but I have propagated them from ſeeds ſeveral times, and have never found either of them vary from their parent plants, ſo I make no doubt of their being diſtinct ſpecies, for their difference of leaves is as great as in any of the other ſpecies.

The fortieth ſort is an annual plant, which grows naturally at the Cape of Good Hope; this riſes with herbaceous branching ſtalks near a foot high, which are garniſhed with doubly-winged leaves at each joint; the lower leaves ſtand upon long foot-ſtalks, but thoſe on the upper part ſit cloſe to the ſtalks. The flowers ſtand upon naked foot-ſtalks, which proceed from the ſide of the ſtalks, on the oppoſite ſide to the leaves; they grow three or four together upon ſhort ſeparate foot-ſtalks; theſe are ſhaped ſomewhat like a papilionaceous flower; the two upper petals, which are large, form a kind of ſtandard, the other three petals are narrow, and reflexed downward; they are of a pale fleſh colour, appearing in July, and the ſeeds ripen in September, ſoon after which the plants decay.

The forty-firſt ſort hath a pretty thick tuberous root, from which is ſent out ſeveral irregular ſtalks, which divide into branches, and grow diffuſed; theſe have ſwelling joints, and are ſomewhat ligneous; they are garniſhed with one double winged leaf at each of the joints, and oppoſite to the leaves come out the foot-ſtalks of the flowers; thoſe which are ſituated on the lower part of the ſtalk, are very long and naked, but thoſe which terminate the branches are ſhorter, and have one or two ſmall leaves ſet at their baſe; theſe foot-ſtalks are terminated by a ſmall bunch of flowers, ſhaped like thoſe of the former ſort, but larger, and of a paler colour; theſe continue in ſucceſſion moſt part of the ſummer: this and the former ſort are ſuppoſed to be the ſame by Dr. Linnæus, but the former is an annual plant in every country, periſhing ſoon after the ſeeds are perfected, and the latter is an abiding plant with ligneous ſtalks.

The forty-ſecond ſort is a biennial plant, which grows naturally at the Cape of Good Hope; this ſends out a great number of very ſlender trailing ſtalks, which are proſtrate on the ground, and extend a foot and a half in length, garniſhed with ſmall, roundiſh, hand-ſhaped leaves, which are crenated on their edges. The flowers ſit upon ſhort ſlender foot-ſtalks, which come out at every joint from the ſide of the ſtalks; they are very ſmall, and of a reddiſh colour; ſometimes they are ſingle, and at other times there are two or three flowers upon a foot-ſtalk. They continue in ſucceſſion all the ſummer, and the ſeeds ripen in about five weeks after the flowers decay.

The forty-third ſort hath a ſhrubby ſtalk, which riſes to the height of four or five feet, ſending out ſeveral branches, which are garniſhed with oblong leaves, indented, and unequally ſawed on their edges; the flowers ſtand upon long foot-ſtalks, which come out from the ſide of their branches; they are large, of a red colour, and the two upper petals are larger than the other; this ſort flowers in June and July.

The forty-fourth ſort grows naturally in the iſle of Chio in the Levant. This is an annual plant, which ſends out ſeveral branches a foot long; the lower leaves are almoſt heart-ſhaped, but thoſe on the branches are formed in the ſhape of an ancient lyre. Theſe are placed alternate on the branches; the foot-ſtalks of flowers are produced on the ſide of the branches, theſe are ſix inches long, ſuſtaining many bright purple flowers at the top, which are ſucceeded each by five ſeeds, having long ſlender beaks; theſe ripen in five or ſix weeks after the flowers fall away, and if they are permitted to ſcatter, the young plants will come up in the autumn; and if the winter is favourable, they will live in the open air, ſo will flower early the

following spring: but if these should be killed in the winter, some seeds should be sown in the spring, on a border of light ground, and when the plants come up they should be thinned, and kept clear from weeds; these will flower in July, and their seeds will ripen in August.

The forty-fifth sort grows naturally in Portugal and Spain; this is an annual plant, whose lower leaves are heart-shaped, and divided into three lobes; the foot-stalks of the flowers are placed on the side of the branches, which extend a foot and a half each way; these incline to the ground. The foot-stalks sustain many bright red flowers, which are succeeded each by five seeds, having pretty long beaks. This flowers and seeds about the same time as the former sort, and requires the same culture.

The forty-sixth sort grows naturally in Egypt. This is an annual plant, having oval sawed leaves of a gray colour; the branches extend a foot in length, adorned with small leaves placed alternate, and toward the end have three or four foot-stalks produced from their sides, sustaining several pale blue flowers, which are each succeeded by five seeds, having long feathery beaks.

This sort is much tenderer than the two former, therefore if the seeds are sown on a moderate hot-bed in the spring, and when the weather becomes warm, the plants are carefully transplanted on a sheltered border, there will be greater certainty of their perfecting seeds.

The forty-seventh sort grows naturally in Carolina, and is an annual plant, greatly resembling our common Dove's-foot Crane's-bill, but is smaller, and the branches are shorter; the flowers are very small, of a pale blue colour; these are succeeded by five seeds, having short erect beaks, which are black. If the seeds of this sort are permitted to scatter, the plants will arise without farther care; and if thinned and kept clean from weeds, will produce flowers and feeds.

The forty-eighth sort has some resemblance of the forty-fifth, but the leaves are more of an oval heart-shape; the flowers are also of a bright red colour. This grows naturally at the Cape of Good Hope; the plant is tender, therefore will require the same treatment as the forty-seventh sort, with which they will produce flowers and seeds, after which the plants decay.

All the sorts of African Crane's-bill may be propagated by seeds; these may be sown upon a bed of light earth toward the end of March, where the plants will appear in a month or five weeks after, and by the beginning of June the plants will be fit to remove; when they should be carefully taken up, and each planted into a separate pot, filled with light kitchen-garden earth, and placed in a shady situation till the plants have taken new root; then they may be removed into a sheltered situation, and placed among other of the hardier green-house plants, where they may remain till autumn, when they must be removed into the green-house, and treated in the same manner as other hardy kinds of green-house plants.

But those who are desirous to have their plants large, and flower soon, sow the seeds upon a moderate hot-bed in the spring, on which the plants will come up much sooner, and will be fit to remove long before those which are sown in the open air; but when these plants come up, there must be great care taken not to draw them up weak; and when these are transplanted, the pots should be plunged into another moderate hot-bed, observing to shade them from the sun till they have taken new root; then they must be gradually inured to bear the open air, into which they should be removed the beginning of June, and placed in a sheltered situation with other exotic plants. If these plants are brought forward in the spring, most of the sorts will flower the same summer, and the plants will be very strong before the winter, so will make a better appearance in the green-house.

The shrubby African Geraniums, from the twenty-first to the thirty-second inclusive, and also the forty-first and forty-third sorts, are commonly propagated by cuttings, which, if planted in a shady border in June or July, will take good root in five or six weeks, and may then be taken up and planted into separate pots, placing them in the shade till they have taken new root; after which they may be removed into a sheltered situation, and treated in the same manner as the seedling plants. The twenty-ninth, thirtieth, thirty-first, and thirty-second sorts, have more succulent stalks than either of the other, so the cuttings of these sorts should be planted into pots filled with light kitchen-garden earth, and plunged into a very moderate hot-bed, where they should be shaded from the sun in the heat of the day, and should have but little water; for these are very apt to rot with much moisture, so they must only be gently refreshed now and then with water. When these are well rooted, they may be separated and planted in pots filled with the same sort of earth, and placed in the shade till they have taken new root; then they may be removed into a sheltered situation, where they may remain till autumn. These four sorts should be sparingly watered at all times, but especially in the winter, for they are apt to take a mouldiness with moisture, or in a damp air: they will thrive much better in an airy glass-case than in a green-house, because in the former they will have more sun and air than in the latter, so will not be so liable to have a mouldiness or rot. But all the other shrubby sorts are proper furniture for the green-house, where they will only require protection from frost, but should have a large share of free air when the weather is mild; they will require water every week, in mild weather once or twice, but it should not be given them in too great plenty, especially in frosty weather. These plants should be hardened in the spring gradually, and toward the middle or latter end of May, they may be taken out of the green-house, and at first placed under the shelter of trees, where they may remain a fortnight or three weeks to harden; then should be removed into a situation where they may be defended from strong winds, and enjoy the morning sun till eleven o'clock, where they will thrive better than in a warmer situation.

As these shrubby sorts grow pretty fast, so they soon fill the pots with their roots; and if they stand long unremoved in summer, they frequently put out their roots through the holes at the bottom of the pots into the ground, and then the plants will grow vigorously; but when they are suffered to grow long in this manner, it will be difficult to remove them, for if their roots are torn off, all the younger branches will decay, and many times the plants are killed. Therefore the pots should be moved once in a fortnight or three weeks, in the summer months, and the roots which may be then pushing through the holes in the pots cut off, to prevent their striking into the ground. These plants will also require to be new potted at least twice in the summer; the first time should be after they have been three weeks or a month out of the green-house; the second should be towards the end of August, or the beginning of September, that the plants may have time to establish their new roots before they are removed into the green-house.

When these are new potted, all the roots on the outside of the balls of earth should be carefully pared off, and as much of the old earth drawn away from the roots, as can be done with safety to the plants; then if they require it, they should be put into pots a size larger than those out of which they were taken, putting a quantity of fresh earth into the bottom of the pot; then place the plants upon that, being careful the ball about the roots of the plant is not so high as the rim of the pot, that some room may be left to contain the water which may be given to the plants. Then the cavity all round the ball should be filled up with fresh earth, which should be gently pressed down, and the bottom of the pot beaten upon the ground, to settle down the earth; then the plant should be well watered, and the stem fastened to a rail, to prevent the

the wind from displacing of the root before they are fixed in the new earth.

The compost in which I have always found these plants thrive best (where there has not been a conveniency of getting some good kitchen-garden earth) was fresh hazel loam from a pasture, mixed with a fourth or fifth part of rotten dung; if the earth is inclinable to bind, then a mixture of rotten tan is preferable to dung; but if it is light and warm, then a mixture of neat's-dung is best: this compost should be mixed three or four months before it is used, and should be turned over three or four times, that the parts may be well mixed and incorporated; but where a quantity of good kitchen-garden earth can be had, which has been well worked, and is clean from the roots of bad weeds, there will need no composition, for in that they will thrive full as well as in any mixture which can be made for them, especially if the earth has lain in a heap for some time, and has been two or three times turned over to break the clods, and make it fine: these plants should not be planted in very rich earth, for that will cause them to grow very luxuriant, but they will not flower so well as in a poorer soil.

The thirty-third sort hath herbaceous stalks, so is best propagated by seeds, which the plants produce in great plenty; but the cuttings of this will take root as freely as either of the other, but the seedling plants are preferable to those propagated by cuttings; and where the seeds of this and many other of the African sorts are permitted to scatter, there will be a supply of young plants come up the spring following, provided the seeds are not buried too deep in the ground.

The thirty-fourth sort may be propagated by seeds, or from heads slipped off from the short fleshy stalk; these heads should have their lower leaves stripped off, that the stalk which is to be planted may be clear of leaves; then they may be planted single into a small pot, or if the heads are small, there may be two or three put into one small pot; then they may be plunged into a very moderate hot-bed, which will forward their putting out roots, and if they are shaded from the sun and gently refreshed with water, they will take root in a month or five weeks, when they must be hardened gradually, and removed into the open air, where they may remain till autumn, when they must be removed into shelter for the winter season.

The thirty-fifth, thirty-sixth, thirty-seventh, thirty-eighth and thirty-ninth sorts are generally propagated by parting of their roots; the best time for doing this is in August, that the young roots may be established before the cold comes on. Every tuber of these roots will grow, provided they have a bud or eye to them; they may be planted in the same sort of earth as was before directed, and if the pots are plunged into an old tan-bed, under a good frame in winter, the plants will thrive better than in a green-house; the glasses of the frame may be drawn off every day in mild weather, whereby the plants will enjoy the free air; and if in hard frost the glasses are well covered to prevent the cold penetrating to the plants, it is all the shelter they will require; but in this situation they should have but little wet in winter, therefore the glasses should be kept over them in heavy rains to keep them dry; but in mild weather the glasses may be raised on the upper side to admit the fresh air to the plants, which will give them greater slope to carry off the wet. With this management the roots will thrive and flower very strong every year. These sorts may also be propagated by seeds.

The fortieth sort is an annual plant, and is only propagated by seeds, which should be sown upon a gentle hot-bed in the spring, to bring the plants forward; otherwise if the season should not prove very warm, the plants will not perfect their seeds in this country. When the plants are come up, and grown strong enough to remove, they should be each planted into a separate small pot, and plunged into a moderate hot-bed again, observing to shade them till they have taken new root; then they must be gradually hardened to bear the open air, into which they should be removed in June; and when the plants have filled the small pots with their roots, they should be shaken out, and the ball of earth preserved to their roots, and put into pots a size larger, in which they will flower and ripen seeds, and soon after the plants will decay.

The forty-second sort is also propagated by seeds, which may be either sown upon a moderate hot-bed in the spring, or upon a bed of light earth in the open air, where the plants will come up very well, though they will not be so forward as those on the hot-bed. Those which are sown in the open air will require no other care but to keep them clean from weeds, and thin the plants where they are too close. These plants will flower in July and August, and if the autumn proves favourable, the seeds will ripen in September; but if these should fail, those which were raised on the hot-bed will come earlier to flower, so there will be no danger of their perfecting seeds; and these plants, if they are in pots, may be preserved through the winter, if they are plunged into an old tan-bed under a frame, and treated in the same manner as the tuberous-rooted sorts before mentioned.

The shrubby sorts must be looked over frequently during the winter, while they are in the green-house, to pick off all decayed leaves from them, which, if left on, will not only render the plants unsightly, but by their falling off, they will occasion litter among the other plants; and if they are suffered to rot in the house, they will occasion a foul, nasty, damp air, which will be very prejudicial to all the plants; therefore to avoid this, they should be constantly picked off every week; and during the summer season, they will require to be picked every fortnight or three weeks to keep them clean from dead leaves; for as the branches advance, and new leaves are produced on their top, the under ones as constantly decay; and if left on till they drop off, will render the plants very unsightly.

GERMANDER. See Teucrium.

GEROPOGON. Goat's-beard.

The Characters are,

*The empalement is single, composed of many keel-shaped leaves which are longer than the corolla; the flower is composed of several hermaphrodite florets, which are imbricated and shorter than the empalement, and are of one petal, divided into five segments at the top. These have each five short stamina, terminated by cylindrical summits, and an oblong germen with a slender style, supporting two thread-like stigma which are recurved; the seeds are included in the empalement, and are crowned by five bearded spreading rays.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia Æqualis, the florets having five connected stamina, and are fruitful.

The Species are,

1. Geropogon (*Glabrum*) foliis glabris. Lin. Sp. 1109. *Goat's-beard with smooth leaves.* Tragopogon gramineo folio glabrum, flore dilute incarnato. Raii Sup. 149.
2. Geropogon (*Hirsutum*) foliis pilosis. Lin. Sp. 1109. *Goat's-beard with hairy leaves.* Tragopogon gramineo folio, suave rubente flore. Col. Ecphr. 1. p. 232.

The first sort grows naturally in Italy; this hath an erect stalk more than a foot high, garnished with smooth, Grass-like, long leaves; the stalk branches upward into two or three divisions, each being terminated by one flesh-coloured flower, composed of several florets.

The second sort grows naturally in Italy and Sicily. This rises with an erect stalk a foot high, garnished with hairy narrow leaves, and seldom divides into branches, but is terminated by one flower composed of four or five hermaphrodite florets, which are succeeded by so many bearded seeds.

These plants require the same treatment as the Tragopogon, to which article the reader is desired to turn for their culture.

GESNERA. Plumier Nov. Gen. 27. tab. 9. Lin. Gen. Plant. 667. This plant was so named by father Plumier, who discovered it in America, in honour of Conrad Gesner, a very learned botanist, and natural historian.

The CHARACTERS are,

*The empalement of the flower is of one leaf, cut into five acute parts at the top, and is permanent, in which is situated the germen; the flower hath one petal which is tubulous, and first bent inward, and afterward out again like a bugle-horn; the brim is divided into five obtuse segments which are equal; it hath four stamina which are shorter than the petal, terminated by single summits; the germen which sits under the petal supports a single crooked style, crowned by a headed stigma. The germen afterward becomes a roundish capsule with two cells, filled with small seeds, which are fixed on each side the partition.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, which includes those plants whose flowers have two long and two shorter stamina, and the seeds are included in a capsule.

The SPECIES are,

1. GESNERA (*Tomentosa*) foliis ovato-lanceolatis crenatis hirsutis, pedunculis lateralibus longissimis corymbiferis. Hort. Cliff. 318. *Gesnera with oval, hairy, crenated leaves, and long foot-stalks proceeding from the sides of the stalks, supporting flowers in a corymbus.* Gesnera amplo digitalis folio tomentoso. Plum. Gen. 27.
2. GESNERA (*Humilis*) foliis lanceolatis serratis sessilibus, pedunculis ramosis multifloris. Lin. Sp. Plant. 612. *Gesnera with spear-shaped sawed leaves sitting close to the stalks, and branching foot-stalks having many flowers.* Gesnera humilis flore flavescente. Plum. Nov. Gen. 27. *Low Gesnera with a yellowish flower.*

The first sort grows naturally in the West-Indies; the seeds of this were sent me from Jamaica, which succeeded in the Chelsea garden; this rises with a shrubby stalk to the height of six or seven feet, which divides into two or three irregular branches, covered with a russet wool, and garnished with hairy leaves which are seven or eight inches long, and two and a half broad in the middle, having a russet woolly midrib, and the edges are crenated; these are placed on every side the branches without order, and have short foot-stalks; towards the end of the branches come out the foot-stalks of the flowers at every joint, arising from the wings of the stalk; they are naked, and nine inches in length, branching at the top into many smaller foot-stalks, each sustaining a single flower, having a short crooked tube, indented at the top in five obtuse parts, and of an obsolete purple colour. These are succeeded by roundish capsules sitting close in the empalement, the divisions of which arise above the capsule; which Dr. Linnæus, from Plumier's figure, has taken for the empalement sitting upon the capsule, whereas the capsule is dictinct from the empalement and is inclosed by it. The capsule is divided into two cells which are filled with small seeds. It flowers here in July and August, but hath not ripened seeds.

The second sort is a plant of humbler growth; this seldom rises more than three feet high; the leaves are much smaller, are sawed on their edges, and sit close to the stalk; the flowers stand upon branching foot-stalks, each sustaining many yellowish flowers, which are deeper cut at their brims than those of the first sort. This was found growing naturally by the late Dr. Houstoun at Carthagena in New Spain.

There is a third species of this genus mentioned by Plumier, which grows to to a tree, and hath spotted and fringed flowers; but this I have not seen in any of the English gardens. These plants are propagated by seeds, which must be procured from the countries where they grow naturally; these should be brought over in their capsules, which is the best way to preserve the seeds good; for as they are very small and light, so when they are separated from the partition to which they adhere, they soon lose their vegetative quality; for I have received the seeds several times from America, which were taken out of the vessels, but not one of them grew, till I procured some to be sent in their vessels, which succeeded very well.

The seeds should be sown in pots filled with light earth, and plunged into a hot-bed of tanners bark as soon as they arrive, for they sometimes lie long in the ground; those which I have sown in autumn, came up the following spring; therefore when they happen to arrive here at that season, the pots in which the seeds are sown should be plunged into the tan-bed in the stove, and during the winter the earth should be now and then gently watered to prevent its drying too much, but it must not be too moist. In the spring the pots should be removed out of the stove, and plunged into a fresh hot-bed, which will bring up the plants soon after. When these are fit to remove, they should be each planted into a separate pot, and plunged into a good hot-bed of tan, observing to shade them till they have taken new root; then they must be treated in the same way as other tender plants from the same countries.

In autumn they must be plunged into the tan-bed in the stove, where, during the winter, they should have but little water given to them; for if they receive much wet, it will destroy them. In this stove the plants must constantly remain, for they will not thrive if they are kept out of the tan. In the summer, they should have free air admitted to them at all times when the weather is warm; and they must be frequently refreshed with water during that season, but it must not be given to them in too great plenty. As the plants advance in growth they will require larger pots, but there must be care taken not to over-pot them, for they will not thrive in large pots. With this management the plants will flower the second year, and may be continued three or four years, but they are not of long duration in their native country.

GEUM. Lin. Gen. Plant. 561. Caryophyllata. Tourn. Inst. R. H. 294. tab. 151. Avens, or Herb Bennet; in French, *Benoite*.

The CHARACTERS are,

*The flower hath a one-leaved empalement, cut at the top into ten segments, which are alternately smaller than the other. The flower has five roundish petals, which are narrow at their base, where they are inserted in the empalement; it hath a great number of awl-shaped stamina, which are the length of the empalement, into which they are inserted, and are terminated by broad obtuse summits. In the center of the flower is situated a great number of germen collected into a head; these have styles inserted in their sides, which are long, hairy, and crowned by single stigmas. The germen afterward become so many flat rough seeds, which are hairy, and have the style which is bent like a knee adhering to them; these sit in the common empalement.*

This genus of plants is ranged in the fifth section of Linnæus's twelfth class, intitled Icosandria Polygynia, in which he places those plants whose flowers have more than twenty stamina, and have many styles inserted into the empalement.

The SPECIES are,

1. GEUM (*Urbanum*) floribus erectis, fructu globoso, aristis uncinatis nudis, foliis lyratis. Hort. Cliff. 195. *Geum with erect flowers, a globular fruit, naked hooked beards, and harp-shaped leaves.* Caryophyllata vulgaris. C. B. P. 321. *Common Avens, or Herb Bennet.*
2. GEUM (*Rivale*) floribus nutantibus, fructu oblongo, aristis plumosis. Hort. Cliff. 195. *Geum with nodding flowers, and an oblong fruit with feathery beards.* Caryophyllata aquatica, nutante flore. C. B. P. 321. *Aquatic Herb Bennet with a nodding flower.*
3. GEUM (*Pyrenaicum*) floribus nutantibus, fructu globoso, aristis nudis, foliis lyratis, foliolis rotundioribus. *Geum with nodding flowers, a globular fruit with naked beards, and harp-shaped leaves with rounder lobes.* Caryophyllata Pyrenaica, amplissimo & rotundiori folio, nutante flore. Tourn. Inst. R. H. 295. *Pyrenean Avens*

*Avens with a very large and rounder leaf, and a nodding flower.*

4. Geum (*Montanum*) flore erecto solitario fructu oblongo, aristis plumosis. Lin. Sp. Plant. 501. *Geum with a single upright flower, and an oblong fruit with feathery beards.* Caryophyllata montana flore luteo magno. J. B. 2. p. 398. *Mountain Avens with a large yellow flower.*

5. Geum (*Alpinum*) flore solitario erecto, fructu globoso, aristis tenuioribus nudis. *Geum with a single erect flower, and a globular fruit with narrower naked beards.* Caryophyllata alpina minor. C. B. P. 322. *Smaller Alpine Avens.*

6. Geum (*Virginianum*) floribus erectis, fructu globoso, aristis uncinatis nudis, foliis ternatis. Hort. Cliff. 195. *Geum with upright flowers, a globular fruit with naked beards and trifoliate leaves.* Caryophyllata Virginiana, albo flore minore, radice inodorâ, H. L. 111. *Virginia Avens with a smaller white flower, and a root without scent.*

The first sort grows plentifully by the side of hedges, and in woods, in most parts of England, so is rarely admitted into gardens. This stands in the list of medicinal plants; the root is the only part used, which is esteemed cephalic and alexipharmic, and is manifestly of a binding nature, so is useful in all fluxes, &c.

The second sort grows naturally in moist meadows in the northern parts of England. This is of an humbler growth than the first, the lower leaves have two pair of small lobes at bottom, and three large ones at the top, that which terminates being the largest. The leaves upon the stalks are composed of three acute lobes which sit close to the stalk; the flowers are of a purplish colour, and nod on one side; they appear in May, and the seeds ripen in July.

The third sort grows upon the Alps, and also on the mountains in the north; this hath some resemblance to the second, but the leaves are much larger and rounder, and are indented on their edges; the flowers are larger and of a gold colour. This flowers about the same time as the second.

The fourth sort grows naturally upon the Alps; this hath leaves much larger than either of the other species; the lower leaves are composed of three or four pair of small irregular pinnæ set along the midrib, which is terminated by one very broad roundish lobe, which is crenated on the edge. The flowers are large, of a bright yellow colour, standing single on the top of the stalk, which seldom rises more than five or six inches high. It flowers in May and June.

The fifth sort grows naturally on the Alps; it is a very low plant, the flower-stalks are about three inches long, and bend on one side; they are each terminated by one bright yellow flower, about the size of those of the common sort. This flowers about the same time as the former.

The sixth sort grows naturally in North America; the stalks of this sort rise a foot and a half or two feet high, and branch out at the top into small footstalks, each being terminated by a small white flower; the leaves of this sort are trifoliate, and the root has no scent. These are all very hardy plants which require a shady situation, but will thrive in any soil; they may be easily propagated by seeds, which should be sown in autumn; for when they are sown in the spring, they do not grow the same year.

GILLIFLOWER, or JULY-FLOWER. See Dianthus.

GILLIFLOWER, or STOCK-GILLIFLOWER. See Cheiranthus.

GILLIFLOWER, the Queen's or Dame's Violet. See Hesperis.

GINGER. See Amomum.

GINGIDIUM. See Artedia.

GLADE is an open and light passage made through a wood, by lopping off the branches of trees along that way.

GLADIOLUS. Lin. Gen. Plant. 55. Tourn. Inst. R. H. 365. tab. 190. [takes its name of Gladius, *Lat.* sword; q. d. little sword; because the leaves of this plant resemble a sword.] Cornflag; in French, *Glaicul.*

The Characters are,

*The flowers are included in sheaths, which stand at a distance from each other; the petal of the flower is cut into six parts, three of the upper are near together, the three under spread open, but they all form a short incurved tube with their base; they have three awl-shaped stamina, which are inserted into every other petal, and all of them ascend to the upper petals, and are terminated by oblong summits. The germen is situated below the flower, supporting a single style the length of the stamina, crowned by a concave trifid stigma. The germen afterward becomes an oblong, swelling, three-cornered capsule, with three cells, opening with three valves, filled with roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's third class, intitled Triandria Monogynia, which includes those plants whose flowers have three stamina and one style.

The Species are,

1. Gladiolus (*Communis*) foliis ensiformibus, floribus distantibus, Lin. Sp. Plant. 36. *Cornflag with Swordshaped leaves and flowers standing at a distance.* Gladiolus floribus uno versu dispositis. C. B. P. 41. *Cornflag with flowers disposed on one side the stalk.*

2. Gladiolus (*Italicus*) foliis ensiformibus, floribus ancipitibus. *Cornflag with sword-shaped leaves, and flowers standing on both sides the stalk.* Gladiolus utrinque floribus. C. B. P. 41. *Cornflag with flowers on each side the stalk.*

3. Gladiolus (*Byzantinus*) foliis ensiformibus, spathis longioribus. *Cornflag with sword-shaped leaves and longer sheaths to the flowers.* Gladiolus major Byzantinus. C. B. P. 41. *Greater Cornflag of Byzantium.*

4. Gladiolus (*Indicus*) foliis ensiformibus, floribus maximis incarnatis. *Cornflag with sword-shaped leaves, and very large incarnate flowers.* Gladiolus maximus Indicus. C. B. P. 41. *Greatest Indian Cornflag.*

5. Gladiolus (*Angustis*) foliis linearibus floribus distantibus, corollarum tubo limbis longiore. Lin. Sp. Plant. 37. *Cornflag with very narrow leaves, flowers standing at a distance from each other, and the tube longer than the margins of the petal.* Gladiolus Africanus, folio gramineo, floribus carneis, maculam rhomboideam inscriptis uno versu positis. Boerh. Ind. alt. 2. 127. *African Cornflag, with a grassy leaf, and flesh-coloured flowers, marked with a purple rhomboid spot ranged all on one side the stalk.*

6. Gladiolus (*Tristis*) foliis lineari cancellatis corollis campanulatis. *Cornflag with very narrow channelled leaves, and a stalk bearing bell-shaped flowers.* Lilio-Gladiolus bifolius & biflorus, foliis quadrangulis. Trew. tab. 39. *Lily Cornflag with two leaves and flowers, and four-cornered leaves.*

The first sort grows naturally in arable land in most of the warm countries in Europe, and was formerly cultivated in the English gardens, where the roots have multiplied so greatly as to become a most troublesome weed, and are very difficult to eradicate; this hath a round, compressed, tuberous root, which is of a yellowish colour, covered with a brown furrowed skin, like those of the large yellow vernal Crocus; from the root arise two flat sword-shaped leaves, which embrace each other at their base, and between these arise the flower-stalk, which grows near two feet high, having one or two narrow leaves embracing it like a sheath; the stalks are terminated by five or six purple flowers, standing above each other at some distance, and ranged on one side of the stalk; each of these has a spatha (or sheath) which covers the flower-bud before it expands, but splits open lengthways when the flowers blow, and shrivel up to a dry skin, remaining about the seed-vessel till the seeds are ripe. The flower hath one petal, which is cut almost to the bottom in six parts, so as to appear like a flower of six petals; the three upper segments stand near together, and rise like a labiated flower; the under one turns downward, and the two side segments form the chaps of the flower, and spread open at the top,

but are curved downward at the bottom. They are ranged along one side of the stalk, and are of a purplish red colour. This flowers the latter end of May, and in June, and the seeds ripen the beginning of August; it requires no care, for when it is once planted in a garden, it will multiply too fast, so as to become a troublesome weed.

There is a variety of this with white flowers, and another with flesh-coloured flowers, which have accidentally risen from seeds, so are not different species.

The second sort differs from the first, in having the flowers ranged on both sides the stalk, but in other respects it is very like to that; and of this there is a variety with white flowers, but these are not so common in the English gardens as the former.

The third sort hath larger roots than either of the former, but are of the same form; the leaves are also much broader and longer, the veins or channels of the leaves are deeper, the flower-stalks rise higher; the flowers are much larger, and of a deeper red colour than those of the former sorts, and the sheaths are longer. This plant makes a fine appearance in flower, so is worthy of a place in every good garden; and the rather, because the roots do not increase so fast as to become troublesome in the borders. This is propagated by offsets, which are sent off from the roots in the same manner as Tulips. The roots may be taken out of the ground the end of July, when their stalks decay, and may be kept out of the ground till the latter end of September, or the beginning of October; at which time they should be planted in the borders of the flower-garden, where they will thrive in any situation, and being intermixed with other flowers of the same growth, they will add to the variety.

The fourth sort grows naturally at the Cape of Good Hope, from whence I have several times received the seeds. This has been many years cultivated in the English gardens, but very rarely flowers here; for in near thirty years that I have cultivated this sort, I have never seen it but once in flower, though I have kept it in all situations, and planted it in various soils. The roots increase very fast, but will not live in the open air through the winter in this country. The roots of this sort are broader and flatter than those of any of the other sorts, and are covered with a netted skin; the leaves come out in the same manner, embracing each other like the former sorts; they are longer, smoother, and of a brighter green, than any of the others; these begin to appear in September, and continue growing in size till after Christmas; they begin to decay in March, and the latter end of June are quite withered, when the roots may be taken up, and kept out of the ground till August; the time of its flowering is in January. The flowers of this sort are placed on each side the stalk, and sit close to it, like the grains of the flat Barley; the sheaths between the flowers are not so long as those of the other sorts, and form a kind of scaly covering to them. The flowers are of a pale red colour without, but the three lower segments are yellow within toward their base, with a few red stripes. The flowers do not all open at the same time, but the lower ones decay before those on the upper part of the spike are in beauty; however, they make a good appearance at a season when all flowers are valuable.

This sort propagates by offsets very fast; these should be planted in a warm border of kitchen-garden earth, and in winter they should be covered with glasses or mats to guard them from frost; for I have with a slight shelter preserved those which were in pots under a common frame, and some which were planted in the full ground, when the frost has not been severe; and I have always found that those plants which were hardily treated, grew much stronger than those which were placed in a moderate degree of warmth; so that where there is a conveniency of covering a warm border with glasses in the winter, if these roots are planted in the full ground, where they may be protected from the frost, there will be a greater probability of their flowering, than in any other method of culture.

The fifth sort grows naturally at the Cape of Good Hope, from whence I received the seeds, which succeeded in the Chelsea garden, where the plants annually produce their beautiful flowers.

This hath a round, smooth, bulbous root, which is covered with a thin dark-coloured skin, from which come out in autumn two or three very narrow grassy leaves, folded over each other at their base, but open flat above, and rise near two feet high. In the spring of the year arises a single stalk from between the leaves about two feet long, which always bend on one side; toward the upper part of this come out two or three flowers, ranged on one side of the stalk, standing upright, each having a narrow spatha, or hood, and long slender tubes, which swell large upward, and are divided into six parts, which are nearly equal. The flower is of a dusky flesh colour, and each segment of the petal has a rhomboidal mark of a dark red, or purple colour; afterward the tube of the flower opens, and the deep division of the petals is seen, and the three stamina with their summits appear, attended by the style with its trifid stigma, arising from the germen. This plant flowers in May and the beginning of June; as this plant is a native of a warm country, it requires protection from the frost in winter; therefore the bulbs should be planted in pots filled with light earth, and placed in the green-house in winter; or, where there is not such conveniency, they may be put under a hot-bed frame during that season, where they may have air in mild weather, and be screened from the frost; in such situations I have had them thrive and flower very well.

This is propagated by offsets from the root in the same manner as the last, and also by seeds, which are frequently perfected in England; these should be sown the latter end of August, in pots filled with light earth, and placed in a shady situation till the middle of September; then the pots should be removed where they may have the sun great part of the day, and in October they must be placed under a hot-bed frame, where they may be protected from frost and great rains, but enjoy the free air in mild weather. In the spring the young plants will appear, when they will require a little water once in eight or ten days, but it should be given them sparingly, for too much wet will rot these tender bulbs. In May, when the danger of frost is over, the pots should be removed to a sheltered situation, where they may have the morning sun till noon; and, if the season proves dry, they must be now and then refreshed with water. Toward the latter end of June, the leaves of these plants will decay; then the roots should be taken up, and may be mixed with sand, and kept in a dry room till the end of August, when they should be planted again; and as the roots are small, four or five may be planted in each halfpenny pot, filled with light earth; these should be placed where they may have only the forenoon sun, till the middle of September, when they should have a warmer situation; and in October they must be placed under a hot-bed frame as before, and treated in the same way during the winter season; and in the spring they must be placed in the open air till their leaves decay, when they may be again taken out of the ground, and treated in the same manner as before; but as the roots will have grown to a larger size, so when they are planted again, they should each have a separate half-penny pot, because now they will be large enough to flower, so may be treated as the old roots.

The sixth sort is also a native of the Cape of Good Hope, from whence I have several times received the seeds; the root of this sort is oval, not compressed as those of the common sorts. The leaves are very long and narrow, having two deep furrows running the whole length, the midrib rising very prominent, so as

to have the appearance of a four-cornered leaf. The leaves are ſingle, and wrapped cloſe about the flower-ſtalk at their baſe to a conſiderable length; there are ſeldom more than two of theſe leaves from one root; the ſtalk is ſlender and round, and riſes about two feet high; and the top is garniſhed with two flowers, which are placed two inches and a half aſunder on the ſame ſide of the ſtalk, each having a ſhort ſpatha, or ſheath, embracing the germen and the baſe of the tube, which is long, narrow, and recurved, but enlarges greatly before it is divided. The upper part of the flower is cut into ſix equal ſegments, which end in acute points of a purpliſh colour, which form a ſtripe through the middle of each ſegment. The petal is of a cream colour, and fades to a ſulphur colour before it decays. This flowers in June, and ſometimes the ſeeds ripen well in England. This may be propagated by offſets from the root, or by ſeeds in the ſame manner as the fifth ſort, and the plants require the ſame treatment.

GLANDIFEROUS trees, are ſuch trees as bear maſt, as Acorns, &c.

GLANDULOUS roots, are ſuch roots as grow kernel-wiſe.

GLANS is that ſort of fruit which is contained within a ſmooth, but hard bark, having but one ſeed; its hinder parts covered with a kind of cup, the fore-part being bare, as Acorns; but it is properly the fruit without the cup.

GLASTENBURY THORN. See Mespilus.

GLAUCIUM. See Chelidonium.

GLAUX, Sea Chickweed, or Milkwort, and black Saltwort, is a low trailing perennial plant, with leaves ſomewhat like Chickweed, but of a thicker conſiſtence, which ſit cloſe to the ſtalks. The flowers come out from the boſom of the leaves; they are white, and like thoſe of Chickweed. This is ſeldom cultivated in gardens, ſo I ſhall not trouble the reader with a further account of it. This grows upon the ſea-ſhores in moſt parts of England.

GLECHOMA. Ground Ivy, Gill go by the Ground, Ale-hoof, or Turn-hoof.

This plant grows naturally under hedges, and upon the ſides of banks in moſt parts of England, ſo is rarely cultivated in gardens, for which reaſon I ſhall paſs over it, with barely mentioning it here.

GLEDITSIA. Lin. Gen. Plant. 1025. Acacia. Raii Meth. 161. Honey Locuſt, or three-thorned Acacia.

The Characters are,

*It hath male and hermaphrodite flowers in the ſame katkin, and female flowers in different plants. The male katkins are long, compact, and cylindrical, and have each a three-leaved ſmall empalement; they have three roundiſh petals, which ſpread open in form of a cup; theſe have a turbinated nectarium, whoſe mouth afterward grows to the parts of fructification; they have ſix ſlender ſtamina, which are longer than the petals, terminated by oblong compreſſed ſummits. The hermaphrodite flowers in the ſame katkin, are ſituated at the end; theſe have empalements, petals, and ſtamina like the male, and have a germen, ſtyle, and ſeeds like the female, which are ſituated on different trees, and are diſpoſed in a looſe katkin; theſe have a five-leaved empalement, and have five oblong petals, with two ſhort thread-like nectariums, and a broad germen longer than the petals, ſupporting a ſhort reflexed ſtyle, crowned by a thick ſtigma. The germen afterward becomes a large flat pod, with ſeveral tranſverſe partitions, having a pulp in each diviſion, ſurrounding one hard roundiſh ſeed.*

This genus of plants is ranged in the ſecond ſection of Linnæus's twenty-third claſs, intitled Polygamia Diœceia, which includes thoſe plants which have male and hermaphrodite flowers in the ſame plant, and female flowers in different plants.

The Species are,

1. Gleditsia (*Triacanthus*) ſpinis triplicibus axillaribus. Lin. Sp. 1509. *Gleditſia with three thorns on the ſide of the branches.* Acacia Americana Abruæ folio triacanthos, five ad axillas foliorum, ſpinâ triplici donatâ. Pluk. Mant. 1. *Three-thorned American Acacia.*

2. Gleditsia (*Inermis*) ſpinis paucioribus, folis bipinnatis, ſiliquis ovalibus. *Gleditſia with fewer ſpines, winged leaves, and oval pods.* Acacia Abruæ folio triacanthos, capſulâ ovali unicum ſemen claudente. Cateſb. Car. 1. p. 43. *Three-thorned Acacia with an Abrus leaf, and an oval pod containing one ſeed.*

Theſe trees grow naturally in America; the firſt ſort is very common in moſt parts of North America, where it is known by the title of Honey Locuſt; this has been many years cultivated in the Engliſh gardens, and is known among the gardeners by the title of three-thorned Acacia. It riſes with an erect trunk to the height of thirty or forty feet, and is armed with long ſpines, which have two or three ſmaller coming out from the ſide, and are frequently produced in cluſters at the knots on the ſtems of the trees; they are ſometimes three or four inches long. The branches of this tree are alſo armed with the ſame ſort of ſpines, and are garniſhed with winged leaves, compoſed of ten pair of ſmall leaves which ſit cloſe to the midrib, and are of a lucid green. The flowers come out from the ſide of the young branches in katkins; they are of an herbaceous colour, ſo make no figure. The hermaphrodite flowers are ſucceeded by pods near a foot and a half long, and two inches broad, divided into many cells by tranſverſe partitions, each containing one ſmooth, hard, oblong ſeed, ſurrounded by a ſweet pulp.

The leaves of this tree ſeldom come out till June in this country, and the flowers appear the latter end of July, but they do not flower till they are of a large ſize: there was one tree in the Chelſea garden which produced flowers ſeveral years, and there is one now growing in the Biſhop of London's garden at Fulham, which produced pods in the year 1728, and came to their full ſize, but the ſeeds did not ripen.

The ſecond ſort hath much the appearance of the firſt, but it hath fewer ſpines. The leaves are ſmaller, and the pods are oval, containing but one ſeed; this was diſcovered by the late Mr. Cateſby, in Carolina, from whence he ſent the ſeeds to England, by the title of Water Acacia, by which it is known in the gardens.

Theſe trees are propagated by ſeeds, which muſt be procured from America, where the trees grow naturally; thoſe of the firſt ſort are annually ſent to England in plenty, by the title of Locuſt, or Honey Locuſt, to diſtinguiſh it from the falſe Acacia, which is frequently called Locuſt-tree in America; theſe ſeeds may be ſown upon a bed of light earth in the ſpring, burying them half an inch deep; and if the ſpring ſhould prove dry, they muſt be frequently watered, otherwiſe the plants will not come up the firſt year, for I have ſometimes had the ſeeds remain two years in the ground before they have come up; therefore thoſe who are deſirous to ſave time, ſhould ſow the ſeeds as ſoon as they arrive, and plunge the pots into a moderate hot-bed, obſerving to water them frequently; by this method moſt of the plants will come up the ſame ſeaſon, but theſe ſhould be gradually inured to bear the open air, for if they are continued in the hot-bed, they will draw up weak; during the ſummer ſeaſon, thoſe plants in pots will require frequent waterings, but thoſe in the full ground will not dry ſo faſt, therefore need no water, unleſs the ſeaſon ſhould prove very dry. In autumn, thoſe in the pots ſhould be placed under a hot-bed frame to protect them from froſt, for theſe young plants generally keep growing late in the ſummer, ſo the upper part of their ſhoots is tender, and the early froſts of the autumn often kill the ends of them, if they are not protected, and this frequently occaſions great part of the ſhoots decaying in winter; for which reaſon thoſe plants in the full ground ſhould be covered with mats in autumn, on the firſt appearance of froſt; for a ſmall froſt in autumn will do more miſchief to theſe young ſhoots which are full of ſap, than ſevere froſt when the ſhoots are hardened.

The following ſpring the plants may be tranſplanted into nurſery-beds, at a foot diſtance row from row, and

and six inches asunder in the rows; but this should not be performed till April, after the danger of hard frost is over; for as the plants do not put out their leaves till very late, so there will be no hazard in removing them any time before May. If the season should prove dry, they must be watered; and if the surface of the beds is covered with moss, or mulch, to prevent the earth from drying, it will be of great service to the plants. In these beds the plants may remain two years, during which time they must be constantly kept clean from weeds; and in the winter there should be some rotten tan, or other mulch, spread over the surface of the ground to keep out the frost. If the plants thrive well, they will be fit to transplant to the places where they are to remain after two years growth, for they do not bear removing when large; the best season for transplantlng of these trees, is late in the spring; they thrive best in a light deep soil, for in strong shallow ground they become mossy, and never grow large; they should also have a sheltered situation, for when they are much exposed to winds, their branches are frequently broken in the summer season, when they are fully clothed with leaves.

GLOBULARIA. Lin. Gen. Plant. 106. Tourn. Inst. R. H. 466. tab. 265. *Blue Daisy.*

The Characters are,

*It hath a flower composed of many florets, which are included in one common scaly empalement; each floret has an empalement of one leaf, which is tubulous, and cut into five segments at the top. The florets have one petal, whose base is tubulous, but the brim is cut into four parts; the upper segment, which is the least, is reflexed; they have four stamina the length of the petal, terminated by distinct summits; in the bottom of the tube is situated an oval germen supporting a single style, crowned by an obtuse stigma. The germen afterward becomes an oval seed, sitting in the common empalement.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetandria Monogynia, which includes those plants whose flowers have four stamina and one style.

The Species are,

1. Globularia (*Vulgaris*) caule herbaceo, foliis radicalibus tridentatis, caulinis lanceolatis. Flor. Suec. 109. *Globularia with an herbaceous stalk, the lower leaves divided into three points, and those on the stalks spear-shaped.* Globularia vulgaris. Tourn. 467. *Common Globularia.*
2. Globularia (*Nudicaulis*) caule nudo, foliis integerrimis lanceolatis. Lin. Sp. Plant. 97. *Globularia with a naked stalk, and spear-shaped entire leaves.* Globularia Pyrenaica, folio oblongo, caule nudo. Tourn. 467. *Pyrenean Globularia, with an oblong leaf and naked stalk.*
3. Globularia (*Alypum*) caule fruticoso, foliis lanceolatis tridentatis integrisque. Prod. Leyd. 190. *Globularia with a shrubby stalk, spear-shaped leaves, some ending in three points, and others are entire.* Globularia fruticosa, myrti folio tridentato. Tourn. 467. *Shrubby Globularia with a trifid Myrtle leaf.*
4. Globularia (*Spinosa*) foliis radicalibus crenato-aculeatis, caulinis integerrimis mucronatis. Lin. Sp. Plant. 96. *Globularia with lower leaves crenated and prickly, those on the stalks entire, ending in a point.* Globularia spinosa. Tourn. 467. *Prickly Globularia.*
5. Globularia (*Cordifolia*) caule subnudo, folis cuneiformibus tricuspidatis, intermedio minimo. Lin. Sp. Plant. 96. *Globularia with a naked stalk, and wedge-shaped leaves ending in three points, whose middle segment is the least.* Globularia Alpina minima, origani folio. Tourn. 467. *Smallest Alpine Globularia with a wild Marjoram leaf.*
6. Globularia (*Orientalis*) caule subnudo, capitulis alternis sessilibus, foliis lanceolato-ovatis integris. Lin. Sp. Plant. 97. *Globularia with a naked stalk, alternate heads sitting close to the stalks, and oval, spear-shaped, entire leaves.* Globularia Orientalis, floribus per caulem sparsis. Tourn. Cor. 35. *Eastern Globularia with flowers scattered along the stalks.*

The first of these plants grows plentifully about Montpelier, as also at the foot of the mountains Jura and Saleva, and in many other parts of Italy, and in Germany; this plant hath leaves very like those of the Daisy, but are thicker and smoother. The flower-stalks rise about six inches high, supporting a globular head of flowers, composed of several florets, which are included in one common scaly empalement; they are of a fine blue colour, and appear in June; these are succeeded by seeds, which sit in the empalement, and ripen in autumn.

The second sort grows plentifully in the woods, near the convent of the Carthusians, and on the Pyrenean mountains; this is much larger than the former, and hath a shrubby stalk a foot and a half high; the foot-stalk is quite naked. The leaves are narrower, and much longer.

The first sort may be propagated by parting of the roots after the manner of Daisies. The best season for parting and transplanting of the plants is in September, that they may take new root before the frosty weather comes on. They should be planted in a shady situation, and require a moist loamy soil, in which they will thrive much better than in a light ground and an open situation; but the plants should not be removed oftener than every other year, if they are required to flower strong.

The third sort grows about Montpelier in France, and in Valentia, and several other parts of Spain. This has a hard woody stem, which rises about two feet high, having many woody branches, beset with leaves like those of the Myrtle-tree. On the top of the branches the flowers are produced, which are of a blue colour, and globe-shaped; this plant may be propagated by cuttings, which should be cut off in April, just before they begin to make new shoots; the cuttings should be planted into pots filled with light fresh earth, and then placed into a very moderate hot-bed, observing to water and shade them until they have taken root, when they may be taken out of the bed, and inured to bear the open air by degrees. In summer these plants may be exposed with other hardy exotic plants, and in winter they should be placed under a hot-bed frame, where they may enjoy the free air in mild weather, but should be screened from hard frost, which will destroy them, if they are exposed thereto, but in mild winters they will live in the open air. This plant never produces good seeds in this country.

The fourth sort was found in the mountains of Granada, by Dr. Albinus; this plant is of low growth, and may be propagated as the first; as may also the fifth sort, which is the least of all the sorts, and the most hardy; therefore should have a shady situation, and a cool moist soil.

The sixth sort was found by Dr. Tournefort in the Levant; this is somewhat tender, and should be sheltered from the frost in winter, under a frame, but in summer it should be exposed with other hardy exotic plants, and will require to be frequently watered in dry weather. This may be propagated by seeds, or by parting of their roots, as was directed for the first sort.

GLORIOSA. Lin. Gen. Plant. 374. Methonica. Tourn. Acad. R. Scien. 1706. *The Superb Lily.*

The Characters are,

*The flower hath no empalement; it hath six long spear-shaped petals, which are waved, and reflexed to the foot-stalk. It hath six stamina, which spread open each way, and are terminated by prostrate summits. In the center is situated a globular germen, supporting a slender inclining style, crowned by an obtuse triple stigma. The germen afterward becomes an oval thin capsule having three cells, filled with globular seeds, disposed in a double range.*

This genus of plants is ranged in the first section of Linnæus's sixth class, intitled Hexandria Monogynia, which includes the plants whose flowers have six stamina and one style.

1. Gloriosa (*Superba*) foliis longioribus capreolis terminalibus. *Superb Lily with longer leaves ending with claspers.*

*claspers.* Methonica Malabarorum. Hort. Lugd. 688. *Methonica of Malabar,* and the Lilium Zeylanicum superbum. Hort. Amst. 1. p. 69. *Superb Lily of Ceylon.*

2. Gloriosa (*Cærulea*) foliis ovato-lanceolatis acutis. *Superb Lily with oval, spear-shaped, acute leaves.*

The first sort grows naturally on the coast of Malabar, and also in Ceylon, from whence it was first brought to the gardens in Holland, where it has been many years cultivated; this hath a long fleshy root of a whitish colour, and a nauseous bitter taste, from the middle of which arises a round weak stalk, which requires support to prevent its trailing on the ground. The stalks grow to the height of eight or ten feet, garnished with leaves placed alternate on every side, which are smooth, about eight inches long, and one inch and a half broad at the base, growing narrower till within two inches of the end, which runs out in a narrow point, ending with a tendril, or clasper, by which it fastens to the neighbouring plants for support. At the upper part of the stalk the flower is produced from the side, standing upon a slender foot-stalk; it is composed of six oblong petals, ending with acute points, which, on their first opening, are of an herbaceous colour, and spread wide open; the flower hanging downward as the Crown Imperial and Fritillary, but afterward the petals turn quite back, and change to a beautiful red flame colour, their acute points meeting at the top; these petals are finely waved on their edges. The six stamina spread out every way almost horizontal, and are terminated by prostrate summits. In the center of the flower is situated a roundish germen, supporting an inclining style, crowned by a triple stigma. This plant flowers in June and July, but seldom perfects seeds in this country. The stalks decay in autumn, and the roots remain inactive all the winter, and the new stalks come out in March. The roots and every part of this plant is very poisonous, so should not be put in the way of children.

The seeds of the second sort were sent me by Monf. Richard, gardener to the French king at Trianon; these were brought from Senegal by Monf. Adanson, who discovered this plant growing there naturally; this is said to have a blue flower, but the plants which are in the Chelsea garden have not yet flowered. This hath a climbing stalk, which is garnished with smooth leaves about three inches long, and two broad, ending in acute points, but have no tendril or clasper. The stalks as yet have not grown more than two feet high here, but have the appearance of climbing like the other sort. The leaves have a strong disagreeable scent on being handled, so as to be troublesome to the head if too near, or long smelt to.

As these plants rarely produce seeds in this country, they are generally propagated by their roots; those of the first sort creep and multiply pretty fast, but the second hath not as yet put out any offsets; but as the plants are young, we cannot as yet say how they may increase when they are of a proper age. These roots may be taken out of the ground when their stalks are decayed, and preserved in sand during the winter season, but they must be kept in the stove, or a warm room, where they can receive no injury from the cold; and in the spring they must be planted in pots filled with light earth, and plunged into the tan-bed in the stove; but others chuse to let the roots continue in the ground all the winter, keeping the pots always in the tan-bed: where this is practised, the roots should have very little water in the winter; for as they are then in an inactive state, so moisture at that time frequently rots the roots.

Toward the latter end of March, or the beginning of April, their stalks will appear, when there should be some tall sticks put down by them to support them, otherwise they will trail over the neighbouring plants, and the first sort will fasten to the plants by the tendrils, which are at the end of the leaves. The stalks of this sort will rise ten or twelve feet high, if the roots are strong, and some of the stalks will produce two or three flowers, which come out from the wings of the stalk near the top; these flowers make a fine appearance in the stove, during their continuance, which is seldom more than ten days or a fortnight. In summer, when the plants are growing, they will require frequently to be watered, but they must not have it in too large quantities, for they are very subject to rot with much wet at any season. Those roots which are not taken out of the pots in winter, should be transplanted and parted the beginning of March, before they put out new fibres, or stalks, for they must not be removed when they are in a growing state; the pots in which these roots are planted should not be too large; for unless they are confined, they will not put out strong stalks; the largest roots may be planted in twopenny pots, but the small ones will require only pots of about five or six inches over at the top.

GLYCINE. Lin. Gen. Plant. 797. Apios. Boer. Ind. alt. *Knobbed-rooted Liquorice Vetch.*

The Characters are,

*The empalement of the flower is of one leaf, divided into two lips at the top, the upper lip being obtuse and indented; the lower lip is longer, trifid, and acute, the middle indenture being extended beyond the other. The flower is of the butterfly kind. The standard is heart-shaped, deflexed on the sides, gibbous on the back, and indented at the point. The wings are small, oblong, and oval toward their end, and bend backward. The keel is narrow, sickle-shaped, turning upward with its point to the standard, where it is broadest. It hath ten stamina, nine of which are joined in one body, and the other stands single, terminated by single summits. In the center is situated an oblong germen supporting a spiral cylindrical style, crowned by an obtuse stigma. The germen afterward becomes an oblong pod with two cells, inclosing kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes the plants whose flowers have ten stamina joined in two bodies. Tournefort places the first sort under this genus of Astragalus, which is ranged in the fifth section of his tenth class, which includes the herbs with a butterfly flower, whose pointal turns to a pod with two cells.

The Species are,

1. Glycine (*Apios*) foliis impari-pinnatis ovato-lanceolatis. Hort. Upsal. 227. *Glycine with oval, spear-shaped, winged leaves.* Astragalus tuberosus scandens, Fraxini folio. Tourn. Inst. 415. *Climbing tuberous Milk Vetch with an Ash leaf*; and the Apios Americana. Cornut. 200.

2. Glycine (*Frutescens*) foliis impari-pinnatis caule perenni. Hort. Cliff. 361. *Glycine with winged leaves and a perennial stalk.* Phaseoloides frutescens, Caroliniana, foliis pinnatis, floribus cæruleis conglomeratis. Hort. Angl. tab. 15. *Carolina Kidney-bean-tree, with winged leaves, and blue flowers growing in whorls.*

3. Glycine (*Abrus*) foliis abrupto-pinnatis pinnis numerosis obtusis. Lin. Sp. 1025. *Glycine with abrupt winged leaves, whose lobes are obtuse.* Orobus Americanus, fructu coccineo nigrâ maculâ notato. Tourn. Inst. 393. *American Bitter Vetch with a scarlet fruit, marked with a black spot, commonly called wild Liquorice in the West-Indies.*

4. Glycine (*Comosa*) foliis ternatis hirsutis, racemis lateralibus. Lin. Sp. Plant. 754. *Glycine with hairy trifoliate leaves, and flowers growing in long bunches from the sides of the stalks.* Phaseolus Marianus scandens, floribus commosis. Pet. Mus. 453. *Climbing Kidney-bean of Maryland with spiked flowers.*

5. Glycine (*Tomentosa*) foliis ternatis tomentosis, racemis axillaribus brevissimis, leguminibus dispermis. Lin. Sp. Plant. 754. *Glycine with woolly trifoliate leaves, and very short spikes of flowers proceeding from the sides of the stalks, with pods containing two seeds.* Anonis phaseoloides scandens, floribus flavis sessilibus. Hort. Elth. 30. tab. 26. *Climbing Rest-Harrow like Kidney-bean, with yellow flowers sitting close to the stalks.*

The first sort grows naturally in Virginia; this hath roots composed of several knobs, or tubers, which hang to each other by small strings; from these come out in the spring slender twining stalks, which rise to the height of eight or ten feet, garnished with winged leaves, composed of three pair of oval spear-shaped lobes, terminated by an odd one. The flowers come out in short spikes from the side of the stalks; they are of a Pea-blossom kind, of a dirty flesh-colour, having little scent. These appear in August, but do not produce seeds in England. The stalks decay in autumn, but the roots continue; this is propagated by parting of the roots, each of the tubers being separated from the principal root, will grow; the best time for this is about the end of March, or the beginning of April, before they put out shoots. The roots should be planted in a warm situation, and in hard frost covered with tan or mulch to protect them, otherwise they will not live abroad in this country: where they have been planted against a south wall, they have thriven and flowered extremely well, which they seldom do in any other situation; and those roots which are planted in pots rarely flower, nor do their stalks rise near so high as those which are planted in the full ground; some ignorant persons call this the Twickenham Climber.

The second sort was brought from Carolina, but has been since observed in Virginia, and some other places in North America; this sort has woody stalks, which twist themselves together, and also twine round any trees that grow near, and will rise to the height of fifteen feet, or more. The leaves are winged, and in shape somewhat like the Ash-tree, but have a greater number of pinnæ. The flowers are produced in clusters from the wings of the leaves, which are of a purple colour; these are succeeded by long cylindrical pods, shaped like those of the scarlet Kidney-bean, containing several kidney-shaped seeds, but these are never perfected in England.

This climbing shrub is propagated in several nurseries near London, where it is known by the name of Carolina Kidney-bean-tree. It is increased by laying down the young branches in October, which will be rooted well by that time twelvemonth (especially if they are duly watered in dry weather) and may then be transplanted, either in a nursery for a year to get strength, or to the place where they are to remain for good, which should be in a warm light soil and a sheltered situation, where they will endure the cold of our ordinary winters very well; and if their roots are covered with straw, Fern, Peas-haulm, or any other light covering, there will be no danger of their being destroyed by the frost.

The third sort grows naturally in both Indies, and also in Egypt. This is a perennial plant, with slender twining stalks, which twist about any neighbouring support, and rise to the height of eight or ten feet, garnished with winged leaves, composed of sixteen pair of small, oblong, blunt lobes, set close together; these have the taste of Liquorice, from whence the inhabitants of the West-Indies have given it the name of Wild Liquorice, and use the herb for the same purpose as the Liquorice in Europe. The flowers are produced from the side of the stalks in short spikes or bunches; they are of a pale purple colour, and shaped like those of the Kidney-bean; these are succeeded by short pods, each containing three or four hard round seeds of a scarlet colour, with a black spot or eye on that side which is fastened to the pod. The seeds of this plant are frequently strung, and are worn as ornaments by the natives of those countries, where the plants grow naturally: they are frequently brought to England from the West-Indies, and are wrought into various forms, with shells and other hard seeds.

This plant is propagated by seeds, which must be sown upon a good hot-bed in the spring; but as the seeds are very hard, so unless they are soaked in water twelve or fourteen hours before they are sown, they frequently lie in the ground a whole year before they vegetate; but when soaked, the plants will appear in a fortnight after the seeds are sown, if they are good, and the bed in a proper temperature of heat. When the plants are two inches high, they should be each transplanted into a separate pot, filled with light earth, and plunged into a hot-bed of tanners bark, where they should be shaded from the sun till they have taken new root; after which they must be treated in the same manner as other tender plants from the same countries, always keeping them in the bark-stove, for they are too tender to thrive in any other situation in England. This sort will flower the second year from seeds, and sometimes ripens seeds here.

There are two other varieties of this plant, one with a white, and the other a yellow seed, but the plants do not differ from the other in leaf or stalk; but as these have not as yet flowered in England, I do not know how their flowers may differ.

The fourth sort hath a perennial root and an annual stalk, which decays in the autumn. This rises from two to three feet high, with slender herbaceous stalks, which are garnished with trifoliate hairy leaves, sitting close to the stalks; the small leaves or lobes, are of the oval spear-shape, ending in acute points. The flowers come out from the side of the stalks, at the foot-stalk of the leaves; the naked part of the foot-stalk is about two inches long, and the spike of flowers is about the same length, and is recurved; the flowers are of a Pea-blossom kind, sitting close together. They are small, and of a fine blue colour, coming out the beginning of June, and are sometimes succeeded by seeds in England, which ripen in August.

This sort grows naturally in North America, and is hardy enough to live in the open air in England. It may be propagared by seeds, or parting of the roots; the former is the best method, where good seeds can be obtained: these may be sown on a bed of light earth in the spring, and if the season should prove dry, they must be frequently refreshed with water, otherwise they will remain a long time in the ground before they vegetate: when the plants come up, they must be kept clean from weeds in the summer, and in the autumn when their stalks are decayed, if some rotten tanners bark is spread over the surface of the ground, it will protect the roots from being injured by the frost. In the spring, the roots should be transplanted to the places where they are desiged to remain, which must be in a warm sheltered situation, but not too much exposed to the sun, and in a light soil, where they will thrive and produce flowers annually. If this is propagated by parting of the roots, it should be done in the spring, before the roots begin to shoot, which is the best season for transplanting the plants: but these roots should not be parted oftener than every third year, for if they are often removed they will not flower so strong.

The fifth sort hath a perennial root and a climbing stalk, which rises near four feet high, garnished with woolly trifoliate leaves: the flowers come out in short bunches from the side of the stalks; they are small, of a yellow colour, and are succeeded by short pods, which contain two roundish seeds in each. This flowers in June, and the seeds ripen in autumn. It grows naturally in America, but is too tender to live in the open air in England. This is propagated in the same manner, and requires the same treatment as the third sort.

GLYCYRRHIZA. Lin. Gen. Plant. 788. Tourn. Inst. R. H. 389. tab. 210. [so called of γλυκὺς, sweet, and ῥίζα, *Gr.* a root, q. d. sweet root: the ancients called it Scythian Root, because the Scythians first brought it into use.] Liquorice; in French, *Reglisse.*

The Characters are,

*The flower hath a permanent tubulous empalement of one leaf, divided into two lips; the upper lip is cut into three parts, the middle one being broad and bifid, the under lip is single. The flower hath four petals, is of the butterfly kind, having a long erect standard, with oblong*

*oblong wings, and a two-leaved keel which is acute. It hath ten stamina, nine joined and one standing single; they are longer than the keel, and terminated by roundish summits. In the bottom is situated a short germen, supporting an awl-shaped style the length of the stamina, crowned by a rising obtuse stigma. The germen afterward becomes an oblong, or oval compressed pod with one cell, including two or three kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, which includes those plants which have ten stamina joined in two bodies.

The Species are,

1. Glycyrrhiza (*Glabra*) leguminibus glabris. Hort. Cliff. 490. *Liquorice with smooth pods.* Glycyrrhiza siliquosa, vel Germanica. C. B. P. *Common Liquorice.*
2. Glycyrrhiza (*Echinata*) leguminibus echinatis. Prod. Leyd. 386. *Liquorice with prickly pods.* Glycyrrhiza capite echinato. C. B. P. *Rough-podded Liquorice.*
3. Glycyrrhiza (*Hirsuta*) leguminibus hirsutis. Prod. Leyd. 386. *Liquorice with hairy pods.* Glycyrrhiza Orientalis, siliquis hirsutissimis. Tourn. Cor. *Eastern Liquorice with hairy pods.*

The first sort is that which is commonly cultivated in England for medicine; the other two kinds are preserved in curious botanic gardens for variety, but their roots are not so full of juice as the first, nor is the juice so sweet; though the second sort seems to be that which Dioscorides has described and recommended, but I suppose the goodness of the first has occasioned its being so generally cultivated in Europe. The roots of this run very deep into the ground, and creep to a considerable distance, especially where they are permitted to stand long unremoved; from these arise strong herbaceous stalks, four or five feet high, garnished with winged leaves, composed of four or five pair of oval lobes, terminated by an odd one; the leaves and stalks are clammy, and of a dark green; the flowers come out in spikes from the wings of the stalks, standing erect; they are of a pale blue colour, and are succeeded by short compressed pods, each containing two or three kidney-shaped seeds. It flowers the latter end of July, but the seeds do not ripen in England.

This plant delights in a light sandy soil, which should be three feet deep at least, for the goodness of Liquorice consists in the length of the roots: the greatest quantity of Liquorice which is propagated in England, is about Pontefract in Yorkshire, and Godalmin in Surry; though of late years there hath been a great deal cultivated in the gardens near London: the ground in which you intend to plant Liquorice, should be well dug and dunged the year before you plant it, that the dung may be perfectly rotted, and mixed with the earth, otherwise it will be apt to stop the roots from running down; and before you plant it, the ground should be dug three spades deep, and laid very light; when your ground is thus well prepared, you should furnish yourself with fresh plants taken from the sides or heads of the old roots, observing that they have a good bud or eye, otherwise they are subject to miscarry; these plants should be about ten inches long, and perfectly sound.

The best season for planting them is in the beginning or middle of March, which must be done in the following manner, viz. First strain a line cross the ground in which you would plant them, then with a long dibble made on purpose, put in the shoot, so that the whole plant may be set strait into the ground, with the head about an inch under the surface in a strait line, about a foot asunder, or more, in the rows, and two feet distance row from row; and after having finished the whole spot of ground, you may sow a thin crop of Onions, which being plants that do not root deep into the ground, nor spread much above, will do the Liquorice no damage the first year; for the Liquorice will not shoot very high the first season, and the hoeing of the Onions will also keep the ground clear from weeds; but in doing of of this you must be careful not to cut off the top shoots the Liquorice plants when they appear above ground, which would greatly injure them; and also observe to cut up all the Onions which grow near the heads of the Liquorice; and after your Onions are pulled up, you should carefully hoe and clean the ground from weeds; and in October, when the shoots of the Liquorice are decayed, you should spread a little very rotten dung upon the surface of the ground, which will prevent the weeds from growing during the winter, and the rain will wash the virtue of the dung into the ground, which will greatly improve the plants.

In the beginning of March following you should slightly dig the ground between the rows of Liquorice, burying the remaining part of the dung; but in doing of this, you should be very careful not to cut the roots. This stirring of the ground will not only preserve it clean from weeds a long time, but also greatly strengthen the plants.

The distance which I have allowed for planting these plants, will, I doubt not, by some, be thought too great; but in answer to that, I would only observe, that as the largeness of the roots is the chief advantage to the planter, so the only method to obtain this, is by giving them room; and besides, this will give a greater liberty to stir and dress the ground, which is of great service to Liquorice; and if the plantation designed were to be of an extraordinary bigness, I would advise the rows to be made at least three feet distant, whereby it will be easy to stir the ground with a breast plough, which will greatly lessen the expence of labour.

These plants should remain three years from the time of planting, when they will be fit to take up for use, which should not be done until the stalks are perfectly decayed; for when it is taken up too soon, it is subject to shrink greatly, and lose of its weight.

The ground near London being rich, increases the bulk of the root very fast; but when it is taken up, it appears of a very dark colour, and not near so sightly as that which grows upon a sandy soil in an open country.

The second sort grows naturally in some parts of Italy, and in the Levant; the stalks and leaves of this are very like those of the first, but the flowers are produced in shorter spikes, and the pods which succeed them are very short, broad at their base, ending in acute points, and are armed with sharp prickles. This flowers about the same time as the first, and in warm seasons will perfect seeds in England.

The third sort grows naturally in the Levant, from whence the seeds were sent to the royal garden at Paris, by Dr. Tournefort. This hath much the appearance of the other two species, but the pods of it are hairy, and longer than those of the other. Both these sorts may be propagated in the same manner as the first, or from seeds, which may be sown in the spring on a bed of light earth; but as neither of these are used, so they are seldom propagated unless for the sake of variety.

GNAPHALIUM. Lin. Gen. Plant. 850. Elichrysum. Tourn. Inst. R. H. 452. tab. 259. Goldylocks, or Eternal Flower; in French, *Immortelle.*

The Characters are,

*It hath a compound flower, made up of hermaphrodite florets and female half florets, included in one scaly empalement; the hermaphrodite florets are tubulous, funnel-shaped, and cut into five parts at the brim, which are reflexed; these have five short hairy stamina, terminated by cylindrical summits. In the center is situated a germen, supporting a slender style the length of the stamina, crowned by a bifid stigma; the germen afterward becomes a single seed, which in some species is crowned with a hairy down, and in others a feathery down. The female flowers which are intermixed with these have no stamina, but a germen supporting a slender style, crowned by a bifid reflexed stigma. These are in some species fruitful, and in others they are barren. The empalement of the flower is permanent and shining.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which includes those plants which have hermaphrodite and female flowers inclosed in one common empalement, and are fruitful.

The Species are,

1. Gnaphalium (*Stœchas*) fruticosum foliis linearibus, ramis virgatis, corymbo composito. Hort. Cliff. 401. *Goldylocks with a shrubby stalk garnished with very narrow leaves, and a compound corymbus of flowers.* Elichrysum seu stœchas citrina angustifolia. C. B. P. 264. *Cassidony, or narrow-leaved Goldylocks.*

2. Gnaphalium (*Angustissimum*) foliis linearibus, caule fruticoso ramoso, corymbo composito. Hort. Cliff. 401. *Goldylocks with a branching shrubby stalk, and very narrow leaves, with a compound corymbus of flowers.* Elichrysum angustissimo folio. Tourn. Inst. R. H. 452. *Goldylocks with very narrow leaves.*

3. Gnaphalium (*Uniflorum*) foliis alternis, acutè dentatis, subtus villosis, pedunculis longissimis unifloris. *Goldylocks with alternate leaves sharply indented, woolly on their under side, with very long foot-stalks sustaining one flower.* Elichrysum sylvestre latifolium, flore parvo singulari. Tourn. Inst. R. H. 452. *Broad-leaved wild Goldylocks, with a single small flower.*

4. Gnaphalium (*Luteo-album*) foliis semiamplexicaulibus ensiformibus, repandis obtusis, utrinque pubescentibus, floribus conglomeratis. Prod. Leyd. 149. *Goldylocks with sword-shaped leaves half embracing the stalks, which are obtuse, reflexed, woolly on both sides, and flowers growing in clusters.* Elichrysum sylvestre latifolium capitulis conglobatis. C. B. P. 264. *Broad-leaved wild Goldylocks, with heads growing in clusters.*

5. Gnaphalium (*Aquaticum*) caule ramoso diffuso, floribus confertis. Flor. Lapp. 300. *Goldylocks with a diffused branching stalk, and flowers in clusters at the top.* Elichrysum aquaticum, ramosum, minus, capitulis, foliaceis. Tourn. Inst. 452. *Lesser branching aquatic Goldylocks, with leafy heads.*

6. Gnaphalium (*Sylvaticum*) caule simplicissimo, floribus sparsis. Flor. Lapp. 298. *Goldylocks with a single stalk, and flowers growing scatteringly.* Elichrysum spicatum. Tourn. Inst. R. H. 453. *Spiked Goldylocks.*

7. Gnaphalium (*Dioicum*) caule simplicissimo corymbo simplici terminali, sarmentis procumbentibus. Hort. Cliff. 400. *Goldylocks with a single stalk terminated by a single corymbus, and trailing branches.* Elichrysum montanum flore rotundiori candido. Tourn. Inst. R. H. 453. *Mountain Goldylocks with a rounder white flower.*

8. Gnaphalium (*Montanum*) foliis radicalibus cuneiformibus, caulinis acutis sessilibus, caule simplicissimo, capitulo terminali aphyllo, floribus oblongis. *Goldylocks with the lower leaves wedge-shaped, those on the stalks acute, and sitting close, a single stalk without leaves, terminated by oblong flowers.* Elichrysum montanum longiore folio & flore albo. Tourn. Inst. 453. *Mountain Goldylocks, with a longer leaf and white flower.*

9. Gnaphalium (*Chrysocomum*) humile, caule suffruticoso, foliis linearibus subtus argenteis, squamis calycinis longioribus acuminatis. *Low Goldylocks with a shrubby stalk, very narrow leaves, silvery on their under side, and longer acute-pointed scales to the empalement.* Chamæchrysocoma prælongis purpurascentibusque Jacææ capitulis. Barrel. Icon. 406. *Dwarf Goldylocks with longer and purplish heads like Knapweed.*

10. Gnaphalium (*Orientale*) subherbaceum, foliis lineari-lanceolatis sessilibus, corymbo composito, pedunculis elongatis. Lin. Sp. 195. *Herbaceous Goldylocks with narrow spear-shaped leaves, and a compound cluster of flowers.* Elichrysum Orientale. C. B. P. 264. *Eastern Goldylocks, called Immortal Flower.*

11. Gnaphalium (*Ignescens*) fruticosum, foliis sublanceolatis tomentosis sessilibus, corymbis alternis conglobatis, floribus globosis. Prod. Leyd. 149. *Shrubby Goldylocks, with spear-shaped woolly leaves sitting close to the stalks, and alternate clusters of globular flowers.* Elichrysum Germanicum, calyce ex aureo rutilante. Tourn. Inst. R. H. 452. *German Goldylocks having a reddish gold-coloured empalement.*

12. Gnaphalium (*Margaritaceum*) herbaceum foliis lineari-lanceolatis acuminatis, alternis, caule supernè ramoso corymbis fastigiatis. Hort. Cliff. 401. *Herbaceous Goldylocks with narrow, spear-shaped, pointed leaves placed alternate, and the upper part of the stalk branching, with a compact corymbus of flowers.* Elichrysum Americanum latifolium. Tourn. Inst. R. H. 453. *Broad-leaved American Goldylocks.*

13. Gnaphalium (*Fœtidum*) herbaceum foliis amplexicaulibus, integerrimis acutis subtus tomentosis, caule ramoso. Hort. Cliff. 402. Lin. Sp. Plant. 850. *Herbaceous Goldylocks with entire leaves embracing the stalks, woolly on their under side, and a branching stalk.* Elichrysum Africanum fœtidissimum, amplissimo folio. Tourn. Inst. R. H. 454. *Most stinking African Goldylocks with a large leaf.*

14. Gnaphalium (*Argenteum*) foliis amplexicaulibus integerrimis ovatis nervosis utrinque tomentosis, caule ramoso. Hort. Cliff. 402. *Goldylocks with entire acute leaves embracing the stalks, woolly on both sides, and a branching stalk.* Elichrysum Africanum fœtidissimum amplissimo folio calyce argenteo. Tourn. Inst. 454. *Most stinking African Goldylocks, with a very large leaf, and a silvery empalement to the flower.*

15. Gnaphalium (*Undulatum*) herbaceum foliis decurrentibus lanceolatis acutis, undatis, subtus tomentosis, caule ramoso. Hort. Cliff. 402. *Goldylocks with acute running leaves which are waved, and woolly on their under side, and a branching stalk.* Elichrysum graveolens acutifolium, caule alato. Hort. Elth. 130. *Stinking Goldylocks, with an acute leaf and winged stalk.*

16. Gnaphalium (*Cymosum*) herbaceum foliis lanceolatis trinerviis supra glabris caule infernè ramoso terminali. Hort. Cliff. 401. *Goldylocks with spear-shaped leaves, having three veins, smooth on their upper side, and the under branches terminated with flowers.* Elichrysum Africanum folio oblongo, subtus incano, suprâ viridi, flore luteo. Boerh. Ind. alt. 1. 121. *African Goldylocks with an oblong leaf, hoary on the under side, and green above, with a yellow flower.*

17. Gnaphalium (*Americanum*) caule herbaceo simplicissimo, foliis lanceolatis obtusis tomentosis, floribus spicatis lateralibusque. *Goldylocks with a single herbaceous stalk, obtuse, spear-shaped, woolly leaves, and flowers growing in spikes from the sides of the stalks.* Gnaphalium ad stœchadem citrinam accedens. Sloan. Cat. Jam. 125. *Cudweed like golden Cassidony.*

18. Gnaphalium (*Rutilans*) herbaceum foliis lineari-lanceolatis, caule infernè ramoso, corymbo composito terminali. Hort. Cliff. 401. *Herbaceous Goldylocks with narrow spear-shaped leaves, the under part of the stalk branching, and a compound corymbus terminating the branches.* Elichrysum Africanum, folio oblongo angusto, flore rubello postea aureo. Boerh. Ind. alt. 121. *African Goldylocks with an oblong narrow leaf and a reddish flower, which is afterwards yellow.*

19. Gnaphalium (*Sanguineum*) herbaceum, foliis decurrentibus lanceolatis tomentosis planis apiculo nudo terminali. Amœn. Acad. 4. p. 78. *Herbaceous Goldylocks, with spear-shaped, woolly, running leaves, terminated by a naked point.* Chrysocoma Syriaca, flore atro rubente. Breyn. Cent. 146.

20. Gnaphalium (*Fruticosum*) frutescens foliis infernè lanceolatis caulinis lineari-lanceolatis, utrinque tomentosis, corymbo composito terminali. *Shrubby Goldylocks with the under leaves spear-shaped, those on the stalks narrow, spear-shaped, woolly on both sides, and the stalks terminated by a corymbus of flowers.* Elichrysum Africanum frutescens, angustis & longioribus foliis incanis. Hort. Amst. 2. p. 109. *Shrubby African Goldylocks, with longer and narrower leaves which are hoary.*

21. Gnaphalium (*Odoratissimum*) foliis decurrentibus obtusis infernè villosis, corymbis conglobatis terminalibus. *Goldylocks with obtuse running leaves, hoary on their under side, and a clustered corymbus of flowers terminating the stalk.* Elichrysum foliis linearibus decurrentibus, subtus incanis, floribus corymbosis. Fig. Plant. tab. 131. fol. 2. *Goldylocks with narrow running leaves, hoary on their under side, and flowers growing in a corymbus.*

22. Gnaphalium (*Plantaginifolium*) sarmentis procumbentibus caule simplicissimo, foliis radicalibus ovatis maximis,

maximis, farmentis procumbentibus. Lin. Sp. Plant. 850. *Goldylocks with a fimple ftalk, large oval leaves at bottom, and trailing runners.* Gnaphalium plantaginis folio, Virginianum. Pluk. Alm. 171. *Virginia Goldylocks with a Plantain leaf.*

23. Gnaphalium (*Obtufifolium*) herbaceum foliis lanceolatis, caule tomentofo paniculato terminalibus glomeratis conicis. Lin. Sp. Plant. 851. *Goldylocks with fpear-fhaped leaves, a woolly ftalk, terminated by a conical clufter of flowers.* Elichryfum obtufifolium, capitulis argenteis conglobatis. Hort. Elth. 130. *Blunt-leaved Goldylocks, with filvery heads growing in clufters.*

24. Gnaphalium (*Spicatum*) foliis lanceolatis decurrentibus tomentofis, floribus fpicatis terminalibus lateralibufque. *Goldylocks with fpear-fhaped, woolly, running leaves, and flowers growing in fpikes at the ends and fides of the ftalks.* Elichryfum caule alato, floribus fpicatis. Sloan. Cat. Jam. 125. *Goldylocks with a winged ftalk and fpiked flowers.*

The firft fort hath a fhrubby ftalk, which rifes about three feet high, branching out into long flender ftalks irregularly; the lower branches are garnifhed with obtufe leaves, two inches and a half long, and an eighth of an inch broad at the point, but thofe upon the flower-ftalks are very narrow, ending in acute points; the whole plant is very woolly: the flowers terminate the ftalks in a compound corymbus; their empalements are of a filvery colour at firft, and very neat, but afterward turn of a yellowifh fulphur colour. If thefe are gathered before the flowers are much opened, the heads will continue in beauty many years, efpecially if they are kept from the air and duft. The plants begin to flower in June, and there is a fucceffion of flowers all the fummer, fome of which will continue in beauty moft part of the winter. This is generally fuppofed to be the true golden Caffidony of the fhops, but the fecond fort is ufually fubftituted for it in England.

It is propagated by flips or cuttings, which may be planted in June or July, in a bed of light earth, and covered with glaffes, or fhaded with mats, obferving to refrefh them frequently with water, but it muft not be given in large quantities; thefe cuttings will put out roots in fix or eight weeks, then they fhould be taken up and planted in pots filled with light earth, and placed in a fhady fituation till they have taken new root, when they may be removed to an open fituation, and placed among other hardy exotics, till about the middle or end of October; at which time they fhould be placed under a common frame, where they may be protected from froft, but in mild weather they fhould be expofed to the open air. With this management in winter, the plants will be much ftronger than thofe which are kept in the green-houfe, where they generally draw too weak; for this fort only wants to be fheltered from hard froft, being fo hardy as in very mild winters to live abroad in warm borders near walls, with little fhelter.

The fecond fort hath a fhrubby ftalk, which divides into many flender branches, covered with a white bark; thefe form a thick bufhy under fhrub, and rife near three feet, garnifhed with very narrow leaves, hoary on their under fide, but green on their upper, placed without order on every fide the ftalks; the flowers are produced in a compound corymbus at the end of the branches; their heads are fmall, and are of a yellow colour when fully blown; thefe are continued in fucceffion moft part of fummer. This grows naturally in France and Germany, and is hardy enough to live in the open air in England. It is propagated by flips or cuttings, which may be planted in a fhady border during any of the fummer months, and in the autumn they may be tranfplanted into the places where they are defigned to remain. This fhould have a dry undunged foil, in which it is rarely injured unlefs in the moft fevere froft.

The third fort is an annual plant, which grows naturally in Italy and Sicily; this hath an herbaceous ftalk, which rifes little more than a foot high, garnifhed with acute indented leaves, which are hoary on their under fide; the flowers ftand upon long foot-ftalks, which rife far above the branches, each fuftaining one fmall whitifh flower. Thefe appear in July, and the feeds ripen in September. It is propagated by feeds, which fhould be fown in autumn upon a bed of light earth, where the plants are defigned to remain; and when the plants come up in the fpring, they fhould be thinned where they are too clofe, and kept clean from weeds, which is all the culture they require.

The fourth fort is an annual plant with woolly leaves, which rife with woolly ftalks about eight inches high, garnifhed with oblong leaves which embrace the ftalks with their bafe; the flowers grow in clofe clufters at the top, and from the fide of their ftalks, which are included in dry filvery empalements.

There is another fpecies of this with narrower leaves, not quite fo woolly; the ftalks rife higher, and are more branched; the flowers grow in clofe bunches on the top of the ftalks, and are of a pale yellow colour. Both thefe forts will come up better from the fcattered feeds, than when they are fown by art; but if the feeds are fown, it muft be foon after they are ripe, otherwife they will not fucceed. The plants requi e no other care but to keep them clean from weeds, and thinned where they are too clofe. They flower in July, and the feeds ripen in autumn.

The fifth fort is an annual plant, which grows naturally in many parts of England, on places which are covered with water in the winter; this is a low branching plant, with filvery leaves and dark heads of flowers, but being of no ufe is not cultivated in gardens.

The fixth fort is alfo an annual plant with narrow leaves, which are hoary on their under fide; the ftalks grow erect about a foot high, and at every joint is produced a fhort fpike of white flowers, with dark-coloured empalements. This is found growing naturally in fome parts of England, fo is not often admitted into gardens. If the feeds of this fort are permitted to fcatter, the plants will come up in the fpring with greater certainty than if fown, and they will require little culture. Thefe flower in July, and the plants decay foon after they have ripened their feeds.

The feventh fort grows naturally in the northern parts of England, upon the tops of hills and mountains, where the fhoots which are fent out from every fide of the plant put out roots, whereby it is propagated in great plenty: the leaves of this grow clofe to the ground, they are narrow at their bafe, but rounded at the end where they are broad; they are near an inch long, and hoary on their under fide; the ftalks are fingle, and rife about four inches high, terminated by a corymbus of flowers which is fingle. This flowers in May and June.

There are two varieties of this, one with a purple and the other a variegated flower, which have rifen accidentally from feeds, but continue their difference in the gardens. They are eafily propagated by offsets, which fhould be planted in the autumn, in a fhady fituation, where they will require no other care but to keep them clean from weeds. This plant is called Pes Cati, or *Catsfoot*.

The eighth fort grows naturally on the Alps. This is a low plant, with under leaves like the laft mentioned; the ftalks are fingle, and rife about fix inches high, garnifhed with very fmall acute leaves, and terminated by four or five oblong flowers, which in fome plants are white, and in others of a purplifh colour. They appear about the fame time as the former fort, and the plants may be propagated and treated in the fame manner.

The ninth fort grows naturally in Spain and Italy. This is a low plant with a ligneous ftalk, which feldom rifes more than fix inches high, garnifhed with very narrow leaves, white on their under fide; the flowers are produced from the fide of the ftalks, each ftanding upon a feparate foot-ftalk; their empalements are fcaly and long, ending in acute ftiff points, and are of a purplifh colour. This fort flowers in July, but feldom perfects feeds in this country.

The tenth sort is supposed to have been brought first from India to Portugal, where it has been long propagated for the beauty of its golden heads of flowers, which, if gathered before they are too open, will continue in beauty several years; so that in the winter season they ornament their churches with these flowers, and many of them are annually brought to England, and sold for ornaments to the ladies. These plants have a short shrubby stalk, seldom rising more than three or four inches high, putting out many heads; the leaves are narrow and woolly on both sides, and come out without order; the flower-stalks arise from these heads; they grow eight or ten inches high, are garnished all the way with narrow hoary leaves, and terminated by a compound corymbus of bright yellow flowers with large heads. These begin to flower in May, and there is a succession of them most part of summer. This is propagated by slipping off the heads during any of the summer months, and after stripping off the lower leaves, they should be planted in a bed of light earth, covering them with hand-glasses, which must be shaded every day when the sun is warm; and the cuttings must be supplied with water, which should be often repeated, but not in too great quantities; when these are rooted they should be planted in pots, and treated in the same manner as hath been directed for the first sort. These plants in mild winters will live abroad in a very warm border with little shelter, and the hardier they are treated, the greater number of flowers they will produce; for when they are drawn weak in a green-house, they never flower so strong.

The eleventh sort hath very woolly stalks and leaves, which are much longer than those of the tenth; the stalks rise a foot high, sending out a few side branches; these are terminated by a compound corymbus of flowers, whose heads are small, and of a gold colour, changing a little red as they fade. This is propagated by slips in the same manner as the last mentioned, but the plants will live in the open air, if they are planted on a dry soil.

The twelfth sort grows naturally in North America, but has been long in the English gardens. This hath a creeping root, which spreads far in the ground, so as to become a troublesome weed very often, unless it is kept within bounds; the stalks of this are woolly, rising a foot and a half high, garnished with long leaves ending in acute points, which are placed alternate, and are woolly on their under side; the upper part of the stalk branches into two or three divisions, each being terminated by a close corymbus of flowers, with pretty large silvery empalements, which, if gathered and properly dried, will retain their beauty several years. This sort will thrive in almost any soil or situation, and is easily propagated by its creeping roots. It flowers in June and July, and the stalks decay in autumn.

The thirteenth sort grows naturally at the Cape of Good Hope. This is an annual plant, which sends out many oblong blunt leaves near the root; the stalks rise a foot and a half high, garnished with leaves placed alternate, which are broad at their base where they embrace the stalks, but end in acute points; they are woolly, and when handled, emit a very rank odour; the stalks are terminated by a corymbus of flowers, in large silvery empalements, which will retain their beauty several years.

The fourteenth sort grows naturally at the Cape of Good Hope, and is an annual plant, very like the former sort, but the leaves are of a yellowish green on their upper side, and woolly on their under; the stalks branch, and the heads of flowers are of a bright yellow colour, and these differences are permanent. Both these plants are propagated by seeds, which, if sown in the autumn on a warm border, will more certainly succeed, than when they are sown in the spring; or if the seeds are permitted to scatter, the plants will come up without care, and may be transplanted while they are young, to the places where they are designed to remain: when the plants have taken root, they will require no other care but to keep them clean from weeds. They flower in July, and the seeds ripen in autumn.

The fifteenth sort grows in Africa, and also in North America, from both these countries I have received the seeds. It is an annual plant, with oblong leaves at the bottom, which are a little waved, and hoary on their under side. The stalks rise about a foot high, and are garnished with acute-pointed leaves; from their base runs a border or wing along the stalk; the whole plant has a disagreeable odour. The flowers grow in a corymbus on the top of the stalks, they are white, and appear in July. The seeds ripen in the autumn, which, if permitted to scatter, the plants will come up without care, as the two former sorts.

The sixteenth sort rises with a shrubby stalk three or four feet high, sending out many branches from the lower part, garnished with narrow spear-shaped leaves, which half embrace the stalks with their base; they are of a dark green on their upper side, but are hoary on their under; the stalks are terminated by a compound corymbus of yellow flowers, whose heads are small: these continue in succession great part of the summer, but are rarely succeeded by seeds in England. It is easily propagated by cuttings in any of the summer months, which may be planted in a shady border, and duly watered. These will take root in a month or five weeks, and may then be taken up and planted in pots, placing them in a shady situation till they have taken fresh root; then they may be removed to a sheltered situation, and placed with other hardy green-house plants till autumn, when they must be carried into the green-house, where, during the winter season, they should have as much free air as possible in mild weather, for they only require protection from frost, so they should be treated in the same manner as other hardy green-house plants.

The seventeenth sort is an annual plant, which grows naturally in France, Italy, and Spain. This hath a woolly herbaceous stalk, which rises six or eight inches high, garnished with obtuse, spear-shaped, woolly leaves. The flowers are produced in short spikes from the side, and at the top of the stalks; they are of a silvery colour, and appear in June and July. The seeds ripen in autumn, which, if permitted to scatter, the plants will come up without care, and require no other culture, but to keep them clean from weeds.

The eighteenth sort grows naturally at the Cape of Good Hope; this rises with a slender shrubby stalk, which sends out many lateral branches below; these are garnished with very narrow leaves, which are hoary on their under side. The flowers are produced in a compound corymbus at the end of the branches; they are at their first appearance of a pale red colour, but afterward change to a gold colour; the empalements of this sort are small, and dry like the other species of this genus. This sort is propagated by cuttings, in the same manner as the sixteenth, and the plants require the same treatment.

The nineteenth sort grows naturally in Egypt and Palestine. This is a perennial plant, whose under leaves spread near the ground; they are woolly on their under side; the stalks rise about six inches high; the leaves upon these are spear-shaped, ending in acute points; the stalks and leaves are woolly, and the stalk is terminated by a large corymbus of flowers sitting very close; these are of a fine soft red colour, so make a pretty appearance in the month of June, when they are in beauty.

This sort is propagated by offsets in the same manner as the seventh and eighth sorts, but this doth not produce them in plenty, so is very uncommon in the English gardens at present: it requires a drier soil than the seventh, and a warmer situation, but not too much exposed to the mid-day sun, so should be planted to a south-east aspect.

The twentieth sort grows naturally at the Cape of Good Hope, but has been long preserved in many curious gardens in Europe; the stalk rises three or four feet high, sending out several long irregular branches, which are terminated by a compound corymbus

rymbus of flowers. The heads of this fort are compofed of leaves, which are much longer than thofe of any other fort; the heads of the flowers are of a bright filver colour. This is propagated by cuttings, which fhould be planted in the fame manner as hath been directed for the tenth fort, and the plants fhould alfo be treated in the fame way.

The twenty-firft fort was raifed from feeds in the Chelfea garden, which came from the Cape of Good Hope; the lower leaves of this are oblong and blunt. The ftalks are fhrubby, and divide into many irregular branches, which rife about three feet high; thefe are garnifhed with oblong blunt-pointed leaves, hoary on their under fide, but of a dark green above; from the bafe of the leaves runs a border along the ftalk, like a wing, of the fame confiftence with the leaves, fo is what the former botanifts termed a winged ftalk, but Dr. Linnæus calls it a running leaf. The ftalks are terminated by a compound corymbus of flowers, which are very clofely joined together, and are of a bright gold colour, but the flowers are fmall, and change to a darker colour as they fade; there is a fucceffion of thefe flowers moft part of the fummer, and the early flowers are frequently fucceeded by feeds in England. Thi sfort may be propagated by flips, or cuttings, in the fame manner as the tenth, and the plants may be treated in the fame manner as is directed for that. It is engraven in the 131ft plate of the figures of plants.

The twenty-fecond fort grows naturally in North America, from whence the feeds have been brought to England; this is a perennial plant, whofe lower leaves are large and oval; from the main ftalk there come out runners, which take root in the ground, and have young plants at their extremity. The ftalks are fingle, and garnifhed with narrower woolly leaves, placed alternate. The flowers are produced at the top of the ftalks in a corymbus, they are of a white colour and fmall. They appear in June and July, and fometimes are fucceeded by feeds, but the plants propagate fo faft by offsets, that the feeds are little regarded; this will thrive in the open air, if planted in a dry foil and a warm fituation.

The twenty-third fort grows naturally in North America; it is an annual plant, with woolly obtufe leaves. The ftalks are fingle, and rife about nine inches high. The flowers grow in fpikes from the fide of the ftalks; they are of a dirty white colour, fo make no great appearance. If the feeds of this are permitted to fcatter, the plants will rife without trouble, and only require to be kept clean from weeds.

The twenty-fourth fort grows naturally in Jamaica, and other of the hot parts of America; this rifes with a fhrubby ftalk about two feet high, garnifhed with leaves about the fize and fhape of thofe of Sage, but woolly on their under fide, and much veined; from the bafe of each leaf runs a border along the ftalk. The flowers are produced in fpikes from the fide, and at the end of the ftalk; thefe are long, and clofely joined in the fpike. It flowers in July and Auguft, but never perfects feeds in England.

It is propagated by feeds, which fhould be fown on a hot-bed in pots, becaufe the plants do not often rife the fame year; therefore when it fo happens, the pots fhould be placed in the ftove in winter, and the following fpring put upon a frefh hot-bed to bring up the plants; when thefe appear they muft be planted into pots, and kept conftantly in the hot-bed, otherwife they will not thrive in England.

GNAPHALODES. See MICROPUS.

GNIDIA.

The CHARACTERS are,

*It hath a funnel-fhaped empalement of one coloured leaf, with a long tube divided into four fegments; the flower hath four plain petals fhorter than the empalement inferted to it, and eight briftly erect ftamina, terminated by fimple fummits, and an oval germen fupporting a flender ftyle on the fide inferted with the ftamina, crowned by a ftinging ftigma; the germen afterward becomes one oval oblique-pointed feed, inclofed in the empalement.*

This genus of plants is ranged in the firft order of Linnæus's eighth clafs, intitled Octandria Monogynia, the flower having eight ftamina and one ftyle.

We have but one SPECIES of this genus, viz.

1. GNIDIA (*Pinifolia*) foliis fparfis linearibus fubulatis, floribus verticillatis, aggregatis terminalibus. Lin. Sp. 512. *Gnidia with linear awl-fhaped leaves, and flowers placed clofely in whorls terminating the branches.* Rapunculus foliis nervofis linearibus, floribus argenteis non galeatis. Burm. Afr. 112.

This plant grows naturally in Æthiopia. It hath a low fhrubby ftalk, which rifes three or four feet high, fending out a few fide branches, garnifhed with narrow, oblong, acute-pointed leaves, which are green on their upper fide, but pale on their under, with a ftrong longitudinal nerve, refembling the leaves of Rofemary: the flowers come out almoft in whorls from between the leaves on the extremity of the branches, ftanding on fhort foot-ftalks; they have long flender tubes, and are divided at the top into four fegments which fpread horizontally, having eight very fhort ftamina in the bottom of the tube, and an oval germen with a flender ftyle faftened to the fide of the ftamina; the germen is afterward fucceeded by one oval-pointed feed. There are two varieties of this, one with a white, and the other hath a blue flower.

This is ufually propagated here by cuttings, which if carefully planted during the fummer months, in pots filled with light earth, plunged into a very moderate hot-bed, covering the pots clofely with either bell or hand-glaffes to exclude the air, being careful to fhade the glaffes daily, the cuttings will put out roots in fix weeks, when they fhould be gradually inured to the open air. In winter the plants fhould be placed in a dry airy glafs-cafe, where they may enjoy free air in mild weather, but protected from froft and damp air.

GOMPHRENA. Lin. Gen. Plant. 279. Amaranthoides. Tourn. Inft. R. H. 654. tab. 420.

The CHARACTERS are,

*The flower hath a large three-leaved empalement, which is coloured and permanent. The petal is erect, and cut into five parts at the top; it hath a cylindrical tubulous empalement the length of the petal, cut into five fmall parts at the brim, which fpread open; it hath five ftamina fcarcely difcernible, fituated in the brim of the nectarium, terminated by fummits, fhut up in the mouth of the nectarium. In the center is fituated an oval-pointed germen, with two fmall ftyles, crowned with fingle ftigma the length of the ftamina. The germen afterward becomes one large roundifh feed, inclofed in a thin crufted capfule with one cell.*

This genus of plants is ranged in the fecond fection of Linnæus's fifth clafs, intitled Pentandria Digynia, which includes the plants whofe flowers have five ftamina and two ftyles.

The SPECIES are,

1. GOMPHRENA (*Globofa*) caule erecto, foliis ovato-lanceolatis, capitulis folitaris, pedunculis diphyllis. Hort. Cliff. 86. *Gomphrena with an erect ftalk, oval fpear-fhaped leaves, fingle heads, and foot-ftalks having two leaves.* Amaranthoides Lychnidis folio, capitulis purpureis. Tourn. Inft. R. H. 654. *Globe Amaranthus with purple heads.*
2. GOMPHRENA (*Serrata*) caule erecto, fpicâ interruptâ. Prod. Leyd. 419. *Gomphrena with an erect ftalk, and an interrupted fpike of flowers.*
3. GOMPHRENA (*Perennis*) foliis lanceolatis, capitulis diphyllis, flofculis perianthio proprio diftinctis. Lin. Sp. Plant. 224. *Gomphrena with fpear-fhaped leaves, two leaves to the heads, and each floret having its proper empalement.* Amaranthoides perenne, floribus ftramineis radiatis. Hort. Elth. 24. tab. 20. *Perennial Globe Amaranthus with radiated ftraw-coloured flowers.*

The firft fort grows naturally in India, from whence the feeds were brought to Europe, and the plants have been many years cultivated in all the curious gardens: it is an annual plant, which rifes with an upright branching ftalk about two feet high, garnifhed with fpear-fhaped leaves placed oppofite. The branches alfo come out oppofite, and the foot-ftalks of the flowers, which are long and naked, having two fhort

leaves,

leaves, close under each head of flowers arises from the forks of the branches. The heads at their first appearance are globular, but as they increase in size become oval; these are composed of dry scaly leaves or petals, placed imbricatim like the scales of fish; under each of these is situated a tubulous flower, which just peeps out of the covering, but these are not much regarded by the generality of people; for the scaly empalement which covers them is so beautiful, and these if gathered before they are too much faded, will retain their beauty several years. After the flowers are past, the germen, which is situated in the bottom of each, becomes a large oval seed, inclosed in a chaffy covering, which ripens late in autumn, and the plants decay soon after.

There are two varieties of this sort, one with fine bright purple heads, the other hath white or silvery heads, and these never alter from seeds, so that they are permanent varieties, though in other respects they do not differ: there is also one with mixed colours, but whether this arose accidentally from the seeds of either of the former, I cannot determine, for this variety continues from seeds, and the other two I have cultivated more than thirty years, and have never found either of them vary.

There are also two varieties of these which grow naturally in the West-Indies, one with purple, and the other with white heads, which are much smaller and rounder than those before-mentioned. The plants grow much larger, and spread more into branches, and they are later before they flower, so that in cold seasons the seeds rarely ripen in England; these are called Bachelors Buttons by the inhabitants of America, but whether they are specifically different from the others, I cannot with certainty determine.

The second sort hath much slenderer stalks than the first, which grow taller, and are irregular. The leaves are smaller, but of the same shape. The flowers grow in spikes at the end of the branches, which are broken, or divided into three or four parts with spaces between them. The spikes are small, and of a pale purple colour. The seeds of this sort were sent me by the late Dr. Houstoun from Campeachy.

The third sort hath slender upright stalks, which are garnished with spear-shaped leaves placed opposite; they are hairy, and sit close to the stalks, which also are hairy, and terminated by small heads of flowers, which spread open from each other, so as that the empalement appear distinct; these are of a pale straw colour, and appear in July. The seeds sometimes will ripen in England, but the plants will live two or three years, if they are preserved in a stove.

The two sorts with large heads of flowers which are first mentioned, one with purple, and the other which is silver-coloured, are very ornamental plants in gardens, and are now very commonly cultivated in the English gardens. In Portugal, and other warm countries, they are cultivated to adorn their churches in the winter; for if these are gathered when they are fully grown, and dried in the shade, they will retain their beauty a long time, especially if they are not exposed to the air; these plants are annual, so are only propagated by seeds, which should be sown on a good hot-bed the beginning of March; but if the seeds are not taken out of their chaffy covering, it will be proper to soak them in water for twelve hours before they are sown, which will greatly facilitate their growing. When the plants are come up half an inch high, they should be transplanted on a fresh hot-bed, at about four inches distance, observing to shade them till they have taken root; then they should have fresh air admitted to them every day, in proportion to the warmth of the season; they will also require to be frequently refreshed with water. In about a month's time, if the hot-bed is of a proper warmth, the plants will have grown so large, as to nearly meet, therefore they will require more room, otherwise they will draw up weak; then a fresh hot-bed should be prepared, into which there should be a sufficient number of three farthing pots plunged, filled with light rich earth, and when the bed is in a proper temperature of warmth, the plants should be carefully taken up with balls of earth to their roots, and each planted into a separate pot, observing to shade them till they have taken new root, afterward they must be treated in the same manner as other tender exotic plants. When the plants have filled these pots with their roots, they should be shaken out of the pots, and their roots on the outside of the ball of earth must be carefully pared off; then they should be put into pots a size larger, and when there is conveniency of a deep frame, to plunge the pots into another gentle hot-bed, it will bring the plants early to flower, and cause them to grow much larger than those which are placed abroad. In July the plants should be inured gradually to bear the open air, into which they may be removed about the middle of that month, and intermixed with other annual plants to adorn the pleasure-garden; but it will be proper to keep a plant or two of each sort in shelter for seeds, because when the autumn proves cold or wet, those plants which are exposed abroad, seldom produce good seeds.

GOOSEBERRY. See Grossularia.

GORTERIA.

The Characters are,

*The empalement of the flower is stiff, scaly, ending in bristly spines; the flower is composed of hermaphrodite florets in the disk, and female in the rays or border; the hermaphrodite florets are funnel-shaped, five-pointed, having five short stamina terminated by cylindrical summits, with a hairy germen supporting a slender style, crowned by a bifid stigma; the germen afterward becomes one roundish seed, surrounded by fine hairs. The female florets are tongue-shaped, have no style or stigma, and are barren.*

This genus of plants is ranged in the third section of Linnæus's nineteenth class, intitled Syngenesia Polygamia frustranea, the flowers being composed of hermaphrodite florets in the disk which are fruitful, and female florets in the border, having neither style or stigma, so are barren.

The Species are,

1. Gorteria (*Ringens*) scapis unifloris, foliis lanceolatis pinnatifidis, caule depresso. Amœn. Acad. 6. p. 86. *Gorteria with one flower on each foot-stalk, spear-shaped, wing-pointed leaves, and a depressed stalk.* Arctotis ramis decumbentibus, foliis lineari-lanceolatis rigidis subtus argenteis. Ed. prior.
2. Gorteria (*Fruticosa*) foliis lanceolatis integris dentato-spinosis subtus tomentosis, caule fruticoso. Lin. Sp. 1284. *Gorteria with entire spear-shaped leaves, whose indentures end in spines, woolly on their under side, and a shrubby stalk.* Carthamus Africanus frutescens, folio ilicis, flore aureo. Walth. Hort. 13. tab. 7.

The first sort grows naturally at the Cape of Good Hope; it is a low spreading plant, with ligneous stalks six or eight inches long trailing on the ground, having two or three side branches, each terminating in a close head of leaves, which are narrow, green on their upper side, but silvery on their under, cut into three or five segments at their ends. The foot-stalks of the flowers arise from the heads, and are six inches long, naked, supporting one large Orange-coloured flower at the top, composed of several hermaphrodite florets in the disk, which are fruitful; but the female half florets on the border are tongue-shaped, spreading open, each having a dark mark toward their base, with a white spot intermixed. The flowers appear in May and June, but are seldom succeeded by seeds in England.

This plant is easily propagated by cuttings planted in a shady border during any of the summer months, and the plants must be afterward treated as is directed for Arctotis.

The second sort grows naturally at the Cape of Good Hope. This rises with a shrubby slender stalk three feet high, sending out a few weak branches, garnished with oblong leaves sitting close to the branches; they are smooth on their upper side, woolly underneath, and indented on their edges, each indenture ending with a weak spine. The flowers terminate the stalks,

having leafy empalements ending with ſpines; the flowers are yellow, and appear in the ſummer months, but are not ſucceeded by ſeeds in England.

It is propagated by planting of the ſmall heads at the end of the branches, in June or July, which muſt be cloſely covered with either bell or hand-glaſſes, or they will not ſucceed, and ſhould be carefully ſcreened from the ſun. When theſe are well rooted, they ſhould be put each into a ſmall pot, and in winter ſhould be placed in an airy glaſs-caſe ſecure from damps.

GORZ. See ULEX.

GOSSYPIUM. Lin. Gen. Plant. 755. Xylon. Tourn. Inſt. R. H. 101. tab. 27. Cotton.

The CHARACTERS are,

*The flower has a double empalement; the outer is large, of one leaf, and cut half way into three ſegments; the inner is cup-ſhaped, of one leaf, cut into five obtuſe ſegments at the top. It hath five plain heart-ſhaped petals, which join at their baſe, and ſpread open. It hath a great number of ſtamina, which are joined at bottom in a column, but are looſe above, and inſerted into the petals; theſe are terminated by kidney-ſhaped ſummits. It hath a round germen, ſupporting four ſtyles, joined in the column, and are the ſame length of the ſtamina, crowned by four thick ſtigmas. The germen afterward becomes a roundiſh capſule, ending in a point, having four cells, which are filled with oval ſeeds, wrapped up in down.*

This genus of plants is ranged in the third ſection of Linnæus's ſixteenth claſs, intitled Monodelphia Polyandria, which includes the plants whoſe flowers have many ſtamina, which are joined together with the ſtyles in one column or body.

The SPECIES are,

1. GOSSYPIUM (*Herbaceum*) foliis quinquelobis, caule herbaceo lævi. Hort. Upſal. 203. *Cotton with leaves having five lobes, and a ſmooth herbaceous ſtalk.* Goſſypium. Camer. Epit. 203. *The common herbaceous Cotton.*
2. GOSSYPIUM (*Barbadenſe*) foliis trilobis integerrimis ſubtus biglandulofis. Hort. Upſal. 205. *Cotton-tree with entire leaves, having three lobes with three glands under their ſide.* Goſſypium fruteſcens annuum, folio trilobo Barbadenſe. Pluk. Alm. 172. tab. 188. *Shrubby annual Barbadoes Cotton, with leaves having three lobes.*
3. GOSSYPIUM (*Arboreum*) foliis palmatis, lobis lanceolatis, caule fruticoſo. Lin. Sp. Plant. 693. *Cotton with hand-ſhaped leaves, having five ſpear-ſhaped lobes, and a ſhrubby ſtalk.* Xylon arboreum, flore flavo. Tourn. Inſt. R. H. 101. *Tree Cotton with a yellow flower.*
4. GOSSYPIUM (*Hirſutum*) foliis trilobis & quinquelobiſque acutis, caule ramoſo hirſuto. *Cotton with leaves having three and five lobes, ending in acute points, and a hairy branching ſtalk.* Xylon Americanum præſtantiſſimum, ſemine vireſcente. Lign. Tourn. Inſt. R. H. 101. *Fineſt American Cotton with a green ſeed.*

The firſt ſort is the common Levant Cotton, which is cultivated in ſeveral Iſlands of the Archipelago, as alſo in Malta, Sicily, and the kingdom of Naples; it is ſown in tilled ground in the ſpring of the year, and is ripe in about four months after, when it is cut down in harveſt as Corn is in England; the plants always periſh ſoon after the ſeeds are ripe: this plant grows about two feet high, with an herbaceous ſtalk, garniſhed with ſmooth leaves divided into five lobes. The ſtalks ſend out a few weak branches upward, which are garniſhed with leaves of the ſame form but ſmaller. The flowers are produced near the extremity of the branches, at the foot-ſtalks of the leaves; theſe have two large empalements, the outer is cut into three parts, and the inner into five. The petals of the flower are of a pale yellow colour, inclining to white; theſe are ſucceeded by oval capſules, which open in four parts, having four cells, which are filled with ſeeds wrapped up in down, which is the Cotton.

The ſecond ſort grows naturally in ſeveral iſlands of the Weſt-Indies; this riſes with a ſhrubby ſmooth ſtalk four or five feet high, ſending out a few ſide branches, which are garniſhed with ſmooth leaves, divided into three lobes. The flowers are produced toward the end of the branches, which are ſhaped like thoſe of the former ſort, but are larger, and of a deeper yellow colour. The pods are larger, and the ſeeds are black.

The third ſort hath a perennial ſhrubby ſtalk, which riſes ſix or eight feet high, and divides into many ſmooth branches, garniſhed with hand-ſhaped leaves, having four or five lobes. The flowers are produced toward the end of the branches; theſe are larger than thoſe of the two former ſorts, and are of a deep yellow colour. The pods of this ſort are larger than thoſe of the former.

The fourth ſort is a native of the Eaſt and Weſt-Indies, from whence the ſeeds have been brought to Europe; this is alſo an annual plant, which periſhes ſoon after the ſeeds are ripe. It riſes to the height of three feet or more, and ſends out many lateral branches, which extend to a great diſtance, where they are allowed room to grow; theſe are hairy, and garniſhed with leaves, having in ſome three, and others five acute-pointed lobes, with ſhort hairy down on their ſurface. The flowers are produced from the ſide, and at the end of the branches; theſe are large, of a dirty ſulphur colour, each petal having a large purple ſpot at the baſe, and are ſucceeded by oval pods, which open into four cells, which are filled with oblong green ſeeds wrapped up in a ſoft down. Where the plants have room to ſpread, their branches will produce four or five pods of Cotton upon each, ſo that from a ſingle plant, thirty or more pods may be produced; and each of theſe are as large as middling Apples, ſo there will be a much greater produce from this than from any other ſort, and the ſtaple is much finer; therefore it is well worth the attention of the inhabitants of the Britiſh colonies in America to cultivate and improve this ſort, ſince it will ſucceed in Carolina, where it it has been cultivated for ſome years; and might be a commodity worthy of encouragement by the public, could they contrive a proper gin to ſeparate the Cotton from the ſeeds, to which this ſort adheres much cloſer than any of the other ſorts, the Cotton from this ſhrub being preferable to any other yet known.

All theſe ſorts are very tender plants, therefore will not thrive in the open air in England, but they are frequently ſown in curious gardens for variety: the firſt and fourth ſorts will produce ripe ſeeds in England, if their ſeeds are ſown early in the ſpring, upon a good hot-bed; and when the plants are come up, planted each into ſeparate pots, and plunged into a hot-bed of tanners bark to bring them forward; and when they are grown too tall to remain under the frames, removed into the tan-bed in the ſtove, and ſhifted into larger pots, when their roots have filled the other; with this management I have had their flowers appear in July, and toward the end of September the ſeeds have been perfectly ripe, and the pods as large as thoſe produced in the Eaſt and Weſt-Indies; but if the plants are not brought forward early in the ſpring, it will be late in the ſummer before the flowers will appear, and there will be no hopes of the pods coming to perfection.

The Shrub-cotton will riſe from the ſeeds very eaſily, if they are ſown upon a good hot-bed; and when they are ſown early in the ſpring, and brought forward in the ſame manner as hath been directed for the former ſorts, the plants will grow to be five or ſix feet high the ſame ſummer; but it is difficult to preſerve the plants through the winter, unleſs they are hardened gradually in Auguſt during the continuance of the warm weather; for when they are forced on at that time, they will be ſo tender, as to render them incapable of reſiſting the leaſt injury. The plants of this ſort muſt be placed in the bark-ſtove in autumn, and kept in the firſt claſs of heat, otherwiſe they will not live through the winter in England.

GRAFTING is the taking a ſhoot from one tree, and inſerting it into another, in ſuch a manner, as that both may unite cloſely, and become one tree; this is called by the ancient writers in huſbandry and gardening, inciſion, to diſtinguiſh it from inoculating, or budding, which they call inſerere oculos.

The use of grafting is to propagate any curious sorts of fruits, so as to be certain of the kinds, which cannot be done by any other method; for as all the good fruits have been accidentally obtained from seeds, so the seeds of these, when sown, will many of them degenerate, and produce such fruit as are not worth cultivating; but when shoots are taken from such trees as produce good fruit, these will never alter from their kind, whatever be the stock, or tree, on which they are grafted; for though the grafts receive their nourishment from the stocks, yet their varieties are never altered by them, but continue to produce the same kind of fruit as the tree from which they were taken; the only alteration is, that when the stocks on which they are grafted do not grow so fast, and afford a sufficient supply of nourishment to the grafts, they will not make near so great progress as they otherwise would do, nor will the fruit they produce be so fair, and sometimes not so well flavoured.

These shoots are termed cions, or graffs; in the choice of these the following directions should be carefully observed. 1st, That they are shoots of the former year, for when they are older, they never succeed well. 2dly, Always to take them from healthy fruitful trees, for if the trees are sickly from whence they are taken, the grafts very often partake so much of the distemper as rarely to get the better of it, at least for some years; and when they are taken from young luxuriant trees, whose vessels are generally large, they will continue to produce luxuriant shoots, and are seldom so fruitful as those which are taken from fruitful trees, whose shoots are more compact, and the joints closer together; at least it will be a great number of years before the luxuriant grafts begin to produce fruit, if they are managed with the greatest skill. 3dly, You should prefer those grafts which are taken from the lateral, or horizontal branches, to those from the strong perpendicular shoots, for the reasons before given.

These grafts, or cions, should be cut off from the trees before their buds begin to swell, which is generally three weeks or a month before the season for grafting; therefore, when they are cut off, they should be laid in the ground with the cut downwards, burying them half their length, and covering their tops with dry litter, to prevent their drying; if a small joint of the former year's wood is cut off with the cion, it will preserve it the better, and when they are grafted, this may be cut off; for at the same time the cions must be cut to a proper length before they are inserted in the stocks; but, till then, the shoots should remain their full length, as they were taken from the tree, which will preserve them better from shrinking; if these cions are to be carried to a considerable distance, it will be proper to put their ends into a lump of clay, and to wrap them up in moss, which will preserve them fresh for a month, or longer; but these should be cut off earlier from the trees than those which are to be grafted near the place where the trees are growing.

Having given directions for the cions and grafts, we next come to that of the stock, which is a term applied to the trees intended for grafting; these are either such old trees as are already growing in the places where they are to remain, whose fruit is intended to be changed, or young trees, which have been raised in a nursery for a supply to the garden; in the former case there is no other choice, but that of the branches, which should be such as are young, healthy, well situated, and have a smooth bark; if these trees are growing against walls, or espaliers, it will be proper to graft six, eight, or ten branches, according to the size of the trees, by which they will be much sooner furnished with branches again, than when a less number of cions are put in; but in standard-trees, four, or at most six cions will be sufficient.

In the choice of young stocks for grafting, you should always prefer such as have been raised from the seed, and that have been once or twice transplanted. Next to these, are those stocks which have been raised from cuttings, or layers, but those which are suckers from the roots of other trees should always be rejected, for these are never so well rooted as the others, and constantly put out a great number of suckers from their roots, whereby the borders and walks of the garden will be always pestered with them during the summer season, which is not only unsightly, but they also take off part of the nourishment from the trees.

If these stocks have been allowed a proper distance in the nursery where they have grown, the wood will be better ripened, and more compact than those which have grown close and have been there drawn up to a greater height; the wood of these will be soft, and their vessels large, so that the cions grafted into them will shoot very strong, but they will be less disposed to produce fruit than the other; and when trees acquire an ill habit at first, it will be very difficult to reclaim them afterward.

Having directed the choice of cions and stocks, we come next to the operation, in order to which you must be provided with the following tools.

1. A neat small hand-saw to cut off the heads of large stocks.
2. A good strong knife with a thick back, to make clefts in the stocks.
3. A sharp penknife to cut the grafts.
4. A grafting chissel and a small mallet.
5. Bass strings, or woollen yarn, to tie the grafts with, and such other instruments and materials as you should find necessary, according to the manner of grafting you are to perform.
6. A quantity of clay, which should be prepared a month before it is used, and kept turned and mixed, like mortar every other day, which is to be made after the following manner:

Get a quantity of strong fat loam (in proportion to the quantity of trees intended to be grafted, then take some new stone-horse dung, and break it in amongst the loam, and if you cut a little straw, or hay, very small, and mix amongst it, the loam will hold together the better; and if there be a quantity of salt added, it will prevent the clay from dividing in dry weather; these must be well stirred together, putting water to them after the manner of making mortar; it should be hollowed like a dish, and filled with water, and kept every other day stirred; but it ought to be remembered, that it should not be exposed to the frost, or drying winds, and the oftener it is stirred and wrought the better.

Of late years some persons have made use of another composition for grafting, which they have found to answer the intention of keeping out the air, better than the clay before described. This is composed of turpentine, bees-wax, and rosin, melted together, which, when of a proper consistence, may be put on the stock round the graft, in the same manner as the clay is usually applied; and though it be not above a quarter of an inch thick, yet it will keep out the air more effectually than the clay; and as cold will harden this, there is no danger of its being hurt by frost, which is very apt to cause the clay to cleave, and sometimes fall off; and when the heat of summer comes on, this mixture will melt, and fall off without any trouble. In using of this, there should be a tin, or copper-pot, with conveniency under it to keep a very gentle fire with small-coal, otherwise the cold will soon condense the mixture; but you must be careful not to apply it too hot, lest you injure the graft. A person who is a little accustomed to this composition, will apply it very fast, and it is much easier for him than clay, especially if the season should prove cold.

There are several ways of grafting, the principal of which are four:

1. Grafting in the rind, called also shoulder-grafting, which is only proper for large trees; this is called crown-grafting, because the grafts are set in form of a circle, or crown, and is generally performed

formed about the latter end of March, or the beginning of April.

2. Cleft-grafting, which is also called stock, or slit-grafting; this is proper for trees or stocks of a lesser size, from an inch, to two inches or more diameter; this grafting is to be performed in the months of February and March, and supplies the failure of the escutcheon-way, which is practised in June, July, and August.

3. Whip-grafting, which is also called tongue-grafting; this is proper for small stocks of an inch, half an inch, or less, diameter; this is the most effectual way of any, and which is most in use.

4. Grafting by approach, or ablactation; this is to be performed when the stock you would graft on, and the tree from which you take your graft, stand so near together, that they may be joined; this is to be performed in the month of April, and is also called inarching, and is chiefly used for Jasmines, Oranges, and other tender exotic trees.

We come next to the manner of performing the several ways of grafting.

The first method, which is termed rind, or shoulder-grafting, is seldom practised but on large trees, where either the head, or the large branches, are cut off horizontally, and two or four cions put in, according to the size of the branch, or stem; in doing of this, the cions are cut flat on one side, with a shoulder to rest upon the crown of the stock; then the rind of the stock must be raised up, to admit the cion between the wood and the bark of the stock, which must be inserted about two inches, so as the shoulder of the cion may meet, and closely join the crown of the stock; and after the number of cions are inserted, the whole crown of the stock should be well clayed over, leaving two eyes of the cions uncovered therewith, which will be sufficient for shooting; this method of grafting, was much more in practice formerly than at present; the discontinuance of it was occasioned by the ill success it was attended with; for as these cions were placed between the rind of the stock and the wood, so they are frequently blown out by strong winds, after they had made large shoots, which has sometimes happened after five or six years growth; so that whenever this method is practised, there should be some stakes fastened to support the cions, until they have almost covered the stock.

The next method is termed cleft, or stock-grafting; this is practised upon stocks, or trees, of a smaller size, and may be used with success, where the rind of the stock is not too thick, whereby the inner bark of the cion will be prevented joining to that of the stock; this may be performed on stocks, or branches, which are more than one inch diameter; in the doing of this, the head of the stock, or branch, must be cut off with a slope, and a slit made the contrary way, in the top of the slope, deep enough to receive the cion, which should be cut sloping like a wedge, so as to fit the slit made in the stock, being careful to leave that side of the wedge, which is to be placed outward, much thicker than the other; and in putting the cion into the slit of the stock, there must be great care taken to join the rind of the cion to that of the stock; for if these do not unite, the grafts will not succeed: when this method of grafting is used to stocks which are not strong, it will be proper to make a ligature of bass, to prevent the slit of the stock from opening; then the whole should be clayed over, to prevent the air from penetrating the slit, so as to destroy the grafts, only leaving two eyes of the cions above the clay for shooting.

The third method is termed whip, or tongue-grafting, which is the most commonly practised of any by the nurserymen near London, especially for small stocks, because the cions much sooner cover the stocks in this method than in any other.

This is performed by cutting off the head of the stocks sloping; then there must be a notch made in the slope toward the upper part downward, a little more than half an inch deep, to receive the cion, which must be cut with a slope upward, and a slit made in this slope like a tongue, which tongue must be inserted into the slit made in the slope of the stock, and the cion must be placed on one side of the stock, so as that the two rinds of both cion and stock may be equal, and join together exactly; then there should be a ligature of bass to fasten the cion, so as that it may not be easily displaced, and afterward clay it over, as in the former methods.

The fourth sort of grafting is termed inarching-grafting by approach, or ablactation. This is only to be performed when the stocks, which are designed to be grafted, and the tree from which the graft is to be taken, stand so near together, or may be brought so near together, as that their branches may be united; this method of grafting is commonly practised on tender exotic plants, and some other sorts which do not succeed in any of the other methods.

In performing this operation, a part of the stock, or branch, must be slit off about two inches in length, observing always to make choice of a smooth part of the stock; then a small notch should be made in this slit of the stock downward, in the same manner as hath been directed for whip-grafting; then the branch of the tree designed to be inarched, should have a part slit off in like manner as the stock, and a slit made upward in this, so as to leave a tongue; which tongue should be inserted into the slit of the stock, observing to join their rinds equally, that they may unite well together; then make a ligature of bass, to keep them exactly in their situation, and afterward clay this part of the stock over well, to keep out the air; in this method of grafting, the cion is not separated from the tree, until it is firmly united with the stock, nor is the head of the stock, or branch, which is grafted, cut off till this time, and only half the wood pared off with a slope, about three inches in length, and the same of the cion, or graft.

This method of grafting is not performed so early in the season as those of the other, it being done in the month of April, when the sap is flowing, at which time the cion and stock will join together, and unite much sooner than at any other season.

The Walnut, Fig, and Mulberry, will take by this method of grafting, but neither of these will succeed in any of the other methods; there are also several sorts of Evergreens, which may be propagated by this method of grafting; but all the trees which are grafted in this way are weaker, and never grow to the size of those which are grafted in the other methods; therefore this is rarely practised, but on such sorts of trees as will not take by the other methods.

The next thing which is necessary to be known, by those who would practise this art, is, what trees will take and thrive by being grafted upon each other; and here there have been no sure directions given by any of the writers on this subject, for there will be found great mistakes in all their books, in relation to this matter; but as it would swell this article too great, if all the sorts of trees were to be here enumerated, which will take upon each other by grafting, I shall only mention such general directions, as, if attended to, will be sufficient to instruct persons, so as they may succeed.

All such trees as are of the same genus, i. e. which will agree in their flower and fruit, will take upon each other: for instance, all the Nut-bearing trees may be safely grafted on each other, as may all the Plumb-bearing trees, under which head I reckon not only the several sorts of Plumbs, but also the Almond, Peach, Nectarine, Apricot, &c. which agree exactly in their general characters, by which they are distinguished from all other trees; but as many of these are very subject to emit large quantities of gum from the parts of the trees as are deeply cut and wounded; so the tender trees of this kind, viz. Peaches and Nectarines, which are most subject to this, it is found to be the surest method to bud or inoculate these sorts of fruits, for which see Inoculation.

Then all such trees as bear cones will do well upon each other, though they may differ in one being evergreen, and the other shedding its leaves in winter; as is obiervbale in the Cedar of Libanus, and the Larch-tree, which are found to succeed upon each other very well;

well; but these must be grafted by approach, for they abound with a great quantity of resin which is apt to evaporate from the graft, if separated from the tree before it is joined with the stock, whereby they are often destroyed; as also the Laurel on the Cherry, or the Cherry on the Laurel. All the mast-bearing trees will also take upon each other, and those which have a tender soft wood will do well if grafted in the common way; but those that are of a more firm contexture, and are slow growers, should be grafted by approach.

By strictly observing this rule, we shall seldom miscarry, provided the operation be rightly performed, and at a proper season, unless the weather should prove very bad, as it sometimes happens, whereby whole quarters of fruit-trees miscarry; and it is by this method that many kinds of exotic trees are not only propagated, but also rendered hardy enough to endure the cold of our climate in the open air; for, being grafted upon stocks of the same sort which are hardy, the grafts are rendered more capable to endure the cold, as hath been experienced by most of our valuable fruits now in England, which were formerly transplanted here from more southerly climates, and were at first too impatient of our cold to succeed well abroad; but have been, by budding or grafting upon more hardy trees, rendered capable of resisting our severest cold.

And these different graftings seem to have been greatly in use among the ancients, though they were certainly mistaken in the several sorts of fruits which they mention to have succeeded upon each other; as the Fig upon the Mulberry, the Plumb upon the Chestnut, with many others of the like kind; most of which I have already tried, and find they will not succeed; therefore what has been advanced on this head by the ancients, is not founded on experience; or at least they did not mean the same plants, which at present are called by those names; though I cannot help thinking we are apt to pay too much deference to the writings of the ancients, in supposing them seldom to be mistaken, or to assert a falshood; whereas, if their works are carefully examined, it will be found, that they have often copied from each other's writings, without making experiments to prove the truth of their assertions: and it is well known, that the ranging of plants before Cæsalpinus's time (which is about 170 years since) was, by their outward appearance, or from the supposed virtues of them, which method is now justly exploded; and it hath been observed, from many repeated trials, that however plants may resemble each other in the shape and make of their leaves, manner of shooting, &c. unless they agree in their fruit, and their other distinctive characters, they will not grow upon each other, though performed with ever so much art.

GRAMEN. Tourn. Inst. R. H. 516. tab. 297. Raii Meth. Plant. 171. Grass; in French, *Chien-dent*.

To enumerate all the species of Grass which are found growing naturally in England, would swell this article greatly beyond the design of the work; therefore I shall only take notice of a few species, which are either used in medicine, or cultivated for fodder; for there is scarce a pasture in this country, where at least twenty different species are not to be found intermixed, and in most of them more than twice that number. These were, by the former writers on botany, all included under the common denomination of Gramen, but were divided into different sections. Mr. Ray has ranged them in the following order, Gramen Triticum, i. e. Wheat-grass. Gramen Secalinum, i. e. Rye-grass. Gramen Loliaceum, i. e. Darnel-grass. Gramen Paniceum, i. e. Panic-grass. Gramen Phalaroides, i. e. Canary-grass. Gramen Alopecuroides, i. e. Fox-tail-grass. Gramen Typhinum, i. e. Cat's-tail-grass. Gramen Echinatum, i. e. Hedgehog-grass. Gramen Cristatum, i. e. Crested-grass. Gramen Avenacium, i. e. Oat-grass. Gramen Dactylon, i. e. Cock's-foot-grass. Gramen Arundinaceum, i. e. Reed-grass. Gramen Milleacem, i. e. Millet-grass. And under each of these sections there are many species. And there are many others, which, by older writers, were included under this general title, some of which have no relation to this class; but there are others which are near nearly allied to it, as the Cyperus and Cypress Grasses, &c. These Dr. Linnæus has divided into genera; but by this method of classing them, he has separated them to a great distance from each other; for all those whose flowers have three stamina, are ranged in his third class; and others which have male and female flowers, are removed to his twenty-first class. However, it would have been much better to have kept them together, as Dr. Van Royen has done in the Prodromus of the Leyden garden, under one general title to the class of Graminea.

As the several genera under which the different species of Grass are ranged, have different characters by which they are distinguished, so it would be to little purpose to give them all in this work; and as there are no general characteristics by which the whole class can be known, so I shall not trouble the reader with any of them here, but proceed to enumerate a few of the species.

1. GRAMEN spicâ triticeâ repens vulgare, caninum dictum. Raii Syn. 2. p. 247. *Common creeping Grass with a spike like Wheat, called Dog-grass.* Triticum calycibus sublatis trifloris acuminatis. Lin. Sp. Plant. *Wheat with an awl-shaped pointed empalement including three flowers, commonly called Couch, Couch-grass, or Quick-grass.*
2. GRAMEN loliaceum, angustiore folio & spicâ. C. B. P. *Darnel-grass, with a narrower leaf and spike.* Lolium spicâ muticâ. Lin. Sp. Plant. 83. *Darnel with a chaffy spike, commonly called Ray, or Rye-grass.*
3. GRAMEN pratense, paniculatum majus angustiore folio. C. B. P. 2. *Meadow-grass with larger panicles and a narrower leaf.* Poa paniculâ diffusâ, spiculis quadrifloris pubescentibus, culmo erecto tereti. Flor. Suec. 77. *Poa with a diffused panicle, the smaller spikes having four hairy flowers, and a taper erect straw.*
4. GRAMEN pratense, paniculatum majus, latiore folio. C. B. P. 2. *Meadow-grass with a larger panicle and broader leaf.* Poa paniculâ diffusâ spiculis trifloris glabris, culmo erecto tereti. Flor. Suec. 76. *Poa with a diffused panicle, small spikes with three flowers, and an upright straw.*
5. GRAMEN avenacium pratense elatius paniculâ flavescente, locustis parvis. Raii Syn. 407. *Taller Meadow Oat-grass, with a yellowish panicle and small husks.* Avena paniculâ laxâ, calycibus trifloris brevibus, flosculis omnibus aristatis. Prod. Leyd. 66. *Oat-grass with a loose panicle, three flowers in each empalement, which is short, and all the flowers having awns.*
6. GRAMEN secalinum. Ger. Emac. lib. 1. cap. 22. n. 4. *Tall Meadow Rye-grass.*
7. GRAMEN tremulum maximum. C. B. P. 2. *Greatest Quaking-grass, or Cowquakes.* Briza spiculis cordatis, flosculis septendecim. Hort. Cliff. 23. *Briza with heart-shaped little spikes, and seventeen flowers in each.*

The first sort of Grass is that which is directed to be used in medicine; the roots of this are chiefly used, and are accounted aperitive and diuretic, opening obstructions of the reins and bladder, provoking urine, and are of service against the gravel and stone. The juice of the leaves and stalks was greatly esteemed by Dr. Boerhaave, who generally prescribed this in all cases where he supposed there were any obstructions in the bile conduit.

This hath a creeping root, which spreads far in the ground, and is a very troublesome weed in gardens and arable land; for every small piece of the root will grow and multiply exceedingly, so it is very difficult to extirpate where it once gets possession: in gardens, the common method of destroying it is, to fork out the roots as often as the blades appear above ground; where this is two or three times carefully repeated, it may be totally rooted out; but when the surface of the ground is very full of the roots of this Grass, the shortest way of destroying it, is to trench the

the ground two ſpits and a ſhovelling deep, turning all the couch into the bottom, where it will rot, and never ſhoot up; but this can only be practiſed, where there is a ſufficient depth of ſoil; for in ſhallow ground the roots cannot be buried ſo deep, as to lie below the depth to which they naturally ſhoot.

Where the roots of this Graſs get poſſeſſion in arable fields, it is very difficult to root out again; the uſual method is by laying the land fallow in ſummer, and frequently harrowing it well over to draw out the roots: where this is carefully practiſed, the ground may be ſo well cleaned in one ſummer, as that the roots cannot much injure the crop which may be ſown upon it; but ſuch land ſhould be cropped with Beans, Peas, or ſuch things as require the horſe-hoeing culture; for where the land can be frequently ſtirred and harrowed afterward, it will be of great ſervice in cleaning it from the roots of this Graſs and other bad weeds. The blade of this Graſs is ſo rough, that cattle will not feed upon it.

The ſecond ſort is frequently cultivated, eſpecially in ſtrong cold land, upon which this Graſs will ſucceed better than any other ſpecies, and is an earlier feed in the ſpring; but this is a very coarſe Graſs, and unleſs it is cut very early for hay, it becomes hard and wiery in the ſtalks, ſo that few cattle care to eat it; for this ſpecies has but few leaves, running all to ſtalk, ſo is uſually called Bents, and in ſome counties Bennet; when this graſs is fed, it will be proper to mow off the Bents in the beginning of June, otherwiſe they will dry upon the ground, and have the appearance of a ſtubble field all the latter part of ſummer; ſo that it will not only be very diſagreeable to the ſight, but alſo be troubleſome to the cattle that feed on it, by tickling their noſtrils; ſo that the want of better paſture only, will force them to eat of the young Graſs which ſprings up between theſe Bents, for thoſe they will not touch; therefore thoſe who ſuppoſe that theſe are eaten in ſcarcity of feed by the cattle, are greatly miſtaken; for I have many years cloſely attended to this, and have always found theſe Bents remaining on the ground untouched, till the froſt, rain, and winds, deſtroy it in winter; and, by permitting theſe to ſtand, the after-growth of the Graſs is greatly retarded, and the beautiful verdure is loſt for three or four months; ſo that it is good huſbandry to mow them before they grow too dry, and rake them off the ground: if theſe are then made into the hay, it will ſerve for cart-horſes or cows feed in winter, and will pay the expence of mowing it.

There is another ſpecies of this Graſs called Red Darnel, which is of a worſe nature than the firſt, the ſtalks growing hard much ſooner, and having narrower leaves. This is very common in moſt paſture grounds, for as it comes early to flower, ſo the ſeeds are generally ripe before the hay is cut, and from the falling ſeeds the ground is ſupplied with plenty of this ſort; therefore thoſe who are deſirous to keep their paſtures as clear from this Graſs as poſſible, ſhould always mow it before the ſeeds are ripe.

This Graſs is uſually ſown with Clover, upon ſuch lands as are deſigned to be ploughed again in a few years, and the common method is to ſow it with Spring Corn; but from many repeated trials, I have always found, that by ſowing theſe ſeeds in Auguſt, when there has happened a few ſhowers to bring up the Graſs, that the crop has anſwered much better than any which has been ſown in the common way; for the Graſs has often been ſo rank, as to afford a good feed the ſame autumn; and the following ſpring there has been a ton and a half of hay per acre mowed very early in the ſeaſon, and this has been upon cold ſour land; ſo that I am convinced of that being the beſt ſeaſon for ſowing theſe Graſſes, though it will be very difficult to perſuade thoſe perſons to alter their practice, who have been long wedded to old cuſtoms. The quantity of ſeeds which I allow to an acre is about two buſhels, and eight pounds of the common Clover, which, together, will make as good plants upon the ground as can be deſired; but this is not to be practiſed upon ſuch lands where the beauty of the verdure is principally regarded, therefore is fit for thoſe who have only profit in view.

The third and fourth ſorts are the two beſt ſpecies of Graſs for paſtures, ſo that if the ſeeds of theſe were carefully collected and ſown ſeparately without any other mixture of Graſs-ſeeds, they would not only afford a greater quantity of feed on the ſame ſpace of land, but the Graſs would alſo be better, the hay ſweeter, and the verdure more laſting than of any other ſorts; but there requires ſome attention to the ſaving of theſe ſeeds pure without mixture. I have tried to ſave the ſeeds of ſeveral ſpecies of Graſs ſeparately, in order to determine their qualities, but have found it very difficult to keep them diſtinct in gardens where the ſeeds of other ſorts of Graſs have been ſcattered: the only method in which I could ſucceed, was by ſowing each ſpecies in a diſtinct pot, and when the plants came up, to weed out all the other kinds of Graſs which came up in the pots; by this means I preſerved a great variety of the graſſy tribe ſeveral years, but not having ground enough to propagate the moſt uſeful ſpecies in any quantity, I was obliged to abandon the purſuit: but I muſt recommend this to perſons of leiſure and ſkill who have a ſufficient quantity of land for the purpoſe, to carry this project into execution, which may be of ſingular benefit to the public; for we have an inſtance of the advantage which the inhabitants of the Netherlands have made, by ſaving the ſeeds of the White Clover, or Honeyſuckle Trefoil, which is a plant common to moſt of the Engliſh paſtures; yet few perſons in this country ever gave themſelves the trouble to collect the ſeeds from the fields for ſowing, but have purchaſed vaſt quantities of this ſeed annually, at a conſiderable price from Flanders, where the peaſants have been ſo induſtrious, as to collect the ſeeds and ſow great quantities of land with it, with a view of ſale to this country only. This is not an inconſiderable article in huſbandry, but deſerves the attention of all thoſe, who, by choice or otherwiſe, are engaged in the buſineſs of agriculture; for one acre of land will produce as much ſeeds of this ſpecies of Trefoil, as will ſell for 12 l. where it is well planted and ſaved from the ſpring crop; and if the Graſs-ſeeds before-mentioned were ſeparately ſown, and carefully weeded from all other ſpecies, and permitted to ſtand till their ſeeds were ripe, it might be of equal advantage with the other, eſpecially now, when every gentleman is endeavouring to improve the verdure near their habitations.

The fifth and ſixth ſorts are alſo very good Graſſes for paſtures, and have perennial roots, ſo are the next beſt ſorts for ſowing to thoſe before-mentioned, which, in my opinion, deſerve the preference to all the other; but as it will be difficult to ſave a ſufficient quantity of ſeeds of thoſe alone, to ſupply the demand which may be for their ſeeds; ſo theſe two ſpecies may be admitted in aid of the other, as they are very leafy kinds of Graſs, and their ſtalks do not become ſtiff and harſh like many other ſpecies, but with proper care may be made very fine; and, if duly rolled, their roots will mat and form a very cloſe ſward, therefore theſe ſhould be included in the number of ſown Graſſes.

The ſeventh ſort is mentioned for the ſake of variety, and not for uſe; this hath an annual root, which ſends up many broad hairy leaves, between which ariſe ſlender ſtiff ſtalks from a foot to near two two feet high, dividing upward into a large looſe panicle, garniſhed with heart-ſhaped ſmall ſpikes, each having about ſeventeen ſmall floſcules or florets; theſe, after the flowers are paſt, have a ſingle ſeed ſucceeding them; the heads hang by ſlender long foot-ſtalks, which are moved by every wind, ſo that they generally appear ſhaking, from whence it had the title of Quaking Graſs. There are four ſpecies of this Graſs, two of them grow naturally in England; and theſe Graſſes coming to head in May, occaſioned the following

English proverb, *May come she early come she late, makes the cow quake.* The large sort here mentioned, grows naturally in the south of France and Italy, and is only preserved in some English gardens for the sake of variety.

If the seeds of this sort are sown in the autumn, or permitted to scatter when ripe, the plants will come up stronger, and flower much earlier, than when they are sown in the spring, so good seeds may always be expected from them, which can seldom be attained from the spring plants in England; and as two or three plants of this sort will be full enough in a garden for variety, so these should be allowed to spread; for where they grow at a distance from each other, the roots will send out a great number of stalks, which will be stronger, and produce much larger panicles than those which are too near together.

The Cock's-foot Grass, Capon's-tail Grass, and Millet Grasses are too coarse to deserve attention in England, though some of their species are very useful in the warm parts of America, where there is a great scarcity of finer Grass; and some of these are much better adapted to those warm countries, than any of our European Grasses, for many of them lie flat on the ground, and emit roots from their joints, so are well prepared for heat; their stalks are large and juicy, so will live in heat where few of the European Grasses can be made to thrive.

The land on which Grass-seed is intended to be sown, should be well ploughed, and cleared from the roots of noxious weeds, such as Couch-grass, Fern, Rushes, Heath, Gorse, Broom, Rest-harrow, &c. which, if left in the ground, will soon get the better of the Grass, and over-run the land. Therefore in such places where either of these weeds abound, it will be a good method to plough up the surface in April, and let it lie some time to dry; then harrow the roots into small heaps, and burn them. The ashes so produced, when spread on the land, will be a good manure for it. The method of burning the roots is particularly directed under the article Land, which see: but where Couch-grass, Fern, or Rest-harrow is in plenty, whose roots run far under ground, the land must be ploughed two or three times pretty deep in dry weather, and the roots carefully harrowed off after each ploughing, which is the most sure method to destroy them. Where the land is very low, and of a stiff clayey nature, which holds water in winter, it will be of singular service to make some under-ground drains to carry off the wet; which, if detained too long on the ground, will render the Grass sour. The method of making these drains is prescribed under the article Land, which see.

Before the seed is sown, the surface of the ground should be made level and fine, otherwise the seed will be buried unequal. When the seed is sown, it must be gently harrowed in, and the ground rolled with a wooden roller, which will make the furface even, and prevent the seeds being blown in patches. When the Grass comes up, if there should be any bare spots, where the seed has not grown, they may be sown again, and the ground rolled, which will fix the seeds; and the first kindly showers will bring up the Grass, and make it very thick.

Where the land is designed to continue in pasture, it should be sown with the best sorts of Grass-seeds, and white Dutch Clover, or what is commonly called Honeysuckle Grass in many parts of England, but there is a great difficulty of procuring hay-seeds which are good; for in all the good pastures near London, which abound with the best sorts of Grass, the hay is commonly cut before the seeds of the Grass are ripe; so that those seeds which are procured from the stables where the horses are fed with the best sort of hay, are little more than chaff, or at best are only such as are of the early kinds of Grass, with a great quantity of Plantain and other weeds: which has discouraged many gentlemen from sowing them, nor has any one attempted to save these seeds properly; and as it requires longer time, and more attention, to save a quantity of seeds of the purer sort of Grass than the generality of people care to bestow, so I would recommend the setting some of those upland pastures, which are cleanest from weeds, and have the sweetest herbage aside, to stand for seeds; and although by so doing the hay will be less valuable, yet from the sale of the seeds, it may answer better to the possessor, than to mow it merely for the hay; for any gentleman who has regard to the beauty of his land, had better give six times the price for such seeds, as is usually paid for the ordinary seeds, since the first expence of seeds is not to be put in competion with the beauty and advantage of having such as are good; for when the land is brought to a good sward (which may be done in one year, where it is properly prepared and sown with good seeds) it may be kept in good order, and by good management improved annually, and will continue so, as long as proper care is taken of it. I know some land which was sown in the method hereafter directed above forty years ago, which are now as good pastures as any I have seen, and may be always continued so.

These grounds abounded with many bad weeds, so they had a winter and summer's fallow, in which time they were five times ploughed and ten times harrowed in order to destroy the weeds, and make the surface of the ground fine; in August they were sown with the best Grass-seeds as could be procured, three bushels of this, and nine pounds of the white Dutch Clover-seeds were allowed to each acre; as there happened rains soon after the seeds were sown, so the Grass came up well; but among it were a great number of weeds, which were drawn up and carried off the ground, and in the beginning of October the fields were rolled with a Barley roller; in the spring the fields were again weeded, and afterward rolled, and that summer there was more than two tons of hay per acre mowed off the land; and by constant weeding twice a year, sweeping it with a bush-harrow, rolling and dressing of the land, the Grass has been greatly improved since, and is now as good pasture as any in England: and since I have laid down great quantities of land in the same manner, and with equal success; therefore from many years experience can recommend it, as the surest method of having good pastures.

But I know the generality of farmers will object to the first loss of their crop, and also to the after expence of weeding, rolling, &c. as too great for common practice: however, I am well satisfied from experience, that whoever will be at the expence, will find their account in it; for the crops of hay will be so much better, and the after pasture also, that it will more than pay the expence, as from many exact accounts, which have been kept of the whole, is sufficiently demonstrated, and the verdure of these pastures is charming to all those who have any taste of natural beauties.

The proper management of pasture land is the least understood of any part of agriculture; the farmers never have attended to this, being more inclined to the plough, though the profits attending that have not of late years been so great as to encourage them in that part of husbandry; but these people never think of laying down land for pasture, to continue longer than three years, at the end of which time they plough it up again, to sow it with grain.

There is a sort of striped Grass which is preserved in many gardens for the beauty of its variegated leaves, which continue fresh the greatest part of the summer. This sort is easily propagated by parting the roots, either in spring or autumn, for every offset will increase to be a large root in one year's time. It will grow on any soil or in any situation, therefore may be planted in any abject part of the garden, where it will thrive, and afford an agreeable variety. This sort is by many persons called Ribband-grass, from the stripes of white and green, which run the whole length of the blade, like the stripes in some ribbands.

For the further management of Grafs in fields, fee PASTURE and MEADOW; and for that in gardens, fee GRASS.

Clover-grafs. See TRIFOLIUM.

Saint-foin. See ONOBRYCHIS, or HEDYSARUM.

La Lucerne. See MEDICA.

Nonefuch, See MELILOTUS, or TRIFOLIUM.

Trefoil. See TRIFOLIUM.

Spurry. See SPERGULA.

GRANADILLA. See PASSIFLORA.

GRAPES. See VITIS.

GRASS. The Englifh Grafs is of fo good a quality for walks or Grafs-plats, that if they be kept in good order, they have that exquifite beauty that they cannot come up to in France, and feveral other countries. But green walks and green plats are, for the moft part, not made by fowing the Grafs-feed, but by laying turfs; and, indeed, the turfs from a fine common or down, are much preferable to fown Grafs.

In fowing a fine green plat, there is a difficulty in getting good feed; it ought not to be fuch as is taken out of the hay-loft without diftinction; for that feed fhooting too high and making large ftalks, the lower part will be naked and bare; and although it be mowed ever fo often, it will never make handfome Grafs; but, on the contrary, will come to nothing but tufts of weeds and Quick-grafs, very little better than that of the common fields.

If walks or plats be made by fowing, the beft way is to procure the feed from thofe paftures where the Grafs is naturally fine and clear, or elfe the trouble of keeping it from fpiry and benty Grafs will be very great, and it will fcarce ever look handfome.

In order to fow Grafs-feed, the ground muft be firft dug or broken up with a fpade; and when it has been dreffed and laid even, it muft be very finely raked over, and all the clods and ftones taken off, and covered over an inch thick with good mould, to facilitate the growth of the feed; this being done, the feed is to be fown pretty thick, that it may come up clofe and fhort; and it muft be raked over again to bury and cover the feed, that if the weather fhould happen to be windy, it may not be blown away.

As to the feafon of fowing Grafs, the middle or latter end of Auguft is a good time, becaufe the feed naturally requires nothing but moifture to make it grow: if be not fown till the latter end of February, or the beginning of March, if the weather proves dry, it will not fo foon make the walks or quarters green. It is alfo beft to fow it in a mild day, and inclining to rain; for that, by finking down the feed in the earth, will caufe it to fhoot the fooner. But where Grafs is fown in gardens, either for lawns or walks, there fhould always be a good quantity of the White Trefoil or Dutch Clover fown with it, for this will make a fine turf much fooner than any other fown Grafs, and will continue a better verdure than any of the Grafs tribe.

After the feed is well come up, and the Grafs is very thick and of a beautiful green, it will require a conftant care to keep it in order: this confifts in mowing the Grafs often, for the oftener it is mowed, the thicker and handfomer it grows; it muft alfo be rolled with a cylinder or roller of wood, to level it as much as poffible.

If Grafs be neglected, it will run into Quick-grafs and weeds; and if it does fo, there is no way to recover it, but either by fowing it, or laying it over again, and that once in every two years; but if the ground be well cleared from the roots of ftrong weeds, and the turf be taken from a fine level common, it will continue handfome for feveral years, provided it be well kept.

In order to keep Grafs-plats or walks handfome and in good order, in autumn you may fow fome frefh feed over any places that are not well filled, or where the Grafs is dead, to renew and furnifh them again; but there is nothing which improves Grafs fo much as conftant rolling and polling it, to deftroy wormcafts, and thereby the turf is rendered fine.

It is a general practice when turf is laid in gardens, to cover the furface of the ground under the turf, either with fand or very poor earth; the defign of this is to keep the Grafs fine, by preventing its growing too rank. This is proper enough for very rich ground, but is not fo for fuch land as is but middling or poor; for when this is practifed in fuch places, the Grafs will foon wear out, and decay in patches.

When turf is taken from a common or down, there fhould be regard had to the cleannefs of it, and not to take fuch as is full of weeds: for it will be a very tedious piece of work, to weed them out after the turf is laid; and unlefs this is done, the Grafs will never appear handfome.

Where turf is defigned to remain for years without renewing, there fhould be dreffing laid upon it every other year, either of very rotten dung, afhes, or, where it can be eafily procured, very rotten tan, is a good dreffing for Grafs; but thefe dreffings fhould be laid on early in winter, that the rain may wafh them into the ground, before the drought of the fpring comes on, otherwife they will occafion the Grafs to burn when the warmth of fummer begins. Where Grafs is fo dreffed, and kept well rolled and mowed, it may be kept very beautiful for many years; but where it is not dreffed or fed with fheep, it will rarely continue handfome more than eight or ten years.

GRATIOLA. Lin. Gen. Plant. 27. Raii Meth. Plant. 90. Digitalis. Tourn. Inft. R. H. 165. Hedge Hyffop.

The CHARACTERS are,

*The flower hath a permanent empalement, which is cut into five parts; it hath one petal of the grinning kind, with a tube longer than the empalement, cut at the top into four fmall fegments, the upper being broader and indented at the end where it is reflexed, the other three are erect and equal. It hath five awl-fhaped ftamina, three of which are fhorter than the petal, and fteril; the other two are longer, and adhere to the tube of the petal; thefe are fruitful in male duft; they are terminated by roundifh fummits. In the center is fituated a conical germen, fupporting an erect ftyle, crowned by a ftigma with two lips, which clofe after being fœcundated. The germen afterward becomes an oval capfule ending in a point, having two cells which are filled with fmall feeds.*

This genus of plants is ranged in the firft fection of Linnæus's fecond clafs, intitled Diandria Monogynia, which includes thofe plants whofe flowers have but two ftamina and one ftyle, for he does not efteem the three barren ftamina as worthy notice.

The SPECIES are,

1. GRATIOLA (*Officinalis*) floribus pedunculatis, foliis lanceolatis ferratis. Lin. Mat. Med. 18. *Hedge Hyffop with flowers ftanding on foot-ftalks, and fpear-fhaped leaves.* Digitalis minima Gratiolata dicta. Mor. Hift. 2. 479. *Leaft Foxglove, called Gratiola.*

2. GRATIOLA (*Virginiana*) foliis lanceolatis obtufis fub dentatis. Flor. Virg. 6. *Hedge Hyffop with obtufe indented leaves.*

3. GRATIOLA (*Peruviana*) floribus fubfeffilibus. Lin. Sp. Plant. 17. *Hedge Hyffop with flowers fitting clofe to the branches.* Gratiola latiore folio flore albo. Feuill. Peruv.

The firft fort grows naturally on the Alps, and other mountainous parts of Europe. This hath a thick, flefhy, fibrous, creeping root, which propagates very much when planted in a proper foil and fituation, from which arife feveral upright fquare ftalks, near a foot high, garnifhed with narrow fpear-fhaped leaves placed oppofite; the flowers are produced on the fide of the ftalks at each joint, they are fhaped like thofe of the Foxglove, but are fmall, and of a pale yellowifh colour. Thefe appear in July, but are feldom fucceeded by feeds in England.

It is eafily propagated by parting of the roots; the beft time to do this is in the autumn, when the ftalks decay; the plants fhould have a moift foil and a fhady fituation, in which they will thrive exceedingly; but in dry ground they often decay in fummer, unlefs they are plentifully watered.

This ſtands in the liſt of medicinal plants, but is very rarely uſed in England, though it is recommended by ſome good writers as a purger of ſerous and choleric humours.

The ſecond ſort grows naturally in North America, from whence I received the ſeeds. This grows naturally in moiſt places, where it riſes more than a foot high, but in England I have not ſeen it more than eight inches; the leaves are blunt, and indented at their extremities; the flowers are white, and come out from the ſide of the ſtalks, like thoſe of the other, but are not ſucceeded by ſeeds here. It may be propagated in the ſame manner as the firſt ſort, and requires the ſame treatment.

The ſeeds of the third ſort were ſent me from Carthagena, where it was found growing naturally in places where there had been ſtanding waters, which were then dried up; this plant grew about nine inches high, with a weak ſtalk, and the leaves placed oppoſite; they were about three quarters of an inch long, and half an inch broad, ſawed on their edges; the flowers came out ſingle on each ſide the ſtalk; they were white, and much ſmaller than thoſe of the firſt ſort, but were not ſucceeded by ſeeds, ſo the plant was loſt here.

GRAVEL and Graſs are naturally ornaments to a country-ſeat, and the glory of the Engliſh gardens, and things in which we excel all other nations, as France, Holland, Flanders, &c.

There are different ſorts of Gravel, but for thoſe who can conveniently have it, I approve of that Gravel on Blackheath, as preferable to moſt that we have in England; it conſiſting of ſmooth even pebbles, which, when mixed with a due quantity of loam, will bind exceeding cloſe, and look very beautiful, and continue handſome longer than any other ſort of Gravel which I have ſeen.

Some recommend a ſort of iron-mould Gravel, or Gravel with a little binding loam amongſt it, than which nothing, they ſay, binds better when it is dry; but in wet weather it is apt to ſtick to the heels of one's ſhoes, and will never appear handſome.

Sometimes loam is mixed with Gravel that is over ſandy or ſharp, which muſt be very well blended together, and let lie in heaps, after which it will bind like a rock.

There are many kinds of Gravel which do not bind, and thereby cauſe a continual trouble of rolling, to little or no purpoſe; as for ſuch,

If the Gravel be looſe or ſandy, you ſhould take one load of ſtrong loam, to two or three of Gravel, and ſo caſt them well together, and turn this mixture over three or four times, that they may be well blended together; if this is done in proper porportion, it will bind well, and not ſtick to the feet in wet weather.

There are many different opinions about the choice of Gravel; ſome are for having the Gravel as white as poſſible, and in order to make the walks more ſo, they roll them well with ſtone rollers, which are often hewn by the maſons, that they may add a whiteneſs to the walks; but this renders it very troubleſome to the eyes, by reflecting the rays of light ſo ſtrongly, therefore this ſhould ever be avoided; and ſuch Gravel as will lie ſmooth, and reflect the leaſt, ſhould be preferred.

Some ſcreen the Gravel too fine, which is an error; for if it be caſt into a round heap, and the great ſtones only raked off, it will be the better.

Some are apt to lay Gravel-walks too round, but this is likewiſe an error, becauſe they are not ſo good to walk upon, and beſides, it makes them look narrow; one inch riſe is enough in a crown for a walk of five feet; and it will be ſufficient, if a walk be ten feet wide, that it lies two inches higher in the middle than it does on each ſide; if fifteen feet, three inches; twenty feet, four; and ſo in proportion.

For the depth of Gravel-walks, ſix or eight inches may do well enough, but a foot thickneſs will be ſufficient for any; but then there ſhould always be a depth of rubbiſh laid under the Gravel, eſpecially if the ground is wet; in which caſe there cannot be too much care to fill the bottom of the walks with large ſtones, flints, brick rubbiſh, chalk, or any other materials which can be beſt procured, which will drain off the moiſture from the Gravel, and prevent its being poachy in wet weather; but as it may be difficult in ſome places to procure a ſufficient quantity of theſe materials to lay in the bottom of the walks, ſo there may be a bed of Heath, or Furze, which ever can be procured at the leaſt expence, laid under the Gravel to keep it dry: and if either of theſe are uſed green, they will lie a long time, as they will be covered from air, and theſe will prevent the Gravel from getting down into the clay, and will always keep the Gravel dry; and where there is not this precaution in the firſt laying of the Gravel upon clay, the water being detained by the clay, will cauſe the Gravel to be poachy whenever there is much rain.

In making of Gravel-walks, there muſt be great regard had to the level of the ground, ſo as to lay the walks with eaſy deſcents toward the low parts of the ground, that the wet may be drained off eaſily; for when this is omitted, the water will lie upon the walks a conſiderable time after hard rains, which will render them unfit for uſe, eſpecially when the ground is naturally wet or ſtrong; but where the ground is level, and there are no declivities to carry off the wet, it will be proper to have ſink-ſtones laid by the ſides of the walks, at convenient diſtances, to let off the wet; and where the ground is naturally dry, that the water will ſoon ſoak away, the drains of the ſink-ſtones may be contrived ſo as to convey the water in ſeſſpools, from which the water will ſoak away in a ſhort time; but in wet land there ſhould be under-ground drains, to convey the wet off, either into ponds, ditches, or the neareſt place to receive it; for where this is not well provided for, the walks will never be ſo handſome or ſo uſeful.

The month of March is the propereſt time for laying Gravel; it is not prudent to do it ſooner, or to lay walks in any of the winter months before that time. Some indeed turn up Gravel-walks in ridges in December, in order to kill the weeds; but this is very wrong, for, beſides that it deprives them of the benefit of them all the winter, it does not anſwer the end for which it is done, but rather the contrary; for though it does kill the weeds for the preſent, yet it adds a fertility to them, as to the great future increaſe of both them and Graſs.

If conſtant rolling them after the rains and froſt will not effectually kill the weeds and moſs, you ſhould turn the walks in March, and lay them down at the ſame time.

In order to deſtroy worms that ſpoil the beauty of Gravel, or Graſs-walks, ſome recommended the watering them well with water, in which Walnut-tree leaves have been ſteeped, and made very bitter, eſpecially thoſe places moſt annoyed with them; and this they ſay, as ſoon as it reaches them, will make them come out haſtily, ſo that they may be gathered; but if, in the firſt laying of the walks, there is a good bed of lime rubbiſh laid in the bottom, it is the moſt effectual method to keep out the worms, for they do not care to harbour near lime.

GREEN-HOUSE, or Conſervatory.

As of late years there have been great quantities of curious exotic plants introduced into the Engliſh gardens, ſo the number of Green-houſes, or Conſervatories, have increaſed; and not only a greater ſkill in the management and ordering of theſe plants has increaſed therewith, but alſo a greater knowledge of the ſtructure and contrivance of theſe places, ſo as to render them both uſeful and ornamental, hath been acquired; and ſince there are many particulars to be obſerved in the conſtruction of theſe houſes, whereby they will be greatly improved, I thought it neceſſary not only to give the beſt inſtructions for this I was capable of, but alſo to give a deſign of one in the manner I would chuſe to erect it, upon the annexed copper-plate.

4 H.

# Plan of the Green house.

A. The Ground plan of the Green-house.

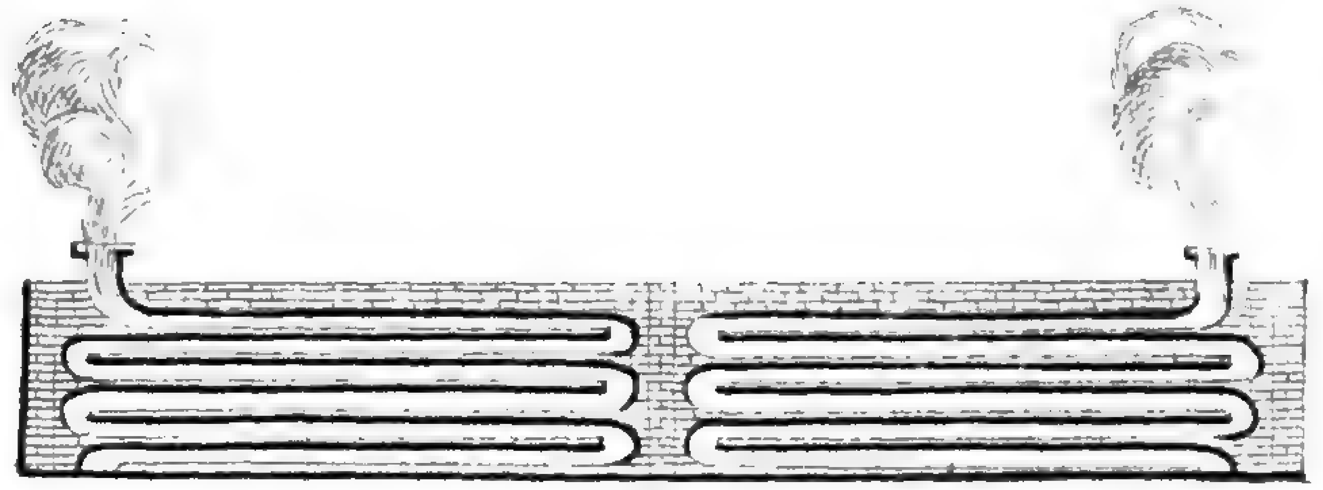
B.B. The Ground Plan of the two Stoves.

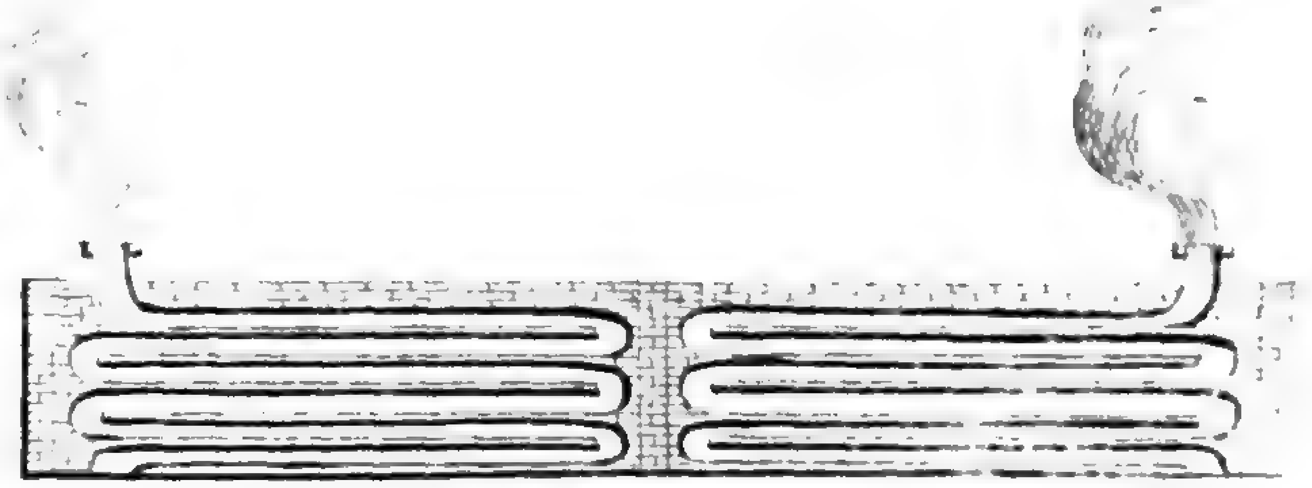
C.C.C. The Sheds behind the Green-house and Stoves.

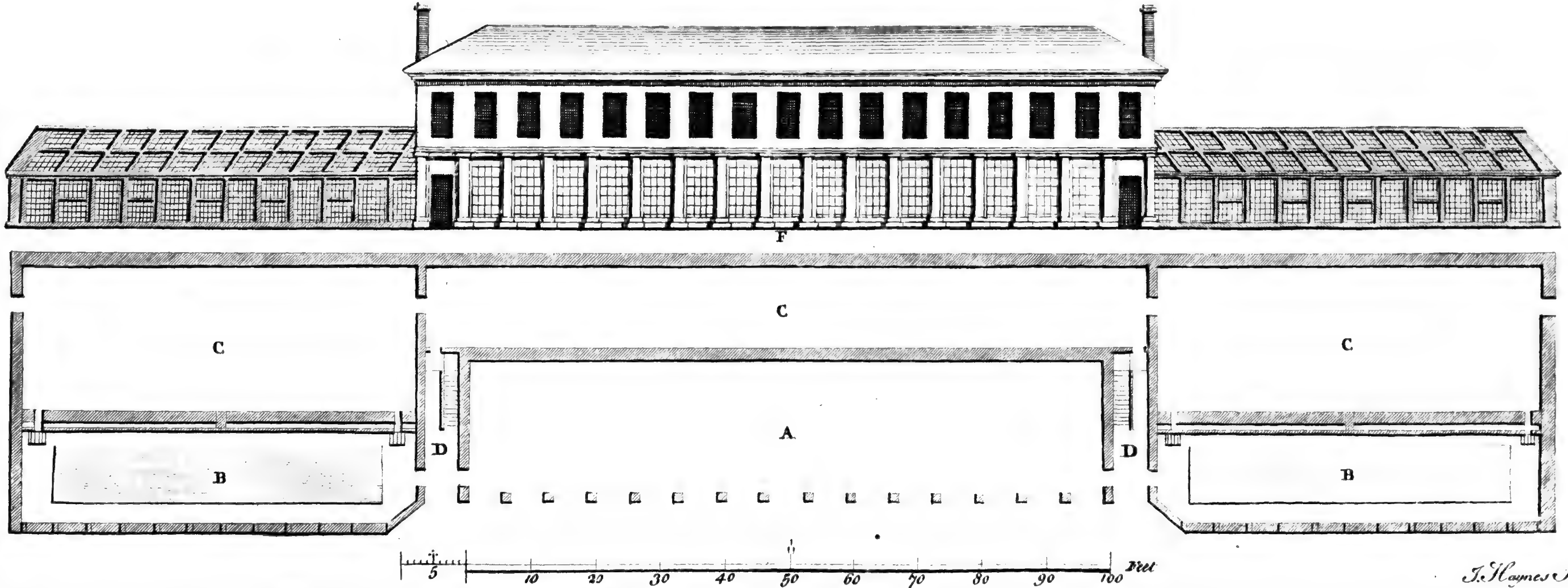
D.D. The passage of communication between the Green-house and Stoves, where the Stairs are placed which lead to the Rooms over the Green-house.

E.E. The Section of the Flues in the back of the Stoves.

F. The upright of the Green-house and Stoves.




J. Haynes Sculp.

As to the length of theſe houſes, that muſt be proportioned to the number of plants they are to contain, or the fancy of the owner; but their depth ſhould never be greater than their height in the clear, which in ſmall, or middling houſes, may be ſixteen or eighteen feet, but for large ones, from twenty to twenty-four feet, is a good proportion; for if the Green-houſe is long, and too narrow, it will have a bad appearance both within and without, nor will it contain ſo many plants, if proper room be allowed for paſſing in front, and on the backſide of the ſtands on which the plants are placed; and on the other hand, if the depth of the Green-houſe is more than twenty-four feet, there muſt be more rows of plants placed to fill the houſe, than can with conveniency be reached in watering and cleaning; nor are houſes of too great depth ſo proper for keeping of plants, as thoſe of moderate ſize.

The windows in front ſhould extend from about one foot and a half above the pavement, to within the ſame diſtance of the cieling, which will admit of a cornice round the building, over the heads of the windows. As it is neceſſary to have theſe windows ſo long, it will be impoſſible to make them in proportion as to their breadth; for if in the largeſt buildings the ſaſhes are more than ſeven, or ſeven feet and a half broad, they will be ſo heavy and troubleſome to move up and down, as to render it very difficult for one perſon to perform; beſides, their weight will occaſion their ſoon decaying. There is alſo another inconvenience in having the windows too broad, which is that of fixing proper ſhutters to them, in ſuch a manner as that they may fall back cloſe to the piers, ſo as not to be incommodious, or when open to obſtruct any part of the rays of light from reaching the plants. The piers between theſe windows ſhould be as narrow as poſſible to ſupport the building, for which reaſon I ſhould chuſe to have them of ſtone, or of hard well-burnt bricks; for if they are built with fine rubbed bricks, thoſe are generally ſo ſoft, that the piers will require to be made thicker, and the building will be leſs ſtrong, eſpecially if there are any rooms over the Green-houſe; which is what I would always adviſe, as being of great uſe to keep the froſt out in very hard winters. If theſe piers are made of ſtone, I would adviſe them to be two feet and a half in diameter, worked as columns cylindrical, whereby the rays of the ſun will not be taken off, or obſtructed by the corners of the piers, which it would be if they were ſquare; but if they are built with bricks, it will be proper to make them three feet in front, otherwiſe they will be too weak to ſupport the building; theſe I would alſo adviſe to be ſloped off toward the inſide to admit the ſun.

At the back of the Green-houſe there may be erected a houſe for tools, and for many other purpoſes, which will be extremely uſeful, and will alſo prevent the froſt from entering the houſe on the backſide, ſo that the wall between theſe need not be more than two bricks and a half in thickneſs; whereas were it quite expoſed behind, it ſhould be at leaſt three bricks, or three and a half in thickneſs; and by this contrivance, if you are willing to make a handſome building, and to have a noble room over the Green-houſe, you may make the room over the tool-houſe, and carry up the ſtair-caſe in the back, ſo as not to be ſeen in the Green-houſe, and hereby you may have a room twenty-five or thirty feet in width, and of a proportionable length; and under this ſtair-caſe there ſhould be a private door into the green-houſe, at which the gardener may enter in hard froſty weather, when it will not be ſafe to open any of the glaſſes in the front. The floor of the Green-houſe, which ſhould be laid either with Bremen ſquares, Purbeck ſtone, or broad tiles, according to the fancy of the owner, muſt be raiſed two feet above the ſurface of the ground whereon the houſe is placed, which in dry ground will be ſufficient; but if the ſituation is moiſt and ſpringy, and thereby ſubject to damps, it ſhould be raiſed at leaſt three feet above the ſurface; and if the whole is arched with low brick arches under the floor, it will be of great ſervice in preventing the damps riſing in winter, which are often very hurtful to the plants, eſpecially in great thaws, when the air is often too cold to be admitted into the houſe, to take off the damps. Under the floor, about one foot from the front, I would adviſe a flue of one foot in width, and two feet deep, to be carried the whole length of the houſe, which may be returned againſt the back wall, and carried up in proper funnels adjoining to the tool-houſe, three times over each other, by which the ſmoke may paſs off. The fire-place may be contrived at one end of the houſe, and the door at which the fuel is put in, as alſo the aſh-grate, may be contrived to open into the tool-houſe, ſo that it may be quite hid from the ſight, and be in the dry, and the fuel may be laid in the ſame ſhed, whereby it will always be ready for uſe.

I ſuppoſe many people will be ſurpriſed to ſee me direct the making of flues under a Green-houſe, which has been diſuſed ſo long, and by moſt people thought of ill conſequence, as indeed they have often proved, when under the direction of unſkilful managers, who have thought it neceſſary, whenever the weather was cold to make fires therein; but however injurious flues may have been under ſuch management, yet when ſkilfully looked after they will be found of very great ſervice; for though perhaps it may happen, that there will be no neceſſity to make any fires in them for two or three years together, as when the winters prove mild there will not, yet in very hard winters they will be extremely uſeful to keep out the froſt, which cannot be effected any other way, but with great trouble and difficulty.

Withinſide of the windows, in front of the Green-houſe, you ſhould have good ſtrong ſhutters, which ſhould be made with hinges to fold back, that they may fall back quite cloſe to the piers, that the rays of the ſun may not be obſtructed thereby. Theſe ſhutters need not be above an inch and a half thick, or little more when wrought, which if made to join cloſe, will be ſufficient to keep out our common froſt; and when the weather is ſo cold as to endanger the freezing in the houſe, it is but making a fire in the oven, which will effectually prevent it; and without this conveniency it will be very troubleſome, as I have often ſeen, where perſons have been obliged to nail mats before their windows, or to ſtuff the hollow ſpace between the ſhutters, and the glaſs with Straw, which when done, is commonly ſuffered to remain till the froſt goes away; which if it ſhould continue very long, the keeping the Green-houſe cloſely ſhut up, will prove very injurious to the plants; and as it frequently happens, that we have an hour or two of the ſun-ſhine in the middle of the day, in continued froſts, which is of great ſervice to plants, when they can enjoy the rays thereof through the glaſſes, ſo when there is nothing more to do than to open the ſhutters, which may be performed in a very ſhort time, and as ſoon ſhut again when the ſun is clouded, the plants may have the benefit thereof whenever it appears; whereas, where there is ſo much trouble to uncover, and as much to cover again, it would take up the whole time in uncovering and ſhutting them up, and thereby the advantage of the ſun's influence would be loſt. Beſides, where there is ſo much trouble required to keep out the froſt, it will be a great chance if it be not neglected by the gardener; for if he be not as fond of preſerving his plants, and as much in love with them as his maſter, this labour will be thought too great by him; and if he takes the pains to cover the glaſſes up with mats, &c. he will not care to take them away again until the weather alters, ſo that the plants will be ſhut up cloſe during the whole continuance of the froſt.

There are ſome people who commonly make uſe of pots filled with charcoal to ſet in their Green-houſe in very ſevere froſts, but this is very dangerous to the perſons who attend theſe fires, and I have ſometimes known they have been almoſt ſuffocated therewith, and at the ſame time they are very injurious to the

plants; nor is the trouble of tending upon these small, and the many hazards to which the use of these fires is liable, have justly brought them into disuse with all skilful persons; and as the contrivances of flues, and of the fires, are but small charges in their first erecting, they are much to be preferred to any other method for warming the air of the house.

The wall on the back part of the house should be either laid over with stucco, or plastered with mortar, and white-washed, for otherwise the air in severe frost will penetrate through the walls, especially when the frost is attended with a strong wind, which is often the case in most severe winters. There are some persons who are at the expence of wainscotting their Green-houses, but when this is done, it is proper to plaster the walls with lime and hair behind the wainscot, to keep out the cold; and when they are lined with wainscot, they should be painted white, as should the cieling, and every part withinside of the house; for this reflects the rays of light in a much greater quantity than any other colour, and is of signal service to plants, especially in the winter, when the house is pretty much closed, and but a small share of light is admitted through the windows; for at such times I have observed, that in some Green-houses which have been painted black, or of a dark colour, the plants have cast most of their leaves.

Where green-houses are built in such places as will not admit of rooms over them, or the person is unwilling to be at the expence of such buildings, there must be care taken to keep out the frost from entering through the roof. To prevent which it will be very proper to have a thickness of Reeds, Heath, or Furz, laid between the cieling and the tiles; in the doing of which there must be care taken in framing the joists, so as to support these, that their weight may not lie upon the ceiling, which might endanger it; for these should be laid a foot thick at least, and as smooth as possible, and fastened down well with laths to prevent their rising, and then covered over with a coat of lime and hair, which will keep out the air, and also prevent mice and other vermin from harbouring in them, which, if left uncovered, they would certainly do. For want of this precaution there are many Green-houses built, which will not keep out the frost in hard winters, and this is many times attributed to the glasses in front admitting the cold, when the fault is in the roof; for where there is only the covering, either of tiles or slates, over the cieling, every severe frost will penetrate through them.

In this Green-house you should have tressels, which may be moved out and into the house, upon which you should fix rows of planks, so as to place the pots or tubs of plants in regular rows one above another, whereby the heads of the plants may be so situated, as not to interfere with each other. The lowest row of plants, which should be the forwardest towards the windows, should be placed about four feet therefrom, that there may be a convenient breadth left next the glasses to walk in front; and the rows of plants should rise gradually from the first, in such a manner that the heads of the second row should be entirely advanced above the first, the stems only being hid thereby; and at the back side of the house there should be allowed a space of at least five feet, for the conveniency of watering the plants, as also to admit of a current of air round them, that the damps occasioned by the perspiration of the plants, may be the better dissipated, which, by being pent in too closely, often occasions a mouldiness upon the tender shoots and leaves, and when the house is close shut up, this stagnating rancid vapour is often very destructive to the plants; for which reason also you should never croud them too close to each other, nor should you ever place Sedums, Euphorbiums, Torch Thistles, and other tender succulent plants, amongst Oranges, Myrtles, and other Evergreen trees; for, by an experiment which I made, anno 1729, I found that a Sedum placed in a Green-house among such trees, almost daily increased its weight, although there was no water given to it the whole time; which increase of weight was owing to the moisture imbibed from the air, which, being replete with the rancid vapours perspired from the other plants, occasioned the leaves to grow pale, and in a short time they decayed and dropped off; which I have often observed has been the case with many other succulent plants, when placed in those houses which were filled with many sorts of Evergreen trees, that required to be frequently watered.

Therefore, to avoid the inconvenience which attends the placing of plants of very different natures in the same house, it will be very proper to have two wings added to the main Green-house, which, if placed in the manner expressed in the annexed plan, will greatly add to the beauty of the building, and also collect a greater share of heat. In this plan the Green-house is placed exactly fronting the south, and one of the wings faces the south-east, and the other the south-west; so that from the time of the sun's first appearance upon any part of the building, until it goes off at night, it is constantly reflected from one part to the other, and the cold winds are also kept off from the front of the main Green-house hereby; and in the area of this place you may contrive to place many of the most tender exotic plants, which will bear to be exposed in the summer season; and in the spring, before the weather will permit you to set out the plants, the beds and borders of this area may be full of Anemonies, Ranunculuses, early Tulips, &c. which will be past flowering, and the roots fit to take out of the ground by the time you carry out the plants, which will render this place very agreeable during the spring season, when the flowers are blown: and here you may walk and divert yourself in a fine day, when perhaps the air in most other parts of the garden will be too cold for persons not much used thereto, to take pleasure in being out of the house.

In the center of this area may be contrived a small bason for water, which will be very convenient for watering of plants, and add much to the beauty of the place; besides the water being thus situated, will be softened by the heat which will be reflected from the glasses upon it, whereby it will be rendered much better than raw cold water for these tender plants.

The two wings of the building should be contrived so as to maintain plants of differing degrees of hardiness, which must be effected by the situation and extent of the fire-place, and the manner of conducting the flues, a particular account of which will be exhibited under the article of STOVES. But I would here observe, that the wing facing the south-east should always be preferred for the warmest stove, its situation being such, as that the sun, upon its first appearance in the morning, shines directly upon the glasses, which is of great service in warming the air of the house, and adding life to the plants, after having been shut up during the long nights in the winter season. These wings being in the draught annexed, allowed sixty feet in length, may be divided in the middle by partitions of glass, with glass-doors to pass from one to the other. To each of these there should be a fire-place, with flues carried up against the back wall, through which the smoke should be made to pass, as many times the length of the house, as the height will admit of the number of flues; for the longer the smoke is in passing, the more heat will be given to the house, with a less quantity of fuel, which is an article worth consideration, especially where fuel is dear. By this contrivance you may keep such plants as require the same degree of heat in one part of the house, and those which will thrive in a much less warmth in the other part, but this will be more fully explained under the article of STOVES.

The other wing of the house, facing the south-west, may also be divided in the same manner, and flues carried through both parts, which may be used according to the seasons, or the particular sorts of plants which are placed therein; so that here will be four divisions in the wings, each of which may be kept up

to

to a different degree of warmth, which, together with the Green-houſe, will be ſufficient to maintain plants from all the ſeveral countries of the world; and without having theſe ſeveral degrees of warmth, it will be impoſſible to preſerve the various kinds of plants from the ſeveral parts of Africa and America, which are annually introduced into the Engliſh gardens; for when plants from different countries are placed in the ſame houſe, ſome are deſtroyed for want of heat, while others are forced and ſpoiled by too much of it; and this is often the caſe in many places, where there are large collections of plants.

In the building theſe wings, if there are not ſheds running behind them their whole length, the walls ſhould not be leſs than three bricks thick; and if they are more, it will be better, becauſe where the walls are thin, and expoſed to the open air, the cold will penetrate them, and when the fires are made, the heat will come out through the walls, ſo that it will require a larger quantity of fuel, to maintain a proper temperature of warmth in the houſe. The back part of theſe houſes having ſloping roofs, which are covered either with tiles or ſlates, ſhould alſo be lined with Reeds, &c. under the covering, as is before directed for the Green-houſe, which will keep out the cold air, and ſave a great expence of fuel; for the cloſer and better theſe houſes are built, and the glaſſes of the ſlope, as alſo in front, well guarded by ſhutters, or Reeds in hard froſt, the leſs fuel will be required to warm the houſes; ſo that the firſt expence in building theſe houſes properly, will be the cheapeſt, when the after-expence of fires is taken into conſideration.

The ſloping glaſſes of theſe houſes ſhould be made to ſlide and take off, ſo that they may be drawn down more or leſs in warm weather, to admit air to the plants; and the upright glaſſes in front may be ſo contrived, as that every other may open as doors upon hinges, and the alternate glaſſes may be divided into two; the upper part of each ſhould be contrived ſo as to be drawn down like ſaſhes, ſo that either of theſe may be uſed to admit air, in a greater or leſs proportion, according as there may be occaſion.

But beſides the Conſervatories here mentioned, it will be proper to have a deep hot-bed frame, ſuch as is commonly uſed to raiſe large annuals in the ſpring, into which may be ſet pots of ſuch plants as come from Carolina, Virginia, &c. while the plants are too ſmall to plant in the open air, as alſo many other ſorts from Spain, &c. which require only to be ſcreened from the violence of froſts, and ſhould have as much free air as poſſible in mild weather; which can be no better effected than in one of theſe frames, where the glaſſes may be taken off every day when the weather will permit, and put on every night; and in hard froſts the glaſſes may be covered with mats, Straw, Peas-haulm, or the like, ſo as to prevent the froſt from entering to the pots to freeze the roots of the plants, which is what will many times utterly deſtroy them, though a ſlight froſt pinching the leaves or ſhoots, very ſeldom does them much harm; if theſe pits are ſunk a foot or more, below the ſurface of the ground, they will be the better, provided the ground is dry, otherwiſe they muſt be wholly above ground; the ſides of this frame ſhould be built with brick, with a curb of wood laid round on the top of the wall, into which the gutters, on which the glaſſes ſlide may be laid; the back wall of this frame may be four feet high, and two bricks and a half thick, the front one foot and a half; the width of the inſide of the frame about ſix feet, and the length in proportion to the number of plants to be containd therein.

GREWIA. Lin. Gen. Plant. 914. This genus of plants was conſtituted by Dr. Linnæus, who gave it this name in honour of Dr. Grew, F. R. S. who publiſhed a curious book of the anatomy of plants.

The CHARACTERS are,

*The flower hath a thick leathery empalement, compoſed of five ſpear-ſhaped leaves, which are coloured, and ſpread open. The flower hath five petals of the ſame form, but ſmaller, and are indented at their baſe, where is ſituated a ſcaly nectarium to each petal, which is thick and incurved, inclining to the border, to which the ſtyle is fixed; it hath many ſtamina, which are briſtly, the length of the petals, terminated by roundiſh ſummits. In the center is ſituated the roundiſh germen, which is lengthened to a column, ſupporting a ſlender ſtyle, crowned by a four-cornered obtuſe ſtigma. The germen afterward becomes a four-cornered berry with four cells, each incloſing one globular ſeed.*

This genus of plants is ranged in the ſeventh ſection of Linnæus's twentieth claſs, which includes thoſe plants whoſe flowers have many ſtamina joined to the ſtyle, forming a column of one body.

The SPECIES are,

1. GREWIA (*Occidentalis*) foliis ſubovatis crenatis. *Grewia with oval crenated leaves.* Ulmi facie arbuſcula Æthiopica, ramulis alatis, floribus purpuraſcentibus. Hort. Amſt. 1. p. 165. tab. 85. *Ethiopian Shrub with the appearance of Elm, winged branches, and purpliſh flowers.*
2. GREWIA (*Africanus*) foliis ovato-lanceolatis ſerratis. *Grewia with oval ſpear-ſhaped leaves which are ſawed.*

The firſt ſort has been long preſerved in many curious gardens, both in England and Holland, and is figured by Dr. Plukenet, by the title of Ulmifolia arbor Africana baccifera, floribus purpureis; but by Dr. Boerhaave it was ſuppoſed to be one of Father Plumier's American plants, intitled Guidonia Ulmi foliis, flore roſeo; but the characters of this do not at all agree with thoſe of the Guidonia, that particular ſpecies of this genus being in the royal garden at Paris, which is extremely different from this. It grows naturally at the Cape of Good Hope, from whence I have received the ſeeds, which have ſucceeded in the Chelſea garden.

This will grow to the height of ten or twelve feet, and has a ſtem and branches very like thoſe of the ſmall-leaved Elm, the bark being ſmooth, and of the ſame colour as that of Elm when young; the leaves are alſo very like thoſe of the Elm, and fall off in winter; the flowers are produced ſingly along the young branches from the wings of the leaves, which are of a bright purple colour; theſe appear toward the end of July, and continue in Auguſt, and the beginning of September, but are never ſucceeded by fruit in this country.

This may be propagated from cuttings or layers; the cuttings ſhould be taken off, and planted in April, before the buds ſwell, for they do not ſucceed well after; theſe cuttings ſhould be planted in ſmall pots filled with loamy earth, and the pots ſhould be plunged into a moderate hot-bed of tanners bark, where, if they are duly watered, and in the heat of the day ſhaded from the ſun, they will take good root in about two months, and may then be gradually inured to bear the open air, into which they ſhould be removed in June, and placed in a ſheltered ſituation, where they may remain till autumn, when they muſt be removed into the green-houſe; the beſt time to lay down the layers of this plant is in the ſpring, before the buds come out, and theſe will be rooted by the ſame time the following year, when they may be cut off from the old plants, and planted each into a ſeparate pot filled with a ſoft loamy ſoil.

The beſt time to remove or tranſplant this plant is, either in the ſpring, juſt before the buds begin to ſwell, or in autumn, when the leaves begin to drop; for in ſummer, when the plants are in full leaf, it will be very improper to diſturb them.

In winter theſe plants ſhould be placed in the green-houſe, for they are too tender to live abroad in England; but they ſhould have as much free air as poſſible in mild weather, for they only require to be protected from froſt, and after their leaves are fallen, they will require very moderate watering; but in ſummer they ſhould be conſtantly watered three or four times a week in dry weather, and placed in a ſheltered ſituation, with other hardy green-houſe plants, where they will add to the variety.

The ſeeds of the ſecond ſort were ſent me by Monſ. Richard, gardener to the King of France at Marſeilles,

ſeilles, which were brought from Senegal in Africa, by Monſ. Adanſon; this riſes in this country with a ſhrubby ſtalk five or ſix feet high, ſending out many lateral branches, which are covered with a brown hairy bark, and garniſhed with oval ſpear-ſhaped leaves, about two inches long, and one inch and a quarter broad in the middle, having ſeveral tranſverſe veins from the midrib to the ſides, where they are ſawed; theſe are placed alternately on the branches, having very ſhort foot-ſtalks, and continue in verdure through the year; the plants are young, ſo have not as yet flowered in England, therefore I can give no further account of them.

This ſort is tender, ſo will not live through the winter in England, unleſs it is placed in a warm ſtove; nor do thoſe plants thrive well, which are placed on ſhelves in the dry ſtove; therefore the only method to have them ſucceed, is to place them in the bark-bed in the tan-ſtove, where the plants have grown very well for ſome years. In ſummer theſe plants require a good ſhare of free air to be admitted to them, and ſhould have water three or four times a week in warm weather; but in winter they muſt be ſparingly watered, and require to be kept warm.

GRIAS. Lin. Gen. 659. Anchovy Pear.

The Characters are,

*The empalement is cup-ſhaped, of one leaf, cut into four equal ſegments; the flower has four leathery concave petals, and many briſtly ſtamina which are inſerted to the receptacle, terminated by roundiſh ſummits, and a depreſſed germen immerſed in the empalement, having no ſtyle, crowned by a four-cornered croſs-ſhaped ſtigma, which afterward becomes a fleſhy berry, with a large nut having eight furrows, and one cell containing a large pointed ſeed.*

This genus of plants is ranged in the firſt order of Linnæus's thirteenth claſs, intitled Polyandria Monogynia, the flower having many ſtamina and one ſtyle.

We know but one Species of this genus, viz.

1. Grias (*Cauliflora*). Lin. Sp. 732. *Anchovy Pear.* Palmis affinis malus Perſica maxima, caudice non ramoſa, foliis longiſſimis, flore tetrapetalo pallide luteo, fructu ex arboris trunco prodeunte. Sloan. Hiſt. Jam. 2. p. 122.

This plant grows naturally in Jamaica, and in many other warm parts of America, where it riſes with a ſtrait undivided ſtem about twenty feet high, having a gray bark, marked with the veſtigia of the fallen leaves; the top of the ſtem is garniſhed with leaves near two feet long and ſix inches broad, ſitting cloſe without foot-ſtalks; theſe have one longitudinal midrib with ſeveral tranſverſe veins, and are of a lucid green; the flowers come out from the ſtem below the leaves, having no foot-ſtalk, in ſome places one, and in others they are in cluſters, each having four thick yellow petals, and a great number of ſtamina which are fixed to the empalement of the flower; the germen is included in the empalement, which afterward becomes a large oval Plumb, including a large pointed nut.

The fruit of this tree is by the Spaniards in the Weſt-Indies pickled and ſent to old Spain as preſents, who eat them as Mango's, and ſome ſay the ripe fruit is eaten as a deſart.

The plant is propagated by planting of the ſtones, which ſhould be put into the ground ſoon after the fruit is gathered, and the plants muſt be conſtantly kept in the bark-bed in the ſtove, otherwiſe it will not thrive in this country.

GRONOVIA. Martyn. Cent. 4. Lin. Gen. Plant. 284. The name of this genus was given by the late Dr. Houſton, in honour of Dr. Gronovius, a learned botaniſt at Leyden.

The Characters are,

*The flower hath a permanent empalement of one leaf, which is coloured, and cut to the middle into five ſegments. It hath five ſmall petals which are fixed to the cuts of the empalement, and five hairy ſtamina the length of the petals, which are inſerted into the empalement, and are placed alternate with the petals, terminated by twin ſummits which are erect. The germen is ſituated under the flower, ſupporting a ſlender ſtyle which is longer than the ſtamina, crowned by an obtuſe ſtigma. The germen afterward becomes a roundiſh-coloured fruit with one cell, incloſing one large roundiſh ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, intitled Pentandria Monogynia, which includes thoſe plants whoſe flowers have five ſtamina and one ſtyle.

We know but one Species of this genus, viz.

Gronovia (*Scandens*). Hort. Cliff. 74. Gronovia ſcandens lappacea, pampinea fronde. Houſt. *Climbing burry Gronovia.*

This plant was diſcovered by the late Dr. Houſtoun at La Vera Cruz, from whence he ſent the ſeeds to Europe, which have ſucceeded in many gardens. It is an annual plant, which ſends forth many trailing branches like thoſe of the Cucumber, which are cloſely ſet with broad green leaves, in ſhape like thoſe of the Vine; but they are covered with ſmall ſpines on both ſides, which ſting like the Nettle: the branches have many tendrils or claſpers, by which they faſten themſelves to whatever plants they grow near, and will riſe to the height of ſix or eight feet; the flowers are ſmall, and of a greeniſh yellow colour, ſo make no great appearance.

This being a very tender plant, muſt be raiſed on a hot-bed early in the ſpring, and afterward placed in the bark-ſtove, and treated in the ſame way as the Momordica, with which management it will produce ripe ſeeds; but this having neither uſe or beauty, is rarely cultivated but in botanic gardens for the ſake of variety.

GROSSULARIA. Raii Meth. Plant. 145. Tourn. Inſt. R. H. 639. tab. 409. Ribes. Lin. Gen. Plant. 247. Gooſeberry; in French, *Groſelier.*

This and the Currant are by Tournefort placed in the ſame genus, under the title of Groſſularia; they are alſo joined together by Dr. Linnæus, under the title of Ribes, for in their principal characters they agree; ſo according to the ſyſtems of botany, they ſhould be included in the ſame genus; but this may not be quite ſo proper in a body of gardening, for as theſe fruits have always paſſed under different denominations, ſo if they are here joined together, it may occaſion ſome confuſion among thoſe who do not enter into the ſtudy of botany. Mr. Ray has ſeparated theſe into different genera, and makes the difference of Gooſeberry from the Currant, to conſiſt in the firſt having thorns on the branches, and the fruit growing ſingle; whereas the latter hath ſmooth branches, and the fruit growing in long bunches; and although theſe differences may not be ſtrictly ſcientific, yet it may be allowed ſufficient to diſtinguiſh them among gardeners.

The Characters are,

*The flower has a permanent empalement of one leaf, cut into five ſegments at the top, which is ſwollen, concave, and coloured. It hath five ſmall, obtuſe, erect petals, which riſe from the border of the empalement; and five awl-ſhaped ſtamina, which are inſerted into the empalement, terminated by compreſſed proſtrate ſummits. The germen is ſituated below the flower, having a bifid ſtyle crowned by an obtuſe ſtigma, and afterward becomes a globular berry having a navel, with one cell, which is filled with roundiſh compreſſed ſeeds included in a pulp.*

This genus of plants is ranged by Dr. Linnæus in the firſt ſection of his fifth claſs, intitled Pentandria Monogynia, which contains thoſe plants whoſe flowers have five ſtamina and one ſtyle.

The Species are,

1. Grossularia (*Reclinatum*) ramis reclinatis aculeatis, pedunculis triphyllis. *Gooſeberry with reclining branches armed with ſpines, and a three-leaved foot-ſtalk.* Groſſularia ſpinoſa, fructu obſcure purpuraſcente. J. B. 1. 48. *Prickly Gooſeberry with a dark purpliſh fruit.*

2. Grossularia (*Hirſuta*) ramis aculeatis, baccis hirſutis. *Gooſeberry with prickly branches and hairy berries.* Groſſularia fructu maximo hiſpido margaritarum fere colore. Raii Hiſt. 1484. *Gooſeberry with a very large rough fruit, almoſt of a pearl colour.*



3. Gros-

3. Grossularia (*Uva Crispa*) ramis aculeatis, erectis, baccis glabris. *Gooseberry with erect prickly branches, and smooth berries.* Grossularia simplici acino, vel spinosa sylvestris. C. B. P. 455. *Gooseberry with a single fruit, or wild prickly Gooseberry.*

4. Grossularia (*Oxyacanthoides*) ramis undique aculeatis. *Gooseberry whose branches are armed on all sides with spines.* Grossularia oxyacanthæ foliis amplioribus è sinu Hudsonis. Pluk. Amalth. 212. *Gooseberry with larger Hawthorn leaves from Hudson's Bay.*

5. Grossularia (*Cynosbati*) aculeis subaxillaribus, baccis aculeatis racemosis. *Gooseberry with spines on the lower part of the branches, and prickly berries growing in clusters.* Ribes aculeis subaxillaribus, baccis aculeatis racemosis. Lin. Sp. Plant. 202. *Currant with spines on the lower part of the branches, and prickly berries growing in bunches.*

The sorts which are here enumerated, are supposed to be distinct species; but there are several other varieties which have been obtained from seeds, and are propagated for sale in the nurseries; most of these are titled from the persons who raised them, as Lamb's Gooseberry, Hunt's Gooseberry, Edwards's Gooseberry, &c. and as there are frequently new varieties obtained, it is needless to enumerate them here, therefore I shall proceed to their culture.

These are propagated either by suckers taken from the old plants, or by cuttings; the latter of which I prefer to the former, because those plants which are produced from suckers are always more disposed to shoot out a greater number of suckers from their roots, than such as are raised from cuttings, which generally form much better roots.

The best season for planting these cuttings is in autumn, just before their leaves begin to fall; observing always to take the handsomest shoots, and from such branches as generally produce the greatest quantity of fruit; for if you take those which are produced from the stem of the old plants (which are commonly very luxuriant) they will not be near so fruitful as those taken from bearing branches: these cuttings should be about six or eight inches long, and must be planted in a border of light earth, exposed to the morning sun, about three inches deep, observing to water them gently when the weather proves dry, to facilitate their taking root; and in the summer, when they have put out branches, you should rub off all the under shoots, leaving only the uppermost or strongest, which should be trained upright, to form a regular stem. In October following these plants may be removed; at which time you should prepare an open spot of fresh earth, which should be well dug, and cleansed from all noxious weeds, roots, &c. and being levelled, you should proceed to take up your plants, trimming their roots, and cutting off all lateral side branches; then plant them at three feet distance row from row, and one foot asunder in the rows, observing to place some short sticks to the plants, in order to train their stems upright and regular. In this place they may remain one or two years, being careful to keep them clear from weeds, as also to trim off all lateral shoots which are produced below the head of the plant, so that the stem may be clear about a foot in height above the surface of the earth, which will be full enough; and as the branches are produced commonly very irregular in the head, you must cut out such of them as cross each other, or thin them where they are too close, whereby the head of the plant will be open, and capable of admitting the air freely into the middle, which is of great use to all kinds of fruits.

After these plants have remained in this nursery one or two years at most, they will be fit to transplant to the places where they are designed to remain; for it is not so well to let them grow in the nurseries too large which will occasion their roots to be woody, whereby the removing of them will not only hazard the growth of the plants, but such of them as may take very well will remain stined for two or three years, before they will be able to recover their check. The soil in which these plants thrive to the greatest advantage, is a rich light earth; though they will do very well upon middling soils, which are not too strong or moist, and in all situations; but where the fruit is cultivated, in order to procure it in the greatest perfection, they should never be planted in the shade of other trees, but must have a free open exposure. The distance they ought to be planted is eight feet row from row, and six feet asunder in the rows. The best season for transplanting them is in October, when their leaves begin to decay; observing, as was before directed, to prune their roots, and trim off all lateral shoots, or such as cross each other, shortening all long branches, so as to make the head regular.

In the pruning of these shrubs most people make use of garden-shears, observing only to cut the head round, as is practised for Evergreens, &c. whereby the branches become so much crowded, that what fruit is produced, never grows to half the size as it would do were the branches thinned, and pruned according to art; which should always be done with a pruning-knife, shortening the strong shoots to about ten inches, and cutting out all those which grow irregular, thinning the fruit-bearing branches where they are too thick, observing always to cut behind a leaf bud. With this management your fruit will be near twice as large as those which are produced upon such bushes as are not thus pruned, and the shrubs will continue in vigour much longer; but you must observe to keep the ground clear from weeds, and dig it at least once a year; and every other year you should bestow a little rotten dung upon it, which will greatly improve the fruit.

It is a common practice with the gardeners near London, who have great quantities of these bushes in order to supply the markets, to prune them soon after Michaelmas, and then to dig up the ground between the rows, and plant it with Coleworts for spring use, whereby their ground is employed all the winter, without prejudicing the Gooseberries; and in hard winters these Coleworts often escape, when those which are planted in an open exposure are all destroyed; and these are generally pulled up for use in February or March, so that the ground is clear before the Gooseberries come out in the spring; which is a piece of husbandry well worth practising where ground is dear, or where persons are confined for room.

GROVES are the greatest ornaments to a garden, nor can a garden be complete which has not one or more of these. In small gardens there is scarce room to admit of Groves of any extent, yet in these there should be at least one contrived, which should be as large as the ground will allow it; and where these are small, there is more skill required in the disposition, to give them the appearance of being larger than they really are.

Groves have been in all ages held in great veneration: the ancient Romans had a sort of Groves near several of their temples, which were consecrated to some God, and were called luci by antiphrasis, à non lucendo, as being shady and dark; and these were dedicated to holy uses, being places of solitude and retirement, and were never to be violated with the ax.

These Groves are not only great ornaments to gardens, but are also the greatest relief against the violent heats of the sun, affording shade to walk under in the hottest part of the day, when the other parts of the garden are useless; so that every garden is defective which has not shade.

Groves are of two sorts, viz. open and close Groves: open Groves are such as have large shady trees, which stand at such distances, as that their branches may approach so near each other, as to prevent the rays of the sun from penetrating through them; but as such trees are a long time in growing to a proper size for affording a shade, so where new Groves are planted, the trees must be placed closer together, in order to have shade as soon as possible; but in planting of these Groves, it is much the best way to dispose all the trees irregularly, which will give them a greater magnificence, and also form a shade sooner, than when the

trees are planted in lines; for when the sun shines between the rows of trees, as it must do some part of the day in summer, the walks between them will be exposed to the heat at such times, until the branches of these trees meet; whereas in the irregular plantations, the trees intervene, and obstruct the direct rays of the sun.

When a person who is to lay out a garden, is so happy as to meet with large full grown trees upon the spot, they should remain inviolate, if possible; for it will be better to put up with many inconveniencies, than to destroy these, which will require an age to retrieve; so that nothing but that of offending the habitation, by being so near as to occasion great damps or obstructing fine views, should tempt the cutting of them down.

Most of the Groves which have been planted either in England, or in those celebrated gardens of France, are only a few regular lines of trees; many of which are avenues to the habitation, or lead to some building, or object; but these do not appear so grand, as those which have been made in woods where the trees have grown accidentally, and at irregular distances; and where the trees have large spreading heads, and are left at such a distance, as to permit the Grass to grow under them, then they afford the greatest pleasure: for nothing is more noble than fine spreading trees with large stems, growing through Grass, especially if the Grass is well kept, and has a good verdure; besides, most of these planted Groves have generally a gravel-walk, made in a strait line between them, which greatly offends the sight of persons who have true taste; therefore whenever a gravel-walk is absolutely necessary to be carried through these Groves, it will be much better to twist it about, according as the trees naturally stand, than to attempt regularity; but dry walks under large trees are not so useful as in open places, because the dropping of the trees will render these walks useless after rain, for a considerable time.

Close Groves have frequently large trees standing in them, but the ground is filled under these with shrubs, or under-wood; so that the walks which are made in them are private, and screened from winds, whereby they are rendered agreeable for walking, at such times when the air is too violent or cold for walking in the more exposed parts of the garden.

These are often contrived so as to bound the open Groves, and frequently to hide the walls, or other inclosures of the garden; and when they are properly laid out, with dry walks winding through them, and on the sides of these sweet-smelling shrubs and flowers irregularly planted, they have a charming effect; for here a person may walk in private, sheltered from the inclemency of cold or violent winds, and enjoy the greater sweets of the vegetable kingdom: therefore where it can be admitted, if they are continued round the whole inclosure of the garden, there will be a much greater extent of walk; and these shrubs will appear the best boundary, when there are not fine prospects to be gained.

These close Groves are by the French termed bosquets, from the Italian word bosquetto, which signifies a little wood, and in most of the French gardens there are many of them planted; but these are reduced to regular figures, as ovals, triangles, squares, and stars; which have neither the beauty or use which those have that are made irregularly, and whose walks are not shut up on each side by hedges, which prevents the eye from seeing the quarters; and these want the fragancy of the shrubs and flowers, which are the great delight of these private walks: add to this, the keeping of the hedges in good order is attended with a great expence, which is a capital thing to be considered in the making of gardens.

GUAIABARA. See Coccolobos.

GUAJACANA. See Diospyros.

GUAJACUM. Plum. Nov. Gen. 39. tab. 17. Lin. Gen. Plant. 465. Lignum Vitæ, or Pockwood.

The Characters are,

*The flower hath a concave empalement of one leaf, which is quinquefid. It hath five oblong, oval, concave petals, which are inserted in the empalement and spread open, and ten erect stamina inserted in the empalement, terminated by small summits. The style is long and slender, the germen is oval and pointed, and the stigma is single and slender. The germen afterward becomes a berry which is roundish, with an oblique point, and deeply furrowed, inclosing an oval hard seed.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, which includes those plants whose flowers have ten stamina and one style.

The Species are,

1. Guajacum (*Officinale*) foliolis bijugatis obtusis. Lin. Sp. Plant. 381. *Guajacum with obtuse lobes placed by pairs.* Guajacum flore cæruleo, fructu subrotundo. Plum. Nov. Gen. 391. *Guajacum with a blue flower and a roundish fruit.*
2. Guajacum (*Sanctum*) foliolis multijugatis obtusis. Lin. Sp. Plant. 382. *Guajacum with many pair of obtuse lobes.* Guajacum flore cæruleo fimbriato, fructu tetragono. Plum. Nov. Gen. 391. *Guajacum with a blue fringed flower, and a four-cornered fruit.*
3. Guajacum (*Afrum*) foliolis multijugatis obtusis. Lin. Sp. Plant. 382. *Guajacum with many pair of acute-pointed lobes.* Guilandinoides. Hort. Cliff. 489. and the Afra arbor acaciæ similis, foliis myrti aculeatis splendentibus. Boerh. Ind. alt. 2. p. 57. *African-tree like the Acacia, with shining, acute-pointed, Myrtle leaves.*

The first sort is the common Lignum Vitæ, or Guajacum, which is used in medicine, and grows naturally in most of the islands in the West-Indies, where it rises to be a very large tree, having a hard, brittle, brownish bark, not very thick; the wood is firm, solid, and ponderous, appearing very resinous, of a blackish yellow colour within, and of a hot aromatic taste; the smaller branches have an Ash-coloured bark, garnished with leaves, which are divided by pairs, each pair having two pair of small, oval, blunt leaves (or pinnæ) of a stiff consistence, and a lucid green; the flowers are produced in clusters at the end of the branches, composed of five oval concave petals, of a fine blue colour; in the center of these is fixed a style with an oval germen, crowned by a slender stigma; and round this is situated from ten to twenty stamina, which are as long as the style, terminated by sickle-shaped summits. Dr. Linnæus supposes the flowers to have but ten stamina, whereas they certainly have near twenty.

The bark and wood of this tree are much of the same nature, only the wood is accounted hotter; they are used in diet-drinks to purify and cleanse the blood, and to cause sweating; they are esteemed good for the gout and dropsy, the king's-evil, and particularly for the French pox. The gum or resin, which is black, shining, and brittle, and when powdered, of a greenish white colour, of an aromatic smell, and poignant taste, is somewhat cathartic, and a good purge in rheumatic cases, to the quantity of two scruples mixed with the yolk of an egg, and given in a convenient vehicle.

The wood of this tree is so hard as to break the tools in felling them, so they are seldom cut down for fire-wood, being difficult to burn; but the wood is of great use to the sugar-planters, for making of wheels and cogs for the sugar-mills, &c. It is also frequently brought to Europe, and wrought into bowls, and other utensils are made of the wood.

This tree can only be propagated by seeds, which must be procured from the countries where it naturally grows; these must be fresh, otherwise they will not grow; when they arrive, they should be sown in pots filled with light earth, and plunged into a good hot-bed: if the seeds are good, and the bed in which they are plunged is of a proper temperature of heat, the plants will appear in six weeks or two months after; and in six weeks will grow to be of strength enough more

for

for transplanting; then they should be carefully taken out of the seed-pots, so as to preserve their roots as entire as possible, and each planted in separate small pots filled with light earth, and plunged into a new hot-bed of tanners bark, where they must be shaded from the sun till they have taken fresh root; then they must be treated in the same manner as other tender exotic plants from warm countries, admitting a large share of free air to them when the weather is warm: they will require to be frequently refreshed with water in warm weather, but it must be given them with caution, for too much wet will infallibly destroy them. While the plants are young, they may be kept during the summer season in a hot-bed of tanners bark under a frame; but in the autumn they must be removed into the bark-stove, and plunged into the hot-bed of tan, where they should constantly remain, and must be treated in the same manner as other tender plants, being careful not to give them too much water in the winter, when it is very prejudicial to them, and in summer they should have a large share of free air admitted to them every day. With this treatment the plants will thrive very well, but they are plants of slow growth in their own country, so cannot be expected to make great progress in Europe.

The second sort has many small leaves placed along the midrib by pairs, which are rounded and obtuse at their ends, but narrow at their base: they are of the same consistence with those of the former sort, but of a darker green colour; the flowers are produced in loose bunches toward the end of the branches, which are of a fine blue colour, and their petals are fringed on their edges. This is called in some of the islands Bastard Lignum Vitæ; I received it from Antigua by that title. It requires the same treatment as the first sort, and is propagated by seeds in the same way.

I have also received specimens from the island of Barbuda of one, which seems different from either of those before-mentioned: the branches have the same appearance with those of the first sort, but the leaves are larger and indented at their extremities, and are placed all round the branches, on very short foot-stalks; the flowers were broken off, so I cannot determine the difference between them, but by all appearance they seem to be of the same genus.

The third sort has been long an inhabitant in some of the curious gardens in England and Holland, but seldom produces flowers in Europe. This grows naturally at the Cape of Good Hope, from whence the seeds were brought first to Holland, where it passed for a species of Acacia, until it produced its flowers; which, by the account given of them by the late Dr. Boerhaave, were of the butterfly kind; but whether Dr. Linnæus has seen the flowers or not, I cannot say; however, he has removed it from that class of plants, and has added it to this genus; and as I have not yet seen the flowers, so I do not know if it is rightly placed. The plants retain their leaves all the year, and will live in a good green-house in winter, but in summer must be placed abroad with other green-house plants. It is of slow growth, and is with difficulty propagated by layers.

GUAJAVA. See Psidium.

GUANABANUS. See Annona.

GUAZUMA. See Theobroma.

GUIDONIA. See Samyda.

GUILANDINA. Lin. Gen. Plant. 464. Bonduc. Plum. Nov. Gen. 25. tab. 39. The Nickar-tree.

The Characters are,

*The empalement of the flower is of one leaf, is bell-shaped, and cut at the top into five equal segments: the flower has five concave spear-shaped petals which are equal, and sit close to the empalement, into which they are inserted. It hath ten awl-shaped stamina which are erect, and inserted in the empalement, being alternately shorter than each other, and terminated by obtuse summits. In the center is situated an oblong germen, supporting a slender style the length of the stamina, crowned by a single stigma. The germen afterward becomes a rhomboid pod, with a convex suture on the upper side; it is swelling and compressed, having one cell, including oval hard seeds, which are separated by partitions.*

This genus of plants is ranged in the first section of Linnæus's tenth class, in which he includes the plants whose flowers have ten stamina and one style.

The Species are,

1. Guilandina (*Bonduc*) aculeata pinnis ovatis foliolis aculeis solitariis. Lin. Sp. 545. *Prickly Guilandina with oval-winged leaves, whose small leaves are armed with single spines.* Bonduc vulgare majus polyphyllum. Plum. Nov. Gen. 25. *Common greater Bonduc, having many leaves, called yellow Nickar.*
2. Guilandina (*Bonducella*) aculeata, pinnis oblongo-ovatis foliolis aculeis geminis. Lin. Sp. 545. *Prickly Guilandina with oblong oval leaves, having spines by pairs.* Bonduc vulgare minus polyphyllum. Plum. Nov. Gen. 25. *Smaller common Bonduc, or Nickar-tree having many leaves, called gray Nickar.*
3. Guilandina (*Glabra*) inermis foliis bipinnatis, foliolis ovatis acutis alternis. *Smooth Guilandina with double winged leaves, whose small leaves are oval-pointed and alternate.*
4. Guilandina (*Moringa*) inermis, foliis subpinnatis, foliolis inferioribus ternatis. Flor. Zeyl. 155. *Smooth Guilandina with winged leaves, whose under small leaves are trifoliate.* Moringa Zeylanica, foliorum pinnis pinnatis, flore majore, fructu anguloso. Burm. Zeyl. 162. tab. 75. *Morunga of Ceylon, with double-winged leaves, a larger flower, and an angular fruit.*
5. Guilandina (*Dioica*) inermis foliis bipinnatis basi apiceque simpliciter pinnatis. Lin. Sp. 546. *Guilandina with smooth branches, doubly winged leaves, whose base and tops are single winged.* Bonduc Canadense polyphyllum, non spinosum, mas & fœmina. Du Hamel. *Canada Nickar-tree having many leaves, which have no spines, and are male and female in different plants.*

The first and second sorts grow naturally in most of the islands in the West-Indies, where they twine their stalks about any neighbouring support, and rise to the height of twelve or fourteen feet. The leaves of the first sort are near a foot and a half long, and are composed of six or seven pair of pinnæ, or wings, each of which has as many pair of lobes, or small leaves set along the midrib; these are oval and entire; the foot-stalk or principal midrib of the leaf, is armed with short, crooked, single thorns, which are placed irregularly; the stalks are closely armed with the like thorns, which are larger. The stalks at first grow erect, but afterward they twine about the neighbouring trees or shrubs, being too weak to stand without support: the flowers come out in long spikes from the wings of the stalk; they are composed of five concave yellow petals, which are equal; in the center is situated the oblong germen, surrounded by ten stamina. After the flower is past, the germen becomes a broad thick pod, about three inches long and two broad, closely armed with slender spines, opening with two valves, each inclosing two hard seeds about the size of children's marbles, of a yellowish colour,

The second sort differs from the first, in having much smaller leaves, which are set close together; and below each pair of lobes are situated two short stiff crooked spines, which are placed opposite; the flowers are of a deeper yellow colour than those of the first sort, and the seeds are of an Ash-colour.

The third sort was discovered by the late Dr. Houstoun at Campeachy, from whence he sent the dried samples to England, but there was no fruit on the trees at the time when he was there; but he mentions that this sort had an upright stem, which was of a large size, dividing into many branches; these are garnished with double winged leaves, which are smooth; the wings come out altenrnate, each leaf being composed of four pair, but the lobes are placed opposite upon the middle rib; they are oval, but end in a point, and are of a light green colour.

The fourth sort grows naturally in the island of Ceylon, and in several places on the Malabar coast, from

from whence the seeds were brought to England. This in its native country rises to the height of twenty-five or thirty feet, with a strong stem, covered with a smooth bark, which in the young branches is green, but on the older it is of an Ash-colour; the root grows knobbed, and very thick. This, when young, is scraped and used by the inhabitants as Horse-radish is in Europe, having much the same sharp taste; the branches are garnished with decompounded winged leaves; those which are situated at the base have but three leaves, but above, the leaves are branched out into several divisions, which are again divided into smaller, having each five or six pair of oval lobes, terminated by an odd one; they are of a light green, and a little hoary on their under side. The flowers are produced in loose bunches from the side of the branches; they are composed of an unequal number of petals, from five to ten; they have ten short stamina surrounding the germen, which afterward turns to a long taper pod, including several angular seeds, covered with a thin membrane. These have a flavour like the root.

These four sorts are natives of warm countries, so will not live through the winter in England, unless they are placed in a warm stove, and the pots plunged into the tan-bed. They are propagated by seeds, but those of the two first sorts are so hard, that unless they are soaked two or three days in water before they are put into the ground, or placed under the pots in the tan-bed to soften their covers, they will remain years in the ground without vegetating: when the plants come up, they will be fit to transplant in a short time; then they should be each transplanted into a small pot filled with light fresh earth, and plunged into a moderate hot-bed of tanners bark, shading them till they have taken fresh root; then they must be treated in the same manner as other tender exotic plants, giving them a large share of air in warm weather, and but little water; and when the plants have advanced to be too tall to remain in the frames, they must be removed into the bark-stove and plunged into the hot-bed, where they will make great progress, provided they have not too much water, especially during the winter season, for these plants are very impatient of moisture in cold weather.

The fourth sort requires the same treatment as those before-mentioned, but the seeds will grow without being steeped in water; and the plants are with difficulty shifted from one pot to another, for their roots are large, fleshy, and have but few fibres; so that unless great care is taken, all the earth will fall away from them, which often causes their stalks to decay almost to the root, and sometimes occasions the loss of the plants. This plant must be sparingly watered at all times, but particularly in cold weather, when moisture will cause them to rot in a short time.

The fifth sort grows naturally in Canada, from whence the plants were brought to Paris, where it has been some years cultivated; but about fourteen years past, it was first brought to England. This, in the country where it naturally grows, rises with an erect stem to the height of thirty feet or more, dividing into many branches, which are covered with a bluish Ash-coloured bark very smooth, and garnished with large decompounded winged leaves which are of the oval shape, very smooth and entire, but are ranged alternate on the midrib; these fall off in the autumn, and new ones come out late in the spring.

There are male and female of this sort in different plants; as these have not as yet flowered in any of the English gardens, so I can give no farther account of them nor of the fruit, having never seen any of them. This sort lives abroad in the open air, and is never hurt by frost. It is propagated by cutting off some of the horizontal roots, which will cause them to shoot upward, so it may be taken from the old root, and planted in pots, whereby the plant may be multiplied, or by suckers from the root. It requires a light soil, not too moist.

GUNDELIA. Tourn. Cor. 51. tab. 586. Lin. Gen. Plant. 828. Hacub. Vaill. Ac. Reg. Scien. 1718.

This plant was so named by Dr. Tournefort, in honour of Dr. Gundelicheimer, who found it in his travels in company with Dr. Tournefort in the Levant.

The CHARACTERS are,

*It hath an uniform tubulous flower, composed of many hermaphrodite florets, which are incircled by leaves. They have but one petal which is closed at the bottom, but swells at the top, where it is slightly cut into five segments: they have five short hairy stamina, terminated by long cylindrical summits. The oval germen is situated at the bottom of the flower, crowned by small scales, supporting a slender style which is longer than the petal, terminated by two revolving stigmas. The germen afterward becomes a roundish single seed inclosed in the common receptacle, which is conical, and the seeds are separated by a chaffy down.*

This genus of plants is by Tournefort referred to his twelfth class, which contains the herbs with flosculous flowers. Dr. Linnæus ranges it in the fifth section of his nineteenth class, intitled Syngenesia Polygamia segregata, which includes those plants whose flowers have a common empalement, and each of the florets are included in another.

We have but one distinct SPECIES of this genus at present in England, viz.

GUNDELIA. Lin. Sp. Plant. 814. There is no English title to this plant, but there are two varieties of it mentioned by Tournefort, which are supposed to arise from the same seeds, as they were found growing promiscuously together. These are,

1. GUNDELIA (*Tournefortii*) Orientalis acanthi aculeati foliis, floribus intensè purpureis, capite araneosâ lanugine obsito. Tourn. Cor. 51. *Eastern Gundelia with prickly Bear's-breech leaves, deep purple flowers, and a head covered with a down like a cobweb.*
2. GUNDELIA (*Glabro*) Orientalis, acanthi aculeati folio, capite glabro. Tourn. Cor. 51. *Eastern Gundelia with a prickly Bear's-breech leaf, and a smooth head.*

This plant was discovered by Dr. Gundelscheimer, in company with Tournefort, near Baibout in Armenia, but has since been foundgrowing naturally in several places in the Levant, where it is generally found in dry strong land. The stalks of this plant seldom rise more than a foot and a half high; the under leaves are long, narrow, and sawed on their edges, their teeth ending in a spine; the other leaves are broader, which are irregularly slashed to the midrib, and armed at the points with sharp prickles; the stalks divide upward into several branches, which are armed with leaves of the same form, but are narrower; and each is terminated by a conical head of flowers, resembling those of Fuller's Thistle, being surrounded at the base by a circle of long, narrow, prickly leaves: these heads are composed of many hermaphrodite florets, which are shut up in the scales, each having an empalement, and a germen with five stamina surrounding it; but there are few of the seeds which ripen perfectly in each head, in the natural places of its growth. If rain happens at the time when the plants are in flower, the germen perishes, which is the case with several other of those plants whose flowers are collected into heads.

These plants are propagated by seed, which should be sown the beginning of March, in a warm dry border of fresh, but lean earth, in the place where the plants are designed to remain. When the plants come up, they must be carefully cleared from weeds; as they grow large, they should be thinned, leaving the plants which are designed to remain, about two feet asunder, that they may have room to spread. After this there is no other culture required, but to keep them clear from weeds; and if the frost should prove severe in winter, the plants should be covered with straw or Peas-haulm to protect them, but this covering must be taken off in mild weather; in two years they will produce their flowers, when they will make a fine appearance amongst other hardy plants in the pleasure-garden. They flower in May, and the plants lose their stalks and leaves in autumn, but their roots will abide many years.

GYPSOPHYLA. Lin. Gen. Plant. 498. We have no English title for this genus.

The CHARACTERS are,

*The flower hath a permanent, angular, bell-shaped empalement, cut into five parts at the top. It hath five oval blunt petals, which spread open, and ten awl-shaped stamina, terminated by roundish summits. In the center is situated a globular germen, supporting two slender styles, crowned by single stigmas. The germen afterward becomes a globular capsule with one cell, opening with five valves, filled with small roundish seeds.*

This genus of plants is ranged in the second section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and two styles.

The SPECIES are,

1. GYPSOPHYLA (*Aggregata*) foliis mucronatis recurvatis, floribus aggregatis. Lin. Sp. Plant. 406. *Gypsophyla with pointed recurved leaves, and flowers gathered in a head.* Lychnis Hispanica kali folio multiflora. Tourn. Inst. R. H. 338. *Spanish Lychnis with a Glasswort leaf and many flowers.*
2. GYPSOPHYLA (*Fastigiata*) foliis lanceolato-linearibus, obsoletè triquetris lævibus obtusis secundis. Lin. Sp. Plant. 407. *Gypsophyla with narrow spear-shaped leaves, having three blunt angles, and smooth obtuse leaves in clusters.* Saponaria caule simplici, foliis linearibus ex alis foliorum confertis teretibus. Hort. Cliff. 166. *Sopewort with a single stalk, very narrow leaves, coming out in clusters from the wings of the stalks.*
3. GYPSOPHYLA (*Prostrata*) foliis lanceolatis lævibus, caulibus diffusis, pistillis corollâ campanulatâ longioribus. Lin. Sp. Plant. App. 1195. *Gypsophyla with smooth spear-shaped leaves, diffused stalks, and the pointal longer than the petal, which is bell-shaped.*
4. GYPSOPHYLA (*Perfoliata*) foliis ovato-lanceolatis, semiamplexicaulibus. Lin. Sp. Plant. 408. *Gypsophyla with oval spear-shaped leaves, half embracing the stalks.* Lychnis Orientalis, saponariæ folio & facie, flore parvo & multiplici. Tourn. Cor. 24. *Eastern Lychnis with the leaf and appearance of Sopewort, having many small flowers.*
5. GYPSOPHYLA (*Paniculata*) foliis lanceolatis scabris, floribus dioicis corollis revolutis. Lin. Sp. Plant. 407. *Gypsophyla with rough, spear-shaped leaves, male and female in different plants, and the petals of the flowers recurved.* Alsine frutescens caryophylli folio, flore parvo albo. Gerb. *Shrubby Chickweed with a Clove Gilliflower leaf, and a small white flower.*

The first sort grows naturally in the south of France, Spain, and Italy, upon the mountains. This hath a perennial root, from which arise many narrow leaves ending in acute points, which are recurved; the stalks rise about a foot high, garnished with narrower leaves placed opposite, and at some of the joints there are smaller leaves growing from the stalks in clusters; the upper part of the stalk divides into smaller branches, each being terminated by a close bunch of small white flowers. These appear in July, and are succeeded by small oval capsules, filled with small seeds.

The second sort is somewhat like the first, but the leaves are much narrower, and almost three-cornered; they are placed in clusters, which come out from the side of the stalk; the bunches of the flowers are smaller, and not so closely joined. This hath a perennial root, and grows naturally upon the Helvetian mountains.

The third sort hath a perennial root, from which arise smooth spear-shaped leaves in clusters; the stalks are near a foot long, but are prostrate on the ground; the flowers have a purplish cast, and the stamina are much longer than the petals of the flowers. This flowers in June and July, and the seeds ripen in autumn.

The fourth sort grows naturally in the Levant, and also in Spain. It hath a strong, fleshy, fibrous root, which strikes deep in the ground, sending up several thick, fleshy stalks, which rise near two feet high, garnished with oval spear-shaped leaves, which half embrace the stalks with their base; the upper part of the stalk divides into many smaller branches, which are terminated with loose bunches of small white flowers. These open in July, and the seeds ripen in autumn.

The fifth sort grows naturally in Siberia and Tartary, the seeds of it were sent me from Petersburgh. This hath a perennial root, from which arise many branching stalks a foot and a half high, garnished with narrow smooth-pointed leaves, shaped like those of Gilliflowers; at the top of the stalks are produced loose clusters of very small white flowers, which appear at the same time with the former sorts, and the seeds ripen in the autumn.

These plants have no great beauty, so are rarely cultivated but in botanic gardens for the sake of variety.

They are propagated by seeds, which should be sown in a bed of light earth, and when the plants are fit to remove, they may be transplanted into the places where they are designed to remain, and will require no other culture but to keep them clean from weeds; for the roots will continue several years, and annually produce flowers and seeds.

# H.



HÆMANTHUS. Tourn. Inst. R. H. 657. tab. 433. Lin. Gen. Plant. 394. Dracunculoides. Boerh. Ind. alt. 2. 226. [Αἵμανθος, of Αἷμα, blood, and Ἄνθος, flos, a flower, i. e. Blood-flower.]

The CHARACTERS are,

*The flower has a permanent empalement of six leaves, which is large, and shaped like an umbel. It hath one erect petal, which is cut into six parts, having a short angular tube, and six awl-shaped stamina, which are inserted in the petal, but are longer, terminated by oblong prostrate summits. The germen is situated under the flower, supporting a single style the length of the stamina, crowned by a single stigma. The germen afterward becomes a roundish berry with three cells, each containing one triangular seed.*

This genus of plants is ranged in the first section of Linnæus's sixth class, intitled Hexandria Monogynia, which includes the plants whose flowers have six stamina and one style.

The Species are,

1. Hæmanthus (*Coccineus*) foliis linguiformibus planis lævibus. Prod. Leyd. 42. *Blood-flower with plain, tongue-shaped, smooth leaves.* Hæmanthus Africanus. H. L. Bat. *African Blood-flower, or Cape Tulip.*
2. Hæmanthus (*Carinatus*) foliis longioribus carinatis. *Blood-flower with longer keel-shaped leaves.*
3. Hæmanthus (*Puniceus*) foliis lanceolato ovatis undulatis erectis. Hort. Cliff. 127. *Blood-flower with spear-shaped, waved, erect leaves.* Hæmanthus colchici foliis perianthio herbaceo. Hort. Elth. 167. *Blood-flower with Meadow Saffron leaves, and an herbaceous involucrum.* Dracunculoides. Boerh. Ind. alt. 2. 226. *Bastard Dragon.*

The first sort has been many years in several curious gardens in Europe, where it hath seldom flowered. This hath a large bulbous root, from which in the autumn comes out two broad flat leaves, of a fleshy consistence, shaped like a tongue, which turn backward on each side, and spread flat on the ground, so have a singular appearance all the winter; and in the spring these leaves decay, so that from the end of May to the beginning of August, they are destitute of leaves: when these produce their flowers, it is always in the autumn, just before the new leaves come out. In the books where this plant is figured, the flowers are represented growing upon a strong upright foot-stalk; but all those which I have seen in flower, never have risen more than two or three inches from the bulb, with a large cluster of bright red flowers, inclosed in a common leafy-coloured empalement; these were tubulous, with one petal cut into six parts, each having six long stamina, standing out beyond the petal, and in the center appears the germen sitting under the flower, supporting a single style, crowned with a stigma. The germen never ripens to a seed in England, but decays with the flower, and then the green leaves grow and spread on the ground.

The second sort hath a large bulbous root like the first, which sends out three or four leaves, that grow a foot long or more; these are not flat like those of the other, but are hollowed like the keel of a boat, and stand more erect than those of the former sort, but are not quite so broad; the flowers of this are like those of the first, but are of a paler red; this is certainly different from the other. I received the roots of this from Dr. Van Royen, professor of botany at Leyden.

The third sort hath roots composed of many thick fleshy tubers, which join at the top, where they form a head, out of which arises a fleshy spotted stalk, like that of the dragon, which spreads out at the top into several spear-shaped leaves, which are waved on their edges. The stalks grow about a foot high, and the leaves are six or eight inches long, and two broad in the middle; from the side of this stalk near the ground, breaks out a strong fleshy foot-stalk, about six or eight inches long, sustaining at the top a large cluster of flowers, included in one common empalement or covering, which is permanent; the flowers are shaped like those of the other sorts, but are of a yellowish red colour. These appear in May, June, or July, and are succeeded by berries which are of a beautiful red colour when ripe.

The two first sorts are with difficulty propagated in Europe, for their roots put out offsets but sparingly, so the gardens in Holland are supplied with them from the Cape of Good Hope, where they naturally grow, and produce seeds; the plants are too tender to thrive in this country in winter in the open air, therefore the roots must be planted in pots filled with light loamy earth, and, in the winter, placed in a dry glass-case, where, during that season, the leaves will be in full vigour, so will make a pretty appearance, when intermixed with other plants in the stove; and though they seldom flower here, yet are they worthy of a place in every garden where there is conveniency of keeping them. The roots may be taken up when their leaves are decayed, and kept out of the ground till August, when they should be new potted, and may remain abroad till the end of September, at which time they may be removed into the glass-case; and during the time they are growing, will require to have frequent waterings, but it must not be given to them in large quantities.

If a border is made either against the front of the green-house or stoves, which may be contrived so as to be covered with glasses in winter, in which these roots, with the African Gladiolus's, Ixia's, Persian Cyclamens, &c. are planted in the full ground, they will flower more constantly, and the foot-stalks will rise much higher than those kept in pots.

The third sort is also a native of the Cape of Good Hope, from whence it was first brought to Holland, where it has been propagated and dispersed over Europe; this may be propagated by parting of the roots; the best time for this is in the spring, before the plants put out new stalks, which is also a right time to shift and new-pot them; but as the roots do not multiply very fast in offsets, the best way is to propagate them from seeds, which they ripen plentifully in England; these should be sown soon after they are ripe, in pots filled with light earth, and kept in the stove all the winter; if these pots are plunged into the tan-bed in the bark-stove, in the vacancies between the plants, the earth will be kept warm, and will not dry so fast, as when they are placed in a dry stove, so the seeds will be sooner prepared to vegetate; in the spring the pots may be taken out of the stove, and plunged into a hot-bed, which will bring up the plants; these must have air admitted to them every day in mild weather, to prevent their drawing up weak; and when they are fit to remove, they may be each planted in a separate small pot filled with light earth, and plunged into the hot-bed again, to promote their taking new root; then they must be gradually hardened, and afterward may be removed into the dry stove, where they should constantly remain, otherwise the plants will not thrive and flower in this country. In the winter season they must not have too much wet, for as their roots are fleshy and succulent, so they are apt to rot with moisture. In the summer they must have a large share of air in warm weather, and require to be frequently watered, especially during the time of their flowering.

HÆMATOXYLUM. Lin. Gen. Plant. 417. Bloodwood, Logwood, or Campeachy Wood.

The Characters are,

*The flower hath a permanent empalement, which is cut into five oval segments. It hath five oval petals which are equal, and larger than the empalement, and ten awl-shaped stamina, which are longer than the petals, terminated by small summits. In the center is situated an oblong oval germen, supporting a single style, crowned by a thick indented stigma. The germen afterward becomes a compressed obtuse capsule, with one cell, opening with two valves, containing two or three oblong kidney-shaped seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, which includes those plants whose flowers have ten stamina and one style.

We have but one Species of this genus, viz.

Hæmatoxylum (*Campechianum*). Hort. Cliff. 161. *Logwood*, Lignum Campechianum, species quædam. Sloan. Cat. Jam 213. *Campeachy Wood.*

This tree grows naturally in the Bay of Campeachy, at Honduras, and other parts of the Spanish West-Indies, where it rises from sixteen to twenty-four feet high. The stems are generally crooked, and very deformed, and are seldom thicker than a man's thigh. The branches come out on every side; they are crooked, irregular, and armed with strong thorns, garnished with winged leaves, composed of three or four pair of lobes, which are obtuse, and indented at the top. The flowers come out in a racemus from the wings of the leaves, standing erect; they are of a pale yellowish colour, with a purple empalement, and are succeeded by flat oblong pods, each containing two or three kidney-shaped seeds.

The wood of this tree is brought to Europe, where it is used for dyeing purples, and for the finest blacks, so is a valuable commodity; but the Spaniards, who claim a right to the possession of those places where it naturally grows, are for excluding all other countries from cutting of the wood, which has occasioned many disputes with their neighbours, but particularly with the English; this it is to be hoped will soon be over, as there are some of the planters in Jamaica, and the other islands in America, belonging to the crown of Great-Britain, who have propagated this tree in so great plenty, as to have hopes of supplying the demand for this wood in Britain in a very few years; for the trees grow so fast there, as to be fit for use in ten or twelve years years from seed; and as they produce great plenty of seeds in the British colonies, so those seeds scattering about, the plants come up in all the neighbouring lands, therefore will soon be like an indigenous plant of the country.

Some of the planters in Jamaica have inclosed their estates with hedges formed of these trees, which are very strong and durable; but where the hedges are cut, it will greatly retard the growth of the trees, so that those who propose to make an advantage by the propagation of the wood, should sow the seeds upon swampy lands, which may be unfit for growing of sugar, and permit all their branches to remain, which will be of great use in augmenting the bulk of their stems; and if, while the plants are young, they are kept clean from weeds, &c. it will be of great advantage in promoting of their growth. I have been credibly informed by some of the planters in Jamaica, that they have had some plants of this sort upward of ten feet high in three years, so that it requires but few years to raise a supply of this wood, sufficient to answer all the demands for it.

This plant is preserved in some curious gardens in England, for the sake of variety. The seeds are frequently brought from America, which, if fresh, readily grow when sown upon a good hot-bed; and if the plants are kept in a moderate hot-bed, they will grow to be upward of a foot high the same year, and, while the plants are young, they are generally well furnished with leaves; but afterward they make but little progress, and are frequently but thinly clothed with leaves. These plants are very tender, so should be constantly kept in the bark-stove, where, if they are duly watered, and the stove kept in a good degree of heat, the plants may be preserved very well. There are some of these plants now in England, which are upward of six feet high, and as thriving as those in their native soil.

HALESIA. Lin. Gen. Plant. 596.

The Characters are,

*The flower hath a small permanent empalement of one leaf, indented in four parts; it hath a bell-shaped swelling flower of one petal, divided at the brim into four lobes, and from twelve to sixteen stamina, shorter than the petal, terminated by oblong erect summits; the germen is situated below, is oblong, supporting a slender style longer than the petal, crowned by a simple stigma; the germen afterward becomes an oblong nut, narrowed at both ends, having four angles, with two cells, inclosing a single seed in each.*

This genus of plants is ranged in the first section of Linnæus's eleventh class, intitled Dodecandria Monogynia, the flower having twelve stamina and one style.

The Species are,

1. Halesia (*Tetraptera*) foliis lanceolato-ovatis, petiolis glandulosis. Lin. Sp. 636. *Halesia with oval spear-shaped leaves, whose foot-stalks are glandulous.* Frutex padi foliis serratis, floribus monopetalus albis campaniformibus, fructu crasso tetragono. Catesb. Hist. Carol. 1. p. 64.
2. Halesia (*Diptera*) foliis ovatis, petiolis lævibus. Lin. Sp. 636. *Halesia with oval leaves having smooth foot-stalks.*

This genus of plants received its title from the late learned and reverend Doctor Hales, minister of Teddington, near Hampton-Court.

Both the sorts grow naturally in South-Carolina; the first on the banks of Santee river, where it frequently comes up with two or three stems from the same root, which rise from fifteen to twenty feet high, sending out branches toward their tops, garnished with oval spear-shaped leaves, sawed on their edges: the flowers are produced on the side of the branches in clusters, from two or three to six or seven in each; they are bell-shaped, hanging downward, of one petal, white, which is indented in four parts at the brim; these are succeeded by oblong nuts, having four wings and four cells, each containing one oblong seed.

The second sort hath much resemblance to the first, the leaves are oval, and the foot-stalks are smooth; the fruit has but two angles.

These plants are propagated by seeds, when they can be procured fresh from the places of their natural growth. These should be sown in pots as soon as the seeds arrive, plunging the pots into the ground, in a situation where they may have only the morning sun. The seeds often remain a year in the ground, therefore the earth in the pots should not be disturbed, until there is no probability of the seed growing. When the plants appear, they should be screened from the sun, and frequently, but not too plentifully watered; for while the plants are young, much moisture will rot their shanks. The following autumn, the pots should be placed in a common frame, where the plants may enjoy the free air in mild weather, and be screened from frost. The spring following, before the plants begin to shoot, they should be each put into a separate small pot, plunging them in a frame, where they should be shaded from sun; and in the summer placed in a shady situation, screening them in winter; and the spring following they may be turned out of the pots, and planted in the full ground where they are designed to remain.

HALICACABUM. See Physalis.

HALICACABUS PEREGRINA. See Cardiospermum.

HALIMUS. See Atriplex.

HALLERIA. Lin. Gent. Plant. 679. Caprifolium. Boerh. Ind. alt. 2. p. 226. *African Fly Honeysuckle.*

The Characters are,

*The flower hath a permanent empalement of one leaf, which is cut into three parts at the top, the upper segment being much broader than the other. It hath one petal of the grining kind. The bottom of the tube is roundish. The chaps are swollen and inflexed, the brim is erect and oblique, cut into four segments, the upper being longer than the others, and is blunt, with an indenture at the top; the two side ones are shorter, and pointed, the lower is very short and acute. It hath four stamina, which are bristly, two being longer than the other, terminated by twin summits. In the bottom of the tube is situated an oval germen, with a style longer than the stamina, crowned by a single stigma. The germen afterward becomes a roundish berry with two cells, each containing one hard seed.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, which includes the plants with a ringent flower, which have two long and two shorter stamina, and the seeds are included in a capsule.

We have but one Species of this genus, viz.

Halleria (*Lucida*). Hort. Cliff. 323. This plant has its title from Dr. Haller, who was professor of botany at Gottingen, in Germany. Caprifolium Africanum folio pruni leviter serrato, flore ruberrimo, baccâ nigrâ. Boerh. Ind. alt. 2. 226. *African Fly Honeysuckle, with a Plumb leaf lightly sawed, a very red flower, and a black berry.*

The English name which I have here added, has been given to this plant by some gardeners, who observed that the shape of the flower had some resemblance to that of the Upright, or Fly Honeysuckle, and for want of an English name gave this to it; or they might take it from the Latin name, by which it was called by Dr. Boerhaave, who made it a species of Honeysuckle.

This plant grows to the height of six or eight feet, having a woody stem, which is well furnished with branches; these have oval sawed leaves, which are placed opposite, and continue green through the year; the flowers come out singly, and are of a red colour, but, being intermixed with the leaves, are not seen unless they are looked after, for they grow scatteringly on the branches; these come out in June, and the seeds ripen in September; the leaves are green in winter, so the plants make a variety in the green-house during that season.

It may be propagated by cuttings, which, if planted in pots filled with light earth in June, and plunged into a gentle hot-bed, will soon take root; these plants may be exposed in summer, and will require plenty of water in that season; in winter they must be housed with Myrtles, and other hardy exotic plants, which require a large share of air in mild weather.

HAMAMELIS. Lin. Gen. Plant. 155. Trilopus. Mitch. Gen. 22. *The Witch Hazel.*

The CHARACTERS are,

*It is male and female in different plants; the male flowers have a four-leaved empalement, and four narrow petals, which are reflexed; they have four narrow stamina, which are shorter than the petals, terminated by horned reflexed summits. The female flowers have a four-leaved involucrum, in which are four flowers; these have a four-leaved empalement, which is coloured; they have four narrow petals, which are reflexed, and four nectariums adhering to the petals. In the center is situated an oval hairy germen, supporting two styles, crowned by headed stigmas. The germen afterward becomes an oval capsule sitting in the involucrum, having two cells, each containing one hard, oblong, smooth seed.*

This genus of plants is ranged in the second section of Linnæus's fourth class, but properly belongs to the second section of his twenty-second class, which includes those plants which have male and female flowers in different plants, whose female flowers have two styles.

We have but one SPECIES of this genus in the English gardens at present, viz.

HAMAMELIS (*Virginiana*). Flor. Virg. 139. *The Witch Hazel.* Pistachia Virginiana nigra, coryli foliis. Pluk. Alm. 296. *Black Virginia Pistachia with Hazel leaves.*

This plant grows naturally in North America, from whence the seeds have been brought to Europe, and many of the plants have been raised in the English gardens, where they are propagated for sale by the nursery gardeners. It hath a woody stem, from two to three feet high, sending out many slender branches, garnished with oval leaves, indented on their edges, having great resemblance to those of the Hazel Nut, placed alternately on the branches; these fall away in autumn, and when the plants are destitute of leaves, the flowers come out in clusters from the joints of the branches; these sometimes appear the latter end of October, and often not till December, but are not succeeded by seeds in this country.

As the flowers of this shrub make very little appearance, so it is only preserved in the gardens of the curious, more for the sake of variety than its beauty.

This is propagated by laying down the young branches in autumn, which will take root in one year, provided they are duly watered in dry weather; but many of the plants which are in the gardens, have been produced from seeds which came from America; these seeds always remain a whole year in the ground, so they should be sown in pots, which may be plunged into the ground in a shady part of the garden, where they may remain all the summer, and require no other care but to keep the pots clean from weeds, and in very dry weather to water them now and then; in autumn the pots may be removed to a warmer situation, and plunged into the ground under a warm hedge; and if the winter should prove very severe, they should have some light covering thrown over the pots, which will secure the seeds from being destroyed. In the spring the plants will come up, therefore as the season grows warm, the pots may be removed where they may have the morning sun till eleven o'clock; and if they are duly watered in dry weather, the plants will have made good progress by autumn, when they should be transplanted, either into small pots, or in a nursery-bed, where in one, or at most two years time, they will be strong enough to plant where they are designed to remain; they love a moist soil, and a shady situation.

HAMELLIA. Lin. Gen. 232.

The CHARACTERS are,

*The empalement of the flower is small, permanent, and cut into five acute segments; the flower is of one petal, having a long tube, whose brim is cut into five acute points; it hath five awl-shaped stamina inserted to the middle of the petal, terminated by linear summits the length of the petal; and an oval germen, whose lower point is conical, supporting a slender style the length of the corolla, crowned by an obtuse linear stigma: the germen afterward becomes an oval furrowed berry, with five cells, filled with small compressed seeds.*

This genus of plants is ranged in the first order of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style: it is named in honour of Monsieur du Hamel des Monceaux, member of the Academy of Sciences at Paris, and fellow of the Royal Society of London; a gentleman well known to the learned, by the many useful books he has published.

We know but one SPECIES of this genus, viz.

1. HAMELLIA (*Patens*) racemis erectos. Jacq. Amer. 71. *Hamellia with erect spikes of flowers.*

This plant grows naturally in Africa, and also in the warm parts of America: I received the seeds from Paris, which were brought from Senegal by Mr. Adanson, with the title of Mortura on the paper; and before that, received a drawing of the plant in flower, from the late Dr. Houstoun, who found it growing naturally in America, where it has since been found growing by Mr. Jacquin, who has figured it.

It rises with a ligneous stalk five or six feet high, sending out several erect branches toward the top, garnished with oval woolly leaves, placed by threes round the branches, having red foot-stalks; the flowers terminate the branches in slender spikes; they are tubulous, and cut at their brims into five sharp segments, standing erect, of a bright red colour: these are not succeeded by seeds in England.

This plant is propagated by seeds, when they can be procured fresh from the countries where it grows naturally: these should be sown in small pots, and plunged into a moderate hot-bed: the plants generally appear in about five or six weeks after, and should then be treated in the same way as other plants from the same countries; giving them proper air in warm weather, and gently refreshing them with water; and when they are fit to transplant, they should be each planted in a small pot, plunging them into the hot-bed again, where they should be shaded from the sun until they have taken new root, when they should have air and moisture according to the warmth of the season. In the autumn the plants must be removed into the tan-stove, plunging the pots into the bed, where they should be always continued: this flowers in July and August, when it makes a pretty appearance.

As the seeds of this plant are seldom brought to England, so the plant may be propagated by cuttings, which if planted in small pots, plunged into a moderate hot-bed, and closely covered with either bell or hand-glasses, will put out roots in about six weeks, and may then be treated in the same way as the seedling plants.

HARMALA. See PEGANUM.

HASSELQUISTIA. Lin. Gen. 341.

The CHARACTERS are,

*It is an umbelliferous plant, whose universal umbel is composed of six spreading rays; these are for the most part double; the greater involucrum has many short bristly leaves;*

*leaves; the proper empalement is very small, and hath five indentures; the general umbel is half radiated; the outer flowers are fruitful, but those in the disk are barren; they have five petals, and five slender stamina longer than the petals, terminated by roundish summits: the turbinated germen is situated under the flower, supporting two slender recurved styles, crowned by obtuse stigmas; the germen afterward becomes an orbicular fruit, composed of two seeds having borders.*

This genus of plants is ranged in the second order of Linnæus's fifth class, intitled Pentandria Digynia, the flowers having five stamina and two styles.

It it named after Mr. Hasselquist, who was a pupil of Dr. Linnæus.

1. Hasselquistia (*Ægyptiaca*). Amœn. Acad. 4. p. 370. *Egyptian Hasselquistia.* Pastinaca Orientalis, foliis eleganter incisis. Buxb. Cent. 3. p. 16.

This plant is bennial, and being a native of warm countries, is with difficulty preserved in England; for when the plants come up early in the spring, they do not perfect their seeds the same year: and those plants which arise in the autumn, seldom live through the winter; therefore the surest method to procure good seeds in this country, is to sow the seeds in pots about the middle of August, placing the pots where they may have the morning sun only, being careful to water them duly; and as weeds will come up in the pots to take them out, and where the plants are too close, thin them; in October remove the pots into a common frame, where they may enjoy the free air in mild weather, but be screened from frost: in the spring following, if the plants are carefully turned out of the pots, and planted in the full ground, they will flower in June, and the seeds will ripen in August.

**HAWTHORN.** See Mespilus.

**HAZEL.** See Corylus.

**HEDERA.** Lin. Gen. Plant. 249. Tourn. Inst. R. H. 612. tab. 384. *The Ivy-tree.*

The Characters are,

*The flowers are disposed in form of an umbel, having a small involucrum indented in many parts. The empalement is cut into five parts, and sits upon a germen. The flower hath five oblong petals, which spread open, whose points are incurved; they have five awl-shaped stamina, terminated by prostrate summits, which are cut into two at their base. The germen, which is situated below the flower, supports a short style, crowned by a single stigma. The germen afterward becomes a globular berry with one cell, inclosing four or five large seeds, convex on one side, and angular on the other.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and but one style.

The Species are,

1. Hedera (*Helix*) foliis ovatis lobatisque. Flor. Lapp. 91. *Ivy with oval lobed leaves.* Hedera arborea. C. B. P. 305. *Tree Ivy*; and the Hedera communis major. J. B. 2. 111. *Great common Ivy.*
2. Hedera (*Quinquefolia*) foliis quinatis, ovatis, serratis. Hort. Cliff. 74. *Ivy with leaves composed of five lobes, which are sawed.* Vitis quinquefolia Canadensis scandens. Tourn. Inst. 613. *Climbing Canada Vine with five leaves, commonly called Virginia Creeper.*

The first sort grows naturally in most parts of England, where it meets with any neighbouring support. The stalks will fasten to it, and rise to a very great height, sending out roots on every side, which get into the joints of walls, or the bark of trees, and thereby are supported; or if there is no support near, the stalks trail upon the ground, and take root all their length, so that they closely cover the surface, and are difficult to eradicate; for where any small parts of the stalks are left, they will soon spread and multiply. While these are fixed to any support, or trail upon the ground, their stalks are slender and flexible; but when they have reached to the top of their support, they shorten and become woody, forming themselves into large bushy heads, and their leaves are larger, more of an oval shape, and not divided into lobes like the lower leaves, that it hath a different appearance, which has occasioned some to take them for distinct species.

In the latter part of the last century, when it was the fashion to fill gardens with all sorts of sheered Evergreens, there were many of these plants trained into round heads, which were clipped into balls, or in form of a cone; and as these were so hardy as not to be injured by weather, and would grow in any soil, so they were then much esteemed; but since that unnatural taste has been exploded, these plants are seldom admitted into gardens, unless to cover walls, or run over grottos, &c. for which purpose there is no plant so well adapted.

There are two varieties of this, one with silver-striped leaves, and the other with yellowish leaves on the top of the branches; these are preserved in some gardens for the sake of variety.

These plants are easily propagated by their trailing branches, which send forth roots their whole length; which branches being cut off, and planted, will grow in almost any soil or situation, and may be trained up to stems, or suffered to remain as climbers, to cover walls, pales, &c.

They may also be propagated by seeds, which should be sown soon after they are ripe, which is in the beginning of April: if these are kept moist and shaded, they will grow the same spring, otherwise they will remain a year in the ground; therefore few persons trouble themselves to propagate the plants in this way, the other being much more expeditious.

While the stalks of this plant trail, either on the ground or upon walls, or other support, they do not produce any flowers, which has occasioned its being called sterile, or barren Ivy; but when the branches get above their support, they produce flowers at the end of every shoot; these appear in September, and are succeeded by berries, which turn black before they are ripe, and are formed into round bunches, which are called corymbi, and from these the epithet of corymbus, so frequently used by botanists, is taken.

The leaves of this plant are frequently applied to issues to keep them cool, and free from inflammations; they are also used for curing of scabs, sores, and scald heads. Mr. Boyle, in his Usefulness of Experimental Philosophy, commends a large dose of the full ripe berries, as a remedy against the plague; but Schroder says, they purge upward and downward. The gum of Ivy is caustic, but is recommended by some to take spots and freckles out of the face.

There is mention made of another species of Ivy, which is titled Hedera Poetica, by Caspar Bauhin; this grows in many of the islands of the Archipelago, and produces yellow berries; but as I have not seen this plant, I cannot determine if it is a distinct species. Dr. Linnæus supposes it to be only a variety, though he has not seen the plant; but Tournefort, who gathered it in the Levant, puts it down as a different sort.

The second sort grows naturally in all the northern parts of America; it was first brought to Europe from Canada, and has been long cultivated in the English gardens, chiefly to plant against walls, or high buildings to cover them, which these plants will do in a short time, for they will shoot almost twenty feet high in one year, and will mount up to the top of the highest building; but as the leaves fall off in autumn, the plants make but an indifferent appearance in winter; and as it is late before they come out in the spring, they are not much esteemed, unless it is for such situations, where better things will not thrive; for this plant will thrive in the midst of London, and is not injured by smoke, or the closeness of the air, so are very proper for such situations. The stalks of these plants put out roots, which fasten themselves

into the joints of the walls, whereby they are supported.

This may be propagated by cuttings, which if planted in autumn on a shady border, will take root, and by the following autumn will be fit to plant where they are designed to remain.

HEDERA TERRESTRIS. See GLECHOMA.

HEDGES. Hedges are either planted to make fences round inclosures, or to part off and divide the several parts of a garden: when they are designed as outward fences, they are planted either with Hawthorn, Crabs, or Black Thorn, which is the Sloe; but those Hedges which are planted in gardens, either to surround wilderness quarters, or to screen the other parts of a garden from sight, are planted with various sorts of plants, according to the fancy of the owner; some preferring ever-green Hedges, in which case the Holly is best, next the Yew, then Laurel, Laurustinus, Phillyrea, &c. others, who make choice of the deciduous plants, prefer the Beach and Hornbeam, English Elm, or the Alder, to any other; I shall first treat of those Hedges which are planted for outside fences, and afterward briefly touch on the other.

These Hedges are most commonly made of Quick, yet it will be proper, before planting, to consider the nature of the land, and what sorts of plants will thrive best in that soil, whether it be clay, gravel, sand, &c. likewise what the soil is from whence the plants are to be taken; for if the land they are taken from is much better than that in which they are to be planted, it will be more difficult to get them to grow. As for the size, the sets ought to be about the bigness of a goose quill, and cut within about four or five inches of the ground; they should be fresh taken up, strait, smooth, and well rooted. Those plants which are raised in the nursery, are to be preferred to all others, and if raised on a spot near the place, it will be best.

Secondly, If the Hedge has a ditch, it should be made six feet wide at top, and one foot and a half at bottom, and three feet deep, that each side may have a proper slope; for when the banks are made too upright, they are very subject to fall down after every frost or hard rain; besides, if the ditches are made narrower, they are soon choked up in autumn by the falling leaves, and the growth of weeds, nor are they a sufficient fence to the Hedge against cattle, where they are narrower.

Thirdly, If the bank be without a ditch, the sets should be set in two rows, almost perpendicular, at the distance of a foot from each other, in the quincunx order, so that in effect they will be but six inches asunder.

Fourthly, The turf is to be laid with the Grass side downwards, on that side of the ditch the bank is designed to be made, and some of the best mould should be laid upon it, to bed the Quick; then the Quick is to be planted upon it a foot asunder, so that the ends of the Quick may stand upright.

Fifthly, When the first row of Quick is planted, it must be covered with mould, and the turf laid upon it as before; so that when the bank is a foot high, you may plant another row of sets against the spaces of the lower Quick, and cover them as the former was done; and the bank is to be topped with the bottom of the ditch, and a dry, or dead Hedge laid on the other side, to defend the under plantation from the cattle.

In making of these dead Hedges, there should be stakes driven into the loose earth, at about two feet and a half distance, so low as to reach the firm ground.

Oak stakes are accounted the best, and Black Thorn and Sallow the next; then let the small bushes be laid at bottom, but not too thick, for that will cause the bushes to rot; but the upper part of the Hedge should be laid with long bushes to bind the stakes in with, by interweaving them.

And, in order to render the Hedge yet stronger, you may edder it (as it is called,) i. e. bind the top of the stakes in with some small long poles, or sticks on each side; and when the eddering is finished, drive the stakes anew, because the waving of the Hedge and eddering is apt to loosen the stakes.

The Quick must be constantly kept weeded, and secured from being cropped by the cattle, and in February it will be proper to cut it within an inch of the ground, if it was not done before; which will cause it to shoot strong, and help it much in the growth.

When a Hedge is of about eight or nine years growth, it will be proper to plash it; the best time for this work is either in October or February.

When a Hedge is grown old, i. e. of about twenty or thirty years growth, and there are in it old stubs as well as new shoots, the old stubs should be cut sloping off within two or three inches of the ground, and the best and longest of the middle size should be left to lay down; and some of the strongest, at the height of five or six feet, according as you design the height of the Hedge to be, may be left to serve instead of stakes, and fresh stakes should be put in those places where they are wanting; the Hedge should be then thinned, so as to leave on the stubs only such shoots as are designed to be of use, that there may be room left to put a spade in between them; the ditch also should be cleansed, and each side of the slopes kept as in a new ditch; and where the earth is washed from the roots of the Quick, or is hollow, face it anew with so much of the first spit of earth that is dug out of the ditch, as there is occasion for, and lay what is dug out at the second spit, on the top of the bank; for if it be laid on the side, or face of the bank, it will slip into the ditch again when wet comes, and also take a great deal of the bank along with it.

In plashing Quicks, there are two extremes to be avoided; the first is, laying it too low and too thick; because it makes the sap run all into the shoots, and leaves the plashes without nourishment, which, with the thickness of the Hedge, kills them.

Secondly, It must not be laid too high, because this draws all the sap into the plashes, and so causes but small shoots at the bottom, and makes the Hedge so thin, that it will neither hinder the cattle from going through, nor from cropping of it.

When the shoot that is designed to be plashed is bent, give it a small cut with a bill, half through, sloping a little downwards, and then weave it about the stakes; and when the whole is finished, trim off the small superfluous branches that straggle too far out on both sides of the Hedge.

If the stubs are very old, cut them quite down, and secure them with good dead Hedges on both sides, till the young shoots are got up tall enough to plash, and plant new sets in the void spaces.

In making a Hedge, if it be set with Crab Stocks, it will be proper to leave one standing uncut up at every thirty or forty feet, if the ground on both sides of the Hedge be your own; which being done, they may be so ordered, by pruning or staking, that one may lean into one ground, and the other into another, &c.

These stocks should be pruned up every year, till they are brought out of the reach of the cattle, and then they may be grafted with the Red Streak, Gennetmoil, or what other kind of cyder Apple you please.

If the stocks be of Apple kernels, they may stand ungrafted, for many of them will yield very good cyder fruit; but then such stocks as are not grafted, will be longer before they bear; and also when you do graft, you may be certain of your kind; but if you find a very natural stock, which by leaf, shoot, and bud, appears likely, you may try it, and so you may have a new fine fruit; and if you do not like it, you may graft it when you please.

As for the rest of the Hedge, when it has shot four or five years, you may lay it to make a fence for the doing of which, take the following directions:

First, At every laying to lay down some old plashes; or, if the Hedge be thin, young ones; but they must be so laid, as to point with their ends to the ditch side of the bank, the ends being kept low on the bank; by being so ordered, they will the better thicken the bottom of the Hedge, and keep up the earth of the bank.

Secondly, To heighten the bank every time you lay earth on it, so as to cover the layers, all but the ends, this earth will very much help the Quick; and by heightening the banks, and deepening the ditch, you will render the fence the better.

Thirdly, Not to cut the plashes too much, but just so as they may bend down well; nor to lay them too upright, as some do, but to lay them near to a level; for by so doing, the sap will the better break out at several places, and not run so much to the ends, as it will when they lie too much upon the slope.

If you have much wood to spare, you may cut up great part of those that grow near the ditch, but then you ought to hang the bank with bushes, to prevent cattle from cropping them the first year; these will shoot strong, secure the Hedge, keep up the bank, and thicken the bottom of the Hedge.

Fourthly, Take care to lay the Hedge pretty thick, and turn the beard on the ditch side; but you must not let the beard hang uncut (though it makes a good shew at the first making), but you must cut off all the straggling boughs within half a foot of the Hedge on both sides, which will cause it to shoot strong at these places, and make the Hedge much the thicker.

Fifthly, If the bank be high, make the Hedge so low, that it may just serve for a fence the first year, for it will soon grow higher; and the lower the Hedge is made, the faster the Quick will grow, and also will be the thicker at the bottom; but care must be taken to preserve it from cattle on the field side for the two first years that it is made.

Sixthly, If you would have a good Hedge, or fence, you should new lay it once in fourteen or fifteen years, and constantly root out Elder, Travellers Joy (which some call Bull-bine), Briony, &c. and do not leave too many high standards, or pollards in it, though the Elm is one of the best; also no dead wood is to be left in the bottom of the Hedges, for that will choke the Quick; but if there be a gap, the dead Hedge should be made at a distance.

The Crab is also frequently planted for Hedges, and if the plants are raised from the kernels of the small wild Crab, they are much to be preferred to those which are raised from kernels of all sorts of Apples without distinction; because the plants of the true small Crab never shoot so strong as those of the Apples, so may be better kept within the proper compass of a Hedge; and as they have generally more thorns upon them, they are better guarded against cattle, &c. than the other; besides, the plants of the Crab will grow more equal than those which are raised from the kernels of various kinds of Apples, for these always produce a variety of plants, which differ from each other in their manner of growth, as much as in the size and flavour of their fruits; so that Hedges made of these will not appear so well, nor can be so well managed as the other.

Some persons intermix Crab with the White Thorn in their Hedges, but this is not a good method; for the plants of the Crab will grow much stronger than those of the White Thorn, so that the Hedge will not be of equal growth; which is not near so beautiful or useful, as when the plants of a Hedge keep pace in their growth.

The Black Thorn, or Sloe, is also frequently planted for Hedges, and is a strong durable plant for that purpose, especially as it is so strongly armed with thorns, that cattle seldom care to brouze upon it; but where this is planted, the best way is to raise the plants from the stones of the fruit; for all those which are taken from the roots of old trees, spawn, and put out suckers in such plenty from their roots, as to spread over, and fill the neighbouring ground to a considerable distance on each side of the Hedge; and this plenty of suckers drawing away the nourishment from the old plants of the Hedge, they never grow so well as where there are few or no suckers produced, which those plants which are propagated from the stones send not forth, or at least but sparingly, therefore may with little trouble be kept clear of them. The best method of raising these Hedges is, to sow the stones in the place where the Hedge is intended (where it can be conveniently done), for then the plants will make a much greater progress than those which are transplanted; but the objection to this method will arise from the difficulty of securing the young plants from the cattle; but this can have little force, when it must be considered, that if the Hedge is planted, it must be fenced for some years, to prevent the cattle from destroying it; therefore the same fence will do for it when sown, nor will this require a fence much longer than the other. For the plants which stand unremoved, will make a better fence in seven years, than that which is planted, though the plants should be of three or four years growth when planted; which is what I have seen two or three times, where the experiment has been tried. The stones of this fruit should be sown early in January, if the weather will permit; but when they are kept out of the ground longer, it will be proper to mix them with sand, and keep them in a cool place. The bushes of the Black Thorn are by much the best of any for making of dead Hedges, being of longer duration, and having many thorns, neither the cattle nor the Hedge-breakers, will care to meddle with them; these bushes are also the best to be used for under ground drains, for the draining of land, for they will remain sound a long time when the air is excluded from them.

The Holly is sometimes planted for Hedges, and is a very durable strong fence; but where it is exposed, there will be great difficulty to prevent its being destroyed, otherwise it is by far the most beautiful plant, and being an Evergreen, will afford much better shelter to cattle in winter, than any other sort of Hedge; and the leaves being armed with thorns, the cattle will not care to brouze upon it. Another objection to this plant is the slow growth, so that Hedges planted with this plant, require to be fenced a much longer time than most others. This is a reason which must be admitted, to prevent this being generally practised; but in such grounds as lie contiguous to, or in sight of gentlemen's houses, these sort of Hedges will have an exceeding good effect, especially when they are well kept, as they will appear beautiful at all seasons of the year; and in the spring of the year, when the sharp winds render it unpleasant to walk abroad in exposed places, these Hedges will afford good shelter, as they will effectually keep off the cold winds, if they are kept close and thick. The surest method of raising these Hedges is, by sowing the berries in the place where they are to stand; but these berries should be buried in the ground one year before they are sown, by which method they will be prepared to grow the following spring. The way of doing this is, to gather the berries about Christmas (which is the time they are usually ripe,) and put them into large flower-pots, mixing some sand with them; then dig holes in the ground, into which the pots must be sunk, covering them over with earth about ten inches thick; in this place they may remain till the following October, when they should be taken up, and sown in the place where the Hedge is intended. The ground for this Hedge should be well trenched, and cleared from the roots of all bad weeds, bushes, trees, &c. Then two drills should be made at about a foot distance from each other, and about two inches deep, into which the seeds should be scattered pretty close, lest some should fail; for it is better to have too many plants come up, than to want. The reason of my advising two drills is, that the Hedge may be thick to the bottom, which in a single row rarely happens, especially if there is not great care taken of them in the beginning. When the plants come up, they must be carefully weeded; for if the

weeds are permitted to grow among them, they will soon destroy them, or weaken them so much, that they will not recover their strength in a long time. This should be constantly observed, by every person who is desirous to have good Hedges of either sort; for when the weeds are suffered to grow near the plants, they will not only rob them of a great part of their nourishment, but also prevent their putting out shoots near the ground, which will occasion the bottom of the Hedge to be thin and naked.

When these Holly Hedges are designed to be kept very neat, they should be sheered twice a year, in May and August; but if they are only designed as fences, they need not be sheered oftener than once a year, which should be about the latter end of June, or the beginning of July; and if this is well performed, the Hedges may be kept very beautiful.

The fences which are made to secure these Hedges from cattle while they are young, should be contrived so as to admit as much free air as possible, which is absolutely necessary for the growth of the plants; for when they are crowded on each side with dead Hedges, the plants seldom thrive well. The best sort of fences for this purpose, are those which are made with posts and rails; or instead of rails, three ropes drawn from post to post, and holes made in the posts to draw the ropes through; this is the cheapest fence of this kind, and will appear very handsome; but if sheep are not admitted into the fields, there will be occasion for two ropes only, which will be enough to keep off larger cattle; and if the ropes are painted over with a composition of melted pitch, brown Spanish colour, and oil, mixed well together, they will last sound several years; and these sort of fences never obstruct the air, and the place, at the same time being open to view, the weeds will be better discovered than when the fences are close. In the latter case, the Hedges are sometimes suffered to be over-run with weeds, by their being excluded from the sight, so are frequently forgotten, especially in moist weather, when the weeds grow more luxuriant.

There are some persons who intermix Holly with the White Thorn in making their Hedges, which if rightly managed, will have a good effect, especially when young; but when this is practised, the Holly should be planted so near, as that the Hedge may be entirely formed of it as it grows up, when the White Thorn should be quite rooted out; for as these advance, they will not keep pace in their growth, so will not appear beautiful when intermixed.

When a Hedge of Holly is intended to be made by plants, the ground should be well trenched, as was before advised for the seeds; and (unless the ground be very wet) the plants should be set in October, but, in wet ground, March is preferable. The plants should not be taken from a better soil than that in which they are to be planted; for when it so happens, the plants are much longer before they recover this change, than those are which are taken from a leaner soil. If the plants have been before removed two or three times, they will have better roots, and will be in less danger of miscarrying; besides, they may be removed with balls of earth to their roots. When the frost comes on, if mulch be laid upon the ground near the roots of the plants, it will prevent the tender fibres, which may then have been put out, from being destroyed by the cold. I would never advise the planting of Hedges with Holly plants, of above five or six years growth from the berries; for when the plants are older, if they take to grow, they are longer before they form a good Hedge, than plants which are much younger; and if the plants have been twice before transplanted, they will more certainly grow.

I shall next treat of Hedges for ornaments in gardens: these are sometimes planted with Evergreens, especially if they are not intended to grow very high; in which case, they are planted with deciduous trees. Evergreen Hedges are planted with Holly, Yew, Laurel, Laurustinus, Phillyrea, Alaternus, evergreen Oak, and some others of less note. The Holly is preferable to any other, for the reasons before given. Next to this, most people prefer the Yew, on account of its growing very close; for when these Hedges are well kept, they will be so thick as that a bird cannot get through them; but the dead colour of the Yew, renders these Hedges less agreeable. The Laurel is one of the most beautiful greens of any of the evergreen trees, but then it shoots so luxuriant, as to render it difficult to keep the Hedges which are planted with it, in tolerable shape; besides, the leaves being very large, if the Hedge is clipped with sheers, the leaves will be cut through, which gives them a bad appearance; therefore where there are Hedges of this kind, it will be the best way to prune them with a knife, cutting the shoots just down to a leaf. And although by this method the Hedge cannot be rendered so even as when cut with sheers, yet it will have a much better appearance than that of most of the leaves being cut through and stubbed, in the manner they must be when sheered.

The Laurustinus is also a very fine plant for this purpose, but the same objection is to be made to this as hath been to the Laurel; and as one of the great beauties of this plant is in its flowers, which are produced in the winter and spring, so when these are sheered, the flowers are generally cut off, by which their beauty is lost. Nor can this be avoided, where the Hedge is to be kept in close order, therefore this plant is not so proper for the purpose; but in such places where walls or other fences are designed to be hid, there is not any plant better adapted than this, provided it is rightly managed; for the branches of this plant are slender and pliable, so may be trained up close to the fence, whereby it may be entirely covered; and if, instead of clipping these with sheers, they are pruned with a knife, they may be so managed, as to have them full of flowers from the ground upward. This may be effected by pruning them in April, when the flowers are going off, cutting out those shoots that have flowered, or project too far from the fence; always cutting close to the leaf, that no stubs may be left: but those new shoots of the same spring must by no means be shortened, because the flowers are always produced at the extremity of the shoots of the same year; therefore when these are topped, as they must be by sheering, there can be few or no flowers upon these plants, except toward the top, where the sheers have not passed. By this method of knife pruning, the leaves will also be preserved entire, and the Hedge may always be kept enough within compass; and so thick, as fully to answer the purpose of covering the fence; and by the shoots growing a little irregular, it will make a much better appearance than any shorn Hedge whatever.

The small leaved and the rough leaved Laurustinus are the best sorts for this purpose, because their branches grow closer together than those of the shining leaved; they are also more hardy, and flower much better than the other, when growing in the open air.

The True Phillyrea is the next best plant for Hedges; it is by the gardeners called the True Phillyrea, to distinguish it from the Alaternus, which they simply call the Phillyrea. The branches of this are strong, the leaves pretty large, and of a strong green colour. And as this is a plant of middling growth, the Hedges planted with this may be led up to the height of ten or twelve feet; and if these Hedges are kept narrow at the top, that there may not be too much width for the snow to lodge upon them, they may be rendered very close and thick, and being a very good green, will make a fine appearance.

The Alaternus was formerly much more cultivated in the English gardens than at present. This was often planted to form Hedges, but the branches of this plant are too pliant for this purpose, being frequently displaced by strong winds, which render these Hedges unsightly; they also shoot very irregular and thin, so that

that the middle of the Hedge is frequently open and wide, and only the ſides of them can be kept tolerably cloſe, and that muſt be by often clipping them. If we add to this, their being frequently laid or broken down by ſnow in the winter, it muſt be deemed an improper plant for this purpoſe.

The Ilex, or evergreen Oak, is alſo planted for Hedges, and where theſe are deſigned to grow pretty tall, it is a fit plant for the purpoſe; becauſe it is a plant of large growth, eſpecially the ſort which is moſt common in England; for there are two ſorts of them which grow in the ſouth of France and Italy, that are of much humbler growth, ſo are better adopted to this purpoſe, eſpecially where the Hedge is not intended to be high, but theſe are not at preſent common here. When theſe Hedges are planted very young, and kept cloſe trained from the beginning, they may be very cloſe from the ground to the height of twenty feet or more; but theſe muſt always be kept narrower at the top than below, that there may not too much ſnow lodge upon them in the winter, which is apt to break and diſplace the branches, whereby the Hedges will be rendered unſightly.

There are alſo ſome perſons who have planted the Pyracantha, or evergreen Thorn, Juniper, Box, Cedar of Virginia, Bay, &c. as alſo the Halimus, or Sea Purſlane, and the Furz, Roſemary, and ſeveral other plants for Hedges; but the five ſorts firſt mentioned having very pliant branches, which will require to be ſupported, and the three laſt being often deſtroyed by ſevere froſt, renders them unfit for this purpoſe; nor are there other ſorts of evergreen plants in the Engliſh gardens, which are ſo well adapted for Hedges, as thoſe before-mentioned,

The deciduous trees, which are uſually planted to form Hedges in gardens, are the following ſorts.

The Hornbeam is much eſteemed for this purpoſe, eſpecially in ſuch places where they are not required to be very high, or not wanted to grow very faſt; for this plant, while young, doth not make ſo great progreſs as many others; but as it is of ſlower growth, the Hedges may be kept neat with leſs trouble than moſt other plants will require; and the branches naturally growing very cloſe, they will make one of the cloſeſt Hedges of all the deciduous trees; but as the leaves of this tree continue upon the branches all the winter, and until the buds in the ſpring force them off, they have a bad appearance during the winter ſeaſon.

The Beech is alſo a very proper tree for this purpoſe, having the ſame good qualities as the Hornbeam; but the leaves of this continue late in winter upon the branches, when they will have a bad appearance; beſides, the litter which is occaſioned by their leaves gradually falling moſt part of the winter, prevents the garden from being made clean a great while longer than if there are none of theſe trees planted.

The ſmall-leaved Engliſh Elm, is alſo a proper tree for tall Hedges; if theſe are planted young, and kept cloſely clipped from their firſt ſetting out, the Hedges may be trained up to the height of thirty or forty feet, and be very cloſe and thick the whole height. But when theſe trees are planted for this purpoſe, they ſhould not be crowded ſo cloſe together as they uſually are by moſt people; by which method, when the trees have ſtood ſome years, if they have thriven well, their ſtems will approach ſo near each other, as that few branches can be maintained below, whereby the bottom of the Hedge will be naked; therefore they ſhould not be planted cloſer together than ſeven or eight feet, or if they are ten feet it will be ſtill better. And although at this diſtance they will not form a cloſe Hedge ſo ſoon as when the trees are planted cloſer together, yet they will in a few years recompenſe for that, by their growing much cloſer and better from the ground upward.

The Dutch Elm was formerly in great eſteem for Hedges, being quick of growth, and thriving in ſuch ſoils as the Engliſh Elm would not grow; but the wretched appearance which theſe Hedges made, after they had been growing a few years, very juſtly occaſioned their being almoſt univerſally rooted out of gardens, for a more abominable plant was never introduced into gardens than this.

The Lime-tree hath alſo been recommended for Hedges, and in ſome of the old gardens there were many planted with this tree, which, for a few years after planting, made a tolerable appearance, eſpecially when they grow upon a moiſt ſoil; but after they had ſtood ſome years, they grew very thin at bottom, and by being ſheered at the top, they were rendered very ſtubby and unſightly, their leaves growing very thinly upon the branches, and theſe frequently turning of a black diſagreeable colour, and falling off very ſoon in the autumn, and ſometimes in the ſummer in dry ſeaſons, has brought theſe trees ſo much into diſrepute, as that few perſons make uſe of them at preſent for this purpoſe: nor ſhould any of the very ſtrong ſhooting trees be applied to this uſe; for the more they are cut, the ſtronger they will ſhoot, and of courſe will appear very unſightly; beſides, the often cutting of theſe Hedges occaſions great trouble and expence, and frequent litters in gardens.

The Alder is frequently planted for Hedges, and where the ſoil is moiſt, there is not any of the deciduous trees equal to it for this purpoſe; for the leaves are of a lively green, continuing freſh till late in the autumn; and when they decay, their litter is ſoon over, for they all drop in a ſhort time.

There are, beſides the trees before-mentioned, many of the flowering ſhrubs which have been planted to form Hedges; ſuch as Roſes, Honeyſuckles, Sweetbriar, &c. but theſe make a bad appearance, being more difficult to train; and if they are cut to keep them within compaſs, their flowers, which are their greateſt beauty, will be entirely deſtroyed. But as theſe are but of low growth, they are not proper to plant where the Hedges are to be of any height.

Although I have given theſe full directions for planting and ordering of theſe Hedges for the pleaſure-garden, yet I am far from recommending them as ornamental or uſeful. But as there are numbers of perſons who may differ from me in their opinion, and therefore might think it a deficiency in my book, had I not given theſe inſtructions; to avoid their reproach, I have inſerted as much as I think will be neceſſary for the obtaining theſe Hedges wherever they are deſired, and at a leſs expence than the late method of planting them hath been generally attended with; where it is not uncommon to ſee four times the number of trees planted in theſe Hedges as would have been neceſſary, or that can remain long cloſe together with any beauty. But moſt people who plant, are in too great a hurry to have their garden filled; and therefore frequently plant ſo cloſe, as that in three or four years (if their trees thrive) three-fourths of them will require to be taken away again, to make room for thoſe which are left to grow; and there are not wanting perſons, who are ready enough to encourage this practice, ſince their own intereſt is thereby promoted.

The taſte in gardening having been greatly altered of late years for the better, theſe clipped Hedges have been almoſt excluded; and it is to be hoped, that a little time will entirely baniſh them out of the Engliſh gardens, as it has already been done by the ſhorn Evergreens, which, a few years ſince, were eſteemed the greateſt beauties of gardens. The latter was introduced by the Dutch gardeners, and that of tall Hedges with treillage-work, was in imitation of the French gardens; in ſome of which, the expence of the iron treillage, to ſupport the trees which compoſe their cabinets, pavillions, bowers, porticoes, and other pieces of rural architecture, amounted to a very great ſum. I have been informed this work, in one garden, has coſt above twenty thouſand crowns; and this only to train up trees in the diſtorted ſhape of pilaſters, niches, cornices, pediments, &c. when at the ſame time, theſe can no longer retain the forms intended,

tended, than they are kept closely shorn into them; for no sooner do the trees begin to make fresh shoots, but the whole frame is altered; and instead of carrying the fine finished appearance of a regular piece of architecture, it is grown into a rude unpolished form. This expensive sort of work never has made much progress in England, but that part of the French taste, in surrounding all the several divisions of gardens with tall clipped Hedges, making great alleys, forming the walks into stars, and the like stiff performances, have too much obtained for some years past in England: and the taller these clipped Hedges were, the more they were admired; though many times they shut out from the view the sight of some of the noblest Oaks, and other timber trees, growing in the quarters, which are infinitely more pleasing to a person of true taste, than all the ridiculous forms it is possible for trees to be framed in by art. Besides, when the expence of keeping these Hedges, together with the great litter they occasion when clipped, is considered, these, added to many other reasons which might be given, are sufficient to exclude them out of gardens; where they can never be esteemed necessary, but to shut out from the view the sight of worse objects.

HEDYPNOIS. See Hyoseris.

HEDYSARUM. Lin. Gen. Plant. 793. Tourn. Inst. R. H. 401. tab. 225. French *Honeysuckle.*

The Characters are,

*The flower hath a permanent empalement of one leaf, cut into five segments at the top. It is of the butterfly kind, having an oblong compressed standard, which is indented at the point and reflexed; the wings are oblong and narrow; the keel is compressed, broader at the end, but convex at the base. It hath nine stamina joined, and one standing separate, which are terminated by roundish compressed summits; the stamina are reflexed, having an angle or knee. In the center is situated a long narrow germen, supporting an awl-shaped inflexed style, crowned by a single stigma. The germen afterward becomes a jointed pod which is compressed, each joint being roundish, and incloses a single kidney-shaped seed.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, which includes those plants whose flowers have ten stamina joined in two bodies.

The Species are,

1. Hedysarum (*Coronarium*) foliis pinnatis, leguminibus articulatis aculeatis, nudis, rectis, caule diffuso. Hort. Cliff. 365. *French Honeysuckle with winged leaves, naked, prickly, jointed pods, and a diffused stalk.* Hedysarum clypeatum, flore suaviter rubente. H. Eyst. *French Honeysuckle, with a delicate red flower.*

2. Hedysarum (*Spinosissimum*) foliis pinnatis, leguminibus articulatis, aculeatis tomentosis, caule diffuso. Hort. Upsal. 231. *French Honeysuckle with winged leaves, jointed, prickly, woolly pods, and a diffused stalk.* Hedysarum clypeatum minus, flore purpureo. Raii Hist. *Smaller French Honeysuckle with a purple flower.*

3. Hedysarum (*Canadense*) foliis simplicibus ternatisque, floribus racemosis. Hort. Cliff. 232. *French Honeysuckle with single and trifoliate leaves, and flowers in bunches.* Hedysarum triphyllum Canadense. Cornut. *Three-leaved French Honeysuckle of Canada.*

4. Hedysarum (*flexuosum*) foliis pinnatis, leguminibus articulatis, aculeatis, flexuosis, caule diffuso. Lin. Sp. Plant. 750. *French Honeysuckle with winged leaves, jointed prickly pods which are waved, and a diffused stalk.* Hedysarum annuum, siliquâ asperâ undulatâ intortâ. Tourn. *Annual French Honeysuckle, with a rough, waved, writhed pod.*

5. Hedysarum (*Diphyllum*) foliis binatis petiolatis, floralibus sessilibus. Flor. Zeyl. 291. *French Honeysuckle with two leaves upon a foot-stalk, sitting close to the stalks.* Hedysarum minus diphyllum, flore luteo. Sloan. Cat. 73. *Smaller two-leaved French Honeysuckle, with a yellow flower.*

6. Hedysarum (*Purpureum*) foliis ternatis, foliolis obovatis floribus paniculatis terminalibus, leguminibus intortis. *French Honeysuckle with trifoliate oval leaves, flowers growing in panicles at the ends of the stalks, and intorted pods.* Hedysarum triphyllum fruticosum, flore purpureo, siliquâ varie distortâ. Sloan. Cat. 73. *Three-leaved shrubby French Honeysuckle, with a purple flower and a variously distorted pod.*

7. Hedysarum (*Canescens*) foliis ternatis subtus nervosis, caule glabro fruticoso floribus spicatis terminalibus. *Three-leaved shrubby dwarf Honeysuckle, with veins on the under side, a smooth shrubby stalk, with flowers growing in spikes at the ends.* Hedysarum triphyllum fruticosum supinum, flore purpureo. Sloan. Cat. *Three-leaved shrubby dwarf French Honeysuckle, with a purple flower.*

8. Hedysarum (*Sericeum*) foliis ternatis, foliolis ovatis subtus sericeis, floribus spicatis alaribus terminalibusque. *Three-leaved French Honeysuckle, with oval leaves sitting on their under side, and flowers in spikes from the side and the end of the stalks.* Hedysarum triphyllum frutescens, foliis subrotundis & subtus sericeis, flore purpureo. Houst. *Three-leaved shrubby French Honeysuckle with roundish leaves, which are silky underneath, and a purple flower.*

9. Hedysarum. (*Villosum*) foliis ternatis, caulibus diffusis villosis, floribus spicatis terminalibus, calycibus, villosissimis. *Three-leaved French Honeysuckle, with diffused stalks which are hairy, flowers growing in spikes at the ends of the branches, and very hairy empalements.* Hedysarum triphyllum humile, flore conglomerato calyce villoso. Houst. *Dwarf three-leaved French Honeysuckle, with flowers growing in clusters, and a hairy cup.*

10. Hedysarum (*Procumbens*) foliis ternatis caulibus procumbentibus racemosis, floribus laxè spicatis terminalibus, leguminibus contortis articulis quadrangularibus. *Three-leaved French Honeysuckle, with branching trailing stalks, flowers growing in loose spikes at the ends of the branches, and twisted pods with square joints.* Hedysarum triphyllum procumbens, foliis rotundioribus & minoribus, siliquis tenuibus & intortis. Houst. *Trailing three-leaved French Honeysuckle, with smaller and rounder leaves, and narrow contorted pods.*

11. Hedysarum (*Intortum*) foliis ternatis, foliolis obcordatis, caule erecto triangulo villoso, racemis terminalibus, leguminibus articulatis incurvis. *French Honeysuckle, with trifoliate leaves whose lobes are heart-shaped, a triangular upright hairy stalk, flowers growing in long bunches at the ends of the branches, and and jointed incurved pods.* Hedysarum triphyllum, caule triangulari, foliis mucronatis, siliquis tenuibus intortis. Houst. *Three-leaved French Honeysuckle, with a triangular stalk, pointed leaves, and a narrow contorted pod.*

12. Hedysarum (*Glabrum*) foliis ternatis obcordatis, caule paniculato, leguminibus monospermis glabris. *French Honeysuckle with trifoliate heart-shaped leaves, a paniculated stalk, and smooth pods containing one seed.* Hedysarum triphyllum, annuum, erectum, siliquis intortis, & ad extremitatem amplioribus. Houst. *Three-leaved, annual, upright French Honeysuckle, with contorted pods, which are broad at their extremity.*

13. Hedysarum (*Scandens*) foliis ternatis, foliolis obversè-ovatis, caule volubili, spicâ longissimâ reflexâ. *Three-leaved French Honeysuckle, with obverse oval lobes, a twining stalk, and a very long reflexed spike of flowers.* Hedysarum triphyllum Americanum scandens, flore purpureo. *Three-leaved, climbing, American French Honeysuckle, with a purple flower.*

14. Hedysarum (*Repens*) foliis ternatis obcordatis, caulibus procumbentibus racemis lateralibus. Lin. Sp. 1056. *Three-leaved French Honeysuckle, with oval heart-shaped leaves, trailing hairy stalks, and flowers on the side of the stalks.* Hedysarum procumbens, trifolii fragiferi folio. Hort. Elth. 172. *Trailing French Honeysuckle, with leaves like the Strawberry Trefoil.*

15. Hedysarum (*Maculatum*) foliis simplicibus ovatis obtusis. Hort. Cliff. 449. *French Honeysuckle, with oval, obtuse, single leaves.* Hedysarum humile, capparidis folio maculato. Hort. Elth. 170. *Low French Honeysuckle, with a spotted Caper leaf.*

16. Hedysarum (*Frutescens*) foliis ternatis ovato-lanceolatis, subtus villosis, caule frutescente villoso.



*Trifoliate*

*Trifoliate French Honeysuckle, with oval spear-shaped leaves, hairy on their under side, and a shrubby hairy stalk.* Quere, Whether this be not the Hedysarum foliis ternatis sub-ovatis subtus villosis caule frutescente. Flor. Virg. 174. *Three-leaved French Honeysuckle, with oval leaves and a shrubby stalk.*

17. Hedysarum (*Pedunculatum*) foliis ternatis, foliolo intermedio pediculo longiore, racemis alaribus erectis longissimis. *French Honeysuckle with trifoliate leaves, the middle lobe standing on a longer foot-stalk, and very long bunches of flowers coming from the sides of the stalks.*

18. Hedysarum (*Alhagi*) foliis simplicibus lanceolatis obtusis, caule fruticoso spinoso. Lin. Sp. Plant. 745. *French Honeysuckle with single, spear-shaped, obtuse leaves, and a prickly shrubby stalk.* Alhagi Maurorum. Rauwolf. 94. *The Alhagi of the Moors.*

19. Hedysarum (*Triquetrum*) foliis simplicibus cordato-oblongis integerrimis glabris. *French Honeysuckle with single, oblong, heart-shaped leaves, which are smooth and entire.* Onobrychis Zeylanica aurantii folio. Pet. Hort. Scic. 247. *Cockshead of Ceylon with an Orange-leaf.*

20. Hedysarum (*Echastaphyllum*) foliis simplicibus ovatis subtus sericeis, petiolis muticis. Amœn. Acad. 5. p. 403. *French Honeysuckle with oval single leaves, silky on their under side, and a spiked foot-stalk.* Spartium scandens, citri foliis, floribus albis ad nodos confertim nascentibus. Plum. Sp. 19.

21. Hedysarum (*Gangeticum*) foliis simplicibus ovatis acuminatis, spicis longissimis nudis terminalibus. *French Honeysuckle with oval-pointed single leaves, and very long naked spikes of flowers terminating the stalks.* An Hedysarum foliis simplicibus ovatis acutis basi stipulatis. Lin. Sp. 1052.

The first sort has been long cultivated in the English gardens for ornament. This grows naturally in Italy; there are two varieties of this, one with a bright red, and the other a white flower, which very rarely vary from one to the other; but as there is no other difference but in the colour of their flowers, so they are supposed to be the same species.

It is a biennial plant, which flowers the second year, and soon after the seeds are ripe, the roots generally perish: this sends up several hollow smooth stalks two or three foot long, which branch out on each side, garnished with winged leaves, composed of five or six pair of oval lobes, terminated by an odd one; the leaves are placed alternate, and from their base comes out foot-stalks which are five or six inches long, sustaining spikes of beautiful red flowers; these are succeeded by compressed jointed pods, which are very rough, standing erect; in each of the joints is lodged one kidney-shaped seed. This sort flowers in June and July, and the seeds ripen in September. The white is only a variety of this, and as such, is sometimes preserved in gardens.

They are propagated by sowing their seeds in April, in a bed of light fresh earth; and when the plants come up, they should be transplanted into other beds of the like earth, and in an open situation, at about six or eight inches distance from each other, leaving a path between every four rows, to go between them to hoe, and clear them from weeds. In these beds they may remain until Michaelmas, then may be transplanted into the large borders of a parterre or pleasure-garden, allowing them at least three feet distance from other plants, amongst which they should be interspersed, to continue the succession of flowers; where they will make a fine appearance when blown, especially the red sort, which produces very beautiful flowers.

As these plants decay after they have perfected their seeds, so there should annually be a fresh supply of plants raised, where they are desired, for the old roots seldom continue longer. They are very proper ornaments for large borders, or to fill up vacancies among shrubs, but they grow too large for small borders, unless their stalks are pruned off, leaving only two or three on each plant; which, if kept upright with sticks, will prevent their hainging over other flowers. They are propagated for supplying the markets with plants to adorn the London gardens and balconies, by the gardeners in the neighbourhood of London.

The second sort is an annual plant, which grows naturally in Spain and Portugal; the leaves of this are narrow and oblong, four or five pair being placed along the midrib, with an odd one at the end; the stalks are terminated by small spikes of purple flowers, which are succeeded by small rough pods, shaped like those of the former sort. This plant is preserved in botanic gardens for the sake of variety; it is propagated by seeds, which should be sown the beginning of April, in the place where the plants are to remain, and will require no other culture but to thin them where they are too near, and keep them clean from weeds. This flowers in July, and the seeds ripen in autumn.

The third sort hath a perennial root, which will abide many years if planted in a dry soil. This is propagated by sowing the seeds in the manner directed for the former; but when the plants are come up two inches high, they should be transplanted where they are to remain for good; but if they are not too thick in the seed-bed, they may be suffered to remain there until the following autumn; at which time they should be carefully taken up, and transplanted into the borders where they are designed to stand; for their roots generally run down very deep, so that it is not safe to remove them often. This plant produces its flowers about the same time of the year as the former, and if the season proves favourable, perfects its seeds in autumn; and the roots will abide in the open air very well, resisting the severest cold, provided they are planted in a dry soil.

The fourth sort is an annual plant, which grows naturally in the Levant. This hath some resemblance of the first, but is much smaller; the stalks arise near a foot high, and are garnished with winged leaves, composed of two or three pair of oval lobes, terminated by an odd one; the flowers come out in spikes at the top of the stalks, which are of a pale red intermixed, with a little blue. These appear in July, and are succeeded by jointed pods which are waved on both sides, forming an obtuse angle at each joint; the seeds ripen in the autumn. This is propagated in the same way as the second sort, and is equally hardy.

The fifth sort grows naturally in both Indies; the seeds of this were sent me from La Vera Cruz, by the late Dr. Houstoun. This is an annual plant, with a long tap root, which runs deep in the ground, sending out one or two stalks, which rise about nine inches high, the lower part being garnished with oval leaves by pairs on each foot-stalk; but the upper part of the stalk where the flowers come out, is garnished with small leaves, ending in acute points, sitting close to the stalks, and at each of these is situated a single, small, yellow flower, inclosed by the two leaves. These make but little appearance, and are succeeded by oblong pods, containing one kidney-shaped seed.

The sixth sort was sent me by the the late Dr. Houstoun from La Vera Cruz, where he found it growing naturally, as it also does in Jamaica. This is an annual plant, which rises with a shrubby stalk upward of four feet high, dividing into several branches, which are garnished with oblong oval leaves that are trifoliate, standing upon pretty long foot-stalks, the middle lobe standing an inch beyond the other two; the branches are terminated by long loose panicles of purple flowers, which are succeeded by narrow jointed pods which are twisted. These plants flower in July, and their seeds ripen in autumn.

The two last mentioned are tender plants, so their seeds must be sown in the spring upon a hot-bed; and when the plants are fit to remove, they should be each planted in a separate small pot, filled with light earth, and plunged into a hot-bed, keeping them shaded from the sun till they have taken new root; then

then they muſt be treated in the ſame way as other tender plants from hot countries, always keeping them in the ſtove or glaſs-caſe, otherwiſe they will not flower or produce ſeeds in England.

The ſeventh ſort grows naturally in Jamaica, from whence the ſeeds were ſent me by the late Dr. Houſtoun. This is a ſhrubby plant, which riſes about five feet high, and divides into ſeveral branches, which are garniſhed with trifoliate leaves which are oval, the middle lobe being much larger than the other two; the ſtalks are terminated by long ſpikes of ſmall purple flowers, which are ſucceeded by narrow pods, ſtrait on one ſide, but jointed on the other.

The eighth ſort was ſent me from La Vera Cruz by the late Dr. Houſtoun, who found it growing there naturally. This riſes with a ſhrubby ſtalk ſix or ſeven feet high, dividing into ſeveral branches, which are garniſhed with trifoliate oval leaves, ſilky and white on their under ſide, but of a pale green on their upper ſide; the flowers come out in long narrow ſpikes from the wings, and at the end of the branches, ſitting cloſe to the ſtalks; they are ſmall, of a bright purple colour, and are ſucceeded by flat, ſmooth, jointed pods, about one inch long, each joint having one kidney-ſhaped ſeed.

The two laſt ſorts will continue two or three years, if the plants are placed in the bark-ſtove. They are propagated by ſeeds, which muſt be ſown upon a hot-bed, and the plants treated in the ſame manner as thoſe juſt before-mentioned; and when they have obtained height, they ſhould be removed into the bark-ſtove, where they ſhould conſtantly remain, allowing them a large ſhare of air in warm weather. Theſe plants ſeldom flower till the ſecond year, when they will produce ſeeds which ripen in the autumn.

The ninth ſort is an annual plant, which grows naturally at La Vera Cruz, from whence it was ſent me by the late Dr. Houſtoun. This ſeldom riſes more than eight or nine inches high, ſending out ſeveral branches from the root, which are diffuſed and hairy; they are cloſely garniſhed with ſmall, oval, trifoliate leaves, a little hoary. The flowers grow in cloſe ſhort ſpikes; they are purple, and have very hairy empalements.

The tenth ſort grows naturally in Jamaica. This hath ligneous trailing ſtalks a foot and a half long, ſending out ſeveral branches on each ſide, which are garniſhed with ſmall, round, trifoliate leaves, of a pale green colour; the flowers are produced in very looſe ſpikes at the ends of the branches; they are ſmall, and of a pale purpliſh colour, ſucceeded by narrow twiſted pods which are jointed, each joint being four cornered, containing a ſingle, ſmall, compreſſed ſeed.

The two laſt ſorts being annual, require the ſame treatment as the fifth and ſixth ſorts before-mentioned, with which management they will flower and ripen their ſeeds in this country.

The eleventh ſort is a ſhrubby plant, which riſes with triangular ſtalks five or ſix feet high, dividing into ſeveral branches, garniſhed with heart-ſhaped trifoliate leaves, ending in acute points; the flowers are produced in very long ſpikes at the end of the branches, which are of a pale purple colour, and are ſucceeded by narrow jointed pods which are variouſly twiſted; the ſeeds are ſmall and compreſſed.

This plant grows naturally in Jamaica, from whence the ſeeds were ſent me by the late Dr. Houſtoun. It will continue three or four years, if the plants are treated in the ſame manner directed for the ſeventh and eighth ſorts, and will perfect ſeeds in this country.

The twelfth ſort is annual, the ſeeds of it were ſent me by the late Dr. Houſtoun from Campeachy. This hath a paniculated ſtalk, which riſes about two feet high, garniſhed with heart-ſhaped trifoliate leaves; the upper part of the ſtalk branches out into panicles of flowers, which are of a pale purple colour; theſe are ſucceeded by lunulated compreſſed pods, which ſtand oblique to the ſtalk, each containing one compreſſed kidney-ſhaped ſeed. This ſort is propagated by ſeeds, and requires the ſame treatment as the fifth and ſixth ſorts.

The thirteenth ſort was ſent me from La Vera Cruz, by the late Dr. Houſtoun. This hath a twining ſtalk, which gets round the trees and ſhrubs which grow near it, and climbs to the height of ten or twelve feet, garniſhed with obverſe, oval, trifoliate leaves, ſtanding upon pretty long foot-ſtalks; the flowers are produced in very long ſpikes, which are reflexed; they are of a dark purple colour, and ſit cloſe to the ſtalk. This is an abiding plant, which requires a ſtove to preſerve it in this country, ſo the plants ſhould be treated in the ſame manner as the ſeventh and eighth ſorts.

The fourteenth ſort is an annual plant, which grows naturally in both Indies. The ſeeds of this were ſent me from the Havannah by the late Dr. Houſtoun; it hath trailing branches near a foot long, which are garniſhed with round trifoliate leaves, a little indented at the top, very like in ſhape to thoſe of the Strawberry Trefoil; the ſtalks and under ſide of the leaves are hairy; the flowers are produced toward the end of the branches, ſometimes ſingle, and at other times two at a joint; they are of a purple colour and ſmall; theſe are ſucceeded by pods about an inch long, which are ſtrait on one ſide, and jointed on the other. This flowers the end of July, and ſometimes perfects ſeeds here.

The fifteenth ſort is a low annual plant, having ſlender ſtalks near a foot long, their lower part being garniſhed with ſingle oval leaves, ſtanding upon ſlender foot-ſtalks; their upper part is adorned with flowers, which come out by pairs above each other, to the end of the ſtalk; they are but ſmall, and of a reddiſh yellow colour; theſe are ſucceeded by jointed narrow pods, which ſit cloſe to the ſtalk, and are ſickle-ſhaped. The two laſt mentioned are annual plants, which require the ſame culture as the fifth and ſixth ſorts.

The ſixteenth ſort was ſent me by the late Dr. Dale, from South Carolina. This hath a perennial root, from which ariſe two or three ſhrubby hairy ſtalks near two feet high, branching out on every ſide near the top, garniſhed with oval, ſpear-ſhaped, trifoliate leaves, which are hairy on their under ſide, and ſtand upon ſhort foot-ſtalks; the flowers are produced at the end of the branches in ſhort ſpikes; they are of a purpliſh yellow colour, and ſmall; the ſtalks of this ſort decay every autumn, and new ones ariſe in the ſpring. It is propagated by ſeeds, which ſhould be ſown upon a hot-bed in the ſpring, and when the plants are fit to remove, they ſhould be planted in ſeparate ſmall pots filled with light earth, and plunged into a moderate hot-bed, obſerving to ſhade them until they have taken new root; then they ſhould have a large ſhare of air admitted to them in warm weather, and in ſummer they may be expoſed to the open air, but in the autumn they muſt be placed under a frame to ſcreen them from froſt; the following ſpring ſome of theſe plants muſt be ſhaken out of the pots and planted in a warm border, where, if the ſummer proves warm, they will flower, but theſe ſeldom perfect their ſeeds; therefore two or three plants ſhould be put into larger pots, and plunged into a moderate hot-bed, which will bring them early into flower; ſo that if the glaſſes are kept over them in bad weather, theſe will ripen their ſeeds in autumn, and the roots will continue ſome years, if they are ſcreened from froſt in winter.

The ſeventeenth ſort was ſent me with the laſt, by the ſame gentleman, from South Carolina. This hath a perennial root and an annual ſtalk, which grows erect about two feet high, garniſhed with long trifoliate leaves, which are rounded at their baſe where they are broadeſt, and narrowed all the way to a point; they are near three inches and a half long, and half an inch broad at their baſe, of a light green colour, and ſmooth; the two ſide lobes ſit pretty cloſe to the ſtalk, but the middle

middle one ſits upon a foot-ſtalk an inch long; the flowers are produced in long ſpikes from the wings of the ſtalk, growing erect; the lower part of the ſpike is but thinly ſet with flowers, but on the upper part they are diſpoſed very cloſe; theſe are ſmall, and of a bright yellow colour, ſitting very cloſe to the ſtalks, and are ſucceeded by jointed pods ſtrait on one ſide.

This plant is propagated by ſeeds, and requires the ſame treatment as the laſt mentioned, with which it will flower and produce ripe ſeeds.

The eighteenth ſort grows naturally in Syria, where it is one of the beauties of the country. It riſes with ſhrubby ſtalks about three feet high, which branch out on every ſide, and are garniſhed with ſingle leaves, ſhaped like thoſe of the broad-leaved Knot-graſs; they are very ſmooth, of a pale green colour, and ſtand on ſhort foot-ſtalks; under theſe leaves come out thorns, which are near an inch long, of a reddiſh brown colour; the flowers come out from the ſide of the branches in ſmall cluſters; they are of a purple colour in the middle, and reddiſh about the rims; theſe are ſucceeded by pods, which are ſtrait on one ſide, and jointed on the other, bending a little in ſhape of a ſickle. This plant is at preſent pretty rare in the Engliſh gardens; it is propagated by ſeeds, which will frequently lie a year in the ground before they vegetate, therefore ſhould be ſown in pots filled with light earth, and plunged into a moderate hot-bed; and if the plants do not appear by the beginning of June, the pots ſhould be taken out of the bed, and placed where they may have only the morning ſun, keeping them clean from weeds; and in the autumn, they ſhould be plunged into an old bed of tanners bark under a frame, where they may be ſcreened from the froſt and hard rains in the winter, and in ſpring plunged into a freſh hot-bed, which will bring up the plants: when theſe are fit to remove, they ſhould be each planted into a ſeparate ſmall pot, filled with light earth, and plunged into a very moderate hot-bed, ſhading them from the ſun till they have taken new root; then they ſhould be gradually hardened to bear the open air, into which they ſhould be removed in June, placing them in a ſheltered ſituation, where they may remain till the autumn; when, if they are plunged into an old tan-bed under a frame, where, in mild weather they may enjoy the free air, and be protected from froſt, they will ſucceed better than if placed in a green-houſe, or more tenderly treated. I have ſeen this plant growing in the full ground, in a very warm border, where, by covering it in froſty weather, it had endured two winters, but a ſevere froſt happening the third winter entirely killed it.

From this ſhrub the Perſian Manna is collected, which is an exſudation of the nutritious juice of the plant. This drug is chiefly gathered about Tauris, a town in Perſia, where the ſhrub grows plentifully. Sir George Wheeler found it growing in Tinos, and ſuppoſed it was an undeſcribed plant. Tournefort found it in plenty in many of the plains in Armenia and Georgia, and made a particular genus of it under the title of Alhagi.

The nineteenth ſort grows naturally in India, from whence the ſeeds have been lately brought to Europe, and ſeveral plants have been raiſed in the Engliſh gardens; theſe have leaves ſo like thoſe of the Orange-tree, as ſcarcely to be diſtinguiſhed while young; but as there are not any plants here of a large ſize, ſo I can give no further account of this ſort at preſent.

The twentieth ſort was ſent me from Carthagena in New Spain, by the late Dr. Houſtoun: this is a perennial plant with a twining ſtalk, which twiſts round any neighbouring ſupport, riſing to the height of ten or twelve feet, ſending out a few ſmall branches from the ſide, garniſhed with oval leaves four or five inches long, and an inch and a half broad in the middle; the under ſide of the leaves are like ſattin; the flowers are white, coming out from the ſide of the ſtalk in cloſe bunches; they are of the ſame form with the other ſpecies of this genus, and are ſucceeded by ſhort pods, containing one or two kidney-ſhaped ſeeds.

The ſeeds of the twenty-firſt ſort I received from the Eaſt-Indies; this is an annual plant, which riſes about three feet high, having a ſlender ſtalk inclining to be ſhrubby, garniſhed with oval leaves placed ſingle on very ſhort foot-ſtalks; ſome of the plants ſend out one or two ſlender branches from the main ſtalk, the lower part of which are garniſhed with leaves of the ſame form with thoſe on the principal ſtalk, but are ſmaller: the upper part of the principal ſtalk and the branches are garniſhed with flowers near a foot in length, which are of a worn-out purple colour, ſtanding ſingle at each joint: theſe are ſucceeded by jointed pods an inch and a half long, containing three or four kidney-ſhaped ſeeds in each.

Theſe two ſorts are too tender to thrive in the open air in England; they are both propagated by ſeeds, which muſt be ſown on a hot-bed early in the ſpring; and when the plants are come up, and fit to remove, they ſhould be parted, and each planted in a ſeparate ſmall pot, plunging them into a freſh hot-bed, where they ſhould be ſcreened from the ſun till they have taken new root; after which, they ſhould be treated in the ſame manner as other tender plants. The twenty-firſt ſort muſt be placed in the bark-ſtove in autumn, but the other will ripen ſeeds the ſame year the beginning of October.

**HEDYSARUM** Zeylanicum majus & minus. See Æschynomene.

**HEDYSARUM** mimoſæ foliis. See Æschynomene.

**HELENIUM.** Lin. Gen. Plant. 863. Heleniaſtrum. Vaill. Act. R. Par. 1720. Baſtard Sun-flower.

The Characters are,

*It hath a flower compoſed of ſeveral hermaphrodite florets, which form the diſk, and female half florets which compoſe the rays. The hermaphrodite florets are tubulous, and cut into five parts at the brim; theſe have each five ſhort hairy ſtamina, terminated by cylindrical ſummits, with an oblong germen ſupporting a ſlender ſtyle, crowned by a bifid ſtigma. The germen afterward becomes an angular ſingle ſeed, crowned by a ſmall five-pointed empalement. The female florets in the border have ſhort tubes, and are ſtretched out on one ſide like a tongue to form the ray; theſe are cut into five ſegments at their points, where they are broad. The female flowers have no ſtamina, but have an oblong germen, which turns to a ſingle ſeed like thoſe of the hermaphrodite flowers; theſe are all included in one common ſingle empalement, which ſpreads open, and is cut into ſeveral ſegments.*

This genus of plants is ranged in the ſecond ſection of Linnæus's nineteenth claſs, which includes thoſe plants which have compound flowers, the hermaphrodite florets in the center, and the female half florets on the border, being both fruitful.

The Species are,

1. Helenium (*Autumnale*) foliis lanceolatis-linearibus integerrimis glabris, pedunculis nudis unifloris. *Helenium with ſpear-ſhaped narrow leaves, which are ſmooth, entire, and naked foot-ſtalks with ſingle flowers.* Heleniaſtrum folio longiore & anguſtiore. Vaill. Act. R. Par. 1720. *Baſtard Sun-flower with a longer and narrower leaf.*
2. Helenium (*Latifolium*) foliis lanceolatis acutis ſerratis, pedunculis brevioribus, calycibus multifidis. *Helenium with pointed, ſpear-ſhaped, ſawed leaves, ſhorter foot-ſtalks, and a many-pointed empalement.* Heleniaſtrum folio breviore & latiore. Vaill. Act. R. S. 1720. *Baſtard Sun-flower with a broader and ſhorter leaf.*

Theſe plants riſe to the height of ſix or ſeven feet in good ground; the roots, when large, ſend up a great number of ſtalks, which branch toward the top; thoſe of the firſt ſort are garniſhed with ſmooth leaves, which are three inches and a half long, and half an inch broad in the middle, with entire edges ſitting cloſe to the ſtalks, and from their baſe is extended a leafy border along the ſtalk, ſo as to form what was generally termed a winged ſtalk, but Linnæus calls it a running leaf; the upper part of the ſtalk divides, and from each diviſion ariſes a naked foot-ſtalk about three inches long, ſuſtaining one yellow flower at the top, ſhaped like a Sun-flower, but much ſmaller, having long rays, which are jagged pretty

deep into four or five segments; these appear in August, and there is a succession of flowers on the plants till the frost puts a stop to them.

The second sort hath the appearance of the first, but the leaves are not three inches long, and are more than an inch broad in the middle, ending in acute points, and are sharply sawed on their edges. The flowers stand upon shorter foot-stalks, growing closer together, for the stalks of this do not branch near so much as those of the other; they both flower at the same season.

There is also another sort with leaves as narrow as the first, which are acutely indented on the edges. The stalks branch at the top somewhat like those of the first, but the middle flowers have much shorter foot-stalks than those which branch on the side, and are garnished with small leaves, almost to the top; but I am not certain if this is a distinct species, or only a variety which has accidentally risen from the seeds of the other.

These plants are both of them natives of America; the seeds of both sorts I have received from Virginia and New England, where they grow wild in great plenty in the woods, and other shady places where the ground is moist. They may be propagated by seeds, or by parting their roots; but the latter is generally practised in this country, because they seldom perfect their seeds here; but if the seeds are procured from abroad, they should be sown the beginning of March on a border of light earth; and if the seeds should not come up the first year, the ground should not be disturbed, because they often remain a whole year in the ground before the plants come up; in which case there is nothing more to be done, but to keep the ground clear from weeds, and wait until the plants rise. When they appear, if the season proves dry, they must be often watered, which will greatly forward their growth; and where the plants come up too close to each other, they should be thinned, and transplanted out into beds a foot asunder every way, being careful to shade them until they have taken root, as also to water them in dry weather. In autumn they may be transplanted where they are to remain, and the following summer they will produce their flowers, which will continue till the frost prevents them; and their roots will abide many years, and afford many offsets, by which they may be increased.

The best season to transplant the old roots, and to part them for increase, is in the end of October, when their flowers are past, or the beginning of March, just before they begin to shoot; but if the spring should prove dry, they must be duly watered, otherwise they will not produce many flowers the same year; these plants should not be removed oftener than every other year, if they are expected to flower strong; they delight in a soil rather moist than dry, provided it be not too strong, or holds the wet in winter; but if they are planted in a dry soil, they must be often and plentifully watered in dry weather, to make them produce plenty of flowers.

HELENIUM, Elecampane. See Inula.

HELIANTHEMUM. Tourn. Inst. R. H. 248. tab. 128. Cistus. Lin. Gen. Plant. 598. *Dwarf Cistus, or Sun-flower.*

The Characters are,

*The flower has a three-leaved empalement, which is permanent, which afterward covers the seed-vessel. It hath five roundish petals which spread open, with a great number of erect stamina, which are terminated by small roundish summits. In the center is situated an oval germen, supporting a single style the length of the stamina, crowned by an obtuse stigma. The germen afterward becomes a roundish, or oval capsule, with three cells, opening in three parts, filled with small roundish seeds.*

This genus of plants is joined by Dr. Linnæus to that of Cistus, and is ranged in the first section of his thirteenth class, which includes those plants whose flowers have many stamina and one style. As the empalement of the flower has but three leaves, and those of Cistus five, and the capsule of the Helianthemum has but three cells, and that of Cistus five, so these characters are sufficient to admit of their being separated into different genera; and as there are a great number of species of both sorts, so by this separation they may be better ascertained.

The Species are,

1. Helianthemum (*Chamæcistus*) caulibus procumbentibus suffruticosis, foliis oblongis subpilosis, stipulis lanceolatis. *Dwarf Cistus with trailing shrubby stalks, oblong hairy leaves, and spear-shaped stipulæ.* Helianthemum vulgare flore luteo. J. B. 2. 15. *Common Dwarf Cistus with a yellow flower.*
2. Helianthemum (*Germanicum*) caulibus procumbentibus suffruticosis, ramosissimis, spicis florum longioribus. *Dwarf Cistus with trailing shrubby stalks full of branches, and longer spikes to the flowers.* Helianthemum album Germanicum. Tab. Icon. 1062. *White German Dwarf Cistus.*
3. Helianthemum (*Pilosus*) caulibus suffruticosis pilosis foliis lanceolatis obtusis, spicis reflexis. *Dwarf Cistus with hairy shrubby stalks, blunt spear-shaped leaves, and reflexed spikes of flowers.* Helianthemum foliis majoribus, flore albo. J. B. 2. 16. *Dwarf Cistus with larger leaves and a white flower.*
4. Helianthemum (*Apenninum*) incanum, caulibus suffruticosis erectis, foliis lanceolatis hirsutis. *Hoary Dwarf Cistus with erect shrubby stalks, and hairy spear-shaped leaves.* Helianthemum saxatile, foliis & caulibus incanis, floribus albis, Appenini montis. Mentz. Pug. tab. 8. *Rock Dwarf Cistus of the Apennines, with hoary stalks and leaves, and white flowers.*
5. Helianthemum (*Umbellatum*) caule procumbente non ramoso, foliis linearibus incanis oppositis. *Dwarf Cistus with an unbranched trailing stalk, and narrow hoary leaves placed opposite.* Helianthemum folio thymi incano. J. B. 2. 19. *Dwarf Cistus with a hairy Thyme leaf.*
6. Helianthemum (*Fumana*) caule suffruticoso procumbente, foliis linearibus alternis, floribus auriculatis. *Dwarf Cistus with a shrubby trailing stalk, very narrow leaves placed alternate, and auriculated flowers.* Helianthemum tenuifolium glabrum luteo flore, per humum sparsum. J. B. 2. 18. *Smooth narrow-leaved Dwarf Cistus, with a yellow flower and trailing stalks.*
7. Helianthemum (*Sampsuchifolium*) caule suffruticoso procumbente, foliis lanceolatis oppositis, pedunculis longioribus, calycibus hirsutis. *Dwarf Cistus with a shrubby trailing stalk, spear-shaped leaves placed opposite, longer foot-stalks to the flowers, and hairy empalements.* Helianthemum sive Cistus humilis, folio sampsuchi, capitulis valde hirsutis. J. B. 2. 20. *Dwarf Cistus with a Marjoram leaf, and very hairy heads.*
8. Helianthemum (*Serpillifolium*) caule suffruticoso procumbente, foliis linearibus oppositis, floribus umbellatis. *Dwarf Cistus with a shrubby trailing stalk, very narrow leaves placed opposite, and flowers growing in an umbel.* Helianthemum folio thymi floribus umbellatis. Tourn. Inst. 250. *Dwarf Cistus with a Thyme leaf and umbellated flowers.*
9. Helianthemum (*Cistifolium*) caulibus procumbentibus suffruticosis glabris, foliis ovato lanceolatis oppositis, pedunculis longioribus. *Dwarf Cistus with shrubby trailing stalks which are smooth, oval spear-shaped leaves placed opposite, and longer foot-stalks to the flowers.* Helianthemum Germanicum luteum Cisti folio. Boerh. *Yellow German Dwarf Cistus with a Rock Rose leaf.*
10. Helianthemum (*Tuberaria*) caule lignoso perenne, foliis radicalibus ovatis trinerviis tomentosis caulinis glabris lanceolatis alternis. *Perennial Dwarf Cistus with a woody stalk, whose lower leaves are oval, woolly, with three veins, those on the stalks smooth, spear-shaped, and placed alternate.* Helianthemum plantaginis folio perenne. Tourn. Inst. 250. *Perennial Dwarf Cistus with a Plantain leaf.*
11. Helianthemum (*Polifolium*) caulibus sessilibus suffruticosis, foliis lanceolatis oppositis tomentosis caule florali racemoso. *Dwarf Cistus with very short shrubby stalks, woolly spear-shaped leaves placed opposite, and a branching*

*branching flower-stalk.* Helianthemum foliis polii montani. Tourn. Inst. 249. *Dwarf Cistus with leaves like Poley Mountain.*

12. Helianthemum (*Nummularium*) caule suffruticoso procumbente, foliis ovatis nervosis, subtus incanis. *Dwarf Cistus with a shrubby trailing stalk, and oval veined leaves, white on their under side.* Helianthemum ad nummulariam accedens. J. B. 2. 20. *Dwarf Cistus resembling Moneywort.*

13. Helianthemum (*Lavendulæfoliam*) caule suffruticoso, foliis lineari-lanceolatis oppositis subtus tomentosis. *Dwarf Cistus with a shrubby stalk, and narrow spear-shaped leaves placed opposite, which are woolly on their under side.* Helianthemum lavendulæ folio. Tourn. Inst. 249. *Dwarf Cistus with a Lavender leaf.*

14. Helianthemum (*Hirtum*) caule suffruticoso erecto, foliis linearibus margines revolutis subtus incanis. *Dwarf Cistus with a shrubby erect stalk, and narrow leaves reflexed on their edges, with their under side hoary.* Helianthemum foliis Rorismarini splendentibus, subtus incanis. Tourn. Inst. 250. *Dwarf Cistus with shining Rosemary leaves, which are hoary on their under side.*

15. Helianthemum (*Surrejanum*) caulibus suffruticosis procumbentibus, foliis oblongo-ovatis subhirsutis, petalis acuminatis reflexis. *Dwarf Cistus with trailing shrubby stalks, oblong oval hairy leaves, and acute-pointed reflexed petals to the flowers.* Helianthemum vulgare petalis florum perangustis. Hort. Elth. 177. tab. 145. *Common Dwarf Cistus with narrow petals to the flowers.*

16. Helianthemum (*Lusitanicum*) caule suffruticoso erecto, foliis lanceolatis incanis glabris caule florali ramoso. *Dwarf Cistus with a shrubby upright stalk, hoary spear-shaped leaves, which are smooth, and branching flower-stalks.* Helianthemum Lusitanicum, mari folio incano, flore luteo. Tourn. Inst. 250. *Portugal Dwarf Cistus with a hoary Marum leaf, and a yellow flower.*

17. Helianthemum (*Roseum*) caule suffruticoso, foliis oblongo-ovatis oppositis, summis linearibus alternis. *Dwarf Cistus with a shrubby stalk, oblong oval leaves placed opposite, those toward the top being narrow and alternate.* Helianthemum ampliore folio, flore roseo. Sherard. Act. Phil. N°. 383. *Dwarf Cistus with a larger leaf, and Rose-coloured flower.*

18. Helianthemum (*Guttatum*) caule herbaceo hirsuto, foliis lanceolato-linearibus pilosis, pedunculis longioribus. *Dwarf Cistus with an herbaceous stalk which is hairy, narrow spear-shaped hairy leaves, and longer foot-stalks to the flowers.* Helianthemum flore maculoso. Col. Cephr. 2. p. 78. *Dwarf Cistus with a spotted flower.*

19. Helianthemum (*Fugacium*) caule herbaceo, foliis subovatis pilosis, flore fugaci. *Dwarf Cistus with an herbaceous stalk, hairy oval leaves, and a fugacious flower.* Helianthemum annuum humile, foliis subovatis, flore fugaci. Allion. *Annual Dwarf Cistus with oval leaves, and a fugacious flower.*

20. Helianthemum (*Ledifolium*) caule herbaceo erecto, foliis lanceolatis oppositis, floribus solitariis, capsulis maximis. *Dwarf Cistus with an erect herbaceous stalk, spear-shaped leaves placed opposite, flowers growing singly, and very large capsules.* Helianthemum Ledi folio. Tourn. Inst. 249. *Dwarf Cistus with a Ledon leaf.*

21. Helianthemum (*Salicifolium*) caule herbaceo ramoso, foliis oblongo-ovatis oppositis, summis alternis, floribus solitariis. *Dwarf Cistus with a branching herbaceous stalk, oblong oval leaves placed opposite, those toward the top growing alternate, and solitary flowers.* Helianthemum salicis folio. Tourn. Inst. 249. *Dwarf Cistus with a Willow leaf.*

22. Helianthemum (*Fasciculatum*) foliis fasciculatis. Royen. *Dwarf Cistus with leaves growing in bunches.*

23. Helianthemum (*Ægyptiacum*) herbaceum erectum, foliis lineari-lanceolatis petiolatis, calycibus inflatis corolla majoribus. *Dwarf Cistus with erect herbaceous stalks, linear spear-shaped leaves, and swelling empalements larger than the petals.*

24. Helianthemum (*Marifolium*) caule herbaceo procumbente, foliis ovatis tomentosis sessilibus. *Dwarf Cistus with an herbaceous trailing stalk, and oval woolly leaves sitting close to the branches.* Helianthemum Alpinum, folio pilosellæ minoris Fuchsii. J. B. 2. 18. *Hoary Dwarf Cistus of the Alps, with lesser Cat's-foot leaves.*

The first sort grows naturally on the chalky hills and banks in many parts of England; the stalks of this plant are ligneous and slender, trailing upon the ground, extending themselves near a foot each way; these are garnished with small oblong leaves, of a dark green on their upper side, but of a grayish colour on their under. The flowers are produced at the end of the stalks in loose spikes; they are composed of five deep yellow petals, which spread open in the day, but shut close in the evening; these appear in June and July, and are succeeded by roundish capsules, inclosing many angular seeds, which ripen in August and September, and the roots last several years.

The second sort grows naturally in Germany; the stalks of this are much larger, and extend farther than those of the first; the leaves are longer, and are hoary; there are three accuminated stipula at each of the lower joints, which are erect. The spikes of flowers are much longer than those of the former, and the flowers are white and larger. The empalement of the flowers are hairy and whitish; these differences are lasting from seeds.

The third sort grows naturally in the south of France, in Italy, and Germany. The stalks of this grow more erect than either of the former, and are more ligneous. The joints are farther asunder; the leaves are longer and hairy; the spikes of flowers are generally reflexed; they are white, and the size of those of the second; the stipula of this are very narrow.

The fourth sort grows naturally on the Apennine mountains; the stalks of this are more erect than those of the third. The leaves are not so long, the stipula are very small, and the whole plant is very hoary. The flowers are white, and the spikes are shorter and more compact than either of the former.

The fifth sort grows naturally in the south of France, in Spain, and Istria, from the last country I have received the seeds; this hath low trailing stalks, which are ligneous, but seldom branch, and are not more than four or five inches long. The leaves are narrow and hoary, and have no stipula at their base. The flowers are white, and are in small clusters at the end of the stalks; this sort seldom continues longer than two years.

The sixth sort hath trailing shrubby stalks, which extend a foot in length, and are garnished with very narrow smooth leaves placed alternate; but those short stalks near the root, which do not flower, have shorter and finer leaves growing in clusters; these have no stipula at their base. The flowers are placed thinly toward the end of the branches, they are yellow and auriculated; this sort grows in the south of France and Italy.

The seventh sort hath very long, trailing, ligneous stalks, which are garnished with spear-shaped leaves placed opposite, which are very hairy, and gray on their under side, having at their base three long narrow stipula. The spikes of flowers are near a foot in length, but grow thinly; they are large, and of a deep yellow colour, with very hairy empalements; this grows naturally in the south of France and Spain.

The eighth sort hath very shrubby crooked stalks, covered with a purplish brown bark like the common heath. The branches are slender, and garnished with narrow stiff leaves like those of Thyme, which stand opposite, having no stipula at their base. The flowers are produced on naked foot-stalks, which terminate the branches in a sort of umbel; they are of a pale yellow colour, and a little smaller than those of the common sort; this grows naturally on the sands near Fontainbleau, in France.

The ninth ſort grows naturally in Germany, from whence the ſeeds were ſent to the late Dr. Boerhaave, in whoſe curious garden near Leyden I gathered the ſeeds; this ſends out from a ligneous root a great number of trailing ſtalks, which are ſmooth, and extend more than a foot each way, garniſhed with oval, ſpear-ſhaped, ſmooth leaves, placed oppoſite, having at their baſe three ſpear-ſhaped ſtipula. The flowers are large, yellow, and grow in ſhort cluſters at the end of the branches; this always continues the ſame from ſeeds.

The tenth ſort grows naturally in Spain, from whence I received it; this hath a ſhort, thick, woody ſtalk, from which come out ſeveral ſhort ſide-branches, which are garniſhed with oval woolly leaves, having three longitudinal veins. The flower-ſtalk which ariſes from the main ſtem grows about nine inches high, having two or three narrow leaves placed alternate. The flowers are produced in pretty long pedicles toward the top of the ſtalk, and have very ſmooth empalements.

The eleventh ſort was ſent me from Verona, where it grows naturally; this hath a low ſhrubby ſtalk, from which come out a few ſhort branches, garniſhed with ſmall woolly ſpear-ſhaped leaves, placed oppoſite. The flower-ſtalk riſes about ſix inches high, and branches toward the top, where the flowers are produced on pretty long foot-ſtalks; they are white, and ſmaller than thoſe of the common ſort.

The twelfth ſort hath long ſhrubby ſtalks which trail on the ground, and divide into many branches, which are garniſhed with oval veined leaves of a light green on their upper ſide, but of a grayiſh colour below, with three narrow erect ſtipula at their baſe. The flowers are pretty large, white, and grow in cluſters at the end of the branches.

The thirteenth ſort hath ſhrubby ſtalks which grow pretty upright, garniſhed with narrow ſpear-ſhaped leaves, placed oppoſite, woolly on their under ſide, with three very narrow ſtipula growing at their baſe. The flowers are white, growing in long ſpikes at the end of the branches; this grows naturally in the ſouth of France.

The fourteenth ſort hath an erect ſhrubby ſtalk, which ſends out many ſide branches, whoſe joints are pretty cloſe, and are garniſhed with very narrow leaves, placed oppoſite, whoſe borders are reflexed; their upper ſide is of a lucid green, and their under ſide hoary. The flowers are pretty large, white, and grow in ſmall cluſters at the end of the branches; this grows naturally in Spain, from whence the roots were ſent me.

The fifteenth ſort was found by Mr. Edmund Du Bois, near Croydon, in Surry, and was at firſt ſuppoſed to be only an accidental variety of the common ſort, but the ſeeds of this always produce the ſame. I have cultivated this above thirty years, and never have found it vary from ſeeds; this is very like the common ſort, but the leaves are hairy. The petals of the flowers are ſtar-pointed, and ſmaller than thoſe of the common ſort.

The ſixteenth ſort hath upright ſhrubby ſtalks, which riſe a foot and a half high, ſending out branches the whole length; theſe are garniſhed with ſmall ſpear-ſhaped ſilvery leaves, placed oppoſite, which are ſmooth. The flower-ſtalks branch, and the flowers, which are white, are produced in ſhort ſpikes at the end of the branches.

The ſeventeenth ſort was found growing naturally by the late Dr. William Sherrard, near Smyrna, who ſent the ſeeds to England; this hath ſhrubby ſtalks which do not trail on the ground, garniſhed with oblong oval leaves placed oppoſite, but thoſe toward the top are narrow and placed alternate. The flowers are produced at the end of the branches in long looſe ſpikes; they are of a Roſe colour, and the ſize of thoſe of the common ſort.

The eighteenth ſort is annual; this grows naturally in France, Spain, Italy, and in Jerſey, where the late Dr. William Sherrard found it, and ſent the ſeeds to England; this hath a branching herbaceous ſtalk, which riſes four or five inches high, garniſhed with narrow ſpear-ſhaped leaves, placed oppoſite, which are covered with hairs; thoſe on the upper part of the ſtalks are placed alternate, and are narrower. The flowers are produced in looſe ſpikes at the end of the branches, ſtanding upon long foot-ſtalks; they are ſmall, and compoſed of five yellow petals, with a dark purple ſpot at the baſe of each; theſe flowers are very fugacious, for they open early in the morning, and their petals drop off in a few hours after, ſo that by ten of the clock the flowers are all fallen.

The nineteenth ſort grows naturally upon Mount Baldus, from whence the ſeeds were ſent me; this is an annual plant, which ſends out many herbaceous ſtalks from the root, garniſhed with oval leaves, which are hairy. The flowers are produced in looſe ſpikes at the end of the branches; they are of a pale yellow colour, and very fugacious, ſeldom laſting two hours before the petals fall off: there is another variety of this which grows about Verona, with upright ſtalks.

The twentieth ſort grows naturally in the ſouth of France and Italy, and was found by the late Dr. William Sherrard, growing near Smyrna, who ſent the ſeeds to England and Holland by a new title, ſuppoſing it to be a different plant; but when it was cultivated here, it proved to be the ſame with that growing in the ſouth of France; for this plant puts on different appearances, according to the ſoil and ſituation where it grows; for, in a good ſoil, where the plants ſtand ſingle, and are not injured by weeds, they will riſe near a foot and a half high, the leaves will be two inches and a half long, and near half an inch broad in the middle; but in a poor ſoil, or where the plants ſtand too cloſe, or are injured by weeds or neighbouring plants, they do not riſe more than half that height. The leaves are much narrower, and the ſeed-veſſels not half ſo large; ſo that any perſon finding theſe plants in two different ſituations may be deceived, and take them for different ſpecies; but when they are cultivated in a garden in the ſame ſoil and ſituation, they do not differ in any particular. This is an annual plant, which periſhes ſoon after the ſeeds are ripe.

The twenty-firſt ſort is an annual plant, which grows naturally in Spain and Portugal; this hath branching ſtalks, which riſe a foot high, garniſhed with oval oblong leaves placed oppoſite on the lower part of the ſtalk; but on the upper part they are alternate and narrow, a ſingle leaf being placed between each flower, which occaſions the title of Solitary Flowers, for they grow in looſe ſpikes at the end of the branches, in the ſame manner as the other ſpecies.

The twenty-ſecond ſort was ſent me by Dr. Adrian Van Royen, who received the ſeeds from the Cape of Good Hope. This riſes with a ſhrubby ſtalk about nine inches high, garniſhed with very narrow fine leaves, growing in cluſters; the flowers come out from the ſide and at the end of the branches, ſtanding upon ſlender foot-ſtalks; they are of a pale Straw colour, and very fugacious, ſeldom continuing longer than two hours before the petals fall off. This ſeldom continues longer than two years.

The twenty-third ſort grows naturally in Egypt; this is an annual plant having ſhrubby erect ſtalks, garniſhed with narrow ſpear-ſhaped leaves, ſtanding on foot-ſtalks; the upper part of the ſtalks are adorned with white flowers, whoſe petals are not ſo large as the empalement, and being very fugacious they make but little appearance: it flowers in July, and the ſeeds ripen in September, ſoon after which the plants decay.

The twenty-fourth ſort grows naturally about Kendal in Weſtmoreland, and in ſome parts of Lancaſhire, upon rocky ſituations. This hath trailing herbaceous ſtalks, which ſeldom extend more than three or four inches, garniſhed with oval leaves, which are very woolly, and ſit cloſe to the branches; the flowers are produced at the upper part of the branches; they are white and ſmall, ſo make no great appearance.



All

Most of the perennial sorts of Dwarf Cistus are hardy, so will thrive in the open air in England; they are propagated by seeds, which may be sown in places where the plants are to remain, and will require no other care but to keep them clean from weeds, and thin them where they are too close, always observing to leave those sorts at a farther distance, whose stalks trail on the ground, and grow to the greatest length. These plants will continue several years, especially in a poor dry soil; but in rich ground or moist situations, they seldom last long: but as they ripen seeds in plenty, so they may be easily repaired. They all flower about the same time as the common sort, and their seeds ripen in the autumn.

The annual sorts may be propagated with as great facility; for if their seeds are sown upon a bed of common earth in April, the plants will come up in May, and require no other culture, but to thin them where they are too close, and keep them clear from weeds. These will flower in July, and the seeds ripen in the autumn. The twenty-second sort will thrive in the full ground in the same manner as the other; but unless the summer proves favourable, the seeds will not ripen: the roots have stood through the winter when the season has proved mild, without any shelter, and have flowered the following summer.

The twenty-fourth sort requires a shady situation, otherwise it will not thrive here.

HELIANTHUS. Lin. Gen. Plant. 877. Corona solis. Tourn. Inst. R. H. 489. tab. 279. [of Ἥλιος, the sun, and Ἄνθος, a flower,] i. e. Sun-flower; in French, *Soliel.*

This genus of plants was titled Corona solis, by most of the botanic writers; but this being a compound name, Dr. Linnæus has altered it to this of Helianthus: it has also by some been titled Heliotropium, which name is now applied to another genus of plants, very different from this.

The Characters are,

*It hath a compound radiated flower, the border or rays being composed of female half-florets, which are barren, and the disk of hermaphrodite florets, which are fruitful: these are contained in one common scaly empalement, whose scales are broad at their base, pointed at their ends, and expand. The hermaphrodite florets are cylindrical, swelling at their base, cut at the brim into five acute segments, which spread open; these have five stamina which are curved at bottom, as long as the tube, and terminated by tubulous summits. The germen, which is situated at the bottom of the tube, supports a slender style the length of the tube, crowned by a reflexed stigma, divided in two parts; the germen afterward becomes an oblong, blunt, four-cornered seed. The female half florets, which compose the border, are stretched out on one side like a tongue, which is long and entire; these have a germen in the bottom, but no style or stamina, and are not fruitful.*

This genus of plants is ranged in the third section of Linnæus's nineteenth class, in which he includes those plants whose flowers are composed of hermaphrodite fruitful flowers in the center, and female barren flowers in the circumference.

The Species are,

1. Helianthus (*Annuus*) foliis omnibus cordatis trinervatis, floribus cernuis. Lin. Sp. 1276. *Sun-flower, whose leaves are all heart-shaped, with three veins and a nodding flower.* Corona solis. Tabern. Icon. 763. and the Helenium Indicum maximum. C. B. P. 276. *Greatest Indian Sun-flower, commonly called annual Sun-flower.*
2. Helianthus (*Multifloris*) foliis inferioribus cordatis trinervatis, superioribus ovatis. Lin. Sp. Plant. 1277. *Sun-flower whose under leaves are heart-shaped, with three veins, and the upper leaves oval.* Corona solis minor fœmina. Tabern. Icon. 764. *Lesser female Sun-flower, commonly called perennial Sun-flower.*
3. Helianthus (*Tuberosus*) foliis ovato-cordatis triplinerviis. Lin. Sp. Plant. 1277. *Sun-flower with oval heart-shaped leaves with three nerves.* Corona solis parvo flore tuberosâ radice. Tourn. Inst. 489. *Sun-flower with a small flower and a tuberous root, commonly called Jerusalem Artichoke*; in French, *Taupinambours.*
4. Helianthus. (*Strumosis*) radice fussi formi. Hort. Cliff. 420. *Sun-flower with a spindle-shaped root.* Corona solis latifolia altissima. Tourn. Inst. 489. *Tallest broad-leaved Sun-flower.*
5. Helianthus (*Giganteus*) foliis alternis lanceolatis scabris, basi ciliatis, caule stricto scabro. Lin. Sp. Plant. 1278. *Sun-flower with spear-shaped leaves, and a slender rough stalk.* Chrysanthemum Virginianum altissimum angustifolium puniceis caulibus. Mor. Hist. 3. p. 24. *Tallest Virginia Chrysanthemum, with a narrow leaf and purple stalks.*
6. Helianthus (*Divaricatus*) foliis oppositis sessilibus ovato oblongis trinerviis, paniculâ dichotomâ. Lin. Sp. Plant. 1279. *Sun-flower with oblong, opposite, oval leaves, having three veins sitting close to the stalk, and a forked panicle.* Chrysanthemum, Virginianum repens, foliis asperis binatim sessilibus acuminatis. Mor. Hist. 3. p. 22. *Creeping Virginia Chrsyanthemum, with rough-pointed leaves, sitting close by pairs.*
7. Helianthus (*Trachelifolius*) foliis lanceolatis oppositis, supernè scabris, infernè trinerviis, caule dichotomo ramoso. *Sun-flower with spear-shaped leaves placed opposite, whose upper surface is rough, the under having three veins and a divided stalk.* Corona solis trachelii folio, radice repente. Tourn. Inst. 490. *Sun-flower with a Throatwort leaf, and a creeping root.*
8. Helianthus (*Ramosissimus*) caule ramosissimo, foliis lanceolatis scabris, inferioribus oppositis, summis alternis petiolatis, calycibus foliosis. *Sun-flower with a very branching stalk, rough spear-shaped leaves placed opposite at bottom, but alternate toward the top, having foot-stalks, and leafy empalements.* Corona solis trachelii folio tenuiore, calyce floris foliato. Act. Phil. N° 412. *Sun-flower with a narrow Throatwort leaf, and a leafy flower-cup.*
9. Helianthus (*Atrorubens*) foliis ovatis crenatis trinerviis scabris, squamis calycinis erectis longitudine disci Flor. Virg. 103. *Sun-flower with oval, rough, crenated leaves, having three nerves, the scales of the empalement being erect, and as long as the disk of the flower.* Corona solis Caroliniana, parvis floribus, folio trinervi amplo aspero, pediculo alato. Martyn. Cent. 1. 20. *Carolina Sun-flower with small flowers, large rough leaves having three veins, and a winged foot-stalk.*
10. Helianthus (*Decapetalus*) caule infernè lævi, folis lanceolato-cordatis, radiis decapetalis. Lin. Sp. Plant. 905. *Sun-flower with a smooth stalk, heart spear-shaped leaves, smooth on their upper side, and ten petals in the rays.*

All these species of Sun-flowers are natives of America, from whence we are often supplied with new kinds; and it is very remarkable, that there is not a single species of this genus that is European; so that before America was discovered, we were wholly unacquainted with these plants. But although they are not originally of our own growth, yet they are become so familiar to our climate, as to thrive and increase full as well as if they were in their native country, (some of the very late flowering kinds excepted, which require a longer summer than we generally enjoy, to bring them to perfection;) and many of them are now so plentiful in England, that persons unacquainted with the history of these plants, would imagine them at least to have been inhabitants of this island many hundred years; particularly the Jerusalem Artichoke, which, though it doth not produce seeds in our climate, yet doth so multiply by its knobbed roots, that, when once well fixed in a garden, it is not easily to be rooted out.

The first sort is annual, and so well known as to require no description. There are single and double flowers of two different colours, one of a deep yellow, and the other of a sulphur colour; but these vary, so are not worthy to be mentioned as different. They are easily propagated by seeds, which should be sown in March, upon a bed of common earth; and when the plants come up, they must be thinned where they are too close, and kept clean from weeds; when

the plants are grown six inches high, they may be taken up with balls of earth to their roots, and planted into the large borders of the pleasure-garden, observing to water them till they have taken new root; after which they will require no other care, but to keep them clear from weeds.

In July the great flowers upon the tops of the stems will appear, amongst which, the best and most double flowers of each kind should be preserved for seeds; for those which flower later upon the side branches are neither so fair, nor do they perfect their seeds so well, as those which are first in flower: when the flowers are quite faded and the seeds are formed, you should carefully guard the heads from the sparrows, which will otherwise devour most of the good seeds; and about the beginning of October, when the seeds are ripe, you should cut off the heads with a small part of the stem, and hang them up in a dry airy place for about a month, by which time the seeds will be perfectly dry and hard; when you may easily rub them out, and put them into bags or papers, preserving them from vermin until the season for sowing them.

The seeds of this sort of Sun-flower are excellent food for domestic poultry; therefore where a quantity of it can be saved, it will be of great use, where there are quantities of these fowls.

The other perennial sorts rarely produce seeds in England, but most of them increase very fast at their roots, especially the creeping rooted kinds, which spread too far for small gardens. The second sort, which is the most common in the English gardens, is the largest and most valuable flower, and is a very proper furniture for large borders in great gardens, as also for bosquets of large growing plants, or to intermix in small quarters with shrubs, or in walks under trees, where few other plants will thrive; it is also a great ornament to gardens within the city, where it grows in defiance of the smoke, better than most other plants; and for its long continuance in flower, deserves a place in most gardens, for the sake of its flowers for basons, &c. to adorn halls and chimneys, in a season when we are at a loss for other flowers. It begins flowering in July, and continues until October; there is a variety of this with very double flowers, which is now become so common in the English gardens, as to have almost banished the single sort from hence.

The third, fourth, fifth, sixth, and seventh sorts may also have a place in some large borders of the garden, for the variety of their flowers; which, though not so fair as those of the common sort, yet will add to the diversity; and as many of them are late flowerers, so we may continue the succession of flowers longer in the season.

These sorts are all of them very hardy, and will grow in almost any soil or situation; they are propagated by parting their roots into small heads, which in one year's time will spread and increase greatly. The best season for this work is in the middle of October, soon after the flowers are past, or very early in the spring, that they may be well rooted before the droughts come on; otherwise their flowers will be few in number, and not near so fair, and by this means their roots will be weak; but if they are planted in October, you will save the trouble of watering them; their roots being surely fixed before the dry weather, they will need no other trouble than to clear them from weeds.

The Jerusalem Artichoke is propagated in many gardens for the roots, which are by some people as much esteemed as Potatoes; but they are more watery and flashy, and are very subject to trouble the belly by their windy quality, which hath brought them almost into disuse.

These are propagated by planting the smaller roots, or the larger ones cut in pieces, observing to preserve a bud to each separate piece, either in the spring or autumn, allowing them a good distance, for their roots will greatly multiply; the autumn following, when their stems decay, the roots may be taken up for use. These should be planted in some remote corner of the garden, for they are very unsightly while growing, and their roots are apt to over-run whatever grows near them, nor can they be easily destroyed when they are once well fixed in a garden.

The other species which have been ranged under this genus by Tournefort and others, are now removed to the following genera, under which titles they may be found.

Corona Solis. See { Coreopsis. Helenium. Rudbeckia. Silphium.

HELICTERES. Lin. Gen. Plant. 913. Isora. Plum. Nov. Gen. 34. tab. 37. Screw-tree.

The Characters are,

*The flower has a coriaceous empalement of one leaf, which is narrow at bottom, but spreads open at the top, where it is indented in five parts. The flower hath five oblong equal petals, which are longer than the empalement to which they are fixed. It hath ten short stamina at the base of the germen, terminated by oblong summits, and five nectariums surrounding the germen, which have the appearance of petals. The style is very long, slender, and supports the germen at the top, which is roundish, and crowned by an acute stigma. The germen afterward turns to a twisted spiral fruit with one cell, inclosing many kidney-shaped seeds.*

This genus of plants is ranged in the sixth section of Linnæus's twentieth class, which includes those plants whose flowers have ten stamina which are connected to the style.

The Species are,

1. Helicteres (*Isora*) foliis cordato-ovatis serratis, subtus tomentosis, fructu tereti contorto. *Helicteres with oval heart-shaped leaves which are sawed, and woolly on their under side, and a taper twisted fruit.* Isora althææ foliis, fructu longiore & angustiore. Plum. Nov. Gen. 24. *Screw-tree with Marshmallow leaves, and a longer narrower fruit.*
2. Helicteres (*Breviore*) foliis cordatis acuminatis serratis, subtus tomentosis, fructu brevi contorto. *Helicteres with heart-shaped, pointed, sawed leaves, woolly on their under side, and a short twisted fruit.* Isora althææ foliis, fructu breviore & crassiore. Plum. Nov. 34. *Screw-tree with a Marshmallow leaf, and a shorter thicker fruit.*
3. Helicteres (*Arborescens*) caule arboreo villoso, foliis cordatis crenatis nervosis subtus tomentosis fructu ovato contorto villosissimo. *Helicteres with a tree-like hairy stalk, heart-shaped, nervous, crenated leaves, woolly on their under side, and an oval, twisted, very hairy fruit.* Isora althææ folio amplissimo, fructu crassissimo & villoso. Edit. prior. *Screw-tree with a very large Marshmallow leaf, and a very thick hairy fruit.*

The first sort grows naturally in the Bahama Islands, from whence I received the seeds. This rises with a shrubby stalk five or six feet high, sending out several lateral branches, which are covered with a soft yellowish down, garnished with heart-shaped leaves four inches long, and two and a half broad, sawed on their edges, woolly on their under side, standing on long foot-stalks; at the upper part of the branches the flowers come out opposite to the leaves, upon slender foot-stalks which are jointed; these are composed of five oblong white petals, and in the center arises the style, which is curved, three inches long, upon the top of which is situated the germen, crowned by an acute stigma. The germen afterward turns to a taper fruit two inches and a half long, composed of five capsules, which are closely twisted over each other like a screw; these are hairy, and have each one cell, containing several kidney-shaped seeds.

The second sort grows naturally in Jamaica, from whence the late Dr. Houstoun sent me the seeds. This rises with a shrubby stalk nine or ten feet high, sending out many lateral branches, covered with a smooth brown bark, garnished with heart-shaped leaves,

leaves, which end in acute points, ſawed on their edges, a little woolly on their under ſide; the flowers are produced on the ſide of the branches, on ſhorter foot-ſtalks than the former; they are compoſed of five petals, and the ſtyle in the center, which is ſtrait, upright, and not half ſo long as the other; the fruit is thicker, not an inch long, but twiſted in the ſame manner,

The third ſort riſes with a ſtrong woody ſtalk twelve or fourteen feet high, ſending out many ligneous branches, which are cloſely covered with hairy down, garniſhed with large heart-ſhaped leaves, which are crenated on their edges, having large veins running from the midrib to the ſides; they are of a light yellowiſh green, and woolly on their under ſide: the flowers are produced from the ſide of the branches, they are of a yellowiſh white colour, and larger than thoſe of the other ſorts. The ſtyle is near four inches long, curved like that of the firſt ſort; the fruit is oval, about one inch long, very thick at the bottom, and cloſely covered with hairy down. This ſort was ſent me by Mr. Robert Millar, from Carthagena.

Theſe plants are propagated by ſeeds, which muſt be ſown upon a hot-bed in the ſpring, and when the plants are come up ſtrong enough to remove, they ſhould be each planted in a ſeparate ſmall pot, filled with light earth, and plunged into a moderate hot-bed of tan, obſerving to ſhade them from the ſun till they have taken new root; then they ſhould be treated in the ſame way as other tender plants from hot countries, raiſing the glaſſes every day in proportion to the weather, that the plants may enjoy freſh air, which will ſtrengthen them, and prevent their drawing up weak. In the ſummer the plants may remain under the frames, if there is ſufficient height for them to grow; but in autumn they muſt be plunged into the tan-bed in the ſtove, where they ſhould always remain, being careful to ſhift them into larger pots when they require it, and not give them too much wet in the winter; but in ſummer they ſhould have a large ſhare of air in warm weather, and require to be often refreſhed with water: the ſecond year from the ſeeds theſe plants have often flowered in the Chelſea garden, and the ſeeds have ſome years ripened there, but the plants will live ſeveral years with proper management.

HELIOCARPOS. Lin. Gen. Plant. 533. Montia. Houſt. Gen. We have no title in Engliſh for this plant.

The CHARACTERS are,

*The flower hath one petal which is tubulous at the bottom, and cut into five ſegments which expand. It hath an empalement of one leaf, which is cut into five parts ſpreading open. In the center is ſituated a roundiſh germen, ſupporting two erect ſtyles, crowned by acute ſtigmas which ſtand apart; theſe are attended by twelve ſtamina, which are of the ſame length with the ſtyles, terminated by narrow twin ſummits which are proſtrate. The germen afterward becomes an oval compreſſed capſule, about three lines long and two broad, with a tranſverſe partition dividing it in two cells, each containing a ſingle roundiſh ſeed ending in a point; the borders of the capſule are ſet with hairs, reſembling rays.*

This genus of plants is ranged in the ſecond ſection of Linnæus's eleventh claſs, intitled Dodecandria Digynia, which includes the plants whoſe flowers have twelve ſtamina and two ſtyles.

We have but one SPECIES of this plant, viz.

HELIOCARPOS (*Americana.*) Hort. Cliff. 211. tab. 16. Montia arboreſcens mori folio fructu racemoſo. Houſt. MSS. *Tree Montia with a Mulberry leaf and branching fruit.*

This plant was diſcovered by the late Dr. Houſtoun, growing naturally about Old La Vera Cruz in New Spain, from whence he ſent the ſeeds to England, which ſucceeded in the Chelſea garden, where the plants have produced flowers, and ripened ſeeds ſeveral years. It riſes with a thick, ſoft, woody ſtalk, from fifteen to eighteen feet high, ſending out ſeveral lateral branches toward the top, garniſhed with heart-ſhaped leaves full of veins, ſawed on their edges, and ending in acute points; they have foot-ſtalks three inches long, which ſtand oblique to the leaves, and are placed alternate; the flowers are produced at the end of the ſhoots, in branching cluſters; they are of a yellowiſh green, and are ſucceeded by flat compreſſed ſeed-veſſels of an oval ſhape, whoſe borders are cloſely ſet with threads repreſenting rays, of a browniſh colour when ripe; theſe capſules are divided into two cells by an intermediate partition, in each of theſe is lodged a ſingle roundiſh ſeed ending in a point.

This plant is propagated by ſeeds, which muſt be ſown upon a hot-bed in the ſpring; and when the plants are fit to remove, they ſhould be each planted in a ſeparate ſmall pot filled with light kitchen-garden earth, andd plunged into a hot-bed, treating them in the ſame way as other tender plants, which will not bear the open air in this country at any ſeaſon of the year; and while the plants are young, they require to be plunged in the tan-bed, but after they have acquired ſtrength, they will thrive in the dry ſtove. In winter they ſhould have but little water, and muſt be kept warm; but in ſummer they ſhould have plenty of freſh air in mild weather, and muſt be frequently refreſhed with water. With this management the plants will flower the third year, and produce good ſeeds, but may be preſerved ſeveral years with proper care.

I have ſowed the ſeeds of this plant which had been kept ten years, and came up as well as if it had been ſaved the former year; though from the appearance of the ſeeds, it ſeems as unlike to grow after the firſt year as any which I know.

HELIOPHILA. Lin. Gen. 816.

The CHARACTERS are,

*It hath a four-leaved empalement, whoſe borders have membranes; the two outer have ſmall bladders at their baſe. The flower has four roundiſh plain petals, placed in form of a croſs, and two nectariums, which are recurved toward the bladders of the empalement. It hath ſix ſtamina, four of which are longer than the other, terminated by oblong erect ſummits; and a cylindrical germen ſupporting a ſhort ſtyle, crowned by an obtuſe ſtigma; the germen afterward becomes a taper pod, with two cells filled with ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifteenth claſs, intitled Tetradynamia Siliquoſa, the flower having four long and two ſhort ſtamina, and the ſeeds being included in long pods.

The SPECIES are,

1. HELIOPHILA (*Integrifolia*) foliis lanceolatis indiviſis. N. Burman. *Heliophila with ſpear-ſhaped undivided leaves.* Leucoium Africanum, cœruleo flore, latifolium. H. L. 364. *African Gilliflower with a broad leaf and a blue flower.*

2. HELIOPHILA (*Coronopi folia*) foliis linearibus pinnatifidis. Lin. Sp. Plant. 927. *Heliophila with linear wing-pointed leaves.* Leucoium Africanum, cœruleo flore, anguſto coronopi folio majus. H. L. 364. *African Gilliflower, with narrow Hartſhorn leaves and blue flowers.*

Theſe are both annual plants, which grow naturally at the Cape of Good Hope; the firſt riſes with an erect ſtalk about four or five inches high, ſending out two or three ſide branches, garniſhed with long, narrow, entire green leaves, and terminated by a looſe bunch of blue flowers without ſcent, which are ſucceeded by taper pods near three inches long, having a double row of flat ſeeds.

The ſecond ſort grows about the ſame height, but branches more; the leaves are cut into many wing-pointed diviſions, and the flowers are like thoſe of the other ſort.

The ſeeds of both ſorts may be ſown in the ſpring on a ſouth border, and when the plants come up, if they are thinned and kept clean from weeds, it is all the culture they require.

HELIOTROPIUM. Lin. Gen. Plant. 164. Tourn. Inst. R. H. 138. tab. 57. [Ἡλιοτρόπιον, of Ἥλιος, the sun, and τρέπω, to turn.] Turnsole.

The CHARACTERS are,

*The empalement of the flower is of one leaf, tubulous at bottom, but cut into five segments at the brim. The flower hath one petal, with a tube the length of the empalement, spreading flat above, where it is cut into five segments, which are alternately larger than the other; the chaps of the tube is closed, and hath five prominent scales, joined in form of a star. It hath five short stamina within the tube, terminated by small summits, and four germen at the bottom of the tube, with one slender style the length of the stamina, crowned by an indented stigma. The germen afterward becomes so many seeds, sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, which includes those plants whose flowers have five stamina and one style.

The SPECIES are,

1. HELIOTROPIUM (*Europæum*) foliis ovatis integerrimis tomentosis rugosis spicis conjugatis. Hort. Upsal. 33. *Heliotrope with oval, entire, woolly, rough leaves, and conjugated spikes.* Heliotropium majus Dioscoridis. C. B. P. 253. The greater Turnsole of Dioscorides.

2. HELIOTRIPIUM (*Indicum*) foliis cordato-ovatis acutis scabriusculis, spicis solitariis, fructibus bifidis. Flor. Zeyl. 70. *Heliotrope with heart-shaped oval leaves, which are pointed and rough, single spikes of flowers and bifid seeds.* Heliotropium Americanum cœruleum, foliis hormini. Acad. Reg. Sc. *Blue American Turnsole with Clary leaves.*

3. HELIOTROPIUM (*Horminifolium*) foliis lanceolato-ovatis acuminatis rugosis, spicis solitariis gracilioribus alaribus & terminalibus. *Heliotrope with spear-shaped oval leaves, which are rough, and end in acute points, having slender single spikes of flowers proceeding from the sides and tops of the stalks.* Heliotropium Americanum cœruleum, foliis hormini angustioribus. H. L. *Blue American Turnsole with narrower Clary leaves.*

4. HELITROPIUM (*Capitatum*) foliis oblongo-ovatis integerrimis glabris subtus incanis, floribus capitatis alaribus, caule arborescente. *Heliotrope with oblong, oval, entire, smooth leaves, which are hoary on their under side, flowers growing in heads from the wings of the stalks, and a tree-like stalk.* Heliotropium arborescens, folio teucrii, flore albo in capitula densa congesto. Boerh. Ind. *Tree-like Turnsole, with a Germander leaf, and white flowers growing in thick short heads.*

5. HELIOTROPIUM (*Canariense*) foliis ovatis crenatis oppositis, floribus capitatis alaribus dichotomis, caule arborescente. *Heliotrope with oval crenated leaves placed opposite, flowers growing in heads from the wings of the stalks, which diverge, and a tree-like stalk.* Heliotropium Canariense arborescens, folio scorodonæ. Hort. Amst. *Canary tree-like Turnsole, with a Wood Sage leaf.*

6. HELIOTROPIUM (*Peruvianum*) foliis lanceolato-ovatis, caule fruticoso, spicis numerosis aggregato-corymbosis. Lin. Sp. 187. *Peruvian Helitrope with oval spear-shaped leaves, a shrubby stalk, and many spikes of flowers joined in a corymbus.*

7. HELIOTROPIUM (*Curassavicum*) foliis lanceolato-linearibus glabris aveniis, spicis conjugatis. Hort. Cliff. 45. *Heliotrope with narrow, spear-shaped, smooth leaves without veins, and conjugated spikes of flowers.* Heliotropium Curassavicum, foliis lini umbilicati. Par. Bat. Prod. *Heliotrope of Curassao, with a Venus Navelwort leaf.*

8. HELIOTROPIUM (*Gnaphalodes*) foliis linearibus obtusis tomentosis, pedunculis dichotomis, spicarum floribus quaternis, caule frutescente. Lin. Sp. 188. *Heliotrope with linear, obtuse, woolly leaves, forked foot-stalks, with four spikes of flowers and a shrubby stalk.* Heliotropium arboreum maritimum, tomentosum, gnaphalii Americani foliis. Sloan. Cat. 93. *Tree maritime woolly Heliotrope, with a Sea Cudweed leaf.*

9. HELIOTROPIUM (*Fruticosum*) foliis lineari-lanceolatis pilosis, spicis solitariis sessilibus. Lin. Sp. 187. *Heliotrope with linear, spear-shaped, hairy leaves, and single spikes of flowers sitting close to the stalk.* Heliotropium minus lithospermi foliis. *Smaller Heliotrope with leaves like Gromwell.*

10. HELIOTROPIUM (*Procumbens*) caule procumbente, foliis ovatiis tomentosis integerrimis, spicis solitariis terminalibus. *Heliotrope with a trailing stalk, oval, woolly, entire leaves, and single spikes of flowers terminating the branches.* Heliotropium Americanum supinum & tomentosum, foliis subrotundis. Houst. MSS. *Low American woolly Heliotrope with roundish leaves.*

11. HELIOTROPIUM (*Americanum*) foliis oblongo-ovatis tomentosis, spicis conjugatis terminalibus, caule fruticoso. *Heliotrope with oblong, oval, woolly leaves, and double spikes of flowers terminating the stalk, which is shrubby.* Heliotropium Americanum frutescens & tomentosum, foliis oblongis, floribus albis. Houst. MSS. *Shrubby and woolly American Heliotrope, with oblong leaves and white flowers.*

The first sort grows naturally in the south of France, in Spain, Italy, and most of the warmer countries in Europe. It is an annual plant, which succeds better from seeds which scatter in the autumn, or sown at that season, than in the spring; for when they are sown in the spring, they seldom come up the same year; but if the plant is once obtained, and the seeds suffered to shed, it will maintain itself without any trouble, requiring no other culture but to keep it clean from weeds, and thin the plants where they are too close.

This rises about seven or eight inches high, dividing into two or three branches, garnished with oval rough leaves, two inches long and one broad in the middle, of a light green, standing upon pretty long foot-stalks alternately; the flowers are produced at the end of the branches in double spikes, joined at the bottom, which are about an inch and a half long, turning backward like a scorpion's tail. The flowers are white, and appear in June and July; the seeds ripen in autumn, soon after which the plant decays.

The second sort grows naturally in the West-Indies. This is annual; the stalk rises a foot and a half, or two feet high, branching out toward the top: the leaves are rough and hairy, standing upon pretty long foot-stalks; they are two inches and a half long, and one and a half broad in the middle, ending in acute points; the flowers are produced toward the end of the branches in single spikes, which are six inches long, turning backward at the top like the other species. The flowers are blue, and appear in July and August, the seeds ripen in September and October.

The third sort grows naturally in the West-Indies. This is a smaller plant than the former, seldom growing above two feet high; the leaves are one inch and a half long, and about half an inch broad; the spikes of flowers are very slender, and not more than two inches long; the flowers are small, and of a light blue colour. They appear at the same time with the former, and the seeds ripen in autumn.

The seeds of these two sorts must be sown on a hot-bed in the spring, and when the plants are fit to remove, they must be transplanted on another hot-bed to bring them forward, treating them in the same way as the Balsamine, and other tender annual plants; and in June they may be taken up with balls of earth, and planted in the borders of the flower-garden, where they will flower, and in warm seasons produce ripe seeds.

The fourth sort rises with a shrubby stalk six or seven feet high; the young branches are closely covered with a white down, and the leaves on those are very hoary and entire, but those on the older branches are greener, and some of them are notched on their edges; at each joint of the stalks come out two short branches opposite, which are garnished with small hoary leaves placed opposite: these, when bruised, emit a strong odour, which to some persons is very disagreeable, but others are pleased with it. The plants rarely flower in England, for in near forty years which I have cultivated them, I have but once seen them in flower. The flowers are white, collected in roundish heads, which turn backward, and sit close to the branches; the

the leaves continue all the year, for which the plants are preserved in green-houses, to add to the variety in winter.

The fifth sort grows naturally in the Canary Islands. This rises with a woody stalk three or four feet high, dividing into many branches, which are garnished with oval leaves notched on their edges, growing opposite upon long foot-stalks; they are hairy, and of an Ash colour on their under side; the flowers are produced from the side of the branches on pretty long foot-stalks, each sustaining four short roundish spikes or heads, which divide by pairs, and spread from each other. The flowers are white, and appear in June and July, but are not succeeded by seeds in England. The leaves of this plant, when bruised, emit an agreeable odour, for which it is by some persons much esteemed; the gardeners have given it the title of Madam Maintenon, but for what reason I know not.

The two last sorts are too tender to live through the winter in the open air in this country, so must be kept in a green-house during that season; but they only require to be screened from frost, so may be placed with Myrtles and the other hardy green-house plants, where they may have a large share of air in mild weather, and be treated in the same way; they are easily propagated by cuttings during any of the summer months, which, if planted in a shady border and duly supplied with water, will take root in five or six weeks; then they may be potted, and placed in a shady situation till they have taken new root, after which they may be treated as the old plants.

The sixth sort grows naturally in Peru, from whence the seeds were sent by the younger Jussieu to the Royal Garden at Paris, where the plants produced flowers and seeds; and from the curious garden of the Duke D'Ayen, at St. Germains, I was supplied with some of the seeds, which have succeeded in the Chelsea garden, where the plants have flowered and perfected their seeds for some years.

This rises with a shrubby stalk two or three feet high, dividing into many small branches, garnished with oval, spear-shaped, rough leaves, set on without order; they are three inches long, and one inch and a half broad in the middle, standing on short foot-stalks; they are hairy, and greatly veined on their under side, which is of an Ash colour. The flowers are produced at the end of the branches in short reflexed spikes, growing in clusters. The foot-stalks divide into two or three, and these divide again into less, each sustaining a spike of pale blue flowers, which have a strong sweet odour. The plants continue in flower great part of the year, and those flowers which come out in summer, are succeeded by ripe seeds in autumn.

It may be propagated either by seeds or cuttings. The seeds should be sown upon a moderate hot-bed in the spring, and when the plants are fit to remove, they should be transplanted into small pots filled with light earth, and plunged into a hot-bed, where they should be shaded till they have taken new root; then they should be inured to the open air by degrees, into which they should be removed in summer, placing them in a sheltered situation; and in autumn they must be housed with other exotic plants in a good green-house, where they will flower great part of winter, so will make a good appearance among the Orange-trees, and other green-house plants, with whose culture this plant will thrive. If the cuttings of this plant are put into pots filled with light earth, during any of the summer months, and plunged into a moderate hot-bed, they will take root very freely, but these do not make so good plants as those raised from seeds.

The seventh sort grows naturally on the sea-shore in the West-Indies; this is an annual plant, whose branches trail upon the ground, and grow a foot long; they are garnished with narrow grayish leaves, which are smooth. The flowers are produced in double spikes from the side of their branches; they are white and small, so make no great appearance. It is propagated by seeds, and requires the same treatment as the second and third sorts.

The eighth sort rises with an upright woody stalk six or seven feet high, with a hoary bark, full of marks where the leaves have grown; the upper part of the stalk divides into two or three strong woody branches, which grow erect, and are very closely garnished with long, narrow, woolly leaves, which stand on every side the branches without order. The flowers come out from the side of the stalks, to which they sit close; they are short and reflexed, like those of the other species. The flowers are purple, sitting in very woolly empalements, which are divided into five segments, which spread open; the whole plant is very white and woolly, like the Sea Cudweed, so makes an odd appearance when intermixed with other exotic plants: this is propagated by seeds, which must be procured from the places where it naturally grows, for it never produces any in Europe; these seeds should be sown in a tub of earth in the country, for when the dried seeds come over they seldom grow; and if they do, it is not before the second year: and from several parcels of the seeds which I have received from the West-Indies, I have not raised more than two plants, and these came up from the seeds which had been sown more than a year; so that if the seeds are sown as soon as they are ripe in a tub of earth, when they arrive in England, the tub should be plunged into a hot-bed of tanners bark, which will bring up the plants; and when these are fit to remove, they should be each planted in a separate small pot filled with earth, composed of sand and light undunged earth, with a little lime rubbish well mixed together, then plunged into a hot-bed of tanners bark, and shaded until they have taken new root; after which, they must be treated as other tender exotic plants, always keeping them in the tan-bed in the stove, giving them but little water, especially during the winter season.

The ninth sort is a native of the West-Indies, where it grows plentifully on the sea-shore; it rises with an upright shrubby stalk a foot and a half high, garnished with small spear-shaped leaves, scarce one inch long, and one-third of an inch broad in the middle, ending in acute points, sitting close to the stalk; they are hoary on their under side, but smooth above. The flowers are produced in single slender spikes, which come out from the side, and at the top of the stalks; they are but little recurved, especially those on the side, but those at the top are more bent; they are white, so make but little appearance.

The tenth sort was sent me from Carthagena in New Spain, where it grows naturally on the sandy shores. This is an annual plant, with trailing stalks which grow six or seven inches long, garnished with small oval leaves, which are woolly and entire. The flowers are produced at the end of the branches, in single short spikes, which are reflexed; they are small and white, so make little appearance.

The eleventh sort was sent me by the late Dr. Houstoun from La Vera Cruz, where he found it growing in plenty; this rises with a shrubby stalk three feet high, dividing into slender branches, which are closely garnished with oblong, oval, woolly leaves, placed without order. The flowers are produced at the end of the branches in double spikes, which are slender, short, and strait, not recurved as the other species. The flowers are small and white, and the plant is perennial.

These three last mentioned are propagated by seeds, but the difficulty of getting them fresh from America, and the uncertainty of their growing, unless they are sown abroad, and brought over in earth, has rendered them rare in Europe; and as they are plants of little beauty, so few persons have taken the trouble to procure them: besides, as they require a stove to preserve them in this country, and must have a peculiar soil



and

and management like the eighth sort, so, unless for the sake of variety in botanic gardens, they are not worth cultivating here.

HELLEBORE. See Helleborus.

HELLEBORINE. See Serapias and Limadorum.

HELLEBOROIDES HYEMALIS. See Helleborus.

HELLEBORO RANUNCULUS. See Trollius.

HELLEBORUS. Lin. Gen. Plant. 622. Tourn. Inst. R. H. 271. tab. 144. [Ἑλλέβορος.] Black Hellebore, or Christmas flower; in French, *Ellebore-Noire*.

The Characters are,

*The flowers hath no empalement; it hath five large roundish petals, which are permanent, and many small nectarii placed circularly, each being of one piece, with a narrow tube at the bottom, divided at the brim into two lips, the under being short and indented; it hath a great number of stamina, terminated by compressed erect summits, and several germen, which are compressed, supporting awl-shaped styles, crowned by thick stigmas. The germen afterward turn to compressed capsules with two keels, the lower being short, and the upper convex, which are filled with round seeds adhering to the seam.*

This genus of plants is ranged in the seventh section of Linnæus's thirteenth class, intitled Polyandria Polygynia, which includes those plants whose flowers have many stamina and styles.

The Species are,

1. Helleborus (*Fœtidus*) caule multifloro folioso, foliis pedatis. Lin. Sp. Plant. 784. *Hellebore with many flowers on a stalk, which are intermixed with leaves, and ramose leaves sitting on the foot-stalk.* Helleborus niger fœtidus. C. B. P. *Stinking Black Hellebore, Bears-foot, or Setterwort.*
2. Helleborus (*Viridis*) caule multifloro folioso, foliis digitatis. Lin. Sp. Plant. 558. *Hellebore with many flowers on a stalk, which are intermixed with leaves, and hand-shaped leaves.* Helleborus niger hortensis, flore viridi. C. B. P. *Green flowered Black Hellebore, or Bears-foot.*
3. Helleborus (*Niger*) scapo sub-unifloro sub-nudo, foliis pedatis. Hort. Upsal. 157. *Hellebore with one flower on a stalk, which is naked, and hand-shaped leaves sitting on the foot-stalk.* Helleborus niger, flore albo, etiam interdum valde rubente. J. B. *True Black Hellebore, or Christmas Rose.*
4. Helleborus (*Trifolius*) caule multifloro, foliis ternatis integerrimis. *Hellebore with many flowers on a stalk, and leaves composed of three entire lobes.* Helleborus niger trifoliatus. Hort. Farn. *Trifoliate Black Hellebore.*
5. Helleborus (*Hyemalis*) flore folio insidente. Hort. Cliff. 227. *Hellebore with the flower sitting on the leaf.* Aconitum Hyemale, *or Winter Aconite.*
6. Helleborus (*Latifolius*) caule multifloro folioso, foliis digitatis serratis amplioribus. *Hellebore with many flowers upon a stalk, intermixed with leaves, and large fingered leaves which are sawed.* Helleborus niger amplioribus foliis. Tourn. Inst. R. H. 272. *Black Hellebore with larger leaves.*

The first sort grows naturally in woods in several parts of England, but particularly in Sussex, where I have seen it in great plenty; this hath a jointed herbaceous stalk, which rises two feet high, dividing into two or three heads, garnished with leaves composed of eight or nine long narrow lobes, which join at their base; four of these on each side are joined together at their tails, and the middle one stands on the center of the foot-stalk; these are sawed on their edges, and end in acute points; those on the lower part of the stalk are much larger than the upper, which are small and narrow. The flower-stalk arises from the center of the plant, dividing into many branches, each sustaining several smaller foot-stalks, with one entire spear-shaped leaf upon each, and one large greenish flower at the top with purplish rims; these appear in winter, and the seeds ripen in the spring; which, if permitted to scatter, the plants will rise without care, and may be transplanted into woods, or in wilderness quarters, where they will grow in great shade, and make a good appearance at a season when there are but few plants in beauty.

The second sort grows naturally at Ditton, near Cambridge, and in the woods near Stoken Church, in Oxfordshire. The stalks of this sort grow more upright than those of the first, and do not branch so much. The leaves are composed of nine long lobes, which unite to the foot-stalk at their base, and are sharply sawed on their edges; they are of a lighter green than those of the first sort. The flowers are produced at the top of the stalk, having one or two leaves set on the foot-stalk; they are composed of five oval green petals, with a great number of stamina surrounding the germen in the middle; these appear the beginning of February, and the seeds ripen the end of May, which if sown soon after they are ripe, the plants will come up early the following spring; and, when they have obtained strength, may be planted in shady places under trees, where they will thrive and flower very well. The leaves of this sort decay in autumn, and new ones arise from the roots in the spring, but the first sort is always green.

The third sort is supposed to be the Hellebore of the antients; this grows naturally on the Alps and Apennine mountains. The root of this sort is composed of many thick fleshy fibres, which spread far into the ground, from which arise the flowers upon naked foot-stalks, immediately from the root, each supporting one large white flower, composed of five roundish petals, with a great number of stamina in the middle. The leaves of this are composed of seven or eight thick, fleshy, obtuse lobes, which are slightly sawed on their edges, and unite with the foot-stalk at their base; this plant flowers in winter, from whence the title of Christmas Rose was applied to it: it is propagated by parting of the roots in autumn, for the seeds seldom ripen well in England; it should have a more sheltered situation than either of the former, otherwise it will not flower well.

The fourth sort is like the second, but differs from it in having trifoliate leaves, which are broader and entire, their surface is smoother; this flowers early in winter, and the stalks rise higher than either of the former sorts, but is at at present rare in England.

The fifth sort is the common Winter Aconite, which is so well known as to need no description. It flowers very early in the spring, which renders it worthy of a place in all curious gardens, especially as it requires but little room; this is propagated by offsets, which the roots send out in plenty; these roots may be taken up and transplanted, any time after their leaves decay, which is generally by the beginning of June till October, when they will begin to put out new fibres; but as the roots are small, and nearly of the colour of the ground, so, if care is not taken to search them, many of the roots will be left in the ground; these roots should be planted in small clusters, otherwise they will not make a good appearance; for single flowers scattered about the borders of these small kinds, are scarce seen at a distance; but when these and the Snowdrops are alternately planted in bunches, they will have a good effect, as they flower at the same time, and are much of a size.

The sixth sort is like the first, but the lobes of the leaves are broader, and the stalks grow taller; this grows naturally in Istria and Dalmatia, from whence I received some of the seeds; it has been supposed to be only a seminal variety of the first, and as such I sowed the seeds; but the plants had a very great difference, and the first winter proving severe, they were all destroyed; so that it is not so hardy as our common sort, and depending on their being so, occasioned the loss of the plants.

HELLEBORUS flore globoso. See TROLLIUS.

HELLEBORUS ALBUS. See VERATRUM.

HELMET FLOWER, or MONK's HOOD. See ACONITUM.

HEMEROCALLIS. Lin. Gen. Plant. 391. Lilio-Asphodelus. Tourn. Inst. R. H. 344. tab. 179. Liliastrum. Tourn. Inst. R. H. 369. tab. 194. *Lily Asphodel, or Day Lily*; in French, *Lis de Saint Bruno*.

The CHARACTERS are,

*The flower has no empalement; in some species the flower is of one petal, cut into six parts; in others it hath six petals, with a short tube, spreading open at the top, which is reflexed. There are six awl-shaped declining stamina surrounding the style, terminated by oblong prostrate summits. The roundish furrowed germen is situated in the middle, supporting a slender style, crowned by an obtuse three-cornered stigma. The germen afterward becomes an oval three-cornered capsule with three lobes, opening with two valves, filled with roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes the plants whose flowers have six stamina and one style. Tournefort places the first in the first section of his ninth class, which includes the plants with a Lily-flower of one leaf, cut into six parts, whose pointal becomes the fruit; the second he places in his fourth section of the same class, with the flowers of the same form which have six petals.

The SPECIES are,

1. HEMEROCALLIS (*Flava*) corollis flavis. Lin. Sp. 462. Hort. Upsal. 88. *Day Lily with a yellow flower.* Lilio-Asphodelus luteus. Park. Par. 148. *Yellow Asphodel Lily.*
2. HEMEROCALLIS (*Minor*) scapo compresso corollis monopetalis campanulatis. *Day Lily with a compressed stalk, and a bell-shaped flower of one petal.* Lilio-Asphodelus luteus, minor. Tourn. Inst. R. H. 344. *Smaller yellow Asphodel Lily.*
3. HEMEROCALLIS (*Fulva*) corollis fulvis. *Day Lily with a copper-coloured flower.* Lilio-Asphodelus phœnicius. Park. Par. 148. *Asphodel Lily with a reddish flower.*
4. HEMEROCALLIS. (*Liliastrum*) scapo simplici, corollis hexapetalis campanulatis. Hort. Cliff. 128. *Day Lily with an unbranched single stalk, and bell-shaped flowers with six petals.* Liliastrum Alpinum majus. Tourn. Inst. R. H. 369. *Greater Alpine Bastard Lily, called Savoy Spiderwort*; and in French, *Lis de Saint Bruno, i. e. St. Bruno's Lily.*

The first sort grows naturally in Hungary, Dalmatia, and Istria, but has long been an inhabitant in the English gardens; this hath strong fibrous roots, to which hang knobs, or tubers, like those of the Asphodel, from which come out keel-shaped leaves, which are two feet long, with a rigid midrib, the two sides drawing inward, so as to form a sort of gutter on the upper side. The flower-stalks rise two feet and a half high, having two or three longitudinal furrows; these are naked, and at the top divide into three or four short foot-stalks, each sustaining one pretty large yellow flower shaped like a Lily, having but one petal, with a short tube, spreading open at the brim, where it is divided into six parts; these have an agreeable scent, from which some have given it the title of yellow Tuberose. It flowers in June, and the seeds ripen in August; this plant is easily propagated by offsets, which the roots send out in plenty; these may be taken off in autumn, that being the best season for transplanting the roots, and planted in any situation, for they are extremely hardy, and will require no other culture but to keep them clean from weeds, and to allow them room that their roots may spread; they may also be propagated by seeds, which, if sown in autumn, the plants will come up the following spring, and these will flower in two years; but if the seeds are not sown till spring, the plants will not come up till the year after.

The second sort grows naturally in Siberia; this hath roots like those of the former sort, but are smaller. The leaves are not near so long, nor more than half the breadth of the former, and of a dark green colour. The flower-stalk rises a foot and a half high, is naked and compressed, but has no furrows; at the top is produced two or three yellow flowers, which are nearer the bell-shape than those of the other species, and stand on shorter foot-stalks; these flower the beginning of June, and the seeds ripen early in August. It is propagated by offsets from the root, or by seeds, in the same manner as the former, but the roots do not increase so fast; it should have a moist soil and a shady situation, where it will thrive much better than in dry ground.

The third sort is a much larger plant than either of the former, and the roots spread and increase much more, therefore is not proper furniture for small gardens; the roots of this hath very strong fleshy fibres, to which hang large oblong tubers. The leaves are near three feet long, hollowed like those of the former, turning back toward the top. The flower-stalks are as thick a man's finger, and rise near four feet high; they are naked, without joints, and branching at the top, where are several large copper-coloured flowers, shaped like those of the Red Lily, and as large. The stamina of this sort are longer than those of the other, and their summits are charged with a copper-coloured farina, which sheds on being touched; or if a person smells to the flowers, it will fly off and spread over the face, dyeing it all over of a copper colour, which is a trick often played by some unlucky people to the ignorant: these flowers never continue longer than one day, but there is a succession of flowers on the same plants for a fortnight or three weeks; this sort flowers about the same time as the former, and the roots propagate too fast for those gardens where there is but little room. It will grow on any soil or in any situation; the best time to transplant the roots is in autumn.

The Savoy Spiderwort, or, as the French call it, St. Bruno's Lily, is a plant of humbler growth than either of the former: there are two varieties of this, one is titled Liliastrum Alpinum majus, and the other Liliastrum Alpinum minus by Tournefort; the first of these rises with a flower-stalk more than a foot and a half high; the flowers are much larger, and there is a greater number upon each stalk than the second; but as there is no other essential difference between them, I have not put them down as different species; but the first is by much the finer plant, though not common in England, for the second sort is what I have always observed in the gardens here. I received some roots of the second sort from Monsf. Richard, gardener to the King of France, which continue their difference in the same soil and situation with the first, which flowers earlier in the year; the leaves of this sort are somewhat like those of the Spiderwort, are pretty firm, and grow upright; the flower-stalks grow about a foot and a half high, and have several white flowers at the top, shaped like those of the Lily, which hang on one side, and have an agreeable scent; these are but of short duration, seldom continuing in beauty above three or four days; but when the plants are strong, they will produce eight or ten flowers upon each stalk, so they make a good appearance while they last.

This sort is usually propagated by parting the roots; autumn is the best season for doing this work, as it also is for transplanting the roots; for when they are removed in the spring, they seldom flower the same year, or if they do, it is but weakly: these plants should not be transplanted oftener than every third year, when the roots may be parted to make an increase of the plants, but they should not be divided too small; for if they are, it will be two years before they flower: these plants delight in a light loamy soil and in an open exposure, so must not be planted under the drip of trees; but if they are planted to an east aspect, where they may be protected from the sun in the heat of the day, they will continue in beauty longer than when they are more exposed.

HEMIONITIS [Ἡμιονῖτις, of Ἡμίονος, a Mule, q. d. Mulewort, because this plant was believed to be as barren as a mule.] Moonfern.



This

This is a plant which is seldom propagated in gardens, therefore I shall not trouble the reader with any account of it more than this. That whoever hath a mind to cultivate any of the sorts, must procure the plants from the countries where they naturally grow; there are two sorts which are natives of the warmer parts of Europe, but in America there is a great number of very different kinds; these must be planted in pots filled with loamy undunged earth, and such of them as are natives of hot countries, must be placed in the stove; the others may be sheltered under a common frame in winter, and during the summer they must be frequently watered, but in winter they will require but little. In summer they should also have plenty of free air admitted to them; with this management the plants will thrive.

HEPATICA. Boerh. Ind. Plant. Ranunculus. Tourn. Inst. R. H. 286. Anemone. Lin. Gen. Plant. 614. [Ἡπατῖτις, of Ἧπαρ, the liver, so called, because the leaves of this plant are divided into lobes, like the liver (but it does not at all take its name from its use, for it is of no virtue against the diseases of the liver, as many have erroneously imagined;) and trifolia, from its similitude thereto.] Hepatica, or Noble Liverwort.

The Characters are,

*The flower hath a three-leaved empalement. It hath six petals, which are oval, and expand to the bottom, with a great number of slender stamina shorter than the petals, terminated by obtuse summits; and several germen collected into a head, supporting acuminated styles, crowned by obtuse stigmas. The germen afterward turns to acuminated seeds sitting round the styles.*

This genus of plants is by Tournefort ranged among the Crowfoots, and by Linnæus it is placed under Anemone; but as the flowers of Anemone have no empalement, and the Hepatica hath a three-leaved one, it may be separated from that genus; and as it is well known in the gardens by this title, so should we range it with the Anemone, it might occasion confusion. This is ranged in the seventh section of Linnæus's thirteenth class, which includes the herbs with flowers having many stamina and styles.

The Varieties of this plant are,

1. Hepatica (*Nobilis*) trifolio, cœruleo flore. Clus. *The single blue Hepatica, or Noble Liverwort.*
2. Hepatica (*Plena*) trifolia cœruleo pleno. Clus. *The double blue Hepatica, or Noble Liverwort.*
3. Hepatica (*Alba*) trifolia, flore alba simplici. Boerh. Ind. *The single white Hepatica, or Noble Liverwort.*
4. Hepatica (*Vulgaris*) trifolia, rubro flore. Clus. *Single red Hepatica, or Noble Liverwort.*
5. Hepatica (*Rubra*) trifolia, flore rubro pleno. Boerh. Ind. *Double red, or Peach-coloured Hepatica.*

These plants are some of the greatest beauties of the spring; the flowers are produced in February and March in great plenty, before the green leaves appear, and make a very beautiful figure in the borders of the pleasure-garden, especially the double sorts, which commonly continue a fortnight long in flower than the single kinds, and the flowers are much fairer. I have seen the double white kind often mentioned in books, but could never see it growing, though I do not know but such a flower might be obtained from seeds of the single white, or blue kinds. I have sometimes known the double blue sort produce some flowers in autumn, which were inclining to white, and thereby some people have been deceived, who have procured the roots at that season, and planted them in their gardens; but the spring following their flowers were blue, as before; and this is what frequently happens, when the autumn is so mild as to cause them to flower; but whether the double white sort, mentioned in the books, was only this accidental alteration in the colour of the flower, I cannot say, though it seems very probable it was, since I never could hear of any person who ever saw the double white sort flower in the spring.

The single sorts produce seeds every year, whereby they are easily propagated, and also new flowers may be that way obtained. The best season for sowing of the seeds is in the beginning of August, either in pots or boxes of light earth, which should be placed so as to have only the morning sun until October, when they should be removed into the full sun, to remain during the winter season; but in March, when the young plants will begin to appear, they must be removed again to a shady situation, and in dry weather should be frequently watered, and about the beginning of August they will be fit to be transplanted; at which time you should prepare a border facing the east, of good, fresh, loamy earth, into which you should remove the plants, placing them about six inches distance each way, closing the earth pretty fast to their roots, to prevent the worms from drawing them out of the ground, which they are very apt to do at that season; and, in the spring following, they will begin to shew their flowers; but it will be three years before they flower strong, and till then you cannot judge of their goodness; when, if you find any double flowers, or any of a different colour from the common sorts, they should be taken up, and transplanted into the borders of the flower-garden, where they should continue at least two years before they are taken up or parted; for it is remarkable in this plant, that where they are often removed and parted, they are very subject to die; whereas, when they are permitted to remain undisturbed for many years, they will thrive exceedingly, and become very large roots.

The double flowers, which never produce seeds, are propagated by parting their roots, which should be done in March, at the time when they are in flower; but you should be careful not to separate them into very small heads, nor should they be parted oftener than every third or fourth year, if you intend to have them thrive, for the reason before given. They delight in a strong loamy soil, and in an eastern position, where they may have only the morning sun, though they will grow in almost any aspect, not too warm, and are never injured by cold.

HEPATORIUM. See Eupatorium.

HEPTAPHYLLUM. See Potentilla.

HERACLEUM. Lin. Gen. 345. Sphondylium. Tourn. Inst. 1. Cow Parsnep.

The Characters are,

*The calyx of the greater umbel is large, composed of many smaller, which are plain; the general involucrum is composed of many leaves which fall off; the partial umbels have involucrums of three to seven leaves, the outer being the longest. The general umbel is deformed, the florets are mostly fruitful; those of the disk have five equal petals, which are inflexed; those of the rays have the same number of unequal petals, the outer being the largest; they have each five stamina longer than the petals, terminated by small summits. The germen is situated under the flower, and is almost oval, supporting two styles, crowned by simple stigmas. The germen afterward becomes an elliptical fruit, composed of two oval compressed seeds.*

This genus of plants is ranged in the second order of Linnæus's fifth class, intitled Pentandria Digynia, the flowers having five stamina and two styles.

The Species are,

1. Heracleum (*Sphondylium*) foliolis pinnatifidis. Hort. Cliff. 103. *Cow Parsnep with wing-pointed leaves.* Sphondylium vulgare hirsutum. C. B. P. 157. *Common Cow Parsnep.*
2. Heracleum (*Panaces*) foliis pinnatis, foliolis quinis, intermediis sessilibus, floribus radiatis. Hort. Upsal. 65. *Cow Parsnep with winged leaves having five lobes, and radiated flowers.* Panax Sphondylii folio, sc. Heracleum, C. B. P. 157.
3. Heracleum (*Alpinum*) foliis simplicibus, floribus radiatis. Lin. Sp. 359. *Cow Parsnep with simple leaves and radiated flowers.* Sphondylium Alpinum glabrum. C. B. P. 157. *Smooth Alpine Cow Parsnep.*
4. Heracleum (*Sibricum*) foliis pinnatis, foliolis quinis, intermediis sessilibus, corollulis uniformibus. Hort. Upsal. 65. *Cow Parsnep with winged leaves, having five lobes*

*lobes and a uniform corolla.* Pastinaca foliis simpliciter pinnatis, foliolis pinnafidis. Flor. Siber. 1. p. 218.

The first sort grows naturally in most parts of England, so is rarely admitted into gardens; there is a variety (if not a distinct species of this) with narrower leaves, which are more divided than those of the first; however, as they are seldom cultivated, I shall not trouble the reader with their description.

The second sort is placed in most of the Pharmacopœias as a medicinal plant, but is rarely used as such, especially in England. This rises with a tall stalk near six feet high, which is embraced by the base of the leaves; these are winged, having generally five roundish lobes, whose surface is rough, of a dark green colour: the flowers are produced at the top of the stalks, being closely inclosed by the empalement when they first appear; but this afterward bursting, the umbel expands, having large petals on their exterior row, which are almost heart-shaped, and are succeeded by flat compressed seeds like those of Parsnep, but larger, having black streaks on their outside. This grows naturally on the Appenines.

The third sort grows naturally on the Alps, as also in Siberia: the stalks of this rise as high as those of the former, but the leaves are smooth. This is seldom cultivated.

The fourth sort grows naturally in Siberia and Transylvania; in the former country, the inhabitants eat the stalks and leaves of the plant for want of better food.

As these plants are rarely cultivated, unless in botanic gardens, so I shall recommend to those who are desirous to propagate either of the species, to sow their weeds in the autumn; and in the spring, when the plants are up, to hough the ground, cutting up the seeds, and thinning of the plants, in the same manner as is directed for Parsneps, with which culture the plants will thrive.

HERBA GERARDI. See Angelica Sylvestris minor.

HERBALIST, HERBARIST, a person who is skilled in distinguishing the kinds, natures, or virtues of herbs or plants.

HERBA PARIS. See Paris.

To HERBARIZE, to go abroad in the fields in quest of different or new herbs or plants.

HERBIFEROUS signifies bearing or bringing forth herbs.

HERBIVOROUS, i. e. devouring or feeding on herbs or Grass.

HERBOSE, grassy, or full of Grass or herbs.

HERBOSITY, grassiness, or abundance of Grass or herbs.

HERBULENT, grassy, full of Grass or herbs.

HERMANNIA. Tourn. Inst. R. H. 656. tab. 432. Lin. Gen. Plant. 742. The title of this genus was given by Dr. Tournefort in honour of that great botanist, Paul Herman, M. D. Professor of Botany at Leyden.

The Characters are,

*The flower hath a pitcher-shaped permanent empalement, divided into five parts at the brim. It hath five petals, which are narrow at their base, and twist against the sun within the tubulous empalement, but spread open above, where they are broad and obtuse. It hath five broad stamina, which are joined in one body, terminated by pointed summits, which are joined. In the center is situated a roundish five-cornered germen, supporting an awl-shaped style which is longer than the stamina, crowned by a single stigma. The germen afterward becomes a five-cornered roundish capsule, with five cells opening at the top, inclosing many seeds.*

This genus of plants is ranged in the first section of Linnæus's sixteenth class, which includes the plants whose flowers have five stamina joined in one body to the style.

The Species are,

1. Hermannia (*Alnifolia*) foliis cuneiformibus plicatis, crenato-emarginatis. Hort. Cliff. 342. *Hermannia with wedge-shaped folded leaves, which are crenated and indented.* Hermannia frutescens, folio oblongo serrato latiori. Boerh. Ind. *Shrubby Hermannia with a broader, oblong, serrated leaf.*
2. Hermannia (*Grossulariæfolia*) foliis obovatis acutè incisis, pedunculis bifloris. Prod. Leyd. 347. *Hermannia with oval leaves acutely cut, and foot-stalks having two flowers.* Hermannia frutescens folio grossulariæ parvo hirsuto. Boerh. Ind. *Shrubby Hermannia with a small, hairy, Gooseberry leaf.*
3. Hermannia (*Althææfolia*) foliis obovatis plicatis crenatis tomentosis. Hort. Cliff. 343. *Hermannia with oval, folded, woolly leaves, which are crenated* Hermannia frutescens, folio ibisci hirsuto molli, caule piloso. Boerh. Ind. *Shrubby Hermannia with a soft, hairy, Marshmallow leaf, and woolly stalk.*
4. Hermannia (*Hyssopifolia*) foliis lanceolatis obtusis serratis. Hort. Cliff. 342. *Hermannia with obtuse spear-shaped leaves, which are sawed.* Hermannia frutescens, folio oblongo serrato. Tourn. *Shrubby Hermannia with an oblong serrated leaf.*
5. Hermannia (*Trifoliato*) foliis oblongo-ovatis crenatis tomentosis flore mutabili. *Hermannia with oblong, oval, crenated woolly leaves, and a changeable flower.* Hermannia frutescens, folio oblongo molli cordato hirsuto. Boerh. Ind. *Shrubby Hermannia with a soft, oblong, hairy, heart-shaped leaf.*
6. Hermannia (*Pinnata*) foliis tripartitis, media pinnatifida. Hort. Cliff. *Hermannia with tripartite leaves ending in many points.* Hermannia frutescens, folio multifido tenui, caule rubro. Boerh. Ind. alt. *Shrubby Hermannia with a narrow multifid leaf, and a red stalk.*
7. Hermannia (*Lavendulifolia*) foliis lanceolatis obtusis integerrimis. Hort. Cliff. 342. *Hermannia with obtuse spear-shaped leaves, which are entire.* Hermannia frutescens, folio lavendulæ latiori & obtuso, flore parvo aureo. Boerh. Ind. alt. *Shrubby Hermannia with a broad, blunt, Lavender leaf, and a small golden flower.*
8. Hermannia (*Hirsuta*) foliis simplicibus ternatisque hirsutis sessilibus. *Hermannia with single and trifoliate leaves which are hairy, and sit close to the stalk.*

The first sort rises with a shrubby stalk six or eight feet high, dividing into many erect irregular branches, covered with a brown bark, garnished with wedge-shaped leaves, which are narrow at their base, but broad and round at the top; they are about an inch long, and three quarters broad at the point, where they are indented and crenated. The flowers are produced in short spikes on the upper part of the branches; they are of a pale yellow colour, but small; these appear in April and May, and are often succeeded by seeds, which ripen in August.

The second sort is a shrub of lower stature than the first, but sends out a great number of branches, which spread wide on every side, garnished with smaller leaves than those of the former, which are rough, and sit close to the branches. The flowers are produced in short close spikes at the end of every shoot, so that the whole shrub seems covered with flowers; they are of a bright yellow, and appear toward the end of April, but are not succeeded by seeds in England.

The third sort is a plant of humbler growth than either of the former, seldom rising more than two feet and a half high; the stem is not so woody, and the branches are soft and slender, garnished with oval woolly leaves, which are plaited and crenated on the edges; the flowers are produced in loose panicles at the end of the branches; they are larger than those of the other species, and have very hairy empalements. This sort flowers in June and July, and frequently puts out more in the autumn.

The fourth sort has been longer in the European gardens than either of the other. This rises with a shrubby upright stalk to the height of seven or eight feet, sending out many ligneous branches from the side, which also grow more erect than any of the other; these are cloathed with obtuse spear-shaped leaves, about

about an inch and a half long, and half an inch broad, sawed on the edges toward the end: the flowers come out in small bunches from the side of the stalk; they are of a pale Straw colour, and appear in May and June; these are frequently succeeded by seeds, which ripen the latter part of August.

The fifth sort seldom rises more than two feet high, with a soft ligneous stalk, sending out slender irregular branches, garnished with oblong, oval, woolly leaves, standing upon pretty long footstalks; the flowers are produced in loose spikes at the end of the branches; these are, at their first appearance, of a gold colour, but after they have been some days open, they change to yellow. This flowers in June and July.

The sixth sort rises with a shrubby stalk near three feet high, sending out many slender branches, covered with a reddish bark, garnished with narrow wing-pointed leaves; the flowers come out from the side of the branches in small clusters; they are small, and of a deep yellow colour. This flowers in June and July.

The seventh sort hath shrubby branching stalks, which are very bushy, but seldom rise more than a foot and a half high; the branches are very slender, and garnished with hairy, pale, green leaves of different sizes; some of them are two inches long, and one broad at their ends; but their common size is seldom more than one inch long, and half an inch broad at their points; they are entire, and sit pretty close to the branches; the flowers come out from the side of the stalk singly, they are small, and of a yellow colour. This sort flowers most part of summer.

The eighth sort I raised from seeds which came from the Cape of Good Hope. This rises with a shrubby hairy stalk about two feet high, sending out many side branches, which grow more erect than those of the former, garnished with oblong, veined, hairy leaves, which are sometimes single, and at other times come out by threes, the middle one being the largest; the flowers are produced toward the end of the branches; they are large, and of a deep yellow colour, with large, swollen, hairy empalements. This sort continues flowering most part of summer.

All the species of this genus yet known, are natives of the country about the Cape of Good Hope, from whence most of them were brought to the gardens in Holland, where they have been propagated and spread through most parts of Europe.

The plants are all propagated by planting cuttings of them during any of the summer months, in a bed of fresh earth, observing to water and shade them until they are well rooted, which will be in about six weeks after planting; then you should take them up, preserving a ball of earth to their roots, and plant them into pots filled with light fresh earth, placing them in a shady situation until they have taken fresh root; after which they may be exposed to the open air, with Myrtles, Geraniums, &c. until the middle or latter end of October, when they must be removed into the green-house, observing to place them in the coolest part of the house, where they may have as much free air as possible; for if they are too much drawn in the house, they will appear very faint and sickly, and seldom produce many flowers; whereas, when they are only preserved from the frost, and have a great share of free air, they will appear strong and healthy, and produce large quantities of flowers in April and May, during which season they make a very handsome appearance in the green-house: they must also be frequently watered, and will require to be new potted at least twice every year, i. e. in May and September; otherwise their roots will be so matted, as to prevent their growth.

These plants rarely produce good seeds with us, except the fourth and eighth sorts, which ripen their seeds every year in England; the other rarely producing any, I suppose this may be accounted for by their having been long propagated from cuttings; for those plants which I have raised from seeds, have been fruitful two or three years after, but I have always found those plants which have been propagated by cuttings taken from these, have soon become barren: the same thing I have observed in many other plants, therefore those who are desirous to continue their plants fruitful, should constantly raise them from seeds. These, as also those which are obtained from abroad, must be sown upon a moderate hot-bed; and when the plants come up, they must be transplanted into small pots, and plunged into another very moderate hot-bed, in order to promote their rooting; after which they must be hardened by degrees, to endure the open air in summer, and may then be treated as the old plants.

HERMODACTYLUS, the Hermodactyl, commonly called Snake's-head Iris.

This genus is by Dr. Linnæus joined to Iris, the characters of the flower agreeing pretty well with those of that genus; from which Tournefort has separated it from the difference of the root, which is not according to his own system, where he makes the shape of the petals with their number and position, the principal characteristics in distinguishing the classes and genera; but as this plant requires a particular treatment, so I have continued it under Tournefort's title.

The Characters are,

*It hath a Lily-shaped flower, consisting of one leaf, and shaped exactly like an Iris, but has a tuberous root, divided into two or three dugs, like oblong bulbs.*

We have but one Species of this plant, viz.

Hermodactylus (*Tuberosa*) folio quadrangulo. C. B. P. *Snake's-head Iris*, vulgò. This is also called Iris tuberosa Belgarum, i. e. *Tuberous Iris of the Dutch.*

This plant is easily propagated by its tubers, which should be taken off soon after the green leaves decay, which is the proper season for transplanting the root; but they should not be kept long out of the ground, lest they shrink, which will cause them to rot when they are planted. They should have a loamy soil, not too strong nor deep, and must be planted to an east aspect, where they will flower very well. The roots should not be removed oftener than once in three years, if you design to increase them; but then they should be planted at a farther distance from each other, than if they were to remain but one year; and the beds should be kept clear from weeds, and at Michaelmas there should be some fine earth laid over the beds, which will greatly strengthen their roots. The distance which these plants should be allowed is six inches square, and they should be placed three inches deep in the ground. These produce their flowers in May, and their seeds are ripe in August; but as they multiply pretty fast by their roots, few people are at the trouble of raising them from seeds; but those who have an inclination so to do, must treat them in the manner directed for the bulbous Irises.

The roots of this plant are very apt to run deep into the ground, and then they seldom produce flowers; and many times they shoot so deep as to be lost, especially where the soil is very light; therefore to prevent this, it will be proper to lay a thickness of rubbish under the border where these are planted, to hinder them from getting down. This should always be practised in light ground, but in strong land there will be no occasion to make use of this precaution, because they do not shoot downward so freely in that.

This plant has by some botanic writers been supposed the true Hermodactyl, but what has been long used in Europe for that is the root of a Colchicum.

HERNANDIA. Plum. Nov. Gen. 8. tab. 40. Lin. Gen. Plant. 931. Jack-in-a-Box, vulgò.

The Characters are,

*It hath male and female flowers on the same plant; the male flowers have a partial involucrum, composed of four oval small leaves, which inclose three flowers; each of these has a proper bell-shaped empalement of one leaf; the petal is funnel-shaped, cut into six segments at the brim; it hath three short stamina inserted in the empalement, terminated by erect summits. The female flowers are*

*are shaped like the male, but want stamina; they have a roundish germen, supporting three slender styles, crowned by acute stigmas. The empalement afterward becomes a large, swollen, oblong fruit, perforated at each end, inclosing one hard globular nut.*

This genus of plants is ranged in the third section of Linnæus's twenty-fi st class, intitled Monœcia Triandria, which includes those plants which have male and female flowers in the same plant, whose male flowers have three stamina.

We have but one SPECIES of this genus in England, viz.

HERNANDIA (*Sonora*) foliis peltatis. Hort. Cliff. 485. tab. 13. Hernandia amplo hederæ folio umbilicato. Plum. *Hernandia with a large umbilicated Ivy leaf, commonly called in the West-Indies, Jack-in-a-box.*

This plant is very common in Jamaica, Barbadoes, St. Christopher's, and many other islands in the West-Indies, where it is known by the name of Jack-in-a-box. The fruit of this plant when ripe, is perforated, and the nut in the inside becomes hard; so that when the wind blows through the fruit, it makes a whistling noise, which may be heard at a distance; fom whence, I suppose, the inhabitants gave this name to the plant. It grows in the gullies, where there are rills of water.

In Europe this plant is preserved in curious gardens, with other tender exotic plants. It is propagated by sowing the seeds in a hot-bed in the spring; and when the plants have arisen two inches high, they should be transplanted each into a separate pot, filled with fresh rich earth, and plunged into the hot-bed again, observing to water and shade them until they have taken root; after which time they must have air admitted to them, (by raising the glasses) in proportion to the warmth of the air, or the heat of the bed in which they are placed; and should be frequently watered, otherwise they will not thrive. As the plants advance, they should be removed into larger pots, which should be filled with rich earth; but in doing this, you should be very careful not to break the roots, as also to preserve a good ball of earth to them; and if their leaves should hang after being removed, the plants must be screened from the sun until they have taken new root. The best time to shift these plants is in July, that they may be well rooted before the cold approaches; the plants must be constantly kept in the bark-stove: in winter they should have a moderate share of heat, and in the summer they must have plenty of air in hot weather. With this management, the plants will grow to the height of sixteen feet or more, and the leaves being very large, will make a beautiful appearance in the stove. It hath not as yet flowered in England, though we may expect some of the large plants to flower in a short time.

HERNIARIA. Tourn. Inst. R. H. 507. tab. 228. Lin. Gen. Plant. 272. [of *Hernia*, Lat. a rupture.] Rupturewort.

The CHARACTERS are,

*The flower hath no petals, but a coloured empalement of one leaf, cut into five parts which spread open. It hath five small awl-shaped stamina, situated in the divisions of the empalement, terminated by single summits, and five others which are barren, placed alternately between them. In the center is an oval germen with two stigmas, which have acute points; the germen afterward turns to a small capsule inclosed in the empalement, having one oval-pointed seed.*

This genus of plants is ranged in the second section of Linnæus's fifth class, intitled Pentandria Digynia, which includes the plants whose flowers have five stamina and two styles.

The SPECIES are,

1. HERNIARIA (*Glabra*) glabra herbacea. J. B. 3. 378. *Smooth Rupturewort.*
2. HERNIARIA (*Hirsuta*) hirsuta herbacea. J. B. 3. 379. *Rough or hairy Rupturewort.*
3. HERNIARIA (*Alsines folia*) alsines folio. Tourn. Inst. 507. *Rupturewort with a Chickweed leaf.*
4. HERNIARIA (*Fruticosa*) caulibus fruticosis, floribus quadrifidis. Amœn. Acad. 4. p. 369. *Rupturewort with ligneous stalks and quadrifid flowers.* Herniaria fruticosa, viticulis lignosis. C. B. P. 382.

The two first sorts grow naturally in England, but not very common; they are low trailing plants, their branches lying on the ground, and extend seven or eight inches each way; they have leaves like the smaller Chickweed, the first is smooth, and those of the second are hairy; the flowers come out in clusters from the side of the stalks at the joints; they are small, and of a yellowish green, so make no appearance.

The fourth sort hath shrubby stalks which trail upon the ground, garnished with small hairy leaves like the second sort; the flowers are also very like that.

The third sort is an annual plant, which grows naturally in France and Italy. This doth not spread so much as either of the other sorts, but the flowers and leaves are somewhat like the first, but larger.

These plants are seldom cultivated, but in botanic gardens for the sake of variety. The three first are annual plants, seldom continuing longer than one year; and must be permitted to shed their seeds, whereby they are better preserved than if sown with art. The fourth sort is an abiding plant, which may be propagated by cuttings; but as they are plants of no beauty, they are rarely preserved in gardens.

The first sort is what should be used in the shops, but is rarely seen in London, the herb-women commonly bringing the Parsley Breakstone to the markets, which is sold instead of this plant.

HESPERIS. Tourn. Inst. R. H. 222. tab. 108. Lin. Gen. Plant. 731. [some derive the name of this plant from Hesperia, Italy, from whence the people were anciently called Hesperides; but it is pretty plain, that the name was taken from Ἑσπερος, because the flower commonly smells most in an evening; either of these may be admitted. It is called Viola Matronalis, because it resembles the Violet, and was at first cultivated by women.] Dame's Violet, Rocket, or Queen's Gilliflower; in French, *Juliane*, or *Juliene.*

The CHARACTERS are,

*The flower is composed of four oblong petals in form of a cross, whose base or tails are narrow, and are situated in a four-leaved empalement, which falls away. It hath six awl-shaped stamina, four of them as long as the tube of the flower, and two much shorter, terminated by narrow erect summits, reflexed at their points. It hath a honey-gland situated between the two short stamina, and a four-cornered germen the length of the stamina, but no style, the oblong erect stigma sitting on the germen; the stigma is divided into two parts, which join at their points. The germen afterward becomes a plain, long, compressed pod with two cells, divided by an intermediate partition, inclosing many oval compressed seeds.*

This genus of plants is ranged in the second section of Linnæus's fifteenth class, intitled Tetradynamia Siliquosa, the flowers having four long and two short stamina, and are succeeded by long pods.

The SPECIES are,

1. HESPERIS (*Matronalis*) caule simplici erecto, foliis ovato-lanceolatis denticulatis, petalis mucrone emarginatis. Lin. Sp. 927. *Dame's Violet with a single erect stalk, oval, spear-shaped, indented leaves, and the petals of the flowers indented at the top.* Hesperis hortensis, flore purpureo. C. B. P. 202. *Garden Rocket with a purple flower.*
2. HESPERIS (*Alba*) caule simplici erecto, foliis lanceolatis serratis, petalis integris. *Dame's Violet with a single upright stalk, spear-shaped sawed leaves, and the petals of the flower entire.* Hesperis hortensis flore candido. C. B. P. 202. *Garden Rocket with a white flower.*
3. HESPERIS (*Inodora*) caule simplici erecto, foliis subhastatis dentatis petalis obtusis. Lin. Sp. 727. *Dame's Violet with a single upright stalk, halbert-shaped, indented, obtuse leaves and petals.* Hesperis sylvestris inodora. C. B. P. 202. *Unsavoury wild Rocket.*

4. Hesperis (*Tristis*) caule hispido ramoso patente. Hort. Upsal. 187. *Dame's Violet with a prickly, branching, spreading stalk.* Hesperis montana, pallidia, odoratissima. C. B. P. 202. *Sweetest pale Mountain Rocket.*

5. Hesperis (*Siberica*) caule simplici, foliis lanceolatis dentato-serratis, petalis obtusissimis integris. Lin. Sp. 927. *Dame's Violet with a single stalk, spear-shaped sawed leaves, and blunt entire petals to the flower.*

6. Hesperis (*Exigua*) caule ramosissimo diffuso, foliis lineari-lanceolatis dentatis, siliquis apice truncatis. *Dame's Violet with a very branching diffused stalk, narrow, spear-shaped, indented leaves, and the points of the pods shaped like a truncheon.* Hesperis exigua lutea, folio dentato angusto. Boerh. Ind. 146. *Rocket with a very small yellow flower, and a narrow indented leaf.*

7. Hesperis (*Dentata*) foliis dentato-pinnatifidis, caule lævi. Lin. Sp. Plant. 664. *Dame's Violet with wing-pointed indented leaves, and a smooth stalk.* Hesperis flore albo minimo, siliquâ longâ, folio profundè dentato. Boerh. Ind. alt. 2. 20. *Rocket with a small white flower, a long pod, and leaves deeply indented.*

8. Hesperis (*Africana*) caule ramosissimo diffuso, foliis petiolatis lanceolatis acute dentatis scabris siliquis sessilibus. Lin. Sp. Plant. 928. *Dame's Violet with very branching diffused stalks, spear-shaped, rough, sawed leaves, and pods sitting close to the stalks.* Hesperis Africana, hieracii folio hirsuto, flore minimo purpurascente. Nissol. Act. *African Rocket with a hairy Hawkweed leaf, and a very small purplish flower.*

9. Hesperis (*Verna*) caule erecto ramoso, foliis cordatis amplexicaulibus serratis villosis. Lin. Sp. Plant. 664. *Dame's Violet with an erect branching stalk, and hairy, sawed, heart-shaped leaves embracing the stalk.* Turritis annua verna, purpurascente flore. Tourn. Inst. 224. *Annual vernal Tower Mustard, with a purplish flower.*

The first sort grows naturally in Italy; this was formerly in greater plenty in the English gardens than at present, having been long neglected because the flowers were single, and made but little appearance; however, as the flowers have a very grateful scent, so the plant is worthy of a place in every good garden. This rises with an upright stalk a foot and a half high, garnished with spear-shaped leaves which sit close to the stalk, and are slightly indented on their edges, ending in acute points: the flowers are produced in a loose thyrse on the top of the stalks; they are composed of four petals, which are roundish and indented at their points, of a deep purple colour, and smell very sweet, especially in the evening or in cloudy weather. It flowers in June, and the seeds ripen the latter end of August. It is a biennial plant, so that young plants should be raised every year, to supply the place of those which decay: if the seeds are permitted to scatter, the plants will come up without trouble in the spring; and if the seeds are sown, the best season for it is in the autumn; because those which are sown in the spring often fail if the season proves dry, or will remain a long time in the ground before they vegetate. This plant should have a loamy undunged soil, in which it will thrive better than in rich land.

There is a variety of this with double flowers, in some of the gardens in France; but that which we have in England, is a variety of the third sort with unsavoury flowers.

The second sort has been generally supposed only a variety of the first, differing in the colour of the flower, but is certainly a distinct species; the leaves of this are not so long, but much broader than those of the first, and their borders are entire; the flowers are not quite so large, nor do they form so good spikes; they are white, and have not so fine a scent as the first. This is also a biennial plant, requiring the same treatment as the first.

The third sort grows naturally in Hungary and Austria. This rises with an upright stalk near two feet high, garnished with spear-shaped leaves, ending in acute points, and sharply indented on their edges; they are of a dark green, and sit close to the stalks; the flowers grow in loose spikes on the top of the stalks; in some they are white, in other purple, and sometimes both colours striped in the same flower; these have no odour, so are not deserving of a place in gardens, but may be propagated in the same manner as the two former.

From this sort, the double white and purple Rockets have been accidentally obtained, which are much esteemed for the beauty of their flowers; and if they had the agreeable odour of the Garden Rocket, they would be some of the best furniture for the borders of the flower-garden, but they are without scent; however, for the beauty of their flowers, they are by some greatly esteemed, therefore I shall here insert the best method of propagating them yet known.

These plants are naturally biennial, so the plants with single flowers rarely survive the second year; nor will those with double flowers continue much longer; so that unless young plants are annually raised to supply the place of the old ones, there will soon be a want of them, which is what few persons are careful enough to observe; but thinking the roots to be perennial, trust to their putting out offsets, or the plants remaining after they have flowered; and finding them decay, are apt to think their soil very improper for them, and are at a loss to account for their decaying; whereas, when the plants have flowered, they have finished their period, and seldom continue to flower a second time from the same root; though in poor land, they will often put out a few weak offsets, which may flower again, but seldom so strong as the principal roots; therefore those who are desirous to propagate these plants, should do it in the following manner:

There should be some strong roots of each sort kept apart for this purpose, which are not intended to flower; when these have shot up their flower-stalks about six inches high, they should be cut close to the bottom; each of these may be divided in the middle to make two cuttings, which should be planted in a soft, gentle, loamy soil, to an east exposure, where they may have only the morning sun; and these may be planted pretty near together, so as to be covered with hand or bell-glasses, which should be put over them after the cuttings have been well watered, and closely shut down, drawing the earth round the rim of the glasses to exclude the air; then the glasses should be shaded with mats every day when the sun is hot; and if the cuttings are gently refreshed with water once in seven or eight days, it will be sufficient, for too much moisture will cause them to rot: when these are watered, the glasses should be closely shut down again as before; with this management the cuttings will put out roots in five or six weeks, and will begin to shoot above; then the glasses should be gently raised on one side to admit the air to them, and so gradually harden them to the open air, to prevent their drawing up weak. When these have made good roots, they should be carefully removed, and planted in an east border at about eight or nine inches asunder, observing to shade and water them till they have taken new root; after which they will require no other care, but to keep them clean from weeds till the autumn, when they may be transplanted into the borders of the pleasure-garden, where they are designed to flower.

The roots which are thus cut down, will send up more stalks than before; and when these are of a proper height, they may be cut off and treated in the same way; so that if the roots are sound, there may be two or three crops of these cuttings taken from them, and by so doing, the old roots may be continued much longer than if they are permitted to flower; and by this management, there may be always a supply of good plants for the flower-garden.

These plants are very subject to canker and rot when they are planted in a light rich soil, but in poor strong ground, I have seen them thrive and flower in the utmost perfection, where the stems of flowers have been as large, and the flowers as fair as the finest double Stock-

Stock-gilliflowers. Their season of flowering is in the beginning of June, and I have frequently raised young plants from the stalks after the flowers have decayed, by cutting them in lengths, and planting them in the manner before directed; but these seldom make so good plants as the young cuttings, nor are they so certain to grow, therefore the other are to be preferred.

The fourth sort grows naturally in Hungary. This is much cultivated in the gardens abroad, for the great fragrancy of its flowers, which in the evening is so strong, as to perfume the air at a great distance, especially where there are any number of the plants. The ladies in Germany are very fond of this plant, and during the season of their flowering, have the pots placed in their apartments every evening, that they may enjoy the fragrancy of their flowers; for they have but little beauty, being smaller than those of the Garden Rocket, and of a pale colour, but the scent of their flowers is much preferable to them; though in the day-time, if the weather is clear, they have very little odour; but when the sun leaves them, their fragrancy is expanded to a great distance. To this species it is supposed, that the title of Dame's Violet was first applied.

This sort is very rarely seen in the English gardens: I suppose it has been neglected, because the flowers make no appearance. It is a biennial plant like the Garden Rocket, which is propagated by seeds in the same manner; but the plants are not quite so hardy, and are very subject to rot in winter, especially on a moist soil, or in rich land, where they are apt to grow very rank, so are soon injured by wet and cold in the winter; therefore the plants of this sort should be planted in a dry poor soil, and a warm situation; and if some of them are planted in pots to be placed under a common frame in winter, where they may be sheltered from hard rains and frost, but enjoy the free air at all times when the weather is mild, it will be a sure way to preserve them.

The leaves of this sort are much larger than those of the Garden Rocket, and of a paler green; the stalks are closely set with bristly hairs; the flowers grow in loose panicles at the top of the stalk, and appear about the same time with the Garden Rocket.

The seeds of the fifth sort were sent me from Germany without any title, nor any account of the country from whence it came; but as it was sent with the seeds of some Siberian plants, I suppose this came from the same country. This is a biennial plant, which rises with a strong branching stalk between two and three feet high, which is very hairy, garnished with oblong heart-shaped leaves, ending in acute points, sitting close to the stalk; they are four inches long, and one and a half broad at their base, gradually diminishing to the point, and are slightly sawed on their edges; the upper part of the stalk divides into two or three branches, which are garnished with small leaves of the same shape with those below, and are terminated with loose panicles of single, large, purple flowers of great fragrancy. This sort flowered the end of June 1757, but the great rains which fell in August, rotted the plants before the seeds were ripe.

The sixth sort grows naturally in the warm parts of Europe; this is annual; the stalks rise about eight or nine inches high, branching out greatly on every side in a confused order; they are garnished with small, narrow, indented leaves, and are terminated by clusters of small yellow flowers, which make no appearance.

The seventh sort grows naturally in Sicily. This is an annual plant, which seldom rises more than six inches high; the stalk branches toward the top into three or four smaller, which are terminated by small white flowers; the leaves are two inches long and one broad, cut almost to the midrib on each side, so as to resemble a winged leaf.

The eighth sort grows naturally in Africa. This is an annual plant with a very branching stalk, which rises about nine inches high, garnished with rough spear-shaped leaves sawed on their edges, and terminated by loose panicles of small purple flowers, which appear in June and July; these are succeeded by long pods sitting close to the stalks, and are filled with small seeds which ripen in September.

These three sorts are rarely cultivated, except in botanic gardens for the sake of variety. If the seeds of these are permitted to scatter, the plants will come up without care, and only require to be kept clean from weeds; or they may be sown either in the spring or the autumn where they are to stand, for they do not bear transplanting well.

The ninth sort is an annual plant, which grows naturally in the south of France. This sends out several heart-shaped leaves from the root, which spread on the ground; they are sawed and hairy: the stalk rises nine inches high, branching toward the top, garnished with leaves of the same shape, which embrace the stalks with their base; the flowers are produced in loose panicles at the end of the branches; they are of a lively purple colour, and those plants which rise in the autumn, flower early in the spring. If these seeds are sown in the autumn, they succeed much better than in the spring.

HEUCHERA. Lin. Gen. Plant. 283. Sanicle.

The Characters are,

*The flower is composed of five narrow petals, which are inserted in the border of the one-leaved empalement. It hath five erect awl-shaped stamina, which are much longer than the empalement, terminated by roundish summits. It hath a roundish bifid germen, with two erect styles the length of the stamina, crowned by obtuse stigmas. The germen afterward turns to an oval-pointed capsule with two horns, which are reflexed, having two cells filled with very small seeds.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and two styles.

We have but one Species of this genus, viz.

Heuchera (*Americana*.) Hort. Cliff. 82. Mitella Americana, flore squallidè purpureo villoso. Boerh. Ind. alt. *Mitella of America, with hairy flowers of a dirty purple colour.*

This plant grows naturally in Virginia, but is hardy enough to thrive in the open air in England. It hath a perennial root, which sends out many heart-shaped oval leaves, which are indented into four or five lobes, and are crenated on their edges, of a lucid green, and smooth; from between these come out the foot-stalks of the flower, which are naked, and rise a foot high, dividing at the top into a loose panicle, sustaining many small hairy flowers, of an obsolete purple colour. This flowers in May, and the seeds ripen in August.

It is propagated by parting the roots in autumn, and should be planted in a shady situation; there is little beauty in this plant, but it is preserved in some gardens for the sake of variety.

HIBISCUS. Lin. Gen. Plant. 756. Ketmia. Tourn. Inst. R. H. 99. tab. 26. *Syrian Mallow.*

The Characters are,

*The flower has a double empalement, which is permanent; the outer is composed of eight or ten narrow leaves, the inner is shaped like a cup, and is of one leaf, cut at the brim into five acute points. It hath five heart-shaped petals, which join at their base into one. It hath many stamina, which are joined to the style, in form of a column, within the tube of the flower, but expand toward the top, and are terminated by kidney-shaped summits. It has a round germen, with slender styles longer than the stamina, crowned by roundish stigmas. The germen afterward turns to a capsule with five cells, opening in five parts, inclosing kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's sixteenth class, which includes those plants whose flowers have many stamina joined to the styles in one body, forming a column.

The Species are,

1. Hibiscus (*Syriacus*) foliis cuneiformi-ovatis, supernè inciso-dentatis, caule arboreo. Hort. Cliff. 350. *Hibiscus*

*cus with wedge-shaped oval leaves, whose upper parts are cut, indented, and a tree-like stalk.* Ketmia Syrorum quibusdam. C. B. P. 316. *The Syrian Ketmia, commonly called Althæa frutex.*

2. Hibiscus (*Sinensis*) foliis cordato-quinquangularis obsoletè serratis, caule arboreo. Hort. Upsal. 205. *Hibiscus with heart-shaped leaves, having five angles which are slightly sawed, and a tree-like stalk.* Ketmia sinensis, fructu subrotundo. Tourn. Inst. R. H. 100. *China Ketmia with a roundish fruit, commonly called China Rose.*

3. Hibiscus (*Abelmoschus*) foliis subpeltato-cordatis septemangularibus, serratis hispidis. Hort. Cliff. 349. *Hibiscus with heart-shaped target leaves, having seven angles which are sawed, and set with prickly hairs.* Ketmia Americana hirsuta, flore flavo, & semine moschato. Tourn. Inst. R. H. 100. *Hairy American Ketmia with a yellow flower and musky seed, commonly called Musk.*

4. Hibiscus (*Manihot*) foliis palmato-digitatis septempartitis. Hort. Cliff. 350. *Hibiscus with fingered leaves, which are divided into seven parts.* Ketmia Americana, folio Papayæ, flore magno flavescente, fundo purpureo, fructu erecto pyramidali hexagono, semine rotundulo sapore fatuo. Boerh. Ind. alt. 1. 272. *American Ketmia with a Papaw leaf, and a large yellow flower, having a purple bottom, a pyramidal, six-cornered, erect fruit, and round seeds of a flat taste.*

5. Hibiscus (*Tomentosus*) foliis cordatis angulatis serratis tomentosis, caule arboreo. *Hibiscus with angular, heart-shaped, sawed, woolly leaves, and a tree-like stalk.* Malva arboreo, folio oblongo acuminato veluto dentato & leviter sinuato, flore ex rubro flavescente. Sloan. Cat. 95. *Tree Mallow with oblong, acute-pointed, indented leaves, slightly sinuated, and a reddish yellow flower.*

6. Hibiscus (*Tiliaceus*) foliis cordatis subrotundis indivisis acuminatis crenatis, caule arboreo. Prod. Leyd. 532. *Hibiscus with entire heart-shaped leaves, and a tree-like stalk.* Ketmia Indica tiliæ folio. Tourn. Inst. R. H. 100. *Indian Ketmia with a Lime-tree leaf.*

7. Hibiscus (*Javanica*) foliis ovatis acuminatis serratis glabris, caule arboreo. Flor. Zeyl. 260. *Hibiscus with oval-pointed, sawed, smooth leaves, and a tree-like stalk.* Alcea Javanica arborescens, flore pleno rubicundo. Bryen. Cent. 121. tab. 56. *Tree Vervain Mallow of Java, with a double red flower, called in India Shoe-flower.*

8. Hibiscus (*Vitifolis*) foliis serratis inferioribus ovatis indivisis, superioribus quinquepartitis, caule aculeato. Prod. Leyd. 358. *Hibiscus with sawed leaves, the lower oval and undivided, the upper divided into five parts, and a prickly stalk.* Ketmia Indica vitis folio, magno flore. Tourn. Inst. R. H. 100. *Indian Ketmia with a Vine leaf and large flower.*

9. Hibiscus (*Sabdariffa*) foliis serratis, inferioribus cordatis, mediis tripartitis, summis quinquepartitis, caule aculeato. *Hibiscus with sawed leaves, the lower ones being heart-shaped, the middle divided into three parts, the upper into five, and a prickly stalk.* Ketmia Ægyptiaca vitis folio, parvo flore. Tourn. Inst. R. H. 100. *Egyptian Ketmia with a Vine leaf and a small flower.*

10. Hibiscus (*Gossypifolius*) foliis quinquelobatis serratis, caule glabro. *Hibiscus with sawed leaves divided into five lobes, and a smooth stalk.* Ketmia Indica, Gossyppii folio, acetosæ sapore. Tourn. Inst. R. H. 100. *Indian Ketmia with a Cotton leaf, and the taste of Sorrel.*

11. Hibiscus (*Ficulneus*) foliis quinquefido-palmatis, caule aculeato. Hort. Cliff. 498. *Hibiscus with hand-shaped five-pointed leaves, and a prickly stalk.* Ketmia Zeylanica, fici folio, perianthio oblongo integro. Hort. Elth. 190. tab. 157. *Ketmia of Ceylon with a Fig leaf, and an oblong entire perianthium.*

12. Hibiscus (*Surattensis*) foliis quinquepartitis, lobis ovato-lanceolatis hirsutis crenatis, caule spinossimo. *Hibiscus with leaves divided into five lobes, which are oval, spear-shaped, hairy, and crenated, and a very prickly stalk.* Ketmia Indica aculeata, foliis digitatis. Tourn. Inst. 101. *Prickly Indian Ketmia with hand-shaped leaves.*

13. Hibiscus (*Cordifolius*) foliis cordatis hirsutis crenatis, floribus lateralibus, caule arboreo ramoso. *Hibiscus with heart-shaped, hairy, crenated leaves, flowers growing from the sides of the branches, and a tree-like branching stalk.* Ketmia Americana frutescens foliis subrotundis crenatis hirsutis, flore luteo. Houst. *Shrubby American Ketmia with roundish, hairy, crenated leaves, and a yellow flower.*

14. Hibiscus (*Bahamensis*) foliis oblongo-cordatis glabris, denticulatis, subtus incanis, floribus amplissimis. *Hibiscus with oblong, heart-shaped, smooth, indented leaves, hoary on their under side, and very large flowers.*

15. Hibiscus (*Ficifolius*) foliis quinquepartito pedatis, calycibus inferioribus latere rumpentibus. Lin. Sp. Plant. 696. *Hibiscus with leaves like a hand, divided into five parts, and the lower empalement torn sideways.* Ketmia Brasiliensis, folio ficûs, fructu pyramidato sulcato. Tourn. Inst. R. H. 100. *Ketmia of the Brasils with a Fig leaf, and a pyramidal furrowed fruit.*

16. Hibiscus (*Pentacarpos*) foliis inferioribus cordatis angulatis, superioribus subhastatis, floribus subnutantibus, pistillo cernuo. Lin. Sp. Plant. 697. *Hibiscus with lower leaves heart-shaped and angular, the upper ones somewhat spear-shaped, nodding flowers, and a recurved pistil.* Ketmia palustris minor, folio angusto, flore parvo purpurascente, fructu depresso pentagona. Zannich. Venet. 155. tab. 91. *Smaller Marsh Ketmia with a narrow leaf, a small purplish flower, and a five-cornered depressed fruit.*

17. Hibiscus (*Populneus*) foliis ovatis acuminatis serratis, caule simplicissimo, petiolis floriferis. Hort. Upsal. 205. *Hibiscus with oval-pointed sawed leaves, a single stalk, and foot-stalks having flowers.* Ketmia Africana Populi folio. Tourn. Inst. 100. *African Ketmia with a Poplar leaf.*

18. Hibiscus (*Palustris*) caule herbaceo simplicissimo, foliis ovatis subtrilobis, subtus tomentosis, floribus axillaribus. Lin. Sp. Plant. 693. *Hibiscus with a single herbaceous stalk, oval leaves having three lobes, woolly on their under side.* Ketmia palustris flore purpureo. Tourn. Inst. 100. *Marsh Ketmia with a purple flower.*

19. Hibiscus (*Trionum*) foliis tripartitis incisis, calycibus inflatis. Hort. Upsal. 206. *Hibiscus with tripartite cut leaves, and a swollen empalement.* Ketmia vesicaria vulgaris. Tourn. Inst. *Common Bladder Ketmia, called Venice Mallow, or Flower of an hour.*

20. Hibiscus (*Africana*) foliis tripartitis dentatis, lobis angustioribus caule hirsuto calycibus inflatis. *Hibiscus with tripartite indented leaves having narrower lobes, a hairy stalk, and swollen empalements.* Ketmia vesicaria Africana. Tourn. Inst. 101. *African Bladder Ketmia.*

21. Hibiscus (*Hispidus*) foliis inferioribus trilobis, summis quinque partitis obtusis crenatis calycibus inflatis, caule hispido. *Hibiscus with under leaves having three lobes, the upper being cut into five obtuse segments, which are crenated, swollen empalements, and a prickly stalk.*

22. Hibiscus (*Malvaviscus*) foliis cordatis-crenatis, angulis lateralibus extimis parvis, caule arboreo. Hort. Cliff. 349. *Hibiscus with heart-shaped crenated leaves, whose outward lateral angles are small, and a tree-like stalk.* Malvaviscus arborescens, flore miniato clauso. Hort. Elth. 210. tab. 170. *Tree-like, viscous, seeded Mallow, with a closed scarlet flower.*

The first sort is commonly called Althæa frutex by the nursery gardeners, who propagate the shrubs for sale; of this there are four or five varieties, which differ in the colour of their flowers; the most common hath pale purple flowers with dark bottoms; another hath bright purple flowers with black bottoms, a third hath white flowers with purple bottoms; a fourth variegated flowers with dark bottoms; and a fifth pale yellow flowers with dark bottoms; but the last is very rare at present in the English gardens; there are also two with variegated leaves, which are by some much esteemed.

This grows naturally in Syria, from whence it has been introduced to the gardens, and is one of the great ornaments of the autumn season: it rises with a shrubby stalk

ſtalk to the height of ſix or ſeven feet, ſending out many ligneous branches, covered with a ſmooth gray bark, garniſhed with oval ſpear-ſhaped leaves, whoſe upper parts are frequently divided into three lobes, which are ſawed; theſe are placed alternately on the branches, ſtanding on ſhort foot-ſtalks. The flowers come out from the wings of the ſtalks at every joint of the ſame year's ſhoot; they are large, and ſhaped like thoſe of the Mallow, having five large roundiſh petals, which join at their baſe, ſpreading open at the top in ſhape of an open bell: theſe appear in Auguſt, and if the ſeaſon is not too warm, there will be a ſucceſſion of flowers part of September; the early flowers are ſucceeded by ſhort capſules with five cells, filled with kidney-ſhaped ſeeds; but unleſs the ſeaſon proves warm, they will not ripen in this country.

It is propagated by ſeeds, which ſhould be ſown in pots filled with light earth the latter end of March; and if they are plunged into a gentle heat, it will greatly forward the growth of the ſeeds. When the plants are come up, they muſt be inured to the open air, and in May the pots may be plunged into the ground, in a border expoſed to the eaſt, where they may have the morning ſun: the reaſon of my adviſing the pots to be plunged into the ground, is to prevent the earth from drying ſo faſt as it would do when the pots ſtand on the ſurface, ſo that the plants will not require ſo much water in ſummer; theſe plants will require no other culture, but to keep them clean from weeds, and in very dry weather to refreſh them with water during the firſt ſummer, but in autumn it will be proper to remove the pots under a common frame to ſcreen them from the froſt; or where there is not ſuch conveniency, they may be plunged cloſe to a hedge, pale, or wall, to a good aſpect; and in ſevere froſt, they ſhould be covered with mats, Straw, or other light covering; for although theſe plants, when they have obtained ſtrength, will reſiſt the cold of our winters, yet the young plants, whoſe ſhoots are tender, are very often injured by the firſt froſt of autumn: ſo that if they are not ſcreened the firſt year, they are often killed to the ground. Toward the latter end of March will be a good time to tranſplant theſe plants, at which time a ſpot of light ground muſt be prepared to receive them, which ſhould be divided into beds four feet broad, with paths of two feet broad between; then the plants ſhould be ſhaken out of the pots with the earth about them, and ſeparated with care, for their roots are very tender, and apt to break with little force; theſe ſhould be planted at about nine inches aſunder in the beds; ſo that if four rows are planted in each bed, there will be ſix inches allowed between the outſide rows and the paths. The ground ſhould be gently cloſed about the roots to prevent the air penetrating to them; and if a little old tanners bark, or mulch, is laid over the ſurface of the beds, it will prevent the earth from drying, and be of great uſe to the plants; during the following ſummer they muſt be kept clean from weeds, and if the following winter prove ſevere, it will be prudent to cover the plants again in autumn, eſpecially if they ſhoot late in the ſeaſon, or the autumn proves cold and moiſt, for then the plants will be in great danger of having their tops killed: in theſe beds the plants may remain two years, by which time they will be fit to tranſplant where they are deſigned to remain; for if they are kept longer in the nurſery, they will not remove ſo well. The beſt time for tranſplanting theſe plants is the end of March, or the beginning of April, for they ſeldom begin to ſhoot till the end of April, or the beginning of May; they ſhould have a light ſoil, not too wet, for in ſtrong land their ſtems grow moſſy, and they never thrive after.

Theſe plants may alſo be propagated by cuttings, which, if planted the latter end of March, in pots filled with light earth, and plunged into a gentle heat, will take root; but the plants ſo raiſed, are not ſo good as the ſeedlings. The ſeveral varieties may be propagated by grafting upon each other, which is the common method of propagating the ſorts with ſtriped leaves.

The ſecond ſort grows naturally in India, from whence the French firſt carried the ſeeds to their ſettlements in the Weſt-Indies; and the inhabitants of the Britiſh colonies there have been ſupplied with the ſeeds from them, ſo have given it the title of Martinico Roſe: of this there are the double and ſingle flowering, which from the ſeeds of the double the ſingle is frequently produced, but the ſeeds of the ſingle ſeldom vary to the double. The flowers of theſe plants alter in their colour, for at their firſt opening they are white, then they change to a bluſh Roſe colour, and as they decay they turn to a purple. In the Weſt-Indies, all theſe alterations happen the ſame day, as I ſuppoſe the flowers in thoſe hot countries are not of longer duration: but in England, where the flowers laſt near a week in beauty, the changes are not ſo ſudden.

This plant has a ſoft ſpongy ſtem, which, by age, becomes ligneous and pithy. It riſes to the height of twelve or fourteen feet, ſending out branches on every ſide toward the top, which are hairy, garniſhed with heart-ſhaped leaves, cut into five acute angles on their borders, and are ſlightly ſawed on their edges, of a lucid green on their upper ſide, but pale below, ſtanding alternately upon pretty long footſtalks. The flowers are produced from the wings of the ſtalk, like thoſe of the firſt ſort; the ſingle one is compoſed of five large petals, which ſpread open, and are firſt white, but afterward change in the manner before-mentioned; theſe are ſucceeded by ſhort, thick, blunt capſules, which are very hairy, having five cells, which contain many ſmall kidney-ſhaped ſeeds, having a fine plume of fibrous down adhering to them.

This ſort is propagated by ſeeds, which muſt be ſown upon a hot-bed in the ſpring, and when the plants are fit to remove, they ſhould be each planted in a ſeparate ſmall pot filled with kitchen-garden earth, and plunged into a moderate hot-bed, where they muſt be ſhaded till they have taken new root; then they muſt be treated as other plants from warm countries, but not too tenderly, for theſe require a large ſhare of air in warm weather, otherwiſe they will draw up very weak: theſe plants ſhould not be quite expoſed to the open air the firſt ſeaſon, and the firſt winter will require the warmth of a moderate ſtove; but as they get more ſtrength, they may be treated with leſs care, for they will bear the open air in ſummer, in a warm ſheltered ſituation, and will live through the winter in a very good green-houſe, provided they have not too much wet; but the plants thus hardily treated, will not make ſo great progreſs, nor flower ſo well as with a little additional warmth; and if they are too tenderly managed, they will draw up weak, ſo will be leſs likely to flower. This ſort uſually flowers in England in November, ſo that it keeps to the uſual time of flowering in its native country.

The third ſort grows naturally in the Weſt-Indies, where it is commonly known by the title of Muſk; the French cultivate great quantities of theſe plants in their American Iſlands, the ſeeds of which are annually ſent to France in great quantities, ſo that they certainly have ſome way of rendering it uſeful, as it ſeems to be a conſiderable branch of trade. This riſes with an herbaceous ſtalk about three or four feet high, ſending out two or three ſide branches, garniſhed with large leaves cut into ſix or ſeven angles, which are acute, and ſawed on their edges; theſe ſtand on long foot-ſtalks, and are placed alternately. The ſtalks and leaves of this are very hairy. The flowers come out from the wings of the ſtalk upon pretty long footſtalks, which ſtand erect; they are large, of a ſulphur colour, with dark purple bottoms, and are ſucceeded by pyramidal five-cornered capſules, which open in five cells, filled with large kidney-ſhaped ſeeds of a very muſky odour.

This sort seldom lives more than one year in England, but in its native country will last two years. It is propagated by seeds, which, if sown on a good hot-bed in the spring, and the plants afterward planted in pots filled with light earth, and plunged into a fresh hot-bed, treating them afterward in the same way as the Amaranthus, they will flower in July, and their seeds will ripen in autumn.

The fourth sort grows naturally in both the Indies; this rises with an herbaceous smooth stalk three or four feet high, garnished with leaves which are divided into seven segments almost to the bottom; the middle segment being four inches long and half an inch broad, the upper lateral segments about three inches long and the same breadth; these are indented at their extremities, but the lower segments are not much more than an inch long, and have foot-stalks four inches long. The flowers are produced from the wings of the stalks toward the top, standing on short foot-stalks; they are composed of five large sulphur-coloured petals, which, when open, spread five inches wide; they have a dark purple bottom, with a column of stamina and styles rising in the center, and are succeeded by large, pyramidal, five-cornered, erect seed-vessels, opening in five cells, which are filled with pretty large kidney-shaped seeds, which have little smell or taste.

It is propagated by seeds in the same manner as the former sort, and if so managed, will produce flowers and perfect seeds the same season; but the plants may be continued through the winter in a moderate warmth, though few persons are at the trouble of preserving the plants after they have ripened their seeds, because the young plants make a better appearance.

The fifth sort grows naturally in the West-Indies, where it rises with a woody stalk seven or eight feet high, sending out many side branches toward the top, which are covered with a whitish bark, and garnished with angular heart-shaped leaves, which are woolly; they are about four inches long, and three broad toward their base, ending in acute points, and have several longitudinal veins. The flowers are produced from the wings of the stalk upon long foot-stalks; they are composed of five roundish petals, which are joined at their base, but spread open above, and are of a yellow colour, turning to a red as they decay; these are succeeded by large, obtuse, five-cornered, hairy seed-vessels, which open in five cells, filled with large kidney-shaped seeds.

This is propagated by seeds, which must be sown upon a hot-bed in the spring, and the plants afterward treated in the same way as the two last mentioned, during the first summer, but in the autumn they must be plunged into the tan-bed in the stove, where they should constantly remain, and be treated in the same way as other tender plants from the same country, giving them but little water in winter; the second year the plants will flower, but they have not as yet perfected seeds in England.

The sixth sort grows naturally in both Indies; this rises with a woody pithy stem eight or ten feet high, dividing into several branches toward the top, which are covered with a woolly down, and garnished with round heart-shaped leaves, ending in acute points; they are of a lucid green on their upper side, and hoary on their under, full of large veins, and are placed alternately on the stalks. The flowers are produced at the end of the branches in loose spikes; they are of a whitish yellow colour, and are succeeded by short acuminated capsules, opening in five cells, filled with large kidney-shaped seeds.

This sort is propagated in the same way, and the plants require the same treatment as the fifth, and flower the second year, provided they are brought forward, otherwise they will not flower before the third or fourth season; but they will bear the open air in summer, in a warm situation, though they will not make great progress there.

The seventh sort grows naturally on the coast of Malabar, from whence I received the plants; this rises with a woody stalk twelve or fourteen feet high, dividing into many small branches toward the top, which are garnished with oval sawed leaves, ending in acute points; they are of a lucid green above, but are pale on their under side, and are placed without order. The flowers come out from the side of the branches, at the wings of the leaves, on pretty long foot-stalks; they are composed of many oblong roundish petals of a red colour, which expand like the Rose, the flowers being as large when fully blown, as the common red Rose, and as double. This is a perennial plant, which is propagated by cuttings; and the plants must constantly be kept in the stove, giving them a large share of air in warm weather, and but little water in winter. There is a variety of this with white flowers, but I have not seen any of the plants in the English gardens; nor have I seen the single flowering kind, for the inhabitants of India propagate that with double flowers by cuttings, which put out roots freely; this they do for the sake of flowers, which the women of that country make use of to colour their hair and eye-brows black, which will not wash off: the English there use it for blacking of their shoes, and from thence have titled it Shoe-flower.

The eighth sort is an annual plant, which rises with an upright stalk seven or eight feet high; the lower leaves are oval, serrated, and entire, but the upper leaves are divided almost to the foot-stalk, into five spear-shaped segments, like the fingers of a hand, standing on very long foot-stalks, which have thorns at their base, and are sharply sawed on their edges. The flowers come out from the wings of the stalks; they are large, of a pale sulphur colour, with a dark purple bottom, and are succeeded by oval, acuminated, prickly capsules, which open in five cells, filled with large kidney-shaped seeds.

This sort is propagated by seeds, which must be sown upon a hot-bed, and the plants treated in the same way as the third sort; and when they are grown too tall to stand under the frames, they must be placed in the stove, where they will flower in August, and the seeds will ripen in autumn.

The ninth sort is near of kin to the eighth, but the stalks do not grow so tall; the lower leaves are heart-shaped and entire, the middle leaves are divided into three, and the upper into five segments, almost to the foot-stalks; they are sawed on their edges, and the stalk is prickly. The flowers come out from the wings of the stalks; they are of a very pale sulphur colour, with dark bottoms, but not so large as those of the last.

This is propagated by seeds in the same way as the eighth, and the plants require the same treatment. It flowers in July and August, and the seeds ripen in autumn.

The bark of both these plants is full of strong fibres, which I have been informed the inhabitants of the Malabar coast prepare and make into a strong cordage; and by what I have observed, it may be wrought into fine strong thread of any size, if properly manufactured.

The tenth sort grows naturally in the West-Indies, where the inhabitants use the green pods to add an acid taste to their viands: there are two varieties of this, one with a light green, and the other a deep red pod, which always maintain their difference; but as there is no other difference but that of the colour of their pods, they do not deserve separate titles. This rises with an herbaceous stem about three feet high, sending out several lateral branches, which are garnished with smooth leaves divided into five lobes. The flowers come out from the side of the branches; they are of a dirty white, with dark purple bottoms, and are succeeded by obtuse seed-vessels, divided into five cells, which are filled with kidney-shaped seeds.

This sort is propagated in the same way as the third, and will flower and perfect seeds the same year, so is seldom preserved longer in England.

The eleventh ſort is a native of Ceylon; this riſes with an herbaceous ſtalk, which is prickly, from two to three feet high, dividing upward into ſmall branches, which are garniſhed with hand-ſhaped leaves, divided into five ſegments. The flowers come out from the wings of the leaves; they are ſmall and white, with purple bottoms, and are ſucceeded by ſhort obtuſe capſules with five cells, filled with kidney-ſhaped ſeeds. The ſeeds of this ſort were ſent me by Dr. Breynius of Dantzick.

This plant is annual, ſo muſt be treated in the ſame way as the third.

The twelfth ſort is alſo annual with us; this riſes with an herbaceous ſtalk three feet high, cloſely ſet with prickly hairs, and divides into branches upward, garniſhed with hand-ſhaped leaves, divided into five lobes, which are ſpear-ſhaped, ending in acute points; they are hairy, and crenated on their edges, ſtanding upon very long foot-ſtalks; the flowers come out from the wings of the ſtalk, and are very like thoſe of the third; this plant requires the ſame culture as the third ſort. The ſeeds of this were ſent me by Dr. Juſſieu, from Paris.

The thirteenth ſort was diſcovered by the late Dr. Houſtoun in the iſland of Cuba, from whence he ſent me the ſeeds. This riſes with a woody ſtalk twelve or fourteen feet high, ſending out many lateral branches, garniſhed with hairy heart-ſhaped leaves, crenated on their edges; the flowers come out ſingle from the wings of the leaves; they are of a very bright yellow colour, but not ſo large as either of the former ſorts, and are ſucceeded by ſhort capſules ending in acute points, divided into five cells, which are filled with kidney-ſhaped ſeeds. This plant is tender, ſo requires the ſame treatment as the fifth, and other tender kinds, with which management it flowers and produces good ſeeds here.

The fourteenth ſort has a perennial root but an annual ſtalk. The ſeeds of this were ſent me from the Bahama Iſlands, which ſucceeded in the Chelſea garden, where the plants produced plenty of flowers, but did not ripen their ſeeds. This riſes with ſeveral ſtalks from the root, which grow four feet high, garniſhed with oblong, heart-ſhaped, ſmooth leaves, ending in acute points, of a light green on their upper ſide, but hoary on their under, and are ſlightly indented on their edges, ſtanding upon long foot-ſtalks; the flowers are produced at the top of the ſtalks; they are very large, and of a light purple colour with dark bottoms, and are ſucceeded by ſhort capſules divided into five cells, filled with kidney-ſhaped ſeeds.

This is propagated by ſeeds, which muſt be ſown on a moderate hot-bed in the ſpring, and when the plants are fit to remove, they ſhould be each planted in a ſeparate ſmall pot, and plunged into a hot-bed, treating them in the ſame way as the other tender ſorts, but allowing them a greater ſhare of air in warm weather; for theſe may be brought to ſtand in the open air in ſummer, but unleſs the ſeaſon is very warm they will not flower there; for thoſe which flowered in the Chelſea garden, were plunged into a tan-bed whoſe heat was declining, under a deep frame, where they produced plenty of flowers, but they came too late to ripen ſeeds. The ſtalks decay in the autumn, but if the pots are ſheltered under a hot-bed frame and ſecured from froſt, they will continue ſeveral years, and put out new ſtalks in the ſpring.

The fifteenth ſort is very common in the Weſt-Indies, where the inhabitants cultivate it for the pods or ſeed-veſſels, which they gather green to put into their ſoups; theſe, having a ſoft viſcous juice, add a thickneſs to their ſoups, and renders them very palatable. It riſes with a ſoft herbaceous ſtalk, from three to five feet high, dividing upward into many branches, garniſhed with hand-ſhaped leaves, divided into five lobes; the flowers are produced from the wings of the ſtalk; they are of a pale ſulphur colour with dark purple bottoms, but are ſmaller than either of the other ſorts, and of very ſhort duration, opening in the morning with the riſing ſun, but are faded long before noon in warm weather. Theſe are ſucceeded by capſules of very different forms, in the different varieties; in ſome the capſules are not thicker than a man's finger, and five or ſix inches long; in others they are very thick, and not more than two or three inches long; in ſome plants they grow erect, in others they are rather inclined; and theſe varieties are conſtant, for I have many years cultivated theſe plants, and have not found them vary.

This ſort is propagated by ſeeds in the ſame way as the third, and the plants require the ſame treatment, for they are too tender to thrive in the open air in this country; I have often tranſplanted the plants into warm borders, after they have acquired proper ſtrength, and have ſometimes in very warm ſeaſons had them thrive for a ſhort time, but the firſt cold or bad weather their leaves have all dropped off; and then they have decayed gradually, ſo that they have but rarely flowered, and have never in the beſt ſeaſons perfected their ſeeds; therefore thoſe who are inclinable to cultivate theſe plants, muſt conſtantly ſhelter them in bad weather.

The ſixteenth ſort grows naturally near Venice, in moiſt land; this hath a perennial root, and an annual ſtalk, which riſes from three to four feet high; the lower leaves are angular and heart-ſhaped, but the upper are ſpear-ſhaped, and ſlightly indented on their edges; the flowers are produced from the wings of the leaves, upon long foot-ſtalks; they are ſmall, and of a purple colour with a dark bottom, and are ſucceeded by five-cornered compreſſed capſules, filled with kidney-ſhaped ſeeds.

This ſort is propagated by ſeeds, which muſt be ſown on a hot-bed, and the plants ſhould be treated in the ſame way as the fourteenth ſort, otherwiſe they will not flower; for although the roots will live in the full ground here, yet the ſummers are not warm enough to bring them to flower. I have ſome of the roots which have remained ſeven years, putting up many ſtalks, which riſe upward of three feet, and have the flower-buds formed on their tops; but theſe appear ſo late in the ſeaſon, that they ſeldom have opened.

The ſeventeenth ſort grows naturally in North America; this hath a perennial root and an annual ſtalk; the roots of this ſort will live in the full ground, but unleſs the ſummer is warm, the flowers ſeldom open. It riſes with ſingle ſtalks from the root, two feet high or more; the leaves are oval and ſawed, the flowers are large and purple.

The eighteenth ſort grows naturally in North America, in moiſt ground. This hath a perennial root, and an annual ſtalk like the former, which is herbaceous and never branches; the leaves are oval, with three lobes which are not deeply divided; they are of a bright green on their upper ſide, but woolly on their under; the flowers are produced from the wings of the ſtalk; they are large, and of a bright purple colour. This ſort, like the former, ſeldom flowers in the open air here, unleſs the ſummer proves very warm, but the roots will live in the full ground, if they are planted in a ſheltered ſituation. The only way to have theſe plants flower in this country, is to keep the roots in pots, and ſhelter them under a frame in winter, and in the ſpring plunge them into a gentle hot-bed, which will cauſe them to put out their ſtalks early; and when the ſtalks are ſo high as to reach the glaſſes, the pots may be removed into a glaſs-caſe; where, if they are duly ſupplied with water, and have plenty of air in hot weather, they will flower very well in July, and in warm ſeaſons will ripen their ſeeds.

The nineteenth ſort is an annual plant, which grows naturally in ſome parts of Italy, and has been long cultivated in the Engliſh gardens, by the title of Venice Malva. Gerard and Parkinſon title it Alcea Veneta, and Flos Hora, or Flower of an hour, from the ſhort duration of its flowers, which in hot weather continue but few hours open: however, there



is

is a succession of flowers which open daily for a considerable time, so that a few of these plants may be allowed a place in every curious garden.

It rises with a branching stalk a foot and a half high, having many short spines which are soft, and do not appear unless closely viewed: the leaves are divided into three lobes, which are deeply jagged almost to the midrib; these jags are opposite, and the segments are obtuse; the flowers come out at the joints of the stalks upon pretty long foot-stalks, having a double empalement, the outer being composed of ten long narrow leaves, which join at their base; the inner is of one thin leaf, swollen like a bladder, cut into five acute segments at the top, having many longitudinal purple ribs, and is hairy; both these are permanent, and inclose the capsule after the flower is past. The flower is composed of five obtuse petals, which spread open at the top, the lower part forming an open bell-shaped flower; these have dark purple bottoms, but are of a pale sulphur colour above, having the stamina and apices joined in a column in the center; after the flower is past, the germen turns to a blunt capsule opening in five cells, which are filled with small kidney-shaped seeds. It flowers in June, July, and August, and the seeds ripen about a month after. This sort is propagated by seeds, which should be sown where the plants are designed to remain, for they do not bear transplanting well; if the seeds are sown in autumn, the plants will come up early in the spring, so will flower in the summer, and those which are sown early in the spring will succeed them; so that by sowing them at three different seasons, they may be continued in succession till the frost stops them. These require no other culture but to keep them clean from weeds, and thin them where they are too close; and if the seeds are permitted to scatter, the plants will come up full as well as when sown, so that it will maintain its situation unless it is weeded out.

The twentieth sort grows naturally at the Cape of Good Hope; this is also an annual plant which resembles the former, but the stalks grow more erect, are of a purplish colour, and very hairy; the leaves are composed of three lobes, which are divided almost to the foot-stalk; these are narrow, the middle lobe stretching out more than twice the length of the two side lobes, and they are but slightly indented on their edges, whereas those of the former are cut almost to the midrib; the flowers are larger, and their colour deeper, than those of the other.

The seeds of the twenty-second sort were sent me from the Cape of Good Hope, a few years past. This is also an annual plant, having at first sight some resemblance of the other sorts before-mentioned; but it rises with strong hairy branching stalks, garnished with much broader leaves than either of the former, the lower being divided into three, and the upper into five obtuse lobes, which are crenated on their edges; the flowers are large, but of a paler colour than those of the other. This has maintained the difference ten years, so that there is no doubt of its being a distinct species.

All these are as hardy as the nineteenth sort, so may be treated in the same way.

The twenty-third sort grows naturally at Campeachy, from whence the late Dr. Houstoun sent me the seeds. This differs so essentially from the other species in its fructification, as to deserve another title; for all the other have dry capsules with five cells, including many kidney-shaped seeds, but this hath a soft viscous berry, with a hard shell inclosed, containing five roundish seeds: it rises with a shrubby stalk ten or twelve feet high, dividing into many branches, which are garnished with smooth, heart-shaped, angular leaves, which are crenated on their edges; the flowers come out from the wings of the stalks singly, standing on short foot-stalks; they are composed of five oblong petals, which are twisted together and never expand; they are of a fine scarlet, and are succeeded by roundish berries of a scarlet colour when ripe, inclosing a hard shell which opens in five cells, each containing a single roundish seed.

This sort is generally propagated here by cuttings, because the seeds do not often ripen here; if the cuttings are planted in pots filled with light earth, and plunged into a gentle hot-bed, keeping the air from them, they will soon take root, and should be gradually inured to bear the open air. These plants require a moderate stove to preserve them through the winter; and if they are kept in warmth in summer, they will flower, and sometimes ripen fruit, though they may be placed abroad in a sheltered situation for two or three months in summer, but the plants so treated seldom flower so well.

HIERACIUM. Lin. Gen. Plant. 818. Tourn. Inst. R. H. 469. tab. 267. [of Ἱέραξ, *Gr.* a hawk; so called, because hawks as well as eagles, have a strong and quick sight; and it is reported, that if by reason of the heat of the air, a film grows over the eyes of this bird, then the parent let falls a drop of the juice of it in its eye, which takes it off; and that, in like manner, it is good to clear the human sight.] Hawkweed.

The CHARACTERS are,

*It hath a flower composed of many hermaphrodite florets, which are included in one common scaly empalement, whose scales are narrow, and very unequal in their length and position; the florets are equal and uniform; they have one petal which is shaped like a tongue, indented in five segments at the point, placed imbricatim over each other; these have each five short hairy stamina, terminated by cylindrical summits. At the bottom of the petal is situated the germen, supporting a slender style, crowned by two recurved stigmas; the germen afterward becomes a short four-cornered seed crowned with down, sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which includes the plants with a compound flower, composed only of fruitful florets.

There are a great number of species of this genus, many of which grow naturally as weeds in England, and the others are so in different countries, therefore I shall only select those which are the most beautiful, and best worth cultivating from the number, which to enumerate, would swell this work greatly beyond its bounds.

1. HIERACIUM (*Aurantiacum*) foliis integris caule subnudo simplicissimo piloso corymbifero. Hort. Cliff. 388. *Hawkweed with entire leaves, and a single, hairy, naked stalk, terminated by a corymbus of flowers.* Hieracium hortense, floribus atro purpurascentibus. C. B. P. 128. *Garden Hawkweed with dark purple flowers.*
2. HIERACIUM (*Cerinthoides*) foliis radicalibus obovatis denticulatis, caulinis oblongis semiamplexicaulibus. Prod. Leyd. 124. *Hawkweed with oval indented leaves at the root, those on the stalks oblong, and half embracing them.* Hieracium Pyrenaicum folio cerinthes. Schol. Bot. *Pyrenian Hawkweed with a Honeywort leaf.*
3. HIERACIUM (*Blattaroides*) foliis lanceolatis amplexicaulibus dentatis, floribus solitariis, calycibus laxis. Hort. Cliff. 387. *Hawkweed with spear-shaped indented leaves embracing the stalks, flowers growing singly, and loose empalements.* Hieracium Pyrenaicum, blattariæ folio minus hirsutum. Tourn. Inst. 472. *Pyrenean Hawkweed with a Moth Mullein leaf, less hairy.*
4. HIERACIUM (*Amplexicaule*) foliis amplexicaulibus cordatis subdentatis, pedunculis unifloris hirsutis, caule ramoso. Hort. Cliff. 387. *Hawkweed with heart-shaped, indented, hairy foot-stalks, leaves embracing the stalks bearing one flower, and a branching stalk.* Hieracium Pyrenaicum rotundifolium amplexicaule. Schol. Bot. *Pyrenean Hawkweed, with round leaves embracing the stalks.*
5. HIERACIUM (*Sabaudum*) caule erecto multifloro, foliis ovato-lanceolatis dentatis semiamplexicaulibus. Prod. Leyd. 124. *Hawkweed with an erect stalk bearing many flowers, and oval spear-shaped leaves half embracing the stalk.* Hieracium sabaudum altissimum, foliis latis brevibus, crebrius nascentibus. Mor. Hist. 3. p. 71.



6. HIE-

6. Hieracium (*Umbellatum*) foliis linearibus subdentatis sparsis, floribus subumbellatis. Flor. Lapp. 287. *Hawkweed with linear indented leaves placed thinly, and flowers almost in an umbel.* Hieracium fruticosum, angustissimo incano folio. H. L. 316.

The first sort grows naturally in Syria; this sends out from the root many oblong oval leaves, which are entire and hairy; from between the leaves arise a single stalk, little more than a foot high, covered with hairs; the flowers are produced in a corymbus at the top; they are of a dark red colour, composed of many florets, which are succeeded by oblong black seeds, crowned with a white down, which, when ripe, by the elasticity of the down, is drawn out of the empalement, and by the first strong gale of wind, are wafted to a considerable distance. The flowers appear the beginning of June, and the seeds ripen in about five or six weeks after, but there is frequently a succession of flowers till the autumn.

It is propagated by seeds, which should be sown on an east aspected border in March; and when the plants come up, they must be kept clean from weeds, till they are strong enough to remove, which will be by the beginning of June; then they should be transplanted to a shady border of undunged ground, at six inches distance, observing to water them if the weather should prove dry, till they have taken new root; after which, if they are kept clean from weeds, they will require no other culture: in the autumn they should be transplanted where they are designed to remain; the following summer they will flower and produce ripe seeds, and the roots will continue some years, if they are not planted in a rich moist soil, which frequently occasions their rotting in winter.

The second sort grows naturally on the Pyrenean mountains. It is a perennial plant, whose lower leaves are oval, indented, and of a grayish colour; those on the stalks are smaller, but of the same shape and colour, and half embrace the stalks with their base; the stalks rise a foot high, branching out in several divisions, each being terminated by one yellow flower. This is propagated by seeds as the first sort.

The third sort grows on the Pyrenees; this hath a perennial root, which sends up several erect stalks, garnished with spear-shaped leaves which are indented; the flowers are produced from the wings of the stalks, upon short foot-stalks, each sustaining one large yellow flower, having a loose empalement; this flowers in June; it is propagated by parting of the roots in autumn, and will thrive in any situation.

The fourth sort rises with a branching stalk a foot and a half high, garnished with heart-shaped leaves which are indented at their base, where they embrace the stalks; each division of the branches terminate in a hairy foot-stalk, sustaining one large yellow flower, which appears in June, and the seeds ripen in the end of July. This is a perennial plant, which is propagated by seeds as the first sort, and requires the same treatment.

The fifth sort grows naturally in Savoy; the root of this is perennial, sending up several erect stalks near two feet high, garnished with short, spear-shaped, indented leaves, half embracing the stalk with their base; the flowers are pretty large, of a deep yellow colour, terminating the stalks; it flowers in July.

The sixth sort grows naturally in Holland; it is a perennial plant, rising with three or four slender stalks, garnished with hoary linear leaves, and terminated by yellow flowers. This rarely produces seeds in England, so is propagated by parting of the roots in autumn: but the fifth may be propagated either in the same manner, or from seeds as the first sort, as it produces plenty of seeds here.

HILLS have many uses, of which I shall only mention three or four.

1st, They serve as screens, to keep off the cold and nipping blasts of the northern and eastern winds.

2dly, The long ridges and chains of lofty mountains, being generally found to run from east to west, serve to stop the evagation of those vapours toward the poles, without which they would all run from the hot countries, and leave them destitute of rain.

3dly, They condense those vapours, like alembic heads into clouds; and so by a kind of external distillation, give origin to springs and rivers; and by amassing, cooling, and constipating them, turn them into rain, and by that means render the fervid regions of the torrid zone habitable.

4thly, They serve for the production of a great number of vegetables and minerals, which are not found in other places.

It hath been found by experience and calculation, that Hills, though they measure twice as much as the plain ground they stand upon, yet the produce of the one can be no more than the other; and therefore, in purchasing land, the Hills ought not to be bought for more than their superficial measure, i. e. to pay no more for two acres upon the side of a Hill, than for one upon the plain, if the soil be equally rich.

It is true, that those lands that are hilly and mountainous, are very different as to their valuable contents, from what are found in flat and plain ground, whether they be planted, sown, or built upon, as for example:

Suppose a Hill contains four equal sides, which meet in a point at top; yet the contents of these four sides can produce no more grain, or bear no more trees, than the plain ground on which the Hill stands, or than the base of it; and yet by the measure of the sides, there may be double the number of acres, rods, and poles, which they measure on the base or ground-plot.

For as long as all plants preserve their upright method of growing, hilly ground can bear no more plants in number than the plain at the base.

Again, as to buildings on a Hill, the two sides of a Hill will bear no more than the same number of houses that can stand in the line at the base.

And as to rails, or park pailing over a Hill, though the measure be near double over the Hill to the line at the bottom, yet both may be inclosed by the same number of pales of the same breadth.

HIPPOCASTANUM. See Esculus.

HIPPOCRATEA. Lin. Gen. Plant. 54. Coa. Plum. Nov. Gen. 8. tab. 35.

The Characters are,

*It hath a large spreading empalement of one leaf, cut at the top into five segments; the flower hath five oval petals, which are indented at the points. It hath three awl-shaped stamina, terminated by broad summits, and an oval germen situated below the petal, with a style the length of the stamina, crowned by an obtuse stigma. The germen afterward becomes a heart-shaped capsule winged at the top, inclosing five seeds.*

This genus of plants is ranged in the first section of Linnæus's third class, intitled Triandria Monogynia, the flowers having three stamina and one style.

We have but one Species of this genus, viz.

Hippocratea (*Volubilis.*) Lin. Sp. 50. Plum. Gen. 8. *Hippocratea with a triple roundish fruit and a twining stalk.* Coa scandens, fructu trigemino subrotundo. Plum. Nov. Gen. 8. *Climbing Coa with a triple roundish fruit.*

The seeds of this plant were sent me from Campeachy by Mr. Robert Millar, and several of the plants were raised in England, which continued two years in several gardens, but not one of them lived to flower; they grew to the height of eight or ten feet, twining round stakes, but their stalks were very slender, and decayed at the bottom, probably from their having too much wet.

It is a very tender plant, so must be constantly kept in the bark-bed in the stove, and should have but little wet in winter.

HIPPOCREPIS. Lin. Gen. Plant. 791. Ferrum equinum. Tourn. Inst. 400. tab. 225. Horse-shoe Vetch; in French, *Fer de Cheval.*

The CHARACTERS are,

*The empalement of the flower is permanent, of one leaf, divided into five parts, the two upper being joined. The flower is of the butterfly kind; the standard hath a narrow base the length of the empalement, but is heart-shaped above; the wings are oval, oblong, and blunt; the keel is moon-shaped and compressed. It hath ten stamina, nine joined and one separate, which stand erect, terminated by single summits. It hath an oblong narrow germen, sitting on an awl-shaped style, crowned by a single stigma. The germen afterward becomes a long, plain, compressed pod, which is cut into many parts from the under seam to the upper, each part forming a roundish sinus, with obtuse three-cornered joints connected to the upper seam, each joint being shaped like a horse-shoe, inclosing a single seed.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, which includes the plants with a leguminous flower, having ten stamina joined in two bodies.

The SPECIES are,

1. HIPPOCREPIS (*Unisiliquosa*) leguminibus sessilibus solitariis. Hort. Cliff. 364. *Horse-shoe Vetch with single pods sitting close to the stalk.* Ferrum equinum, siliquâ singulari. C. B. P. 349. *Horse-shoe Vetch with a single pod.*
2. HIPPOCREPIS (*Comosa*) leguminibus pedunculatis confertis, margine exteriore repandis. Prod. Leyd. 384. *Horse-shoe Vetch, with pods growing in clusters upon foot-stalks, whose outer border is turned inward.* Ferrum equinum Germanicum, siliquis in summitate. C. B. P. 346. *German Horse-shoe Vetch having pods on the tops of the stalks.*
3. HIPPOCREPIS (*Multisiliquosa*) leguminibus pedunculatis confertis, margine altero lobatis. Hort. Cliff. 364. *Horse-shoe Vetch with pods growing in clusters upon foot-stalks, one border of which has lobes.* Ferrum equinum siliquâ multiplici. C. B. P. 346. *Horse-shoe Vetch with many pods.*

The first sort grows naturally in Italy and Spain. This is an annual plant, which sends from the root several trailing stalks a foot long, that divide upward into smaller branches, garnished with winged leaves, composed of four or five pair of narrow small lobes, terminated by an odd one, which are obtuse, and indented at their ends; from the wings of the stalk come out single flowers of the butterfly kind, which are yellow, and succeeded by single pods sitting close to the stalks, which are about two inches long, and a third of an inch broad, bending inward like a sickle, and divided into many joints shaped like a horse-shoe. This flowers in June and July, and the seeds ripen in the autumn, soon after which the plants decay.

The second sort is found growing naturally in some parts of England, upon chalky hills, particularly at Hogmagog hills near Cambridge; this is a smaller plant than the former, and hath a perennial root, sending out slender trailing stalks about six inches long, which are garnished with narrow winged leaves; the flowers grow in clusters on the top of long foot-stalks; these are succeeded by pods which are shorter, and twisted inward in roundish curves, but have joints shaped like those of the former sort.

The third sort grows naturally in the south of France, Germany, and Italy. This is an annual plant, with trailing stalks greatly resembling the first, but the flowers are produced in clusters on the top of pretty long foot-stalks; they are shaped like those of the other sorts, and the pods are jointed in like manner, but the joints are fixed to the opposite border. These plants flower in June and July, and the seeds ripen in August and September.

These plants are propagated by seeds, which should be sown in the autumn, where the plants are designed to remain; and when the plants come up, they must be kept clean from weeds, and thinned where they are too close, which is all the culture they require. The two annual sorts will decay in the autumn after they have perfected their seeds, but the roots of the other will continue two or three years, provided they are not in too good ground.

HIPPOLAPATHUM. See RUMEX.

HIPPOMANE. Lin. Gen. Plant. 1099. Mançanilla. Plum. Nov. Gen. 50. tab. 30. The Manchineel.

The CHARACTERS are,

*It hath male and female flowers in the same spike; the male flowers come out in small clusters, from a small cup-shaped empalement; these have no petals; from the center of each empalement arises a single style, terminated by two bifid summits. The female flowers have no petal, but an oval germen wrapped up in a three-leaved empalement; they have no style, but are crowned by a tripartite bifid stigma. The germen afterward becomes a roundish fruit with a fleshy cover, inclosing a rough hard shell with several cells, each inclosing one oblong seed.*

This genus of plants is ranged in the ninth section of Linnæus's twenty-first class, which includes the plants with male and female flowers, which have but one stamina.

The SPECIES are,

1. HIPPOMANE (*Mançinella*) foliis ovatis serratis. Hort. Cliff. 484. *Hippomane with oval sawed leaves.* Mançanella pyrie facie. Plum. Nov. Gen. 50. *Manchineel with the appearance of the Pear-tree.*
2. HIPPOMANE (*Biglandulosa*) foliis ovato-oblongis, basi glandulosis. Lin. Sp. Plant. 1431. *Hippomane with oval oblong leaves, which have glands at their base.* Mançanilla lauri foliis oblongis. Plum. Nov. Gen. 50. *Manchineel with oblong Bay leaves.*
3. HIPPOMANE (*Spinosa*) foliis subovatis dentato spinosis. Lin. Gen. Plant. 1191. *Hippomane with oval leaves which have prickly indentures.* Mançanilla aqui-folii foliis. Plum. Nov. Gen. 50. *Manchineel with Holly leaves.*

The first sort grows naturally in all the islands of the West-Indies. This is a very large tree in its native soil, almost equalling the Oak in size; the wood is much esteemed for making of cabinets, book-cases, &c. being very durable, and taking a fine polish; it is also said, that the worms will not eat it: but as the trees abound with a milky caustic juice, so before they are felled, they make fires round their trunks to burn out their juice, otherwise they who fell them, would be in danger of losing their sight, by the juice flying in their eyes; and wherever this falls on the skin, it will raise blisters; and if it comes upon linen, it will immediately turn it black, and on being washed will come into holes: it is also dangerous working of the wood after it is sawn out, for if any of the saw-dust happens to get into the workmens eyes, it causes inflammations, and the loss of sight for some time; to prevent which, they generally cover their faces with fine lawn, during the time they are working the wood.

This tree hath a smooth brownish bark; the trunk divides upward into many branches, which are garnished with oblong leaves about three inches long, and one inch and a half broad, ending in acute points; they are slightly sawed on their edges, and are of a lucid green, standing on short foot-stalks. The flowers come out in short spikes at the end of the branches, being of both sexes in the same spike, but having no petals they make but little appearance; these are succeeded by fruit, about the size and of the same shape as the Golden Pippin, turning of a yellow colour when ripe, which has often tempted strangers to eat of them to their cost, for they inflame the mouth and throat to a great degree, causing violent pains in the throat and stomach, which is dangerous, unless remedies are timely applied.

The inhabitants of America believe it is dangerous to sit or lie under these trees, and affirm, that the rain, or dew, which falls from the leaves, will raise blisters; but it is very certain, that unless the leaves are broken, and the juice of them mix with the rain, it will do no injury.

The second sort grows naturally at Carthagena in New Spain, and the third at Campeachy, from which places

places the late Dr. Houstoun sent me their seeds. The second sort grows to as large a size as the first. The leaves of this are much longer than those of the first, and have two small glandules growing at their base; they are sawed on their edges, and are of a lucid green.

The third sort is of humbler growth, seldom rising more than twenty feet high; the leaves of this greatly resemble those of the common Holly, and are set with sharp prickles at the end of each indenture; they are of a lucid green, and continue all the year.

These plants are preserved in some of the curious gardens in Europe, where they can never be expected to rise to any great height, for they are too tender to live in these northern countries, but in stoves; they rise easily from seeds, provided they are good. The seeds must be sown upon a good hot-bed, and when the plants come up, they should be each planted in a small separate pot filled with light sandy earth, and plunged into a good bed of tanners bark, treating them in the same way as other tender plants; but they must not have much wet, for these plants abound with an acrid milky juice, and it is certain that most plants which do, are soon killed by much moisture: these plants must be removed into the stove, and plunged into the tan-bed in autumn, where they should constantly remain, giving them very little water in winter; and in summer when the weather is warm, they should have a good share of air admitted to them, and once or twice a week refreshed with water; by this management I have raised many of these plants to the height of five or six feet, which have, by their shining green leaves, made a pretty variety during the winter season in the stove.

**HIPPOPHAE.** Lin. Gen. Plant. 980. Rhamnoides. Tourn. Cor. 52. tab. 481. Bastard Rhamnus, or Sea Buckthorn.

The CHARACTERS are,

*It is male and female in different plants; the male flowers have an empalement of one leaf, cut into two segments, which close at their points; they have no petals, but have four short stamina, terminated by oblong angular summits, which are equal to the empalement. The female flowers have no petals, but have a one-leaved empalement, which is oval, oblong, tubulous, and bifid at the brim; these have no stamina, but in the center is situated a small roundish germen, with a short style, crowned by an oblong thick stigma, twice the length of the empalement. The germen afterward turns to a globular berry with one cell, inclosing one roundish seed.*

This genus of plants is ranged in the fourth section of Linnæus's twenty-first class, intitled Dioecia Tetrandria, in which are included those plants which are male and female in distinct plants, and the male flowers have four stamina.

The SPECIES are,

1. HIPPOPHAE (*Rhamnoides*) foliis lanceolatis. Lin. Sp. Plant. 1023. *Hippophae with spear-shaped leaves.* Rhamnoides salicis folio. Tourn. Cor. 53. *Sea Buckthorn with a Willow leaf.*
2. HIPPOPHAE (*Canadensis*) foliis ovatis. Lin. Sp. Plant. 1024. *Hippophae with oval leaves, called Canada Sea Buckthorn.*

The first sort grows naturally on the sea-banks in Lincolnshire, and also on the sand-banks between Sandwich and Deal, in Kent; there are two varieties of this, one with yellow, and the other with red fruit, but it is the first only which I have observed growing naturally in England; the other I saw growing on the sand-banks in Holland.

These rise with shrubby stalks eight or ten feet high, sending out many irregular branches, which have a brown bark silvered over, garnished with very narrow spear-shaped leaves, about two inches long, and a quarter of an inch broad in the middle, lessening gradually to both ends, of a dark green on their upper side, but hoary on their under, having a prominent midrib; the two borders of the leaves are reflexed like the Rosemary; these are placed alternate on every side the branches, sitting very close. The flowers come out from the side of the younger branches, to which they sit very close; the male flowers growing in small clusters, but the female come out singly; these make but little appearance. They appear in July, and the berries on the female plants are ripe in autumn.

This sort is easily propagated by suckers from the root, for the roots spread wide, and send up a great number of shoots, so as to form a thicket: if these are taken off in autumn, and transplanted into a nursery, they will be fit to transplant after one year's growth, to the places where they are to remain: as there is little beauty in this plant, so one or two of them may be allowed a place in a plantation of shrubs for the sake of variety.

The second sort grows naturally in North America; this hath much the appearance of the former sort, but the leaves differ in their shape, these being much shorter and broader, and are not so white on their under side. This hath not as yet flowered in this country, but the plants seem equally hardy with the former, and may be easily propagated by suckers or layers.

**HIPPOSELINUM.** See SMYRNIUM.

**HIRUNDINARIA.** See ASCLEPIAS.

**HOEING** is necessary and beneficial to plants, for two things: 1st, For destroying of weeds; 2dly, Because it disposes the ground better to imbibe the night dews, keeps it in a constant freshness, and adds a vigour to the plants and trees, whose fruit by that means, becomes better conditioned than otherwise it would be.

This operation is performed by the hand, with an instrument called a Hoe, which is well known to every gardener. There are several sizes of these; the smallest, which is called an Onion Hoe, is not more than three inches broad, and is used for Hoeing of Onions; not only to cut up the young weeds, but also to thin the Onions, by cutting up all those which are too close. The next size is near four inches and a half broad, and is called a Carrot Hoe; this is used for Hoeing of Carrots, or any other crop which requires the same room as those. The largest size is about seven inches broad, and is frequently called a Turnep Hoe, being used for Hoeing of Turneps; but this is generally used by the kitchen-gardeners, for Hoeing between all their crops which are planted out, or stand so far asunder as to admit an instrument of this breadth to pass between the plants. Beside, these sort of Hoes, which are contrived to draw toward the person who uses them, there is another sort of a different form, which is called a Dutch Hoe; this is made for the person who uses it to push from him, so that he does not tread over the ground which is hoed. This is a very proper instrument for scuffling over the ground to destroy weeds, in such places where the plants will admit of its being used, and a person will go over a much greater space of ground in the same time with one of these instruments, than with the common Hoe; but this instrument is not so proper for Hoeing out crops, so as to leave the plants at a proper distance, nor will it penetrate the ground so far; therefore the other sort of hoe is to be preferred to this, because it stirs the ground and loosens the surface, whereby the dews penetrate the ground, and thereby promote the growth of the plants.

Of late years there has also been another instrument introduced in the field culture, called the Horse Hoe, which is a sort of plough with the shear set more inclining to a horizontal position than the common plough; but as most of the farmers are at a loss how to use this instrument, so it has been but little practised in this country as yet; nor is it likely to be brought into use, unless the garden farmers near London, who are undoubtedly the best husbandmen in Europe, introduce it; for the common farmers can never be supposed to alter their old established methods, till by necessity they are drove to it: a strong instance we have of this kind, in the culture of Turneps, which for many years were sown in most of the counties in England, but till within about sixty years past, they were never

hoed, except within twenty or thirty miles of London, where the gardeners who had been bred in the kitchen-gardens near London, every ſeaſon went out in particular gangs to the different parts of the neighbouring country, and each party engaged to hoe the Turneps in ſuch a particular diſtrict, at a certain price per acre; and from the ſucceſs of the farmers who firſt employed them, their neighbours were at length tempted to follow their example, ſo that it became neceſſary for ſome of their labourers to underſtand this work; and from that time it has prevailed ſo much, as that many of the diſtant counties have now engaged in this practice: and if the Horſe-hoeing huſbandry was but well eſtabliſhed among the farmers near London, there would be little doubt of its ſpreading into the diſtant counties; but there are great prejudices againſt it at preſent, moſt of them ariſing from the ignorance of the farmers in general, and others from the over-fondneſs of the author to his own ſchemes, which has in many particulars carried him into many known abſurdities; and theſe being well known to every practical farmer and gardener, are ſufficient arguments with them againſt making trial of the uſeful part of his ſcheme.

The utility of this method of huſbandry, is firſt, in proportioning the number of plants to the paſture, which the ground is ſuppoſed capable of nouriſhing properly. The ſecond is, by frequent ſtirring of the ſurface of the land, all weeds which rob the crop of its nouriſhment is deſtroyed, and the clods of earth are hereby divided and pulverized, ſo that the roots of the plants can more eaſily penetrate them, and ſearch their proper food; beſides, the dews and moiſture are eaſily imbibed in the looſe ground, whereby the plants receive a greater ſhare of nouriſhment.

There are few perſons who properly conſider of what conſequence the ſtirring and breaking of the ſurface of the ground is to all crops growing therein. I have frequently made trial of this, when the crop has been ſo bad as to be thought not worth ſtanding, which has been occaſioned by the great quantity of rain which has fallen, whereby the ſurface of the ground has been ſo cloſely bound, as that the plants could find no nouriſhment, but have changed their uſual verdure to a purple colour, and have made no progreſs; but upon Hoeing the ground and breaking the clods, the plants have put out new roots, and have flouriſhed exceedingly. From many repeated trials of this kind I can affirm, that if the Wheat in general was ſowed in rows, ſo as that the plough may be brought between them in the ſpring, to looſen the ground, which by the winter's rains may have been too cloſely bound, the crop would more than double what is the common produce.

But the author of this ſcheme was too ſanguine in his propoſals, firſt, by aſſerting, that in this method of huſbandry, the land would conſtantly produce the ſame ſort of crops without diminution; and ſecondly, it might be done without dreſſing or manuring the ground; and his fondneſs for his own ſcheme carried him ſo far in the proſecution of it, as at laſt to have much worſe crops than any of his neighbours; however, this ſhould not diſcourage others from the practice of it, though upon different principles: for although the land thus cultivated, will not nouriſh the ſame plant without manuring ſeveral years, yet by this method of huſbandry I can affirm, that all crops will be ſo much improved, as to doubly anſwer the difference of expence, and leſs than a ſixth part of the ſeed will be enough for the ſame ſpace of ground. The common ſwing plough will anſwer all intents of Horſe-hoeing.

HOLCUS. Lin. Gen. Plant. 1015. Milium. Tourn. Inſt. R. H. 514. tab. 298. Sorgum. Mich. Indian Millet, or Corn.

The CHARACTERS are,

*It hath male and hermaphrodite flowers ſometimes on the ſame plant, at others on different plants. The male flowers are ſmall, and have a bivalve chaff; theſe valves are oval, ſpear-ſhaped, and twiſted, ending with an acute beard; they have a ſmall hairy corolla with three hairy ſtamina, terminated by oblong ſummits. The hermaphrodite flowers are ſingle, in a ſtiff bivalve chaff; the inner of theſe is ſlender, hairy, and leſs than the empalement; the outer valve terminates in a rigid beard, and is larger than the empalement; they have three hairy ſtamina, terminated by oblong ſummits, with a roundiſh germen, ſupporting two hairy ſtyles, crowned with plumoſe ſummits. The germen afterward becomes an oval ſingle ſeed wrapped up in the chaff.*

This genus of plants is ranged in the firſt ſection of Linnæus's twenty third claſs, intitled Polygamia Monœcia which includes thoſe plants which have male and hermaphrodite flowers in different parts of the ſame plant, whoſe flowers have ſeveral ſtamina.

The SPECIES are,

1. HOLCUS (*Sorgum*) glumis villoſis, ſeminibus ariſtatis. Hort. Upſal. 301. *Holcus with hairy chaff and bearded ſeeds.* Milium arundinaceum, ſubrotundo ſemine, Sorgo nominatum. C. B. P. 26. *Reed-like Millet, with a roundiſh ſeed, called Sorgum.*
2. HOLCUS (*Saccharatus*) glumis glabris, ſeminibus muticis. Lin. Sp. Plant. 1047. *Holcus with ſmooth huſks, and ſeeds without awns.* Milium Indicum, arundinaceo caule, granis flaveſcentibus. H. L. 425. *Indian Millet with a reedy ſtalk, and yellowiſh grains.*

There are ſeveral other of the graſſy tribe which belong to this genus, but as they are not cultivated for uſe, ſo I ſhall not enumerate them here.

The two ſorts here mentioned, grow naturally in India, where their grain is often uſed to feed poultry, and the ſeeds of theſe are frequently ſent to Europe for the ſame purpoſe; but the ſummers are ſeldom warm enough to ripen the ſeeds in the open air in England, but in Italy they are both cultivated. The ſtalks of theſe plants riſe five or ſix feet high, which are ſtrong reedy, and like thoſe of the Maiz, or Turkey Wheat, but ſmaller. The leaves are long and broad, having a deep furrow through the center, where the midrib is depreſſed on the upper ſurface, and is very prominent below. The leaves are two feet and a half long, and two inches broad in the middle, embracing the ſtalks with their baſe. The flowers come out in large panicles at the top of the ſtalks, reſembling, at firſt appearance, the male ſpikes of the Turkey Wheat; theſe are ſucceeded by large roundiſh ſeeds, which are wrapped round with the chaff.

Theſe plants are propagated in a few gardens for the ſake of variety, but as they are late in ripening their grain here, ſo they are not worth cultivating for uſe. The ſeeds ſhould be ſown on a warm border, or upon a gentle hot-bed in March; and when the plants come up, they ſhould be thinned and planted at the diſtance of a foot aſunder in the rows, and the rows ſhould be three feet diſtance; the culture after this, is to keep the ground clean from weeds, and draw the earth up with a hoe to the ſtems of the plants; if the ſeaſon proves warm, their panicles will appear in July, and the grain will ripen in September, but in bad ſeaſons their grain will not ripen here.

HOLLOW ROOT. See FUMARIA.

HOLLY. See ILEX.

HOLLYHOCKS. See ALCEA.

HOMOGENEAL or HOMOGENEOUS plants, are ſuch plants as are of the ſame kind, or nature, with others.

HONEYSUCKLE. See PERICLYMENUM.

HOPS. See LUPULUS.

HORDEUM. Lin. Gen. Plant. 94. Tourn. Inſt. R. H. 513. tab. 293. Barley; in French, *Orge*.

The CHARACTERS are,

*It hath a partial involucrum of ſix narrow-pointed leaves, which contain three flowers. The petal of the flower opens with two valves; the under valve is angular, ſwelling, oval, and pointed, being longer than the empalement, ending in a long beard; the inner is ſmall and ſpear-ſhaped. The flower hath three hairy ſtamina ſhorter than the petal, terminated by oblong ſummits. It hath an oval turned germen, ſupporting two hairy reflexed ſtyles, crowned by the like ſtigmas. The germen afterward becomes an oblong bellied ſeed,*

*seed, pointed at both ends, having a longitudinal furrow, surrounded by the petal of the flower, which does not fall off.*

This genus of plants is ranged in the second section of Linnæus's third class, which includes the plants whose flowers have three stamina and two styles.

The Species are,

1. Hordeum (*Vulgare*) flosculis omnibus hermaphroditis aristatis ordinibus duobus erectioribus. Lin. Sp. Plant. 84. *Barley with all the flowers hermaphrodite, and two orders of beards, which are erect.* Hordeum polysticum vernum. C. B. P. 22. *Spring Barley with many rows of grain.*
2. Hordeum (*Zeocriton*) flosculis lateralibus masculis muticis, seminibus angularibus imbricatis. Hort. Upsal. 23. *Barley with male flowers on the side, without awns, and angular seeds placed over each other.* Hordeum distichon. C. B. P. 22. *Common long-eared Barley.*
3. Hordeum (*Distichon*) flosculis lateralibus masculis muticis, seminibus angularibus imbricatis. Hort. Upsal. 23. *Barley with male flowers on the side, without awns, and angular imbricated seeds.* Hordeum distichum, spicâ breviore & latiore, granis confertis. Raii Syn. 246. *Barley with shorter and broader spikes, commonly called Sprat, or Battledore Barley.*
4. Hordeum (*Hexastichon*) flosculis omnibus hermaphroditis aristatis, seminibus sexfariàm æqualiter positis. Hort. Upsal. 23. *Barley with all the flowers hermaphrodite, bearded, and six rows of seeds equally ranged.* Hordeum hexasticum pulchrum. J. B. 2. 429. *Winter, or Square Barley, Bear Barley, or Big.*

The first sort is the common Spring Barley, which is principally cultivated in England; of this the farmers make two sorts, viz. the common and rath-ripe Barley, which are the same: for the rath-ripe has only been an alteration, occasioned by being long cultivated upon warm gravelly lands. The seeds of this, when sown in cold or strong land, will the first year ripen near a fortnight earlier than the seeds taken from strong land; therefore the farmers in the vales, generally purchase their seed Barley from the warm land; for if saved in the vales two or three years, it will become full as late in ripening as the common Barley of their own product; and the farmers on the warm land are also obliged to procure their seed Barley from the strong land, otherwise their grain would degenerate in bulk and fulness, which by thus changing is prevented. This sort of Barley is easily distinguished by the two orders of beards, or awns, which stand erect; the chaff is also thinner than that of the two last species, so is esteemed better for malting.

The second sort is the long-eared Barley, which is cultivated in many parts of England, and is an exceeding good sort; but some farmers object to this sort, because they say the ears being long and heavy, it is more apt to lodge; this hath the grains regularly ranged in a double row, lying over each other like tiles on a house, or the scales of fishes. The husk, or chaff of this Barley is also very thin, so is much esteemed for malting.

The third sort is usually called Sprat Barley; this hath shorter and broader ears than either of the other sorts; the awns, or beards, are longer, and the grains are placed closer together, and the awns being long, the birds cannot so easily get out the grains; this seldom grows so tall as the other species, the straw is shorter and coarser, so not very good fodder for cattle.

The fourth sort is rarely cultivated in the southern parts of England, but in the northern counties, and in Scotland, is generally sown, being much hardier than the other species, so will bear the cold; this hath its grains disposed in six rows: the grain is large and plump, but it is not so good for malting, which is the reason for its not being cultivated in the southern parts of England, where the other sorts, which are much better for that purpose, do thrive well.

All these sorts of Barley are sown in the spring of the year, in a dry time; in some very dry light land, the Barley is sown early in March; but, in strong clayey soils, it is not sown till April, and sometimes not until the beginning of May; but when it is sown late, if the season doth not prove very favourable, it is very late in autumn before it is fit to mow, unless it be the rath-ripe sort, which is often ripe in nine weeks from the time of sowing.

Some people sow Barley upon land where Wheat grew the former year; but when this is practised, the ground should be ploughed the beginning of October in a dry time, laying it in small ridges, that the frost may mellow it the better, and this will improve the land greatly; and if this can be ploughed again in January, or the beginning of February, it will break and prepare the ground better; then in March the ground is ploughed again, and laid even where it is not very wet; but in strong wet lands the ground should be laid round, and the furrows made deep to receive the wet. When this is finished, the common method is to sow the Barley-seed with a broad cast at two sowings; the first being harrowed in once, the second is harrowed until the seed is buried; the common allowance of seed is four bushels to an acre. This is the quantity of grain usually sown by the farmers; but if they could be prevailed on to alter this practice, they would soon find their account in it; for if less than half that quantity is sown, there will be a much greater produce, and the corn will be less liable to lodge, as I have many years experienced; for when corn or any other vegetable stands very close, the stalks are drawn up weak, so are incapable to resist the force of winds, or bear up under heavy rains; but when they are at a proper distance, their stalks will be more than twice the size of the other, so are seldom laid. I have frequently observed in fields where there has been a foot-path through the middle, that the corn which has stood thin on each side the path hath stood upright, when all the rest on both sides has been laid flat on the ground: and whoever will observe these roots of corn near the paths, will find them tiller out (i. e. have a greater number of stalks) to more than four times the quantity of the other parts of the field. I have seen experiments made by sowing Barley in rows across divers parts of the same field, and the grains sowed thin in the rows, so that the roots were three or four inches asunder in the rows, and the rows at a foot distance; the intermediate spaces of the same field were at the same time sown broad cast in the usual way; the success was this, the roots which stood thin in the rows tillered out from ten or twelve, to upward of thirty stalks on each root, the stalks were stronger, the ears longer, and the grains larger than any of those sown in the common way; and when those parts of the field where the corn was sown in the usual way has been lodged, these parts sown thin have supported their upright position against wind and rain, though the rows have been made not only lengthways, but cross the lands, in several positions, so that there could be no alteration in regard to the goodness of the land, or the situation of the corn; therefore where such experiments have been frequently made, and always attended with equal success, there can be no room to doubt which of the two methods is more eligible; since if the crops were only supposed to be equal in both, the saving more than half the corn sown is a very great advantage, and deserves a national consideration, as such a saving, in scarce times, might be a very great benefit to the public. I know the farmers in general are very apt to complain if their corn does not come up so thick as to cover the ground green in a short time, like Grass fields; but I have often observed, that from the badness of the season it has come up thin, or by accident has been in part killed, their corn has been stronger, the ears longer, and the grain plumper, so that the produce has been much greater than in those years when it has come up thick; for the natural growth of corn is to send out many stalks from a root, and not rise so much in height; therefore it is entirely owing to the roots standing too near each other, when the stalks are drawn up tall and weak. I have had eighty-six stalks upon one root of Barley, which were strong, produced longer ears, and the grain was better filled than any which I ever saw grow in the common method of husbandry, and the land upon which this

grew was not very rich: but I have frequently observed on the sides of hot-beds in the kitchen-gardens, where Barley-straw has been used for covering the beds, that some of the grains left in the ears has dropped out and grown, the roots have produced from thirty to sixty stalks each, and those been three or four times larger than the stalks ever arrive at in the common way: but to this I know it will be objected, that although upon rich land in a garden, these roots of corn may probably have so many stalks, yet in poor land they will not have such produce; therefore unless there is a greater quantity of seeds sown, their crop will not be worth standing, which is one of the greatest fallacies that can be imagined; for to suppose that poor land can nourish more than twice the number of roots in the same space as rich land, is such an absurdity, as one could hardly suppose any person of common understanding guilty of; and yet so it is, for the general practice is to allow a greater quantity of seed to poor land, than for richer ground; not considering that where the roots stand so close, they will deprive each other of the nourishment, so starve themselves, which is always the case where the roots stand close; which any person may at first sight observe, in any part of the fields where the corn happens to scatter when they are sowing it; or in places where, by harrowing, the seed is drawn in heaps, those patches will starve, and never grow to a third part of the size as the other parts of the same field; and yet common as this is, it is little noticed by farmers, otherwise they surely would not continue their old custom of sowing. I have made many experiments for several years in the poorest land, and have always found that all crops which are sown or planted at a greater distance than usual, have succeeded best; and I am convinced, if the farmers could be prevailed on to quit their prejudices, and make trial of this method of sowing their corn thin, they would soon see the advantage of this husbandry.

The noblemen and gentlemen in France are very busy in setting examples of this husbandry in most of their provinces, being convinced by many trials of its great utility; and it were to be wished, the same was done in England,

When the Barley is sown, the ground should be rolled after the first shower of rain, to break the clods and lay the earth smooth, which will render it better to mow, and also cause the earth to lie closer to the roots of the corn, which will be of great service to it in dry weather.

Where Barley is sown upon new broken up land, the usual method is, to plough up the land in March, and let it lie fallow until June, at which time it is ploughed again, and sown with Turneps, which are eaten by sheep in winter, by whose dung the land is greatly improved; and then in March following the ground is ploughed up again, and sown with Barley as before.

There are many people who sow Clover with their Barley, and some have sown the Lucern with Barley; but neither of these methods is to be commended, for where there is a good crop of Barley, the Clover or Lucern must be so weak as not to pay for standing; so that the better way is to sow the Barley alone without any other crop among it, and then the land will be at liberty for any other crop, when the Barley is taken off the ground; but this practice of sowing Clover, Rye-grass, and other Grass-seeds, with corn, has been so long and universally established among farmers, that there is little hope of prevailing with those people to alter a custom which has been handed down to them from their predecessors, although there should be many examples produced, to shew the absurdity of this practice.

When the Barley has been up three weeks or a month, it will be a very good method to roll it over with a weighty roller, which will press the earth close to the roots of the corn, and thereby prevent the sun and air from penetrating the ground, which will be of singular service in dry seasons; and this rolling of it before it stalks, will cause it to till out into a greater number of stalks; so that if the plants should be thin, this will cause them to spread so as to fill the ground, and likewise to strengthen the stalks.

The time for cutting of Barley is, when the red colour of the ears is off, and the straw turns yellow, and the ears begin to hang down: in the north of England they always reap their Barley, and make it up in sheaves, as practised here for Wheat, by which method they do not lose near so much corn, and it is also more handy to stack; but this method cannot so well be practised where there are many weeds amongst the corn, which is too frequently the case in the rich lands near London, especially in moist seasons; therefore when this is the case, the Barley must lie on the swarth till all the weeds are dead; but as it is apt to sprout in wet weather, it must be shook up, and turned every fair day after rain to prevent it. When it is carried in, it should be thoroughly dry, otherwise if it be stacked wet, it will turn musty; or if too green, it is subject to burn in the mow. The common produce of Barley, is two and a half, or three quarters on an acre, but I have sometimes known six or seven quarters on an acre.

HORIZONTAL SHELTERS have, by some persons, been greatly recommended to preserve fruit-trees from blights; but with how little reason, or upon what slight experiments, every one who has ever made use of them will easily judge; especially those which are contrived by placing tiles in the wall at certain distances, nothing being more obvious, than that vegetables, when prevented from receiving the advantage of dews, rains, &c. those kindly benefits of heaven, grow weak, languid, and at last entirely decay: and since, from vast numbers of experiments which have been lately made, we find that trees imbibe great quantities of nourishment through the pores of their leaves and branches, whereby they are rendered vigorous and healthy, even in such seasons, and upon such soils, where one would think it impossible they should receive much nourishment from the earth; to deprive them of this advantage, is no less than destroying them; though perhaps, if the trees are vigorous, it may not be effected suddenly; but there will be very visible signs of decay on them daily, and a few years will put a period to their lives, as I have more than once observed, where such walls were built.

The only sort of these shelters which I have ever observed useful for fruit-trees, was made with two leaves of slit deal, joined over each other, and painted; this being fixed upon the top of the wall with pullies, to draw up and down at pleasure, formed a sort of penthouse; which being let down in great rains, or cold nights, during the time that the trees were in flower, or the fruit was setting, proved serviceable; but then these shelters were removed away soon after the fruit was set, so that the trees might enjoy all the advantages of rain, dew, &c. in the summer, which is absolutely necessary, if we would have healthy trees or good fruit.

HORMINUM. Tourn. Inst. 178. tab. 82. Salvia. Lin. Gen. Plant. 36. Clary; in French, *Ormin*.

The CHARACTERS are,

*The empalement of the flower is permanent, of one leaf, tubulous, and channelled, having two lips; the upper is broad, ending in three acute points; the under is shorter, ending in two points. The flower has one petal, divided into two lips; the upper is concave, compressed on the two sides, and incurved with a slight indenture at the point, the lower is broader and more indented. It hath two short stamina, situated in the tube of the flower, terminated by short prostrate summits, and two other which decay soon after the flowers open. In the bottom of the tube are four roundish germen, supporting a single style crowned by a bifid stigma, situated in the upper lip of the petal. The germen afterward becomes four seeds, lodged in the empalement.*

This genus of plants is ranged in the first section of Tournefort's fourth class, which includes the herbs with a lip flower of one leaf, whose upper lip is forked, or shaped like a helmet. Dr. Linnæus has joined this genus, and also the Sclarea of Tournefort to the Salvia, including them all in that genus; but

but as there are many species of each genus, so it is better to keep them asunder, whereby their old titles, by which they have always been known in the shops and market will be retained, though there is no very essential difference in their characters.

The Species are,

1. Horminum (*Verbenacea*) foliis sinuatis serratis, corollis calyce angustioribus acutis. *Clary with sinuated sawed leaves, and the petal of the flower narrower than the cup.* Horminum sylvestre lavendulæ flore. C. B. P. 239. *Wild Clary with a Lavender flower.*

2. Horminum (*Lyrata*) foliis pinnato-sinuatis rugosis, calycibus corollâ longioribus. *Clary with wing-shaped sinuated leaves, which are rough, and the empalements longer than the petal of the flower.* Horminum folio querno. Volk. *Oak-leaved Clary.*

3. Horminum (*Verticillatum*) verticillis subnudis, stylo corollarum labio inferiore incumbente. *Clary with heart-shaped, crenated, indented leaves, naked whorls, and the style lying under the lip of the petal.* Horminum sylvestre latifolium verticillatum. C. B. P. 283. *Broad-leaved wild Clary, with flowers growing in whorls.*

4. Horminum (*Napifolium*) foliis radicalibus pinnato-incisis, caulinis cordatis crenatis, summis semiamplexicaulibus. *Clary, whose lower leaves are cut and winged, those on the stalks heart-shaped and crenated, and those on the top half embracing the stalks.* Horminum napi folio. Mor. Hort. R. Blæss. *Clary with a Navew leaf.*

5. Horminum (*Sativum*) foliis obtusis crenatis, bracteis summis sterilibus majoribus coloratis. *Clary with obtuse crenated leaves, the bractæ on the top of the stalks large, coloured, and barren.* Horminum comâ purpuro-violaceâ. J. B. 3. 309. *Clary with a purple Violet top.*

The first sort grows naturally on sandy and gravelly grounds, in many parts of England. This a perennial plant; the lower leaves grow upon pretty long foot-stalks, and are near four inches long and two broad; they are sinuated on their borders, and bluntly crenated; their surface is rugged and wrinkled; the stalks are a foot long, square, and inclining toward the ground; the leaves upon these are smaller, and crenated on their edges; the flowers grow in a whorled spike at the top of the stalk, generally with two shorter spikes, one on each side; the flowers are small and blue; these are scarce so long as their empalements; they have but one petal, which is divided into two lips, the upper being a little longer than the under, and almost shuts over it; there are but two perfect stamina in each flower, and four germen at the bottom, supporting a single style; the germen afterward become so many naked seeds, sitting in the empalement. It flowers in June and July, and the seeds ripen in August and September. This sort propagates itself in plenty, if the seeds are permitted to scatter, and requires no other culture but to keep the plants clean from weeds.

This is sometimes called Oculus Christi, from the supposed virtues of its seeds in clearing of the sight, which it does by its viscous covering; for when any thing happens to fall into the eye, if one of the seeds is put in at one corner, and the eye-lid kept close over it, moving the seed gently along the eye, whatever happens to be there will stick to the seed, and so be brought out. The virtues of this are supposed to be the same as the Garden Clary, but not quite so powerful.

The second sort grows naturally in the south of France and Italy; the lower leaves are upward of four inches long, and not more than one broad, regularly sinuated on both sides, in form of a winged leaf; the stalks rise about the same height with the former, but all the leaves upon the stalks are sinuated in the same manner as the lower; the flowers are smaller than those of the first, but grow in whorled spikes like them. This is a perennial plant, which is very hardy, and will propagate itself in plenty by the scattered seeds. It is seldom kept in gardens but for the sake of variety.

The third sort is a perennial plant, which grows naturally in Austria and Bohemia. This sends out from the root a great number of heart-shaped leaves, which are sawed on their edges and deeply veined, standing upon pretty long foot-stalks which are hairy; the stalks arise from between these, which are square, and grow two feet and a half high, which are garnished with two heart-shaped leaves at each joint, whose base sits close to the stalks, half embracing them; the stalks at the two or three upper joints, put out on each side a long foot-stalk; these, and also the principal stalk, are garnished with whorls of small blue flowers, not much unlike those of the common sort, but larger; the spikes are more than a foot long, and toward the top the whorls are nearer together. It flowers in June, and the seeds ripen in August.

The fourth sort grows naturally in the south of France, and in Italy. This is also a perennial plant, which has some resemblance of the third, but the lower leaves of this are cut at their base to the midrib, into one or two pair of ears or lobes, which are but small, and are often at a distance from each other; the leaves are not sawed, but are bluntly indented; the stalks of this are slenderer, and do not grow so tall as those of the third, nor are the spikes of flowers so long. This flowers and seeds at the same time with the third.

Both sorts may be easily propagated by seeds, which, if sown in the spring on an open spot of ground, the plants will come up, and require no other care but to keep them clean from weeds, and allow them room to grow; for the plants should not be nearer than two feet apart, for they grow very large, and will last several years.

The fifth sort is an annual plant, which grows naturally in Spain; of this there are three varieties which are constant, one with purple tops, another with red tops, and a third with green tops. As they differ in nothing but the colour of their bractæ on the top of the stalks, so I have not put them down as different species, though from more than thirty years cultivating them, I have not known them alter.

These plants have obtuse crenated leaves, shaped like those of the common red Sage; the stalks are square and grow erect, about a foot and a half high; their lower parts are garnished at each joint with two opposite leaves of the same shape, but gradually diminishing in size toward the top: the stalks are garnished upward with whorls of small flowers, and are terminated by clusters of small leaves, which in one are red, in another blue, and a third green, which make a pretty appearance, and are preserved in gardens for ornament. They flower in June and July, and their seeds ripen in the autumn.

The seeds of these are sown in the spring, in the places where they are designed to remain, and require no other care but to keep them clean from weeds, and thin them where they come up too close.

Garden Clary. See Sclarea.

HORNBEAM. See Carpinus.

HORSE CHESTNUT. See Esculus.

HORSE DUNG is of great use to make hot-beds for the raising all sorts of early garden crops, as Cucumbers, Melons, Asparagus, Sallading, &c. for which purpose no other sort of Dung will do so well, this fermenting the strongest; and, if mixed with long litter, and sea-coal ashes in a due proportion, will continue its heat much longer than any other sort of Dung whatsoever; and afterwards when rotted, becomes an excellent manure for most sorts of lands, more especially for such as are of a cold nature; and for stiff clayey lands, when mixed with sea-coal ashes, and the cleansing of London streets, it will cause the parts to separate much sooner than any other compost will do; so that where it can be obtained in plenty, I would always recommend the use of it for such lands.

HOSE IN HOSE, a term used in gardening, to signify one tube or petal within another, as in the Polyanthus,

Polyanthus, where there are in some varieties two petals.

HOT-BEDS are of general use in these northern parts of Europe, without which we could not enjoy so many of the products of warmer climes as we do now; nor could we have the tables furnished with the several products of the garden, during the winter and spring months, as they are at present in most parts of England, better than perhaps in any other country in Europe: for although we cannot boast of the clemency of our climate, yet England is better furnished with all sorts of esculent plants for the table, much earlier in the season, and in greater quantities, than in the gardens of our neighbours, which is owing to our skill in Hot-beds.

The ordinary Hot-beds which are commonly used in the kitchen-gardens, are made with new horse dung, in the following manner:

1st, There is a quantity of new horse dung from the stable (in which there should be part of the litter or straw which is commonly used in the stable, but not in too great proportion to the dung,) the quantity of this mixture must be according to the length of the bed intended; which, if early in the year, should not be less than one good load for each light; this dung should be thrown up in a heap, mixing therewith a few sea-coal ashes, some leaves of trees, and tan, which will be of service to continue the heat of the dung; it should remain six or seven days in this heap; then it should be turned over, and the parts well mixed together, and cast into a heap again, where it may continue five or six days longer, by which time it will have acquired a due heat; then in some well sheltered part of the garden, you must dig a trench in length and width, proportionable to the frames you intend it for; and if the ground be dry, about a foot deep; but if wet, not above six inches; then wheel the dung into the opening, observing to stir every part of it with a fork, and lay it exactly even and smooth thro' every part of the bed; as also to lay the bottom part of the heap (which is commonly free from litter) upon the surface of the bed; this will prevent the steam from rising so plentifully as it would otherwise do. To prevent this, and the heat from rising so violently as to burn the roots of whatever plants are put into the ground, it will be a very good way to spread a layer of neats dung all over the surface of the horse dung, which will prevent the mould from burning: if the bed is intended for Cucumbers or Melons, the earth should not be laid all over the bed at first, only a hill of earth should be first laid in the middle of each light on which the plants should be planted, and the remaining space should be filled up from time to time as the roots of the plants spread; but this is fully explained under those two articles. But if the hot-bed is intended for other plants, then after the bed is well prepared, it should be left two or three days for the steam to pass off, before the earth is laid upon the dung.

In the making of these hot-beds, it must be carefully observed to settle the dung close with a fork; and if it be full of long litter, it should be equally trod down close in every part, otherwise it will be subject to heat too violently, and consequently the heat will be much sooner spent, which is one of the greatest dangers these sort of beds may be liable to. During the first week or ten days after the bed is made, you should cover the glasses but slightly in the night, and in the day time carefully raise them to let out the steam, which is subject to rise very copiously while the dung is fresh; but as the heat abates, so the covering should be increased; otherwise the plants in the beds will be stinted in their growth, if not entirely destroyed. In order to remedy this evil, if the bed be very cold, you must put a pretty good quantity of new hot dung round the sides of it, which will add a fresh heat thereto, and cause it to continue a considerable time after; and as the spring advances, the sun will supply the loss of the dung's heat; but then it will be adviseable to lay some mowings of Grass round the sides of the bed, especially if the nights should prove cold, as it often happens in May, which is many times, even at that season, very hurtful to tender plants on Hot-beds.

But although the Hot-bed I have described is what the kitchen-gardeners commonly use, yet those made with tanners bark are much preferable, especially for all tender exotic plants or fruits, which require an even degree of warmth to be continued for several months, which is what cannot be effected by horse dung only. The manner of making these beds is as follows:

There must be a trench dug in the earth about three feet deep, if the ground be dry; but if wet, it must not be above a foot or six inches deep at most, and must be raised in proportion above ground, so as to admit of the tan being laid three feet thick. The length must be proportioned to the frames intended to cover it, but should never be less than eleven or twelve feet; but if it is twice that length it will be better, and the width not less than six, which is the least size of these beds for to continue the heat. This trench should be bricked up round the sides to the above-mentioned height of three feet, paving the bottom with bricks to prevent the earth mixing with the tan, and should be filled in the spring with fresh tanners bark (i. e. such as the tanners have lately drawn out of their vats, after they have used it for tanning leather) which should be laid in a round heap for a week or ten days before it is put into the trench, that the moisture may the better drain out of it, which, if detained in too great a quantity, will prevent its fermentation; then put it into the trench, and gently beat it down equally with a dung-fork; but it must not be trodden, which would also prevent its heating, by settling it too close; then you must put on the frame over the bed, covering it with the glasses, and in about ten days or a fortnight it will begin to heat; at which time you may plunge your pots of plants or seeds into it, observing not to tread down the bark in doing it.

A Bed thus prepared (if the bark be new and not ground too small) will continue in a good temper of warmth for two or three months; and when you find the heat decline, if you stir up the bark again pretty deep, and mix a load or two of fresh bark amongst the old, it will cause it to heat again, and preserve its warmth two or three months longer. There are many people who lay some hot horse dung in the bottom of the trench, under the bark, to cause it to heat; but this is what I would never practise, unless I wanted the bed sooner than the bark would heat of itself, and then I would put but a small quantity of dung at bottom, for that is subject to make it heat too violently, and will occasion its losing the heat sooner than ordinary; and there will never be any danger of the bark's heating if it be new, and not put into the trench too wet, though it may sometimes be a fortnight or more before it acquires a sufficient warmth, but then the heat will be more equal and lasting.

The frames which cover these Beds should be proportioned to the several plants they are designed to contain: for example, if they are to cover the Ananas or Pine-apple, the back part of the frame should be three feet and a half high, and the lower part fifteen inches, which will be a sufficient declivity to carry off the wet; and the back side will be high enough to contain the large fruiting plants, and the lower side will be sufficient for the shortest plants; so that by placing them regularly according to their height, they will not only have an equal distance from the glasses, but also appear much handsomer to the sight. And although many people make their frames deeper than what I have allotted, yet I am fully persuaded, that where there is but height enough to contain the plants, without bruising their leaves, it is much better than to allow a larger space; for the deeper the frame is made, the less will be the heat of the air inclosed therein, there being no artificial warmth but what the bark affords, which will not heat a large space of air; and

as the Pine-apple requires to be constantly kept very warm, in order to ripen the fruit well, so it will be found upon trial, that the depth I have allowed will answer that purpose better than a greater.

But if the Bed be intended for taller plants, then the frame must be made in depth proportionable thereto; but if it be for sowing of seeds, the frame need not be above fourteen or sixteen inches high at the back, and seven inches deep in the front, by which means the heat will be much greater; and this is commonly the proportion allowed to the frames usually made use of in the kitchen-gardens. As to their length, that is generally according to the fancy of the owner; but they commonly contain three lights each, which is in the whole about eleven feet in length, though sometimes they are made to contain four lights; but this is too great a length for the boxes, for the frames thus made are not so handy to remove, as when they are shorter, and are more subject to decay at their corners. Some indeed have them to contain but two lights, which is very handy for raising Cucumber and Melon plants while young; but this is too short for a Bark-bed, as not allowing room for a proper quantity of bark to continue a warmth for any considerable time, as was before-mentioned; but for the other purposes, one or two such frames are very convenient for common Dung-beds.

As to those frames which are made very deep, it is much the better way to have them made to take asunder at the four corners, so that they may be removed with ease; otherwise it will be very difficult to take the frame off, when there is occasion to put in new bark, or take out the old. The manner of making these frames is generally known, or may be much better conceived by seeing them than can be expressed in writing, therefore I shall forbear saying any thing more on this head.

HOTTONIA. Boerh. Ind. alt. 1. p. 207. Lin. Gen. Plant. 203. Stratoites. Vaill. Act. Par. 1719. Water Violet.

The Characters are,

*The flower is funnel-shaped; it has one petal, with a tube the length of the one-leaved empalement, but is cut above into five oblong oval segments, which spread open, and are indented at their extremity. It hath five short awl-shaped stamina standing on the tube of the petal, opposite to the cuts, terminated by oblong summits. In the center is situated a globular germen ending in a point, supporting a short slender style crowned by a globular stigma, which afterward becomes a capsule of the same form, with one cell, filled with globular seeds, sitting upon the empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, which includes the plants whose flowers have five stamina and one style.

We know but one Species of this genus, viz.

Hottonia (*Palustris.*) Boerh. Ind. alt. 1. p. 207. Water Violet. Millifolium aquaticum sive viola aquatica caule nudo. C. B. P. 141. *Water Milfoil, or Water Violet, with a naked stalk.*

This plant grows naturally in standing waters in many parts of England; the leaves which are for the most part immersed in the winter, are finely winged and flat, like most of the sea plants; these extend pretty wide, and at the bottom have long fibrous roots, which strike into the mud; the flower-stalks rise five or six inches above the water; they are naked, and toward the top have two or three whorls of purple flowers, terminated by a small cluster of the same. These flowers have the appearance of those of the Stock-gilliflower, so make a pretty appearance on the surface of the water. The flowers appear in June.

It may be propagated in deep standing waters, by procuring its seeds, when they are ripe, from the places of their natural growth, which should be immediately dropped into the water where they are designed to grow, and the spring following they will appear; and if they are not disturbed, they will soon propagate themselves in great plenty.

HUMIDITY is the quality commonly called moisture, or the power of wetting others, which quality some liquors and fluids are endowed with; and it differs very much from fluidity, in that it depends altogether on the congruity of the component particles of any liquor to the pores or surfaces of such particular bodies, as it is capable of adhering to.

Thus, quicksilver is not a moist liquor, in respect to our hands or clothes, and many other things it will not stick to; but it may be called a moist liquor, in respect to gold, lead, or tin, to the surfaces of which it will presently adhere.

Nay, water itself, that wets almost every thing, and is the great standard of Humidity, or moisture, is not capable of wetting every thing; for it stands, and runs easily off in globular drops, on the leaves of Cabbages, and many other plants; and will not wet the feathers of ducks, swans, and other water fowl.

And it is very plain, that it is only the texture that may cause the fluid to be humid; because neither quicksilver alone, nor bismuth, will stick upon glass; yet being mixed together, they will form a mass that will stick on it; as it is very well known in the foliating of looking-glasses, in which such a composition is used.

HUMULUS. See Lupulus.

HURA. Lin. Gen. Plant. 965. Hura, or Sand-box-tree.

The Characters are,

*It hath male and female flowers on the same plant. The male flowers have no petal, or scarce any empalement, but a column of stamina, which are joined at bottom to the style, forming a cylinder; these spread out at the top, and are terminated by single summits lying over each other. The female flowers have a swelling empalement of one leaf, with one tubulous petal; the roundish germen is situated in the bottom of the empalement, supporting a long cylindrical style, crowned by a large funnel-shaped stigma, which is a plain convex, divided into twelve equal obtuse parts. The germen afterward becomes an orbicular ligneous fruit, depressed at top and bottom, having twelve deep furrows, with so many cells, which open at the top with an elasticity, each containing one round flat seed.*

This genus of plants is ranged in the ninth section of Linnæus's twenty-first class, intitled Monœcia Monodelphia, which includes those plants which have male and female flowers at separate distances in the same plant, whose stamina are joined to the style, forming one body.

We know but one Species of this genus, viz.

Hura (*Crepitans.*) Hort. Cliff. 486. *Sand-box-tree.* Hura Americana, Abutili Indici folio. Hort. Amst. 2. 131. tab. 66. *American Hura with the leaf of the Indian Abutilon, commonly called in the West-Indies Sand-box-tree.*

This grows naturally in the Spanish West-Indies, from whence it has been introduced into the British colonies of America, where some of the plants are preserved by way of curiosity. It rises with a soft ligneous stem to the height of twenty-four feet, dividing into many branches, which abound with a milky juice, and have scars on their bark, where the leaves have fallen off. The branches are garnished with heart-shaped leaves; those which are the biggest are eleven inches long, and nine inches broad in the middle, indented on their edges, having a prominent midrib, with several transverse veins from that to the sides, which are alternate; these stand upon long slender foot-stalks. The male flowers come out from between the leaves, upon foot-stalks which are three inches long; they are formed into a close spike, or katkin, forming a column, lying over each other like the scales of fish. The female flowers are situated at a distance from the male; these have a swelling cylindrical empalement, out of which rises the petal of the flower, which hath a long funnel-shaped tube, spreading at the top,

top, where it is divided into twelve parts, which are reflexed. After the flower is past, the germen swells and becomes a round, compressed, ligneous capsule, having twelve deep furrows, each being a distinct cell, containing one large round compressed seed; when the pods are ripe, they burst with an elasticity, and throw out their seeds to a considerable distance.

It is propagated by seeds, which should be sown early in the spring, in pots filled with light rich earth, and plunged into a hot-bed of tanners bark. If the seeds are fresh, the plants will appear in about five or six weeks after the seeds are sown. As the plants will advance very fast, where due care is taken of them, so they should have a large share of fresh air admitted to them in warm weather, otherwise they will draw up too weak. When the plants are about two inches high, they should be transplanted each into a separate small pot filled with light rich earth, and plunged again into the hot-bed of tanners bark, being careful to shade them from the heat of the sun, until they have taken new root; after which time they must have free air admitted to them, by raising of the glasses in proportion to the warmth of the season, and should be frequently, but gently, watered. When the plants have filled these small pots with their roots, they must be shaken out of them, and their roots trimmed, and then placed in larger pots, which should be filled with the like rich earth, and plunged again into the hot-bed, where they should remain till Michaelmas, provided the plants have room, without touching of the glasses, at which time they must be removed into the bark-stove, and plunged in the warmest part thereof: during the winter season they must be sparingly watered, for as the plants have succulent stalks, much moisture will rot them; they must also be kept very warm, otherwise they will not live in this country. In summer they must have a large share of fresh air in warm weather, but they must not be removed into the open air, for they are too tender to live abroad in the warmest part of the year in this country.

This plant is now pretty common in the English gardens, where there are collections of tender plants preserved, some of which are grown to the height of twelve or fourteen feet, and many of them have produced flowers, but there has not been any of their fruit produced as yet in England.

As these plants have ample leaves, which are of a beautiful green colour, they afford an agreeable variety among other tender exotic plants in the stove; for where they are kept warm, and duly refreshed with water, they retain their leaves all the year in verdure.

The fruit of this plant is, by the inhabitants of the West-Indies, cut open on the side where the foot-stalk grew, and the seeds carefully taken out, after which the shells are used to contain sand for writing, which gave rise to the name of Sand-box. When these fruit are brought entire into England, it is very difficult to preserve them; for when the heat of the summer comes on, they usually burst with an explosion, and scatter their seeds about; and from the noise made by the ripe fruit, it was by Hernandez titled, Arbor crepitans.

HYACINTHUS. Tourn. Inst. R. H. 344. tab. 180. Lin. Gen. Plant. 427. Hyacinth; in French, *Jacinte.*

The Characters are,

*The flower has no empalement. It has one bell-shaped petal, whose rim is cut into six parts, which are reflexed*; *and three nectariums on the point of the germen, with six short awl-shaped stamina, terminated by summits, which close together. In the center is situated a roundish three-cornered germen, having three furrows supporting a single style, crowned by an obtuse stigma. The germen afterward becomes a roundish three-cornered capsule, having three cells, which contain roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, intitled Hexandria Monogynia, which includes those plants whose flowers have six stamina and but one style.

The Species are,

1. Hyacinthus (*Nonscriptus*) corollis campanulatis sexpartitis apice revolutis. Hort. Cliff. 125. *Hyacinth with a bell-shaped petal divided into six parts, which are reflexed at their tops.* Hyacinthus oblongo flore cæruleus major. C. B. P. 43. *Greater Hyacinth with an oblong blue flower*; and the Hyacinthus Anglicus. Ger. 99. *English Hyacinth, or Hare Bells.*
2. Hyacinthus (*Serotinus*) corollarum exterioribus petalis subdistinctis, interioribus coadunatis. Lin. Sp. Plant. 453. *Hyacinth whose exterior part of the flower has distinct petals, but the interior joined.* Hyacinthus obsoleto flore. C. B. P. 44. *Hyacinth with a worn-out flower.*
3. Hyacinthus (*Utrinque Floribus*) corollis campanulatis sexpartitis, floribus utrinque dispositis. *Hyacinth with a bell-shaped petal which is divided into six parts, and flowers ranged on each side of the stalk.* Hyacinthus floribus campanulæ utrinque dispositis. C. B. P. 44. *Hyacinth with bell-shaped flowers disposed on every side the stalk.*
4. Hyacinthus (*Cernuus*) corollis campanulatis sexpartitis racemo cornuo. Lin. Sp. Plant. 217. *Hyacinth with bell-shaped petals divided into six parts, and a nodding branch of flowers.* Hyacinthus floribus campanulæ, uno versu dispositis. C. B. P. 44. *Hyacinth with bell-shaped flowers ranged on one side the stalk.*
5. Hyacinthus (*Amethystinum*) corollis campanulatis semisexfidis basi cylindricis. Hort. Upsal. 58. *Hyacinth with bell-shaped petals cut half way into six parts, and a cylindrical base.* Hyacinthus oblongo cæruleo flore minor. C. B. P. 44. *Lesser Hyacinth with an oblong blue flower.*
6. Hyacinthus (*Orientalis*) corollis infundibuliformibus semisexfidis basi ventricosis. Hort. Upsal. 85. *Hyacinth with a funnel-shaped petal cut half into six parts, and swelling at their base.* Hyacinthus Orientalis albus primus. C. B. P. 44. *Early White Eastern Hyacinth.*

The sorts here mentioned are all of them distinct species, of which there are several varieties, especially of the sixth, which have been cultivated with so much art, as to render some of them the most valuable flowers of the spring; in Holland the gardens abound with them, where the florists have raised so many varieties as to amount to some hundreds; and some of their flowers are so large, double, and finely coloured, as that their roots are valued at twenty or thirty pounds sterling each root; to enumerate these varieties here, would swell this work to very little purpose, as every year produces new kinds.

The first sort grows naturally in woods and near hedges, in lands which have lately been woods, in many parts of England, so is seldom admitted into gardens; but the poor people, who make it their business to gather the wild flowers of the fields and woods for nosegays, &c. bring great quantities of these in the spring to London, and sell them about the streets.

There is a variety of this with white flowers, which is kept in some gardens, which only differs in the colour of their flowers from the other.

The second sort is preserved in some few gardens for the sake of variety, but as it hath as little beauty as the first, so is seldom allowed a place in the flower-garden. The flowers of this are narrower than those of the first sort, and seem as if their petals were divided to the bottom, three of the outer segments being separated from the other, standing at a small distance from the three interior, but they are all joined at their base; when the flowers first appear, they are of a light blue colour, but before they decay, they fade to a worn-out purple colour. This flowers early in the spring, and grows naturally in Spain and Mauritania.

The third sort grows naturally in Spain and Italy; this hath blue flowers of the open spread bell-shape, which are divided into six segments almost to the bottom,

tom, and are disposed on every side the stalk. The stalks rise about nine inches high, and when the roots are strong, the thyrse of flowers is large. This flowers about the same time with the first sort, and was formerly preserved in gardens, but since there have been so many finer flowers raised from the seeds of the Eastern Hyacinths, these have been almost totally neglected, so that they are seldom seen but in old gardens

The fourth sort seems to be a variety of the first, the flowers being ranged for the most part upon one side of the stalk, and the top of the spike is always bent on one side. The flowers are of a blush Peach colour, and appear about the same time as the first sort.

The fifth sort grows naturally in Spain; this hath a smaller flower than either of the former sorts, and comes earlier in the season. The petal is cut into six parts half the length, and is reflexed at the brim; the lower part is cylindrical, a little swelling at the base, and is of a deeper blue than either of the former. This was formerly called by the gardeners the Coventry blue Hyacinth.

The sixth sort is the Eastern Hyacinth, of which we formerly had no other varieties in the English gardens, but the single and double white and blue flowering; but from the seeds of these there were a few others raised in England; and also by the Flemish gardeners, who came over annually with their flower-roots to vend in England; but the gardeners in Holland have within the last fifty years raised so many fine varieties, as to render the former sorts of little or no value.

But those who are desirous to preserve any of the old sorts, need not be at much trouble about it, for their roots propagate in great plenty in any soil or situation, and will require no other care but to take up their roots every other or third year, soon after their leaves decay, and plant them again in autumn; for if they are permitted to remain longer in the ground, their roots will have multiplied to so great a degree, as to render their flowers very small and weak, so of little worth.

All the different sorts of Hyacinths are propagated by seeds or offsets from the old bulbs; the former method has been but little practised in England till very lately, but in Holland and Flanders it hath been followed for many years, whereby they have obtained a very great variety of the most beautiful flowers of this kind: and it is owing to the industry of the florists in those countries, that the lovers and delighters in gardening are so agreeably entertained, not only with the curious variety of this, but of most other bulbous rooted flowers, few other florists thinking it worth their trouble to wait four or five years for the flowers of a plant, which when produced, perhaps there might not be one in forty that may deserve to be preserved; but they did not consider that it was only the loss of the four or five first years after sowing, for if they continued sowing every year after they began, there would be a succession of flowers annually, which would constantly produce at least some sorts that might be different from what they had before seen; and new flowers being always the most valuable to skilful florists (provided they have good properties to recommend them) it would always be a sufficient recompence for their trouble and loss of time.

The method of raising these flowers from seed is as follows: having provided yourself with some good seed (which should be saved from either semi-double, or such single flowers as are large, and have good properties) you must have a parcel of square shallow boxes or pots, with holes in their bottoms to let off moisture, which must be filled with fresh light sandy soil, laying the surface very level; then sow your seeds thereon as equally as possible, covering it about half an inch thick with the same light earth; the time for this work is about the middle or latter end of August. These boxes, or pots, should be placed where they may enjoy the morning sun only until the latter end of September, at which time they should be removed into a warmer situation, and towards the end of October they should be placed under a common hot-bed frame, where they may remain during the winter and spring months, that they may be protected from hard frosts; though they should be exposed to the open air when the weather is mild, by taking off the glasses. In the latter end of February or the beginning of March, the young plants will begin to appear above ground, at which time they must be carefully screened from frosts, otherwise they will be soon destroyed when they are so young; but you must never cover them at that season but in the night, or in very bad weather; for when the plants are come up, if they are close covered, they will draw up very tall and slender, and thereby prevent the growth of their roots. About the middle of April, if the weather proves good, you may remove the boxes out of the frame, placing them in a warm situation, observing, if the season be dry, to refresh them now and then gently with a little water, as also to keep them very clear from weeds, which would soon overspread the tender plants, and destroy them, if permitted to remain.

Towards the beginning of May these boxes should be removed into a cooler situation; for the heat of the sun at that season would be too great for these tender plants, causing their blades to decay much sooner than they would naturally do, if they were screened from its violence. In this shady situation they should remain during the heat of summer, observing to keep them constantly clear from weeds; but you must not place them under the dripping of trees, &c. nor should you give them any water after their blades are decayed, for that would infallibly rot the roots. About the latter end of August you should sift a little light rich earth over the surface of the boxes, and then remove them again into a warmer situation, and treat them, during the winter, spring, and summer months, as was before directed: and about the middle of August following you should prepare a bed of light rich sandy soil, in proportion to the quantity of your seedling plants; and having levelled the surface very even, you should take the earth from the boxes in which your plants were raised, into a sieve, in order to get out all the roots, which by this time, (if they have grown well) will be about the thickness of a small quill; these roots should be placed upon the bed at about two or three inches asunder, observing to set the bottom part of their roots downwards; then cover them over two inches thick with the same light earth; but as it will be impossible to get all the small roots out of the earth in the boxes, you should spread the earth upon another bed equally, and cover it over with light earth; by which method you will not lose any of the roots, be they ever so small.

These beds must be arched over with hoops, and in very hard frosty weather they must be covered with mats, &c. to protect them from frost; and in the spring, when the green leaves are above ground, if the weather should be very dry, you must refresh them with water; but do this sparingly, for nothing is more injurious to these bulbs than too great quantities of moisture. During the summer season you must constantly keep the beds clear from weeds; but after the blades are decayed, you must never give them any water; and in autumn you should stir the surface of the bed with a very short hand-fork, being exceeding careful not to thrust it so deep as to touch the roots, which, if hurt, are very subject to perish soon after. Then sift a little fresh, light, rich earth over the bed about an inch thick, or somewhat more, and in winter cover them again (as was before directed.) In this bed the roots may continue two years, observing to treat them, both in summer and winter, as before; then the third year the roots should be carefully taken up a little before their leaves decay, laying the roots horizontally in the ground to ripen for three weeks, after which they may be kept out of the ground till the end of August, when they should be planted into new beds prepared as before, placing them at the distance of six inches asunder; in these beds the roots may remain till they flower, during which time they should be treated as before, with this difference only, that instead of covering them with mats in the winter, the surface of the ground should be covered with tanners bark.

When their flowers begin to ſhew themſelves, you ſhould mark all ſuch as appear to have good properties, by thruſting a ſmall ſtick down by each root; which roots, at the time for taking them up, ſhould be ſelected from the reſt, and planted by themſelves; though I would by no means adviſe the rejecting any of the other roots, until they have blown two years, before which you cannot be aſcertained of their value. When the green leaves of theſe plants begin to decay, their roots muſt be taken up, and a bed of light earth, in a ſhady ſituation, ſhould be raiſed into a ridge; the better to ſhoot off the moiſture, the roots ſhould be laid into the earth again in an horizontal poſition, leaving the green leaves hanging out of the ground from the roots, whereby the great moiſture contained in their very ſucculent leaves and flower-ſtalks may be exhaled, and prevented from returning to the roots, which, when ſuffered ſo to do, is very often the cauſe of their rotting after they are out of the ground. In this ridge the roots ſhould remain until the leaves are quite dried off, when they muſt be taken up, and after being cleared of all manner of filth, which would be hurtful to them, they muſt be laid up in boxes, where they may be preſerved dry until September, which is the proper ſeaſon for planting them again; the method of doing this ſhall be hereafter mentioned, when we treat of the management of old roots.

I ſhall now proceed to the culture of ſuch Hyacinths as have either been obtained from Holland, or are of our own product from the ſeeds of ſuch flowers as were very beautiful, and worthy to be preſeved in collections of good flowers: and it hath been the want of ſkill in the management of theſe noble flowers, which has ocaſioned the ill ſucceſs moſt people have had with them in England, whereby they have been neglected, ſuppoſing their roots to degenerate after they have flowered in England, which is a great miſtake; for were the roots managed with the ſame art as hath been practiſed in Holland, I am fully convinced they would thrive near as well in England as there, or elſewhere, as I have experienced; for, from ſome hundreds of roots which I have received from Holland at two or three different times, I have had a very great increaſe of their roots, which were as large, and produced as many flowers upon their ſtems, as the ſame ſorts generally do in Holland.

The ſoil in which theſe flowers ſucceed beſt, is a light, ſandy, freſh, rich earth, which may be compoſed after the following manner: take half freſh earth from a common, or paſture land, which is chiefly of a ſandy loam; this ſhould be off the ſurface, and not taken above eight or nine inches deep at moſt; and if you take the turf, or green ſward with it, it will ſtill be better, provided you have time to let it rot before it is uſed; to this you ſhould add a fourth part of ſea-ſand, and the other fourth part of rotten cow dung; mix theſe well together, and caſt it into a heap, where it may remain until you uſe it, obſerving to turn it over once in three weeks or a month, that it may be well mixed. If this compoſt is made two years before it is uſed, it will be much the better; but if you are obliged to uſe it ſooner, then it ſhould be oftener turned, that the parts may the better unite.

This ſoil ſhould be laid two feet deep on the beds which are deſigned for Hyacinths, and if you lay a little rotten cow dung, or tanners bark, at the bottom, which may be within reach of the fibres, but ſhould by no means touch the bulb, it will be better. If the ſoil is very wet where theſe beds are made, you ſhould raiſe them ten or twelve inches above the ſurface of the ground; but if it be dry, they need not be raiſed above three or four inches.

The manner of preparing the beds is as follows: Firſt, take all the former old earth out of the bed to the depth you intend, which ſhould be near three feet; then ſpread ſome rotten neats dung, or tan, in the bottom, about ſix inches thick, laying it very level; upon this you ſhould lay the above-mentioned earth two feet thick, levelling it very even; then ſcore out the diſtances for the roots, which ſhould be eight inches ſquare, in ſtrait rows each way; after which, place your roots exactly in the ſquares, obſerving to ſet the bottom part downward; then cover the roots ſix inches deep with the ſame prepared earth, being very careful in doing this not to diſplace any of the roots; and if the tops of theſe beds are made a little rounding, to ſhoot off the wet, it will be of ſervice in moiſt ground, provided the middle of the beds are not made too high, which is a fault the other way.

The beſt ſeaſon for planting theſe roots is the middle or latter end of September, according to the earlineſs or lateneſs of the ſeaſon, or the weather when it happens; but I would adviſe you never to plant them when the ground is extreme dry, unleſs there be a proſpect of ſome rain ſoon after; for if the weather ſhould continue dry for a conſiderable time after, the roots will receive a mouldineſs, which will certainly deſtroy them.

The beds will require no farther care until the froſt comes on very ſevere, at which time they ſhould have ſome rotten tan ſpread over them, about four inches thick; and if the alleys on each ſide of the bed are filled up, either with rotten tan, dung, or ſand, it will prevent the froſt from penetrating the ground on each ſide to the roots, and ſecure them from being deſtroyed; but when the winters prove very ſevere, it will alſo be proper to have ſome Peas-haulm, Straw, or ſuch like covering laid over them, which will keep out the froſt better than mats; and lying hollow, will admit the air to the ſurface of the ground, and alſo permit the exhalations to paſs off, whereby the earth will remain dry, and prevent the roots from rotting, which has often happened when the beds have been too cloſe covered. But you muſt obſerve to take off this light covering whenever the weather is mild, and only let it continue on in very hard froſts; for where the beds are covered with tan or ſea-coal aſhes, no common froſt can penetrate through, ſo the coverings are uſeleſs, except in very ſevere froſt; for a ſmall froſt cannot injure the roots before the green leaves appear above ground, which is ſeldom before the beginning of February, at which time the beds muſt be arched over with hoops, that they may be covered either with mats, canvas, or ſome other light covering, to prevent the froſt from injuring the buds as they ariſe above ground; but theſe coverings muſt be conſtantly taken off every day when the weather is mild, otherwiſe the flower-ſtems will be drawn up to a great height, and become very weak, and the foot-ſtalks of the flowers will be long and ſlender, and ſo rendered incapable of ſupporting the bells; which is a great diſadvantage to the flowers, for one of their greateſt beauties conſiſts in the regular diſpoſition of their bells. When theſe hoops are fixed over the beds, the rotten tan ſhould be moſt of it taken off them; in doing of which, great care ſhould be taken not to bruiſe or injure the leaves of the Hyacinths, which by that time will be breaking out of the ground with the flower-ſtem, therefore the tan ſhould be removed by the hands; or if any inſtrument is made uſe of in the doing of it, there muſt be great caution how it is performed.

When the ſtems of the flowers are advanced to their height before the flowers are expanded, you ſhould place a ſhort ſtick down by each root, to which, with a wire formed into a hoop, the ſtem of the flowers ſhould be faſtened, to ſupport them from falling; otherwiſe, when the bells are fully expanded, their weight will incline them to the ground, eſpecially if they are not ſcreened from the wind and rain.

During their ſeaſon of flowering they ſhould be covered in the heat of the day from the ſun, as alſo from all heavy rains; but they ſhould be permitted to receive all gentle ſhowers, as alſo the morning and evening ſun; but if the nights are froſty, they muſt be conſtantly defended therefrom. With this management you may continue your Hyacinths in beauty at leaſt one whole month, and ſometimes more, according to their ſtrength, or the favourableneſs of the ſeaſon.



When

When their flowers are quite decayed, and the tops of their leaves begin to change their colour, you muſt carefully raiſe the roots out of the ground with a narrow ſpade, or ſome other handy inſtrument; this is what the Dutch gardeners term lifting of them: in the doing of this, the inſtrument muſt be carefully thruſt down by the ſide of the root, being careful not to bruiſe or injure it, as alſo to put it below the bottom of the root; then by the forcing of this inſtrument on one ſide, the fibres of the root are raiſed and ſeparated from the ground. The deſign of this is, to prevent their receiving any more nouriſhment from the ground; for by imbibing too much moiſture at this ſeaſon, the roots frequently rot after they are taken up: about a fortnight after this operation the roots ſhould be entirely taken out of the ground, and then carried to beds ſituated where the morning ſun only ſhines upon them; the earth of the beds ſhould be looſe and raiſed into a ſharp ridge, laying the roots into it in a horizontal poſition, with their leaves hanging out, by which means a great part of the moiſture contained in their thick ſucculent ſtalks and leaves will evaporate; which, if it were permitted to return back to the roots, would cauſe them to rot and decay after they are taken up, which has been the general defect of moſt of the Hyacinths in England.

In this poſition the roots ſhould remain until the green leaves are entirely decayed, which perhaps may be in three weeks time. This is what the Dutch gardeners term the ripening of their roots, becauſe by this method the roots become firm, and the outer cover is ſmooth, and of a bright purple colour; whereas thoſe roots which are permitted to remain undiſturbed, till the leaves and ſtalks are quite decayed, will be large, ſpongy, and their outer coats will be of a pale colour; for the ſtems of many of theſe flowers are very large, and contain a great quantity of moiſture, which, if ſuffered to return into the roots, will infallibly cauſe many of them to periſh. After they are ſo ripened, you muſt take them out of the ground, and wipe them clean with a ſoft woollen cloth, taking off all the decayed parts of the leaves and fibres, putting them into open boxes where they may lie ſingly, and be expoſed to the air, but they muſt be preſerved carefully from moiſture; nor ſhould they be ſuffered to remain where the ſun may ſhine upon them; in this manner they may be preſerved out of the ground until September, which is the ſeaſon for planting them again, at which time yon muſt ſeparate all the ſtrong flowering roots, planting them in beds by themſelves, that they may make an equal appearance in their flowers; but the offſets and ſmaller roots ſhould be planted in another ſeparate bed for one year, in which time they will acquire ſtrength, and by the ſucceeding year will be as ſtrong as the older roots.

The ſingle and ſemi-double flowers ſhould be planted alſo in a bed by themſelves, where they ſhould be carefully ſheltered (as was directed before) from the froſt, until the flowers are blown; at which time their covering ſhould be entirely removed, and they ſuffered to receive the open air, but the flower-ſtalks ſhould be ſupported with ſticks; which, though the weather may ſoon deface the beauty of the flowers, yet is abſolutely neceſſary to promote their ſeeding; and when the ſeeds are quite ripe, you muſt cut off the veſſels and preſerve them, with the ſeeds therein, until the ſeaſon for ſowing it. But you muſt obſerve, that after theſe flowers have produced ſeeds, they ſeldom flower ſo well again, at leaſt not in two years after; ſo that the beſt method to obtain good ſeeds is, to plant new roots every year for that purpoſe. Although theſe roots are, by moſt perſons, taken up every year, yet if the beds are well prepared for them, they may remain two years in the ground unremoved, and the roots will increaſe more the ſecond year than the firſt, though the flowers are more liable to degenerate; therefore thoſe who cultivate theſe for ſale, take up their roots annually when they are large and ſaleable; but the offſets and ſmall roots, they uſually leave two years in the ground.

There are ſome perſons who let their Hyacinth roots remain three or four years unremoved, by which they have a much greater increaſe of roots, than when they are annually taken up; but the roots by this great increaſe are frequently degenerated, ſo as to produce ſingle flowers; therefore I ſhould adviſe the taking up of the roots every year, eſpecially thoſe of the moſt valuable kinds, which is the moſt certain method to preſerve them in their greateſt perfection, though the increaſe may not be ſo great; and if theſe roots are planted a fortnight or three weeks earlier in the autumn than is before directed, it will cauſe them to produce ſtronger flowers; and thoſe roots which are annually removed, will be rounder and firmer than ſuch as ſtand two years unremoved.

For the other ſorts of Hyacinth, ſee MUSCARI and ORNITHOGALUM.

HYACINTHUS TUBEROSUS. See CRINUM and POLYANTHES.

HYDRANGEA. Gron. Flor. Virg. 50. Lin. Gen. Plant. 492. We have no Engliſh title for this genus.

The CHARACTERS are,

*The flower hath a ſmall permanent empalement of one leaf, indented in five parts, and five roundiſh petals which are equal, and larger than the empalement. It hath ten ſtamina which are alternately longer than the petal, terminated by roundiſh ſummits. Under the flower is ſituated a roundiſh germen, ſupporting two ſhort ſtyles ſtanding apart, crowned by permanent obtuſe ſtigmas. The germen afterward turns to a roundiſh capſule, crowned by the two horned ſtigmas, divided tranſverſly into two cells, filled with ſmall angular ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's tenth claſs, intitled Decandria Dygynia, which includes the plants whoſe flowers have ten ſtamina and two ſtyles.

We have but one SPECIES of this genus, viz.

HYDRANGEA (*Arboreſcens.*) Gron. Flor. Virg. 50.

This plant grows naturally in North America, from whence it has been brought within a few years paſt to Europe, and is now preſerved in gardens for the ſake of variety more than its beauty. It hath a ſpreading fibrous root, from which is ſent up many ſoft, pithy, ligneous ſtalks, which riſe about three feet high, garniſhed at each joint with two oblong heart-ſhaped leaves placed oppoſite, ſtanding upon foot-ſtalks about one inch long; the leaves are three inches long, and two broad near their baſe, ſawed on their edges, and have many veins running from the mid-rib upward to their borders; they are of a light green, and fall away in the autumn; the flowers are produced at the top of the ſtalks, in form of a corymbus; they are white, compoſed of five petals, with ten ſtamina ſurrounding the ſtyle. Theſe appear toward the end of July and in Auguſt, but ſeldom perfect their ſeeds in England.

This is eaſily propagated by parting of the roots; the beſt time for this is the latter end of October, which is alſo the beſt time to tranſplant them: the plants ſhould have a moiſt ſoil, for they grow naturally in marſhy places; they require no other culture but to keep them clear from weeds, and dig the ground between them every winter. The roots are perennial, and if in very ſevere froſt the ſtalks are killed, they will put out new ones the following ſpring.

HYDRASTIS. See WARNERIA.

HYDROCOTYLE, [of ὕδωρ, water, and κοτύλη, a cavity; becauſe this plant has a cavity in the leaves which contains water, and the plant grows in marſhes.] Water Navelwort.

This plant grows in great plenty in moiſt places in moſt parts of England, and is never cultivated for uſe, ſo I ſhall paſs it over with only naming it.

HYDROLAPATHUM. See RUMEX.

HYDROPHYLLON. Lin. Gen. Plant. 187. Hydrophyllon. Tourn. Inſt. R. H. 81. tab. 16. Water Leaf.

The Characters are,

*The flower has a permanent empalement of one leaf, cut into five segments which spread open. It hath one bell-shaped petal, which is divided into five parts, indented at their points; under each of these segments is fixed a nectarium, which is situated about the middle, and shut up lengthways by two lamellæ. It hath five stamina which are longer than the petal, terminated by oblong prostrate summits, and an oval-pointed germen, supporting an awl-shaped style the length of the stamina, crowned by a bifid spreading stigma. The germen afterward becomes a globular capsule with one cell, inclosing one large round seed.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, which includes the plants whose flowers have five stamina and one style.

We know but one Species of this genus, viz.

Hydrophyllon (*Virginianum*) foliis pinnatifidis. Lin. Sp. 208. Morini. Joncq. Hort. *Water Leaf with wing-pointed leaves.*

This plant grows naturally in many parts of North America, on moist spongy ground. The root of it is composed of many strong fleshy fibres, which spread wide on every side, from which arise many leaves with foot-stalks five or six inches long, which are jagged into three, five, or seven lobes, almost to the midrib; these are indented on their edges, and have several veins running from the midrib to the sides; they are of a lucid green, and in the spring have water standing on the cavities, from whence I suppose Morinus gave it the title of Water Leaf, and not from the plant growing in water, as Tournefort conjectures. The flowers rise with foot-stalks from the root, having one or two small leaves of the same shape with the lower; the flowers are produced in loose clusters hanging downward; they are of a dirty white and bell-shaped, so make no great figure. They appear in June, and the seeds sometimes ripen here in August.

This plant is very hardy in respect to cold, but it should be planted in a moist rich soil; for if it is planted in a dry warm soil, it will not live, unless it is constantly watered in dry weather. It may be propagated by parting of the roots, which should be done in autumn, that the plants may be well rooted before spring, for otherwise they will require a great deal of water. It requires a moist soil and shady situation.

HYDROPIPER, the common biting Arse-smart, which grows in great plenty in moist places near ditches sides almost every where.

HYDROSTATICS [ὑδροςαἶικὴ, of ὕδωρ, water, and ςαἶικὴ, of ςατὸς, standing, of ἵςημι, I stand or stop; Hydrostatics being conceived as the doctrine of the æquillibrum of liquors,] or the doctrine of the gravitation of fluid; or it is that part of the mechanics which considers the weight or gravity of fluid bodies; particularly of water, and of solid bodies immerged therein.

To Hydrostatics belongs whatever relates to the gravities and æquilibria of liquors, with the art of weighing bodies in water, in order to estimate their specific gravities.

Of the use of this science in horticulture, the Rev. Dr. Hales, in his excellent Treatise of Vegetable Staticks, has given many examples, by experiments, shewing the quantities of moisture imbibed and perspired by plants and trees, necessary to be known, in order to promote the business of vegetation.

Some of the most useful heads of this science are;

1. That the upper parts of all fluids press upon the lower.

2. That a lighter fluid may gravitate or press upon a heavier.

3. That if a body that is contiguous to the water, be altogether, or in part, lower than the upper surface of the water, the lower part of the body will be pressed upwards by the water which touches it beneath.

4. There needs only a competent weight of an external fluid, to account for the rising of water in pumps, &c.

5. If a body be placed under water, so that its uppermost surface lie parallel to the horizon, the direct pressure that it sustains is no more than that of a column of water, whose base is the horizontal superficies of the body, and its heighth the perpendicular depth of the water. And if the water which leans on the body be contained in pipes which are open at both ends, the pressure of the water is to be estimated by the weight of a pillar of water, the base of which is equal to the lower orifice of the pipe, and whose height is equal to a perpendicular, which reaches from thence to the top of the water, although the pipe should be much inclined any way, or though it should be ever so regularly shaped, and much broader in some other place than the bottom.

6. A body which is immersed in a fluid, sustains a natural pressure from the fluid, which also increases as the body is placed deeper beneath the surface of the fluid.

7. The reason why water ascends in siphons, and by which it flows through them, may be explained from the external pressure of some other fluid, without having recourse to the abhorrence of a vacuum.

8. The most solid body, which will sink by its own weight at the surface, yet if it be placed at a depth twenty times greater than that of its own thickness it will not sink, if its descent be not assisted by the incumbent water.

9. If a body which is specifically lighter than a fluid, be immersed in that fluid, it will rise with a force proportionable to the excess of gravity in that fluid.

10. If a body which is heavier than a fluid be immersed, it will sink with a force that is proportionable to the excess of its gravity.

11. If any vessel be filled with water, or any other liquor, the surface of which is capable of being even, it will continue so till disturbed by some other external cause.

12. When the fluids are pressed, they are pressed undiquaque, i. e. on all sides.

How far the knowledge of any of these properties of fluids may conduce to the philosophical improvement of gardening, and the business of vegetation, will be more clearly perceived when well considered by the ingenious artist, than being set forth by words.

HYGROMETER [ὑγρόμεἶρον, of ὑγρὸς, moist, and μέἶρον, measure, of μεἶρέω, to measure,] is a machine or instrument contrived to shew or measure, the moistness and driness of the air, according as it abounds with moist or dry vapours, and to measure and estimate the quantity of such moistness and driness.

There are divers kinds of Hygrometers; for whatever body either swells or shrinks by driness or moisture, is capable of being formed into an Hygrometer; such are the woods of most kinds, particularly Ash, Deal, Poplar, &c. such also is a cord, catgut, &c.

Stretch a hempen cord or fiddle-string along a wall, bringing it over a truckle or pully; and to the other end tie a weight, unto which fit a style or index; on the same wall fit a plate of metal, divided into any number of equal parts, and the Hygrometer is complete.

For it is a matter of undoubted observation, that moisture sensibly shortens the length of cords and strings; and that as the moisture evaporates, they return to their former length, and the like may be said of a fiddle-string.

The weight therefore, in the present case, upon an increase of the moisture of the air, will ascend, and upon a diminution of the same will descend.

Hence, as the index will shew the spaces of ascent and descent, and those spaces are equal to the increments and decrements of the length of the cord or gut, the instrument will discover whether the air be more or less humid now, than it was at another given time.

The ordinary contrivance with whip-cord is one of the easiest, for that will infallibly shorten and lengthen as the air grows moister and drier.

Some recommend a cat-gut as the best, which may be a yard in length suspended, having a plumbet or piece of lead, with an index or pointer hanging at the lower end, by means of which the cat-gut will twist or untwist as the air dries or moistens, and shorten and lengthen so as to raise and sink the plumbet with the index, and this index will point out the degree sought for.

The weight of this lead or plumbet, should be about two ounces.

Some persons who approve a fine whip-cord instead of cat-gut, use a greater weight of lead; the twisting and untwisting of the cat gut or whip-cord, will make the lead with the index turn round, as well as rise and fall. The degrees may be made upon an open screw of brass within, with which the plumbet and index has its motion.

When you are provided with a barometer and Hygrometer, compare the motions of the one with the other, in order to judge what proportion the rise or fall of the quicksilver in the barometer bears to the twisting of the cat-gut or whip-cord; the degrees of which motion may be observed by the index or pointer of the Hygrometer; and at the same time both these must be compared with the rising and falling of the spirit in a thermometer, to know what degree of heat or cold attends every different change of weather.

HYGROSCOPE [of ὑγρὸς, moist, and σκοπέω, to view or consider,] a machine the same as the hygrometer, and for the same uses.

These instruments are of good use in conservatories, for measuring or shewing the dampness or driness of them in the winter season.

HYMENÆA. Lin. Gen. Plant. 512. Courbaril. Plum. Nov. Gen. 49. tab. 14. Locust-tree.

The Characters are,

*The outward involucrum of the flower is divided into two parts, the inward is of one leaf, indented in five parts; the flower hath five petals, which are equal in size, and spread open. It hath ten declining stamina, which are short, terminated by oblong summits. In the center is situated an oblong germen, supporting a declining style, crowned by an acute stigma; the germen afterward becomes a large oblong pod, with a thick ligneous shell, divided into several partitions transversly, in each of which is lodged one compressed large seed, surrounded with a farinaceous pulp.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, which includes the plants whose flowers have ten stamina and one style.

We know but one Species of this genus, viz.

Hymenæa (*Courbaril.*) Hort. Cliff. 484. *Locust-tree.* Courbaril bifolia, flore pyramidato. Plum. Nov. Gen. 49. *Two-leaved Courbaril with a pyramidal flower, commonly called Locust-tree in America.*

This is a very large spreading tree in the West-Indies, where it grows in great plenty: it hath a large stem, covered with a russet bark, which divides into many spreading branches, garnished with smooth stiff leaves, which stand by pairs, their base joining at the foot-stalk, to which they stand oblique, one side being much broader than the other, the two outer sides being rounded, and their inside strait, so that they resemble a pair of sheep-shears; they are pointed at the top, and stand alternately on the stalk. The flowers are produced in loose spikes at the end of the branches, some of the short ligneous foot-stalks supporting two, and others three flowers, which are composed of five yellow petals striped with purple; the petals are short and spread open; the stamina are much longer, and of a purplish colour; these flowers are succeeded by thick, fleshy, brown pods, shaped like those of the Garden Bean; they are six inches long, and two inches and a half broad, of a purplish brown colour, and a ligneous consistence, with a large suture on both edges; these contain three or four roundish compressed seeds, divided by transverse partitions.

The wood of this tree is esteemed as good timber in the West-Indies, and it yields a fine clear resin which is called gum anime in the shops, which makes an excellent varnish.

It is easily raised from the seeds if they are fresh; these must be sown in pots, and plunged into a hot-bed of tanners bark: there should be but one seed put into each pot, or if there is more, when the plants appear, they should be all drawn out to one soon after they come up, before their roots entangle, when it will be hazardous doing it; for if great care is not taken, the plant intended to be left may be drawn out with the other. As the roots of this plant are but slender, so they are very difficult to transplant; for unless a ball of earth is preserved to their roots, they seldom survive their removal, therefore they must be seldom transplanted from one pot to another. The plants must constantly remain in the tan-bed in the stove, and should be treated in the same way with other tender plants of the same country, giving but little water to them, especially in the winter. When these plants first appear, they make considerable progress for two or three months, after which time they are at a stand perhaps a whole year without shooting, being in their growth very like the Anacardium, or Cashew Nut, so is very difficult to preserve long in this country.

HYOSCYAMUS. Tourn. Inst. R. H. 117. tab. 42. Lin. Gen. Plant. 218. [of ὗς, a swine, and κύαμος, a Bean, q. d. Hog's-bean,] Henbane; in French, *Jusquaime.*

The Characters are,

*The flower has a cylindrical empalement of one leaf, which is permanent, swelling at the bottom, and cut into five acute segments at the top. It hath one funnel-shaped petal, with a short cylindrical tube, and an erect spreading rim, cut into five obtuse parts, one being larger than the others; it hath five inclined stamina, terminated by roundish summits. In the center is situated a roundish germen, supporting a slender style, crowned by a round stigma. The germen afterward becomes an oval obtuse capsule sitting in the empalement, divided in two cells by an intermediate partition, opening with a lid at the top, to let out the many small seeds which adhere to the partition.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, in which he includes those plants whose flowers have five stamina and one style.

The Species are,

1. Hyoscyamus (*Niger*) foliis amplexicaulibus sinuatis, floribus sessilibus. Hort. Cliff. 56. *Henbane with sinuated leaves embracing the stalks, and sessile flowers.* Hyoscyamus vulgaris, vel niger. C. B. P. *Common Black Henbane.*
2. Hyoscyamus (*Major*) foliis petiolatis, floribus pedunculatis terminalibus. *Henbane with leaves having foot-stalks, and flowers with foot-stalks terminating the branches.* Hyoscyamus major, albo similis, umbilico floris atro-pupureo. T. Cor. *Great Henbane like the white, but with a dark purple bottom to the flower.*
3. Hyoscyamus (*Albus*) foliis petiolatis, floribus sessilibus. Hort. Upsal. 56. *Henbane with leaves having foot-stalks, and flowers sitting close to the branches.* Hyoscyamus major, albo similis, umbilico floris virenti. Jussieu. *Greater Henbane like the white, with a green bottom to the flower.*
4. Hyoscyamus (*Minor*) foliis petiolatis, floribus solitariis lateralibus. *Henbane with leaves having foot-stalks, and flowers proceeding singly from the sides of the branches.* Hyoscyamus minor albo similis, umbilico floris atro purpureo. Tourn. Cor. 5. *Smaller Henbane like the white, with a dark purple bottom to the flower.*
5. Hyoscyamus (*Reticulatis*) foliis caulinis petiolatis cordatis sinuatis acutis, floribus integerrimis, corollis ventricosis. Lin. Sp. 257. *Henbane with heart-shaped,*

 *sinuated,*

*sinuated, acute leaves upon foot-stalks, and entire swollen flowers.* Hyoscyamus rubello flore. C. B. P. *Henbane with a reddish coloured flower.*

6. Hyoscyamus (*Aureus*) foliis petiolatis eroso-dentatis acutis, floribus pedunculatis fructibus pendulis. Lin. Sp. 257. *Henbane with acute indented leaves standing on foot-stalks, the flower having foot-stalks, and the fruit hanging.* Hyoscyamus Creticus luteus major. C. B. P. *Greater yellow Henbane of Candia.*

7. Hyoscyamus (*Pusillus*) foliis lanceolatis dentatis, floralibus inferioribus binis, calycibus spinosis. Hort. Upsal. 44. *Henbane with spear-shaped indented leaves, and a prickly empalement.* Hyoscyamus pusillus aureus Americanus, antirrhini foliis glabris. Pluk. Alm. 188. tab. 37. fol. 5. *Low, golden, American Henbane, with a smooth Snapdragon leaf.*

The first of these sorts is very common in England, growing upon the sides of banks and old dunghills almost every where. It is a biennial plant with long fleshy roots, which strike deep into the ground, sending out several large soft leaves, which are deeply slashed on their edges, and spread on the ground; the following spring the stalks come out, which rise about two feet high, garnished with leaves of the same shape, but smaller, which embrace the stalks with their base; the upper part of the stalk is garnished with flowers standing on one side in a double row, sitting close to the stalks alternately; these are of a dark purplish colour with a black bottom, and are succeeded by roundish capsules, sitting within the empalement; these open with a lid at the top, and have two cells filled with small irregular seeds. This is a very poisonous plant, and should be rooted out in all places where children are suffered to come; for in the year 1729, there were three children poisoned with eating the seeds of this plant, near Tottenham-court; two of which slept two days and two nights before they could be awakened, and were with difficulty recovered; but the third being older and stronger, escaped better.

The roots of this plant are used for anodyne necklaces to hang about children's necks, being cut to pieces and strung like beads, to prevent fits and cause an easy breeding of their teeth, but they are very dangerous to use inwardly. For some years past there was a mixture of these roots brought over with Gentian, and used as such, which was attended with very bad effects, as hath been mentioned under the article of Gentian, so I shall not repeat it here.

The second sort grows naturally in the islands of the Archipelago. This hath rounder leaves, which are obtusely situated upon their borders, and stand upon foot-stalks; the stalks branch more than those of the first, and the flowers grow in clusters toward the end of the branches, standing upon short foot-stalks; they are of a pale yellow colour, with very dark purple bottoms.

The third sort is much like the second, but the flowers are in larger bunches, sitting very close on the ends of the branches; they are of a greenish yellow colour, with green bottoms. It grows naturally in the warm parts of Europe, and is the sort whose seeds should be used in medicine, being the white Henbane of the shops.

The fourth sort was brought from the Levant by Dr. Tournefort. This hath a smaller stalk than either of the former, whose joints are further distant; the leaves are roundish, and deeply indented in obtuse segments, standing upon pretty long foot-stalks; the flowers come out singly from the side of the stalks, at a good distance from each other; they are of a yellow colour with dark bottoms.

The fifth sort grows naturally in Syria; this rises with a branching stalk two feet high, garnished with long spear-shaped leaves having foot-stalks; the lower leaves are regularly cut on both sides into acute segments which are opposite, so are shaped like the winged leaves, but the upper leaves are entire; the flowers grow at the end of the stalks in bunches; they are of a worn-out red colour, and shaped like those of the common sort, but their tubes are swollen.

All these are biennial plants, which perish soon after they have perfected their seeds. They flower in June and July, and their seeds ripen in the autumn, which, if permitted to scatter, will produce plenty of the plants the following spring; or if the seeds are sown at that season, they will succeed much better than in the spring; for when they are sown in spring, the plants seldom come up the same year. They are all hardy except the fifth sort, and require no other culture but to keep them clean from weeds, and thin the plants where they are too close. The fifth sort should have a warm situation and a dry soil, in which it will live much better through the winter than in rich ground.

The sixth sort grows naturally in Candia; this is a perennial plant with weak stalks, which require a support; the leaves are roundish, and acutely indented on their edges, standing upon pretty long foot-stalks; the flowers come out at each joint of the stalk; they are large, of a bright yellow, with a dark purple bottom; the style of this sort is much longer than the petal. It flowers most part of summer, and sometimes ripens seeds in the autumn. If these seeds are sown in pots as soon as they are ripe, and placed under a hot-bed frame in winter, the plants will come up in the spring; but if they are kept out of the ground till spring, they rarely succeed. This sort will continue several years, if they are kept in pots and sheltered in winter, for they will not live in the open air at that season, but it only requires to be protected from frost; therefore if these plants are placed under a common hot-bed in winter, where they may enjoy as much free air as possible in mild weather, they will thrive better than when they are more tenderly treated. This sort may be easily propagated by cuttings, which, if planted in a shady border during any of the summer months, will take root in a month or six weeks, and may be afterward planted in pots, and treated like the old plants.

HYPECOUM. Tourn. Inst. R. H. 230. tab. 115. Hypecoum; Lin. Gen. Plant. 157. We have no English name for this plant.

The Characters are,

*The empalement of the flower is composed of two small oval leaves, which are opposite and erect. The flower hath four petals; the two outer which are opposite, are broad, and divided into three obtuse lobes; the two other which are alternate, are cut into three parts at their points. It hath four stamina situated between the petals, which are terminated by oblong summits. In the center is placed an oblong cylindrical germen, supporting two short styles, crowned by acute stigma. The germen afterward becomes a long, compressed, jointed pod, which is incurved, with one roundish compressed seed in each joint.*

This genus of plants is ranged in the second section of Linnæus's fourth class, which contains the plants whose flowers have four stamina and two styles.

The Species are,

1. Hypecoum (*Procumbens*) siliquis arcuatis compressis articulatis. Hort. Upsal. 31. *Hypecoum with compressed jointed pods bent inward.* Hypecoum latiore folio. Tourn. *Broad-leaved Hypecoum.*

2. Hypecoum (*Pendulum*) siliquis cernuis teretibus cylyndricis. Hort. Upsal. 31. *Hypecoum with taper, cylindrical, nodding pods.* Hypecoum tenuiore folio. Tourn. *Narrow-leaved Hypecoum.*

3. Hypecoum (*Erectum*) siliquis erectis teretibus torulosis. Hort. Upsal. 32. *Hypecoum with taper, erect, wreathed pods.* Hypecoum siliquis erectis teretibus. Amm. Ruth. 58. *Hypecoum with erect taper pods.*

The first sort hath many wing-pointed leaves of a grayish colour, which spread near the ground, and slender branching stalks, which lie prostrate on the surface of the ground; these are naked below, and at the top are garnished with two or three small leaves of the same shape and colour with the under ones; from between these leaves come out the foot-stalks of the flower, each sustaining one yellow flower with four petals,

petals, and a pointal ftretched out beyond the petals, which afterward turns to a jointed compreffed pod about three inches long, which bends inward like a bow, having one roundifh compreffed feed in each joint. This flowers in June and July, and the feeds ripen in Auguft.

The fecond fort hath flender ftalks which ftand more erect, and the fegments of the leaves are longer and much narrower than thofe of the firft; the flowers are fmaller, and come out at the divifion of the branches; thefe are fucceeded by narrow taper pods, which hang downward. It flowers and feeds at the fame time with the firft.

The third fort grows in the eaft; Dr. Amman received the feeds from Dauria, and I received the feeds from Iftria, where it was found growing naturally. This hath much the appearance of the fecond fort in leaf and flower, but the pods grow erect, and are wreathed and twifted about. It flowers and feeds at the fame time with the others.

Thefe plants are all of them annual, fo their feeds fhould be fown foon after they are ripe, otherwife it will be a year before the plants will appear, on a bed of light frefh earth where they are to remain, for they feldom fucceed if they are tranfplanted. When the plants are come up, they fhould be carefully cleared from weeds; and where the plants are too clofe, they muft be thinned, leaving them about fix or eight inches apart; after this they will require no other culture, but to keep them conftantly clear from weeds. In June thefe plants will flower, and their feeds will be ripe in Auguft.

When the feeds are fown in the fpring, and the feafon proves dry, the feeds will not grow the firft year; but if the ground is kept clear from weeds and not difturbed, the plants will come up the following fpring. I have known the feeds of thefe plants remain in the ground two years, and the plants have come up the third fpring very well; fo that it will be very proper to fow fome of the feeds in autumn, foon after they are ripe, in a warm border, where the plants may come up early the following fpring; and thefe will be ftronger, and more likely to perfect feeds, than thofe fown in the fpring, by which method the kinds may be preferved.

If the feeds of thefe plants are permitted to fcatter, the plants will come up the following fpring without any care; and if they are treated in the fame way as the others, they will thrive equally; but when the feeds are fown in the fpring, they fhould be taken out of the pods, and divefted of their fungous covering, which adheres clofe to them, fo prevents their growing, till that is rotted and decayed.

Thefe plants are feldom propagated but by thofe who are curious in botany, though for the fake of variety they may have a place in large gardens, becaufe they require very little trouble to cultivate them; and as they take up but little room, fo they may be intermixed with other fmall annual plants in large borders, where they will make a pretty appearance.

The juice of thefe plants is of a yellow colour, refembling that of Celandine, and is affirmed by fome eminent phyficians to have the fame effect as opium.

HYPERICUM. Tourn. Inft. R. H. 254. tab. 131. Lin. Gen. Plant. 808. St. Johnfwort; in French, *Millepertuis*.

The Characters are,

*The flower hath a permanent empalement, divided into five oval concave fegments; it hath five oblong oval petals which fpread open, and a great number of hairy ftamina, which are joined at their bafe in three or five diftinct bodies, terminated by fmall fummits. It hath in the center a roundifh germen, fupporting one, three, or five ftyles, the fame length of the ftamina, crowned by fingle ftigmas. The germen afterward becomes a roundifh capfule, having the fame number of cells as there are ftyles in the flower, which are filled with oblong feeds.*

This genus of plants is ranged in the third fection of Linnæus's eighteenth clafs, intitled Polyadelphia Polygynia, which contains the plants whofe flowers have many ftamina joined in diftinct bodies, and feveral ftyles.

The Species are,

1. Hypericum (*Perfoliatum*) floribus trigynis, caule ancipiti, foliis obtufis pellucido-punctatis. Hort. Cliff. 383. *St. Johnfwort with three ftyles to the flower, and obtufe leaves having pellucid punctures.* Hypericum vulgare. C. B. P. 279. *Common St. Johnfwort.*
2. Hypericum (*Quadrangulum*) floribus trigynis, caule quadrato herbaceo. Hort. Cliff. 380. *St. Johnfwort with three ftyles to the flowers, and a fquare herbaceous ftalk.* Hypericum Afcyron dictum, caule quadrangulo. J. B. 3. p. 382. *St. Johnfwort with a fquare ftalk, commonly called St. Peterfwort.*
3. Hypericum (*Hircinum*) floribus trigynis, ftaminibus corollâ longioribus, caule fruticofo ancipiti. Hort. Cliff. 331. *St. Johnfwort with three ftyles to the flower, ftamina longer than the petals, and a fhrubby ftalk with two fides.* Hypericum fœtidum frutefcens. Tourn. 255. *Stinking fhrubby St. Johnfwort.*
4. Hypericum floribus trigynis, calycibus obtufis, ftaminibus corollâ longioribus caule fruticofo. Hort. Cliff. 381. *St. Johnfwort with three ftyles to the flower, obtufe empalements, ftamina longer than the petals, and a fhrubby ftalk.* Hypericum frutefcens Canarienfe multiflorum. Hort. Amft. 2. p. 135. *Shrubby St. Johnfwort from the Canaries, having many flowers.*
5. Hypericum (*Olympicum*) floribus trigynis, calycibus acutis, ftaminibus corollâ brevioribus, caule fruticofo. Hort. Cliff. 380. *St. Johnfwort with three ftyles to the flower, acute empalements, ftamina fhorter than the petals, and a fhrubby ftalk.* Hypericum Orientale, flore magno. T. Cor. 19. *Eaftern St. Johnfwort, with a large flower.*
6. Hypericum (*Inodorum*) floribus trigynis, calycibus obtufis, ftaminibus corollâ longioribus, capfulis coloratis, caule fruticofo. *St. Johnfwort with three ftyles to the flower, obtufe empalements, ftamina longer than the petals, coloured feed-veffels, and a fhrubby ftalk.* Hypericum Orientale, fœtido fimile, fed inodorum. Tourn. Cor. 19. *Eaftern St. Johnfwort, like the ftinking kind, but without fmell.*
7. Hypericum (*Afcyron*) floribus pentagynis, caule tetragono herbaceo fimplici, foliis lævibus integerrimis. Hort. Upfal. 236. *St. Johnfwort with five ftyles to the flower, a fquare, fingle, herbaceous ftalk, and fmooth entire leaves.* Afcyrum magno flore. C. B. P. 280. *Tutfan with a large flower.*
8. Hypericum (*Balearicum*) floribus pentagynis, caule fruticofo, foliis ramifque cicatrifatis. Lin. Sp. Plant. 783. *St. Johnfwort with five ftyles to the flower, a fhrubby ftalk, and fcarified leaves and branches.* Afcyron Balearicum, frutefcens, maximo flore luteo, foliis minoribus, fubtus verrucofis falvad. Boerh. Ind. alt. 1. 242. *Shrubby Balearick St. Peterfwort with a large yellow flower, and fmaller leaves warted on their under fide.*
9. Hypericum (*Androfæmum*) floribus trigynis pericarpiis baccatis, caule fruticofo ancipiti. Hort. Upfal. 237. *St. Johnfwort with three ftyles to the flower, a flefhy feed-veffel, and a fhrubby ftalk with two fides.* Androfæmum maximum frutefcens. C. B. P. 280. *Common Tutfan, or Park-leaves.*
10. Hypericum (*Bartramium*) floribus pentagynis calycibus obtufis, ftaminibus corollâ æquantibus, caule erecto herbaceo. *St. Johnfwort with five ftyles to the flower, obtufe empalements, ftamina equalling the petals, and an erect herbaceus ftalk.*
11. Hypericum (*Monogynum*) floribus monogynis, ftaminibus corollâ longioribus, calycibus coloratis, caule fruticofo. *St. Johnfwort with one ftyle to the flowers, ftamina longer than the petals, coloured empalements, and a fhrubby ftalk.*

There are fome other fpecies of this genus, which are preferved in botanic gardens for the fake of variety, but as they are feldom admitted into other gardens, I have not enumerated them here, left the work fhould fwell too large.

The

The first and second sorts are both very common plants, growing in the fields in most parts of England; the first is used in medicine, but the second is of no use: these are rarely propagated in gardens, but I chuse to mention them, in order to introduce the other sorts, which deserve a place in every good garden.

The first sort hath a perennial root, from which arise several round stalks a foot and a half high, dividing into many small branches, which are garnished at each joint with two small oblong leaves, standing opposite, without foot-stalks; the branches also come out opposite. The leaves have many pellucid spots in them, which appear like so many holes when held up against the light. The flowers are numerous on the tops of the branches, standing on slender foot-stalks; they are composed of five oval petals, of a yellow colour, with a great number of stamina, not quite so long as the petals, terminated by roundish summits. In the center is situated a roundish germen, supporting three styles, crowned by single stigmas. The germen afterward becomes an oblong angular capsule, with three cells, filled with small brown seeds. It flowers in June and July, and the seeds ripen in autumn. The root is perennial, so will continue many years; and if the seeds are permitted to scatter, the plants will come up in too great plenty, so as to be very troublesome weeds. The leaves and flowers of this are used in medicine; it is esteemed an excellent vulnerary plant, and of great service in wounds, bruises, and contusions: there is a compound oil made from this plant, which is of great use in the foregoing accidents. From the stamina of the flower is expressed a red juice, which is sometimes used in colouring, but fades very soon.

The second sort hath square stalks, which rise about the same height with the first, but do not branch so much. The leaves are shorter and broader than those of the first, and have no pellucid spots. The flowers sit upon short foot-stalks at the end of the branches, which are shaped like those of the other. This flowers and seeds at the same time with the other, and will propagate in as great plenty if the seeds are permitted to scatter.

The third sort grows naturally in Sicily, Spain, and Portugal; this rises with shrubby stalks about three feet high, sending out small branches at each joint opposite, which are garnished with oblong oval leaves, placed by pairs, sitting close to the stalks, which have a rank smell like a goat. The flowers are produced in clusters at the end of the branches; they are composed of five oval yellow petals, with a great number of stamina which are longer than the petals, and three styles which are longer than the stamina. The germen which supports these, afterward becomes an oval capsule with three cells, filled with small seeds. It flowers in June, July, and August, and the seeds ripen in autumn.

The fourth sort grows naturally in the Canary Islands, so was formerly preserved in green-houses during the winter season, but is found to be hardy enough to resist the greatest cold of this country, so is now cultivated in the nurseries as a flowering shrub; this rises with a shrubby stalk six or seven feet high, dividing into branches upward, which are garnished with oblong leaves, set by pairs close to the branches. The leaves of this have also a strong odour, but not quite so bad as the former. The flowers are produced at the end of the stalks in clusters, and are very like those of the former sort, having a great number of stamina which are longer than the petals; this flowers at the same time with the former, and perfects its seeds in autumn. Both these plants have a very strong odour like that of a goat; so that where the plants grow in large quantities, the scent is carried by the wind to a great distance; or if the leaves are hand ed, they emit the same odour.

These two sorts are propagated by suckers, which are plentifully sent forth from the old plants. The best season for taking off the suckers is in March, just before they begin to shoot; they should be planted in a light dry soil, in which they will endure the severest cold of our climate very well. They may also be propagated by cuttings, which should be planted at the same season; or by seeds, which must be sown in August or September, which is as soon as they are ripe; for if they are kept till spring, few of them will grow; but as they multiply so fast by suckers, the other methods of propagating them are seldom practised in England.

The fifth sort grows naturally on Mount Olympus, where it was discovered by Sir George Wheeler, who sent the seeds to the Oxford garden; this rises with many upright ligneous stalks about a foot high, garnished with small spear-shaped leaves, sitting close to the stalks opposite. The flowers are produced at the the top of the stalks, three or four together; they are composed of five oblong petals, of a bright yellow colour, with a great number of stamina, which are of unequal lengths, some being longer, and others shorter than the petals, terminated by small roundish summits. In the center is situated an oval germen, supporting three slender styles, which are longer than the stamina. The germen afterward becomes an oval capsule with three cells, filled with small seeds. This flowers in July and August, and in warm seasons ripens its seeds in autumn.

This plant is usually propagated by parting of the roots, because the seeds seldom ripen in this country; the best time for doing of this is in September, that the plants may have time to get root before winter; this will live in the open air, if it is planted in a warm situation and a dry soil, but it will be proper to keep a plant or two in pots, to be sheltered under a frame in winter, lest in very severe winters, those in the open air should be destroyed. If this is propagated by seeds, they should be sown soon after they are ripe, in pots filled with light earth, and placed under a frame in the winter, to shelter them from frost, and in the spring the plants will appear; when these are fit to remove, some of them may be planted in a warm border, and others in pots, and treated in the same way as the old plants.

The sixth sort rises with a shrubby stalk seven or eight feet high, with a reddish bark, and sends out many smaller branches, garnished with oval heart-shaped leaves, whose base sits close to the stalks; they are placed opposite. The flowers are produced at the end of the stalks in clusters; they are smaller than those of the third sort, and have obtuse empalements. The stamina are longer than the petals, and are of a deeper colour. The flowers are succeeded by conical capsules of a purplish red colour, having three cells, filled with small seeds. It flowers in May, June, and July, and the seeds ripen in autumn. This is now propagated in the nurseries as a flowering shrub, and may be treated in the same way as the third and fourth sorts.

The seventh sort was first brought to England from Constantinople, but has long been very common in the English gardens, for the roots spread and increase very fast, where it is permitted to stand long unremoved. The stalks of this are slender, and incline downward; they are garnished with oval, spear-shaped, smooth leaves, placed by pairs, sitting close to the stalks. The flowers are produced at the end of the stalks; these are very large, and of a bright yellow colour, with a great number of stamina, which stand out beyond the petals; there are five styles in each flower, which are of the same length with the stamina. The flowers are succeeded by pyramidal seed-vessels with five cells, containing many small seeds. It flowers in June and July.

This plant is easily propagated by parting of the root; the best time for this is in October, that the plants may be well established before the drought of spring, otherwise they will not produce many flowers. As this will grow under trees, so it is a very proper plant to place under shrubs and trees to cover the ground, where they will make a good appearance during the season of their flowering.

 The

The eighth ſort grows naturally in the iſland of Minorca, from whence the ſeeds were ſent to England, by Mr. Salvador, an apothecary at Barcelona, in the year 1718; this riſes with a ſlender ſhrubby ſtalk in this country about two feet high, but in its native ſoil riſes ſeven or eight feet high, ſending out ſeveral weak branches of a reddiſh colour, which are marked where the leaves have fallen off with a cicatrice. The leaves are ſmall, oval, and waved on their edges, having ſeveral ſmall protuberances on their under ſide, ſitting cloſe to the ſtalks, half embracing them with their baſe. The flowers are produced at the top of the ſtalks; they are large, of a bright yellow colour, with a great number of ſtamina, which are a little ſhorter than the petals; theſe flowers have five ſtyles, and are ſucceeded by pyramidal capſules with five cells, which have a ſtrong ſmell of turpentine, and are filled with ſmall brown ſeeds: this plant has a ſucceſſion of flowers great part of the year, which renders it valuable; it is too tender to live through the winter in the open air in England, but requires no artificial heat: if the plants are placed in a dry airy glaſs-caſe in winter, where they may be protected from froſt, and enjoy a good ſhare of freſh air in mild weather, they will thrive better than in a warmer ſituation; but they muſt by no means be placed in a damp air, for their ſhoots ſoon grow mouldy and decay with damp, nor ſhould the plants have much water during the winter; but in ſummer they ſhould be expoſed in the open air, and in warm weather they ſhould be gently watered three times a week; they ſhould have a looſe ſandy ſoil, not over rich. This is propagated by cuttings, which ſhould be planted in June, in pots filled with light earth, and plunged into a very moderate hot-bed, whoſe heat is declining, ſhading them from the ſun in the heat of the day, and now and then refreſhing them with water; theſe cuttings, ſo managed, will put out roots in ſix or ſeven weeks, when they ſhould be carefully taken up, and each planted into a ſeparate ſmall pot, placing them in the ſhade till they have taken new root; then they may be removed to a ſheltered ſituation, where they may remain till the froſt comes, when they ſhould be removed into ſhelter.

If theſe are propagated by ſeeds, they ſhould be ſown in autumn, in the ſame way as is before directed for the fifth ſort, and the plants treated in the ſame manners as thoſe raiſed from cuttings.

The ninth ſort is the common Tutſan, or Park-leaves, which is ſometimes uſed in medicine. It grows naturally in woods in ſeveral parts of England, ſo is not often admitted into gardens; this hath a ſhrubby ſtalk, which riſes two feet high, ſending out ſome ſmall branches toward the top; theſe, and alſo the ſtalks, are garniſhed with oval heart-ſhaped leaves, ſitting cloſe to them with their baſe, they are placed by pairs at every joint. The flowers are produced in ſmall cluſters at the end of the ſtalk; theſe are yellow, but ſmaller than either of the ſorts here mentioned; they have many long ſtamina, which ſtand out beyond the flower, and three ſtyles. The germen afterward turns to a roundiſh fruit, covered with a moiſt pulp, which, when ripe, is black. The capſule has three cells, containing ſmall ſeeds. It flowers in June, and the ſeeds are ripe in autumn. It hath a perennial root, and may be propagated by parting it in autumn; it loves ſhade and a ſtrong ſoil.

The tenth ſort grows naturally in North America; this riſes with an upright herbaceous ſtalk three feet and a half high, ſending out ſeveral ſmall branches upward, which come out oppoſite, and are garniſhed with oblong leaves placed oppoſite, which half embrace the ſtalk with their baſe. At the end of each ſtalk is produced one pretty large yellow flower, with an obtuſe empalement, having many ſtamina, which are equal in length with the petals, and five ſtyles which are ſo cloſely joined as to appear but one. The ſtigmas are reflexed, which denote their number. This ſort ſeldom ripens ſeeds here, ſo is propagated by parting the roots. The beſt time for this is in autumn; it ſhould have a light ſoil and an open ſituation. The flowers appear the latter end of July, and in Auguſt.

The eleventh ſort grows naturally in China, from whence the ſeeds were brought to the Right Hon. the Earl of Northumberland, and the plants were raiſed in his Lordſhip's curious garden at Stanwick, and by his Lordſhip's generoſity the Chelſea garden was furniſhed with this plant.

The root of this plant is compoſed of many ligneous fibres, which ſtrike deep in the ground; from which ariſe ſeveral ſhrubby ſtalks near two feet high, covered with a purpliſh bark, and garniſhed with ſtiff ſmooth leaves about two inches long, and a quarter of an inch broad, placed by pairs, ſitting cloſe to the ſtalk; they are of a lucid green on their upper ſide, and gray on their under, having many tranſverſe veins running from the midrib to the border. The flowers are produced at the top of the ſtalks, growing in ſmall cluſters, each ſtanding upon a ſhort diſtinct foot-ſtalk; theſe have an empalement of one leaf, divided into five obtuſe ſegments almoſt to the bottom, which is of a deep purple colour. The flower is compoſed of five large obtuſe petals, of a bright yellow colour; theſe are concave, and in the center is ſituated an oval germen ſupporting a ſingle ſtyle, crowned by five ſlender ſtigmas, which bend on one ſide; the ſtyle is attended by a great number of ſtamina which are longer than the petals, and terminated by roundiſh ſummits.

This plant continues in flower great part of the year, which renders it the more valuable; and if it is planted in a very warm ſituation, it will live in the open air; but thoſe plants which ſtand abroad will not flower in winter, as thoſe do which are removed into ſhelter in autumn.

It may be propagated by ſlips from the root, or by laying down of the branches; if by ſlips, they ſhould be planted in the ſpring on a moderate hot-bed, which will forward their putting out new roots; the layers ſhould alſo be laid down at the ſame time, which will have taken root by autumn, when they may be tranſplanted into pots, and ſheltered under a frame in winter; and in the ſpring, part of theſe may be planted in a warm border, and the others continued in pots to be ſcreened in winter, leſt thoſe in the open air ſhould be killed.

HYPERICUM FRUTEX. See Spiræa.

HYPOCHÆRIS, a ſort of Hawkweed, of which there are two or three ſpecies, which grow naturally in England; the others are ſeldom admitted into gardens, therefore I ſhall not enumerate them.

HYPOPHYLLOSPERMOUS PLANTS [of ὑπὸ, under, φύλλον, a leaf, and σπέρμα, feed,] are ſuch plants as bear their ſeeds on the backſides of their leaves.

HYSSOPUS. Tourn. Inſt. R. H. 200. tab. 95. Lin. Gen. Plant. 628. [takes its name from the Hebrew word אזוב, in which language Hyſſop ſignifies a holy herb, or for purging or cleanſing ſacred places, as it is ſaid in the Pſalms, Purge me with Hyſſop. But what plant the Hyſſop of the antients was, is not known, but that it ſeems to have been a low plant, becauſe Solomon is ſaid to have deſcribed the plants from the Cedar to the Hyſſop.] Hyſſop; in French, *Hiſope.*

The Characters are,

*The empalement of the flower is oblong, cylindrical, ſtreaked, and permanent. It is of one leaf, cut into five acute parts at the top. The flower is of one petal, of the grinning kind, with a narrow cylindrical tube the length of the empalement. The chaps are inclining. The upper lip is ſhort, plain, roundiſh, erect, and indented at the top. The under lip is trifid, the two ſide ſegments being ſhorter than the middle one, which is crenated. It hath four ſtamina, which ſtand apart; two of them are longer than the petal, the other two are ſhorter, terminated by ſingle ſummits. It hath four germen, with a ſingle ſtyle*

*situated under the upper lip, crowned by a bifid stigma. The germen afterward becomes so many oval seeds sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, intitled Didynamia Gymnospermia, which contains those plants whose flowers have two long and two short stamina, and are succeeded by naked seeds in the empalement.

The Species are,

1. Hyssopus (*Officinalis*) spicis fecundis. Hort. Cliff. 304. *Hyssop with fruitful spikes.* Hyssopus officinarum cœrulea seu spicata. C. B. P. 217. *Hyssop of the shops with blue spikes, or the common Hyssop.*
2. Hyssopus (*Rubra*) spicis brevioribus, verticillis compactis. *Hyssop with shorter spikes, and whorls more compact.* Hyssopus rubro flore. C. B. P. 217. *Hyssop with a red flower.*
3. Hyssopus (*Altissimis*) spicis longissimis verticillis distantibus. *Hyssop with the longest spikes, and whorls at a greater distance.* Hyssopus verticillis florum rarioribus. Houst. *Hyssop with the whorls of flowers thinly ranged.*
4. Hyssopus (*Nepetoides*) caule acuto quadrangulo. Hort. Upsal. 163. *Hyssop with an acute square stalk.* Sideritis Canadensis altissima, scrophulariæ folio, flore flavescente. Tourn. Inst. 192. *Tallest Canada Ironwort, with a Figwort leaf and a yellowish flower.*
5. Hyssopus (*Lophanthus*) corollis subresupinatis staminibus corollâ brevioribus. Hort. Upsal. 162. *Hyssop with transverse petals, and the lower stamina shorter than the petal.* Nepeta floribus obliquis. Dill. *Catmint with oblique flowers.*

The first sort, which is the only one cultivated for use, grows a foot and a half high. The stalks are first square, but afterward become round; their lower parts are garnished with small spear-shaped leaves placed opposite, without foot-stalks, and seven or eight very narrow erect leaves (or bractæa) rising from the same joint. The upper part of the stalk is garnished with whorls of flowers, the lower ones standing half an inch apart, but the upper are almost joined together. The upper lip of the flower is indented at the top, and the under is cut into three parts, the middle being deeply indented at the point. There are four stamina in each flower, which spread at a distance from each other; the two upper are the shortest, which are situated on each side the upper lip; the two longer stand close to the two side segments, and are terminated by twin summits. At the bottom of the tube are situated four naked germen, supporting a slender style, sitting close to the upper lip, crowned by a bifid stigma; these germen afterward become four oblong black seeds, sitting in the empalement. The whole plant has a strong aromatic scent. It flowers in July and August, and the seeds ripen in September, but the roots will abide many years; it grows naturally in the Levant. There is a variety of this with white flowers, but doth not differ from the blue in any other particular.

The second sort doth not grow so tall as the first; the stalks branch more, and the spikes of flowers are much shorter than those of the first. The whorls are closer together, and have long narrow leaves situated under each. The flowers are of a fine red colour, and appear at the same time with the former. This sort is not quite so hardy as the common, for in 1739 the plants were all destroyed by the cold; this is certainly a distinct species, for I cultivated it from seeds twenty years, and never observed it to vary.

The third sort grows much taller than either of the other. The leaves are narrower, the whorls of flowers are farther asunder, the spikes of flowers are much longer, the flowers are larger, and of a deeper blue than those of the common sort, and the plant hath not so strong an odour. It flowers at the same time as the first.

These three sorts of Hyssop are propagated either by seeds or cuttings; if by the seeds, they must be sown in March, upon a bed of light sandy soil; and when the plants come up, they should be transplanted out to the places where they are to remain, placing them at least a foot asunder each way; but if they are designed to abide in those places for a long time, two feet distance will be small enough, for they grow pretty large, especially if they are not frequently cut, to keep them within compass; they thrive best upon a poor dry soil, in which situation they will endure the cold of our climate better than when they are planted on a richer soil. If you would propagate them by cuttings, they should be planted in April or May, in a border where they may be defended from the violent heat of the sun; and being frequently watered, they will take root in about two months; after which, they may be transplanted where they are to continue, managing them as was before directed for the seedling plants.

The first sort was formerly more cultivated than at present in England, that being the sort commonly used in medicine. The other species are preserved in curious gardens for their variety, but they are seldom cultivated for use.

They are very hardy plants, which will endure the cold of our winters in the open air, provided they are planted in a dry undunged soil; for when they are planted in a rich soil, they grow very luxuriant in summer, and are less able to resist the cold in winter; so that when any of these plants grow out of the joints of old walls, (as they frequently do) they will resist the most severe frost, and will be much more aromatic than those which grow in a rich soil.

The fourth sort grows naturally in North America; this hath a perennial root and an annual stalk, which decays in autumn. It rises with an upright square stalk near four feet high, garnished with oblique heart-shaped leaves, which are sawed on their edges, and end in acute points; they are placed opposite on short foot-stalks. The flowers grow in close thick spikes four or five inches long, at the top of the stalks. The upper lip is divided into two roundish segments, the lower one is divided into three, the two side segments standing erect, and the middle one is reflexed, and acutely sawed at the end. The two upper stamina, which are situated on each side the upper lip are the longest, the other two shorter join the two side segments of the lower lip; they are terminated by small summits. The germen are situated at the bottom of the tube, having a slender style under the upper lip, crowned by a bifid stigma. The germen afterward becomes four oblong brown seeds, sitting in the tubulous empalement. This sort flowers in July, and the seeds ripen in September.

There is a variety of this sort with purple stalks and purplish flowers. The leaves stand upon longer foot-stalks, and the spikes of flowers are thicker, but I cannot say if it is a distinct species or only a variety. It grows naturally in the same country with the other. It is titled, Betonica maxima, folio scrophulariæ, floribus incarnatis, by Herman. Par. Bat. 106.

The fifth sort grows naturally in Siberia. The seeds of this were sent me from the Imperial garden at Petersburgh, by the title of Lophanthus, and afterward I received some from Holland, which were titled, Nepeta floribus obliquis. Dill. This is a perennial plant with a strong fibrous root, sending out many square stalks, which divide into smaller branches, garnished with oblong leaves, crenated on their edges, set on by pairs. The flowers are produced at each joint in small clusters, two foot-stalks arising from the base of the leaves, about half an inch long, both inclining to one side of the stalk; each of these foot-stalks divide again into two smaller, and these do each support a cluster of four or five flowers, which have swelling tubulous empalements, cut into five acute segments at the top. The tube of the petal is longer than the empalement. The lips of the flower are oblique to it, being situated horizontally. The two upper stamina and the style stand out beyond the petal, but the other are shorter. The flowers are blue, and appear in June and July, and the seeds ripen in September.

Both these sorts are very hardy, and may be easily propagated by seeds, which should be sown in autumn; for those sown in the spring, often lie a year in the ground before they vegetate; when the plants come up, they must be kept clean from weeds, and thinned where they are too close. The following autumn they should be transplanted where they are to remain, and the plants will flower in summer, and produce seeds, but the roots will abide some years.

It hath been a great dispute amongst modern writers, whether the Hyssop now commonly known is the same which is mentioned in scripture; about which there is great room to doubt, there being very little grounds to ascertain that plant, though it is most generally thought to be the Winter Savory, which plant is now in great request amongst the inhabitants of the eastern countries, for outward washings or purification.

# J.



JACEA. See CENTAUREA.

JACOBÆA. See SENECIO and OTHONNA.

JACQUINIA. Lin. Gen. 254.

The CHARACTERS are,

*The empalement of the flower is composed of five roundish concave leaves, and is permanent. The flower has one bell-shaped petal, which is bellied, cut into ten segments. It hath five awl-shaped stamina arising from the receptacle, terminated by halbert-shaped summits, and an oval germen supporting a style the length of the stamina, crowned by a headed stigma. The germen afterward becomes a roundish berry with one cell, containing one seed.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flowers having five stamina and one style.

The SPECIES are,

1. JACQUINIA (*Ruscifolia*) foliis lanceolatis acuminatis. Jacq. Amer. 15. Lin. Sp. 271. *Jacquinia with spear-shaped acute-pointed leaves.* Fruticulus foliis rusci stellatis. Hort. Elth.
2. JACQUINIA (*Armillaris*) foliis obtusis cum acumine. Jacq. Amer. 15. Lin. Sp. 272. *Jacquinia with blunt leaves ending in acute points.* Chrysophyllum Barbasco. Lœfl. it. 204.
3. JACQUINIA (*Linearis*) foliis linearibus acuminatis. Jacq. Amer. 15. Lin. Sp. 272. *Jacquinia with linear sharp-pointed leaves.*

The first sort grows naturally in the island of Cuba, and in some other warm parts of America; it rises with a shrubby stalk about a foot high, which is ligneous at the bottom, and about the size of a swan's quill, covered with a dark brown bark, sending out a few slender branches, garnished at intervals with hand-shaped stiff leaves, placed in whorls round them; these are stiff like those of Butcher's Broom, ending with sharp points, of a deep green on their upper side, but pale on their under; the flowers are (according to Plumier's figure) produced from between the leaves on the top of the branches; but having seen no flowers in England, so I can give no farther account of them.

The second sort grows naturally at Carthagena, Martinico, and other parts of South America, where it rises with a shrubby stalk four or five feet high, dividing toward the top into four branches, which are situated in whorls round the principal stalk, garnished with oblong blunt leaves, placed also in whorls, having a short slender apex. The flowers are produced in a racemus on the end of the branches, each containing five or six white flowers of a thick consistence, which have a scent like Jasmine flowers, which they retain after they decay, so are worn by the ladies of those countries for ornament.

The third sort grows naturally on the borders of the sea, in the island of Dominica; this is an under-shrub, of a very low growth, rarely rising about two feet high, dividing into several branches, garnished with linear stiff leaves, ending with a thorn; these are placed in whorls round the branches, and from the middle of the whorls come out the foot-stalks of the flowers, each being terminated by one small white flower without scent.

As these plants are natives of hot countries, so they will not live in England, unless they are placed in a warm stove, and treated in the manner directed for other plants from the same countries, giving them little water in winter, and in warm weather plenty of fresh air. They are raised from seeds, when they can be procured from the countries where they naturally grow; which must be sown on a hot-bed, and may afterward be propagated by cuttings, though it is with difficulty they take root.

JALAPA. See MIRABILIS.

JASIONE. Lin. Gen. Plant. 896. This is the Rapunculus scabiosæ capitulo cœruleo. C. B. P. 22. Rampions with Scabious heads. This plant grows naturally on sterile ground in most parts of England, and is rarely admitted into gardens.

JASMINOIDES. See CESTRUM and LYCIUM.

JASMINUM. Tourn. Inst. R. H. 597. tab. 368. Lin. Gen. Plant. 17. [This name is Arabic.] The Jasmine, or Jessamine-tree; in French, *Jasmin.*

The CHARACTERS are,

*The flower hath a tubulous empalement of one leaf, which is permanent, and cut into five segments at the brim, which are erect. The flower is of one petal, having a long cylindrical tube, cut into five segments at the top, which spread open. It hath two short stamina, which are terminated by small summits, and are situated within the tube of the petal. In the center is situated a roundish germen, supporting a slender style, crowned by a bifid stigma. The germen afterward turns to an oval berry, with a soft skin inclosing two seeds, which are flat on those sides which join, and convex on the other.*

This genus of plants is ranged in the first section of Linnæus's second class, intitled Diandria Monogynia, in which he ranges those plants whose flowers have two stamina and one style.

The SPECIES are,

1. JASMINUM (*Officinale*) foliis oppositis pinnatis, foliolis acuminatis. *Jasmine with winged leaves placed opposite,*

*posite, whose lobes end in acute points.* Jasminum vulgatius, flore albo. C. B. P. 397. *The common white Jasmine.*

2. Jasminum (*Humile*) foliis alternis ternatis simplicibusque, ramis angulatis. Hort. Upsal. 5. *Jasmine with trifoliate winged leaves placed alternate, and angular branches.* Jasminum humile luteum. C. B. P. 397. *Dwarf yellow Jasmine, commonly called the Italian yellow Jasmine.*
3. Jasminum (*Fruticans*) foliis alternis ternatis simplicibusque, ramis angulatis. Hort. Cliff. 5. *Jasmine with trifoliate single leaves placed alternate, and angular branches.* Jasminum luteum, vulgò dictum bacciferum. C. B. P. 398. *The common yellow Jasmine.*
4. Jasminum (*Grandiflorum*) foliis oppositis pinnatis, foliolis brevioribus obtusis. *Jasmine with winged leaves placed opposite, whose lobes are shorter and obtuse.* Jasminum humilis, magno flore. C. B. P. 398. *The Spanish white, or Catalonian Jasmine with a larger flower.*
5. Jasminum (*Odoratissimum*) foliis alternis ternatis, foliolis ovatis, ramis teretibus. *Jasmine with trifoliate leaves placed alternate, whose lobes are oval, and taper branches.* Jasminum Indicum flavum odoratissimum. Fer. Flor. *The sweet-scented yellow Indian Jasmine.*
6. Jasminum (*Azoricum*) foliis oppositis ternatis, foliolis cordato-acuminatis. *Jasmine with trifoliate leaves placed opposite, whose lobes are heart-shaped and pointed.* Jasminum Azoricum trifoliatum, flore albo, odoratissimum. Hort. Amst. *The three-leaved Azorian Jasmine, with very sweet white flowers, commonly called the Ivy-leaved Jasmine.*
7. Jasminum (*Capense*) foliis lanceolatis oppositis integerrimis, floribus triandris. *Jasmine with spear-shaped entire leaves placed opposite, and flowers with three stamina.*

The first sort is the common white Jasmine, which is a plant so generally known as to need no description. This grows naturally at Malabar, and in several parts of India, yet has been long inured to our climate, so as to thrive and flower extremely well, but never produces any fruit in England; this hath weak trailing branches, so requires the assistance of a wall or pale to support them. It is easily propagated by laying down the branches, which will take root in one year, and may then be cut from the old plant, and planted where they are designed to remain: it may also be propagated by cuttings, which should be planted early in the autumn, and if the winter should prove severe, the surface of the ground between them should be covered with tan, sea-coal ashes, or saw-dust, which will prevent the frost from penetrating deep into the ground, and thereby preserve the cuttings; or where these are wanting, some Peas-haulm, or other light covering should be laid over the cuttings in hard frost; but these must be removed when the weather is mild, for they will keep off the air and occasion damps, which often destroy them.

When these plants are removed, they should be planted where they are designed to be continued, which should be either against some wall, pale, or other fence, where the flexible branches may be supported; for although it is sometimes planted as a standard, and formed into a head, yet it will be very difficult to keep it in any handsome order; or if you do, you must cut off all the flowering branches; for the flowers are always produced at the extremity of the same year's shoots, which, if shortened before the flowers are blown, will entirely deprive the trees of flowers. These plants should be permitted to grow rude in the summer, for the reason before given; nor should you prune and nail them until the middle or latter end of March, when the frosty weather is past; for if it should prove sharp frosty weather after their rude branches are pruned off, and the strong ones are exposed thereto, they are very often destroyed; and this plant being very backward in shooting, there will be no danger of hurting them by late pruning.

There are two varieties of this with variegated leaves, one with white, and the other yellow stripes, but the latter is the most common: these are propagated by budding them on the plain Jasmine, and it often happens, that the buds do not take, but yet they have communicated their gilded miasma to the plants; so that in a short time after, many of the branches both above and below the places where the buds have been inserted have been thoroughly tinctured; and the following year I have often found very distant branches, which had no other communication with those which were budded than by the root, have been as compleatly tinged as any of the nearer branches, so that the juices must have descended into the root. The two striped sorts should be planted in a warm situation, especially the white striped; for they are much more tender than the plain, and are very subject to be destroyed by great frosts, if they are exposed thereto; therefore the white striped should be planted to a south or south-west aspect, and in very severe winters their branches should be covered with mats or straw, to prevent their being killed: the yellow striped is not so tender, so may be planted against walls to east or west aspects; but these plants with variegated leaves, are not so much in esteem as formerly.

The second sort is frequently called Italian yellow Jasmine by the gardeners, the plants being annually brought from thence by those who come over with Orange-trees. These plants are generally grafted upon the common yellow Jasmine stocks, so that if the graft decays, the plants are of no value. This sort is somewhat tenderer than the common, yet it will endure the cold of our ordinary winters, if it is planted in a warm situation. The flowers of this kind are generally larger than those of the common yellow sort, but have very little scent, and are seldom produced so early in the season. It may be propagated by laying down the tender branches, as was directed for the common white sort; or by budding or inarching it upon the common yellow Jasmine, the latter of which is preferable, as making the plants hardier than those which are obtained from layers: they should be planted against a warm wall, and in very severe winters will require to be sheltered with mats, or some other covering, otherwise they are subject to be destroyed. The manner of dressing and pruning being the same as was directed for the white Jasmine, I shall not repeat it.

The third sort was formerly more cultivated in the gardens than at present, for as the flowers have no scent, so few persons regard them. This hath weak angular branches which require support, and will rise to the height of eight or ten feet, if planted against a wall or pale; but the plants do often produce a great number of suckers from their roots, whereby they become troublesome in the borders of the pleasure-garden; and as they cannot be kept in any order as standards, so there are few of the plants at present introduced into gardens. It is easily propagated by suckers or layers.

The fourth sort grows naturally in India, and also in the island of Tobago, where the woods are full of it; the late Mr. Robert Millar sent me over a great quantity of it from thence. This hath much stronger branches than the common white sort; the leaves are winged, and are composed of three pair of short obtuse lobes, terminated by an odd one, ending in an acute point; these lobes are placed closer than those of the common Jasmine, and are of a lighter green; the flowers come out from the wings of the stalks, standing on foot-stalks which are two inches long, each sustaining three or four flowers, which are of a blush red on their outside, but white within; the tube of the flower is longer, the segments are obtuse, twisted at the mouth of the tube, and are of a much thicker texture than those of the common sort, so that there is no doubt of its being a distinct species: the reason for Dr. Linnæus's supposing it to be so, was by mistake; for as these plants are generally grafted upon stocks of the common Jasmine, so there are always shoots coming out from the stocks of that sort, which, if

if permitted to ſtand, will produce flowers; and theſe often ſtarve and kill the grafts, ſo that there will be only the common ſort left; and this has been the caſe with ſome plants which he examined, therefore ſuppoſed the difference of the other ſort was wholly owing to culture; whereas, if he had only obſerved the difference of their leaves, he would have certainly made two diſtinct ſpecies of them, which he has now done in the laſt edition of his ſpecies.

This plant is propagated by budding or inarching it upon the common white Jaſmine, on which it takes very well, and is rendered hardier than thoſe which are upon their own ſtocks. But the plants of this kind being brought over from Italy every ſpring in ſo great plenty, they are ſeldom raiſed here: I ſhall therefore proceed to the management of ſuch plants as are uſually brought into England from the place above-mentioned, which are generally tied up in ſmall bunches, containing four plants, and their roots wrapped about with moſs, to preſerve them from drying; which, if it happen that the ſhip has a long paſſage, will often occaſion them to puſh out ſtrong ſhoots from their roots, which muſt always be taken off before they are planted, otherwiſe they will exhauſt the whole nouriſhment of the plant, and deſtroy the graft.

In the making choice of theſe plants, you ſhould carefully obſerve if their grafts are alive, and in good health: for if they are brown and ſhrunk, they will not puſh out, ſo that there will be only the ſtock left, which is of the common ſort.

When you receive theſe plants, you muſt clear the roots of the moſs, and all decayed branches ſhould be taken off; then place their roots into a pot or tub of water, which ſhould be ſet in the green-houſe, or ſome other room, where it may be ſcreened from the cold; in this ſituation they may continue two days, after which you muſt prune off all the dry roots, and cut down the branches within four inches of the place where they were grafted, and plant them into pots filled with freſh light earth; then plunge the pots into a moderate hot-bed of tanners bark, obſerving to water and ſhade them, as the heat of the ſeaſon may require. In about a month or ſix weeks after they will begin to ſhoot, when you muſt carefully rub off all ſuch as are produced from the ſtock below the graft; and you muſt now let them have a great ſhare of air, by raiſing the glaſſes in the heat of the day; and as the ſhoots extend, they ſhould be topped, to ſtrengthen them, and by degrees ſhould be hardened to endure the open air, into which they ſhould be removed the beginning of June, but muſt have a warm ſituation the firſt ſummer; for if they are too much expoſed to the winds, they will make but indifferent progreſs, being rendered ſomewhat tender by the hot-bed. If the ſummer proves warm, and the trees have ſucceeded well, they will produce ſome flowers in the autumn following, though they will be few in number, and not near ſo ſtrong as they will be the ſucceeding years, when the trees are ſtronger and have better roots.

Theſe plants are commonly preſerved in green-houſes, with Oranges, Myrtles, &c. and during the winter ſeaſon, will require to be frequently watered; which ſhould be performed ſparingly each time, eſpecially in cold weather, for too much wet at that ſeaſon will be apt to rot the fibres of their roots; they ſhould alſo have a great ſhare of freſh air when the weather, will permit, for which purpoſe they ſhould be placed in the cooleſt part of the green-houſe, among plants that are hardy, where the windows may be opened every day, except in froſty weather; nor ſhould they be crowded too cloſe among other plants, which often occaſions the tender part of their ſhoots to grow mouldy and decay. In April the ſhoots of theſe plants ſhould be ſhortened down to four eyes, and all the weak branches ſhould be cut off; and if you have the conveniency of a glaſs-ſtove, or a deep frame, to place the pots in at that ſeaſon, to draw them out again, it will be of great ſervice in forwarding their flowering; yet ſtill you ſhould be careful not to force them too much; and as ſoon as they have made ſhoots three or four inches long, the glaſſes ſhould be opened in the day time, that the plants may, by degrees, be inured to the open air, into which they ſhould be removed by the latter end of May, or the beginning of June; otherwiſe their flowers will not be ſo fair, nor continue ſo long. If the autumn prove favourable, theſe plants will continue to produce freſh flowers until November; and ſometimes when they are ſtrong, they will continue flowering later; but then they muſt have a great ſhare of air when the weather is mild and will admit of it, otherwiſe the flower-buds will grow mouldy and decay.

But notwithſtanding moſt people preſerve theſe plants in green-houſes, yet they will endure the cold of our ordinary winters in the open air, if planted againſt a warm wall, and covered with mats in froſty weather; they will alſo produce ten times as many flowers in one ſeaſon as thoſe kept in pots, and the flowers will likewiſe be much larger; but they ſhould not be planted abroad till they have acquired ſtrength, ſo that it will be neceſſary to keep them in pots three or four years, whereby they may be ſheltered from the froſt in winter; and when they are planted againſt the wall, which ſhould be in May, that they may take good root in the ground before the ſucceeding winter, you muſt turn them out of the pots, preſerving the earth to their roots; and having made holes in the border where they are to be planted, you ſhould place them therein, with their ſtems cloſe to the wall; then fill up the holes round their roots with good, freſh, rich earth, and give them ſome water to ſettle the ground about them, and nail up their ſhoots to the wall, ſhortening ſuch of them as are very long, that they may puſh out new ſhoots below to furniſh the wall, continuing to nail up all the ſhoots as they are produced. In the middle, or toward the latter end of July, they will begin to flower, and continue to produce new flowers until the froſt prevents them; which, when you obſerve, you ſhould carefully cut off all the tops of ſuch ſhoots as have buds formed upon them, as alſo thoſe which have the remains of faded flowers left; for if theſe are ſuffered to remain on, they will ſoon grow mouldy, eſpecially when the trees are covered, and thereby infect many of the tender branches, which will greatly injure the trees.

Toward the middle of November, if the weather proves cold and the nights froſty, you muſt begin to cover your trees with mats, which ſhould be nailed over them pretty cloſe; but this ſhould be done when the trees are perfectly dry, otherwiſe the wet being lodged upon the branches, will often cauſe a mouldineſs upon them, and the air being excluded therefrom, will rot them in a ſhort time: it will alſo be very neceſſary to take off the mats as ſoon as the weather will permit, to prevent this mouldineſs, and only keep them cloſe covered in froſty weather, and in the nights; at which time you ſhould alſo lay ſome mulch upon the ſurface of the ground about their roots, and faſten ſome bands of hay about their ſtems, to guard them from the froſt; and in very ſevere weather, you ſhould add a double or treble covering of mats over the trees; by which method, carefully performed, you may preſerve them through the hardeſt winters. In the ſpring, as the weather is warmer, you ſhould by degrees take off the covering; but you ſhould be careful not to expoſe them too ſoon to the open air, as alſo to guard them againſt the morning froſts and dry eaſterly winds, which often reign in March, to the no ſmall deſtruction of tender plants if they are expoſed thereto; nor ſhould you quite remove your covering until the middle of April, when the ſeaſon is ſettled; at which time you ſhould prune the trees, cutting out all decayed and weak branches, ſhortening the ſtrong ones to about two feet long, which will cauſe them to ſhoot ſtrong, and produce many flowers.

There is a variety of this with ſemi-double flowers, which is at preſent more rare in England, and only to be found in ſome curious gardens; though in Italy it is pretty common, from whence it is ſometimes

brought over amongſt the ſingle; the flowers of this kind have only two rows of leaves, ſo that it is rather cultivated for itscurioſity, than for any extraordinary beauty in the flowers. This may be propagated by budding it upon the common white Jaſmine, as hath been directed for the ſingle, and muſt be treated in the ſame manner.

The fifth ſort grows naturally in India; this riſes with an upright woody ſtalk eight or ten feet high, covered with a brown bark, ſending out ſeveral branches which want no ſupport; theſe are cloſely garniſhed with trifoliate leaves of a lucid green, which are placed alternate on the branches; the two ſide lobes of theſe leaves which grow oppoſite, are much leſs than the end one; they are oval and entire, continuing green all the year: the flowers are produced at the end of the ſhoots in bunches, which have long ſlender tubes, and are divided at the top into five obtuſe ſegments which ſpread open; theſe flowers are of a bright yellow, and have a moſt grateful odour. They come out in July, Auguſt, September, and October, and ſometimes continue to the end of November; they are frequently ſucceeded by oblong oval berries, which turn black when ripe, and have each two ſeeds.

This ſort of Jaſmine is propagated either by ſeeds, or laying down the tender branches; if you would propagate them by ſeeds, which they ſometimes produce in England, you ſhould make a moderate hot-bed in the ſpring, into which you ſhould plunge ſome ſmall pots, filled with freſh light earth; and in a day or two after, when you find the earth in the pots warm, you muſt put your ſeeds therein; about four in each pot will be ſufficient, covering them about an inch thick with the ſame light earth, and obſerve to refreſh the pots with water as often as you ſhall perceive the earth dry; but do not give them too much at each time, which would be apt to rot the ſeeds.

In about ſix or eight weeks after ſowing, the plants will appear above ground, at which time it will be neceſſary to remove the pots into another freſh hot-bed, of a moderate temperature, in order to bring the plants forward; you muſt alſo be careful to water them as often as is neceſſary, and in the great heat of the day the glaſſes ſhould be tilted pretty high, and ſhaded with mats, to prevent the plants from being ſcorched with heat. About the middle of May you ſhould begin to harden them to the open air, by taking off the glaſſes when the weather is warm; but this muſt be done cautiouſly, for you ſhould not expoſe them to the open ſun in a very hot day at firſt, which would greatly injure them; but rather take off the glaſſes in warm cloudy weather at firſt, or in gentle ſhowers of rain, and ſo by degrees inure them to bear the ſun; and in June you ſhould take the pots out of the hot-bed, and carry them to ſome well ſheltered ſituation, where they may remain until the beginning of October; at which time they muſt be carried into the green-houſe, obſerving to place them where they may enjoy as much free air as poſſible when the windows are opened, as alſo to be clear from the branches of other plants.

During the winter ſeaſon they will require to be often watered, but you muſt be careful not to give them too much at each time; and in March you muſt remove theſe plants each into a ſeparate pot, being careful not to take the earth from their roots; and if at this time you plunge them into a freſh moderate hot-bed, it will greatly facilitate their rooting again, and be of great ſervice to the plants; but when they are rooted, you muſt give them a great deal of air; for if you draw them too much, they will become weak in their ſtems, and incapable to ſupport their heads, which is a great defect in theſe trees.

You muſt alſo harden them to the open air, into which they ſhould be removed about the middle of May, obſerving, as was before directed, to place them in a ſituation that is defended from ſtrong winds, which are injurious to theſe plants, eſpecially while they are young. In winter houſe them as before, and continue the ſame care, with which they will thrive very faſt, and produce annually great quantities of flowers.

Theſe plants are pretty hardy, and will require no other care in winter, than only to defend them from hard froſts; nor do I know whether they would not live in the open air, if planted againſt a warm wall, which is what ſhould be tried by planting ſome againſt a wall for that purpoſe; and I think we have little reaſon to doubt of the ſucceſs, ſince they are much hardier than the Spaniſh; but there is this difference between them, viz. theſe plants have large, thick, Evergreen leaves, ſo that if they were covered with mats, as was directed for the Spaniſh Jaſmine, the leaves would rot and decay the ſhoots; but as theſe will only require to be covered in extreme froſt, ſo if their roots are well mulched, and a mat or two looſely hung over them in ordinary froſts, it will be ſufficient; and theſe mats being either rolled up, or taken quite off in the day, there will be no great danger of their being hurt, which only can proceed from being too long cloſe covered.

In the ſpring theſe ſhould be pruned, when you ſhould cut off all decayed branches; but you muſt not ſhorten any of the other branches, as was directed for the Spaniſh ſort, for the flowers of this kind are produced only at the extremity of the branches, which, if ſhortened, they would be cut off; and theſe growing of a more ligneous ſubſtance than the other, will not produce ſhoots ſtrong enough to flower the ſame year. If you would propagate this plant from layers, the ſhoots ſhould be laid down in March; and if you give them a little cut at the joint, as is practiſed in laying of Carnations, it will promote their rooting: you ſhould always obſerve to refreſh them often with water, when the weather is dry; which, if carefully attended to, the plants will be rooted by the ſucceeding ſpring, fit to be tranſplanted, when they muſt be planted in pots filled with light earth, and managed as was before directed for the ſeedling plants.

This ſort is frequently propagated, by inarching the young ſhoots into ſtocks of the common yellow Jaſmine, but the plants ſo raiſed do not grow ſo ſtrong as thoſe which are upon their own ſtock; beſides, the common yellow Jaſmine is very apt to ſend out a great number of ſuckers from the root, which renders the plants unſightly; and if theſe ſuckers are not conſtantly taken off as they are produced, they will rob the plants of their nouriſhment.

The ſixth ſort grows naturally in the Azores; this hath long ſlender branches which require ſupport, and may be trained twenty feet high; they are garniſhed with trifoliate leaves, whoſe lobes are large and heart-ſhaped, of a lucid green, and are placed oppoſite on the branches; they continue all the year. The flowers are produced at the end of the branches, in looſe bunches; they have long narrow tubes, which at the top are cut into five ſegments ſpreading open; they are of a clear white, and have a very agreeable ſcent. This flowers at the ſame time with the former; the gardeners call it frequently the Ivy-leaved Jaſmine.

The Azorian Jaſmine is alſo pretty hardy, and requires no more ſhelter than only from hard froſts; and I am apt to think, if this ſort was planted againſt a warm wall, and managed as hath been directed for the yellow Indian Jaſmine, it would ſucceed very well; for I remember to have ſeen ſome plants of this kind growing againſt a wall in the gardens at Hampton Court, where they had endured the winter, and were in a more flouriſhing ſtate than ever I ſaw any of the kind in pots, and produced a greater quantity of flowers. Theſe plants are propagated in the ſame manner as the yellow Indian, and require the ſame management.

Theſe plants are as deſerving of a place in all green-houſes, as any which are there preſerved; for their leaves being of a ſhining green, make a good appearance all the year; and their flowers having a fine ſcent, and continuing ſo long in ſucceſſion, renders them very valuable.

The ſeventh ſort was brought from the Cape of Good Hope, by Captain Hutchinſon of the Godolphin, who diſcovered it growing naturally, a few miles up the land from the ſea, being drawn to it by the great fragrancy of its flowers, which he ſmelt at ſome diſtance from the plant, which was then in full flower; and after having viewed the plant, and remarked the place of its growth, he returned thither the following day with proper help, and a tub to put it in, and cauſed it to be carefully taken up, and planted in the tub with ſome of the earth on the ſpot, and conveyed on board his ſhip, where it continued flowering great part of the voyage to England, where it arrived in good health, and has for ſome years continued flowering, in the curious garden of Richard Warner, Eſq; at Woodford in Eſſex, who was ſo obliging as to favour me with branches of this curious plant in flower, to embelliſh one of the numbers of my figures of plants, where it is repreſented in the 180th plate.

This plant ſeems not to have been known to any of the botaniſts, for I have not met with any figure or deſcription of it in any of the books; there is one ſort which is figured in the Malabar garden, and alſo in Burman's plants of Ceylon, which approaches near this; it is titled Nandi ervatum major. Hort. Mal. But it differs from this, in having longer and narrower leaves; the tube of the flower is larger, and the ſegments do not ſpread ſo much as this; the flowers alſo of the Cape Jaſmine fade to a buff colour before they decay, therefore there is no doubt of its being a different ſpecies from that of Dr. Burman; but it is ſurprizing that this plant ſhould be unknown to the people at the Cape of Good Hope, for there was not one plant of it in their curious garden, nor could the captain ſee any other plant of it but that which he brought away.

The ſtem of this plant is large and woody, ſending out many branches, which are firſt green, but afterward the bark becomes gray and ſmooth; the branches come out by pairs oppoſite, and have ſhort joints; the leaves are alſo ſet oppoſite, cloſe to the branches; they are five inches long, and two inches and a half broad in the middle, leſſening to both ends, terminating in a point; they are of a lucid green, having ſeveral tranſverſe veins from the midrib to the borders; they are entire, and of a thick conſiſtence. The flowers are produced at the end of the branches, ſitting cloſe to the leaves; they have a tubulous empalement, with five corners or angles, cut deep at the brim, into five long narrow ſegments, ending in acute points: the flower hath but one petal, for although it is cut into many deep ſegments at the top, yet theſe are all joined in one tube below; ſome of theſe flowers are much more double than others, having three or four orders of petals; theſe which have ſo many, have only a bifid ſtigma, but thoſe which are leſs double have trifid ſtigmas. All thoſe flowers which I have examined have but one or two ſtamina, which may be occaſioned by the fulneſs of the flowers; as is often obſerved in many kinds of plants, whoſe flowers have a greater number of petals than uſual, many of which want both parts of generation, and ſome of them have no male parts. This flower, when fully blown, is as large as a middling Roſe, and ſome of them are as double as the Damaſk Roſe; they have a very agreeable odour; on the firſt approach it is ſomething like that of the Orange flower, but when more cloſely ſmelt to, has the odour of the common double white Narciſſus. The ſeaſon of this plant flowering in England, is in July and Auguſt, but in its native country it is ſuppoſed to flower great part of the year; for Captain Hutchinſon, who brought the plant over, ſaid there was a ſucceſſion of flowers on it, till the ſhip arrived in a cold climate, which put a ſtop to its growth.

Dr. Linnæus has been induced from what has been printed in the Tranſactions of the Royal Society, to alter the title of this plant to Gardenia; but as the deſcription of the plant with its characters as there printed, was taken from a double flower by ſome haſty people, who ſhould have remembred what Linnæus has written to caution perſons againſt regarding the double flowers of all kinds, in ranging them in their claſſes and genera, which if they had adhered to, they would not have made this miſtake; for I have ſince raiſed ſeveral of the plants from ſeeds, ſome of which have produced flowers which were ſingle, having all the marks of the double, the flowers altering to a buff colour before they faded, and all theſe flowers had each but three ſtamina and a trifid ſtigma; whereas in the characters ſet down by Linnæus, there is no ſtamina, but five linear antheræ, by which it is plain from the increaſe of the number of petals (or rather their ſegments) has occaſioned an alteration in the parts of generation; which is alſo very conſpicuous in the double flowers of Dianthus, where ſome flowers have but two or three ſtamina, when the ſame ſpecies with ſingle flowers have uſually ten. Linnæus alſo ſuppoſes the capſule of the ſeed to have two cells full of ſmall ſeeds; but the perſons who led him into this miſtake, have ſince ſuppoſed the figure given by Dr. Plukenet in his 448th plate, under the title of Um-ky, to be the fruit of this plant; whereas this has three cells filled with angular ſweet-ſcented ſeeds, as the ſpecimens I have of that demonſtrate, by which it is certain they are the fruit of a different plant; for the ſeeds which I ſowed of this Jaſmine, were a berry compoſed of two ſeeds like the other Jaſmines; therefore I have continued it under the ſame genus, with an addition to the title of its having three ſtamina.

This plant is eaſily propagated by cuttings during the ſummer ſeaſon; the cuttings ſhould be planted in pots, and plunged into a moderate hot-bed, covering them cloſe with either bell or hand-glaſſes to exclude the external air, being careful to ſcreen them from ſun in the day time; when they have taken root they ſhould be carefully parted, and put each into a ſeparate ſmall pot, plunging them again into the hot-bed, and ſhading them until they have taken new root, after which they ſhould be gradually inured to the open air.

Though the cuttings of this plant take root freely, and make ſtrong ſhoots a year or two after, yet in three or four years they are very apt to ſtint in their growth, their leaves turning pale and ſickly, and frequently die ſoon after; this has happened every where within my knowledge, although the plants have been kept in various degrees of heat in winter; and in ſummer when they have been differently managed, they have frequently failed. I have alſo been informed by a gentleman who lived ſome years in India, where he had the plants in his garden, they frequently went off in the ſame manner. This has greatly leſſened the value of the plants in England.

**JASMINUM ARABICUM.** See Coffee.

**JASMINUM ILICIS FOLIO.** See Lantana.

**JASMINE**, the Arabian. See Nyctanthes.

**JASMINE**, the Perſian. See Syringa.

**JATROPHA.** Lin. Gen. Plant. 961. Manihot. Tourn. Inſt. R. H. 958. tab. 438. Caſſada, or Caſſava; in French *Caſſave*.

The Characters are,

*It hath male and female flowers in the ſame plant; the male flowers have a ſcarce viſible empalement; they are ſalver-ſhaped, of one petal, with a ſhort tube, whoſe brim is cut into five roundiſh ſegments which ſpread open; they have ten awl-ſhaped ſtamina, five being alternately ſhorter than the other, and are joined cloſe together, ſtanding erect in the center of the flower, terminated by roundiſh looſe ſummits. The female flowers which are ſituated in the ſame umbel have no empalement, but have five petals ſpread open like a Roſe. In the center is a roundiſh germen with three deep furrows, ſupporting three ſtyles, crowned by ſingle ſtigmas. The germen afterward becomes a roundiſh capſule with three cells, each containing one ſeed.*

This genus of plants is ranged in the ninth ſection of Linnæus's twenty-firſt claſs, intitled Monœcia Mo-

nodelphia, which includes those plants which have male and female flowers on the same plant, and the stamina are collected in one body.

The Species are,

1. Jatropha (*Manihot*) foliis palmatis, lobis lanceolatis integerrimis lævibus. Lin. Sp. Plant. 1007. *Jatropha with hand-shaped leaves, whose lobes are spear-shaped, entire, and smooth.* Manihot Theveti, juca & cassavi. J. B. 2. 794. *The Manihot of Thevet, and the Juca or Cassava of John Bauhin.*

2. Jatropha (*Quinquelobatus*) foliis quinquelobatis, lobis acuminatis, acutè dentatis lævibus, caule fruticoso. *Jatropha with leaves composed of five smooth lobes ending in points, which are sharply indented on their edges, and a shrubby stalk.* Jussievia frutescens, non spinosa, foliis glabris & minus laciniatis. Houst. MSS. *Shrubby Jussievia without spines, and smooth leaves less divided.*

3. Jatropha (*Urens*) aculeata, foliis quinquelobatis acutè incisis, caule herbaceo. *Prickly Jatropha, with leaves having five lobes which are sharply cut on their edges, and an herbaceous stalk.* Jussievia herbacea, spinosissima, urens, foliis digitatis & laciniatis. Houst. MSS. *The most prickly stinging and herbaceous Jussievia, with fingered leaves which are jagged.*

4. Jatropha (*Herbacea*) aculeata, foliis trilobis, caule herbaceo. Lin. Sp. Plant. 1007. *Prickly Jatropha, with leaves having three lobes and an herbaceous stalk.* Jussievia herbacea spinosissima, urens, foliis trilobatis minimè incisis. Houst. MSS. *Prickly stinging herbaceous Jussievia, with leaves having three lobes, which are very slightly indented.*

5. Jatropha (*Vitifolius*) foliis palmatis dentatis aculeatis. Hort. Cliff. 445. *Jatropha with hand-shaped, indented, prickly leaves.* Manihot spinosissima, folio vitigineo. Plum. Cat. 20. *The most prickly Cassava with a Vine leaf.*

6. Jatropha (*Aconitifolius*) foliis lobatis dentatis acuminatis, urentibus, caule arboreo. *Jatropha with lobated leaves which are indented, acute-pointed, and stinging, and a tree-like stalk.* Jussievia arborea, minùs spinosa, floribus albis umbellatis, foliis aconiti urentibus. Houst. MSS. *Tree Jussievia which is less prickly, with white flowers growing in umbels, and stinging leaves like those of Wolfsbane.*

7. Jatropha (*Multifida*) foliis multipartitis lævibus, stipulis setaceis multifidis. Hort. Cliff. 445. *Jatropha with smooth leaves divided into many parts, and bristly stipulæ with many points.* Ricinoides arbor Americana, folio multifido. 656. *Tree American Bastard Ricinus with a many pointed leaf, commonly called French Physic Nut in America.*

8. Jatropha (*Curcas*) foliis cordatis angulatis. Hort. Cliff. 445. *Jatropha with angular heart-shaped leaves.* Ricinoides Americana gossypii folio. Tourn. Inst. 656. *American Bastard Ricinus with a Cotton leaf, commonly called Physic Nut in America.*

9. Jatropha (*Staphysagrifolia*) foliis quinquepartitis, lobis ovatis integris, setis glandulosis ramosis. Flor. Leyd. Prod. 202. *Jatropha with leaves divided into five parts, the lobes whereof are oval and entire, and branching bristles arising from the glands.* Ricinoides Americana staphysagriæ folio. Tourn. Inst. 656. *American Bastard Ricinus, with a Stavesacre leaf, commonly called Belly-ach Weed in America.*

The first sort here mentioned, is the common Cassada or Cassava, which is cultivated for food in the warm parts of America, where, after the juice is expressed out of the root (which has a poisonous quality) it is ground into a kind of flour, and made up in cakes or puddings, and is esteemed a wholesome food.

This rises with a shrubby stalk six or seven feet high, garnished with smooth leaves, standing upon long foot-stalks alternately; they are composed of seven lobes, which are joined at their base in one center, where they are narrow, but increase in their breadth till within an inch and a half of the top, where they diminish to an acute point; the three middle lobes are about six inches long, and two broad in their broadest part; the two next are about an inch shorter, and the two outside lobes are not more than three inches long; the middle lobes are sinuated on each side near the top, but the two outer are entire. The flowers are produced in umbels at the top of the stalks, these are some male and others female in the same umbel; they are composed of five roundish petals which spread open; the male flowers have their ten stamina joined together in a column, and the female flowers have a roundish germen with three furrows in the center, supporting three styles; two are separated at a distance, and the third arises between them, but is not so long; they are crowned by single stigmas. The germen afterward turns to a roundish capsule with three lobes, each having a distinct cell, containing one seed.

The second sort was discovered by the late Dr. Houstoun at the Havanna, from whence he sent the seeds. This rises with an upright stalk ten or twelve feet high, which is first green and herbaceous, but afterward becomes ligneous, sending out a few branches at the top, which are garnished with smooth leaves, composed of five oval lobes, which end in acute points; the edges are also indented in several irregular points, which are acute. The flowers are produced in an umbel at the extremity of the stalks, they are of an herbaceous white colour, and are male and female in the same umbel, as the other sort; the capsule is smooth and has three cells, each including a single seed.

The third sort was discovered by the late Dr. Houstoun, growing naturally in the sandy grounds about the town of La Vera Cruz, from whence he sent the seeds, which succeeded in the Chelsea garden. This hath a very thick fleshy root, in shape like the white Spanish Radish; the stalk rises from one to two feet high, it is taper, herbaceous, and branching, and closely armed on every side with long white spines, which are not very stiff, but are pungent and stinging; the leaves are divided into five lobes, the middle being the longest; the others are shortened, the two next being about an inch shorter, but the two outer are not more than half the length of the middle; these are deeply jagged on both sides, and are waved on their edges; all the veins of the leaves are closely armed with stinging spines, so that it is dangerous handling them; for all the intermediate parts of the leaves have small stinging spines like those of the Nettle, but they do not appear so visible. At the end of the branches the flowers are produced in umbels; they are white, and have empalements closely armed with the same spines as the stalks and leaves: there are male and female flowers in the same umbel; the female flowers are succeeded by tricapsular vessels, containing three seeds.

The fourth sort rises with an herbaceous stalk about a foot high, dividing into two or three branches, which are garnished with leaves standing alternate upon long foot-stalks; they are composed of three oblong lobes which are slightly sinuated on their edges, ending in acute points; the whole plant is closely armed with long, bristly, stinging spines. The flowers grow in an umbel at the end of the branches; they are small, of a dirty white colour, and are male and female in the same umbel: the female flowers are succeeded by oval capsules with three lobes, which are covered with the same spines as the plant; these have three cells, each containing a single seed. This plant is annual.

The fifth sort was found growing naturally at Carthagena in New Spain, by the late Mr. Robert Millar, who sent the seeds to England, which succeeded in several curious gardens. This hath a thick, swelling, fleshy root, from which arises an herbaceous stalk as big as a man's thumb, which is four or five feet high, and divides into several branches; these are very closely armed with long brown spines; the foot-stalks of the leaves are six or seven inches long, which are also armed with spines, but not so closely, nor are the spines so long as those on the stalk and branches; the leaves are deeply cut into five lobes, which are jagged deeply on their sides, and the nerves are armed with

ſtinging ſpines; the flowers are produced in umbels at the top of the branches, ſtanding upon long naked foot-ſtalks; they are of a pure white colour, and are male and female in the ſame umbel: the male flowers appear firſt, which are compoſed of five petals, forming a ſhort tube at bottom, and the ſtamina ariſe the length of the tube, joined in a column: the petals ſpread open flat above, and the ſtamina fills the mouth of the tube, ſhutting it up: the female flowers are ſmaller, but of the ſame ſhape, having no ſtamina, but an oval three-cornered germen, which afterwards becomes a capſule with three lobes, each having a diſtinct cell, with one ſeed incloſed.

The ſixth ſort was diſcovered by the late Dr. Houſtoun at La Vera Cruz, where it is frequently permitted to grow about the town by way of ornament; this riſes with a ſtrong, brittle, ligneous ſtalk, ten or twelve feet high, covered with a gray bark, and divides into many branches, which are garniſhed with leaves, that are divided into parts like thoſe of the common Woolfsbane, but are armed with ſmall ſtinging ſpines like thoſe of the Nettle; at the end of the branches come out the flower-ſtalks, which are five or ſix inches long, ſuſtaining an umbel of white flowers. The male flowers are of one petal, having a pretty long tube, which is divided at the top into five ſegments. The female flowers expand in form of a Roſe, having the germen in the center, which afterward becomes a globular prickly fruit with three lobes, opening in three cells, each containing a ſingle ſeed.

The ſeventh ſort is now very common in moſt of the iſlands in the Weſt-Indies, but was introduced from the continent, firſt into the French iſlands, and from thence it was brought into the Britiſh iſlands, where it is titled French Phyſic Nut, to diſtinguiſh it from the following ſort, which is called Phyſic Nut, from its purging quality.

This riſes with a ſoft thick ſtem eight or ten feet high, dividing into ſeveral branches, covered with a grayiſh bark. The leaves come out on every ſide the branches on ſtrong foot-ſtalks, which are ſeven or eight inches long; they are divided into nine or ten lobes in form of a hand, which are joined at their baſe; theſe are ſeven inches long, and about two inches broad, with many jagged points on their borders ſtanding oppoſite. The upper ſide of the leaves are of a lucid green, but their under ſide gray, and a little cottony. The flowers come out upon long foot-ſtalks from the end of the branches, formed into an umbel, in which there are male and female flowers, as in the other ſpecies; theſe umbels are large, and the flowers being of a bright ſcarlet, they make a fine appearance; and the leaves being very remarkable for their beauty, has occaſioned the plant being cultivated for ornament in moſt of the iſlands of the Weſt-Indies.

The eighth ſort grows naturally in all the iſlands of the Weſt-Indies; this riſes with a ſtrong ſtalk twelve or fourteen feet high, which divides into ſeveral branches; theſe are garniſhed with angular heart-ſhaped leaves, which end in acute points. The flowers come out in umbels at the end of the branches; they are male and female, of an herbaceous colour, ſo make but little appearance; the female flowers are ſucceeded by oblong oval capſules with three cells, each containing one oblong black ſeed.

The ſeeds of the two laſt ſorts have been uſed as a purgative by the inhabitants of the Weſt-Indies, but they operate ſo violently, that now they are ſeldom uſed; three or four of theſe nuts have worked upward and downward near forty times, on a perſon who was ignorant of their effects; but it is affirmed that this purgative quality is contained in a thin film, ſituated in the center of the nut, which, if taken out, the nuts are harmleſs, and may be eaten with ſafety. The leaves of the laſt ſort are uſed in baths and fomentations.

The ninth ſort grows naturally in all the iſlands of the Weſt-Indies, where it is ſometimes called wild Caſſada, or Caſſava, and at others Belly-ach Weed, the leaves of this plant being accounted a good remedy for the dry belly-ach. This plant riſes with a ſoft herbaceous ſtalk to the height of three or four feet, covered with a purple bark, and at the joints have branching briſtly hairs riſing in ſmall bunches, not only upon the principal ſtalk, but alſo on the branches, and the foot-ſtalks of the leaves. The ſtalk divides upward into two or three branches; theſe are garniſhed with leaves ſtanding on very long foot-ſtalks, divided into five lobes which are oval, entire, and end in acute points. The flowers are produced at the end of the branches, upon ſlender naked foot-ſtalks, in ſmall umbels; they are ſmall, of a dark purple colour, having male and female flowers in the ſame umbel; the female flowers are ſucceeded by oblong tricapſular veſſels, ſmooth, and covered with a dark ſkin, when ripe; in each of the cells is lodged one oblong brown ſeed.

All theſe plants are natives of the warm parts of America, ſo are too tender to thrive in the open air in England. The firſt ſort is cultivated in the Weſt-Indies for food, where it is propagated by cutting the ſtalks into lengths of ſeven or eight inches, which, when planted, put out roots; the method of doing this having been mentioned in various books, I ſhall not repeat it here.

The other ſorts are eaſily propagated by ſeeds, which ſhould be ſown on a good hot-bed in the ſpring, and when the plants are fit to remove, they ſhould be each tranſplanted into a ſmall pot filled with light earth, and then plunged into a freſh hot-bed of tanners bark, carefully ſhading them till they have taken freſh root; after which they muſt be treated in the ſame manner as other tender plants from hot countries, admitting freſh air to them daily, in proportion to the warmth of the ſeaſon; but as many of the ſorts have ſucculent ſtalks, ſome of which have a milky juice, they ſhould have but little water given them, for they are ſoon deſtroyed by wet.

The fourth ſort is an annual plant, ſo if the ſeeds are ſown early in the ſping, and the plants are brought forward, they will perfect their ſeeds the ſame year; but the other ſorts are perennial, ſo do not flower till the ſecond or third year; therefore the plants ſhould be plunged into the tan-bed in the ſtove, where they ſhould conſtantly remain, giving them a large ſhare of air in warm weather; but in winter they muſt be tenderly treated, and in that ſeaſon muſt have very little water. With this management the plants will continue ſeveral years, and produce their flowers, and frequently perfect their ſeeds in England.

IBERIS. Dillen. Nov. Gen. 6. Lin. Gen. Plant. 721. Thlaſpidium. Tourn. Inſt. R. H. 214. tab. 101. Sciatica Creſs.

The CHARACTERS are,

*The flower hath an empalement of four oval leaves, which ſpread open, are hollowed and fall away. It hath four unequal petals, which are oval, obtuſe, and ſpread open, having oblong erect tails; the two outer petals are longer than the other. It hath ſix awl-ſhaped erect ſtamina, the two on the ſides being ſhorter than the reſt, terminated by roundiſh ſummits. In the center of the tube is ſituated a round compreſſed germen, ſupporting a ſhort ſingle ſtyle, crowned by an obtuſe ſtigma. The germen afterward becomes a roundiſh compreſſed veſſel, having two cells, each containing one oval ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifteenth claſs, intitled Tetradynamia Siliculoſa, which includes thoſe plants whoſe flowers have four long and two ſhort ſtamina, and the ſeeds grow in ſhort pods.

The SPECIES are,

1. IBERIS (*Semperflorens*) fruteſcens, foliis cuneiformibus obtuſis integerrimis. Lin. Hort. Cliff. 330. *Shrubby Sciatica Creſs with entire, wedge-ſhaped, blunt leaves, commonly called the Tree Candy Tuft.* Thlaſpidium fruticoſum, leucoii folio, ſemperflorens. Tourn. Inſt. 214. *Shrubby Thlaſpidium with a Gilliflower leaf, always flowering.*

2. Iberis (*Sempervirens*) frutescens foliis linearibus acutis integerrimis. Lin. Hort. Cliff. 330. *Shrubby Sciatica Cress with narrow-pointed whole leaves, commonly called Perennial Candy Tuft.* Thlaspi montanum, sempervirens. C. B. P. 106. *Evergreen Mountain Candy Tuft.*

3. Iberis (*Umbellata*) herbacea foliis lanceolatis acuminatis, inferioribus serratis, superioribus integerrimis. Lin. Hort. Cliff. 330. *Herbaceous Sciatica Cress with spear-shaped pointed leaves, the under ones being sawed, but the upper entire, commonly called Candy Tuft.* Thlaspi Creticum quibusdam, flore rubente & albo. J. B. 2. 924. *True Cretan Treacle Mustard with a red and white flower.*

4. Iberis (*Odorata*) foliis linearibus supernè dilatatis serratis. Flor. Leyd. 330. *Sciatica Cress with narrow leaves dilated at their top, and sawed.* Thlaspi umbellatum Creticum, flore albo odoro, minus. C. B. P. 106. *Small umbellated Treacle Mustard of Crete with a white sweet flower.*

5. Iberis (*Nudicaulis*) herbacea foliis sinuatis, caule nudo simplici. Lin. Hort. Cliff. 328. *Sciatica Cress with sinuated leaves, and a single naked stalk.* Nasturtium petræum. Tab. Ic. 451. *Rock Cress.*

6. Iberis (*Amara*) herbacea foliis lanceolatis acutis subdentatis, floribus racemosis. Lin. Hort. Upsal. 184. *Sciatica Cress with acute, spear-shaped, indented leaves, and flowers growing in bunches.* Thlaspi avense umbellatum amarum. J. B. 2. 925. *Bitter, umbellated, Field Treacle Mustard.*

7. Iberis (*Rotundifolia*) foliis subrotundis crenatis. Royen. Lin. Sp. Plant. 49. *Iberis with roundish crenated leaves.* Thlaspi Alpinum, folio rotundiore carnoso, flore purpurascente. Tourn. Inst. 112. *Alpine Treacle Mustard with a rounder fleshy leaf, aud a purplish flower.*

8. Iberis (*Linifolia*) frutescens, foliis linearibus acutis, corymbis hemisphæricis. *Shrubby Sciatica Cress with narrow acute leaves, and hemispherical bunches of flowers.* Thlaspi Lusitanicum umbellatum, gramineo folio, purpurascente flore. Tourn. Inst. R. H. 213. *Portugal, umbellated, Treacle Mustard, with a Grass leaf and a purplish flower.*

The first sort here mentioned is a low shrubby plant, which seldom rises above a foot and a half high, having many slender branches, which spread on every side, and fall toward the ground if they are not supported. These branches are well furnished with leaves toward their extremity, which continue green all the year; and in summer the flowers are produced at the end of the shoots, which are white, and grow in an umbel. These flowers continue long in beauty, and are succeeded by others, so that the plants are rarely destitute of flowers for near eight months, from the end of August to the beginning of June, which renders the plant valuable.

This plant is somewhat tender, therefore is generally preserved in green-houses in winter, where, being placed among other low plants toward the front of the house, it makes an agreeable variety, as it continues flowering all the winter. But although it is commonly so treated, yet in moderate winters this plant will live in the open air, if it be planted in a warm situation and on a dry soil; and if, in very hard frost, they are covered either with mats, Reeds, Straw, or Peas-haulm, they may be preserved very well; and these plants which grow in the full ground, will thrive better, and produce a greater number of flowers, than those which are kept in pots; but the soil in which these are planted, should not be over rich, nor too wet, for in either of these they will grow too vigorous in summer, so will be in greater danger of suffering by the frost in winter; but when they grow on a gravelly soil, or among lime rubbish, their shoots will be short, strong, and not so replete with moisture, so will better resist the cold.

This plant very rarely produces seeds in England, therefore is only propagated by cuttings, which, if planted during any of the summer months, and shaded from the sun, and duly watered, will be rooted in two months, and may afterward be either planted in pots, or into the borders where they are designed to stand.

There is a variety of this with variegated leaves, which is preserved in some of the gardens where persons delight in these striped-leaved plants. This is not so hardy as the plain sort, therefore must be treated more tenderly in winter; this is also increased by cuttings in the same manner as the other.

The second sort is a plant of humbler growth than the first; this seldom rises more than six or eight inches high, nor do the branches grow woody, but are rather herbaceous; the leaves of this plant continue green through the year, and the flowers are of as long duration as those of the first sort, which renders it valuable. This rarely produces seeds in England, but is propagated by slips, which in summer easily take root, and the plants may be treated in the same manner as hath been directed for the first sort, and will thrive in the open air.

The third sort is a low annual plant, the seeds of which were formerly sown to make edgings for borders in the pleasure-garden, for which purpose all the low annual flowers are very improper, because they do not answer the intent, which is to prevent the earth of the borders falling into the walks, which these plants never can do; and though they make a pretty appearance during their continuance in flower, which is seldom more than a fortnight or three weeks, yet after their flowers are past they become very unsightly; therefore all these sorts of flowers should be sown in small patches in the borders of the flower-garden, where, if they are properly mixed with other flowers, they will have a very good effect; and by sowing of them at three or four different seasons, there may be a succession of them continued in flower till autumn.

There are two different varieties of this third sort, one with red, and the other hath white flowers; but the white is not common in the gardens, but the seeds of the sixth sort are generally sold for it, and is seldom distinguished but by those who are skilled in botany: this plant seldom rises more than five or six inches high, and if they have room will branch out on every side, but when they are left too close, they draw each other up, and are weak: as these do not bear transplanting well, so the seeds should be sown thin in patches, and when the plants are grown pretty strong, they should be thinned, leaving but six or eight in in each patch to flower; and by thus treating them, they will put out side branches, and flower much stronger, and continue longer in beauty than when they are left closer together; these plants will require no other culture but to keep them clean from weeds.

The fourth sort seldom grows so large as the third, and the flowers are much smaller, but have an agreeable odour. It grows naturally in Helvetia, and is preserved in botanic gardens for variety. It is annual, and requires the same treatment as the third.

The fifth sort grows on sandy and rocky places in several parts of England, so is rarely admitted into gardens. The leaves of this are small, and cut to the midrib into many jags; these are spread on the ground, and between them arise a naked foot-stalk two or three inches long, sustaining small umbels of white flowers. This is an annual plant, whose seeds should be sown in autumn where the plants are designed to remain, and require no other care but to keep them clean from weeds.

The sixth sort is very like the third, but differs in the shape of the leaves. The flowers of this are white, so may be sown to make a variety with the red. It requires the same treatment.

The seventh sort grows naturally on the Alps, from whence it was sent me; this is a perennial plant, which roots pretty deep in the ground. The lower leaves which rise from the root, are round, fleshy, and crenated on their edges. The stalk rises four or five inches high, and is garnished with small oblong leaves which half embrace the stalks with their base. The flowers terminate the stalk in a round compact

pact umbel; they are of a purple colour, and appear in June, but are seldom succeeded by seeds in England.

It is propagated by seeds, which should be sown on a shady border in autumn, and when the plants are strong enough to remove, they should be transplanted on a shady border where they are designed to remain, and will require no other care but to keep them clean from weeds.

The eighth sort grows naturally in Spain and Portugal; this hath a great resemblance of the second, but the stalks do not spread so much; they grow erect, about seven or eight inches high, are ligneous and perennial. The leaves are very narrow, and seldom more than an inch long, standing thinly upon the stalks, having no foot-stalks. The flowers grow in hemispherical umbels on the top of the stalks, and are of a purple colour. It flowers in May and June, but seldom produces good seeds here.

This sort may be propagated by cuttings, which should be treated in the same way as is before directed for the first sort; and some of the plants may be planted on a warm border in a dry soil, where they will endure the cold of our ordinary winters very well; but it will be proper to have two or three plants in pots, which may be sheltered under a frame in winter, to preserve the kind, if, by severe frost, those in the open air should be destroyed.

IBISCUS. See Hibiscus.

ICACO. See Chrysobalanus.

ICE is a hard transparent body, formed from some liquor congealed, or fixed.

Ice is said to be the natural state of water, which remains firm, and not liquid, when no external cause acts upon it.

The true cause of the congelation of water into Ice, seems to be the introduction of frigorific particles into the pores or interstices between the particles of water, and by that means getting so near them, as to be just within the spheres of one another's attractions, and then they must cohere into one solid or firm body.

It may be wondered why Ice goes to the top of the water, for one would imagine, that being colder than flowing water, it ought to be more condensed, and consequently heavier; but is to be considered, that there are always some bubbles of air interspersed in Ice. It is certain, by the swimming of Ice upon water, that it is specifically lighter than the water out of which it is made by freezing; and it is as certain, that this lightness of Ice proceeds from those numerous bubbles that are produced in it by congelation.

Water, when it is frozen into Ice, takes up more space than it did before it was congealed. It is visible, that the dimensions of water are increased by freezing, its particles being kept at some distance the one from the other, by the intervention of the frigorific matter.

And, besides, there are many little volumes of air included at several distances, both in the pores of the watery particles, and in the interstices made by the spherical figures. Now, by the insinuation of these chrystals, the volumes of air are driven out of the watery particles, and many of them uniting, form larger volumes; these have thereby a greater force to expand themselves than when they are dispersed, and so both enlarge their dimensions, and lessen the specific gravity of water thus congealed into Ice.

It seems very probable, that cold, and freezing, and consequently Ice, are produced by some substance of a saline nature floating in the air; in that salts, and more eminently some particular ones, when mixed with Ice or snow, do wonderfully increase the force and effects of cold.

It is also visible, that all saline bodies cause a stiffness and frigidity in those bodies into which they enter.

It is manifest, by observing salts by microscopes, that the figures of some salts, before they shoot into masses, are then double wedge-like particles, which have abundance of surface in respect to their solidity; and this is the reason why they swim in water, when once they are raised in it, although they are specifically heavier, these small points of salts getting into the pores of the water, whereby they are, in some measure, suspended in the winter, when the heat of the sun is not ordinarily strong enough to dissolve the salts into fluid, to break their points, and to keep them in perpetual motion; which being less disturbed, are more at liberty to approach one another, and by shooting into chrystals, of the form above-mentioned, do, by their extremities, insinuate themselves into the pores of water, and by that means freeze it into a solid form, called Ice.

Monf. Mariotte, in his Treatise of Hydrostatics, gives the subsequent account of what happens to water in freezing, which he discovered by the following experiment.

Having filled a cylindric vessel, of about seven or eight inches high, and six inches diameter, within two inches of the top, with cold water, he exposed it to the open air in a great frost, and observed exactly the whole progress of the freezing of it.

The first congelation was in the upper surface of the water, in little long water shoots, or laminæ, which were jagged like a saw, the water between them remaining still unfrozen, though the rest of the surface was already frozen to the thickness of more than two lines; he observed that several bubbles of air were formed in the Ice, that began to fix on the bottom and sides of the vessel, some would rise up, and others remained entangled in the Ice, which made him imagine that these bubbles taking up more space in the water, than when their matter was, as it were, dissolved in it, they pushed up a little water through the hole at the top, after the same manner that new wine works out at the bung-hole of a vessel when it begins to heat, and the little water that ouzed out at this little hole in the Ice, spreading itself upon the upper surface of the water, which was already frozen, became Ice also, and there began to form a hill of Ice; and that hole continuing open, by reason of the water which passed successively through it, being pushed up by the new bubbles which formed themselves in the Ice, which continue to increase about the sides and bottom of the vessel, he observed that the upper surface of the water was frozen above an inch thick towards the edges of the vessel, and above an inch and a half round about the little hole, before the water that was contained in it, as in a pipe, became frozen, but at last it was frozen; then the middle of the water remaining unfrozen, and the water which was compressed by the new bubbles, which formed themselves for two or three hours, having no vent at the little hole, the Ice broke at once towards the top, by the spring of the included air.

In like manner the frost acts upon vegetables, by these frigorific particles entering the tender shoots of plants, and insinuating between the pores of the sap, thereby increasing its bulk, so that the tender vessels of the plants are torn, and those parts of the plants are soon killed; and the greater the quantity of moisture is in vegetables, the more they are in danger of being destroyed, for we frequently see many plants which grow on the top, and from the joints of walls, escape the severest frosts, when those of the same kinds are all destroyed which were in the ground; which is entirely owing to their vessels being stronger and more compact, and not so replete with moisture: so when the autumn proves cold and moist, whereby the vessels of plants are not properly hardened, and are replete with moisture, a small frost will do great mischief to them; whereas when the autumn is dry and warm, the tender shoots of trees and shrubs are hardened, and drained of their moisture, so are not liable to the like accidents.

ICE-HOUSE is a building contrived to preserve ice for the use of a family in the summer season.

These are more generally used in warm countries, than in England, but particularly in Italy, where the meanest person who rents a house, is not without a a vault or cellar for keeping of ice; but as the use of ice in England is much greater of late than it was formerly, so the number of Ice-houses has been greatly increased; and although the mention of these may, at first sight, seem foreign to my subject, yet if it is considered, that these buildings are generally erected in gardens, and as often put under the care of gardeners, it may not be amiss for me to give some general directions for the choice of the situation and structure of the building, as also for the management of the ice.

In the choice of a situation for an Ice-house, the principal regard should be, that of a dry spot of ground, for wherever there is moisture, the ice will melt; therefore in all strong lands, which detain the wet, there cannot be too much care taken to make drains all round the building to carry off all moisture; for when this is lodged near the building, it will occasion a damp there, which will always be prejudicial to the keeping of the ice.

The next consideration must be, to have the place so elevated, that there may be descent enough to carry off whatever wet may happen near the building, or from the ice melting; also, that the place be as much exposed to the sun and air as possible, and not placed under the drip, or in the shade of trees, as hath been too often practised, under a false notion, that if it should be exposed to the sun, the ice will melt away in summer, which never can be the case where there is sufficient care taken to exclude the outward air (which must always be regarded in the building of these houses) for the heat of the sun can never penetrate through the double arches of the building, so as to add any warmth to the air; but when the building is entirely open to the sun and wind, all damps and vapours will thereby be removed from about the building, which can never be kept too dry, or free from moist vapours. As to the figure of the building, that may be according to the fancy of the owner; but for the well into which the ice is to be put, a circular figure is the most convenient; the depth of the well, as also the diameter of it, must be proportioned to the quantity of ice wanted, but it is always best to have enough; for when the house is well built, it will keep the ice for two or three years; and there will be this advantage in having it large enough to contain ice for two years consumption, that if a mild winter should happen, when there is not ice to be had, there will be a stock to supply the want.

If the quantity wanting is not great, a well of six feet diameter, and eight feet deep, will be large enough; but for large consumption, it should not be less than nine or ten feet diameter, and as many deep: where the situation is either dry chalk, gravel, or sand, the pit may be entirely below the surface of the ground; but in strong loam, clay, or moist ground, it will be the best way to raise it so high above the surface, as that there may be no danger from the wet.

At the bottom of the well there should be a space left, about two feet deep, to receive any moisture which may drain from the ice, and a small underground drain should be laid from this, to carry off the wet; over this space of two feet, should be placed a strong grate of wood, to let the moisture fall down, which may at any time happen, from melting of the ice. The sides of this well must be bricked up with a wall, at least two bricks and a half thick; but if it is yet thicker, it will be better, because the thicker the walls are made, the less danger there will be of the well being affected by any external cause. When the well is brought within three feet of the surface, there must be another outer arch or wall begun, which must be carried up to the height of the top of the intended arch of the well; and if there is a second arch turned over from this well, it will add to the goodness of the house; but this must be submitted to the person who builds, if he will be at the expence; but if not, then the plate into which the roof is to be framed, must be laid on this outer wall, which should be carried high enough above the inner arch, to admit of a door-way in, to get out the ice. If the building is to be covered with slates or tiles, there should be a thickness of Reeds laid under, to keep out the sun and external air; if these Reeds are laid two feet thick, and plastered over with lime and hair, there will be no danger of the heat getting through it.

The external wall need not be built circular, but of any other figure, either square, hexangular, or octangular; and where this stands much in sight may be so contrived as to make it a good object. I have seen an Ice-house built in such a manner as to have a handsome alcove seat in the front, and behind this seat was contrived a passage to get out and put in the ice; and by having the entrance behind, to the north aspect, a small passage being next the seat, through which a person might enter to take out the ice, and a large door being contrived with a porch, wide enough for a small cart to back in, to shoot down the ice upon the floor near the mouth of the well, where it may be well broken, before it is put down. The aperture of this mouth of the well need not be more than two feet and a half diameter, which will be large enough to put down the ice, and if it was greater, it would be inconvenient; there should be a stone fitted to stop this aperture, which must be closed up as secure as possible, after the ice is put in, and all the vacant space above and between this and the outer door, must be filled close with Barley Straw, to exclude the air; so the door to enter for taking out the ice should be on the opposite side, immediately behind the alcove seat, as was before-mentioned; and this door should be no larger than is absolutely necessary for the coming at the ice, and must be strong and close to exclude the air; and at five or six feet distance from this another door should be contrived, which should be closely shut before the inner door is opened, whenever the ice is taken out.

The building being finished, should have time to dry before the ice is put into it; for when the walls are green, the damp of them frequently melts the ice. At the bottom of the well, upon the wooden grate, should be laid some small faggots; and if upon these a layer of Reeds is placed smooth for the ice to lie upon, it will be better than Straw, which is commonly used; and in the choice of the ice, the thinner it is, the better it may be broken to powder; for the smaller it is broken, the better it will unite when put into the well: in putting of it in, there must be care taken to ram it close, as also to allow a vacancy all round next the wall, of about two inches; this is to give passage to any moisture, which may be occasioned by the melting of some of the ice on the top, which, if pent up, will melt the ice downward; when the ice is put into the well, if there is a little salt-petre mixed at every ten inches or a foot thickness, it will cause the ice to join more closely into a solid mass. The instructions here given, being carefully observed, will be sufficient to guide persons wholly ignorant in these matters.

JET D'EAU is a French word, which signifies a fountain that casts up water to any considerable height in the air.

Monf. Mariotte, in his Treatise of Hydrostatics, says, That a Jet d'Eau will never rise so high as its reservatory, but always falls short of it by a space which is in a subduplicate ratio of that height; and this he proves by several experiments; that though Jets ought to rise to the height of the reservatories, yet the friction of the sides of the ajutages, and the resistance of the air, are the causes that in Jets that have very high reservatories, the height of the Jets does not come up to that of the reservatory by a great deal.

He adds, That if a greater branches out in many smaller ones, or is distributed through several Jets, the square of the diameter of the main pipe must be proportioned

portioned to the sum of all the expences of its branches; that if the reservatory be fifty-two high, and the ajutages half an inch in diameter, the pipe ought to be three inches in diameter.

He says, That the beauty of Jets of water consists in their uniformity and transparency at the going out of the ajutage, and spreading but very little, and that to the highest part of the Jet.

That the worst sort of ajutages are those that are cylindrical, for they retard very much the height of the Jets, the conic retard it less; but the best way is, to bore the horizontal plane, which shuts the extremity of the pipe, or conduit, with a smooth and polished hole, taking care that the plate be perfectly plain, polished, and uniform.

These spouts of water are some of the greatest beauties of the Italian gardens, and are certainly better adapted for gardens in those warm countries, than they are for our climate, because, in the great heats of summer, the sight of these water-spouts is cooling and refreshing to the imagination, and they certainly add a real coolness to the air; but in cold countries they cool the air too much, therefore should not be erected; or if they are, they should be placed at such distances from the habitation, as that the damp may no ways affect it.

Where these Jets are contrived, if there is not a constant supply for a large column of water, they should by no means be made, for nothing can have a meaner appearance, than those pitiful pissing spouts, so frequently to be seen in England, which perhaps have not a supply of water to play above an hour or two; therefore where there is not a natural body of water, to supply these Jets, without the expence of raising it, there should never be any of these contrived in gardens.

**ILEX.** Lin. Gen. Plant. 158. Aquifolium. Tourn. Inst. R. H. 600. tab. 371. The Holly-tree; in French, *Houx*.

The CHARACTERS are,

*They have male, female, and hermaphrodite flowers on different plants. The male flowers have a small permanent empalement of one leaf, which is indented in four parts; they have but one petal, which is cut into four segments almost to the bottom; they have four awl-shaped stamina, which are shorter than the petal, and are terminated by small summits. The female flowers have their empalements and petals the same as the male, but have no stamina; in their center is placed the roundish germen, having four obtuse stigmas sitting on it. The germen afterward becomes a roundish berry with four cells, each containing a single hard seed.*

This genus of plants is ranged in the third section of Linnæus's fourth class, intitled Tetrandria Tetragynia, which includes those plants whose flowers have four stamina and four styles; but according to his own system, it should be placed in the third section of his twenty-second class, with those plants which have male and hermaphrodite flowers on different plants.

The SPECIES are,

1. ILEX (*Aquifolium*) foliis oblongo-ovatis, undulatis, spinis acutis. *Holly-tree with oblong leaves which are waved, and have acute spines.* Ilex aculeata baccifera. C. B. P. 425. *Prickly berry-bearing Ilex*; and the Aquifolium sive agrifolium vulgò. J. B. 1. 114. *The common Holly.*
2. ILEX (*Echinata*) foliis ovatis, undulatis, marginibus aculeatis, paginis supernè spinosis. *Holly with oval waved leaves, whose borders are armed with strong thorns, and their upper surface prickly.* Aquifolium echinatâ folii superfice. Cornut. Canad. 180. *Holly-tree whose upper surface of the leaves are prickly, commonly called Hedge-hog Holly.*
3. ILEX (*Caroliniana*) foliis ovato-lanceolatis serratis. Hort. Cliff. 40. *Holly with oval, spear-shaped, sawed leaves.* Aquifolium Caroliniense, foliis dentatis, baccis rubris. Catesb. Carol. 1. p. 31. *Carolina Holly with indented leaves and red berries, commonly called Daboon Holly.*

There are several varieties of the common Holly with variegated leaves, which are propagated by the nursery gardeners for sale, and some years past were in very great esteem, but at present are but little regarded, the old taste of filling gardens with shorn Evergreens being pretty well abolished; however, in the disposition of the clumps or other plantations of Evergreen trees and shrubs, a few of the most lively colours may be admitted, which will have a good effect in the winter season, if they are properly disposed. As the different variegations of the leaves of Hollies, are by the nursery gardeners distinguished by different titles, so I shall here mention the most beautiful of them, by the names they are generally known:

Painted Lady Holly, British Holly, Bradley's best Holly, Phyllis, or Cream Holly, Milkmaid Holly, Pritchet's best Holly, Gold-edged Hedge-hog Holly, Cheyney's Holly, Glory of the West Holly, Broaderick's Holly, Partridge's Holly, Herefordshire white Holly, Blind's Cream Holly, Longstaff's Holly, Eales's Holly, Silver-edged Hedge-hog Holly.

All these varieties are propagated by budding or grafting them upon stocks of the common green Holly: there is also a variety of the common Holly with smooth leaves, but this is frequently found intermixed with the prickly-leaved on the same tree, and often on the same branch, there are both sorts of leaves.

The common Holly grows naturally in woods and forests in many parts of England, where it rises from twenty to thirty feet high, and sometimes more, but their ordinary height is not above twenty-five feet. The stem by age becomes large, and is covered with a grayish smooth bark; and those trees which are not lopped or browzed by cattle, are commonly furnished with branches the greatest part of their length, so form a sort of cone; the branches are garnished with oblong oval leaves about three inches long, and one and a half broad, of a lucid green on their upper surface, but are pale on their under, having a strong midrib: the edges are indented and waved, with sharp thorns terminating each of the points, so that some of the thorns are raised upward and others are bent downward, and being very stiff, renders them troublesome to handle. The leaves are placed alternate on every side of the branches, and from the base of their footstalks come out the flowers in clusters, standing on very short foot-stalks; each of these sustain five, six, or more flowers. In some plants I have observed the flowers were wholly male, and produced no berries; in others I have observed female and hermaphrodite flowers, but upon some large old trees growing on Windsor forest, I have observed all three upon the same trees. The flowers are of a dirty white, and appear in May; they are succeeded by roundish berries, which turn to a beautiful red about Michaelmas, but continue on the trees if they are not destroyed, till after Christmas before they fall away.

The second sort grows naturally in Canada, from whence it was brought to Europe. The leaves of this sort are not so long as those of the common Holly, and their edges are armed with stronger thorns standing closer together; the upper surface of the leaves is set very close with short prickles, from whence the gardeners have given it the title of Hedge-hog Holly. This sort is usually propagated in the nurseries, by budding or grafting it upon the common Holly; but I have raised it from the berries, and found the plants to be the same as those from whence the seeds were taken, so make no doubt of its being a distinct species.

There are two varieties of this with variegated leaves, one of which is yellow, and the other white. There is also a variety of the common Holly with yellow berries, which is also accidental, and is generally found on those plants which have variegated leaves, and but seldom on plain Hollies.

The common Holly is a very beautiful tree in winter, therefore deserves a place in all plantations of

Evergreen trees and shrubs, where its shining leaves and red berries make a fine variety; and if a few of the best variegated kinds are properly intermixed, they will enliven the scene. The Holly was also formerly planted for hedges, and is a very proper plant for that purpose; but then it should not be clipped with shears, because when the leaves are cut through the middle, they are rendered unsightly, so they should be cut with a knife close to the leaf; and although in this method they are not shorn so even as with shears, yet they will have a much better appearance, and may be made as close and secure as by any other method generally practised.

The Holly is propagated by seeds, which never come up the first year, but lie in the ground as the Haws do; therefore the berries should be buried in the ground in a large pot or tub one year, and then taken up and sown in the autumn upon a bed exposed only to the morning sun; the following spring the plants will appear, which must be kept clean from weeds; and if the spring should prove dry, it will be of great service to the plants if they are watered once a week; but they must not have it oftener, nor in too great quantity, for too much moisture is very injurious to these plants when young.

In this seed-bed the plants may remain two years, and then should be transplanted in the autumn, into beds at about six inches distance each way, where they may stand two years longer, during which time they must be constantly kept clean from weeds; and if the plants have thriven well, they will be strong enough to transplant where they are designed to remain; for when they are transplanted at that age, there will be less danger of their failing, and they will grow to a larger size than those which are removed when they are much larger; but if the ground is not ready to receive them at that time, they should be transplanted into a nursery in rows at two feet distance, and one foot asunder in the rows, in which place the plants may remain two years longer; and if they are designed to be grafted or budded with any of the variegated kinds, that should be performed after the plants have grown one year in this nursery; but the plants so budded or grafted should continue two years after in the nursery, that they may make good shoots before they are removed; though the plain ones should not stand longer than two years in the nursery, because when they are older, they do not transplant so well. The best time for removing of Hollies is in the autumn, especially in dry land; but where the soil is cold or moist, they may be transplanted with great safety in the spring; if the plants are not too old, or if they have not stood long unremoved, there is great odds of their dying when removed.

The Dahoon Holly grows naturally in Carolina, from whence the seeds were sent by the late Mr. Mark Catesby, who found the trees growing on a swamp at a distance from Charles-town, but it hath since been discovered in some other countries in North America. This rises with an upright branching stem to the height of eighteen or twenty feet; the bark of the old stems is of a brown colour, but that of the branches or younger stalks is green and smooth, garnished with spear-shaped leaves, which are more than four inches long, and one and a quarter broad in the broadest part, of a light green and thick consistence; the upper part of the leaves are sawed on their edges, each serrature ending in a small sharp spine; they stand alternately on every side the branches, upon very short foot-stalks. The flowers come out in thick clusters from the side of the stalks; they are white, and shaped like those of the common Holly, but are smaller; the female and hermaphrodite flowers are succeeded by small roundish berries in its native country, which make a fine appearance in winter, but they have not as yet produced fruit in England, so far as I can learn.

Dr. Linnæus supposes this plant and the evergreen Cassine to be the same, but they are undoubtedly distinct plants: he may probably have been led into this mistake, by receiving seeds of this sort mixed together with the berries of Cassine from America, which I have more than once done; but whoever sees the two plants growing, cannot doubt of their being different.

This sort is tender while young, so requires protection in the winter till the plants are grown strong and woody, when they may be planted in the full ground in a warm situation, where they will endure the cold of our ordinary winters pretty well; but in severe frost they should be protected, otherwise the cold will destroy them.

This sort is propagated from seeds, in like manner as the common sort; the seeds of it will lie as long in the ground, so the berries should be buried in the ground a year, and then taken up and sown in pots filled with light earth, and placed under a frame in winter; in the spring the pots should be plunged into a hot-bed, which will bring up the plants; these must be preserved in the pots while young, and sheltered in winter under a common frame till they have obtained strength, when in the spring they may be turned out of the pots and planted in the full ground, in a warm situation.

From the bark of the common Holly is made the bird-lime, and the wood is made into hones for setting of razors. The wood is very white, and takes a fine polish, so is very proper for several kinds of furniture. I have seen a floor of a room laid in compartments with Holly and Mahogany, which had a very pretty effect.

ILLECEBRUM. Lin. Gen. 291. Corrigiola. Dill. Gen. p. 169. Paronychia. Tourn. Inst. 281.

The CHARACTERS are,

*It hath a five-cornered coloured empalement of five leaves, which is permanent, but has no petals; it hath five slender stamina within the empalement, terminated by simple summits, and an oval germen with a short style, crowned by an obtuse stigma. The empalement afterward becomes a roundish capsule with five angles, having one cell, containing one large seed, which is pointed on every side.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flowers having five stamina and one style.

The SPECIES are,

1. ILLECEBRUM (*Suffruticosum*) floribus lateralibus solitariis, caulibus suffruticosus. Lin. Sp. 298. *Illecebrum with an under-shrub stalk, having single flowers on the sides.* Paronychia Hispanica fruticosa, myrti folio. Tourn. Inst. 508.
2. ILLECEBRUM (*Paronychia*) floribus bracteis nitidis obvalatis, caulibus procumbentibus. Lin. Sp. 299. *Illecebrum with neat bractea inclosing the flowers, and trailing stalks.* Paronychia Hispanica. Clus. Hist. 2. p. 183.
3. ILLECEBRUM (*Capitatum*) floribus bracteis nitidis occultantibus capitula terminalia, caulibus erectis, foliis ciliatis. Lin. Sp. 299. *Illecebrum with neat bractea terminating the erect stalks, and silvery leaves.* Paronychia Narbonensis erecta. Tourn. Inst. 508.
4. ILLECEBRUM (*Achyrantha*) caulibus repentibus pilosis, foliis ovatis mucronatis opposito minore, capitulis subglobosis subspinosis. Lin. Sp. 299. *Illecebrum with creeping stalks, small oval-pointed leaves placed opposite, almost globular heads of flowers, having small spines.* Achyrantha repens, foliis bliti pallidi. Hort. Elth. 8. tab. 7.
5. ILLECEBRUM (*Polygonoides*) caulibus repentibus hirtis, foliis lato-lanceolatis petiolatis, capitulis orbiculatis nudis. Lin. Sp. 300. *Illecebrum with hairy creeping stalks, broad spear-shaped leaves on foot-stalks, and orbicular naked heads of flowers.* Amaranthoides humile Curassavicum, foliis polygoni. Herm. Parad. 17.
6. ILLECEBRUM (*Vermiculatum*) caulibus repentibus glabris foliis, subteretibus carnosis, capitulis oblongis glabris terminalibus. Lin. Sp. 300. *Illecebrum with smooth creeping stalks, almost taper fleshy leaves, and oblong smooth heads terminating the branches.* Amaranthoides humile Curassavicum, cepeæ foliis lucidis, capitulis. Herm. Parad. 15.

The three first sorts grow naturally in Spain, Portugal, and the south of France; the first has ligneous stalks about a foot high, garnished with small leaves like those of Knot-grass; the flowers come out singly on the side of the stalks, which make little appearance, so is seldom preserved in gardens.

The second and third sorts have trailing stalks near two feet long, which spread on the ground, garnished with leaves like those of the first sort; the heads of flowers come out from the joints of the stalk, having neat silvery bractea surrounding them, which make a pretty appearance. Their flowers appear in June, and there is generally a succession of them for at least two months; and when the autumn proves warm, they will ripen their seeds the beginning of October.

These three sorts may be propagated by seeds, which should be sown on a bed of light earth the beginning of April; the plants will come up in May, when they should be kept clean from weeds till the plants are fit to remove; then the plants should be carefully taken up, planting some of each sort in small pots, and the other into a warm dry border, observing to water and shade them until they have taken new root; after which, those which are planted in the full ground will require no other culture but to keep them clean from weeds; for in the ordinary winters of England, they will live in the open air: but as these plants are sometimes killed in severe winters, therefore I advise some plants to be planted in pots, which may be placed in a common frame in winter, where they may enjoy the open air in mild weather, but be screened from frost.

As the seeds of these plants do not constantly ripen in England, so they may be propagated by cuttings, which, if carefully taken off in May or June, and planted in a shady border, will in two months put out roots; then in moist weather they may be transplanted, and afterward treated as the old plants.

The other three sorts are natives of the warm parts of America; the fourth sort grows naturally at Beunos Ayres; the fifth and sixth, in many of the islands in the West-Indies.

These have creeping stalks, which send out roots from the joints, which fasten to the ground in their native soil, whereby they spread to a great distance; and in this country, when the pots are plunged into a tan-bed, they will multiply as fast, by taking root in tan, or any of the other pots of plants which are near them.

The flowers of the fourth sort make little appearance, therefore the plant is rarely propagated, except in botanic gardens for variety; but those of the fifth and sixth sort have dry heads of flowers, resembling those of the Amaranthoides, under which genus they were formerly ranged.

These three sorts are tender, so will not thrive in the open air in England; therefore their seeds should be sown on a hot-bed in the spring, at the same time as the Amaranthus, Gomphrena, and other tender plants; and afterward, if they are plunged into the tan-bed in the stove, their branches will put out roots, whereby they may be propagated in plenty.

IMPATIENS. Rivin. Ord. 4. Lin. Gen. Plant. 899. Balsamina. Tourn. Inst. R. H. 418. tab. 235. Female Balsamine; in French, *Balsamine*.

The Characters are,

*The flower has a two-leaved small empalement, which is coloured, and placed on the side of the petals. It hath five petals which are unequal, and shaped like a lip-flower; the petals are roundish, the upper is erect, slightly cut at the point into three parts, where it is sharp-pointed, forming the upper lip; the two lower petals are broad, obtuse, irregular, and reflexed; these constitute the lower lip; the intermediate pair are alike, and are placed opposite, joining at their base. It hath a nectarium in the bottom of the flower, shaped like a hood or cowl, which is oblique to the mouth, rising on the outside, whose base ends in a tail or spur. It hath five short stamina which are narrow toward their base, and incurved, terminated by summits, which join at the top round the stamina, but are divided at their base. In the bottom is situated an oval sharp-pointed germen, having no style, but a single stigma shorter than the summits. The germen afterward becomes a capsule with one cell, opening with an elasticity in five valves, which twist spirally, and contain several roundish seeds fixed to a column.*

This genus of plants is ranged in the fifth section of Linnæus's nineteenth class, which includes those plants which have single flowers in the empalement, whose stamina vary in number and situation.

The Species are,

1. Impatiens (*Noli tangere*) pedunculis multifloris solitariis, foliis ovatis, geniculis caulinus tumentibus. Flor. Suec. 722. *Impatiens with foot-stalks sustaining many single flowers, oval leaves, and stalks having swelling joints.* Balsamina lutea, sive, Noli me tangere. C. B. P. 306. *Yellow Balsamine, or Touch me not.*
2. Impatiens (*Balsamina*) pedunculis unifloris aggregatis, foliis lanceolatis, nectaris floribus brevioribus. Hort. Upsal. 276. *Impatiens with foot-stalks sustaining single flowers, which arise in clusters, spear-shaped leaves, and nectariums which are shorter than the flower.* Balsamina fœmina. C. B. P. 306. *The female Balsamine.*
3. Impatiens (*Triflora*) pedunculis trifloris solitariis, foliis angusto-lanceolatis. Flor. Zeyl. 315. *Impatiens with three flowers on a foot-stalk, and narrow spear-shaped leaves.* Balsamina erecta, sc. fœmina, Persicæ angusto folio Zeylanica. Herm. Par. Bat. 105. *Upright, or female Balsamine of Ceylon, with a narrow Peach leaf.*

There are several other species of this genus, which grow naturally in India, which are plants of little beauty, so have not been introduced into the English gardens; the sorts here mentioned, are all I have yet seen growing here, except one tall sort from North America.

The first sort grows naturally in several parts of Westmoreland and Yorkshire, but is frequently introduced into gardens by way of curiosity. It is an annual plant, which rises about a foot and a half high, with an upright succulent stalk, whose joints are swollen, garnished with oval smooth leaves, which stand alternate on every side the stalk. The flowers come out from the wings of the stalks upon long slender foot-stalks, which branch into several other smaller, each sustaining one yellow flower, composed of five petals, which in front are shaped like the lip or grinning flowers, but at their base have a nectarium with a long tail like the flowers of Indian Cress; these are succeeded by taper pods, which, when ripe, burst open upon being touched, and twist spirally like a screw, casting out the seeds with great elasticity. If the seeds of this plant are permitted to scatter, they generally succeed better than when they are sown; for unless they are sown in the autumn soon after they are ripe, they very rarely grow. The plants require no care but to keep them clean from weeds, and thin them where they are too close. It flowers in June, and the seeds ripen about a month or five weeks after; this delights in a shady situation and a moist soil.

The second sort is the female Balsamine, of which there are several varieties; the common sort has been long an inhabitant in the English gardens, of this there is the white, the red, and striped flowered, and likewise the single and double flowering, with variegated flowers of two colours. These sorts are so hardy as to rise in the full ground; and where the seeds scatter, the plants will come up the following spring; but such self-sown plants do not come to flower so early as those which are raised upon a hot-bed; however, they generally are stronger plants, and continue much longer in the autumn in flower than the others, so are an ornament to the garden, when there is a greater scarcity of flowers.

This sort rises a foot and a half high, dividing into many succulent branches, which are garnished with long, spear-shaped, sawed leaves. The flowers come out from the joints of the stalks, upon slender foot-

ftalks about an inch long, each fuftaining a fingle flower; but there are two, three, or four of thefe foot-ftalks arifing from the fame joint. The flowers are compofed of five large unequal petals, which are fhaped like thofe of the former fort, but are larger, and fpread open much wider; there are white, purple, and red of this fort, as alfo fingle and double flowers. If the feeds of thefe are fown on a moderate hot-bed in the fpring, the plants will flower in June; but thofe which are fown in the full ground, will not flower before the middle of July; and thefe will continue flowering till the froft puts a ftop to them in the autumn.

There are two other varieties of this, if not diftinct fpecies; one of them grows naturally in the Eaft, and the other in the Weft-Indies; that which comes from the Eaft-Indies, by the title of Immortal Eagle Flower, is a moft beautiful plant; the flowers are double, much larger than thofe of the common fort; they are fcarlet and white variegated, and purple and white in others; and the plants producing many flowers, render them very valuable; and if the feeds of thefe are carefully faved, the kinds may always be preferved; but I have raifed fome plants from foreign feeds, whofe flowers were fo very double as to lofe their male parts, fo did not produce any feeds.

The feeds of thefe plants fhould be fown on a moderate hot-bed in the fpring, and when the plants are come up about an inch high, they fhould be tranfplanted on another moderate hot-bed at about four inches diftance each way, obferving to fhade them from the fun till they have taken new root; after which they fhould have a large fhare of free air admitted to them, at all times when the weather is favourable, to prevent their drawing up tall and weak: they will require to be often refrefhed with water, but it fhould not be given to them in too great plenty; for as their ftems are very fucculent, fo they are apt to rot with much moifture. When the plants are grown fo large as to touch each other, they fhould be carefully taken up with balls of earth to their roots, and each planted into a feparate pot filled with light rich earth, and plunged into a very moderate hod-bed under a deep frame, to admit the plants to grow, fhading them from the fun until they have taken frefh root; then they fhould have a large fhare of air admitted to them every day, and by degrees hardened, fo as to bear the open air, into which part of the plants may be removed in July, placing them in a warm fheltered fituation; where, if the feafon proves favourable, they will flower and make a fine appearance; but it will be proper to keep part of the plants either in a glafs-cafe or a deep frame, in order to get good feeds, becaufe thofe in the open air will not ripen their feeds unlefs the fummer proves very warm; and the plants in fhelter muft have a good fhare of free air every day, otherwife they will grow pale and fickly; nor fhould they have too much of the fun in the middle of the day, in very hot weather, for that occafions their leaves hanging and their requiring water, which is often very hurtful; therefore if the glaffes are fhaded in the middle of the day for three or four hours, the plants will thrive better, and continue longer in beauty than when they are expofed to the great heat. Thofe who are curious to preferve thefe plants in perfection, pull off all the fingle and plain coloured flowers from the plants which they preferve for feeds, leaving only thofe flowers which are double and of good colours; where this is carefully done, they may be continued without the leaft degeneracy conftantly.

The fort which grows in the Weft-Indies, is there called Cockfpur. This hath fingle flowers as large as the laft-mentioned fort, but I never faw any of them more than half double, and only with white and red ftripes: the plants are very apt to grow to a very large fize before they produce any flowers, fo that it is late in the autumn before they begin to flower; and fometimes in bad feafons they will fcarce have any flowers, and but rarely ripen their feeds here, fo that few perfons care to cultivate this fort, efpecially if they can have the other.

The third fort here mentioned grows naturally in Ceylon, and in many parts of India; this hath very narrow fpear-fhaped leaves, which are fawed on their edges; the foot-ftalks fuftain each three flowers, which are fmaller than thofe of the common fort, fo are not worthy of a place in gardens, except for the fake of variety. This is a tender plant, and requires the fame treatment as the Immortal Eagle Flower.

IMPERATORIA. Lin. Gen. Plant. 321. Tourn. Inft. R. H. 316. tab. 168. Mafterwort; in French, *Imperatoire.*

The CHARACTERS are,

*It hath an umbellated flower; the principal umbel is plain, and compofed of many fmaller; the greater umbel has no involucrum, but the fmall ones have, which are compofed of many narrow leaves, almoft as long as the umbel; the principal umbel is uniform; the flowers have five heart-fhaped petals, which are equal and inflexed. They have five hairy ftamina, terminated by roundifh fummits. The germen is fituated under the petals, fupporting two reflexed ftyles, crowned by obtufe ftigmas. The germen afterward becomes a roundifh compreffed fruit divided in two parts, containing two oval-bordered feeds.*

This genus of plants is ranged in the fecond fection of Linnæus's fifth clafs, intitled Pentandria Digynia, which contains the plants whofe flowers have five ftamina and two ftyles.

We have but one SPECIES of this genus, viz.

IMPERATORIA (*Oftruthium.*) Hort. Cliff. 103. *Mafterwort.* Imperatoria major. C. B. P. 156. *Greater Mafterwort*; and the Aftrantia of Dodonæus. Pempt. 320. *Mafterwort, or falfe Pellitory of Spain.*

This plant grows naturally on the Auftrian and Styrian Alps, and upon other mountainous places in Italy; the root is as thick as a man's thumb, running obliquely in the ground; it is flefhy, aromatic, and has a ftrong acrid tafte, biting the tongue and mouth like Pellitory of Spain; the leaves arife immediately from the root; they have foot-ftalks feven or eight inches long, dividing into three very fhort ones at the top, each fuftaining a trilobate leaf, indented on the border; the foot-ftalks are deeply channelled, and when broken emit a rank odour. The flower-ftalks rife about two feet high, and divide into two or three branches, each being terminated by a pretty large umbel of white flowers, whofe petals are fplit; thefe are fucceeded by oval compreffed feeds, fomewhat like thofe of Dill, but larger. It flowers in June, and the feeds ripen in Auguft.

This plant is cultivated iu gardens to fupply the markets. It may be propagated either by feeds, or by parting the roots: if you would propagate it by feeds, they fhould be fown in autumn foon after they are ripe, on a bed or border, in a fhady fituation; obferving not to fow the feeds too thick, nor fhould they be covered too deep. In the fpring the plants will appear, when they fhould be carefully weeded; and if the feafon fhould prove very dry, they fhould be now and then refrefhed with water, which will greatly promote their growth. Toward the beginning of May, if you find the plants come up too clofe together, you fhould prepare a moift fhady border (and thin the plants carefully, leaving them about fix inches afunder;) and plant thofe which you draw up into the border about the fame diftance apart every way, being careful to water them duly, if the feafon fhould prove dry, until they have taken root; after which time, thefe plants (as alfo thofe remaining in the feed-beds) will require no other culture but to keep them clear from weeds; which may be eafily effected, by hoeing the ground between the plants now and then in dry weather, which will deftroy the weeds; and by thus ftirring the ground, will be of great fervice to the plants. The following autumn thefe plants fhould be tranfplanted where they are defigned to remain, which fhould be in a rich moift foil and a fhady fituation;

tation; where they will thrive much better than if too much exposed to the sun, or in a dry soil, for they delight in shade and moisture; so that where these are wanting the plants will require a constant supply of water in dry weather, otherwise they will thrive but slowly. The distance which these plants should be placed, must not be less than two feet every way, for where they like their situation, they will spread and increase much. When these plants are rooted, they will require no other culture but to keep them clear from weeds; and in the spring, before they shoot, the ground should be every year gently dug between the plants; in doing of which, great care should be had not to cut or bruise their roots. These plants, with this management, will continue several years, and will produce seeds in plenty.

If you would propagate these plants by offsets, their roots should be parted at Michaelmas, and planted in a shady situation, at the same distance as has been directed for the seedling plants, observing to water them until they have taken root, after which time they must be managed as the seedlings.

The roots of this plant are used in medicine, and are greatly reccommended for their virtue in contagious distempers, or the bites of venomous creatures; they are alexipharmic and sudorific; by some they are recommended for cholics and asthmas, for the cramp, and all cold diseases of the nerves.

**INARCHING** is a method of grafting, which is commonly called grafting by approach. This method of grafting is used when the stock you intend to graft on, and the tree from which you would take the graft stand so near (or can be brought so near) that they may be joined together. The method of performing it is as follows: take the branch you would Inarch, and having fitted it to that part of the stock where you intend to join it, pare away the rind and wood on one side about three inches in length. After the same manner cut the stock or branch in the place where the graft is to be united, so that the rind of both may join equally together, at least on one side, that the sap may meet; then cut a little tongue upwards in the graft, and make a notch or slit in the stock downward to admit it; so that when they are joined, the tongues will prevent their slipping, and the graft will more closely unite with the stock. Having thus placed them exactly together, you must tie them with some bass, or other soft bandage; then cover the place with grafting clay, to prevent the air from entering to dry the wound, or the wet from getting in to rot the stock: you should also fix a stake into the ground to which that part of the stock, as also the graft should be fastened, to prevent the wind from breaking them asunder, which is often the case when this precaution is not observed.

In this manner they are to remain about four months, in which time they will be sufficiently united, and the graft may then be cut from the mother tree, observing to slope it off close to the stock; and if at this time you cover the joined parts with fresh grafting clay, it will be of great service to the graft.

This operation is always performed in April or May, that the graft may unite with the stock before the succeeding winter, and is commonly practised upon Oranges, Myrtles, Jasmines, Walnuts, Firs, Pines, and several other trees, which will not succeed so well by common grafting or budding. But although I have mentioned Orange-trees among the rest, yet I would by no means advise this practice where the trees are designed to grow large, which, in this method, they rarely ever will do; and it is chiefly practised upon those trees only as a curiosity, to have a young plant with fruit upon it, in a year or two from seed, by Inarching a bearing branch into a young stock, whereby it is effected, yet these plants are seldom long lived.

**INDIGOFERA.** Lin. Gen. 889. Indigo.

The CHARACTERS are,

*The empalement is of one leaf, spreading almost flat, and cut into five segments; the flower is of the butterfly kind, having a roundish spreading standard, which is indented at the point and reflexed: the wings are oblong, obtuse, and their under borders spreading; the keel is obtuse, spreading, and acute-pointed. It hath ten stamina digested in a cylinder whose points ascend, terminated by roundish summits, and a cylindrical germen, supporting a short style, crowned by an obtuse stigma. The germen afterward becomes a long taper pod, inclosing kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, from the flowers having ten stamina formed in two bodies.

The SPECIES are,

1. INDIGOFERA (*Tinctoria*) leguminibus arcuatis incanis, racemis folio brevioribus. Flor. Zeyl. 273. *Indigo with hoary arched pods, and the bunches of flowers shorter than the leaves.* Anil sive Indigo Americana, siliquis in falculæ modum contortis. Acad. R. Scien. 1718. *Guatimala Indigo.*
2. INDIGOFERA (*Suffruticosa*) leguminibus arcuatis incanis, caule fruticosa. *Indigo with a shrubby stalk, and hoary arched pods.* Colutea affinis fruticosa argentea, floribus spicatis è viride purpureis, siliquis falcatis. Sloan. Cat. Jam. 142.
3. INDIGOFERA (*Caroliniana*) leguminibus teretibus, foliolis quinis spicis longissimis sparsis, radice perenne. *Indigo with taper pods, leaves with five lobes, long loose spikes of flowers, and a perennial root.*
4. INDIGOFERA (*Indica*) leguminibus pendulis lanatis compressis, foliis pinnatis. *Indigo with woolly, compressed, hanging pods, and winged leaves.*
5. INDIGOFERA (*Glabra*) leguminibus glabris teretibus, foliolis trifoliatis. *Indigo with smooth taper pods, and trifoliate leaves.*

The first and fifth sorts are annual plants with us; the seeds of these must be sown on a hot-bed early in the spring of the year, and when the plants are come up two inches high, they should be transplanted into small pots filled with good fresh earth, and the pots plunged into a hot-bed of tanners bark; when the plants have obtained some strength, they must have a great share of free air, by raising the glasses in the day time; and in June they may be exposed more to the open air, by which time they will begin to produce their flowers, which will be succeeded by pods in a short time after, and in August their seeds will be perfected, if the plants are brought forward in the spring.

The second sort grows to the height of five or six feet, and will abide two or three years, if it is preserved in a very warm stove in winter; this produces spikes of flowers from the wings of the leaves on the sides of the stems of the plant, and sometimes will perfect its seeds in England. This must be raised in a hot-bed, as was directed for the two former, but must not be wholly exposed to the open air, even in the hottest weather.

The fourth sort is supposed to be promiscuously used to make the Indigo, but the first is the common sort which is cultivated in the English plantations in America; but I have been assured by a person of great credit, that he has made as good Indigo from the second sort, as any that was produced in our plantations; and this being a much larger plant, will afford a greater quantity from the same compass of ground, than any one of the other species, especially if cut before the stalks grow ligneous; and this sort will grow on poorer land, so may be cultivated in such places where the first sort will not thrive so well, by which means great improvements may be made with this plant in our American plantations. There are some other sorts of this plant which are natives of India, from which this commodity is made; two of which, viz. the fourth and fifth sorts I have had growing in the garden at Chelsea, both which are very different in their leaves and pods from either of the American sorts which have been cultivated. I have also received seeds from India of the third sort, which is the same species of Indigo which grows naturally in South Carolina, and which was greatly esteemed

ſome years ago by the Indigo planters of that country, for the beauty of the commodity which it produced; but the plants being ſlender and thinly garniſhed with leaves, which were ſmall, they did not furniſh a quantity of Indigo in proportion to their bulk, ſo of late this ſort has not been much cultivated there; though the account which I received with the ſeeds was, that it was what the beſt Indigo of India was made from.

The whole proceſs in making the Indigo being exactly deſcribed by Pere Labat in his voyages, I thought it would not be unacceptable to the Engliſh reader, to tranſlate his account in this place, which is as follows:

There was formerly a great deal of Indigo made in the pariſh of Macauba: there is not a ſtream nor river in it, where one does not meet with Indigo works, that is, backs or vats of ſtone-work well cemented, in which the plant that yields the dye is put to digeſt: there are uſually three of theſe vats one above another, in the manner of a caſcade; ſo that the ſecond, which is lower than the bottom of the firſt, may receive the liquor contained in the firſt, when the holes which are made in the bottom of the firſt are unſtopped; and that the third may in its turn receive what was in the ſecond.

The firſt, largeſt, and higheſt of theſe vats is called the ſteeper or rot; it is uſually made twenty feet long, twelve or fifteen feet wide, and three or four feet deep. The ſecond is called the battery, it is almoſt half as ſmall again as the firſt: and the third, which is much leſs than the ſecond, is called the devilling.

The names of the two firſt perfectly agree with their uſes, for the plant is laid to ſteep in the firſt, where it ferments, is macerated, and becomes like rotten dung: after that the ſalts and ſubſtance of the leaf and rind are diffuſed in the water by the fermentation, which the heat and ripeneſs of the plant has excited in it. It is in the ſecond that they agitate and beat this water, impregnated and loaded with the ſalts of the plant, till having collected, re-united, and, as it were, coagulated them with one another, they form the particles which compoſe the dye.

As for the name of the third, I do not ſee how it agrees with it, unleſs it be becauſe this vat is deeper coloured than the others; for the Indigo already formed remaining in it, conſequently dyes and colours it much deeper than the others.

To which I ſhould add, that it is only at St. Domingo that they make uſe of this name. In the Windward Iſlands they call this laſt vat the ſettler, and this name ſuits it perfectly well, becauſe it is in this, that the Indigo begun in the ſteeper, and perfected in the battery unites, grows into a maſs, ſeparates itſelf from the particles of water which remained in it, leaves them at top, and ſettles at the bottom of the vat; whence it is taken out to be put into little bags, and then into the boxes, as I ſhall mention hereafter.

Nothing ought to be omitted in the building and making theſe vats ſubſtantial; the ſtrength of the fermentation is ſo great, that unleſs the ſtone-work and plaſter be very well done, and the mortar carefully choſen and wrought, they crack; and a very moderate crack is ſufficient to let out a vat of Indigo, and cauſe a conſiderable loſs to the owner.

When this misfortune happens, the following is an eaſy and infallible remedy, which I can anſwer for, as having experienced it. Take ſome ſea ſhells of any kind whatever, pound them without burning them, powder them, and ſift them through a fine ſieve. Take an equal quantity of quick lime and ſift it; mix theſe together with water enough to make a ſtiff mortar, and as quick as you can, ſtop the cracks of your vats with it. This mixture incorporates, ſticks, and dries in a moment, and immediately prevents the matter's running out of the vat.

Every body does, or ſhould know, that Indigo is a dye uſed to dye wool, ſilk, cloths, and ſtuffs, blue: the Spaniards call it Anilo: the fineſt they make, i. e. in New Spain, comes from Guatimala, which makes a great many people call it barely Guatimalo. It is made alſo in the Eaſt-Indies, particularly in the dominions of the Great Mogul, the kingdom of Golconda, and other places thereabouts, as Mr. Tavernier relates in his voyages. This ſort is in Europe oftener called India than Indigo or Anil, people taking for its proper name the name of the place it was made at. Some authors, and among others, Father du Tertre of our order, having fancied that the Indigo which comes from the Eaſt-Indies is more beautiful, finer, and dearer, than that which comes from the Weſt-Indies, which they call flat Indigo, while they call that from the Eaſt barely India. They would have ſpoken more properly, if they had called the latter round India; for, by their leave, all the difference between the two Indias, or Indigos, is, that that made in the Eaſt-Indies is ſhaped like half eggs, and that of the Weſt like cakes; for as for goodneſs and beauty, the one will not be a whit ſuperior to the other, if both are wrought with equal care and fidelity.

The ſhape of the Oriental Indigo obliges the merchants who would carry it into Europe to pound it, that they may put the more into the cheſts, or barrels they put it up in. It is certain, that being thus pounded, its grain having been broken under the peſtle, ground, and reduced to powder, makes it finer than the Weſt-Indian Indigo, which coming in cakes juſt as it was dried, ſhews its grain entire, and conſequently muſt appear coarſer; but what is that to the intrinſic goodneſs of the commodity; I maintain it is the ſame in both, though there ſeems to be a difference.

To be convinced of this truth, take a lump of ſugar equally white throughout, break it in two, pound one part of it, and reduce it to powder; this will look finer and whiter than that which is whole, which proceeds only from this, that the grain of the one has been ſeparated and divided into a greater number of parts, which, though very ſmall, and almoſt inſenſible, yet have a greater number of ſurfaces, and conſequently reflect more light; whereas the other remaining entire, preſenting to the ſight only a large grain, which has but little ſurface, of courſe reflects leſs light, and by a neceſſary conſequence muſt appear leſs white; which is the ſame as appearing leſs beautiful, ſince the beauty of ſugar conſiſts in its whiteneſs. Methinks we may reaſon in the ſame manner upon Indigo, and ſay, that cæteris paribus, the Weſt-Indian Indigo is as beautiful as the Eaſt-Indian, when they are both wrought alike.

I think I ſhould add, that the American Indigo is better for uſe than the other; for who does not ſee, that there is no pounding this dye, without the moſt ſubtle parts being diſſipated in the air, as Mr. Tavernier allows? And who can doubt that theſe parts are the beſt, and thoſe that go fartheſt when it is uſed?

I grant that the Indigo which comes from the Eaſt-Indies, is dearer than that which is made in the Weſt-Indies; the reaſon is plain, it comes farther, runs greater riſks; and thoſe who bring it would not find their account in ſelling it, at the ſame price with that which comes from a much nearer place; but that does not at all prove it to be more beautiful, or better.

Indigo is compoſed of the ſalt and ſubſtance of the leaves and rind of a plant of the ſame name; ſo that one may ſay, it is a diſſolution or digeſtion of the plant, cauſed by the fermentation it has excited in the water it was laid to ſteep in. I know ſome writers pretend, that the ſubſtance of the leaves does not produce the Indigo, which (as they would have it) is only a viſcous tincture, or colour, which the fermentation of the plant diffuſes in the water: but before I take their words for it, I deſire they would tell me what becomes of the ſubſtance of the plant; for when it is taken out of the ſteeper, it is certain, that it has no longer the ſame weight, conſiſtence, nor colour, it had before. The leaves, which were very plump,

plump, and very full of juice, are light, flabby, and withered, and look more like dung than any thing elſe, which makes them frequently give the name of rot to the ſteeper. If then we no longer find in the leaves, and the reſt of the plant, the ſame ſubſtance that was obſervable in it before it was laid to ſteep, is it not moſt natural to believe, that it is the ſame ſubſtance and ſalts, which, being freed from their incloſures, and diffuſed in the water, have thickened it, and by their union or coagulation have formed that blue maſs which they call Indigo, ſo uſeful in painting and dyeing?

The culture.] This plant requires a good rich level ſoil, not too dry; it greatly robs and impoveriſhes the ground where it grows, and muſt be alone. There cannot be too much care taken to keep it clean, and to hinder herbs of any kind whatever from growing near it. They weed and cleanſe the ground where they intend to plant the Indigo ſeed, five times over. I ſhould think they ſhould call it ſowing, but the term of planting is conſecrated in our iſles, and I do not think I ought for the ſake of a word to fall out with our planters, who deſerve our eſteem upon a thouſand accounts, though they have got a habit of murdering the French language. They ſometimes carry their neatneſs to ſuch a pitch, that they ſweep the piece of ground as they do a room. After that they make the holes wherein the ſeeds are to be put for this purpoſe; the ſlaves, or others, who are to work at it, range themſelves in the ſame line, at the top of the piece of ground; and going backwards they make little drills the breadth of their hoe, of the depth of two or three inches, at about a foot diſtance every way, and as much as poſſible in a ſtrait line. When they are come to the end of the ground, each furniſhes himſelf with a little bag of ſeeds, and returning that way they came, they put eleven or thirteen ſeeds into each of the holes they have made. A relick of ſuperſtition has taught them that the number muſt be odd. I by no means approve of this practice, but I ſhall take care not to endeavour to ſhew them the uſeleſſneſs and folly of it, being ſatisfied I ſhall only loſe my time and labour.

This work is the moſt toilſome of any in the manufacture of Indigo; for thoſe who plant it muſt be always ſtooping, without riſing up, till the planting of the whole length of the piece is ended; ſo that when that is large, which almoſt always happens, they are obliged to remain two hours, and often more, in this poſture.

When they come to the top of the piece, they go back again, and cover the holes where they have put the ſeed in, by thruſting in with their feet the earth they had taken out of them, and ſo the ſeed is covered with about two inches of earth.

The culture of this plant may be rendered very eaſy, provided the inhabitants of our colonies in America could be brought to make uſe of the drill plough; for with this inſtrument two perſons and a horſe or mule will ſow more land with Indigo in one day, than twenty perſons can perform in the ſame time, in the method now practiſed; for the plough makes the drill, and the hopper which is fixed to the plough follows, and ſcatters the ſeeds at equal diſtances in the drills; and another inſtrument behind the hopper covers in the drills, whereby the whole operation is performed at the ſame time, and with great eaſe. Indeed the uſe of this machine muſt be underſtood by the perſons who are to perform it, otherwiſe they will do it in a bad manner, but a little practice will bring any perſon to the right uſe of it.

As the Indigo is ſown in rows, a hoeing plough may be made of a proper dimenſion, in order to clean the ground between the rows; with this contrivance it may be performed in much leſs time than in the method now practiſed. But in doing of this, I would adviſe the ſtirring of the ground, ſoon after the Indigo plants are come up, before the weeds have got much ſtrength, at which time they are ſoon deſtroyed; and by ſtirring of the ground the plants will be greatly encouraged; and the ſtrongeſt and moſt thriving plants will always make the beſt Indigo.

What Le Bat ſays of cutting the plants before they are too old, in order to have the Indigo of a better colour, is certainly right. Therefore as ſoon as the flowers begin to appear, it ſhould be cut; for if it ſtands much longer the ſtems of the plants will grow hard and ſtringy, and the lower leaves will change to a yellowiſh colour, which will render the Indigo leſs valuable; as will alſo the plants being too cloſe together, which will occaſion their bottom leaves to decay for want of free air: the ſame will happen if weeds are ſuffered to grow among the plants. Therefore there muſt be great regard to their being kept always clean.

Though all ſeaſons are good for the planting of Indigo, yet care muſt be taken not to put it in the ground in a dry time: it is true, the ſeed may keep a whole month in the ground, without being ſpoiled; but when it is planted ſo, one runs the riſk of having it eaten up by vermin, or carried away by the wind, or choked by the weeds that ſpring up with it; ſo that the prudent planters never run the riſk of planting it dry, i. e. at a time when they do not probably expect rain in two or three days after the planting is ended: they chuſe therefore, uſually, a moiſt ſeaſon, which promiſes rain, and then they are ſure of ſeeing the plant ſpring up in three or four days after its being planted.

Notwithſtanding all the care that has been taken in clearing the ground where the ſeeds have been planted, the planter muſt not be careleſs when the Indigo is got above ground; becauſe the goodneſs of the ſoil, joined to the moiſture and warmth of the climate, and the plentiful dews that fall every night, makes a prodigious quantity of weeds ſpring up, which would choke and abſolutely ſpoil the Indigo, if extreme care was not taken to weed them up as ſoon as they appear, and to keep the plant extraordinary neat; and very often the weeds are partly the cauſe of the breeding of a kind of caterpillars, which devour all the leaves in a ſhort time.

From the time of the plants riſing above ground, to its perfect maturity, is but two months, and then it is fit to cut: if one was to ſtay longer it would bloſſom, its leaves would grow drier and harder, and conſequently they would yield leſs ſubſtance, and the colour would not be near ſo beautiful.

After this firſt cutting, the new branches and leaves which the plant produces may be cut about every ſix weeks, provided the ſeaſon be rainy, and that care be taken not to cut it in a time of drought, becauſe then we ſhould infallibly loſe the plant, or, as they call it there, the Choupues, and be obliged to plant again; but all things being rightly managed, the plant may laſt two years; after which it muſt be plucked up, and new ones planted.

When the plant is ripe, which is known by the leaves, which grow brittle and leſs ſupple, they cut it ſome inches from the ground. They uſe for the cutting of it great crooked knives made like ſickles. Some planters make it into bundles like double bottles of hay, that a negro may eaſily carry them to the ſteeper; but moſt people put it into large pieces of coarſe cloth, which they tie by the four corners; and this is more convenient, the plant is leſs handled and ſqueezed, and the ſmall are carried away as ſafely as the great; and beſides the work goes on quicker this way, than in making bottles; and as time is precious every where, and eſpecially in America, there cannot be too much care taken not to loſe any.

Eighteen or twenty packets of plants, each about the ſize of two bottles of hay, are ſufficient to fill a ſteeper of the afore-mentioned ſize. When it is filled with water, ſo that it covers the plants, they put pieces of wood on the top, that the plants may not riſe above the water (much after the manner as they do upon the Grapes that are put into the preſs) and let all ferment. According as the heat is greater or leſs, or the plant more or leſs ripe, the fermentation is raiſed ſooner or later,

later, sometimes in six, eight, or ten hours; and sometimes one is obliged to wait eighteen or twenty hours, but very seldom longer. Then the effect of the fermentation visibly appears, the water heats, and boils up on all sides, as the Grapes do in the vat; and the water which at first was clear, insensibly grows thick, and becomes of a blue, inclining to a Violet colour. Then without meddling at all with the plants, they open the cocks, which are at the bottom of the steeper, and let all this water, loaded with the salts and substance of the plant, which were freed by the fermentation, run into the battery; and while they throw away as useless, and almost rotten, the plants that were in the steeper, and clean it, that it may be filled with fresh, they beat the water, which they have let out of the steeper into the battery.

They formerly used for this purpose a battledoor wheel, whose axle was placed upon the middle of the vat, and which they turned by two handles that were at the end of the same axle. Since that, in the room of battledoors, they have put little bottomless boxes, and afterwards others, whose bottoms were bored full of holes: at present they use a kind of pretty large pails, fastened to strong poles, placed upon chandeliers, by means of which, the negroes violently and continually raise, beat, and stir the water, till the salts and other parts of the substance of the plant are united, and sufficiently, as it were, coagulated to incorporate.

The hitting this minute exactly shews the skill of him who oversees the making of the Indigo; for if he makes them leave off beating a little too soon, the grain not yet formed, remains dispersed in the water, without sinking and gathering together at the bottom of the vat, and is lost with the water, when they are obliged to let it out, which is a great loss to the owner; or if when it is formed they continue to beat, they dissolve it, and the same inconvenience follows. This minute then must be nicked, and when it is found, they must leave off beating and let the matter rest.

To find this minute, they make use of a little silver cup, designed for this use alone; they fill it with this water, while the negroes beat it, and according as they observe that the fæces sink to the bottom of the cup, or remain dispersed in the water, they cease, or continue beating.

The General Dictionary printed at Trevoux, relates very seriously, upon the credit of father Plumier a minim, that the Indigo-maker having taking up some of the water of this battery in his cup, spits in it; and that if the Indigo be formed, the fæces immediately sink to the bottom of the cup, and that then he makes them leave off beating, if not, he makes them continue it. This is not the only incident in which people have imposed upon father Plumier's credulity and simplicity. I have been a witness of it upon other occasions.

When they have left off beating they let the matter rest, the fæces sink to the bottom of the vat, and gather together like a kind of mud; and the water freed from all the salts it was impregnated with, swims above it, and grows clear. Then they open the cocks, which are placed in the battery at different distances from the bottom, and let this water run away; and when they come to the surface of the fæces, they open the cocks of the bottom, that the fæces may all fall into the devilling or settler. There they let it settle a little while longer, after which they put it into linen bags, fifteen or eighteen inches long, made with a point, where it perfectly purges itself from the rest of the water, which remained among its particles. When that is done, they spread it in little boxes three or four feet long, two feet broad, and about three inches deep, and expose it to the air to dry it perfectly. They observe not to expose it to the sun, because it would starve the colour in drying it; and they take a great deal of care to keep it from the rain, because that would dissolve and utterly spoil it.

It sometimes happens that the caterpillars get among the Indigo; and if they are let alone ever so little a while they eat all the leaves, and often the very rind and ends of the branches, and kill the stocks; it is but lost time to endeavour to destroy them, or hinder them from ravaging a whole piece, by stopping them with a ditch. The surest way is to cut down the Indigo with all speed, let its age be what it will, and to throw both plants and caterpillars together into the steeper; there they burst, and part with what they had devoured, and the Indigo is not the less beautiful for it. It is true, when the plant is not come to its perfect maturity, it yields much less; but many experiments have taught us, that the colour it yields is much more beautiful; so that what is lost one way is gained another.

I would not wait for so perfect a ripeness before I cut the plant. Perhaps all the secret of those, whose Indigo is so much extolled beyond ours, lies only in cutting the plant when it yields the liveliest colour. I have experienced that in leaving some cochineal flies upon some Indian Figs, which were too ripe, instead of being red, they grew of a filemot colour, like the fruit they fed upon. The same thing might happen in Indigo; and what I here propose is not a groundless doubt, since it is backed by the experiment I have just related; which plainly proves, that the same plant, cut at different ages, produces colours different in beauty. I would not venture to give this advice to men wedded to their interest, who value the quantity rather than the quality of their commodity; but I believe I have nothing to fear from our islanders, who are generous and magnificent, sometimes even beyond their abilities: I advise them therefore to make different trials, as to the soil, the season, the age of the plant, the water they steep it in, the point of dissolution, &c. and I am sure, that with a little time, labour, and patience, they will make Indigo that will equal, and even excel, the most boasted Indigo of foreign countries. The planters of St. Domingo know that in 1701 their coarse sugar was very bad, and was not made without infinite trouble; and at present every body allows, that by their labour, assiduity, and enquiries, it is grown much more esteemed than that of the Windward Islands: why may not the same be hoped for in Indigo?

Mr. Pomet, author of the General History of Drugs, says in his first part, chap. 10. That the Indians of the village of Sarquesse, near Amadabat, use only the leaves of the Indigo, and throw away the plant and branches; and that it is from thence the most esteemed Indigo comes.

I am pretty much of his opinion; for we see, that those who take the pains to strip off the Grapes from the branches, before they put them into the vat, and throw away the stalks entirely, make much the best wine; because the stalks always contain an acid, which mixes with the juice of the Grape in the treading and pressing them both together; and for the same reason, the stalks of the Indigo plant must contain a liquid much less perfect in colour than that of the leaves: but one ought to have the leisure and patience of the Indians to undertake such a work, and have workmen as cheap as they are in that country, supposing the fact true, as Mr. Pomet delivers it from the relation of Mr. Tavernier.

Though I am a great friend to those experiments which may carry our manufactures to a greater perfection, yet I dare not propose this, because of the expence they must be at, who would try it; and because the profit arising from it would not perhaps quit cost: however, I have here given the method of the Indians of Sarquesse, that I may have no reason to reproach myself with having omitted a thing which may be of some use to my country.

Good Indigo ought to be so light, as to swim upon water; the more it sinks the more it is to be suspected of being mixed with earth, ashes, or powdered slate. Its colour ought to be a deep blue, inclining to a Violet, brilliant, lively, and bright: it ought to be more

more beautiful within than without, and look ſhining, and as it were ſilvered.

If it is too heavy in proportion to its bulk, it ought to be ſuſpected, and its quality examined into; for as it often bears a conſiderable price, it is fit that thoſe who buy it, ſhould be acquainted with the frauds that may be committed in it.

The firſt is the beating the plant too much in the ſteeper, that the leaves and rind of it may be entirely conſumed. It is certain that the quantity of the matter is very conſiderably increaſed by this diſſolution, but the Indigo is a great deal the leſs beautiful for it; it is blackiſh, thick, heavy, and fitter to be thrown away than uſed.

The ſecond is the mixing aſhes, earth, or a certain brown ſhining ſand (which is pretty commonly found in the bays by the ſea-ſide) and eſpecially powdered ſlate, with the fæces, as they fall into the devilling, and ſtirring all well together, that it may incorporate, and the fraud not appear: and this fraud is much more eaſily committed in the powdered Indigo, than in that which is in cakes; becauſe it is very difficult for thoſe heterogeneous bodies to unite ſo well together, as not to make in many places, as it were, beds of a different matter; and then, by breaking the piece of Indigo, they are eaſily perceived.

The two following expedients may be made uſe of, in order to know the goodneſs or badneſs of Indigo.

The firſt is to diſſolve a bit of it in a glaſs of water. If it is pure and well made, it it will entirely diſſolve; but if it is adulterated, the foreign matter will ſink to the bottom of the glaſs.

The ſecond is to burn it. The good Indigo will burn all away, whereas the aſhes, earth, ſand, and ſlate, remain after the true Indigo is conſumed.

In 1694, Indigo was ſold at the Windward Iſlands, from three livres ten ſols, to four livres per pound, according to its beauty, and the number of veſſels to be freighted with it. I have known it ſince at a much lower price; however, the planter would not fail of making a very conſiderable profit of it, though he ſhould ſell it for no more than forty ſols per pound, becauſe this commodity requires fewer utenſils and leſs charges than a ſugar-work.

Since the cultivation of Indigo was introduced in South Carolina, great quantities of that uſeful dye has been brought from thence to England; and it may be hoped that the encouragement granted by parliament to the planters, will enable them to proſecute this branch of commerce with ſuch ſucceſs, as to be a great national benefit, and of equal advantage to that colony: but as yet the planters have not arrived to ſo much perfection in the making of it as could be wiſhed; for moſt of the Indigo which I have ſeen of the produce of that country, has been ſo hard as to render it difficult to diſſolve, occaſioned by their pouring a quantity of lime-water into the vat, in order to make the fæces of the plant ſubſide. I have alſo been informed by letters from many of the planters, that after the fermentation of the plant in the vat, it comes out again almoſt entire, being but in a very ſmall proportion leſſened, either in bulk or weight. This may probably be owing, in great part, to their culture of the plant, as alſo from their vats not being large enough to contain a ſufficient quantity of the herb, to make the fermentation ſtrong enough to diſſolve it; or from the vats being built in the open air, whereby the fermentation may be impeded, by the cooler breezes of the evening air: for in the iſlands where the beſt Indigo is made, their vats are all built under cover, where their heat is much greater than that in Carolina, therefore this requires the attention of the planters of Indigo.

As to the culture of the plant, by all the information I have been able to procure from thence, they commit a great error in ſowing their ſeeds too thick, whereby the plants are drawn up with ſlender ſtems, which are not ſufficiently garniſhed with leaves; nor are the leaves ſo large and ſucculent as they would naturally grow, were the plants allowed a greater ſhare of room, ſo that the ſtalks conſiſt of little elſe but ſtrong veſſels which are not diſſolvable by the fermentation, and it is only the upper parts of the plant which are furniſhed with leaves, like young trees growing cloſe together which are drawn up with ſlender ſtems, having no lateral branches, nor leaves, but at their tops; therefore it is not to be ſuppoſed, a great quantity of Indigo can be produced from plants ſo managed; for it is a common obſervation of the cultivators of Woad, that when their plants ſpire, and have narrow thin leaves, they produce but little of the dye; ſo that they make choice of rich ſtrong land for ſowing the ſeeds of this plant, and are careful to thin them, that they may have room to ſpread, and produce large ſucculent leaves, from which they always reap the greateſt profit. If the planters of Indigo in America would but imitate the cultivators of Woad in this particular, they would certainly find their advantage in ſo doing.

Another thing in which they err is, letting the plant ſtand too long before they cut it, ſuppoſing from the height of the plant to procure a great quantity of the dye; but in this they are greatly miſtaken, for the older the plant is before it is cut, the drier and firmer will be the ſtalks; therefore but little of the plant will be diſſolved by fermentation, nor will the fæces of the old plants be near ſo beautiful as that of the young. Therefore it is to be wiſhed, that they would try ſome few experiments in the culture and management of the plants, by ſowing thin, and keeping the plants perfectly clean from weeds; as alſo to cut them while young and full of juice, and hereby they will be better informed how to improve it to the greateſt advantage. But as labour is dear in that country, ſo many perſons probably object to the expence of cultivating the Indigo in this method; therefore, to avoid this, I have before propoſed ſowing the ſeeds with a drill plough, whereby the firſt expence will be greatly leſſened, and the ſeeds more equally ſown; and by the uſe of the hoe plough, ten acres may be kept clean from weeds with as ſmall expence, as one when managed by the hand hoe; and by ſtirring of the ground often, and earthing up the plants, they would grow much ſtronger, be leſs liable of being deſtroyed by flies, and have larger and more ſucculent ſtalks and leaves.

INGA. See Mimosa.

INOCULATING, or Budding. This is commonly practiſed upon all ſorts of ſtone fruit, in particular, ſuch as Peaches, Nectarines, Cherries, Plums, &c. as alſo Oranges and Jaſmines, and is preferable to any ſort of grafting for moſt ſorts of fruit. The method of performing it is as follows: you muſt be provided with a ſharp penknife, having a flat haft (the uſe of which is to raiſe the bark of the ſtock, to admit the bud) and ſome ſound baſs mat, which ſhould be ſoaked in water to increaſe its ſtrength, and make it more pliable; then having taken off the cuttings from the trees you would propagate, you ſhould chooſe a ſmooth part of the ſtock about five or ſix inches above the ſurface of the ground, if deſigned for dwarfs, and for half ſtandards at three feet; but for ſtandards, they ſhould be budded ſix or more feet above ground; then with your knife make an horizontal cut croſs the rind of the ſtock, and from the middle of that cut make a ſlit downwards about two inches in length, ſo that it may be in the form of a T; but you muſt be careful not to cut too deep, leſt you wound the ſtock: then having cut off the leaf from the bud, leaving the foot-ſtalk remaining, you ſhould make a croſs cut about half an inch below the eye, and with your knife ſlit off the bud, with part of the wood to it, in form of an eſcutcheon: this done, you muſt with your knife pull off that part of the wood which was taken with the bud, obſerving whether the eye of the bud be left to it, or not (for all thoſe buds which loſe their eyes in ſtripping, ſhould be thrown away, being good for nothing) then having gently raiſed the bark of the ſtock where the croſs in-

cision was made, with the flat haft of your penknife clear to the wood, you should thrust the bud therein, observing to place it smooth between the rind and the wood of the stock, cutting off any part of the rind belonging to the bud, which may be too long for the slit made in the stock; and so having exactly fitted the bud to the stock, you must tie them closely round with bass mat, beginning at the under part of the slit, and so proceed to the top, taking care that you do not bind round the eye of the bud, which should be left open.

When your buds have been inoculated three weeks or a month, you will see which of them have taken; those of them which appear shrivelled and black, being dead, but those which remain fresh and plump, you may depend are joined; and at this time you should loosen the bandage, which, if not done in time, will pinch the stock, and greatly injure, if not destroy, the bud.

The March following you must cut off the stock about three inches above the bud, sloping it that the wet may pass off, and not enter the stock; to this part of the stock left above the bud, it is very proper to fasten the shoot which proceeds from the bud, and would be in danger of being blown out, if not prevented; but this must continue no longer than one year, after which it must be cut off close above the bud, that the stock may be covered thereby.

The time for Inoculating is, from the middle of June until the middle of August, according to the forwardness of the season, and the particular sorts of trees to be propagated; but the time may be easily known, by trying the buds, whether they will come off well from the wood. However, the most general rule is, when you observe the buds formed at the extremity of the same year's shoots, which is a sign of their having finished their spring growth. The first sort commonly inoculated is the Apricot, and the last the Orange-tree, which should never be done until the middle of August; and in doing of this work, you should always make choice of cloudy weather; for if it be done in the middle of the day, in very hot weather, the shoots will perspire so fast, as to leave the buds destitute of moisture; nor should you take off the cuttings from the trees long before they are used; but if you are obliged to fetch your cuttings from some distance, as it often happens, you should then be provided with a tin box or case, having a socket about ten inches long, and a cover to the top, which must have five or six holes; in this socket you should put as much water as will fill it about two or three inches high, and place your cuttings therein in an upright position, so that that part which was cut from the tree may be set in the water, and so fasten down the cover to keep out the air; and the holes in the cover will be sufficient to let the perspiration of these branches pass off, which, if pent in, would be very hurtful to them; you must also be careful to carry it upright, that the water may not reach to the buds; for it is a very wrong practice in those who throw their cuttings all over in water, which so saturates the buds with moisture, that they have no attractive force left to imbibe the sap of the stock, whereby they very often miscarry.

But before I leave this head, I beg leave to observe, that though it is the ordinary practice to divest the bud of that part of the wood which was taken from the shoot with it; yet, in many sorts of tender trees, it is best to preserve a little wood to the bud, without which they often miscarry. The not observing this, has occasioned some people to imagine, that some sorts of trees are not to be propagated by Inoculation; whereas, if they had performed it in this method, they might have succeeded, as I have several times experienced.

INTYBUS. See Cichorium.

INULA. Lin. Gen. Plant. 860. Enula. Cæsalp. Helenium. Raii Meth. 33. Aster. Tourn. Inst. R. H. 481. tab. 274. Elecampane.

The Characters are,

*It hath a radiated compound flower, with an imbricated empalement, composed of loose, spreading, small leaves, the outer being the broadest. The disk, or middle of the flower, is composed of hermaphrodite florets, and the border, or ray of the female half florets, stretched out like a tongue. The hermaphrodite florets are funnel-shaped, erect, and cut into five segments at the top; these have five short slender stamina, terminated by cylindrical summits, which coalesce at the top: they have one long germen, crowned with down, supporting a slender style the length of the stamina, crowned by an upright bifid stigma. The female half florets have a narrow entire tongue, no stamina, but a long crowned germen with a hairy style, and an upright stigma. The germen in both flowers become a single, narrow, four-cornered seed, crowned with a down, sitting on a naked receptacle.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, intitled Syngenesia Polygamia superflua, which includes the plants with a compound flower, made up of hermaphrodite florets in the disk, and female half florets for the rays, which are fruitful.

The Species are,

1. Inula (*Helenium*) foliis amplexicaulibus ovatis, rugosis, subtus tomentosus, calycum squamis ovatis. Amœn. Acad. 1. p. 410. *Elecampane with oval rough leaves, which embrace the stalks, woolly on their under side, and the scales of the empalement oval.* Aster omnium maximus, Helenium dictus. Tourn. Inst. 483. *The greatest Starwort, called Elecampane.*
2. Inula (*Odora*) foliis amplexicaulibus dentatis hirsutissimis radicalibus ovatis, caulinus lanceolatis caule paucifloro. Lin. Sp. Plant. 1236. *Inula with hairy indented leaves embracing the stalks, those at the bottom oval, but those on the stalks spear-shaped, which have but few flowers.* Aster luteus radice odorâ. C. B. P. 266. *Yellow Starwort with a sweet root.*
3. Inula (*Salicina*) foliis sessilibus lanceolatis recurvis serrato-scabris, floribus inferioribus altioribus, ramis sub-angulatis. Amœn. Acad. 1. p. 410. *Inula with spear-shaped, recurved, rough, sawed leaves, sitting close to the stalks, and the under flowers growing taller than the upper, and angular branches.* Aster montanus luteus, salicis glabro folio. C. B. P. 266. *Yellow Mountain Starwort with a smooth Willow leaf.*
4. Inula (*Germanica*) foliis sessilibus lanceolatis recurvis, scabris, floribus subfasciculatis. Lin. Sp. Plant. 883. *Inula with spear-shaped recurved leaves sitting close to the stalks, which are rough, and flowers growing in clusters.* Aster Thuringiacus altissimus latifolius, montanus, flore luteo parvo. Haller. Jen. 181. *Tallest broad-leaved Mountain Starwort of Thuringia, with a small yellow flower.*
5. Inula (*Crithmoides*) foliis linearibus carnosis tricuspidatis. Lin. Sp. Plant. 883. *Inula with narrow fleshy leaves ending in three points.* Aster maritimus flavus crithmum chrysanthemum dictus. Raii Syn. Ed. 3. p. 174. *Yellow maritime Starwort, called Golden Samphire.*
6. Inula (*Montana*) foliis lanceolatis hirsutis integerrimis, caule unifloro calyce brevi imbricato. Lin. Sp. Plant. 124. *Inula with hairy, spear-shaped, entire leaves, one flower on a stalk, having a short scaly cup.* Aster montanus luteo magno flore. C. B. P. 267. *Mountain Starwort with a large yellow flower.*
7. Inula (*Oculis Christi*) foliis amplexicaulibus oblongis, integerrimis hirsutis, caule piloso, corymboso. Lin. Sp. Plant. 1237. *Inula with oblong, entire, hairy leaves, and flowers growing in a corymbus.* Conyza Pannonica lanuginosa. C. B. P. 265. *Hungarian woolly Fleabane.*
8. Inula (*Britannica*) foliis amplexicaulibus lanceolatis, distinctis serratis, subtus villosis, caule ramoso villoso erecto. Flor. Suec. 756. *Inula with spear-shaped sawed leaves embracing the stalk, hairy on their under side, and an erect branching stalk.* After palustris luteus, folio longiore lanuginoso. Tourn. Inst. 483. *Yellow Marsh Starwort with a longer woolly leaf.*

9. Inula (*Hirta*) foliis sessilibus lanceolatis, recurvatis, subserrato-scabris, floribus inferioribus, altioribus, caule teretiusculo subpiloso. Lin. Sp. 1239. *Inula with spear-shaped, recurved, rough leaves, sitting close to the stalks, and the lower flowers rising above the other.* After luteus, salicis folio hirsuto. C. B. P. 266. *Yellow After with a hairy Willow leaf.*

10. Inula (*Bifrons*) foliis oblongis decurrentibus denticulatis, floribus congestis terminalibus subsessilibus. Lin. Sp. 1236. *Inula with oblong indented leaves running along the stalks, and flowers in clusters terminating the stalks.* Conyza Pyrenaica, foliis primulæ veris. Par. Bat. 127.

11. Inula (*Squarosa*) foliis ovalibus lævibus reticulato-venosis subcrenatis, calycibus squarrosis. Lin. Sp. 1240. *Inula with smooth oval leaves and netted veins, with rough empalements to the flowers.* After Conyzoides odoratus luteus. Tourn. Inst. 483.

12. Inula (*Canariensis*) foliis linearibus carnosis tricuspidatis, caule fruticoso. *Inula with narrow, fleshy, three-pointed leaves, and a shrubby stalk.* After Canariensis frutescens, folio tridentato crassa. Hort. Chelf. 26. *Shrubby Canary Starwort with a thick leaf, ending in three points.*

13. Inula (*Saturejaoides*) foliis linearibus hirsutis oppositis, pedunculatis nudis unifloris. *Inula with narrow hairy stalks placed opposite, and naked foot-stalks, having one flower.* After saturejæ foliis conjugatis & pilosis, flore luteo. Houst. MSS. *Starwort with hairy Savoury leaves growing by pairs, and a yellow flower.*

14. Inula (*Mariana*) caule erecto hispido, foliis lanceolatis asperis, floribus alaribus solitariis sessilibus, terminalibus umbellatis. *Inula with an erect prickly stalk, spear-shaped rough leaves, flowers proceeding singly from the sides of the stalks, sitting close, and terminating in an umbel.* After luteus Marianus Saligneis breviorribus foliis hirsutis pubescentibus, summo caule ramosus. Pluk. Mant. 30. *Yellow Starwort of Maryland, with shorter, sallow, hairy leaves, and the top of the stalk branching.*

15. Inula (*Fruticosa*) foliis lanceolatis acutis, subtus trinerviis, squamis calycinis acutis caule fruticosa. *Inula with spear-shaped acute leaves, having three veins on their under side, the scales of the empalement sharp-pointed, and a shrubby stalk.*

The first sort grows naturally in several parts of England, but it is also cultivated in gardens for the sake of the roots, which are used in medicine, and are accounted carminative, sudorific, and alexipharmic, of great service in shortness of breath, coughs, stuffing of the lungs, and infectious distempers.

This hath a perennial root, which is thick, branching, and of a strong odour. The lower leaves are a foot long, and four inches broad in the middle, rough on their upper side, but downy on their under. The stalks rise about three feet high, and divide toward the top into several smaller branches, garnished with oblong oval leaves, which are indented on their edges, and end in acute points. The flowers terminate the stalks, each branch ending with one large, yellow, radiated flower, sitting in a scaly empalement, whose scales are oval, and placed like the scales on fish over each other. The flowers are succeeded by narrow four-cornered seeds crowned with down. It flowers in June and July, and the seeds ripen the latter end of August.

This sort may be propagated by seeds, which should be sown in autumn soon after they are ripe; for if they are kept till the spring, they seldom grow; but where they are permitted to scatter, the plants will come up the following spring without any care, and may be either transplanted the following autumn; or if they are designed to remain, they should be hoed out to the distance of ten inches, or a foot each way, and constantly kept clean from weeds; these roots will be fit for use the second year.

But most people propagate the plant by offsets, which, if carefully taken from the old roots, with a bud, or eye, to each, will take root very easily; the best time for this is the autumn, as soon as the leaves begin to decay; these should be planted in rows about a foot asunder, and nine or ten inches distance in the rows; the spring following the ground must be kept clean from weeds, and if in autumn it is slightly dug, it will promote the growth of the roots; these will be fit for use after two years growth, but the roots will abide many years, if they are permitted to stand; however, the young roots are preferable to those which are old and stringy. It loves a gentle loamy soil, not too dry.

The second sort hath a perennial root, from which arise several stalks, about two feet high. The leaves at bottom are oval, indented, and hairy; those above embrace the stalks with their base. The stalks are divided into several branches, garnished with a few scattering yellow flowers. The root has a very sweet odour when broken. It flowers in July, but rarely ripens seeds here.

The third sort hath a perennial root, from which arises many spear-shaped leaves, which are smooth and recurved. The stalks rise near two feet high; they are angular, and branch at the top into several foot-stalks, each sustaining one yellow radiated flower. It flowers in June, July, and August, and the seeds ripen in September.

The fourth sort rises with an upright stalk between three and four feet high, with spear-shaped leaves, which are turned backward, indented on their edges, and rough on their upper side. The flowers are collected in close bunches on the upper part of the stalks; they are small and yellow. It grows on the Alps, and other mountainous parts of Europe. It flowers in June, and the seeds ripen in autumn.

The fifth sort grows naturally on the sea-coasts in many parts of England. I have seen it growing plentifully near Sheerness, in the isle of Sheepy, in Kent; this rises with an upright stalk a foot and a half high, garnished with fleshy succulent leaves, which come out in clusters, and are about an inch and a quarter long, and one eighth of an inch broad, ending in three points. The flowers come out at the top of the stalks in small umbels; they are yellow, and have a border of rays; this flowers in July, and the seeds ripen in autumn. The younger branches of this plant are frequently sold in the London markets for Samphire; but this is a great abuse, because this plant has none of the warm aromatic taste of the true Samphire.

The sixth sort grows naturally in Germany; this rises with upright stalks a foot and a half high, garnished with spear-shaped leaves which are covered with soft hairs, and are entire. The stalks each support one large yellow flower, which appears in July, but rarely ripens seeds here.

The seventh sort hath a perennial root and an annual stalk; this grows naturally in Hungary. The leaves are oblong and hairy; the stalks branch at the top in form of a corymbus. The flowers are small, yellow, and are in close clusters; these appear in July, but seldom perfect seeds in England.

The eighth sort grows naturally in Austria, Bohemia, and other parts of Germany; it hath a perennial root, and an annual stalk which rises near two feet high, garnished with spear-shaped woolly leaves, which are sawed, and closely embrace the stalks with their base. The upper part of the stalk divides into two or three erect branches, or foot-stalks, each sustaining one pretty large deep yellow flower; these are in beauty in July, but seldom ripen seeds here.

The ninth sort grows naturally in the south of France, Spain, and Italy; this hath a perennial root, from whence arise several stalks about one foot high; the lower leaves are spear-shaped and prickly; the upper half embrace the stalks, which divide into several branches, each being terminated by one yellow flower, which appears in July, but seldom perfects seeds here.

The tenth sort rises about a foot high, dividing into many branches, which are garnished by oval hairy leaves, which half embrace the stalks with their base;

each of the branches is terminated by one large yellow flower, whose empalement is composed of oval scales. It flowers in July and August, but never perfects seeds in this country.

The eleventh sort grows naturally in Hungary; this rises with single upright stalks near two feet high, garnished with oval spear-shaped leaves, which are slightly indented on the edges, and sit close to the stalks, which are hairy, and divide in form of a corymbus at the top. The flowers are pretty large, of a pale yellow colour, and appear in July, but are not succeeded by seeds in this country.

The twelfth sort grows naturally in the Canary Islands; this rises with several shrubby stalks near four feet high, which divide into smaller branches, garnished with clusters of narrow fleshy leaves, which are divided into three segments at their points. The flowers come out on the side of the branches at the top of the stalks; they are small, and of a pale yellow colour, appearing in August.

The second, third, fourth, sixth, seventh, eighth, and ninth sorts are abiding plants, which will thrive and flower in the open air in England; they may be all propagated by parting of their roots. The best time for doing of this is in autumn, at which time the plants may be removed; these may be intermixed with other flowering plants in the borders of large gardens, where they will make an agreeable variety during their continuance in flower. As these roots multiply pretty fast, they should be allowed room to spread, therefore should not be planted nearer than two feet from other plants; and if they are removed every third year, it will be often enough, provided the ground between them is dug every winter, and, in snmmer, if they are kept clean from weeds, they will require no other care.

As some of these sorts produce good seeds in England, they may be propagated by sowing of the seeds in the autumn, on a border of light earth exposed to the east, where the morning sun only is admitted; and in the spring, when the plants appear, they should be kept clean from weeds till they are fit to remove, when they should be transplanted on a shady border, six inches asunder, observing to shade and water them till they have taken new root; and during the summer season they should be kept clean from weeds, and in autumn they may be transplanted into the borders where they are to remain.

The tenth sort grows naturally in the south of France, and on the Pyrenean mountains. This hath a thick fibrous root, which is perennial, sending out many oblong indented leaves, whose base runs along the stalks from one joint to another: from the root arise three or four stalks about two feet high, which divide each into three or four small branches, which are terminated by clusters of small yellow flowers, sitting close between the small leaves; these appear in June and July, and are succeeded by narrow seeds, crowned with down, which ripen in the autumn.

It is propagated by seeds, which should be sown on a bed of light earth early in the spring; in May the plants will appear, which should be kept clean from weeds till they are fit to transplant, when they should be planted in an east border, at about six inches distance each way, watering and shading them till they have taken new root; after which they will require no other culture but to keep them clean from weeds till the autumn, when they should be planted where they are designed to remain.

The eleventh sort grows naturally near Montpelier, and also in Italy; this hath a fibrous root, from which arise two or three erect stalks about two feet high, garnished with smooth oval leaves placed alternate, sitting close to the stalks; the veins of the leaves are slender, and formed like net-work. The stalks are terminated by one yellow flower inclosed in a rough scaly empalement, and at the two joints of the stalk immediately under the flower, come out small foot-stalks, with smaller flowers than those on the top.

This plant seldom continues above two or three years, therefore young plants should be raised from seeds to succeed them. The seeds may be sown at the same time, and in the same manner as is directed for the tenth sort, and the plants afterward treated in the same way.

The fifth sort grows naturally in the salt marshes in several parts of England, which are flowed by the tides, therefore is seldom admitted into gardens. The roots of this are perennial, but the stalks decay in autumn; and if any one has curiosity to keep a plant or two of it in their gardens, they may transplant it into a shady border from the place of its natural growth, and, by keeping it moist in dry weather, it will thrive pretty well, but the stalks will not rise so high, nor will the leaves be near so fleshy as in the salt marshes.

The twelfth sort will not live abroad in the open air in England, during the winter season, so must be removed into shelter in autumn, but should have as much free air as possible at all times, when the weather is mild, otherwise it is apt to draw up weak. In cold weather the plants must have very little water, for their stalks and leaves being succulent, they are very apt to rot with too much wet; in summer they should be placed abroad with other hardy exotic plants in a sheltered situation, where they will add to the variety, though they are plants of no great beauty, and seldom flower in England, unless the summer is very warm. This is easily propagated by cuttings, any time in summer, which, if planted in a shady border, will take root in a short time.

The thirteenth sort was discovered by the late Dr. Houstoun, growing naturally at La Vera Cruz; this rises with a shrubby stalk about two feet high, dividing into many smaller branches, which are hairy, and garnished with narrow stiff leaves placed opposite, without foot-stalks; from the edges of these arise long hairs, which are stiff, and come out by pairs; at the end of the branches arise the naked foot-stalks, which are four or five inches long, sustaining one small, yellow, radiated flower.

This is propagated by cuttings during the summer season, which must planted on a bed of light earth, and shaded till they have taken root; after which the plants must be treated in the same manner as other hardy exotics, sheltering them from frost in winter.

The fourteenth sort was sent me from Maryland, where it grows naturally; this rises with a strong stalk about a foot and a half high, which is pretty closely set with prickly hairs, and garnished with rough spear-shaped leaves, about three inches long, and near one inch broad in the middle: toward the upper part of the stalk there are single flowers coming from the wings at each joint, and the stalk is terminated by a cluster of small yellow flowers, disposed in form of an umbel. This plant flowers here in August, but has not as yet perfected seeds in England.

The fifteenth sort was discovered growing naturally at Carthagena, by the late Dr. Houstoun; this rises with a shrubby stalk to the height of ten or twelve feet, divided into several ligneous branches, garnished with spear-shaped leaves five inches long, and one inch and a half broad in the middle, and smooth on their upper side, but on their under have three longitudinal veins. The flowers are produced at the end of the branches, having very large scaly empalements; they are as large as a small Sun-flower, of a pale yellow colour. This plant is too tender to live in the open air in England, so must be constantly kept in the bark-stove. It is propagated by seeds, which must be procured from the country where it naturally grows, for it does not produce any here; these must be sown upon a hot-bed, and when the plants are fit to remove, they should be each planted into a small pot filled with light earth, and plunged into a fresh hot-bed, treating them in the same manner as other tender plants from the same country.

JOHNSONIA. Dale. Callicarpa. Lin. Gen. Plant. 127. Spondylococus. Mitch. 20. This plant was so titled by the late Dr. Dale, of South Carolina, in memory of Dr. Johnson, who published an edition of Gerard's Herbal, corrected and much improved.

The CHARACTERS are,

*The flower hath an empalement of one leaf, cut at the brim into four short segments, which are erect. It hath one petal, which is tubulous, and divided into four parts at the brim, which spread open. It hath four slender summits, which are longer than the petal, terminated by oblong yellow summits. In the center is situated a roundish germen, supporting a slender style, crowned by a thick obtuse stigma. The germen afterward becomes a smooth globular berry, inclosing four hard oblong seeds.*

Dr. Linnæus ranges this genus of plants in the first section of his fourth class, intitled Tetrandria Monogynia, which includes the plants whose flowers have four stamina and one style. As the seeds of this plant were sent me from Carolina by the late Dr. Dale with this title, in the year 1739, and with them the characters of the genus, which was before it was mentioned by Dr. Linnæus, I have continued it under the Doctor's title.

We have but one SPECIES of this genus, viz.

JOHNSONIA (*Americana*) floribus verticillatis sessilibus, foliis ovato lanceolatis oppositis, caule fruticoso. Dale. *Shrubby Johnsonia with oval spear-shaped leaves placed opposite, and flowers growing in whorls sitting close to the stalks.* Callicarpa. Act. Upsal. 1741. Mr. Catesby, in his History of Carolina, has figured it under the following title, Frutex baccifer verticillatus, foliis scabris latis dentatis & conjugatis, baccis purpureis densè congestis, vol. ii. p. 47.

This shrub grows plentifully in the woods near Charles-town, in South Carolina. It rises from four to six feet high, sending out many branches from the root, which are woolly when young, like those of the Wayfaring-tree, garnished with oval spear-shaped leaves placed opposite, standing on short foot-stalks; they are about three inches long, and one inch and a quarter broad in the middle, growing narrow at both ends, and a little indented on their edges, their surface rough, and a little hoary. The flowers come out in whorls round the stalks, sitting very close to the branches at the foot-stalks of the leaves; they are small, tubulous, cut into four obtuse segments at the top, which expand, and are of a deep purple colour; these are succeeded by soft succulent berries, which turn first to a bright red colour, but afterward change to a deep purple when ripe, and inclose four hard oblong seeds.

The seeds of this plant were sent me by Mr. Catesby, from Carolina, in 1724; and many of the plants were then raised in several curious gardens in England; most, if not all all of them were afterward planted in the open air, where they flourished very well for some years, and several of the plants produced flowers in the Chelsea garden for four or five years, but these were not succeeded by fruit; and in the severe frost in 1740, they were most of them destroyed, as were also the young plants which were raised from Dr. Dale's seeds the year before, which were only sheltered under a frame; so that until the Doctor sent a fresh supply of seeds in 1744, there were scarce any of the plants living in the English gardens; but since then, there has been quantities of the seeds brought to England.

This plant rises easily from seeds, if they are sown in a moderate hot-bed; the best way is to sow the seeds in pots, and plunge them into a tan-bed of a moderate warmth; and when the plants come up, and have obtained some strength, they should be gradually inured to the open air, into which they should be removed in June, and placed in a sheltered situation, where they may remain till autumn; during which time they must be kept clear from weeds, and gently refreshed with water in dry weather; but as these young plants are tender, they should be placed under a frame before the early frost comes on; for a frost in autumn will kill the tender part of their shoots, which often causes their stalks to decay most part of their length before the spring. During the winter season they should be screened from frost, but in mild weather they must enjoy the free air, otherwise their shoots will turn mouldy and decay. The following spring, just before the plants shoot, they should be carefully turned out of the pots, so as not to break their roots; and part of them may be planted in small pots filled with light earth, and the others into a nursery-bed in a warm situation, at about four or five inches asunder; those in the pots should be plunged into a moderate hot-bed, which will forward their taking root, but afterward must be hardened to bear the open air as before; these plants in the pots should be sheltered under a frame in winter for three or four years, till they have obtained strength; then they may be turned out of the pots, and planted in a warm situation, where they will live in the open air in common winters; but in severe frost they are in danger of being killed, if they are not sheltered; therefore the surface of the ground about their roots should be covered with old tan to keep out the frost, and their tops covered with Straw, Peas-haulm, or Fern, which will protect them.

Those plants in the beds should also be covered with mats, or Straw, in frosty weather, and after they have obtained strength, they may be transplanted into a warm situation, and treated every winter in the same manner as the other.

The leaves of this shrub were often used by Dr. Dale, in dropsical cases, with very good success. A particular account of the virtues of this, and many other plants of Carolina, was sent me with dried samples of each, by the Doctor, during the last war; but as the ships were taken in their passage, they were all lost, and the Doctor dying soon after, I could never recover them.

JONTHLASPI. See CLYPEOLA.

JONQUIL. See NARCISSUS.

IPOMOEA. Lin. Gen. Plant. 199. Quamoclit. Tourn. Inst. R. H. 116. tab. 39. *Quamoclit, or Scarlet Convolvulus.*

The CHARACTERS are,

*The flower hath a small permanent empalement, cut into five parts at the top. The petal is funnel-shaped, having a long cylindrical tube, whose brim is five-pointed, spreading open flat. It hath five awl-shaped stamina, nearly the length of the petal, terminated by roundish summits. In the bottom of the tube is situated a round germen, supporting a slender style, crowned by a roundish stigma. The germen afterward becomes a roundish capsule with three cells, inclosing three oblong seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, which includes those plants whose flowers have five stamina and one style.

The SPECIES are,

1. IPOMOEA (*Quamoclit*) foliis pinnatifidis linearibus, floribus subsolitariis. Hort. Cliff. 60. *Ipomoea with very narrow many-pointed leaves, and solitary flowers.* Quamoclit foliis tenuiter incisis & pennatis. Tourn. Inst. R. H. 116. *Quamoclit with narrow, cut, winged leaves.*
2. IPOMOEA (*Coccinea*) foliis cordatis acuminatis, basi angulatis, pedunculis multifloris. Hort. Upsal. 39. *Ipomoea with heart-shaped pointed leaves, angular at the base, and many flowers on a stalk.* Quamoclit Americana folio hederæ flore coccineo. Com. Rar. Plant. 21. *American Quamoclit with an Ivy leaf and a scarlet flower, commonly called Scarlet Convolvulus.*
3. IPOMOEA (*Solanifolia*) foliis cordatis acutis integerrimis, floribus solitaris. Prod. Leyd. 430. *Ipomoea with acute, heart-shaped, entire leaves, and solitary flowers.* Quamoclit Americana solani folio, flore roseo. Plum. Cat. 3. *American Quamoclit with a Nightshade leaf, and a Rose-coloured flower.*
4. IPOMOEA (*Violacea*) foliis cordatis integerrimis, floribus confertis corollis indivisis. Sauv. Monsp. 114. *Ipomoea with heart-shaped entire leaves, flowers growing in clusters, and undivided petals.* Quamoclit foliis amplissimis cordiformibus. Plum. Cat. 4. *Quamoclit with large heart-shaped leaves.*
5. IPOMOEA (*Tuberosa*) foliis palmatis, lobis septenis lanceolatis integerrimis pedunculis trifloris. Hort. Upsal. 39. *Ipomoea with hand-shaped leaves, composed of seven spear-shaped entire lobes, and foot-stalks having three flowers.* Convolvulus major heptaphyllus, flore sulphureo odorato. Sloan. Cat. 55. *Greater seven-leaved Bind-*

*Bindweed with a yellow sweet flower, called Spanish Arbour Vine.*

6. Ipomoea (*Triloba*) foliis trilobis cordatis, pedunculis trifloris. Lin. Sp. Plant. 161. *Ipomea with heart-shaped leaves having three lobes, and three flowers on a foot-stalk.* Convolvulus pentaphyllos minor, flore purpureo. Sloan. Cat. 55. *Smaller five-leaved Bindweed with a purple flower.*

7. Ipomoea (*Hepaticæfolia*) foliis palmatis, floribus aggregatis. Flor. Zeyl. 79. *Ipomoea with hand-shaped leaves, and flowers growing in clusters.* Volubilis Zeylanica pes tigrinus dicta. Hort. Elth. 318. *Volubilis of Ceylon, called Tyger's-foot.*

8. Ipomoea (*Digitata*) foliis digitatis glabris floribus sessilibus, caule lævi. Lin. Sp. Plant. 162. *Ipomoea with smooth hand-shaped leaves, whose lobes sit close, and a smooth stalk.* Convolvulus quinquefolius glaber Americanus. Pluk. Alm. 116. *Smooth five-leaved American Bindweed.*

The first sort grows naturally in both Indies; in the West-Indies it is called Sweet-William, and by some Indian Pink. It rises with a twining stalk seven or eight feet high, sending out many slender twining branches, which twist about any neighbouring plants for support; the leaves are winged, being composed of several pair of very fine narrow lobes, not thicker than fine sowing thread; they are about an inch long, of a deep green, and sometimes are by pairs opposite, and at others they are alternate; the flowers come out singly from the side of the stalks, standing upon slender foot-stalks about one inch long; they are funnel-shaped, having a tube an inch long, which is narrow at bottom, but gradually widens to the top, which spreads open flat, with five corners or angles: they are of a most beautiful scarlet colour, so make a fine appearance. This is an annual plant in England, but whether it is so in its native place I cannot tell; for as the seeds fall to the ground, so there is a succession of young plants, which continue flowering great part of the year.

This is a tender plant, so will not thrive in the open air in England; it is propagated by seeds, which should be sown on a hot-bed in the spring; and as the plants will soon appear, they should be each transplanted into a small pot filled with light earth, before they twine about each other, for then it will be difficult to disengage them without breaking their tops. When they are potted, they should be plunged into a new hot-bed, and sticks placed down by each plant for their stalks to twine about; after they have taken new root, they should have a good share of air in warm weather to prevent their drawing up weak; and when they are advanced too high to remain under the frame, they should be removed into the tan-bed in the stove, where they should have support, for their branches will extend to a considerable height. They will begin to flower in June, and there will be a succession of flowers till the end of September, and the seeds will ripen well in this situation every autumn.

The second sort grows naturally in Carolina and the Bahama Islands; this is also an annual plant in England, but is not so tender as the former. It hath a twining stalk, which rises six or eight feet high, garnished with heart-shaped leaves ending in acute points, which are divided into angles at their base; the flowers come out from the side of the branches, upon slender foot-stalks, which support three or four flowers of the same form and size as the former, but are not so deep coloured. There is a variety of this with Orange-coloured flowers, but they do not differ in any other respect. If the seeds of this sort are sown on a hot-bed in the spring, and when the plants come up, if they are gradually hardened, and afterward transplanted into a warm border, in favourable seasons they will flower and produce good seeds; but most people raise the plants on a very gentle hot-bed, and transplant them afterward into another; by which method they are brought forward, so will perfect their seeds earlier.

The third sort is like the second, but the leaves have no angles, and the flowers are of a Rose colour, each foot-stalk sustaining one flower. This may be treated in the same manner as the second sort.

The fourth sort grows naturally in the West-Indies, where it twines about any neighbouring support, and rises ten or twelve feet high, garnished with large heart-shaped entire leaves: the flowers come out from the side of the branches upon slender foot-stalks, in clusters; they are of a blue colour, and their brims are not angular as in the former species, but entire. This sort is propagated by seeds, which should be sown on a hot-bed in the spring, and the plants afterward treated in the same way as is before directed for the first sort, for it is too tender to thrive in the open air here.

The fifth sort is cultivated in most of the islands in the West-Indies, but is supposed to have been introduced there from the Spanish Main. These plants rise to a very great height, and send out many branches, so are planted to cover arbours for shade in the islands, from whence it had the appellation of Spanish Arbour Vine. The stalks of this plant are covered with a purple bark; they twine about any neighbouring support, sending out many side branches, so that one plant will cover an arbour of fifty feet long. The leaves are divided into seven lobes almost to the bottom; the flowers come out from the side of the stalks; they are large, funnel-shaped, of a bright yellow colour, and smell very sweet; these are succeeded by large roundish capsules with three cells, containing one large seed in each, which are of a dark colour.

This is a perennial plant, but too tender to thrive in the open air in England; the seeds of this must be sown upon a hot-bed in the spring, and when the plants come up, they must be transplanted into separate pots, and plunged into a fresh hot-bed; but as they will soon grow too tall to stand under a frame, they should be removed into the bark-stove, where they must be supported, otherwise they will twine about all the neighbouring plants. As these plants extend their shoots to a very great length, they require a tall stove, where they may have room to grow, without which they will never produce any flowers. I have had these plants several years, but have only seen one flower produced from them; for they grow so very large before they begin to have flowers, as that few of the stoves in England have height enough for their growth.

The sixth sort grows naturally in most of the islands in the West-Indies; this hath a twining stalk, which rises ten or twelve feet high, garnished with leaves divided into three lobes, which are heart-shaped; the foot-stalks arise from the side of the stalks, each sustaining three purple flowers. This is also tender, so the plants must be raised on a hot-bed in the spring, and afterward planted in separate pots, plunging them into another hot-bed, where they may remain till they reach the glasses, when they should be removed into a glass-case where they may have room, and be screened from the cold, but should have a large share of free air admitted to them in warm weather; with this treatment the plants will flower and produce ripe seeds.

The seventh sort grows naturally in India; this rises with a twining hairy stalk four or five feet high, garnished with hand-shaped leaves which are hairy, and divided at the bottom into several lobes; the flowers come out in clusters, inclosed in a five-cornered involucrum; they are of a purplish colour, but small, and open only in the evening, so make no figure. This is propagated by seeds, and requires the same treatment as the sixth sort.

The eighth sort grows naturally in the West-Indies; this hath a smooth twining stalk which rises four or five feet high, garnished with hand-shaped leaves having five lobes, which sit close to the stalks; the flowers come out from the side of the stalks upon short foot-stalks, which sustain two or three purple flowers; these are succeeded by round tricapsular seed-vessels; in each cell there is one brown seed.

This

This sort requires the same treatment as the two former, with which it will produce flowers and perfect its seeds in England.

IRESINE. Lin. Gen. 1113. Amaranthus. Sloan. Cat. Jam. 49.

The CHARACTERS are,

*It hath male and female flowers on different plants; the male flowers have an empalement composed of two neat small leaves, and five erect, small, spear-shaped petals, and five nectarii situated between the five erect stamina, which are terminated by roundish summits; the female flowers on the other plants, have the like empalement and corolla as the male, with an oval germen but no style, crowned by two roundish stigma; the empalement afterward becomes an oval capsule, inclosing woolly seeds.*

This genus is ranged in the fifth order of Linnæus's twenty-second class of plants, intitled Diœcia Pentandria, from their having male and female flowers on different plants, and the male flowers having five stamina.

We know but one SPECIES of this genus, viz.

IRESINE (*Celosioides.*) Lin. Sp. 1456. Amaranthus panicula flavicante gracili holosericea. Sloan. Cat. Jam. 49. *Amaranthus with slender yellowish panicles of silky flowers.*

This plant grows naturally in Jamaica, and most of the other islands in the West-Indies, from whence I have received the seeds. It is perennial; the stalks are weak, so require support; they rise ten or twelve feet high, having large knots at each joint, garnished with oval, spear-shaped, smooth leaves. The stalks are very diffused, branching out on every side; the flowers are produced on the top, in slender loose panicles, covered with a silky down, of a pale yellow colour; these appear in July and August, and in warm seasons the seeds will ripen in the autumn.

It is propagated by seeds, which should be sown upon a hot-bed in the spring, and the plants should be afterward treated in the same manner as hath been directed for the tender sorts of Amaranthus, till they are grown too tall to remain in the frame, when they should be removed to the bark-stove, plunging the pots into the tan-bed, and supporting the branches of the plants with a trellis to prevent their falling on other plants; in this situation they will produce flowers and seeds the second year, but the plants may be continued three or four years longer.

IRIS. Tourn. Inst. R. H. 358. tab. 186, 187, 188. Lin. Gen. Plant. 57. Flower-de-luce; in French, *Flambe.*

The CHARACTERS are,

*The flowers are inclosed in spathæ (or sheaths) which are permanent; the flowers are divided into six parts; the three outer petals are oblong, obtuse, and reflexed, the three inner are erect, and end in acute points; these all join at their base: they have three awl-shaped stamina, which lie upon the reflexed petals, and are terminated by oblong depressed summits. Under the flower is situated an oblong germen, supporting a slender style, crowned by a large three-pointed stigma; the germen afterward becomes an oblong angular capsule with three cells, filled with large seeds.*

This genus of plants is ranged in the first section of Linnæus's third class, intitled Triandria Monogynia, which contains those plants whose flowers have three stamina and one style.

The SPECIES are,

1. IRIS (*Pseudoacorus*) corollis imberbibus, petalis interioribus stigmate minoribus, foliis ensiformibus. Hort. Cliff. *Iris with an unbearded flower, the inner petals smaller than the stigma, and sword-shaped leaves.* Iris palustris lutea. Tabern. Icon. 643. *Yellow Marsh Flower-de-luce.*
2. IRIS (*Squalens*) corollis barbatis, caule foliis longiore multifloro. Hort. Cliff. 18. *Iris with bearded flowers, and the stalks longer than the leaves, having many flowers.* This is the Iris vulgaris Germanica sive sylvestris. C. B. P. 30. *Common German, or wild Flower-de-luce.*
3. IRIS (*Aphylla*) corollis barbatis, scapo nudo longitudine foliorum multifloro. Prod. Leyd. 17. *Iris with a bearded flower, and a naked stalk the length of the leaves, with many flowers.* Iris latifolia, caule aphyllo. C. B. P. 32. *Broad-leaved Flower-de-luce, whose stalks are without leaves.*
4. IRIS (*Variegata*) corollis barbatis, caule subfolioso longitudine foliorum multifloro. Prod. Leyd. 17. *Iris with a bearded flower, and a leafy stalk the length of the leaves, with many flowers.* Iris latifolia pannonica, colore multiplici. C. B. P. 31. *Broad-leaved Hungarian Flower-de-luce of many colours.*
5. IRIS (*Susiana*) corollis barbatis, caule foliis longiore unifloro. Hort. Cliff. 18. *Iris with a bearded flower, and a stalk longer than the leaves, having one flower.* Iris Susiana, flore maximo ex albo nigricante. C. B. P. 31. *Flower-de-luce with a very large flower of a black and white colour, commonly called Chalcedonian Iris.*
6. IRIS (*Biflora*) corollis barbatis, caule foliis breviore trifloro. Hort. Upsal. 17. *Iris with a bearded flower, and a stalk shorter than the leaves, with three flowers.* Iris humilis major, saturatè purpurea biflora. Tourn. Inst. 361. *Greater Dwarf Flower-de-luce of a dark purple colour, and having two flowers on each stalk.*
7. IRIS (*Pumila*) corollis barbatis, caule foliis breviore unifloro. Lin. Sp. Plant. 38. *Iris with a bearded flower, and a stalk shorter than the leaves, with one flower.* Iris humilis minor, flore purpureo. Tourn. Inst. 361. *Smaller Dwarf Flower-de-luce with a purple flower.*
8. IRIS (*Germanica*) corollis barbatis, caule foliis longiore multifloro, floribus inferioribus pedunculatis. Lin. Sp. 55. *Iris with a bearded flower, a stalk longer than the leaves with many flowers, and the lower flowers on foot-stalks.* Iris Asiatica cærulea polyanthos. C. B. P. *Blue Asiatic Flower-de-luce with many flowers, called greater Dalmatian Iris.*
9. IRIS (*Orientalis*) corollis barbatis, germinibus trigonis, foliis ensiformibus longissimis caule foliis longiore bifloro. Pluk. 154. *Iris with a bearded flower, a three-cornered germen, very long sword-shaped leaves, and a stalk longer than the leaves, with two flowers.*
10. IRIS (*Graminea*) corollis imberbibus, germinibus sexangularibus, caule ancipiti, foliis linearibus. Hort. Cliff. 19. *Iris with flowers having no beards, a six-cornered germen, a stalk having flowers on both sides, and narrow leaves.* Iris angustifolia prunum redolens minor. C. B. P. 33. *Smaller narrow-leaved Flower-de-luce smelling like Plums.*
11. IRIS (*Maritima*) corollis imberbibus, caule foliis breviore trifloro, foliis lineari-ensiformibus. *Iris whose flowers are not bearded, the stalk shorter than the leaves, having three flowers, and narrow sword-shaped leaves.* Iris angustifolia maritima major. C. B. P. 33. *Greater narrow-leaved maritime Flower-de-luce.*
12. IRIS (*Angustifolia*) corollis imberbibus, caule foliis æqualibus multifloro, spathâ majoribus erectis. *Iris whose flowers have no beards, the stalks equal in length with the leaves, having many flowers which are larger and more erect than the spatha.* Iris angustifolia, maritima minor. C. B. P. *Smaller narrow-leaved maritime Flower-de-luce.*
13. IRIS (*Bicolor*) corollis imberbibus, caule foliis longiore multifloro, germinibus sexangularibus, foliis linearibus. *Iris whose flowers have no beards, the stalks longer than the leaves, with many flowers, a six-cornered germen, and very narrow leaves.* Iris angustifolia, bicolor. C. B. P. 33. *Narrow-leaved Flower-de-luce with two colours.*
14. IRIS (*Spuria*) corollis imberbibus, germinibus sexangularibus, caule tereti, foliis sublinearibus. Hort. Cliff. 19. *Iris whose flowers have no beards, with a six-cornered germen, a taper stalk, and very narrow leaves.* Iris pratensis angustifolia, folio fœtido. C. B. P. 32. *Narrow-leaved Meadow Flower-de-luce, with a stinking leaf.*
15. IRIS (*Sativa*) corollis imberbibus, spathâ bifoliâ, caule folioso longitudine foliorum, pedunculis longioribus. *Iris with flowers having no beards, a sheath containing two leaves, a leafy stalk the length of the leaves, and longer foot-stalks to the flowers.* Iris sativa lutea. C. B. P. 32. *Yellow Garden Flower-de-luce.*
16. IRIS (*Picta*) corollis imberbibus, caule longitudine foliorum multifloro, foliis ensiformibus. *Iris with an unbearded flower, a stalk the length of the leaves, with many*

*many flowers, and sword-shaped leaves.* Iris humilis minor, flore picto. Tourn. Inst. 362. *Lesser Dwarf Flower-de-luce with a painted flower.*

17. Iris (*Verna*) corollis imberbibus, caule unifloro foliis breviore, radice fibrosâ. Flor. Virg. 10. *Iris with an unbearded flower, a stalk shorter than the leaves, with one flower, and a fibrous root.* Iris Virginiana pumila sive chamæiris verna angustifolia, flore purpuro-cæruleo odorato. Pluk. Alm. 196. *Dwarf Spring Virginia Flower-de-luce, with a narrow leaf, and a purple blue sweet smelling flower.*

18. Iris (*Versicolor*) corollis imberbibus, germinibus subtrigonis, caule tereti, foliis ensiformibus. Lin. Sp. Plant. 39. *Iris with an unbearded flower, a three-cornered germen, a taper stalk, and sword-shaped leaves.* Iris Americana versicolor stylo crenato. Dill. Hort. Elth. 188. *Party-coloured American Flower-de-luce, with a crenated style.*

19. Iris (*Fœtidissima*) corollis imberbibus petalis interioribus patentissimis, caule uniangulato foliis ensiformibus. Hort. Cliff. 19. *Iris with an unbearded flower, the inner petals spreading, a stalk with one angle, and sword-shaped leaves.* Iris fœtidissima, seu Xyris. Tourn. Inst. 360. *Most stinking Flower-de-luce, or Xyris, called Stinking Gladwyn.*

20. Iris (*Siberica*) corollis imberbibus, germinibus trigonis, caule tereti, foliis linearibus. Lin. Hort. Cliff. 19. *Iris with an unbearded flower, a three-cornered germen, a taper stalk, and narrow leaves.* Iris pratensis, angustifolia non fœtida altior. C. B. P. 32. *Taller narrow-leaved Meadow Flower-de-luce, not stinking.*

21. Iris (*Tuberosa*) corollis imberbibus, foliis tetragonis. Vir. Cliff. 6. *Iris with an unbearded flower and four-cornered leaves.* Hermodactylus folio quadrangulo. Tourn. Cor. 50. *Hermodactyle with a four-cornered leaf.*

22. Iris (*Florentina*) corollis barbatis, caule foliis altiore subbifloro floribus sessilibus. Lin. Sp. 55. *Iris with a bearded corolla, stalks taller than the leaves, having two sessile flowers.* Iris alba Florentina. C. B. P. 31. *White Florentine Iris.*

23. Iris (*Sambucina*) corollis barbatis, caule foliis altiore multifloro, petalis deflexis planis, erectis emarginatis. Lin. Sp. 55. *Iris with a bearded corolla, stalks taller than the leaves, having many flowers whose petals are deflexed, and the upright are indented.* Iris latifolia Germanica, sambuci odore. C. B. P. 31.

The first sort grows naturally in ditches and standing waters in most parts of England; this is titled in the Pharmacopeia, Acorus adulterinus, or Pseudo acorus. *Bastard Acorus.* The roots of this are pretty thick, fleshy, and spread every way near the surface of the ground; the leaves are sword-shaped, very long, of a deep green colour, and not so stiff as those of the Garden Iris; the stalks rise from two to three feet high, toward the top of which grow three or four flowers one above another, which gradually succeed each other; they are shaped like the ordinary Flower-de-luce, but the three inner petals are less than the stigmas, so they want the three upright petals which are termed standards. These appear in June, and are succeeded by large three-cornered capsules, containing three rows of flat seeds.

This sort is not cultivated in gardens, but being an officinal plant, it is here mentioned to introduce the other.

The second sort grows naturally in Germany, but has been long cultivated in the English gardens for ornament; the roots of this are very thick, fleshy, and divided into joints, spreading just under the surface of the ground; they are of a brownish colour on their outside, but white within; the leaves arise in clusters, embracing each other at their base, but spread asunder upward in form of wings; they are a foot and a half long, and two inches broad, having sharp edges, ending in points like swords; the stalks between these, which are a little longer than the leaves, having at each joint one leaf without a foot-stalk; these diminish in their size upward; the stalks divide into three branches, each of which produce two or three flowers one above another at distances, each inclosed in a sheath; they have three large Violet-coloured petals which turn backward, and are called falls; these have beards near an inch long on their midrib toward their base, and have a short arched petal which cover the beard, with three broad erect petals of the same colour, called standards; the stamina lie upon the reflexed petals. Under each flower is situated an oblong germen, which turns to a large three-cornered capsule with three cells, filled with large compressed seeds. This flowers in June, and the seeds ripen in August.

There is a variety of this with blue standards and purple falls, which is titled Iris hortensis latifolia, by Caspar Bauhin; and one with pale purple standards, another with white, and a third with a smaller flower, but these are accidental varieties which have come from seeds.

The third sort has broader leaves than the last, the stalks have no leaves upon them, and are equal in length with the leaves; they have three or four large bright purple flowers, which stand above each other, having purplish sheaths or hoods; the three bending petals or falls are striped with white, from the base to the end of the beard; the flowers are succeeded by large blunt triangular capsules with three cells, filled with compressed seeds. It flowers the latter end of May, and the seeds ripen the beginning of August.

The fourth sort grows naturally in Hungary; the leaves of this are like those of the second sort, but are of a darker green; the stalks rise as tall as the leaves, and toward the bottom are garnished with one leaf at each joint, whose base embrace the stalks; the upper part is naked, and branches into three, each having two or three flowers above one another; the three upright petals or standards are yellow, and the bending petals or falls are variegated with purple stripes. This flowers in June, but is rarely succeeded by seeds in England.

The fifth sort grows naturally near Constantinople, and in other parts of the east. The leaves of this sort are not so broad as those of the second, and are of a grayish colour; the stalks rise two feet and a half high, supporting one very large flower; the three upright petals are almost as broad as a hand, but very thin, of mixed black and white stripes; the three bending petals or falls are of a darker colour, from whence some gardeners have called it the Mourning Iris. This flowers the latter end of May, or the beginning of June, but never has any seeds in England.

The sixth sort hath broad leaves like those of the second sort, but shorter; the stalks rise nine or ten inches high, branching into two or three at the top, each sustaining two deep purple flowers. This flowers in May, but is not succeeded by seeds in England.

The seventh sort hath narrower and shorter leaves than the former; the stalks are shorter than the leaves, and support one flower on the top, of a light purple colour. This flowers the beginning of May, but rarely produces seeds in this country. There are two or three varieties of this, which differ in the colour of their flowers.

The eighth sort hath the largest leaves of any of the Flower-de-luce, they are of a grayish colour and spread wide, embracing each other at their base, where they are purplish. The stalks rise near four feet high, and divide into several branches, each supporting three or four flowers above each other at distances, covered with a thin sheath; the three bending petals or falls, are of a faint purple inclining to blue, with purple veins running lengthways; the beard is yellow, and the three erect petals or standards are of a bright blue, with some faint purple stripes, the flowers have an agreeable scent. They appear the latter end of June, but are seldom succeeded by seeds in England.

The seeds of the ninth sort were brought from Carniola, by the Right Rev. Dr. Pocock, Bishop of Ossory, who found the plants growing there naturally: these were sown in the Chelsea garden, where they succeeded very well, and the plants have been since communicated to many curious gardens in Europe.

This

This plant hath a thick fleshy root, divided into many knots or tubers, which spread and multiply in the ground; these send out many strong, thick, fleshy fibres, which strike deep in the earth, putting out several smaller fibres from their sides. From these roots arise clusters of flat sword-shaped leaves of a deep green colour, which are more than three feet long, and little more than one inch broad in the broadest part, ending in points; these leaves are connected together at their base into several heads or bundles, wrapping over each other; and between these arise the flower-stalks, which grow four feet high and are jointed, having very long spathæ or sheaths at each of the upper joints, which include the flowers. These stalks generally sustain two flowers, one coming out of each sheath or spatha; these are permanent, and when the flowers are past, closely cover the seed-vessel. The flowers are divided into nine leaves, three of these stand erect, which are white, and six turn down, which are joined together at their base, the lower spreading out into a broad, obtuse, reflexed fall, having a beard which is of a bright yellow colour; the upper segment is arched over the lower, so as to form a sort of lip, which is reflexed backward; under these is situated an oblong three-cornered germen, which afterward becomes an oblong, swollen, three-cornered seed-vessel, ending in a long point, which opens into three longitudinal cells, in which the seeds are ranged; these are angular and compressed. This plant flowers the latter end of June, or the beginning of July, and the seeds ripen in the autumn. It is very hardy, and thrives well in the open air without any protection. The leaves decay to the root in the autumn, and new ones arise in the spring. The roots also propagate very fast, when they are in a light moist soil, so that it may soon be had in plenty, without waiting for plants from seeds.

The tenth sort grows naturally in Austria; this hath narrow, flat, Grass-like leaves, about a foot long, of a light green colour; between these arise the stalks about six inches high, having two narrow green leaves, which are much longer than the stalks; these stalks sustain two or three flowers, which are smaller than any of the former species; the petals have no beards, but have a broad yellow line adorned with purple stripes; the three falls are of a light purple colour striped with blue, and have a convex ridge running longitudinally, the other are of a reddish purple variegated with violet; they have a scent like fresh Plums. It flowers in July, and is succeeded by seed-vessels which are short, having three borders or wings running lengthways, opening in three cells, which are filled with angular seeds, which ripen in September.

The eleventh sort grows naturally near the sea, in the south of France, and in Italy. This hath narrow sword-shaped leaves, little more than a foot long, of a deep green colour; the stalks do not rise so tall as the leaves; they sustain at the top two or three flowers which stand near together; they are of a bright purple colour with very deep falls, and the three standards are blue; the bending petals have no beards, but instead of that white broad stripes through the middle. This flowers in July, and the seeds ripen in September.

The twelfth sort hath narrower leaves than the former, but of the same deep green colour; the stalks do not rise higher than the leaves, and support two or three flowers, which have long permanent empalements standing erect, which cover the seed-vessel till the seeds are ripe; the flowers are smaller, and of a paler colour than those of the eleventh sort.

The thirteenth sort has very narrow, long, Grass-like leaves, of a light green; the stalks rise two feet and a half high, sustaining three or four flowers above each other, which have blue falls, and purple standards striped with pale blue lines. This flowers in July, and the seeds ripen at Michaelmas.

The fourteenth sort grows naturally in Germany; this hath leaves like those of the eleventh sort, which, when broken, have a disagreeable scent; but this is accidental, and not common to all the plants; the stalks of this are taper, and rise a little above the leaves, and sustain three or four flowers one above another, which have light blue standards, and purple variegated falls without beards; instead of which, they have a broad white line in the middle; these are succeeded by short thick capsules, which have scarce any angles, opening in three cells, which are filled with angular seeds. It flowers in July, and the seeds ripen in September.

The fifteenth sort has narrower leaves than those of the second, of a pale green colour, and not so stiff; the stalks are equal in height with the leaves, and branch out on both sides with long foot-stalks, each sustaining one pretty large yellow flower, inclosed in a long two-leaved sheath; at each joint where the foot-stalks come out there is a single leaf, which embraces the stalks with their base. This flowers in June, but rarely produces seeds in this country.

There are two varieties of this sort, one with a sulphur-coloured, and the other with a variegated flower, which are supposed to be only varieties which have been accidentally produced from seeds.

The sixteenth sort hath broad sword-shaped leaves about eight inches long; the stalks rise about the same height with the leaves, and divide into two or three foot-stalks, each sustaining two or three flowers one above another, which have yellow standards, and the falls are variegated with dark stripes. This flowers in June, but does not produce seeds here.

The seventeenth sort grows naturally in North America; this hath tufted fibrous roots, from which arise many Grass-like leaves about nine inches long; from between these come out the stalks, which are shorter than the leaves, supporting one purple flower with blue standards. This sort flowers in May, but seldom produces seeds in England.

The eighteenth sort grows also in North America; this hath narrow sword-shaped leaves about a foot long, of a light green colour; the stalks rise a little above the leaves, they are taper, and support two or three flowers one above another; the standards are of a light blue, and the falls are purple variegated, with a broad white line instead of a beard through the middle. The germen, which is situated under the flower, is three-cornered below, but taper toward the top. This flowers in June, and often produces seeds here.

The nineteenth sort grows naturally in moist places in many parts of England, so is seldom admitted into gardens. This hath thick tufted fibrous roots; the leaves are of a Grass-green, sword-shaped, and when broken emit a strong odour, not much unlike that of hot roast beef at the first scent, but if smelt too close, becomes disagreeable. It is generally called stinking Gladwyn in England; the stalks rise about the same height with the leaves, supporting two small flowers, of a purple colour, variegated. It flowers in June, and the seeds ripen in autumn.

The twentieth sort grows naturally in Austria and Bohemia; this hath narrow sword-shaped leaves near a foot and a half long, of a dark green colour; the flower-stalks rise above the leaves, and support two or three flowers with light blue standards, and deep blue falls, with a broad stripe of white, instead of the beard. This flowers in July, and the seeds ripen in September.

There are several varieties of these flag or sword-leaved Irises, which chiefly differ in the colour of their flowers, so are not to be regarded as distinct species; those which are here enumerated are supposed to be specifically different, great part of them I have cultivated by seeds, and found them constantly produce the same as the parent plants.

All these sorts are generally propagated by parting of their roots, which most of them multiply fast enough. The best time to remove and part the roots is in autumn, that they may get good root before the spring, otherwise they will not flower strong the following summer. All those sorts which spread much

at their roots should be transplanted every other year, to keep them within bounds, otherwise they will spread so much as to become troublesome, especially if they are planted near other flowers; indeed, the large growing kinds are most of them too spreading for the flower-garden, so are only fit to fill up the spaces between trees and shrubs in large plantations, where they will have a good effect during the time of their flowering.

The fifth, sixth, seventh, tenth, eleventh, sixteenth, seventeenth and eighteenth sorts, grow in less compass, so may be admitted into the large borders, or in clumps of flowers in the pleasure-garden, where they will add to the variety. The fifth sort should have a warmer situation, being a little tender, but all the other sorts will grow in almost any soil or situation; these may all be propagated by seeds, which should be sown soon after they are ripe, then the plants will come up the following spring; but if the seeds are sown in the spring, they will lie a year in the ground before they vegetate: when the plants come up they must be kept clean from weeds, and the following autumn should be transplanted into beds at ten inches or a foot distance, where they may remain till they flower, which will be the second summer after transplanting; but as most of the sorts are so easily propagated by their roots, few people care to wait for seedling plants, unless of those sorts which are scarce.

The twenty-first sort grows naturally in the islands of the Archipelago; this hath a tuberous knobbed root, from which arise five or six long, narrow, four-cornered leaves, between which arise the stalk, which supports one flower, shaped like those of the Iris, but small, and of a dark purple colour. This flowers in April, but does not produce seeds in England. It is propagated by the roots, which send out offsets; these may be taken up and transplanted when their leaves decay, but should not be kept too long out of the ground. If these are planted in a deep loose soil, the roots will run down, and be lost in a few years where they are not disturbed, so they should be annually transplanted, and have a shallow soil; they are hardy in respect to cold, and require no farther care but to keep them clean from weeds.

The twenty-second sort grows naturally in the warm parts of Europe, but is hardy enough to thrive in the open air in England; the leaves of this sort are broad, of a pale green colour; the flower-stalks rise taller than the leaves, supporting one or two white flowers which sit close to the stalks. The roots of this are used in medicine, and is usually called Sweet Iris.

The twenty-third sort hath broad leaves, of a deeper green than those of the last sort. The stalks rise much above the leaves, each having four or five flowers, which have a yellow ground, variegated with dark brown stripes, and have a scent like Elder; the two sorts flower the latter end of May, or beginning of June.

They are so hardy as to thrive as well as the second sort in the open air in this country, and may be propagated by parting of their roots, or by seeds, in the same way as is directed for that sort.

IRIS bulbosa. } See Xiphium.
IRIS Persica. }

ISATIS. Tourn. Inst. R. H. 211. tab. 100. Lin. Gen. Plant. 738. Woad; in French, *Pastel.*

The Characters are,

*The empalement of the flower is composed of four oval coloured leaves, which spread open and fall away. The flower hath four oblong petals, placed in form of a cross, which are narrow at their base, but broad and obtuse at their ends. It hath six stamina, four of which are as long as the petals, the other two are shorter; these are terminated by oblong lateral summits. It has an oblong compressed germen, the length of the two shorter stamina, crowned by an obtuse stigma. The germen becomes an oblong compressed pod with one cell, opening with two valves, inclosing one oval compressed seed in the center.*

This genus of plants is ranged in the second section of Linnæus's fifteenth class, intitled Tetradynamia Siliquosa, which includes the plants whose flowers have four long and two shorter stamina, and their seeds in pods.

The Species are,

1. Isatis (*Tinctoria*) foliis radicalibus oblongo-ovatis obtusis integerrimis, caulinis sagittatis siliculis oblongis. *Wood with oblong, oval, blunt, entire leaves at bottom, but those on the stalks arrow-pointed, and oblong pods.* Isatis sativa vel latifolia. C. B. P. 113. *Broad-leaved cultivated Wood.*
2. Isatis (*Dalmatica*) foliis radicalibus lanceolatis crenatis, caulinis lineari-sagittatis, siliculis brevioribus emarginatis. *Woad with spear-shaped lower leaves which are slightly crenated, those on the stalks very narrow and arrow-pointed, and shorter indented pods.* Isatis Dalmatica major. Bobart. *Greater Woad of Dalmatia.*
3. Isatis (*Lusitanica*) foliis radicalibus crenatis, caulinis sagittatis, pedunculis subtomentosis. Lin. Sp. 936. *Woad with crenated lower leaves, those on the stalks halbert-shaped, and the foot-stalks of the flowers woolly.* Isatis sylvestris, minor Lusitanica. H. L. App. *Smaller wild Portugal Woad.*
4. Isatis (*Ægyptiaca*) foliis omnibus dentatis. Lin. Sp. 937. *Woad whose leaves are all indented.*

The first sort is cultivated in several parts of England for the purposes of dyeing, this being used as a foundation for many of the dark colours.

This is a commodity well worth propagating in all places where the land is suitable for it, which must be a pretty strong soil, but not too moist.

The plant is biennial, in which it differs from the third and fourth sort, which are annual. The lower leaves of this are of an oblong oval figure, and pretty thick consistence, when growing in a proper soil; they are narrow at their base, but broad above, and end in obtuse roundish points, entire on their edges, and of a lucid green. The stalks rise near four feet high, dividing into several branches, garnished with arrow-shaped leaves, sitting close to the stalks; the ends of the branches are terminated by small yellow flowers, in very close clusters, which are composed of four small petals, placed in form of a cross; these are succeeded by pods shaped like a bird's tongue, half an inch long, and one eighth of an inch broad, which when ripe turn black, and open with two valves, having one cell, in which is situated a single seed. It flowers in July, and the seeds ripen the beginning of September.

The third sort has been supposed to be the same species as the first, only differing by culture; but I have propagated both sorts more than forty years, and have not found either of them alter; there are also very essential differences between the two plants, particularly in the shape of the under leaves, which in the wild sort are narrow and spear-shaped, and those on the stalks are not more than half the breadth of those of the cultivated Woad. The stalks do not branch so much, and the pods are narrower than those of the other sort, nor do the roots abide so long, for they generally die the same year.

The second sort grows naturally in Dalmatia; this is a biennial plant; the lower leaves are spear-shaped, and crenated on their edges, but those on the stalks are very narrow and arrow-pointed. The stalks branch more than those of the first sort, and rise higher. The flowers are larger, and of a brighter yellow colour. The seed-vessels are shorter, and broader at their ends, which are indented. These plants all flower in July, and their seeds ripen in September.

The fourth sort grows naturally in Egypt, and is an annual plant, which is too tender to thrive in the open air in England, therefore the seeds should be sown on a hot-bed in the spring; and when the plants are fit to remove they must be transplanted on a fresh hot-bed to bring them forward, but as soon as they have taken new root, they should have a large share of fresh air admitted to them daily, to prevent their being drawn up weak. In this bed they may remain five or six weeks, by which time they will be fit to transplant into pots, which should be carefully performed, not

to

to let the earth fall from their roots; the pots should also be plunged into a moderate hot-bed, giving the plants plenty of air at all times when the weather will permit, and supporting their stalks, which will otherwise trail on the ground; with this management the plants will flower in June, and ripen their seeds in September.

The three last sorts are not cultivated for use, so are only preserved in botanic gardens for the sake of variety; the second and third sorts are propagated by seeds, which should be sown in autumn; and when the plants come up, they must be thinned, leaving them six inches apart; afterward they must be kept clean from weeds: the summer following they will flower and produce ripe seeds, after which these sorts soon decay; the roots of the first sort will live another year. The first sort which is propagated for use, is sown upon fresh land which is in good heart, for which the cultivators of Woad pay a large rent; they generally chuse to have their land situated near great towns, where there is plenty of dressing, but they never stay long on the same spot, for the best ground will not admit of being sown with Woad more than twice; for if it is oftener repeated, the crop seldom pays the charges of culture, &c.

Those who cultivate this commodity, have gangs of people, who have been bred to this employment, so that whole families travel about from place to place, wherever their principal fixes on land for the purpose; but these people go on in one track, just as their predecessors taught them; nor have their principals deviated much from the practice of their ancestors, so that there is a large field for improvement, if any of the cultivators of Woad were persons of genius, and could be prevailed on to introduce the garden culture so far as it may be adapted to this plant; this I know from experience, having made numbers of trials in the culture of this plant, therefore I shall insert them here for the benefit of those who may have ingenuity enough to strike out of the old beaten track.

As the goodness of Woad consists in the size and fatness of the leaves, the only method to obtain this, is by sowing the seed upon ground at a proper season, and allow the plants proper room to grow, as also to keep them clean from weeds; which, if permitted to to grow, will rob the plants of their nourishment. The method practised by some of the most skilful kitchen-gardeners in the culture of Spinach, would be a great improvement to this plant, for some of them have improved the round-leaved Spinach so much by culture, as to have the leaves more than six times the size they were formerly; and their fatness has been in the same proportion, upon the same land, which has been effected by thinning of the plants when young, and keeping the ground constantly clean from weeds; but to return to the culture of Woad.

After having made choice of a proper spot of land, which should not be too light and sandy, nor over stiff and moist, but rather a gentle hazel loam, whose parts will easily separate: the next is to plough this up just before winter, laying it in narrow high ridges, that the frost may penetrate through the ridges, to mellow and soften the clods; then in the spring plough it again crossway, laying it again in narrow ridges; after it has lain some time in this manner, and the weeds begin to grow, it should be well harrowed to destroy them; this should be twice repeated while the weeds are young, and if there are any roots of large perennial weeds, they must be harrowed out, and carried off the ground. In June the ground should be a third time ploughed, when the furrows should be narrow, and the ground stirred as deep as the plough will go, that the parts may be as well separated as possible; and when the weeds appear again, the ground should be well harrowed to destroy them. Toward the end of July, or the beginning of August, it should be ploughed the last time, when the land should be laid smooth, and when there is a prospect of showers, the ground must be harrowed to receive the seeds, which should be sown either in rows with the drill plough, or in broad-cast, after the common method; but it will be proper to steep the seeds one night in water before they are sown, which will prepare them for vegetation: if the seeds are sown in drills with a plough, they will be covered by an instrument fixed to the plough for that purpose; but those which are sown broad-cast in the common way, must be well harrowed in. If the seeds are good and the season favourable, the plants will appear in a fortnight, and in a month or five weeks after will be fit to hoe; for the sooner this is performed when the plants are distinguishable, the better they will thrive, and the weeds being then young, will be soon destroyed. The method of hoeing these plants is the same as for Turneps, with this difference only, that these plants need not be thinned so much; for at the first hoeing, if they are separated to the distance of three or four inches, and at the last to six inches, it will be space enough for the growth of the plants; if this is carefully performed, and in dry weather, most of the weeds will be destroyed: but as some of them may escape in this operation, and young weeds will arise, so the ground should be a second time hoed in October, always chusing a dry time for this work; at this second operation, the plants should be singled out to the distance they are to remain. After this the ground will be clean from weeds till the spring, when young weeds will come up, therefore about a fortnight in April will be a good time to hoe the ground again, when the weeds will be young, so may be performed in less than half the time it would require if the weeds were permitted to grow large, and the sun and wind will much sooner kill them; this hoeing will also stir the surface of the ground, and greatly promote the growth of the plants; if it is performed in dry weather, the ground will be clean till the first crop of Woad is gathered, after which it must be again well cleaned; if this is carefully repeated, after the gathering of each crop, the land will always lie clean, and the plants will thrive the better. The expence of the first hoeing will be about six shillings per acre; and for the after-hoeings half that price will be sufficient, provided they are performed when the weeds are young; for if they are suffered to grow large, it will require more labour, nor can it be so well performed; therefore it is not only the best husbandry to do this work soon, but it will be found the cheapest method; for the same number of men will hoe a field of ten acres three times, when it is performed while the weeds are young, as is required to hoe it twice only, because the weeds have longer time to grow between the operations.

If the land in which the seed is sown, should have been in culture before for other crops, so not in good heart, it will require dressing before it is sown, in which case rotten stable dung is preferable to any other; but this should not be laid on till the last ploughing before the seeds are sown, and not spread but as the land is ploughed, that the sun may not exhale the goodness of it, which in summer is soon lost, when spread on the ground. The quantity should not be less than twenty loads to each acre, which will keep the ground in heart till the crop of Woad is spent.

The time for gathering the crop is according to the season, but it should be performed as soon as the leaves are fully grown, while they are perfectly green; for when they begin to change pale, great part of their goodness is over; for the quantity will be less, and the quality greatly diminished.

If the land is good, and the crop well husbanded, it will produce three or four gatherings, but the two first are the best; these are commonly mixed together in the manufacturing of it, but the after-crops are always kept separate; for if these are mixed with the other, the whole will be of little value. The two first crops will sell from twenty-five to thirty pounds a ton; but the latter will not bring more than seven or eight pounds, and sometimes not so much.

An acre of land will produce a ton of Woad, and in good seasons near a ton and a half.

When the planters intend to save the seeds, they cut three crops of the leaves, and then let the plants stand till the next year for seed; but if only one crop is cut, and that only of the outer leaves, letting all the middle leaves stand to nourish the stalks, the plants will grow stronger, and produce a much greater quantity of seeds.

These seeds are often kept two years, but it is always best to sow new seeds when they can be obtained. The seeds ripen in August; when the pods turn to a dark colour, the seeds should be gathered; it is best done by reaping the stalks in the same manner as Wheat, spreading the stalks in rows upon the ground, and in four or five days the seeds will be fit to thresh out, provided the weather is dry; for if it lies long, the pods will open and let out the seeds.

There are some of the Woad planters who feed down the leaves in winter with sheep, which is a very bad method; for all plants which are to remain for a future crop, should never be eaten by cattle, for that greatly weakens the plants; therefore those who eat down their Wheat in winter with sheep are equally blameable.

ISOPYRUM. Lin. Gen. Plant. 621. Helleborus. Amman.

The Characters are,

*The flower has no empalement. It hath five equal oval petals, which fall off, and five short tubulubous nectarii, situated within the petals, divided at their brim into three lobes, the middle one being the largest. It hath a great number of short hairy stamina, terminated by single summits, and several oval germen, with single styles of the same length, crowned by an obtuse stigma the length of the stamina. The germen afterward become so many recurved capsules with one cell, filled with small seeds.*

This genus of plants is ranged in the seventh section of Linnæus's thirteenth class, intitled Polyandria Polygynia, which includes those plants whose flowers have many stamina and styles.

The Species are,

1. Isopyrum (*Fumaroides*) stipulis subulatis, petalis acutis. Hort. Upsal. 157. *Isopyrum with awl-shaped stipulæ, and acute petals.* Helleborus fumariæ foliis. Amman. Ruth. 57. tab. 12. *Hellebore with Fumitory leaves.*
2. Isopyrum (*Thalictroides*) stipulis ovatis, petalis obtusis. Lin. Sp. Plant. 557. *Isopyrum with oval stipulæ, and obtuse petals.* Ranunculus nemorosus, thalictri folio. C. B. P. 178. *Wood Crowsfoot with a Meadow Rue leaf.*
3. Isopyrum (*Aquilegioides*) stipulis obsoletis. Lin. Sp. Plant. 557. *Isopyrum with obsolete stipulæ.* Aquilegia montana, flore parvo, thalictri folio. C B. P. 144. *Mountain Columbine with a small flower, and Meadow Rue Leaf.*

The first sort grows naturally in Siberia, from whence the seeds were sent to the Imperial garden at Petersburgh, and the late Dr. Amman, professor of botany there, sent me part of the seeds; this is an annual plant, which seldom rises more than three or four inches high. The leaves are shaped like those of Fumitory; they are small, and of a gray colour. The stalk is naked to the top, where there is a circle of leaves just under the flowers. The flowers are small, of an herbaceous colour on their outside, but yellow within, having five acute petals, and as many honey glands, with a great number of stamina which are shorter than the petals, and several reflexed moon-shaped germen, having so many single styles, crowned by obtuse stigmas. The flowers are succeeded by many recurved seed-vessels with one cell, filled with small shining black seeds. It flowers the beginning of April, and the seeds ripen in May, then the plants decay.

The seeds of this plant should be sown in a shady border soon after they are ripe, for when they are kept long out of the ground, they seldom grow the first year; therefore when the seeds are permitted to scatter, they succeed better than those which are sown, and the plants will require no other care but to keep them clean from weeds; as there is no great beauty in this plant, so a small patch or two of them in any shady part of the garden, by way of variety, will be sufficient.

The second and third sorts were sent me from Verona, near which place they grow naturally. The second sort hath leaves very like those of the smallest Meadow Rue. The stalks rise four or five inches high, supporting a few small white flowers, with obtuse petals, containing many small seeds. It flowers the latter end of March, and the seeds ripen in May.

The third sort hath leaves like the second, but a little larger, and of a greener colour. The stalks rise about six inches high, supporting two or three small white flowers, shaped like those of the second sort; these are succeeded by recurved seed-vessels, filled with small seeds. It flowers in April, and the seeds ripen in June.

Both these plants delight in a moist shady situation; they are propagated by seeds in the same way as the first sort, but these will live two or three years.

ISORA. See Helicteres.

ITEA. Lin. Gen. Plant. 243. Flor. Virg. 143. Diconangia. Mitch. Gen. 5.

The Characters are,

*The empalement of the flower is small, permanent, and erect, ending in five acute points. The flower has five petals, which are inserted in the empalement. It hath five awl-shaped stamina inserted in the empalement, which are as long as the petals, terminated by roundish summits, and an oval germen supporting a cylindrical style, which is permanent, crowned by an obtuse stigma. The germen afterward becomes a long oval capsule, with the style at the top, having one cell filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, which includes those plants whose flowers have five stamina and one style.

We have but one Species of this genus, viz.

Itea (*Virginica.*) Flor. Virg. 143. We have no English title for this plant.

This shrub grows in moist soils in several parts of North America, where it rises to the height of six or seven feet, sending out many branches from the ground upward, garnished with spear-shaped leaves placed alternately, slightly sawed on their edges, which are reflexed, veined, and of a light green. At the extremity of the same year's shoots, in the month of July, are produced fine spikes of white flowers, three or four inches long, erect; and when these shrubs are in vigour, they will be entirely covered with these spikes of flowers, so that they make a fine appearance at their season of flowering.

This shrub is now pretty common in England; but the garden where I have seen it in the greatest vigour, is that of his late Grace the Duke of Argyle, at Whitton, near Hounslow, where the soil agrees so well with this plant, that it thrives and flowers there as well as in its native country.

This shrub will live in the open air in England, the cold never injuring it, but it will not thrive upon dry gravelly ground, being very apt to die in such places in the summer season. It is propagated by layers, which, if laid down in the autumn, will put out roots so as to be fit to remove by the following autumn; when they may be transplanted into a nursery, or to the place where they are to remain. This shrub flowers at a season when there are few others in beauty, so it is the more valuable on that acount.

IVA. Lin. Gen. 1059. Tarconanthus. Vail. Act. Par. 1719.

The Characters are,

*It hath male and female flowers in the same plant; the flowers have a roundish permanent empalement, including several florets, which are convex; the male flowers have one petal, which is funnel-shaped, and indented in five parts at the brim; these are situated in the disk; they have five bristly stamina, terminated by erect summits, approaching*

*ing each other; the female half florets have neither petal or stamina; they have an oblong germen supporting two hair-like styles, crowned with acute stigmas. The empalement afterward becomes the capsule, including one naked seed.*

This genus of plants is ranged in the fifth section of Linnæus's twenty-first class, intitled Monœcia Pentandria, from the plants having male and female florets, and the male florets having five stamina.

The Species are,

1. Iva (*Annua*) foliis lanceolato-ovatis, caule herbaceo. Hort. Upsal. 285. *Ivy with oval spear-shaped leaves and an herbaceous stalk.* Tarconanthus foliis cordatis serratis trinervis. Prod. Leyd. 538.
2. Iva (*Frutescens*) foliis lanceolatis, caule fruticoso. Amœn. Acad. 3. p. 25. *Iva with spear-shaped leaves and a shrubby stalk.* Agerato affinis, Peruviana frutescens. Pluk. Alm. 12.

The first sort grows naturally in many parts of the West-Indies; it is an annual plant, with an herbaceous stalk, which rises from two to three feet high, sending out several branches from the sides, which are garnished with oval spear-shaped leaves, having three deep longitudinal veins, and are sawed on their edges; the stalks and branches are terminated by small clusters of pale blue flowers, which appear in July, and are succeeded by seeds which ripen in the autumn.

This is propagated by seeds, which should be sown in the spring upon a moderate hot-bed: and when the plants are fit to remove, they should be transplanted on another hot-bed to bring them forward, treating them in the same way as is directed for Impatiens, with which management the plants will flower and perfect their seeds.

The second sort has been long an inhabitant of the English gardens, where it has been known by the title of Jesuits Bark-tree. It hath slender ligneous branches which rise eight or ten feet high, garnished with spear-shaped sawed leaves; the branches (in warm seasons) are terminated by small clusters of flowers, of a pale purple colour, which appear the latter end of August, but are not succeeded by seeds in England.

This shrub was some years past preserved in greenhouses, being supposed too tender to live through the winter in the open air; but late trials have made it appear, that the ordinary winters in England seldom hurt it, provided it is planted in a dry soil and a sheltered situation. It is propagated in the nursery-gardens about London for sale, and if the branches are layed into the ground in the spring, they will put out roots in six months; or if cuttings are planted in a shady border in May, they will take root.

JUDAICA ARBOR. See Cercis.

JUGLANS. Lin. Gen. Plant. 950. Nux. Tourn. Inst. R. H. 581. tab. 346. Walnut; in French, *Noisetier.*

The Characters are,

*It hath male and female flowers at separate distances on the same tree. The male flowers are disposed in an oblong rope, or katkin, which is cylindrical and imbricated, with spaces between the scales; each scale has one flower, with one petal fixed in the outer center, toward the outside of the scale. The petal is divided into six equal parts; in the center is situated many short stamina, terminated by erect acute summits. The female flowers grow in small clusters, sitting close to the branches; these have a short, erect, four-pointed empalement, sitting on the germen, and an acute erect petal, divided into four parts. Under the empalement sits a large oval germen, supporting two short styles, crowned by large reflexed stigmas. The germen afterward becomes a large oval dry berry, with one cell, inclosing a large oval nut with netted furrows, whose kernel hath four lobes, which are variously furrowed.*

This genus of plants is ranged in the eighth section of Linnæus's twenty-first class, intitled Monœcia Polyandria, including those plants which have male and female flowers on the same plant, and the male flowers have many stamina.

The Species are,

1. Juglans (*Regia*) foliolis ovalibus glabris subserratis subæqualibus. Hort. Cliff. 449. *Walnut with oval small leaves or lobes, which are smooth, sawed, and equal.* Nux juglans sive Regia vulgaris. C. B. P. 417. *Common Walnut.*
2. Juglans (*Nigra*) foliolis quindenis lanceolatis serratis, exterioribus minoribus gemmulis super axillaribus. Lin. Sp. 1415. *Walnut-tree with spear-shaped lobes which are sharply sawed, the middle being the largest.* Nux juglans Virginiana nigra. H. L. 452. *Black Virginia Walnut.*
3. Juglans (*Oblonga*) foliolis cordato-lanceolatis infernè nervosis, pediculis foliorum pubescentibus. *Walnut with heart spear-shaped lobes, having many veins on their under side, and downy foot-stalks to the leaves.* Juglans nigra, fructu oblongo profundissime insculpto. Cat. Hort. Chelf. *Black Virginia Walnut, with an oblong fruit very deeply furrowed.*
4. Juglans (*Alba*) foliolis lanceolatis serratis, exterioribus latioribus. Lin. Sp. Plant. 997. *Walnut with spear-shaped sawed lobes, the outer being the broadest.* Nux juglans alba Virginiensis. Park. Theat. 1414. *White Virginia Walnut called Hickery Nut.*
5. Juglans (*Glabra*) foliolis cuneiformibus serratis, exterioribus majoribus. *Walnut with wedge-shaped lobes which are sawed, the outer beiug the largest.* Juglans alba fructu minori cortice glabro. Clayt. Flor. Virg. *White Walnut with a smaller fruit, and a smooth bark.*
6. Juglans (*Ovata*) foliolis lanceolatis serratis glabris subæqualibus. *Walnut with smooth, spear-shaped, sawed lobes, which are equal.* Juglans alba fructu ovato compresso, nucleo dulce, cortice squamoso. Clayt. Flor. Virg. *White Walnut with an oval compressed fruit, a sweet kernel, and a scaly bark, commonly called Shagbark in America.*

There are several varieties of the common Walnut, which are distinguished by the following titles: the large Walnut, the thin shelled Walnut, the French Walnut, the late ripe Walnut, and the double Walnut; but these do all of them vary when raised by the seed, so that the nuts from the same tree will produce plants whose fruit will differ; therefore there can be no dependence upon the trees which are raised from nuts, till they have produced fruit; so that those persons who plant the trees for their fruit, should make choice of them in the nurseries when they have their fruit upon them, otherwise they may be deceived, by having such as they would not chuse.

The second sort is commonly called Black Virginia Walnut; this grows to a large size in North America. The leaves of this sort are composed of five or six pair of spear-shaped lobes, which end in acute points, and are sawed on their edges; the lower pair of lobes are the least, the other gradually increase in their size to the top, where the pair at the top, and the single lobe which terminates the leaf, are smaller; these leaves, when bruised, emit a strong aromatic flavour, as do also the outer cover of the nuts, which are rough, and rounder than those of the common Walnut. The shell of the nut is very hard and thick, and the kernel small, but very sweet.

The third sort grows naturally in North America, where the trees grow to a large size. The leaves of this sort are composed of seven or eight pair of long heart-shaped lobes, broad at their base, where they are divided into two round ears, but terminate in acute points; they are rougher, and of a deeper green than those of the second sort, and have nothing of the aromatic scent which they have. The fruit is very long. The shell is deeply furrowed, and is very hard. The kernel is small, but well flavoured.

The fourth sort is very common in most parts of North America, where it is called Hickery Nut. The leaves of this sort are composed of two or three pair of oblong lobes, terminated by an odd one; these are of a light green, and sawed on their edges; the lower pair of lobes are the smallest, and the upper the largest. The fruit is shaped like the common Wal-

 nut;

nut; but the shell is not furrowed, and is of a light colour.

The fifth sort is not so large as the fourth. The leaves are composed of two pair of lobes, terminated by an odd one; these are narrow at their base, but broad and rounded at their ends; they are sawed on their edges, and are of a light green. The nuts are small, have a smooth shell, and are very hard and white.

The sixth sort grows naturally in North America, where it rises to a middling stature. The leaves of this sort are composed of three pair of smooth spear-shaped lobes, of a dark green colour, sawed on their edges, and ending in acute points. The fruit is oval, the shell white, hard, and smooth; the kernel small, but very sweet. The young shoots of the tree are covered with a very smooth brownish bark, but the stems and older branches have a rough scaly bark, from whence it had the appellation of Shagbark, in America.

The common Walnut is propagated in many parts of England for the fruit, and formerly the trees were propagated for their wood, which was in very great esteem, till the quantity of Mahogany, and other useful woods which have been of late years imported into England, have almost banished the use of Walnut.

These trees are propagated by planting their nuts, which, as was before observed, seldom produce the same sort of fruit as are sown; so that the only way to have the desired sort, is to sow the nuts of the best kinds; and if this is done in a nursery, the trees should be transplanted out when they have had three or four years growth, to the place where they are designed to remain; for these trees do not bear transplanting when they are of a large size, therefore there may be a good number of the trees planted, which need not be put at more than six feet apart, which will be distance enough for them to grow till they produce fruit; when those whose fruit are of the desired kind may remain, and the others cut up, to allow them room to grow; by this method a sufficient number of the trees may be generally found among them to remain, which will thrive and flourish greatly when they have room; but as many people do not care to wait so long for the fruit, so the next best method is to make choice of some young trees in the nurseries, when they have their fruit upon them; but though these trees will grow and bear fruit, yet they will never be so large or so long lived, as those which are planted young.

All the sorts of Walnuts which are propagated for timber, should be sown in the places where they are to remain; for the roots of these trees always incline downward, which being stopped or broken, prevent their aspiring upward, so that they afterwards divaricate into branches, and become low spreading trees; but such as are propagated for fruit, are greatly mended by transplanting; for hereby they are rendered more fruitful, and their fruit are generally larger and fairer; it being a common observation, that downright roots greatly encourage the luxuriant growth of timber in all sorts of trees; but such trees as have their roots spreading near the surface of the ground, are always the most fruitful and best flavoured.

The nuts should be preserved in their outer covers in dry sand until February, when they should be planted in lines, at the distance you intend them to remain; but in the rows they may be placed pretty close, for fear the nuts should miscarry; and the young trees, where they are too thick, may be removed, after they have grown two or three years, leaving the remainder at the distance they are to stand.

In transplanting these trees, you should observe never to prune either their roots or large branches, both which are very injurious to them; nor should you be too busy in lopping or pruning the branches of these trees when grown to a large size, for it often causes them to decay; but when there is a necessity for cutting any of their branches off, it should be done early in September (for at that season the trees are not so subject to bleed) that the wound may heal over before the cold increases; the branches should always be cut off quite close to the trunk, otherwise the stump which is left will decay, and rot the body of the tree.

The best season for transplanting these trees is as soon as the leaves begin to decay, at which time if they are carefully taken up, and their branches preserved entire, there will be little danger of their succeeding, although they are eight or ten years old, as I have several times experienced; though, as was before observed, these trees will not grow so large, or continue so long, as those which are removed young.

This tree delights in a firm, rich, loamy soil, or such as is inclinable to chalk or marl; and will thrive very well in stony ground, and on chalky hills, as may be seen by those large plantations near Leatherhead, Godstone, and Carshalton in Surry, where are great numbers of these trees planted upon the downs, which annually produce large quantities of fruit, to the great advantage of their owners; one of which I have been told, farms the fruit of his trees, to those who supply the markets, for 30 l. per annum.

The distance these trees should be placed, ought not to be less than forty feet, especially if regard be had to their fruit; though when they are only designed for timber, if they stand much nearer, it promotes their upright growth. The black Virginia Walnut is much more inclinable to grow upright than the common sort, and the wood being generally of a more beautiful grain, renders it preferable to that, and better worth cultivating. I have seen some of this wood which hath been beautifully veined with black and white, which, when polished, has appeared at a distance, like veined marble. This wood is greatly esteemed by the cabinet-makers for inlaying, as also for bedsteads, stools, tables, and cabinets; and is one of the most durable woods for those purposes of English growth, being less liable to be infected with insects than most other kinds (which may proceed from its extraordinary bitterness;) but it is not proper for buildings of strength, it being of a brittle nature, and exceeding subject to break very short, though it commonly gives notice thereof, by its cracking some time before it breaks.

The general opinion is, that the beating of this fruit improves the trees, which I do not believe, since in the doing of this, the younger branches are generally broken and destroyed; but as it would be exceeding troublesome to gather it by hand, so in beating it off, great care should be taken that it be not done with violence, for the reason before assigned. In order to preserve the fruit, it should remain upon the trees till it is thorough ripe, when it should be beaten down, and laid in heaps for two or three days; after which they should be spread abroad, when, in a little time, their husks will easily part from the shells; then you must dry them well in the sun, and lay them up in a dry place, where mice or other vermin cannot come to them, in which place they will remain good for four or five months; but there are some persons who put their Walnuts into an oven gently heated, where they let them remain four or five hours to dry, and then put them up in oil jars, or any other close vessel, mixing them with dry sand, by which method they will keep good six months. The putting of them in the oven is to dry the germ, and prevent their sprouting; but if the oven be too hot it will cause them to shrink, therefore great care must be had to that.

All the other sorts are propagated in the same way, but as few of the sorts produce fruit in England, so their nuts must be procured from North America; which should be gathered when fully ripe, and put up in dry sand, to preserve them in their passage to England: when they arrive here, the sooner they are planted the greater chance there will be of their succeeding;

ceeding; when the plants come up, they should be kept clean from weeds; and if they shoot late in the autumn, and their tops are full of sap, they should be covered with mats, or some other light covering, to prevent the early frosts from pinching their tender shoots, which often causes them to die down a considerable length before the spring; but if they are screened from these early frosts, the shoots will become firmer and better able to resist the cold. Some of these sorts are tender while young, so require a little care for the two first winters, but afterward will be hardy enough to resist the greatest cold of this country.

The black Virginia Walnut is full as hardy as the common sort: there are some large trees of this kind in the Chelsea garden, which have produced great quantities of fruit upward of forty years; the nuts have generally ripened so well there as to grow, but their kernels are small, so are of little value.

The trees all require the same culture as the common Walnut, but they grow best in a soft loamy soil not too dry, and where there is a depth of soil for their roots to run down. The Hickery, when young, is very tough and pliable, so the sticks of it are much esteemed; but the wood when grown large is very brittle, so not of any great use. The black Virginia Walnut is the most valuable wood of all the sorts; some of the trees are beautifully veined, and will take a good polish, but others have very little beauty, which is the case of many other sorts of wood.

JUJUBE. See Ziziphus.

JULIANS, or ROCKETS. See Hesperis.

JULY FLOWER. See Dianthus.

JUNCUS. Tourn. Inst. R. H. 246. tab. 127. Lin. Gen. Plant. 396. Rush; in French, *Jonc.*

The Characters are,

*It hath a chaff opening with two valves, an empalement with six oblong pointed little leaves which are permanent; the flower hath no petals, but the coloured empalement is by some taken for petals. It hath six short hairy stamina, terminated by oblong erect summits, and a three-cornered pointed germen, with a short slender style, crowned by three long, hairy, slender stigmas, which are reflexed. The germen afterward becomes a close three-cornered capsule with one cell, opening with three valves, inclosing roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, intitled Hexandria Monogynia, which contains the plants whose flowers have six stamina and one style.

The Species are,

1. Juncus (*Acutus*) culmo subnudo tereti mucronato, paniculâ terminali, involucro diphyllo spinoso. Lin. Sp. Plant. 325. *Rush with a naked, taper, pointed stalk, terminated by a panicle, and a prickly two-leaved involucrum.* Juncus acutus, capitulis sorghi. C. B. P. 11. *Prickly large Sea Rush.*
2. Juncus (*Filiformis*) culmo nudo, apice membranaceo incurvo, paniculâ laterali. Lin. Sp. Plant. 326. *Rush with a naked stalk, an incurved membranacous apex, and a lateral panicle.* Juncus acutus, panicula sparsa. C. B. P. *Common hard Rush.*
3. Juncus (*Effusus*) culmo nudo stricto, paniculâ laterali. Flor. Leyd. 44. *Rush with a naked close stalk, and a lateral panicle.* Juncus lævis, paniculâ sparsâ, major. C. B. P. *Larger common soft Rush, with a spreading panicle.*
4. Juncus (*Conglomeratis*) culmo nudo stricto, capitulo laterali. Prod. Leyd. 44. *Rush with a close naked stalk and lateral heads.* Juncus lævis, paniculâ non sparsâ. C. B. P. *Soft Rush with a more compact panicle.*

There are many other species of this genus, some of which grow naturally in England, and are very troublesome weeds in many places, so are not worthy of being enumerated here; and those which are here mentioned, is only to point out a method of destroying them.

The first and second sorts grow on the sea-shores, where they are frequently watered by the salt water. These two sorts are planted with great care on the banks of the sea in Holland, in order to prevent the water from washing away the earth; which being very loose, would be in danger of removing every tide, if it were not for the roots of these Rushes, which fasten themselves very deep in the ground, and mat themselves near the surface, so as to hold the earth closely together. Therefore, whenever the roots of these Rushes are destroyed, the inhabitants immediately repair them to prevent farther damage. In the summer time, when the Rushes are fully grown, the inhabitants cut them, and tie them up into bundles, which are dried, and afterward carried into the larger towns and cities, where they are wrought into baskets, and several other useful things, which are frequently sent into England. These sorts do not grow so strong in England, as they do on the Maese, and some other places in Holland, where I have seen them upward of four feet high.

The third and fourth sorts grow on moist, strong, uncultivated lands in most parts of England, and consume the herbage where they are suffered to remain. The best method of destroying these Rushes is, to fork them up clean by the roots in July, and after having let them lie a fortnight or three weeks to dry, to lay them in heaps, and burn them gently; and the ashes which these afford, will be good manure for the land; but in order to prevent their growing again, and to make the pasture good, the land should be drained, otherwise there will be no destroying these Rushes entirely; but after it is well drained, if the roots are annually drawn up, and the ground kept duly rolled, they may be subdued.

JUNIPERUS. Tourn. Inst. R. H. 588. tab. 361. Lin. Gen. Plant. 1005. Juniper; in French, *Genévrier.*

The Characters are,

*It hath male and female flowers in different plants, and sometimes at separate distances on the same plant. The male flowers grow on a conical katkin; the flowers are placed by threes, two of them fastened along the common tail opposite, terminated by a single one; the scales are broad, short, lying over each other, and fixed to the column by a very short foot-stalk. The flower has no petal, but three stamina in the male flower which are joined in one body below, having three distinct summits, adhering to the scales of the lateral flowers. The female flowers have a small three-pointed empalement sitting upon the germen, which is permanent; they have three stiff, acute, permanent petals; the germen sitting below the empalement, supports three single styles, crowned by stigmas. The germen afterward becomes a roundish berry, inclosing three stony seeds, which are oblong and angular on one side, but convex on the other.*

This genus of plants is ranged in the twelfth section of Linnæus's twenty-second class, intitled Diœcia Monodelphia, which includes those plants which have male and female flowers in different plants, whose stamina are joined in one body.

The Species are,

1. Juniperus (*Communis*) foliis ternis patentibus mucronatis bacca longioribus. Lin. Sp. Plant. 1040. *Juniper with spreading sharp-pointed leaves placed by threes.* Juniperis vulgaris fruticosa. C. B. P. 488. *The common English Juniper.*
2. Juniperis (*Suecia*) foliis ternis patentibus, acutioribus, ramis erectioribus, bacca longioribus. *Juniper with longer and more acute-pointed leaves placed by threes, erect branches, and longer berries.* Juniperis vulgaris arbor. C. B. P. 488. *The Tree, or Swedish Juniper.*
3. Juniperus (*Virginiana*) foliis ternis omnibus patentibus. *Juniper with leaves placed by threes, which are all of them spreading.* Juniperus Virginiana. H. L. Folio ubique juniperino. Boerh. Ind. *Cedar of Virginia, or red Cedar.*
4. Juniperus (*Caroliniana*) foliis ternis basi adnatis, junioribus imbricatis, senioribus patulis. Hort. Cliff. 464. *Juniper with leaves placed by threes adhering at their base, the young ones lying over each other, and the old ones spreading.* Juniperus Virginiana, foliis inferioribus juniperinis, superioribus sabinam, vel cypressum referentibus. Boerh. Ind. *Carolina Cedar.*

5. Juni-

5. Juniperus (*Bermudiana*) foliis inferioribus ternis, superioribus quadrifariàm imbricatis. *Juniper with spreading under leaves placed by threes, and the upper by fours, which lie close over each other.* Juniperis Bermudiana. H. L. *Cedar of Bermudas.*

6. Juniperis (*Thurifera*) foliis quadrifariàm imbricatis acutis. Lin. Sp. 1471. *Juniper with awl-shaped acute leaves placed by fours, lying over each other.* Juniperus major baccâ cæruleâ. C. B. P. *Greater Juniper with blue berries.*

7. Juniperus (*Phœnicia*) foliis ternis obliteratis imbricatis obtusis. Lin. Sp. 1471. *Juniper with leaves placed by threes, which are obliterate, obtuse, and lying over each other.* Cedrus folio cupressi major, fructu flavescente. C. B. P. *Greater Cedar with a Cypress leaf and yellowish fruit.*

8. Juniperus (*Lycia*) foliis ternis undique imbricatis ovatis obtusis. Flor. Leyd. 90. *Juniper with oval blunt leaves, which every where lie over each other.* Cedrus folio cupressi media, majoribus baccis. C. B. P. 488. *Middle Cedar, with a Cypress leaf and larger berries.*

9. Juniperus (*Barbadensis*) foliis omnibus quadrifariàm imbricatis junioribus ovatis senioribus acutis. Prod. Leyd. 90. *Juniper with all the leaves placed by fours, lying over each other, the young being oval, the older acute.* Juniperus maxima cupressi folio minimo, cortice exteriore in tenues philyras spiralis ductili. Sloan. Cat. Jam. 128. *Greatest Juniper with the least Cypress leaf, and the outer bark splitting off in thin ductile pieces, commonly called Jamaica Berry-bearing Cedar.*

10. Juniperus (*Sabina*) foliis oppositis erectis decurrentibus, ramis patulis. *Juniper with opposite, erect, running leaves, and spreading branches.* Sabina folio tamarisci. C. B. P. 487. *Savin with a Tamarisk leaf, or common Savin.*

11. Juniperus (*Lusitanica*) foliis oppositis patulis decurrentibus, ramis erectioribus. *Juniper with opposite spreading leaves, which run over each other, and more erect branches.* Sabina folio cupressi. C. B. P. 487. *Savin with a Cypress leaf, commonly called Berry-bearing Savin.*

12. Juniperus (*Oxycedrus*) foliis undique imbricatis obtusis, ramis teretibus. *Juniper with obtuse leaves everywhere lying over each other, and taper branches.* Juniperus major, baccâ rufescente. C. B. P. 489. *Greater Juniper with a brownish berry.*

13. Juniperus (*Hispanica*) foliis quadrifariàm imbricatis acutis. Prod. Leyd. 90. *Juniper with acute leaves lying over each other, placed four ways.* Cedrus Hispanica procerior, fructu maximo nigro. Tourn. Inst. 588. *Taller Spanish Cedar, with a very large black fruit.*

The first sort grows naturally upon chalky lands in many parts of England. This is a low shrub, seldom rising more than three feet high, sending out many spreading branches, which incline on every side, covered with a brown bark, and garnished with narrow awl-shaped leaves ending in acute points, which are placed by threes round the branches, pointing outward; these are of a grayish colour, and continue through the year; the male flowers sometimes are situated on the same plant with the female, but at distances, at other times they are upon distinct plants: the female flowers are succeeded by roundish berries, which are first green, but when ripe, are of a dark purple colour. The berries ripen in the autumn.

The wood, the berries, and the gum, are used in medicine; the gum is titled Sandaracha.

The second sort is known in the gardens by the title of Swedish Juniper: this is by many supposed to be only a variety of the first, but is undoubtedly a distinct species, for I have many years raised both sorts from the seeds, and have never found them alter. This sort rises to the height of ten or twelve feet, the branches grow more erect, the leaves are narrower, and end in more acute points: they are placed farther asunder on the branches, and the berries are longer. It grows naturally in Sweden, Denmark, and Norway.

The third sort grows naturally in most parts of North America, where it is called red Cedar, to distinguish it from a sort of Cypress, which is called white Cedar there. Of this there are two, if not three varieties, besides the species here enumerated; one of which has leaves in every part, like those of the Savin, and upon being rubbed, emit a very strong ungrateful odour: this is commonly distinguished in America, by the title of Savin-tree. There is another with leaves very like those of Cypress, but as these generally arise from the same seeds when they are sent from America, so they may be supposed to be only seminal variations.

The lower leaves of the fourth sort are like those of the Swedish Juniper, but the upper leaves are like those of the Cypress; and this difference is constant, if the seeds are carefully gathered from the same tree; but as most of those people who send over these seeds, are not very careful to distinguish the difference, so it often happens that the seeds of two or three sorts are mixed together, which has given occasion to people to imagine them but one species; but all the leaves of the third are like those of the Juniper, so the gardeners call this the red Virginia Cedar; and the fourth they call Carolina Cedar, though all the sorts grow naturally in Virginia.

The fifth sort is the Bermudas Cedar, whose wood has a very strong odour, and was formerly in great esteem for wainscotting of rooms, and also for furniture; but the odour being too powerful for many persons, has rendered it less valuable, and at present there is not much of it imported into England. These plants, while young, have acute-pointed leaves, which spread open, and are placed by threes round the branches; but as the trees advance, so their leaves alter, and the branches are four-cornered; the leaves are very short, and placed by fours round the branches, lying over each other like the scales of fish; the berries are produced toward the end of the branches; these are of a dark red colour, inclining to purple. As there are few of these trees of any great size in England, so I have not had an opportunity of examining their flowers, therefore do not know if they have male and female flowers on the same plant, or if they are on different plants; for although I have received very fine specimens from Bermudas, yet they are all with fruit on them almost fully grown, and not one with male flowers; and as these trees are commonly destroyed in England whenever there happens a severe winter, where they are not sheltered, so we have little hopes of seeing them in flower here.

The sixth sort grows naturally in Istria, from whence I received the berries, which have succeeded with me in the Chelsea garden. This hath spreading branches, growing thinly, which are garnished with acute-pointed leaves, placed by fours round the branches; they are of a deep green, and not very close to each other, but grow horizontally, pointing outward; the berries are much larger than those of the common Juniper, and are blue when ripe.

The seventh sort grows naturally in Portugal, from whence I have frequently received the berries. This sort grows with its branches in a pyramidical form; the lower ones are garnished with short, acute-pointed, grayish leaves, placed by threes round the branches, pointing outward; but those on the upper branches are of a dark green, lying over each other like the scales of fish, but end in acute points. The male flowers are produced at the extremity of the branches; they are situated in a loose, scaly, conical katkin, standing upon a short foot-stalk erect; the fruit is produced sometimes upon the same tree, at distances from the flowers, and at other times they are upon separate trees; the berries of this are of a pale yellow when ripe, and about the size of those of the common Juniper.

The eighth sort grows naturally in Spain and Italy, from both which countries I have received it. The branches of this sort grow erect, and are covered with a reddish brown bark; the leaves are small, obtuse,

and

and lie over each other like the ſcales of fiſh; the male flowers grow at the extremity of the branches in a conical katkin, and the fruit grows ſingle from the ſide of the branches below the katkins, on the ſame branch; the berries are large, oval, and, when ripe, are brown.

The ninth ſort grows naturally in Jamaica, and alſo in the other iſlands of the Weſt-Indies, where it riſes to be one of the largeſt timber trees in thoſe countries; the wood is frequently fetched from thence by the inhabitants of North America, for building of ſhips. This ſort is generally confounded with the Bermudas Cedar, and taken for the ſame, but the ſpecimens of it which were ſent me by the late Dr. Houſtoun, prove them to be different trees; for the branches of this ſpread very wide, the leaves are extremely ſmall, and are every where lying imbricatim over each other; the bark is rugged, and ſplits off in ſtrings, and is of a very dark colour; the berries are ſmaller than thoſe of the Bermudas Cedar, and are of a light brown colour when ripe: this ſort is male and female in different trees.

The tenth ſort is the common Savin; this grows naturally in Italy, Spain, and the Levant, upon the mountains where it is cold. It ſends out its branches horizontally, ſo ſeldom riſes more than three or four feet high, but ſpreads to a conſiderable diſtance every way; the branches are garniſhed with very ſhort acute-pointed leaves placed oppoſite, which run over each other along the branches, whoſe ends point upward. This ſort very rarely produces either flower or ſeed in the gardens; I have frequently examined old plants which have been ſtanding more than fifty years, and have not more than three times found any male flowers upon them, and but once have ſeen any berries, which were upon a ſeparate tree from the flowers; theſe berries were ſmaller than thoſe of the common Juniper, but of the ſame colour, and were a little compreſſed; the whole plant has a very rank ſtrong odour when touched. The leaves of this ſhrub are much uſed by the farriers for horſes when they have worms; and Mr. Ray commends the juice of it mixed with milk, and ſweetened with ſugar, as an excellent medicine for children who are troubled with worms. The leaves beaten into a cataplaſm with hog's-lard, will cure children's ſcabby heads.

The eleventh ſort has, by many, been ſuppoſed to be only an accidental variety of the former, but there is a a manifeſt difference between them; for the branches of this grow more erect than thoſe of the eleventh ſort, the leaves are ſhorter, and end in acute points which ſpread outward. This ſort will riſe to the height of ſeven or eight feet, and produces great quantities of berries. I have propagated this ſort from ſeeds, but have never found it vary. It has been diſtinguiſhed by moſt of the old botaniſts, by the title of Berry-bearing Savin. It grows naturally on the Alps, from whence I have received the berries.

The twelfth ſort grows naturally in Spain, Portugal, and the ſouth of France, where it riſes ten or twelve feet high, ſending out branches the whole length of the ſtem, which are garniſhed with ſmall obtuſe leaves, lying over each other like the ſcales of fiſh; the branches are ſmall and taper, having no angles or corners, as moſt of the others have; the male flowers are ſituated at the end of the branches in conical ſcaly katkins, and the berries grow below from the ſide of the ſame branches. Theſe are larger than thoſe of the common Juniper, and when ripe are brown.

The thirteenth ſort grows naturally in Spain and Portugal, where it riſes from twenty-five to thirty feet high, ſending out many branches which form a ſort of pyramid; the branches are garniſhed with acute-pointed leaves, which lie over each other four ways, ſo as to make the branches four-cornered; the berries of this ſort are very large, and black when ripe.

Theſe plants are all propagated by ſowing their ſeeds, the beſt ſeaſon for which is as ſoon as they are ripe, if they can then be procured; for when they are kept until ſpring before they are ſown, they will not come up until the ſecond year. The ground in which the ſeeds of the hardy ſorts are ſown, ſhould be freſh and light, but it ſhould not be dunged: it ſhould be well dug and levelled very even; then ſow your ſeeds thereon pretty thick, and ſift ſome earth over them about half an inch thick; this bed will require no farther care than only to keep it clear from weeds, and toward the middle or latter end of April, you will find ſome of your plants appear above ground, though, perhaps, the greateſt part of them may lie till the ſpring following before they come up; therefore you ſhould carefully clear the beds from weeds, and in very dry weather refreſh them with ſome water, which will greatly promote the growth of thoſe plants which are up, and alſo cauſe the other ſeeds to vegetate; but if the bed in which theſe ſeeds are ſown is much expoſed to the ſun, it ſhould be ſhaded with mats in the day; for when the plants come firſt up, they will not bear too much heat. In this bed they ſhould remain till the ſecond autumn, when you muſt prepare ſome beds to tranſplant them into, which ſhould alſo be of light, freſh, undunged ſoil; and having well dug and cleanſed the ground from all noxious weeds and roots, you ſhould make it level; and then in the beginning of October, which is the proper ſeaſon for removing theſe plants, you ſhould raiſe up the young plants with a trowel, preſerving as much earth as poſſible to their roots, and plant them into beds about five or ſix inches aſunder each way, giving them ſome water to ſettle the earth to their roots; and if it ſhould prove very dry weather, you may lay a little mulch upon the ſurface of the ground round their roots, which will be of great ſervice to the plants. But as many of the ſeeds will be yet left in the ground where they are ſown, ſo the beds ſhould not be diſturbed too much in taking up the plants; for I have known a bed ſown with theſe berries, which has ſupplied plants for three years drawing, ſome of the berries having lain ſo long in the ground before they ſprouted; therefore the ſurface of the beds ſhould be kept level, and conſtantly clean from weeds.

The plants may remain two years in theſe beds, obſerving to keep them clear from weeds; in the ſpring you ſhould ſtir the ground gently between them, that their roots may with greater eaſe ſtrike into it; after which time they ſhould be tranſplanted, either into a nurſery, at the diſtance of three feet row from row, and eighteen inches aſunder in the rows, or into the places where they are to remain for good. The beſt ſeaſon to tranſplant them (as I before obſerved) is in the beginning of October, when you ſhould take them up carefully, to preſerve a ball of earth to their roots; and when planted, their roots ſhould be mulched; all which, if carefully attended to, as alſo obſerving to refreſh them with water in very dry weather until they have taken new root, will preſerve them from the danger of not growing; and they being extreme hardy in reſpect to cold, will defy the ſevereſt of our winters to injure them, provided they are not planted in a moiſt or rich ſoil.

In order to have theſe trees aſpire in height, their under branches ſhould be taken off, eſpecially where they are inclined to grow ſtrong, but they muſt not be kept too cloſely pruned, which would retard their growth; for all theſe Evergreen trees do more or leſs abound with a reſinous juice, which in hot weather is very apt to flow out from ſuch places as are wounded; ſo that it will not be adviſeable to take off too many branches at once, which would make ſo many wounds, from which their ſap in hot weather would flow in ſuch plenty, as to render the trees weak and unhealthy.

The two ſorts of Virginian Cedars grow to a much greater height than the former, and in their native country afford excellent timber for many uſes; but with us there are very few which are above twenty-



five

five or thirty feet high, though there is no doubt of their growing larger; for they thrive very fast after the three first years, and resist the sharpest frost of our climate exceeding well, and are very apt to grow strait and regular, provided they are not suffered to shoot out too much at bottom.

These plants are also propagated by seeds, which must be procured from Virginia or Carolina (for they rarely produce ripe seeds in England) and sown as was directed for the other Junipers; but as this seed cannot be procured in England till spring, so when sown at that season, it remains in the ground until the succeeding spring before the plants appear; therefore you must observe to keep the beds clear from weeds, and not suffer the seeds to be disturbed, which is often the fault of some impatient people, who think, because the plants do not rise the first year, that they will never come up, and so dig up the ground again, whereby their seeds are buried; but if they are let remain, they seldom fail to grow, though sometimes it is two years after sowing before they come up. When the plants come up they must be carefully weeded, and in dry weather should be refreshed with water, which will greatly forward their growth; and the autumn following they should have a little rotten tan laid between them, to keep out the frost. In this bed the plants may remain till they have had two years growth, then they should be transplanted into other beds, as was directed before for the other sorts, observing to preserve a ball of earth to their roots; and after they are planted, if the season proves dry, they must be carefully watered, and the surface of the ground covered with mulch, to prevent the sun and wind from entering the earth to dry their fibres; but they should not be too much watered, which often proves injurious to these trees, by rotting their tender fibres soon after they are emitted, whereby the plants have been often destroyed.

In these beds they may remain two years, observing to keep them clear from weeds; and in winter you should lay a little fresh mulch upon the surface of the ground round their roots, which will prevent the frost from penetrating to them, and effectually preserve them; for while the plants are so young, they are liable to be injured by hard frosts, when too much exposed thereto; but when they have attained a greater strength, they will resist the severest of our cold.

After two years, they should either be removed into a nursery (as was directed for the common Juniper) or transplanted where they are designed to remain, observing always to take them up carefully, otherwise they are subject to fail upon transplanting; as also to mulch the ground, and water them as was before directed, until they have taken root; after which they will require no farther care, than only to keep the ground clear about their roots, and to prune up their side branches to make them aspire in height.

The soil in which you plant these trees should be fresh and light, but must not be dunged, especially at the time when they are planted; for dung is very hurtful to them, if it be not quite rotted to mould; therefore the mulch which is laid upon the surface of the ground should not be dung, but rather some old tanners bark or sea-coal ashes, which will prevent the frost from penetrating deep in the ground.

These trees being thus managed, will in a few years rise to a considerable stature, and by the variety of their evergreen leaves and manner of growth, will greatly add to the beauty of all plantations, if rightly disposed, which indeed is what we seldom observe in any of the English gardens or wildernesses; for there are few people who consider the different growths of the several trees with which they compose such plantations, so as to place the tallest growing trees the backwardest from sight, and the next degree to succeed them, and so gradually diminishing till we come to the common Juniper, and others of the same growth, whereby all the trees will be seen, and the gradual declivity of their tops will appear like a verdant slope, and be much more agreeable to the sight, as also more advantageous to the growth of the trees, than to place shrubs of humble growth near such plants as will grow to the first magnitude, whereby the shrub is hid from sight, and will be over-shadowed and destroyed; nor can the distance which each tree requires, be so justly proportioned any other way; for in this distribution, the largest trees being separated by themselves, may be placed at a due distance; and then those of a middling growth succeeding, may be accordingly allowed sufficient room; and the smaller, which are next the sight, being placed much closer, will hide the naked stems of the larger trees, and have an agreeable effect to the sight.

The timber of these trees is of excellent use in America, for building of vessels, wainscotting houses, and for making many sorts of utensils, it abounding with a bitter resin, which prevents its being destroyed by vermin, but it is very brittle, therefore not so proper for stubborn uses; but however, by increasing the number of our timber trees, we shall find many advantages, besides the pleasure their variety affords; for we may hereby have trees of very different kinds, which are adapted to grow in various soils and situations, whereby we shall never want proper trees for all the different sorts of soils in England, if proper care be taken in their choice; which would be a great improvement to many parts of this kingdom, which now lie unplanted, because the owner, perhaps, find that neither Oaks nor Elms will thrive there, and consequently concludes, that no other sort of tree will, which is a great mistake; for if we consider how different the structure of trees are (being designed by the wise Author and contriver of all things, to grow on different soils and situations) and only observe what sorts are adapted for growing on dry barren mountains, and what are designed for the lower and richer valleys, we need never be at a loss for proper trees for all sorts of ground.

The Bermudas Cedar being a native of that island, and also of the Bahama Islands, is much tenderer than either of the former sorts, except that of Jamaica, so is not likely to thrive well in this country; for although many of these plants have lived several years in the open air in England, yet whenever a severe winter happens, it either kills them, or so much defaces them, that they do not recover their verdure in a year or two after.

These plants are propagated by seeds in the same manner as the former, with only this difference, that these should be sown in pots or tubs of earth, that they may be removed into shelter in the winter time, otherwise the young plants are often hurt by hard frosts; but they will require no more care than only to be placed under a common hot-bed frame, where the glasses may be constantly kept off in mild weather, when they cannot have too much free air, and only covered in hard frosts. These seeds constantly remain in the ground until the second year before they come up, therefore the earth in the pots should not be disturbed; and in the summer time they should be placed in the shade, to prevent the earth from drying too fast; and in very dry weather they should be often watered, but do not give too much water to them at once, which would rot the seeds.

The spring following, when the young plants come up, they must be carefully cleared from weeds, and in dry weather refreshed with water; but should stand, during the summer season, in a place defended from strong winds; and in winter must be placed under frames, where they may be covered in hard frosty weather, but must have open air when the weather is mild. In April following you should transplant them each into a single halfpenny pot filled with fresh light earth, being careful to raise them up with a ball of earth to their roots; and when they are planted, you should water them, to settle the earth to their roots; then place the pots in a warm situation, where they may be defended from sun and wind: but if you will bestow a moderate hot-bed to plunge the pots in, it

will

will greatly promote their taking new root; however, you must carefully defend them from the great heat of the sun, which is injurious to them when fresh removed; but when they have taken root, you may expose them by degrees to the open air. If you suffer the pots to remain plunged all the summer, it will preserve the earth therein from drying so fast as it would do, if they were set upon the ground.

In October you should again remove these plants into shelter, or else plunge their pots into the ground under a warm hedge, where they may be protected from the cold north and east winds; and in the spring following you must shift the plants into pots a size larger, taking away some of the earth from the outside of the ball, and adding some fresh, which will promote their growth; and so continue to manage them as was before directed, until you plant them out in the places where they are designed to remain; which should not be done till they are four or five years old, by which time they will be strong enough to bear the cold of our common winters.

The reason for my directing these plants to be preserved in pots until they are planted out for good is, because they are difficult to transplant, and being tender will require some shelter while young; and whoever observes the method here laid down, will find the plants so managed to gain two years growth in six, from those raised in the open air, and be in less danger of being destroyed; and as the trouble and expence in raising them this way is not great, so it is worth practising, since in a few years the trees will recompense the trouble.

The timber of this tree is of a reddish colour, and very sweet, and is commonly known in England by the name of Cedar Wood; though there are divers sorts of wood called by that name, which come from very different trees, especially in the West-Indies, where there are several trees of vastly different appearances and genera, which have that appellation: it is this wood which is used for pencils, as also to wainscot rooms, and make stair-cases, it enduring longer sound than most other sorts of timber, which, perhaps, may be owing to some extreme bitter taste in the resin, with which the tree abounds; for it is very remarkable, that the worms do not eat the bottoms of the vessels built with this wood, as they do those built with Oak; so that the vessels built with Cedar are much preferable to those built with any other sort of timber, for the use of the West-India seas, but they are not fit for ships of war, the wood being so brittle as to split to pieces with a cannon ball.

The Jamaica Juniper is more impatient of cold than the Bermudas, so will not live through the winter in the open air in England, and the plants must be preserved in pots and housed in the winter; this is propagated by seeds, in the same way as the Bermudas Cedar; but if the pots are plunged into a moderate hot-bed the second spring after the seeds are sown, it will bring up the plants sooner, and they will have more time to get strength before winter.

All the other sorts are hardy enough to live in the open air, so are very well worth propagating, as they will add to the variety of Evergreen plantations; some of the sorts will rise to a very considerable height, so may prove to be useful timber, and may be adapted to such soils as will not suit many other trees.

The common Savin should not be neglected, because it is so very hardy as never to be injured by the severest frost; and as this spreads its branches near the ground, so if the plants are placed on the borders of woods, they will have a good effect in winter, by screening the nakedness of the ground from sight.

All these sorts are propagated by their seeds, which may be sown in the same way as the common Juniper, and the plants afterward so managed; and most of the sorts may be propagated by cuttings, which, if planted in autumn in a shady border will take root; but those plants which are raised from cuttings will never grow so upright, nor to so large a size as the plants which are raised from seeds; so that when these can be procured, it is much the better method, but the other is frequently practised on those sorts which do not perfect their seeds in England.

As several of these sorts grow to the height of eighteen or twenty feet, the procuring as many of the sorts as can be gotten from the countries of their growth, will be adding to the variety of our Evergreen plantations, which cannot be too much propagated in England, where, in general, our winters are temperate enough for them to thrive to advantage; and as the sorts which are a little more tender than the others obtain strength, they will be in less danger of suffering by severe winters, as we find by many other plants, which were so tender as not to live in the open air at first, but now defy the severest cold of our climate.

JUSSIÆA. Lin. Gen. Plant. 478.

The CHARACTERS are,

*It hath a small permanent empalement, divided into five segments at the top, sitting upon the germen. The flower has five roundish spreading petals, and ten short slender stamina, terminated by roundish summits. The oblong germen supports a slender style, crowned by a flat stigma, marked with five stripes. The germen afterward becomes a thick oblong capsule, crowned by the empalement, which opens lengthways, and is filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, which includes the plants whose flowers have ten stamina and one style.

The SPECIES are,

1. JUSSIÆA (*Suffruticosa*) erecta villosa, floribus tetrapetalis, decandriis sessilibus. Lin. Sp. Plant. 555. *Upright hairy Jussiæa, with flowers sitting close to the stalks, having four petals and ten stamina.* Lysimachia Indica non papposa, flore luteo minimo, siliquis caryophyllum aromaticum æmulantibus. H. L. 396. *Indian Primrose with a very small yellow flower, and pods resembling Cloves.*
2. JUSSIÆA (*Pubescens*) villosa, caule erecto ramoso, floribus pentapetalis, decandriis sessilibus. *Hairy Jussiæa with an erect branching stalk, flowers having five petals, and ten stamina which sit close to the stalk.* Lysimachia lutea erecta, non papposa major, foliis hirsutis, fructu caryophylloide. Sloan. Cat. Jam. 85. *Yellow upright larger Tree-Primrose with hairy leaves, and a fruit like Cloves.*
3. JUSSIÆA (*Erecta*) erecta glabra, floribus tetrapetalis octandris sessilibus. Flor. Zeyl. 170. *Smooth upright Jussiæa with four petals, and eight stamina to the flowers, which sit close to the stalk.* Lysimachia lutea non papposa, erecta, foliis glabris, fructu caryophylloide. Sloan. Cat. Jam. 85. *Yellow upright Tree-Primrose with smooth leaves, and a fruit like Cloves.*
4. JUSSIÆA (*Onagra*) caule erecta ramoso glabro, floribus tetrapetalis octandris sessilibus, foliis lanceolatis. *Jussiæa with an upright, branching, smooth stalk, flowers having four petals, and eight stamina sitting close to the stalk, and spear-shaped leaves.* Onagra foliis persicariæ amplioribus, parvo flore luteo. Plum. Cat. 7. *Tree-Primrose with a large Arsesmart leaf, and a small yellow flower.*
5. JUSSIÆA (*Hirsuta*) caule erecto simplici hirsuto, foliis lanceolatis, floribus pentapetalis decandris sessilibus. *Jussiæa with a single, upright, hairy stalk, spear-shaped leaves, and flowers which have five petals, and ten stamina sitting close to the stalk.* Onagra erecta, caule rubro hirsuto, foliis oblongis, flore magno luteo. Houst. MSS. *Upright Primrose with a hairy leaf of a reddish colour, oblong leaves, and a large yellow flower.*

The first sort grows naturally at Campeachy, from whence the seeds were sent me by the late Mr. Robert Millar; this rises with a shrubby stalk near three feet high, sending out several side branches, which are garnished with oblong hairy leaves placed alternate. The flowers come out from the side of the stalks singly, having short foot-stalks; they have four small yellow petals with eight stamina; these sit upon the germen, which afterward becomes an oblong seed-vessel, crowned by the four-leaved empalement, and has a great resemblance

ſemblance to Cloves. This plant flowers in July and Auguſt, and the ſeeds ripen in October.

The ſecond ſort grows naturally in Jamaica. The ſeeds of this were ſent me by the late Dr. Houſtoun; this riſes with a hairy branching ſtalk two feet high, and is garniſhed with narrow ſpear-ſhaped leaves, placed alternate. The flowers come out toward the end of the branches ſingly from the wings of the leaves, ſitting cloſe to the ſtalk; they are compoſed of five pretty large yellow petals, and ten ſtamina; theſe ſit upon a long germen, which afterward becomes the ſeed-veſſel, crowned by the empalement; theſe are filled with ſmall ſeeds. It flowers and ſeeds about the ſame time with the laſt.

The third ſort grows naturally in Jamaica, from whence the ſeeds were ſent me with thoſe of the former ſort; this riſes with a ſmooth erect ſtalk three feet high, garniſhed with long, narrow, ſmooth, ſpear-ſhaped leaves. The flowers are large and yellow, ſitting cloſe to the ſtalk; theſe are ſucceeded by long ſeed-veſſels, ſhaped like thoſe of the other ſorts. It flowers and ſeeds at the ſame time with the former.

The fourth ſort was ſent me from Carthagena by the late Dr. Houſtoun; this hath a branching ſmooth ſtalk near three feet high, garniſhed with ſpear-ſhaped leaves, ſtanding upon ſhort foot-ſtalks. The flowers are ſmall, yellow, and are compoſed of four petals and eight ſtamina; theſe ſit very cloſe to the ſtalk, and are ſucceeded by ſeed-veſſels, ſhaped like thoſe of the former ſorts.

The fifth ſort was ſent me from La Vera Cruz, by the late Dr. Houſtoun; this riſes with ſingle upright red ſtalks three feet high, which are hairy and channelled. The leaves are ſpear-ſhaped, and placed alternate on the ſtalks, ſtanding nearer together than in any of the other ſorts. The flowers come out from the wings of the leaves, toward the top of the ſtalk; they are compoſed of five large yellow petals, and ten ſtamina ſitting cloſe to the ſtalks, and are ſucceeded by ſeed-veſſels which are one inch long, and ſhaped like thoſe of the former ſorts.

The firſt, ſecond, and fourth ſorts are annual plants, at leaſt they are ſo in England; for if the plants are raiſed early in the ſpring, they will flower in July, and ripen their ſeed the beginning of October; and thoſe plants which are raiſed later in the ſpring, cannot be preſerved through the winter, though they are placed in a warm ſtove; nor do their ſtalks ever grow ligneous, or ſhew any ſigns of their being perennial in their native country.

The third and fifth ſorts have continued through the winter in the bark-ſtove, but thoſe have been ſuch plants as did not flower and ſeed the firſt year; for after they had perfected ſeeds, the following ſummer the plants decayed.

All theſe ſorts are propagated by ſeeds, which ſhould be ſown early in the ſpring, in pots filled with a ſoft loamy ſoil, and plunged into a moderate hot-bed; but as theſe ſeeds often lie a whole year in the ground before they vegetate, the earth muſt be kept moiſt, and the glaſſes of the hot-bed ſhaded in the heat of the day, by this method the ſeeds may be brought ſoon to vegetate; when the plants come up, and are fit to remove, they ſhould be each planted into a ſmall ſeparate pot, filled with light loamy earth, and plunged into a hot-bed of tanners bark, where they ſhould be ſhaded from the ſun till they have taken new root; after which they ſhould have free air admitted to them every day, in proportion to the warmth of the ſeaſon; they muſt alſo be frequently refreſhed with water, but it muſt not be given to them in too great plenty: when the roots of the plants have filled theſe ſmall pots, the plants ſhould be removed into others a ſize larger; and if the plants are too tall to ſtand under the frames of the hot-bed, they ſhould be removed into the bark-ſtove, where they may remain to flower and perfect their ſeeds; for when the plants riſe early in the ſpring, and are brought forward in hot-beds, all the ſorts will flower and perfect their ſeeds the ſame year, which is better than to have them to keep through the winter.

JUSTICIA. Houſt. Nov. Gen. Lin. Gen. Plant. 27. Adhatoda. Tourn. Inſt. R. H. 175. tab. 79. This plant was ſo named by the late Dr. Houſtoun, in honour of James Juſtice, Eſq; a great lover and encourager of gardening and botany.

The Characters are,

*The empalement of the flower is ſmall, and divided into five acute ſegments at the top. The flower hath one petal, which is divided into two lips almoſt to the bottom, which are entire. The upper lip is raiſed archways, and the under is reflexed. It hath two awl-ſhaped ſtamina ſituated under the upper lip, terminated by erect ſummits which are bifid at their baſe. It hath an oblong germen, ſupporting a ſlender ſtyle which is longer than the petal, crowned by a ſingle ſtigma. The germen afterward becomes an oblong capſule with two cells, divided by a partition, which is contrary to the two valves, which open with an elaſticity, and caſt out the roundiſh ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's ſecond claſs, intitled Diandria Monogynia, which includes thoſe plants whoſe flowers have two ſtamina and one ſtyle. To this genus of Dr. Houſtoun's is joined the Adhatoda of Tournefort, but there is a diſtinction in their flowers; the two lips of Juſticia are entire, but the upper lip of Adhatoda is indented at the end, and the under is divided into three parts; and in the capſule of Juſticia there are ſeldom more than two ſeeds, but in Adhatoda ſeveral.

The Species are,

1. Justicia (*Scorpioides*) foliis oblongo-ovatis hirſutis, ſeſſilibus, floribus ſpicatis alaribus, caule fruticoſo. *Juſticia with oblong, oval, hairy leaves ſitting cloſe to the ſtalks, and flowers growing in ſpikes proceeding from the ſide of the ſtalks, which are ſhrubby.* Juſticia fruteſcens, floribus ſpicatis majoribus, uno verſu diſpoſitis. Houſt. MSS. *Shrubby Juſticia with larger flowers growing in ſpikes, which are ranged on one ſide.*
2. Justicia (*Sexangularis*) caule erecto ramoſo hexangulari, foliis ovatis oppoſitis, bracteis cuneiformibus confertis. *Juſticia with an erect branching ſtalk, having ſix angles, oval leaves placed oppoſite, and wedge-ſhaped ſmall leaves (or bracteæ) growing in cluſters.* Juſticia annua hexangulari caule, foliis Circææ conjugatis, flore miniato. Houſt. MSS. *Annual Juſticia with an hexangular ſtalk, Enchanters Nightſhade leaves ſet by pairs, and a carmine flower.*
3. Justicia (*Fruticoſa*) foliis ovato-lanceolatis, pediculatis, hirſutis, bracteis cordatis acuminatis, caule fruticoſo. *Juſticia with oval ſpear-ſhaped leaves growing on foot-ſtalks, heart-ſhaped acute-pointed bracteæ, and a ſhrubby ſtalk.* Juſticia fruteſcens & hirſuta, foliis oblongis pediculis longiſſimis, flore rubro. Houſt. MSS. *Shrubby and hairy Juſticia with oblong leaves growing on very long foot-ſtalks, and a red flower.*
4. Justicia (*Adhatoda*) arborea, foliis lanceolato-ovatis, bracteis ovatis perſiſtentibus, corollarum galeâ concavâ. Flor. Zeyl. 16. *Tree-Juſticia with oval ſpear-ſhaped leaves, oval permanent bracteæ, and a concave helmet to the flower.* Adhatoda Zeylanenſium. H. L. 642. *Adhatoda of Ceylon, commonly called Malabar Nut.*
5. Justicia (*Hyſſopifolia*) fruticoſa, foliis lanceolatis integerrimis, pedunculis trifloris ancipitibus, bracteis calyce brevioribus. Lin. Sp. Plant. 15. *Shrubby Juſticia with entire ſpear-ſhaped leaves, foot-ſtalks having three flowers placed different ways, and a bractea ſhorter than the empalement.* Adhatoda Indica, folio ſaligno, flore albo. Boerh. Ind. alt. 1. 239. *Indian Adhatoda with a Willow leaf and white flower, commonly called Snap-tree.*
6. Justicia (*Spinoſa*) ſpinoſa, foliis oblongo-ovatis emarginatis, caule fruticoſo ramoſo. *Prickly Juſticia with oblong oval leaves indented at their edges, and a ſhrubby branching ſtalk.* Adhatoda Antegoana, Lycii facie, ſpinoſa. Petiv. *Prickly Adhatoda of Antigua, with the appearance of Boxthorn.*
7. Justicia (*Arborea*) arborea, foliis lanceolato-ovatis ſeſſilibus, ſubtus tomentoſis, floribus ſpicatis congeſtis terminalibus. *Tree-Juſticia with ſpear-ſhaped oval leaves,*

*woolly on their under side, sitting close to the stalks, with spikes of flowers growing in clusters at the ends of the branches.* Adhatoda arborea, foliis oblongis, subtus villosis, floribus spicatis albis. Houst. *Tree-Adhatoda with oblong leaves, hairy on their under side, and spikes of white flowers.*

8. Justicia (*Ecbolium*) arborea, foliis lanceolato ovatis, bracteis ovatis deciduis mucronatis, corollarum galeâ reflexâ. Flor. Zeyl. 17. *Tree-Justicia with spear-shaped oval leaves, oval-pointed bracteæ which fall off, and a reflexed helmet to the flowers.* Adhatoda spicâ longissimâ, flore reflexo. Burman. Zeyl. 7. tab. 4. f. 1. *Adhatoda with a very long spike, and a reflexed flower.*

The first sort was discovered growing naturally at La Vera Cruz, by the late Dr. Houstoun, who sent the seeds to England; this rises with a shrubby brittle stalk five or six feet high, sending out many branches, which are garnished with oblong oval leaves, two inches long, and one inch broad, which are hairy and placed opposite; from the wings of the leaves come out the spikes of flowers, which are reflexed like a scorpion's tail. The flowers are large, of a carmine colour, and ranged on one side of the spike; these are succeeded by short pods about half an inch long.

The second sort was discovered by the same gentleman, in the same country; this is an annual plant with an upright stalk, having six angles, which rises two or three feet high, dividing into many branches, garnished with oval leaves placed opposite, an inch and a half long, and one inch broad; they are smooth, as are also the stalks. At each joint come out clusters of small wedge-shaped leaves, which are, by Dr. Linnæus termed bracteæ, and long before the stalks decay, most of the larger leaves fall off, so there are only these small leaves remaining. The flowers are produced in small spikes at the side of the branches, sitting very close among the leaves; they are of a beautiful carmine colour, and have but one petal, which has two lips. The upper lip is arched, bending over the lower, which is also a little reflexed, but both are entire. The flowers are succeeded by short wedge-shaped capsules, opening lengthways, inclosing two small oval seeds.

The third sort was discovered by the same gentleman at Campeachy; this rises with a hairy shrubby stalk four or five feet high, dividing into several branches, garnished with oval, spear-shaped, hairy leaves, four inches long, and two inches and a half broad, standing upon foot-stalks which are above an inch long, placed opposite. At the base of the foot-stalks come out a cluster of small heart-shaped leaves, ending in acute points, which are termed bracteæ. The flowers come out in loose clusters from the wings of the stalks, toward the end of the branches; they are of a pale red colour, and shaped like those of the former sort.

These plants are propagated by seeds, which should be sown early in the spring, in small pots filled with fresh light earth, and plunged into a moderate hot-bed of tanners bark, observing to water the earth gently as it appears dry. The seeds of these plants frequently lie a year in the ground, so that the pots must not be disturbed, if the plants do not come up the same year; but in the winter should be kept in the stove, and the spring following plunged into a fresh hot-bed, which will bring up the plants if the seeds were good. When the plants begin to appear, the glasses of the hot-bed should be raised every day, when the weather is warm, to admit fresh air to them. The plants must also be frequently watered in warm weather; but water should not be given in large quantities while the plants are young, because they are then very tender, and subject to rot at the bottom of their stems, with much moisture.

When the plants are about two inches high, they should be carefully taken up, and each transplanted into a separate small pot filled with fresh light earth, and then plunged into the hot-bed again, being careful to water and shade them until they have taken new root; after which time they should have air admitted to them every day, in proportion to the warmth of the season, and should be duly watered every two or three days in hot weather.

As the plants advance in their growth, they should be shifted into larger pots, for if their roots are too much confined, the plants will not make any considerable progress; but they should not be over potted, for that will be of worse consequence than the other; because when they are planted in very large pots, they will starve and decay, without producing any flowers. They are too tender to endure the open air in this country, therefore they should always remain in the hot-bed, being careful to let them have a due proportion of air in hot weather; and the annual sort should be brought forward as fast as possible in the spring, that the plants may flower early, otherwise they will not produce good seeds in England.

The first and third sorts should remain in the hot-bed during the summer season (provided there is room under the glasses, without being scorched;) but at Michaelmas they should be removed into the stove, and plunged into the bark-bed, where they must remain during the winter season, observing to keep them warm, as also to water them gently once or twice a week, according as they shall require. The following summer these plants will flower, and abide several years, but they rarely produce good seeds in Europe.

The fourth sort grows naturally in the island of Ceylon, but has been long in the English gardens, where it is commonly known at present by the title of Malabar Nut; but was formerly called Beetle Nut, and was by some supposed to be the tree of which the Chinese chew the leaves and nuts: this, though a native of so warm a country, is hardy enough to live in a good green-house in England, without any artificial heat. It rises here with a strong woody stalk to the height of twelve or fourteen feet, sending out many spreading branches, which are garnished with spear-shaped oval leaves more than six inches long, and three inches broad, placed opposite. The flowers are produced on short spikes at the end of the branches, which are white, with some dark spots; these appear in July, but are not succeeded by any seeds in England.

This sort may be propagated by cuttings, which, if planted in pots in June or July, and plunged into a very moderate hot-bed, will take root; but they must be every day screened from the sun, and if the external air is excluded from them, they will succeed better than when it is admitted to them. It may also be propagated by laying down their young branches, which will take root in the tubs or pots in one year; then the young plants should be put each into a separate pot, filled with soft loamy earth, and placed in the shade till they have taken new root, when they may be placed in a sheltered situation during the summer, but in winter they must be housed, and treated in the same way as Orange-trees, with only this difference, that these require more water.

The fifth sort grows naturally in India; this rises with a shrubby stalk from three to four feet high, sending out branches on every side from the bottom, so as to form a kind of pyramid; these are covered with a white bark, and garnished with spear-shaped entire leaves, near two inches long, and one third of an inch broad; they are smooth, stiff, and of a deep green, standing opposite. At the base of the foot-stalks come out clusters of smaller leaves, of the same shape and texture. The flowers come out upon short foot-stalks from the side of the branches, each foot-stalk supporting one or two white flowers, having long empalements; these are succeeded by oblong seed-vessels, which, when ripe, cast out their seeds with an elasticity, from whence it had the title of Snap-tree.

This is propagated by cuttings during any of the summer months; they should be planted in pots filled with light loamy earth, and plunged into a moderate hot-bed, and shaded from the sun, and now and then gently refreshed with water, and not too much air admitted to them. In about two months the cuttings will have taken root, then they must be gradually

inured to bear the open air, into which they ſhould be removed, placing them in a ſheltered ſituation, where they may ſtay till autumn; but if they get root pretty early in the ſummer, it will be proper to ſeparate them each into a ſingle ſmall pot, ſetting them in the ſhade till they have taken new root, after which they may be placed as before directed; but when it is late in the ſeaſon before they take root, it will be better to let them remain in the ſame pots till the following ſpring. In winter theſe plants muſt be placed in a warm green-houſe, or in a moderately warm ſtove, for they are impatient of cold and damp, nor will they thrive in too much warmth; they will often require water in winter, but during that ſeaſon it muſt be given them moderately; in ſummer they muſt be removed into the open air, but ſhould have a warm ſheltered ſituation, and in warm weather they muſt have plenty of water. This plant flowers at different ſeaſons, but never produces fruit here.

The ſixth ſort grows naturally in Jamaica, from whence the late Dr. Houſtoun ſent it to England; this riſes with many ſhrubby ſlender ſtalks about five feet high, ſending out branches on every ſide from the root upward, which grow erect, and are covered with a whitiſh bark, garniſhed with ſmall, oblong, oval leaves, coming out on each ſide the ſtalk oppoſite, and under the leaves are placed at every joint two ſharp thorns like thoſe of the Berberry; the flowers come out ſingly from the wings of the leaves, they are ſmall, and of a pale red colour, ſhaped like thoſe of the other ſorts.

The ſeventh ſort was found by the late Dr. Houſtoun, growing naturally at Campeachy. This riſes with a ſtrong woody ſtem twenty feet high, dividing into many crooked irregular branches, covered with a light brown bark, garniſhed with ſpear-ſhaped oval leaves, near four inches long and two broad, which are covered with a ſoft down on their under ſide. The flowers grow in ſpikes from the end of the branches, three, four, or five of theſe ſpikes ariſing from the ſame point, the middle ſpike being near three inches long, and the others about half that length. The flowers are ſmall and white, but ſhaped like thoſe of the other ſpecies.

The eighth ſort grows naturally at Malabar and in Ceylon; this riſes in its native ſoil with a ſtrong woody ſtem ten or twelve feet high, dividing into many branches, which are garniſhed with ſpear-ſhaped oval leaves five inches long, and two and a half broad, of a lucid green, placed oppoſite. The flowers grow in very long ſpikes from the end of the branches, they are of a greeniſh colour with a ſhade of blue; the helmet of the flower is reflexed.

Theſe three ſorts are propagated by ſeeds in the ſame manner as the three firſt, and the plants muſt be treated in the ſame way, eſpecially while they are young; but afterward the eighth ſort may be more hardily treated, when they have gotten ſtrength. This ſort may alſo be propagated by cuttings, in the ſame manner as the fifth ſort; and when the plants are two or three years old, they will thrive in a moderate degree of warmth in winter, and in the ſummer they may be placed abroad for two months in the warmeſt ſeaſon of the year; but they ſhould have a warm ſheltered ſituation, and when the nights begin to grow cold, they muſt be removed into the ſtove, but they muſt have free air admitted to them at all times when the weather is warm. The other two ſorts ſhould conſtantly remain in the bark-ſtove, and require the ſame treatment as other tender plants from the warmeſt countries.

IXIA. Lin. Gen. Plant. 54. Siſyrinchium. Com. Hort. Amſt.

The Characters are,

*It hath oblong permanent ſpathæ (or ſheaths) which incloſe the germen; the flower has ſix oblong ſpear-ſhaped petals which are equal; and three awl-ſhaped ſtamina which are ſhorter than the petals, ſituated at equal diſtances, terminated by ſingle ſummits. It hath an oval three-cornered germen ſituated below the flower, ſupporting a ſingle ſtyle which is the length of the ſtamina, crowned by a thick trifid ſtigma; the germen afterward becomes an oval three-cornered capſule with three cells, filled with roundiſh ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's third claſs, intitled Triandria Monogynia, which includes thoſe plants whoſe flowers have three ſtamina and one ſtyle.

The Species are,

1. Ixia (*Chinenſis*) foliis enſiformibus, floribus remotis panicula dichotoma, floribus pedunculatis. Hort. Upſal. 16. *Ixia with ſword-ſhaped leaves, and flowers ſtanding remote in forked panicles upon foot-ſtalks.* Bermudiana iridis folio majori flore croceo, eleganter punctato. Krauſ. Hort. 25. tab. 25. *Bermudiana with a larger Iris leaf, and a Saffron-coloured flower, which is beautifully ſpotted.*
2. Ixia (*Africana*) floribus capitatis, ſpathis laceris. Lin. Sp. Plant. 36. *Ixia with flowers growing in heads, having ragged ſheaths.* Bermudiana Capenſis, capitulis lanuginoſis. Pet. Hort. Sicc. 242. *Bermudiana from the Cape of Good Hope, with woolly heads.*
3. Ixia (*Scillariis*) foliis gladiolatis, nervoſis, hirſutis, floribus ſpicatis terminalibus. Icon. tab. 155. fig. 1. *Ixia with ſword-ſhaped, hairy, veined leaves, and flowers growing in ſpikes at the ends of the ſtalks.*
4. Ixia (*Polyſtacia*) foliis lineari-gladiolatis, floribus alaribus & terminalibus. Icon. tab. 155. fig. 2. *Ixia with narrow ſword-ſhaped leaves, and flowers proceeding from the ſides and tops of the ſtalk.*
5. Ixia (*Crocata*) foliis gladiolatis glabris, floribus corymboſis terminalibus. Icon. tab. 156. *Ixia with ſmooth ſpear-ſhaped leaves, and flowers growing in a corymbus terminating the ſtalk.* Siſyrinchium Africanum majus, flore luteo maculâ notato. Olden. *Greater African Siſyrinchium with a yellow ſpotted flower.*
6. Ixia (*Bulbifera*) foliis lineari-gladiolatis, floribus alternis, caule bulbifero. *Ixia with narrow ſword-ſhaped leaves, flowers placed alternate, and ſtalks bearing bulbs.*
7. Ixia (*Sparſa*) foliis gladiolatis, floribus diſtantibus. *Ixia with ſword-ſhaped leaves, and flowers growing diſtant.*
8. Ixia (*Flexuoſa*) foliis lineari-gladiolatis, floribus ſpicatis ſeſſilibus terminalibus. *Ixia with narrow ſword-ſhaped leaves, and ſeſſile flowers growing in ſpikes at the top of the ſtalk.*

The firſt ſort grows naturally in India, where the ſtalks riſe to the height of five or ſix feet, but in England they are ſeldom more than half that height. It hath a pretty thick fleſhy root, divided in knots or joints of a yellowiſh colour, ſending out many fibres; the ſtalk is pretty thick, ſmooth, and jointed, garniſhed with ſword-ſhaped leaves a foot long and one inch broad, with ſeveral longitudinal furrows embracing the ſtalks with their baſe, ending in acute points; the upper part of the ſtalk divaricates into two ſmaller, with a foot-ſtalk ariſing between them, which ſupports one flower; the ſmaller branches divaricate again in the ſame manner into foot-ſtalks, which are two inches long, each ſuſtaining one flower. At each of theſe joints is a ſpatha or ſheath embracing the ſtalk, which at the lower joints are three inches long, but the upper are not more than one inch, ending in acute points which are permanent; the flowers are compoſed of ſix equal petals, of a yellow colour within, and variegated with dark red ſpots; the outſide is of an Orange colour. Theſe appear in July and Auguſt, and in warm ſeaſons are ſucceede by ſeeds.

This ſort may be propagated either by ſeeds or parting of the roots: if by ſeeds they ſhould be ſown in pots, and plunged into a moderate hot-bed, which will bring up the plants much ſooner than when they are ſown in the full ground; when the plants are fit to remove, they ſhould be each planted in a ſmall ſeparate pot filled with light earth, and if they are placed under a frame till they have taken good root in the pots, it will greatly forward their growth; afterward they may be placed in the open air in a ſheltered ſituation, where they may remain till the autumn, when they

they must be placed under a frame to screen them from frost; and in the spring most of the plants may be turned out of the pots and planted in a warm border, where they will abide through the common winters very well, but in severe frosts they are often killed, unless they are covered with tan, or other covering to keep out the frost; therefore a few of the plants may be kept in pots, and sheltered under a frame in winter.

The stalks and leaves of this plant decay to the root in autumn, so that if the surface of the ground about the roots is covered two or three inches thick with tan, it will secure them from the danger of frost; and in the spring, before the roots shoot, will be the best time to remove and part the roots; but this should not be done oftener than every third year, for when they are often parted they will be weak, and will not flower so well.

The second sort grows naturally at the Cape of Good Hope; this is a low plant, which rarely rises more than three or four inches high; the leaves are narrow and veined, the flowers are small, growing in a downy head on the top of the stalk, but they make little appearance, so are only kept for the sake of variety.

The third sort I raised from seeds, which were sent me from the Cape of Good Hope. This hath a round bulbous root a little compressed, covered with a red skin, from which arise five or six sword-shaped leaves about three or four inches long, hairy, and with several longitutinal furrows; these embrace each other at their base, but spread asunder at the top; between these come out the flower-stalk, which rises six or eight inches high, is naked to the top, and terminated by a cluster of flowers, each having a spatha or hood, which dries and is permanent; the flowers are of a deep blue colour, and appear in May; these are succeeded by roundish three-cornered seed-vessels with three cells, filled with roundish seeds which ripen in July, then the leaves and stalks decay.

The fourth sort was raised from seeds in the Chelsea garden, which came with those of the former sort. This hath a small round bulbous root, from which arise four or five narrow, long, sword-shaped leaves, six or seven inches long; between these come out a very slender round stalk about ten inches long, from the side of which there comes out one or two clusters of flowers, standing upon short foot-stalks, and at the top of the stalk the flowers grow in a loose spike; they are of a pure white, and shaped like those of the other species. These appear in May, and the seeds ripen in July.

The seeds of the fifth sort were sent me from the Cape of Good Hope; this has an oval bulbous root which is a little compressed, from which come up three or four narrow, thin, sword-shaped leaves, near a foot long; the flower-stalk rises a little above the leaves, it is very slender, naked, and terminated by a round cluster of flowers, each having a spatha or hood; they are composed of six pretty large oblong petals which are concave, and of a deep yellow colour, each having a large black spot at the base. This flowers early in May, and the seeds ripen the latter end of June.

The sixth sort hath narrow spear-shaped leaves about six or seven inches long; the stalk rises near a foot and a half high, garnished with one leaf at each of the lower joints, of the same shape with the other, but smaller; these embrace the stalk with their base, and stand erect; the upper part of the stalk is adorned with flowers, composed of six oblong oval petals of a sulphur colour, which are placed alternate on the stalk, which is bent at each joint where the flowers stand; the flowers have three short stamina which are joined at their base, terminated by long, flat, erect summits; the germen is situated under the flower, supporting a long slender style, crowned by a trifid stigma; the germen afterward becomes a roundish capsule with three cells, filled with roundish small seeds. The stalks at each of the lower joints thrust out small bulbs, which, if planted, will grow and produce flowers.

The seventh sort hath shorter and broader leaves than the former; the stalk is slender and furrowed, and at each of the lower joints is garnished with one leaf of the same shape, embracing the stalk with their base; the flowers come out toward the top of the stalk, at two or three inches distance, each stalk supporting two or three sulphur-coloured flowers, which are each composed of six spear-shaped petals an inch and a half long, equal in their size and regular in position; they have a short permanent empalement, cut into two long and two shorter acute segments; these are succeeded by round capsules with three cells, filled with round seeds. This sort flowers in March, and the seeds ripen about two months after.

The eighth sort hath very small, round, bulbous roots, from which arise three or four long, slender, Grass-like leaves, of a dark green colour; between these come out the stalk, which is very slender and round, rising a foot and a half high; at the top the flowers are collected in a spike sitting close to the stalk, each having a thin, dry, permanent spatha or sheath, which covers the capsule after the flower is fallen. The flowers are of a pure white, and shaped like those of the other species, but are smaller; they are succeeded by small round seed-vessels with three cells, each containing two or three round seeds. It flowers the latter end of May, and the seeds ripen in July.

There are some other varieties of this genus, which have flowered in the Chelsea garden, differing only in the colour of their flowers, so are not supposed to be distinct species; one of which is purple on the outside, and white within; another has white flowers, with a blue stripe on the outside of each petal, and a third has white flowers with yellow bottoms. These have already flowered in the Chelsea garden, where there are many more, which have been since raised from seeds, whose flowers have not as yet appeared; and at the Cape of Good Hope, where these plants grow naturally, there are more than thirty varieties mentioned in a catalogue of Dr. Herman's. The roots of most, if not all these sorts, are frequently eaten by the inhabitants at the Cape of Good Hope, who greatly esteem them.

All the sorts multiply very fast by offsets, so that when once obtained, there will be no occasion to raise them from seeds; for the roots put out offsets in great plenty, most of which will flower the following season, whereas those from seeds are three or four years before they flower. These plants will not live through the winter in the full ground in England, so should be planted in small pots filled with light earth, and placed under a frame in winter, where they may be protected from frost, but in mild weather should enjoy the free air; but during the winter they must be guarded from mice, who are very fond of these roots, and if not prevented will devour them.

IXORA. Lin. Gen. 131. Jasminum. Burman.

The Characters are,

*It hath a small permanent empalement cut into four segments; the flower has one funnel-shaped petal, having a slender tube, cut into four segments at the top. It hath four short stamina situated in the divisions of the petal, terminated by oblong summits, and a roundish germen situated at the bottom of the involucrum, supporting a slender style the length of the tube, crowned by a bifid stigma; the germen afterward becomes a berry with two cells, containing two convex angular seeds.*

This genus of plants is ranged in the first order of Linnæus's fourth class, intitled Tetrandria Monogynia, the flowers having four stamina and one style.

The Species are,

1. Ixora (*Coccinea*) foliis ovatis semiamplexicaulibus, floribus fasciculatis. Flor. Zeyl. 22. *Ixora with oval leaves half embracing the stalks, and flowers growing in bunches.* Jasminum Indicum lauri folio, inodorum umbellatum, floribus coccineis. Pluk. Phyt. tab. 59. f. 2.

2. Ixora

Ixora (*Alba*) foliis ovato-lanceolatis, floribus fasciculatis. Lin. Sp. 160. *Ixora with oval spear-shaped leaves, and flowers growing in bunches.* Jasminum Indicum, lauri folio, inodorum, floribus albicantibus & schetti album. Pluk. Phyt. 109. f. 2.

3. Ixora (*Americana*) foliis ternis lanceolato-ovatis, floribus thyrsoideis. Amœn. Acad. 5. p. 393. *Ixora with oval spear-shaped leaves placed by threes, and flowers in a loose spike.* Pavetta foliis oblongo-ovatis oppositis, stipulis setaceis. Brown. Jam. tab. 6. f. 2.

The first sort grows naturally in India, where it rises with a woody stalk five or six feet high, sending out many slender branches covered with a brown bark, garnished with oval leaves, placed sometimes opposite, and at others there are three or four at each joint. The flowers terminate the branches in clusters; they have very long slender tubes, are cut into four oval segments at the top, and are of a deep red colour.

The second sort grows also in India; this hath a woody stalk rising six or seven feet high, sending out weak branches, garnished with oval spear-shaped leaves placed opposite, sitting close to the branch; the flowers terminate the branches in small clusters; they have long slender tubes, divided into four segments at the top, and are white, without scent.

The third sort grows naturally in Jamaica, and some other islands in the West-Indies, where it is called Wild Jasmine. This rises with a shrubby stalk four or five feet high, sending out slender branches opposite, which are garnished with oval spear-shaped leaves placed opposite, which are six inches long, and two inches and a half broad, having short foot-stalks; the flowers are produced at the end of the branches in a loose spike, they are white, and have a scent like Jasmine.

These plants are propagated by seeds, when they can be procured from the countries where they grow naturally, for they do not perfect any seeds in England. They should be sown in small pots as soon as they arrive, and plunged into a hot-bed; if they arrive in autumn or winter, the pots may be plunged in the tan-bed in the stove, between the other pots of plants, so will take up little room; but when they arrive in the spring, it will be best to plunge them in a tan-bed under frames; the seeds will sometimes come up in about six weeks, if they are quite fresh; otherwise they will lie in the ground four or five months, and sometimes a whole year, therefore the earth should not be thrown out of the pots till there is no hopes of their growing; when the plants come up, and are fit to remove, they should be each planted in a separate small pot, filled with light earth, and afterward treated in the manner directed for the Coffee-tree.

They may also be increased by cuttings during the summer months, and planted in small pots plunged into a moderate hot-bed, covering them close either with bell or hand-glasses to exclude the external air, shading them carefully from the sun during the heat of the day, until they have put out good roots, when they should be parted, and each put into a separate pot, treating them as the seedling plants.

# K.



KALI. See Salsola.

KALMIA. Lin. Gen. Plant. 482. Chamærhododendros. Tourn. Inst. R. H. 604. tab. 373.

The Characters are,

*The flower has a small permanent empalement cut into five parts, and one petal cut into five segments, which spread open and are roundish. It hath ten stamina the length of the petal, which decline in the middle, terminated by oval summits. In the center is situated a roundish germen, supporting a slender style as long as the petal, crowned by an obtuse stigma. The germen afterward becomes an oval or globular capsule with five cells, filled with very small seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, which includes those plants whose flowers have ten stamina and one style.

The Species are,

1. Kalmia (*Latifolia*) foliis ovatis, corymbis terminalibus. Amœn. Acad. 3. p. 19. *Kalmia with oval leaves, and flowers growing in bunches terminating the branches.* Chamædaphne foliis tini, floribus bullatis umbellatis. Catesb. Carol. 2. p. 98. tab. 98. *Dwarf Laurel with a Tinus leaf, and studded flowers growing in umbels, commonly called Ivy-tree in America.*

2. Kalmia (*Angustifolia*) foliis lanceolatis corymbus lateralibus. Lin. Gen. Nov. 1079. *Kalmia with spear-shaped leaves, and flowers growing in round bunches on the sides of the stalk.* Chamædaphne sempervirens, foliis oblongis angustis, foliorum fasciculis oppositis. Catesb. Carol. 3. p. 17. *Evergreen Dwarf Laurel, with oblong narrow leaves growing in bunches, which are placed opposite.*

The first sort grows naturally upon rocks and in barren soils in Virginia and Pensylvania, where it rises with a branching stalk to the height of ten or twelve feet, garnished with very stiff leaves, which are two inches long and one broad, of a lucid green on their upper side, but of a pale green on their under; they have short foot-stalks, and stand without order round the branches; between these the buds are formed for the next year's flowers, at the extremity of the branches; these buds swell during the autumn and spring months, till the beginning of June, when the flowers burst out from their empalements, forming a round bunch (or corymbus) sitting very close to the branch; they are of a pale blush colour, the outside of the petal is of a Peach colour. The flower has but one petal, whose base is tubulous, but is cut into five roundish segments, studded with purple spots, which are prominent; after the flowers are past, the germen in the center becomes an oval capsule, crowned by the permanent style, having five cells, which are full of very small seeds. This shrub in its native soil continues flowering great part of the summer, and is one of the greatest ornaments to the country; but as yet it is not so well naturalized to our climate as could be wished, though the plants are not injured by the cold, and some of them have flowered several years past in the Chelsea garden.

In

In the country where this shrub grows naturally, it sends out plenty of suckers from the roots, so that they form thickets which are almost impassable; but here they have not as yet produced any suckers, nor do the seeds come to maturity, so that the plants are not very common in England; for the seeds which are sent from America lie in the ground a whole year before the plants appear, and afterward they make very slow progress, which has discouraged most people from attempting to raise the plants in that method. The only person who has succeeded well in the raising of these, is Mr. James Gordon of Mile End, who has a good number of the plants which have arisen from seeds.

The second sort is a native of the same country with the first, where it rises from three to six feet high, dividing into small ligneous branches which are very close, covered with a dark gray bark, garnished with stiff leaves about two inches long and half an inch broad, of a lucid green, placed without order upon the branches, standing upon slender foot-stalks; the flowers grow in loose bunches on the side of the branches, upon slender foot-stalks; they are of one petal, having a short tube, but spread open at the top, where they are cut into five angles: the flowers are of a bright red colour when they first open, but afterward fade to a blush or Peach bloom colour; these are succeeded by roundish compressed seed-vessels crowned by the permanent style, divided into five cells, which are filled with small roundish seeds. This shrub flowers great part of summer in its native country, but is not yet so well naturalized to this country as to do the like.

The leaves of this elegant plant are supposed to have a noxious quality, destroying sheep and oxen when they feed upon them, yet the deer eat them with impunity.

Both these sorts multiply by their creeping roots in their native soil, and at Whitton, where they have stood unremoved a considerable time, they put out suckers in pretty great plenty; and as these plants which come from suckers, are much more likely to produce others than those which are raised from seeds, and will flower much sooner, so the plants should not be removed, but encouraged to spread their roots and send out suckers.

**KARATAS**, the Penguin or wild Ananas.

The Characters are,

*It hath a tubulous bell-shaped flower, which is divided into three parts at the mouth, from whose empalement where the germen is situated arises the pointal, fixed like a nail in the hinder part of the flower, attended by six short stamina; the germen afterward becomes a fleshy almost conical fruit, which is divided by membranes into three cells, that are full of oblong seeds.*

There is but one sort of this plant at present known in England, which is,

Karatas (*Penguin*) foliis ciliato spinosis mucronatis, racemo terminali. *The wild Ananas or Penguin.*

Father Plumier has made a great mistake in the figure and description of the characters of this plant, and the Caraguata; for he has joined the flower of the Caraguata to the fruit of the Karatas, and vice versâ; this has led many persons into mistakes, who have joined the Bromelia and Ananas to this, making them all of the same genus, whereas by their characters they should be separated.

This plant is very common in the West-Indies, where the juice of its fruit is often put into punch, being of a sharp acid flavour. There is also a wine made of the juice of this fruit which is very strong, but it will not keep good very long, so is only for present use. This wine is very intoxicating and heats the blood, therefore should be drank very sparingly.

In England this plant is preserved as a curiosity, for the fruit seldom arrives to any degree of perfection in this country, though it has often produced fruit in the gardens, which sometimes has ripened pretty well; but if it were to ripen as thoroughly here as in its native country, it would be little valued on account of its great austerity, which will often take the skin off from the mouths and throats of those people who eat it incautiously.

This plant is propagated by seeds, for though there are often suckers sent forth from the old plants, yet they come out from between the leaves, and are so long, slender, and ill-shapen, that if they are planted they seldom make regular plants. These seeds should be sown early in the spring, in small pots filled with light rich earth, and plunged into a hot-bed of tanners bark. When the plants are strong enough to transplant, they should be carefully taken up, and each planted into a separate pot filled with light rich earth, and plunged into the hot-bed again, observing to refresh them frequently with water, until they have taken new root, after which time they should have air and water in proportion to the warmth of the season. In this bed the plants may remain till Michaelmas, at which time they should be removed into the stove, and plunged into the bark-bed, where they should be treated in the same manner as the Ananas.

These plants will not produce their fruit in England until they are three or four years old, so they should be shifted into larger pots, as the plants advance in their growth; for if their roots are too much confined, they will make but little progress. They should also be placed at a pretty great distance from each other, for their leaves will be three or four feet long, which turning downward occupy a large space.

The leaves of this plant are strongly armed with crooked spines, which renders it very troublesome to shift or handle the plants; for the spines catch hold of whatever approaches them by their crooked form, being some bent one way, and others the reverse, so that they catch both ways, and tear the skin or clothes of the persons who handle them, where there is not the greatest care taken of them.

The fruit of this plant is produced in clusters, growing upon a stalk about three feet high, and having generally a tuft of leaves growing on the top, so has, at first sight, the appearance of a Pine Apple; but, when closer viewed, they will be found to be a cluster of oblong fruit, each being about the size of a finger.

A **KATKIN** is an aggregate of summits, hanging down in form of a rope, or Cat's tail, as in the Sallow, Hazel, Birch, &c. and is called in Latin iulus.

**KÆMPFERIA**. Lin. Gen. Plant. 7.

The Characters are,

*It hath a single spatha (or sheath) of one leaf; the flower hath one petal, with a long slender tube, divided into six parts above; three of them are alternately spear-shaped and equal, the other are oval, and at bottom cut into two segments which are vertically heart-shaped. It hath but one stamen, which is membranaceous, oval, and indented, terminated by a linear summit, fastened to it all the length, scarcely emerging out of the tube of the petal. It hath a round germen supporting a style the length of the tube, crowned by an obtuse stigma; the germen afterward becomes a roundish three-cornered capsule with three cells, filled with seeds.*

This genus of plants is ranged in the first section of Linnæus's first class, intitled Monandria Monogynia, which includes those plants whose flowers have one stamen and one style.

The Species are,

1. Kæmpferia (*Galanga*) foliis ovatis sessilibus. Flor. Zeyl. 8. *Kæmpferia with oval leaves sitting close to the root.* Katsjuli Kelengu. Hort. Mal. and the Wanhom. Kæmpf. Amœn. 901. *Galangale.*
2. Kæmpferia (*Rotunda*) foliis lanceolatis petiolatis. Flor. Zeyl. 9. *Kæmpferia with spear-shaped leaves having foot-stalks.* Zedoaria rotunda. C. B. P. *Round Zedoary.*

These plants are both natives of the East-Indies, where their roots are greatly used in medicine as sudorific and carminative. The first sort hath much the scent of green Ginger, when fresh taken out of the ground; the roots are divided into several fleshy tubers, which are sometimes jointed, and grow about four or five inches long; the leaves are oval, about four inches long and

and two broad; these are without foot-stalks, growing close to the root, and seem as if set on by pairs, spreading open each way; and from between these leaves the flowers are produced singly, having no foot-stalks, but are closely embraced by the leaves; the flowers are white, having a bright purple bottom. These are not succeeded by any fruit in England.

The second sort hath roots somewhat like those of the first, but are shorter, growing in large clusters, covered with an Ash-coloured skin, but within are white; from the roots arise the leaves, which fold over each other at their base; they are six or eight inches long, and three broad in the middle, gradually ending in acute points; the flowers arise immediately from the roots, each having a spatha (or sheath) at bottom cut into two segments, which closely embrace the foot-stalk; these have six petals, the three lower which decline downward are long and narrow, the two upper are divided so deeply as to appear like a flower with four petals, and the side petal is bifid; they are of mixed colours, blue, purple, white and red, having a fragrant odour: they flower in July and August, but do not produce seeds in England.

These plants being natives of hot countries, will not bear the open air in England, so requires a warm stove to preserve them through the winter; but as their leaves decay in the autumn, so the plants should not have too much wet while they are in an inactive state. If the plants are placed in the bark-stove, and treated in the same manner as is directed for the Ginger, they will thrive, and produce plenty of flowers every summer. They are both propagated by parting of their roots; the best time for this is in the spring, just before they begin to put out their leaves.

KETMIA. See Hibiscus.

KIGGELARIA. Lin. Gen. Plant. 1001. Laurus. Sterb. We have no English title for this plant.

The Characters are,

*It hath male and hermaphrodite flowers situated on different trees; the male flowers have an empalement of one leaf, cut into five concave segments, and five concave petals which are longer than the empalement, shaped like a pitcher; each of the petals have a honey gland fastened to their base, which have three obtuse lobes and are coloured, fastened to the tails of the petals; they have ten small stamina, terminated by oblong summits. The hermaphrodite flowers have empalements and petals like the male, but few of them have stamina. In the center is situated a roundish germen, supporting five styles, crowned by obtuse stigmas. The germen afterward becomes a rough globular fruit with a thick cover, having one cell, filled with angular seeds.*

This genus of plants is ranged in the ninth section of Linnæus's twenty-second class, intitled Dioecia Decandria; but it should be removed to his twenty-third class, as the hermaphrodite flowers are fruitful, tho' they are situated upon distinct plants, whose male flowers have ten stamina.

We have but one Species of this genus, viz.

Kiggelaria (*Africana.*) Hort. Cliff. 462. fol. 29. Euonymo-affinis Æthiopica sempervirens, fructu globoso scabro, foliis salicis rigidis serratis. H. L. 139. *An Ethiopian Evergreen plant resembling the Spindle-tree, with a rough globular fruit, and stiff sawed Willow leaves.*

This plant grows naturally at the Cape of Good Hope, where it rises to be a tree of middling stature; but as it will not live in the open air here, they cannot be expected to grow to a great magnitude in England. There are plants of it in the Chelsea garden upward of ten feet high, with strong woody stems and pretty large heads; the branches have a smooth bark, which is first green, but afterward changes to a purplish colour; the leaves are about three inches long and one broad, of a light green colour, and sawed on their edges, standing upon short foot-stalks alternately. The flowers come out in clusters from the side of the branches, and hang downward; they are of an herbaceous white colour, and appear in May, at which time the plants are thinly garnished with leaves, for most of the old leaves drop just before the new ones appear. The male flowers fall away soon after their farina is shed, but the hermaphrodite flowers are succeeded by globular fruit about the size of common red Cherries; the cover of these is very rough, and of a thick consistence, opening in five valves at the top, having one cell filled with small angular seeds. These fruit have grown to their full size in the Chelsea garden, but the seeds have rarely come to maturity here.

These plants were not very common in Europe some years past, being very difficult to propagate, unless by seeds, which some plants both in Holland and England have lately produced, so that they are now much more plenty than they were in both countries; for when any of the young branches are laid down, they are two years before they put out roots, and scarce one in five will then have any roots; nor do the cuttings succeed better, for not one in twenty of them will take root, when planted with the utmost care: the best time to plant the cuttings is in the spring, just before the plants begin to shoot; these should be planted in pots filled with a soft loamy earth, and plunged into a very moderate hot-bed, covering them close with a glass, to exclude the air from them, and shade them every day from the sun; they should have very little water after their first planting. If any of them grow, they should be planted into separate small pots, filled with loamy earth, and may be exposed to the air in a sheltered situation till autumn, when they must be removed into the green-house, and treated in the same manner as Orange-trees.

KITCHEN-GARDEN. A good Kitchen-garden is almost as necessary to a country seat, as a kitchen to the house; for without one, there is no way of being supplied with a great part of necessary food; the markets in the country being but poorly furnished with esculent herbs, and those only upon the market days, which are seldom oftener than once a week; so that unless a person has a garden of his own, there will be no such thing as procuring them fresh, in which their goodness consists; nor can any variety of these be had in the country markets; therefore whoever proposes to reside in the country, should be careful to make choice of a proper spot of ground for this purpose; and the sooner that is made and planted, the produce of it will be earlier in perfection; for fruit-trees and Asparagus require three years to grow, before any produce can be expected from them; so that the later the garden is made, the longer it will be before a supply of these things can be had for the table. And although the usefulness of this garden is acknowledged by almost every one, yet there are few who make a proper choice of soil and situation for such a garden; the modern taste, which is, perhaps, carried to as extravagant lengths, in laying open and throwing every obstruction down, as the former custom of inclosing within walls was ridiculous; so that now one frequently sees the Kitchen-garden removed to a very great distance from the house and offices, which is attended with great inconveniencies; and often situated on a very bad soil, sometimes too moist, and at others without water, so that there is a great expence in building walls and making the garden, where there can be little hopes of success.

Nor will a Kitchen-garden be well attended to, when it is so situated as to be out of sight of the possessor, especially if the gardener has not a love and value for it, or if it lies at a great distance from his habitation, or the other parts of the garden; for when it so happens, a great part of the labourer's time will be lost in going from one part to the other: therefore, before the general plan of the pleasure-garden is settled, a proper piece of ground should be chosen for this purpose, and the plan so adapted, as that the Kitchen-garden may not become offensive to the sight, which may be effected by proper plantations of shrubs to screen the walls; and through these shrubs may be contrived

contrived some winding walks to lead to the Kitchen-garden, which will have as good an effect as those which are now commonly made in gardens for pleasure only. In the choice of the situation, if it does not obstruct the view of better objects, or shut out any material prospect, there can be no objection to the placing it at a reasonable distance from the house or offices; for as particular things may be wanted for the kitchen, which were not thought of at the time when directions were given to the gardener what to bring in; so if the garden is situated at a great distance from the house, it will be found very inconvenient to send thither as often as things are wanting: therefore it should be contrived as near the stables as possible, for the conveniency of carrying the dung thither; which, if at a great distance, will add to the expence of the garden.

As to the figure of the ground, that is of no great moment, since in the distribution of the quarters all irregularities may be hid; though if you are at full liberty, an exact square or an oblong, is preferable to any other figure.

The great thing to be considered is, to make choice of a good soil, not too wet, nor over dry, but of a middling quality; nor should it be too strong or stubborn, but of a pliable nature, and easy to work; and if the place where you intend to make the Kitchen-garden should not be level, but high in one part and low in another, I would by no means advise the levelling it; for by this situation you will have an advantage which could not be obtained on a perfect level, which is, the having one part dry ground for early crops, and the low part for late crops, whereby the kitchen may be the better supplied throughout the season with the various sorts of herbs, roots, &c. And in very dry seasons, when in the upper part of the garden the crop will greatly suffer with drought, then the lower part will succeed, and so vice versâ; but I would by no means direct the chusing a very low moist spot of ground for this purpose; for although in such soils garden-herbs are commonly more vigorous and large in the summer season, yet they are seldom so well tasted or wholesome as those which grow upon a moderate soil; and especially since in this garden your choice fruits should be planted, it would be wrong to have a very wet soil.

This garden should be fully exposed to the sun, and by no means overshadowed with trees, buildings, &c. which are very injurious to your kitchen plants and fruit-trees; but if it be defended from the north wind by a distant plantation, it will greatly preserve your early crops in the spring; as also from the strong south-west winds, which are very hurtful in autumn to fruit and garden-herbs. But these plantations should not be too near nor very large; for I have generally found where Kitchen-gardens are placed near woods or large plantations, they have been much more troubled with blights in the spring, than those which have been more exposed.

The quantity of ground necessary for a Kitchen-garden must be proportioned to the largeness of the family, or the quantity of herbs desired: for a small family, one acre of ground may be sufficient; but for a large family, there should not be less than three or four acres; because, when the ground is regularly laid out, and planted with espaliers of fruit-trees, as will hereafter be directed, this quantity will be found little enough, notwithstanding what some persons have said on this head.

This ground must be walled round, and if it can be conveniently contrived, so as to plant both sides of the walls which have good aspects, it will be a great addition to the quantity of wall fruit; and those slips of ground which are without side of the walls, will be very useful for planting of Goosberries, Currants, Strawberries, and some sorts of kitchen plants, so that they may be rendered equally useful with any of the quarters within the walls; but these slips should not be too narrow, lest the hedge, pale, or plantation of shrubs, which inclose them, should shade the borders where the fruit-trees stand: the least width of these slips should be twenty-five or thirty feet, but if they are double that, it will be yet better, and the slips will be more useful, and the fruit-trees will have a larger scope of good ground for their roots to run. These walls should be built about twelve feet high, which will be a sufficient height for any sort of fruit. If the soil where you intend to place your Kitchen-garden be very strong, then you should plough or dig it three or four times before you plant any thing therein; and if you throw it up in ridges to receive the frost in winter, it will be of great service to meliorate and loosen its parts.

The manure which is most proper for such soils, is sea-coal ashes, and the cleansing of streets or ditches, which will render it light much sooner than any other dung or manure; and the greater the quantity of ashes the better, especially if the ground be cold; and where these ashes are not to be obtained in plenty, sea-sand is a very proper dressing, where it can be easily procured, or rotten wood, or the parts of vegetables rotted are very good; all which will greatly loosen the soil, and cause it to be not only easier to work, but also more advantageous for the growth of plants.

But, on the contrary, if your soil be light and warm, you should manure it with rotten neats dung, which is much preferable to any other dressing for hot soils; but if you use horse dung, it must be well rotted, otherwise it will burn up the crops upon the first hot dry weather.

The soil of this garden should be at least two feet deep, but if deeper it will be still better, otherwise there will not be depth enough of soil for many sorts of esculent roots, as Carrots, Parsneps, Beets, &c. which run down pretty deep in the ground, and most other sorts of esculent plants delight in a deep soil; and many plants, whose roots appear short, yet if their fibres by which they receive their nourishment are traced, they will be found to extend to a considerable depth in the ground; so that when these are stopped by meeting with gravel, chalk, clay, &c. the plants will soon shew it by their colour and stinted growth.

You should also endeavour to have a supply of water in the different parts of the garden, which, if possible, should be contained in large basons or reservoirs, where it may be exposed to the open air and sun, that it may be softened thereby; for such water as is taken out of wells, &c. just as it is used, is by no means proper for any sort of plants.

In the distribution of this garden, after having built the walls, you should lay out banks or borders under them, which should be at least eight or ten feet broad, whereby the roots of the fruit-trees will have greater liberty than in such places where the borders are not above three or four feet wide; and upon these banks you may sow many sorts of early crops, if exposed to the south; and upon those exposed to the north, you may have some late crops; but I would by no means advise the planting any sort of deep rooting plants too near the fruit-trees, especially Peas and Beans; tho' for the advantage of the walls, to preserve them in winter, and to bring them forward in the spring, the gardeners in general are too apt to make use of those borders, which are near the best aspected walls, to the great prejudice of their fruit-trees; but for these purposes it is much better to have some Reed-hedges fixed in some of the warmest quarters, under which you should sow and plant early Peas, Beans, &c. where they will thrive as well as if planted under a wall, and hereby your fruit-trees will be entirely freed from such troublesome plants.

Then you should proceed to dividing the ground out into quarters, which must be proportioned to the largeness of the garden; but I would advise never to make them too small, whereby your ground will be lost in walks; and the quarters being inclosed by espaliers of fruit-trees the plants therein will draw up slender,

and

and never arrive to half the size as they would do in a more open exposure.

The walks of this garden should be also proportioned to the size of the ground, which in a small garden should be four feet, but in a large one six; and on each side of the walk should be allowed a border five or six feet wide between the espalier and the walk, whereby the distance between the espaliers will be greater, and the borders being kept constantly worked and manured, will be of great advantage to the roots of the trees; and in these borders may be sown some small sallad, or any other herbs, which do not continue long or root deep, so that the ground will not be lost.

The breadth of these middle walks which I have here assigned them, may by many persons be thought too great; but my reason for this is to allow proper room between the espaliers, that they may not shade each other, or their roots interfere and rob each other of their nourishment: but where the walks are not required of this breadth, it is only enlarging of the borders on each side, and so reducing the walks to the breadth desired.

But the walks of these gardens should not be gravelled, for as there will constantly be occasion to wheel manure, water, &c. upon them, they would soon be defaced, and rendered unsightly; nor should they be laid with turf; for in green walks, when they are wheeled upon or much trodden, the turf is soon destroyed, and those places where they are much used, become very unsightly also; therefore the best walks for a Kitchen-garden are those which are laid with a binding sand; but where the soil is strong and apt to detain the wet, there should be some narrow under ground drains made by the side of the walks, to carry off the wet, otherwise there will be no using of the walks in bad weather; and where the ground is very wet, and the water is detained by the stiffness of the soil, if some lime-rubbish, flints, chalk, or any such material as can be procured with the least expence, and is laid at the bottom of these walks; or if neither of these can be had, a bed of Heath or Furze should be laid, and the coat of sand laid over it; the sand will be kept drier, and the walks will be found and good in all seasons. These sand-walks when they are well laid, are by much the easiest kept of any; for when either weeds or Mcss begin to grow, it is but scuffling them over with a Dutch hoe in dry weather, and raking them over a day or two after, and they will be as clean as when first laid.

The best figure for the quarters to be disposed into, is a square or an oblong, where the ground is adapted to such a figure; otherwise they may be triangular, or of any other shape, which will be most advantageous to the ground.

When the garden is laid out in the shape intended, if the soil is strong, and subject to detain the moisture, or is naturally wet, there should always be underground drains made, to carry off the wet from every quarter of the garden, for otherwise most sorts of kitchen plants will suffer greatly by moisture in winter; and if the roots of the fruit-trees get into the wet, they will never produce good fruit, so that there cannot be too much care taken to let off all superflous moisture from the Kitchen-garden.

These quarters should be constantly kept clear from weeds, and when any part of the ground is unoccupied, it should always be trenched up into ridges, that it may sweeten and imbibe the nitrous particles of the air, which is of great advantage to all sorts of land, and the ground will then be ready to lay down whenever it is wanted.

The ground in these quarters should not be sown or planted with the same crop two years together, but the crops should be annually changed, whereby they will prove much better than when they constantly grow upon the same spot. Indeed the kitchen-gardeners near London, where the land is dear, are often obliged to put the same crop upon the ground for two or three years together; but then they dig and manure their land so well every year, as to render it almost new; though notwithstanding all this, it is constantly observed, that fresh land always produces the best crops.

In one of these quarters, which is situated nearest to the stables, and best defended from the cold winds; or if either of the slips without the garden wall, which is well exposed to the sun, lies convenient, and is of a proper width, that should be preferred for a place to make hot-beds for early Cucumbers, Melons, &c. The reasons for my giving the preference to one of these slips, is, first, there will be no dirt or litter carried over the walks of the Kitchen-garden in winter and spring, when the weather is generally wet, so that the walks will be rendered unsightly; secondly, the view of the hot-beds will be excluded from sight; and lastly, the convenience of carrying the dung into these slips, for by making of a gate in the hedge, or pale, wide enough for a small cart to enter, it may be done with much less trouble than that of barrowing it thro' the garden; and where there can be a slip long enough to contain a sufficient number of beds for two or three years, it will be of great use; because by the shifting of the beds annually, they will succeed much better than when they are continued for a number of years on the same spot of ground; and as it will be absolutely necessary to fence this Melon-ground round with a Reed-hedge, it may be so contrived as to move away in pannels; and then that hedge which was on the upper side the first year, being carried down to a proper distance below that which was the lower hedge, and which may remain, there will be no occasion to remove more than one of the cross hedges in a year; therefore I am persuaded, whoever will make trial of this method, will find it the most eligible.

The most important points of general culture consist in well digging and manuring the soil, and giving a proper distance to each plant, according to their different growths (which is constantly exhibited in their several articles in this book) as also in keeping them clear from weeds; for if weeds aae permitted to grow until their seeds are ripe, they will shed upon the ground, and fill it so as not to be gotten out again in several years. You should also observe to keep your dunghills always clear from weeds, for it will be to litte purpose to keep the garden clean, if this is not observed; for the seeds falling among the dung, will be brought into the garden, whereby there will be a constant supply of weeds yearly introduced, to the no small damage of your plants, and a perpetual labour occasioned to extirpate them again. Another thing which is absolutely necessary to be observed, is, to carry off all the refuse leaves of Cabbages, the stalks of Beans and haulm of Pease, as soon as they are done with, for the ill scent which most people complain of in the Kitchen-gardens, is wholly occasioned by these things being suffered to rot upon the ground; therefore when the Cabbages are cut, all leaves should be carried out of the garden while they are fresh, at which time they may be very useful for feeding of hogs, or other animals, and this will always keep the garden neat and free from ill scents. As for all other necessary directions, they will be found in the articles of the several sorts of kitchen plants, which renders it needless to be repeated in this place.

KLEINIA. See Cacalia.

KNAUTIA. Lin. Gen. Plant. 109. Lychni-Scabiosa. Boerh. Ind. 1. 131.

This name was applied to this plant by Dr. Linnæus, in honour of the memory of Dr. Christian Knaut, who published a method of classing plants.

The Characters are,

*It hath a single oblong empalement, containing several flosscular flowers, which are ranged so as to appear regular, but each irregular, having tubes the length of the empalement, but are cut at the brim into four irregular segments, the outer being the biggest; it hath four stamina the length of the tube, inserted in the receptacle, terminated by oblong incumbent summits; and a germen under the petal, supporting a slender style, crowned by a thick bifid stigma, which*

*which afterward becomes a four-cornered seed with a hairy apex.*

This genus of plants is ranged in the first section of Linnæus's fourth class, intitled Tetrandria Monogynia, the flowers having four stamina and one style.

The SPECIES are,

1. KNAUTIA (*Orientalis*) foliis omnibus pinnatifidis, corollis calyce longioribus. Lin. Sp. App. 1679. *Knautia with all the leaves wing-pointed, and the petal longer than the empalement.* Lychni-scabiosa, flore rubro, annua. Boerh. Ind. alt.
2. KNAUTIA (*Propontica*) foliis superioribus lanceolatis indivisis, corollis calyce æqualibus. Lin. Sp. App. 1666. *Knautia whose upper leaves are spear-shaped and whole, and the petal of the flower equal to the empalement.* Scabiosa Orientalis villosa, flore suaverubente, fructu pulchro oblongo. Tourn. Cor. 35.

These plants are natives of the East, they are both annual; the first has been long cultivated in the English gardens; this rises with an erect branching stalk four feet high, garnished with wing-pointed leaves; the branches are terminated by single foot-stalks, each supporting one flower, having a tubular empalement cut into four segments at the top, and each contain four florets of a bright red colour, cut into four unequal segments, the outer being much larger than the other; these have four stamina the length of the tube of the petal, terminated by oblong summits; and the flowers are succeeded by oblong four-cornered seeds, which, when ripe, soon fall out of the cup if they are not gathered.

The second sort differs from the first in its upper leaves being whole, and the petal of the flower being equal to the cup. The lower leaves of this are sawed on their edges, and terminate in acute points.

These plants propagate easily; if their seeds are permitted to scatter in the autumn, the plants will come up soon after; and if some of these are planted in the borders of the pleasure-garden, or among low shrubs near the walks in October, the plants will live through the winter, and flower in June; so their seeds will ripen the end of July or beginning of August, therefore require no other culture but to keep them clean from weeds.

KNIGHTS CROSS, or SCARLET CROSS, is the Scarlet Lychnis. See LYCHNIS.

# L.



LABIATE FLOWERS are such as have lips, or more properly a labiated flower, is an irregular monopetalous flower, divided into two lips; the upper is called the crest, the under the beard; sometimes the crest is wanting, and then the style and chives supply its place, as in the Ground Pine, Scordium, Bugula, &c. but the greatest part have two lips, which, in some species the upper lip is turned upwards, as the Ground Ivy, &c. but most usually the upper lip is convex above, and turns the hollow part down to the lower lip, and so represents a kind of helmet, or monk's hood, from whence these are called galeate, cucullate, and galericulate flowers, in which form are most of the verticillate plants.

LABLAB. See PHASEOLUS.

LABRUM VENERIS. See DIPSACUS.

LABRUSCA. See VITIS.

LABURNUM. See CYTISUS.

LABYRINTH [Λαβύρινθος,] a winding, mazy, and intricate turning to and fro, through a wilderness or a wood.

The design of a Labyrinth is, to cause an intricate and difficult labour to find out the center, and the aim is, to make the walks so intricate, that a person may lose himself in them, and meet with as great a number of stops and disappointments as is possible, they being the most valuable that are most intricate.

As to the contrivance of them, it will not be possible to give directions in words, there are several plans and designs in books of gardening; they are rarely met with but in great and noble gardens, as Hampton-court, &c.

There are two ways of making them, the first is with single hedges; this method has been practised in England. These, indeed, may be best, where there is but a small spot of ground to be allowed for the making them, but where there is ground enough, the double are most eligible.

Double ones, or those that are made with double hedges of a considerable thickness of wood between hedge and hedge, are approved as much better than single ones, as is the manner of making them in France, and other places, of all which, that of Versailles is allowed by all to be the noblest of its kind in the world.

It is an error in Labyrinths in making them too narrow, for by that means the hedges must be kept close clipped; whereas, if the walks are made wider, according to the foreign practice, they will not stand in so much need of it.

The walks are made with gravel, and the hedges are usually set with Hornbeams; the pallisades ought to be ten, twelve, or fourteen feet high; the Hornbeam should be kept cut, and the walks rolled.

LACRYMA JOBI [so called, because the seed of it resembles a tear, or drop.] Job's Tears. See COIX.

LACTIFEROUS PLANTS are such as abound with a milky juice, as the Euphorbia, Sonchus, Lactuca, &c.

LACTUCA. Tourn. Inst. R. H. 473. tab. 267. Lin. Gen. Plant. 814. [so called from lac, *Lat.* milk, because the leaves, stalks, flower, and branch, being broken, plentifully emit a milk, or white milky juice, quickly turning yellow and bitterish.] Lettuce; in French, *Laitue.*

The CHARACTERS are,

*The flowers are composed of several hermaphrodite florets, inclosed in one scaly oblong empalement; these lie over each other like the scales of fish. The florets have one petal, which is stretched out on one side like a tongue, and is slightly indented at the end in three or four parts; these have each five short hairy stamina; the oval germen supports*

*ports a slender style, crowned by two reflexed stigmas, and afterward becomes one oblong pointed seed, crowned with a single down, sitting in the scaly empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia æqualis, which includes those plants whose flowers are composed of all hermaphrodite, or fruitful florets, and have their stamina and style connected.

It would be beside my purpose to mention in this place the several sorts of Lettuce that are to be found in botanic writers, many of which are plants of little use, and are never cultivated but in botanic gardens for variety; some of them are found wild in many parts of England. I shall therefore pass over those, and only mention the several varieties which are cultivated in the kitchen-garden for use: 1. Common or Garden Lettuce. 2. Cabbage Lettuce. 3. Cilicia Lettuce. 4. Dutch Brown Lettuce. 5. Aleppo Lettuce. 6. Imperial Lettuce. 7. Green Capuchin Lettuce. 8. Versailles, or Upright White Cos Lettuce. 9. Black Cos. 10. Red Capuchin Lettuce. 11. Roman Lettuce. 12. Prince Lettuce. 13. Royal Lettuce. 14. Egyptian Cos Lettuce.

The first of these sorts is commonly sown for cutting very young, to mix with other small sallad herbs, and is only different from the second sort, in being a degeneracy therefrom, or otherwise the second is an improvement by frequent cultivation from the first; for if the seeds are saved from such plants of the second sort as did not cabbage closely, the plants produced from that seed will degenerate to the first sort, which is by the gardeners called Lapped Lettuce, to distinguish it from the other, which they call Cabbage Lettuce. The seeds of the first, which are commonly saved from any of the plants, without having regard to their goodness, are generally sold at a very cheap rate (especially in dry seasons, when these plants always produce the greatest quantity of seeds,) though sometimes this seed is sold in the seed-shops, and by persons who make a trade of selling seeds, for the Cabbage Lettuce, which is often the occasion of peoples being disappointed in their crop; so that this sort should never be cultivated but to be cut up very young, for which purpose this is the only good sort, and may be sown any time of the year, observing only in hot weather to sow it in shady borders; and in the spring and autumn upon warm borders, but in winter it should be sown under glasses, otherwise it is subject to be destroyed by severe frosts.

The Cabbage Lettuce may also be sown at different times of the year, in order to have a continuation of it through the whole season. The first crop is generally sown in February, which should be upon a warm spot of ground, and when the plants are come up, they should be thinned out to the distance of ten inches each way, which may be done by hoeing them out, as is practised for Turneps, Carrots, Onions, &c. provided you have no occasion for the superfluous plants, otherwise they may be drawn up, and transplanted into another spot of good ground at the same distance, which, if done before the plants are too large, they will succeed very well, though they will not be so large as those which are left upon the spot where they were sown, but they will come somewhat later, which will be of service where people do not continue sowing every fortnight or three weeks in summer.

You must also observe in sowing the succeeding crops, as the season advances, to chuse a shady moist situation, but not under the drip of trees, otherwise, in the heat of summer they will run up to seed before they cabbage. In the beginning of August you should sow the last crop, which is to stand over winter; the seeds should be sown thin upon a good light soil, in a warm situation, and when the plants are come up they must be hoed out, so as they may stand singly, and cut down all the weeds to clear them. In the beginning of October they should be transplanted into warm borders, where, if the winter is not very severe, they will stand very well; but in order to be sure of a crop, it will be adviseable to plant a few upon a bed pretty close together, where they may be arched over with hoops, and in severe frosts they should be covered with mats and straw, or Peas-haulm, to secure them from being destroyed; and in the spring of the year they may be transplanted out into a warm rich soil, at the distance before-mentioned; but still those which grew under the wall, if they escaped the winter, and were suffered to remain, will cabbage sooner than those which are removed again; but you must observe not to place them too close to the wall, which would occasion their growing up tall, and prevent their being large or hard.

In order to save good seeds of this kind, you should look over your Lettuces when they are in perfection, and such of them as are very hard, and grow low, should have sticks thrust into the ground, by the sides of as many of them as you intend for seed, to mark them from the rest; and you should carefully pull up all the rest from amongst them as soon as they begin to run up, if any happen to be left, lest when they are run up to flower, they should, by the intermixing their farina with the good ones, degenerate the seeds. It may be some persons may object, that suppose some bad ones should happen to be left among them (for seeds to sow for small sallads,) yet the good ones being marked, the seeds need not be mixed, and so no danger can ensue from thence; but notwithstanding ever so much care be taken to keep the seeds separate, yet, whether from the intermixing of the farina during the time of their being in flower, or what other cause, I cannot say, but it hath been frequently observed, that where good and bad plants have been left for seed upon the same spot, the seeds of the good plants which were carefully saved separately, have very much degenerated, and proved worse than such as have seeded by themselves. The seeds should always be saved either from those which stood through the winter, or those which were sown early in the spring, for the late ones very seldom perfect their seeds.

The Cilicia, Imperial, Royal, Black, White, and Upright Cos Lettuces may be sown at the following times; the first season for sowing these seeds is at the latter end of February, or the beginning of March, upon a moderate hot-bed, or on a warm light soil in a sheltered situation; and when the plants are come up and are fit to transplant, those which were sown on the hot-bed should be planted on another warm bed about four inches asunder, row from row, and two inches distance in the rows, observing to shade them from the sun till they have taken new root; after which they should have a larger share of air admitted to them daily, to prevent their drawing up weak; but if the season proves favourable, they should be transplanted the beginning of April to the place where they are to remain, allowing them sixteen inches room every way, for these large sorts must not be planted too near each other; those which were sown in the full ground will be later before they come up, so should be either hoed out, or transplanted into another spot of ground (as was directed for those sown on the hot-bed allowing them as much room) especially if the soil be good; after they have taken new root, you must carefully keep them clear from weeds, which is the only culture they will require, except the Black Cos Lettuce, which should be tied up when they are full grown (in the manner as was directed for blanching of Endive,) to whiten their inner leaves, and render them crisp, otherwise they are seldom good for much, rarely cabbaging without this assistance.

When your Lettuces are in perfection, you should look over them, and mark as many of the best of them as you intend for seed (in the same manner as was before directed for the common Cabbage Lettuce,) being very careful not to suffer any ordinary ones to seed amongst them, as was before observed, which would prove more injurious to these sorts than to the common, as being more inclinable to degenerate with us, if they are not carefully saved.

You may also continue these sorts through the whole season of Lettuce, by sowing them in April, May, and June, observing, (as was before directed) to sow the late crops in a shady situation, otherwise they will run up to seed before they grow to any size; but in the middle of September you may sow of these sorts, to abide the winter; which plants should be transplanted either under glasses, or into a bed, which should be arched over with hoops, in order to be covered in the winter, otherwise in hard winters they are often destroyed; but you must constanly let these plants have as much free air as possible, when the weather is mild, only covering them in hard rains or frosty weather; for if they are kept too closely covered in winter, they will be subject to a mouldiness, which soon rots them.

In the spring these plants should be planted out into a rich light soil, allowing them at least sixteen inches distance each way; for if they are planted too close, they are very subject to grow tall, but seldom cabbage well; and from this crop, if they succeed well, it will be proper to save your seeds; though you should also save from that crop sown on the hot-bed in the spring, because sometimes it happens, that the first may fail by a wet season, when the plants are full in flower, and the second crop may succeed, by having a more favourable season afterwards; and if they should both succeed, there will be no harm in that, since the seeds will grow very well when two years old, and if well saved, at three, but this will not always happen.

The most valuable of all the sorts of Lettuce in England, are the Egyptian Green Cos, and the Versailles, or White Coss, and the Cilicia, though some people are very fond of the Royal and Imperial Lettuces, but they seldom sell so well in the London markets as the other, nor are so generally esteemed. Indeed of late years, since the White Cos has been commonly cultivated, it has obtained the preference of all the other sorts, until the Egyptian Green Cos was introduced, which is so much sweeter and tenderer than the White Cos, that it is by all good judges esteemed the best sort of Lettuce yet known. This sort will endure the cold of our ordinary winters full as well as the White Cos; but at the season of its cabbaging, if there happens to be much wet, this being very tender, is very subject to rot.

The Brown Dutch and Green Capuchin Lettuces are very hardy, and may be sown at the same seasons as was directed for the common Cabbage Lettuce, and are very proper to plant under a wall, or hedge, to stand the winter, where many times these will abide, when most of the other sorts are destroyed, and therefore they will prove very acceptable at a time when few other sorts are to be had; they will also endure more heat and drought than most other sorts of Lettuce, which renders them very proper for late sowing; for it very often happens, in very hot weather, that the other sorts of Lettuce will run up to seed in a few days after they are cabbaged, whereas these will abide near a fortnight in good order, especially if care be taken to cut the forwardest first, leaving those that are not so hard cabbaged to be last. If some plants of these two last sorts are planted under frames, on a moderate hot-bed in October, they will be fit for use in April, which will prove acceptable to those who are lovers of Lettuce, and being covered by glasses, will render them tender. In saving of these seeds, the same care should be taken to preserve only such as are very large and well cabbaged, otherwise the seeds will degenerate, and be good for little.

The Red Capuchin, Roman, and Prince Lettuces are pretty varieties, and cabbage very early, for which reason a few of them may be preserved, as may also some of the Aleppo, for the beauty of its spotted leaves; though very few people care for either of these sorts at table, when the other more valuable ones are to be obtained; but in a scarcity, these may supply the place pretty well, and these sorts are very proper for soups. The seeds of these must also be saved from such as cabbage best, otherwise they will degenerate, and be good for little.

In saving seeds of all these sorts of Lettuce, you should observe never to let two sorts stand near each other, for by their farina mixing, they will both vary from their original, and partake of each other; and there should be a stake fixed down by the side of each, to which the stem should be fastened, to prevent their being broken, or blown out of the ground by wind, to which the Cilicia, Cos, and the other large growing Lettuces, are very subject when they are in flower. You must also observe to cut such branches of the large growing Lettuce as ripen first, and not wait to have the seed of the whole plant ripe together, which never happens; but, on the contrary, some branches will be ripe a fortnight or three weeks before others; and when you cut them, they must be spread upon a coarse cloth in a dry place, that the seeds may dry, after which you should beat them out, and dry them again, and then preserve them for use, being careful to hang them up where mice and other vermin cannot come at them; for if they do, they will soon eat them up.

LACTUCA AGNINI. See Valerianella.

LADY's SLIPPER. See Cypripedium.

LADY's SMOCK. See Cardamin.

LAGŒCIA, Bastard Cumin.

The Characters are,

*It hath many flowers collected into a head, which have one common empalement, composed of eight indented leaves, but the simple empalement to each flower hath five leaves, which are very narrow and pinnated, ending in many hair-like points. The flower consists of five horned petals, which are shorter than the empalement; at the bottom of each flower is situated the germen, supporting a style crowned by a simple stigma, attended by five stamina, which are long and narrow; the germen afterward changes to an oval seed, crowned with the empalement.*

There is but one Species of this plant, viz.

Lagoecia (*Cuminoides.*) Lin. Hort. Cliff. *Bastard, or Wild Cumin.*

We have no other English name for this plant, nor is this a very proper one, but as it has been titled by some of the antient botanists Cuminum sylvestre, i. e. Wild Cumin, and by Dr. Tournefort it is made a distinct genus, by the title of Cuminoides, it may be styled Wild, or Bastard Cumin.

This is an annual plant, which grows about a foot high. The leaves resemble those of the Honeywort. The flowers, which are of a greenish yellow colour, are collected in spherical heads at the extremity of the stalks; but there being little beauty in the plant, it is rarely cultivated, except in botanic gardens. It grows plentifully about Aix, in Provence, as also in most of the islands of the Archipelago. It is annual, and perishes soon after the seeds are ripe. The seeds of this plant should be sown in autumn on a warm border, soon after they are ripe; or if they are permitted to scatter, the plants will come up, and require no other care but to clear them from weeds. When the seeds are sown in the spring, they commonly remain in the ground a year before they grow, and sometimes I have known them to lie two or three years in the ground, so that if the plants do not come up the first year, the ground should not be disturbed.

LAGOPUS. See Trifolium.

LAMINATED signifies platted. Those things are said to be laminated, whose contexture discovers such a disposition as that of plates lying over one another, or the scales of fish.

LAMIUM. Tourn. Inst. R. H. 183. tab. 89. Lin. Gen. Plant. 636. Dead Nettle, or Archangel.

The Characters are,

*The flower hath a permanent empalement of one leaf, which is tubulous, and cut into five equal segments at the top, which end in beards. The flower is of the lip kind; it hath one petal, with a short cylindrical tube, swollen at the chaps and compressed; the upper lip is arched, roundish, obtuse, and entire; the under is short, heart-shaped, reflexed, and indented at the end. It hath four awl-shaped*

*stamina*

*stamina joined to the upper lip, two of which are longer than the other, terminated by oblong hairy summits. It hath a four-cornered germen, supporting a slender style situated with the stamina, and crowned by an acute two-pointed stigma; the germen afterward become four three-cornered seeds, sitting in the open empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, intitled Didynamia Gymnospermia, in which he ranges those plants whose flowers have two long and two shorter stamina, and are succeeded by naked seeds sitting in the empalement.

The Species are,

1. Lamium (*Purpureum*) foliis cordatis obtusis petiolatis. Hort. Cliff. 314. *Dead Nettle with heart-shaped obtuse leaves standing on foot-stalks.* Lamium purpureum fœtidum, folio subrotundo, sive Galeopsis Dioscoridis. C. B. P. *Purple stinking Archangel, or Dead Nettle, or the Galeopsis of Dioscorides with a roundish leaf.*
2. Lamium (*Album*) foliis cordatis acuminatis serratis petiolatis. Hort. Cliff. 314. *Dead Nettle with pointed heart-shaped leaves, which are sawed, and have foot-stalks.* Lamium album, non fœtens, folio oblongo. C. B. P. *White Archangel or Dead Nettle which does not stink, with an oblong leaf.*
3. Lamium (*Garganicum*) foliis cordatis pubescentibus, corollis fauce inflata, tubo recto dente utrinque gemino. Lin. Sp. 808. *Dead Nettle with heart-shaped hairy leaves, and the chaps of the flower inflated, indented with two teeth.* Lamium garganicum subincanum, flore purpurascente, cum labio superiore crenato. Micheli. *Hoary Dead Nettle with a purplish flower, whose upper lip is crenated.*
4. Lamium (*Moschatum*) foliis cordatis obtusis glabris, floralibus sessilibus, calycibus profundè incisis. *Dead Nettle with heart-shaped, obtuse, smooth leaves, the upper sitting close to the stalks, and empalements deeply cut.* Lamium Orientale, nunc moschatum, nunc fœtidum, magno flore. Tourn. Cor. *Eastern Dead Nettle, sometimes sweet-scented and sometimes stinking, with a large flower.*
5. Lamium (*Melissæfolium*) foliis cordatis nervosis serratis, petiolis longioribus, caule erecto. *Dead Nettle with heart-shaped veined leaves which are sawed, and longer foot-stalks with an erect stalk.* Lamium montanum melissæ folio. C. B. P. 231. Icon. Pl. 158. *Mountain Dead Nettle with a Balm leaf.*

There are several other species of this genus, as also some varieties of it, but as most of them are weeds, I have passed them over, for there are few who care to admit them into their gardens.

The first sort grows naturally in most parts of England, under hedges and by the side of highways; it is also a troublesome weed in gardens, but as it stands in most of the dispensaries as a medicinal plant, I have chosen to insert it. This is an annual plant, whose stalks seldom rise more than four or five inches high; the under leaves are heart-shaped, blunt, and stand upon pretty long foot-stalks, but the upper leaves sit nearer to the stalks; the flowers come out in whorls on the upper part of the stalk; they are of a pale purple colour, and are succeeded by four naked seeds sitting in the empalement; after the seeds are ripe the plant decays. It flowers in the middle of March, when the autumnal self-sown plants appear; these are succeeded by others, which continue in succession all the summer.

The second sort is commonly called Archangel; this is also used in medicine, for which reason I have enumerated it here. The roots of this are perennial, and creep much in the ground, so is difficult to extirpate, where it happens to grow under bushes and hedges; for the roots intermix with those of the bushes, and every small piece of them grow and spread. The stalks of this rise much higher than those of the last, the flowers are larger, white, and grow in whorls round the stalks; these continue in succession most part of the summer.

The third sort grows naturally upon the mountains in Italy; this hath a perennial creeping root, from which arise many thick square stalks a foot high, garnished with heart-shaped leaves which are hairy, placed opposite, standing upon pretty long foot-stalks; the flowers come out in whorls at the upper joints of the stalk, they are large, and of a pale purplish colour; these continue in succession most part of the summer, and the flowers are succeeded by seeds which ripen about six weeks after. This may be propagated by seeds, but as the roots spread greatly in the ground, so when once it is obtained, it will propagate fast enough without culture.

The fourth sort grows naturally in the Archipelago; this is an annual plant, which, if permitted to scatter its seeds, the plants will come up and thrive better than when sown by the hand. The plants come up in the autumn, and during the winter their leaves make a pretty appearance, for they are marked with white somewhat like those of the autumnal Cyclamen; the stalks rise eight or nine inches high, and are garnished with smooth heart-shaped leaves placed opposite; these in dry weather have a musky scent, but in wet weather are fetid; the flowers are white, standing in whorls round the stalks. They appear in April, and the seeds ripen in June, then the plants decay; this requires no culture, but to keep the plants clear from weeds.

The fifth sort grows naturally in Portugal; this hath a perennial root and an annual stalk, which rises a foot and a half high; it is strong, square, and grows erect; the leaves are large, heart-shaped, and much veined; they are deeply sawed on their edges, and are placed opposite. The flowers come out in whorls round the stalks at every joint; they are very large, and of a deep purple colour; those on the lower part of the stalks appear the beginning of May, which are succeeded by others above, so that there is a continuance of flowers almost two months on the same stalks. This plant very rarely produces good seeds in England, nor do the roots propagate very fast, so that it is not common here.

The best time to remove and part these roots is in October, but they must not be transplanted oftener than every third year if they are required to flower strongly; for the great beauty of this plant consists in the number of stalks, which are always proportional to the size of the plants; for small plants will put out one or two stalks only, whereas the larger ones will have eight or ten. The roots are hardy, and will thrive best in a soft loamy soil.

LAMPSANA. See Lapsana.

LAND. Its improvement.

1. By inclosing.

Inclosing of Lands, and dividing the same into several fields, for pasture or tillage, is one of the principal ways of improvement; first, by ascertaining to every man his just property, and thereby preventing an infinity of trespasses and injuries, that Lands in common are subject unto, beside the disadvantage of being obliged to keep the same seasons with the other people who have Land in the same field; so that the sowing, fallowing, and tilling the ground, must be equally performed by all the landholders; and when there happens a slothful negligent person, who has Land intermixed with others, it is one of the greatest nuisances imaginable. Secondly, it being of itself a very great improvement; for where Land is properly inclosed, especially in open countries, and the hedge-rows planted with timber trees, &c. it preserves the Land warm, and defends and shelters it from the violent cold nipping winds, which, in severe winters, destroy much of the corn, pulse, or whatever grows on the open field or champain grounds. And where it is laid down for pasture, it yields much more Grass than the open fields, and the Grass will begin to grow much sooner in the spring. The hedges and trees will afford shelter for the cattle from the cold winds in winter, as also shade for them in the great heats of summer. And these hedges afford the diligent husbandman plenty of fuel, as plough-boot, cart-

cart-boot, &c. And where they are carefully planted and preserved, furnish him with timber and also mast for his swine; or where the hedge-rows are planted with fruit-trees, there will be a supply of fruit for cyder, perry, &c. which in most parts of England are of no small advantage to the husbandman.

By this method of inclosing, there is also much more employment for the poor, and is therefore a good remedy against beggary; for in those open countries, where there are great downs, commons, heaths, and wastes, there is nothing but poverty and idleness to be seen amongst the generality of their inhabitants. It is very observable of late years, how much advantage the inclosing of the Land in Worcestershire, and some other counties at a distance from London, has been to the inhabitants: for before this method was introduced amongst them, the Lands for the most part lay in commons, &c. Upon which the poorer sort of people built themselves cottages with mud walls, where they contented themselves with a cow or two, and some swine; and those of them who were more industrious than the rest, travelled to the neighbourhood of London every spring, where they were employed in the gardens and fields for the summer season; and in autumn they returned to their native countries, where they lived in winter upon what money they had saved in summer. But since they have converted their wastes and commons into inclosures, there are but few of the inhabitants of those countries, who come to London for work, in comparison to the numbers that formerly came; so that most of the labourers, who come to London for employment, are either Welch, or inhabitants of some more distant counties, or from Ireland, where this improvement hath not as yet been introduced.

The advantages of inclosing Land are now so generally known, that there is no occasion for me to enumerate them here; since the improvements which have been made of late years in several parts of England, and the increase of rent that is every where made by those who inclose, are sufficient arguments to enforce the practice, and render it general; more especially in the north, where it is most neglected, because it would greatly shelter the Lands, and render them much warmer than they now are.

In inclosing of Land, regard should be had to the nature of the soil, and what it is intended for, because Corn Land should not be divided into small parcels; for besides the loss of ground in hedges, &c. the Corn doth seldom thrive so well in small inclosures, as in more open fields, especially where the trees are large in the hedge-rows. The Grass also in pastures is not so sweet near hedges, or under the drip of trees, as in an open exposure; so that where the inclosures are made too small, or the Land overplanted with trees, the herbage will not be near so good, nor in so great plenty, as in larger fields; therefore, before a person begins to inclose, he should well consider how he may do it to the greatest advantage; as for instance, it is always necessary to have some smaller inclosures near the habitation, for the shelter of cattle, and the conveniency of shifting them from one field to another, as the season of the year may require; and hereby the habitation, barns, stables, and outhouses, will be better defended from strong winds, which often do great damage to those that are exposed to their fury. These small inclosures may be of several dimensions, some of them three, four, six, or eight acres in extent; but the larger divisions for Corn should not contain less than twenty or thirty acres or more, according to the size of the farm, or the situation of it.

The usual method of inclosing Land is, with a ditch and bank set with quick. But in marsh Land, where there is plenty of water, they content themselves with only a ditch, by the sides of which they usually plant Sallows or Poplars, which being of quick growth, in a few years afford shade to the cattle; and when they are lopped, produce a considerable profit to their owners. In some counties the division of their Lands is by dry walls made of flat stones, laid regularly one upon another, and laying the top course of stones in clay, to keep them together, the weight of which secures the under ones. But in some parts of Sussex and Hampshire, they often lay the foundation of their banks with flat stones, which is of a considerable breadth at bottom; upon which they raise the bank of earth, and plant the hedge on the top, which in a few years makes a strong durable fence, especially if they are planted with Holly, as some of those in Sussex are.

In marshes and open pastures, where there are no hedges, the ditches are generally made six feet wide at the top, especially those which are on the side of highways or commons; but the common ditches about inclosures are seldom more than three feet and a half wide at top, and one foot and a half at bottom, and two feet deep, that the sides may have a good slope, and not be too upright, as they are frequently made about London, so that they are continually washing down with great rains. In these narrow bottomed ditches, the cattle cannot stand to turn themselves, so as to crop the quick; but where the ditches are made wider, they should be proportionally deeper: as for instance, if the ditch is made five feet broad, it must be three feet deep; and if six feet broad, three feet and a half deep, and so in proportion.

The method of inclosing Lands, by raising high banks of earth, on the side of which the quick is planted (as is too much practised in many places near London) is intolerable, for it is not only unsightly, but very expensive; because these banks are continually washing down, so that they must be repaired every year at least, if not oftener, otherwise the earth will be in a few years washed from the roots of the quick, and for want of proper nourishment, the hedge will soon decay, which is the case with the greatest number of the hedges about London: besides, it is a very uncertain way of planting quick on the side of a steep bank, where all the moisture runs off; so that if the spring should prove dry after it is planted, there is a great hazard whether half the plants will grow, and those that take seldom make much progress; whereas those planted on the plain surface, where they enjoy the advantages of sun and moisture, will in four years make a better fence than one of these bank hedges will in eight or ten, and will continue good much longer than the other. Therefore I advise, that the banks on which the hedges are to be planted, should not be raised more than one foot above the surface of the ground, where the Land is dry, and in wet Land not more than two feet, which will be enough.

I shall now mention the most proper plants for making of fences for the different soils and situations, so as to answer the expectation of the planter: and first, the white Thorn is esteemed the best for fencing, and will grow upon almost any soil and in any situation, but it succeeds best on a hazle loam. Of this there are three or four varieties, which differ in the breadth of their leaves and the size of their Haws, but that sort with the smallest leaves and Haws will make the closest fence. For it is very certain, that the branches of all sorts of trees are produced at a distance, in proportion to the size of their leaves; so that Yews, and other Evergreen trees with small leaves, will always make a closer hedge than other trees whose leaves are larger. Therefore, for the closest hedge, the smallest Haws should be chosen; but where the most vigorous shooters are required, for the advantage of lopping, there the largest Haws should be preferred. But as these hedges are usually planted from a nursery, where the Haws are promiscuously sown, it is very common to see two or three sorts planted in the same hedge; which may be easily distinguished, when they have obtained strength, by the difference of their growth. Indeed, where a person is curious in raising of his own quick, it is worth while to gather the Haws separately, and sow them apart; and each sort should be planted in a separate hedge, which will render the

7 P hedges

hedges more equal in their growth. If theſe Haws are ſown in the places where they are deſigned to remain for a fence, they will make a much greater progreſs in a few years, than thoſe which are tranſplanted; but as the ſeeds remain a whole year in the ground before the plants appear, few people care to practiſe this method; however, thoſe who are deſirous to raiſe their hedges this way, ſhould bury the Haws, by putting them in pots ſoon after they are ripe, and burying the pots two feet deep in the ground, where they may remain one year, then take them up and ſow them; by this preparation the plants will come up the following ſpring; but before they are ſown, the Haws ſhould be bruiſed with hands, and their outer coverings waſhed off, whereby the ſeeds may be ſown at a more regular diſtance; for as moſt of the Haws incloſe four or five ſeeds, ſo if they are ſown entire there will be as many plants ariſe in a cluſter, which if permitted to ſtand, will prevent each other's growth; and in drawing out the ſuperfluous plants, there will be great danger of injuring thoſe which are to remain.

The next to the white Thorn is the black Thorn, which, though not ſo generally eſteemed as the white, yet it will make an excellent fence, where proper care is taken in the planting and after management of it; and the loppings of this hedge make much the beſt buſhes for draining of Land, and are of longer duration for dead hedges than thoſe of any other ſort of tree, and are very proper to mend gaps in fences; for their branches being beſet with ſharp thorns, the cattle are not ſo apt to crop them as the white Thorn, and ſome other ſorts. Theſe hedges are alſo better, if the ſtones of the Plumbs are ſown on the ſpot where they are to remain, than where the plants are taken from a nurſery; if theſe are ſown in the autumn ſoon after the fruit is ripe, the plants will come up the ſpring following.

The Crab will alſo make a ſtrong durable fence; this may be raiſed by ſowing the kernels in the place where the hedge is deſigned; but then there ſhould be great care taken of the plants while they are young, to keep them clear from weeds, as alſo to guard them from cattle. When theſe ſtocks have obtained ſtrength, ſome of them may be grafted with Apples for cyder, where the fence is not expoſed to a public road; but theſe grafts ſhould not be nearer than thirty-five or forty feet, leſt they ſpoil the hedge, by their heads overgrowing and dripping on it.

The Holly is alſo an excellent plant for evergreen hedges, and would claim the preference to either of the former, were it not for the ſlowneſs of its growth while young, and the difficulty of tranſplanting the plants when grown to a moderate ſize. This will grow beſt in cold ſtony Lands, where, if once it takes well, the hedges may be rendered ſo cloſe and thick, as to keep out all ſorts of animals, and will grow to a conſiderable height, and is of long duration. Theſe hedges may be raiſed, by ſowing the berries, either in the place where they are deſigned to remain, or by planting young plants of three or four years growth; but as the berries continue in the ground an entire year before the plants appear, few perſons care to wait ſo long; therefore the uſual method is, to plant the hedges with plants of the before-mentioned age. But where this is practiſed, they ſhould be tranſplanted, either early in the autumn, or deferred till toward the end of March; then the ſurface of the ground ſhould be covered with mulch near their roots after they are planted, to keep the earth moiſt; and if the ſeaſon ſhould prove dry, the plants ſhould be watered at leaſt once a week, until they have taken root, otherwiſe they will be in danger of miſcarrying; for which reaſon the autumnal planting is generally preferred to the ſpring, eſpecially in dry grounds.

The Alder will alſo make a good hedge, when planted on a moiſt ſoil, or on the ſide of rivers, or large ditches; and will preſerve the bank from being waſhed away, where there are running ſtreams; for they ſpread pretty much at bottom, and ſend forth ſuckers from their roots in great plenty; but theſe hedges ſhould be ſheared at leaſt once a year, in order to make them thick. Theſe Alder hedges are very ornamental, when they are well kept in large gardens; and as they will thrive beſt on wet ſwampy Lands, where many other plants will not live, they ſhould be ſelected for ſuch ſituations.

Of late years the Furz has been much propagated for hedges in ſeveral parts of England, and indeed will make a good fence on poor, ſandy, or gravelly ſoils, where few other plants will grow. The beſt method of raiſing theſe hedges is, to ſow the ſeed about the latter end of March, or the beginning of April, in the place where the hedge is deſigned; for the plants will not bear to be tranſplanted, unleſs it be done while they are young, and then there is great hazard of their taking. The ground where the ſeeds are to be ſown ſhould be well cleanſed of weeds, and the ſurface made light; then there ſhould be two or three drills made (according to the width which the hedge is intended) about half an inch deep, into which the ſeeds ſhould be ſcattered pretty thick; and then the drills ſhould be filled up with the head of a rake, to cover the ſeeds. This work ſhould be performed in dry weather, for if much wet falls ſoon after the ſeeds are ſown, it is apt to burſt them. When the plants are come up, they ſhould be kept clear from weeds, that they may ſpread and grow thick at bottom; and if theſe hedges are ſecured from cattle brouſing on them, and are cut every ſpring juſt before they begin to ſhoot, they will make an exceeding cloſe fence; but where they are deſigned to be cut for fuel, then the beſt way is to let them ſpread in width; and when they are two years old, to cut them down in the ſpring, juſt before they begin to ſhoot, within two or three inches of the ground, which will cauſe them to ſend forth a number of ſhoots from each root, and thereby increaſe the width of the hedge; and by ſo doing, the plants will not run up tall and weak, and be in danger of being weighed down by great falls of ſnow. Theſe hedges when they are well grown, may be cut down every third or fourth year for fuel; wherefore if there is a treble row of Furz ſown, at about three feet apart, they may be cut down alternately, ſo that there will be a fence always remaining. But this is only recommended for ſuch ſandy Lands as lett for a ſmall rent, and where fuel is ſcarce. The beſt ſort of Furz for this purpoſe is the greater kind, commonly called the French Furz, which will grow to eight or ten feet high, and is not apt to ſpread ſo much as the ordinary ſmall ſort.

Elder is ſometimes planted for hedges, being very quick of growth; ſo that if ſticks or truncheons about four or five feet long be thruſt into a bank ſlopewiſe each way, ſo as to croſs each other, and thereby form a ſort of chequer work, it will make a fence for ſhelter in one year. But as this is a vigorous growing plant, it will never form a cloſe fence; and the young ſhoots being very ſoft and pithy, are ſoon broken by cattle or boys in their ſport. Beſides, where they are ſuffered to bear berries, and theſe are ſcattered over the neighbouring Land, they will come up the following ſpring, and become very troubleſome. Where theſe hedges are planted, they may be cut down every third year near the ground; and theſe ſtakes (when diveſted of their bark, ſo as to prevent their growing) will laſt longer in the ground, to ſupport Vines or any other plants, which do not require tall ſtakes, than any other ſort of tree yet known. And where the trees are ſuffered to grow to any conſiderable ſize, the wood is as hard as Box, and therefore very uſeful for turners and inſtrument makers. The beſt ſeaſon for planting theſe truncheons is ſoon after Michaelmas, becauſe the plants ſhoot very early in the ſpring. Of late years there have been many hedges, and other plantations, made of the white berried Elder, for the ſake of their fruit to make wine; which, if rightly made, hath the flavour of Frontiniac wine, and is by ſome perſons mixed with white wines, and vended for it.

There are ſome other plants which have been recommended for fences, but thoſe here enumerated are the moſt uſeful ſorts for ſuch purpoſes; wherefore I ſhall paſs over the others, as not worthy of the care of the huſbandman. And as to the farther directions for planting and preſerving of hedges, with inſtructions for plaſhing or laying them, the reader is deſired to turn to the articles of FENCES and HEDGES, where there are particular directions for theſe works exhibited, which I ſhall not here repeat.

The draining of Land is alſo another great improvement to it; for though meadows and paſtures, which are capable of being overflowed, produce a greater quantity of herbage than dry Land, yet where the wet lies too long upon the ground, the Graſs will be ſour and extremely coarſe; and where there is not care taken in time to drain this Land, it will produce little Graſs, and ſoon be overun with Ruſhes and Flags, ſo as to be of ſmall value. The land which is moſt liable to this, is cold ſtiff clays where the water cannot penetrate, but is contained as in a diſh; ſo that the wet which it receives in winter, continues till the heat of the ſun exhales the greateſt part of it.

The beſt method for draining of theſe Lands is, to cut ſeveral drains acroſs the Land, in thoſe places where the water is ſubject to lodge; and from theſe croſs drains to make a convenient number of other drains, to carry off the water to either ponds or rivers in the lower parts of the Land. Theſe drains need not be made very large, unleſs the ground be very low, and ſo ſituated as not to be near any river to which the water may be conveyed; in which caſe there ſhould be large ditches dug at proper diſtances, in the loweſt part of the ground, to contain the water; and the earth which comes out of the ditches ſhould be equally ſpread on the Land, to raiſe the ſurface. But where the water can be conveniently carried off, the beſt method is, to make under ground drains at proper diſtances, which may empty themſelves into large ditches, which are deſigned to carry off the water. Theſe ſort of drains are the moſt convenient, and as they are hid from the ſight do not incommode the Land, nor is there any ground loſt where theſe are made.

The uſual method of making theſe drains, is to dig trenches, and fill the bottoms with ſtones, bricks, Ruſhes, or buſhes, which are covered over with the earth which was dug out of the trenches; but this is not the beſt method, becauſe the water has not a free paſſage through theſe drains, ſo that whenever there is a flood, theſe drains are often ſtopped by the ſoil which the water frequently brings down with it. The beſt method I have yet obſerved to make theſe drains, is to dig trenches to a proper depth for carrying off the water, which for the principal drains ſhould be three feet wide at their top, and ſloped down for two feet and a half depth, where there ſhould be a ſmall ledge or bank left on each ſide, upon which the croſs ſtakes or bearers ſhould be laid, and below theſe banks there ſhould be an open drain left, at leaſt one foot deep, and ten or eleven inches wide, that there may be room for the water to paſs through. Theſe larger drains ſhould be at convenient diſtances, and ſmaller drains of about ſeven or eight inches wide at top, and the hollow under the buſhes eight or nine inches deep, ſhould be cut acroſs the ground, which ſhould diſcharge the water into theſe larger drains. The number and ſituation of them muſt be in proportion to the wetneſs of the Land; and the depth of the earth above the buſhes, muſt alſo be proportioned to the intended uſe of the Land; for if it is arable Land to be ploughed, it muſt not be ſhallower than fourteen inches, that there may be ſufficient depth for the plough, without diſturbing the buſhes; but for paſture Land, one foot deep will be full enough; for when the buſhes lie too deep in ſtrong Land, they will have little effect, the ground above will bind ſo hard as to detain the wet on the ſurface. When the drains are dug, there ſhould be prepared a quantity of good bruſh wood, the larger ſticks ſhould be cut out to pieces of about ſixteen or eighteen inches in length, which ſhould be laid acroſs upon the two ſide banks of the drain, at about four inches diſtance; then cover theſe ſticks with the ſmaller bruſh wood, Furz, Broom, Heath, or any other kind of bruſh, laying it lengthwiſe pretty cloſe; on the top of theſe may be laid Ruſhes, Flags, &c. and then the earth laid on to cover the whole. Theſe ſort of drains will continue good for a great number of years, and are never liable to the inconveniencies of the other, for the water will find an eaſy paſſage through them; and where there is plenty of bruſh wood, they are made at an eaſy expence; but in places where wood is ſcarce, it would be chargeable to make them: however, in this caſe, it would be a great advantage to theſe Lands, to plant a ſufficient number of cuttings of Willow, or the black Poplar, on ſome of the moiſt places, which would furniſh bruſh wood for theſe purpoſes in four or five years; and as the expence of planting theſe cuttings is trifling, there cannot be a greater advantage to an eſtate which wants draining, than to practiſe this method, which is in every perſon's power, ſince there is little expence attending it.

In countries where there is plenty of ſtone, that is the beſt material for making theſe under ground drains; for when theſe are properly made, they will never want repairing.

The beſt time of the year for making theſe drains is about Michaelmas, before the heavy rains of autumn fall, becauſe at this ſeaſon the Land is uſually dry, ſo that the drains may be dug to a proper depth; for when the ground is wet, it will be very difficult to dig to any depth, becauſe the water will drain in wherever there is an opening in the ground.

When theſe drains are made, and the water carried off the Land, it will be proper to pare off the Ruſhes, Flags, &c. which may be laid in heaps in proper places to rot, and will afford a good manure for the land. The ground muſt alſo be ploughed to deſtroy the roots of noxious weeds, and if it be laid fallow for one ſeaſon, and ploughed two or three times, it will greatly mend the Land. The Ruſhes and Flags which were pared off the ground when rotten, ſhould be ſpread over the ſurface, and the Graſs-feed ſown thereon, which will greatly forward the Graſs, ſo that it may ſoon be brought to a good turf; which Land thus mended, has been lett for four times the rent it was ſet at before.

There are ſome perſons, who, after they have pared off the Flags, Ruſhes, &c. from their Land, lay them in ſmall heaps, and burn them in dry weather, then ſpread the aſhes on the Land to improve it, which is a good method, where a perſon is in haſte to have Graſs again; but where the ground can be fallowed one year, it will looſen the ſoil, and more effectually deſtroy the roots of all noxious weeds; and the Ruſhes, &c. when rotted, will afford a much larger quantity of manure for the Land than when it is burnt: beſides, this can only be practiſed in the ſummer ſeaſon, when the weather is very dry; for if there ſhould fall much rain, the fires will go out, and it will be impracticable to burn it. But where the method of burning is practiſed, the heaps ſhould not be too great, and it ſhould burn very ſlowly; which will render the aſhes a much better manure, than when the fire is too violent, or the heaps too large; for in this caſe, the inner part will be over-burnt before the fire reaches the outſide of the heap.

As the draining of cold wet Lands is a great improvement to them, ſo the floating or watering of dry looſe Land is not a leſs advantage to them. This may be eaſily effected where there are rivers, or reſervoirs of water, which are ſituated above the level of the ground deſigned to be floated, by under ground drains (made after the manner of thoſe before directed for draining of Land,) through which the water may be conveyed at proper ſeaſons, and let out on the ground: in order to this, there muſt be good ſluices made at the heads of the drains, ſo that the water may never get out, but at ſuch times as is required;

for if this be not taken care of, the water, inſtead of improving the Land, will greatly damage it.

But where the Land lies ſo high, as that there is no water in the neighbourhood lying above its level, it will be more expenſive; becauſe in ſuch caſe, the water muſt be raiſed by machines, from reſervoirs or ſtreams which lie below it. The moſt common engine uſed for this purpoſe is the Perſian wheel (which, being well deſcribed and figured in Woolridge's Art of Huſbandry, is needleſs for me here to repeat.) Yet notwithſtanding the expence of raiſing the water, it has been found greatly advantageous in many parts of England, to drown the Lands, for the profit has many times more than doubled the charge.

The time for drowning of Land, is uſually from November till the end of April; but though this is the general practice, yet I cannot approve of it for many reaſons. The firſt is, that by the wet lying continually on the ground in winter, the roots of the finer ſort of Graſs are rotted and deſtroyed; and by letting on the water, at the ſeaſon when the ſeeds of Docks, and other bad weeds, which commonly grow by river ſides, are falling, theſe ſeeds are carried upon the Land, where they remain and grow, and fill the ground with bad weeds, which is commonly the caſe with moſt of the water meadows in England, the Graſs in general being deſtroyed; ſo that Ruſhes, Docks, and other trumpery, make up the burden of theſe Lands: but if theſe meadows were judiciouſly managed, and never floated till March or April, the quantity of ſweet good Graſs would be thereby greatly increaſed, and the beautiful verdure of the meadows preſerved: but there is little hope of convincing thoſe perſons by any arguments, who are ſo much wedded to their own prejudices, as to ſhut their eyes and ears againſt experiments or reaſon. Where the Land is very hot and dry, and it lieth convenient to be watered at a ſmall expence, it ſhould be repeated every week in dry hot weather, which will prove a great advantage to the Land. But whenever this is done, there ſhould no cattle be admitted while it is wet, for they will poach, and ſpoil the turf.

Another great improvement of Land, is by burning of it, which, for ſour, heathy, and ruſhy Land, be it either hot or cold, wet or dry, is a very great improvement; ſo that ſuch Lands will, in two or three years after burning, yield more, excluſive of the charges, than the inheritance was worth before; but this is not to be practiſed on rich fertile Land; for as the fire deſtroys the acid juice, which occaſions ſterility in the poor Land, ſo it will in like manner conſume the good juices of the richer Land, and thereby impoveriſh it, ſo that it hath been with great reaſon diſuſed in deep rich countries.

The uſual method of burning Land is, to pare off the turf with a breaſt plough, turning it over as it is cut, that it may dry the better. And if it proves hot dry weather when this work is done, then it needs no more turning; but if rain ſhould fall, it muſt be turned, and the turfs ſet a little hollow, that they may dry the better; and when they are thorough dry, they may be laid on ſmall heaps, about half a cart load on a heap, or leſs, for the ſmaller the heaps are, provided there is quantity enough to make a good fire, ſo as to conſume the whole to aſhes, it is the better; if the turf be full of fibrous roots, or hath much Moſs or Fern on it, it will burn without any additional fuel; but if it hath not, the heaps ſhould be raiſed on ſmall bundles of Heath, Fern, Gorze, &c. which will ſet the whole on fire; yet there ſhould be no more of theſe things applied, than what is neceſſary to kindle the fire, becauſe the ſlower the turf conſumes, the better will be the aſhes. When the turf is wholly conſumed, the aſhes ſhould be equally ſcattered over the ground in a calm day, leſt the wind ſhould drive it in heaps. Then the Land ſhould be gently ploughed, and the ſeeds ſown thereon; for if the ground is ploughed too deep, the aſhes will be buried too low for the roots of the Graſs or Corn to reach them for a conſiderable time; nor ſhould the aſhes lie too near the ſurface, becauſe then the roots will reach them too ſoon, and the ſtrength of the aſhes will be ſpent to nouriſh only the blade, ſo that the Corn will grow too rank in winter; and when the roots in the ſpring ſtrike down lower, they will meet with a poorer ſoil, nor will the ſtalks and ears have ſo much advantage from the improvement, as the uſeleſs blade. But when care is taken in this particular, it is wonderful what ſucceſs it hath; for by this method the pooreſt plains, and ſour heathy Lands, have been rendered as fertile as almoſt any good cultivated ground whatever.

It is alſo a very great improvement, where Land is overgrown with Broom, Furz, &c. to ſtub them up by the roots, and when they are dry, lay them on heaps, and cover them with the parings of the earth, and burn them, and ſpread the aſhes over the ground. By this method vaſt tracts of Land, which at preſent produce little or nothing to their owners, might be made good at a ſmall expence, ſo as to become good eſtates to the proprietors.

There are ſeveral other methods of improving Land beſide thoſe here mentioned, as by planting of wood, or adapting the ſeveral ſorts of plants to the particular ſoils with which they agree; but as moſt of theſe things are treated of under the ſeveral articles where theſe plants are mentioned, I ſhall forbear to repeat them in this place, but ſhall beg leave to offer a few general hints on the preſent ſituation of the Lands in England, which may probably excite ſome abler hand to undertake a fuller and more complete diſquiſition of this ſubject.

For ſome years paſt, the quantity of Corn raiſed in England, has greatly exceeded the conſumption, ſo that great quantities of Corn have been exported, by which great ſums of money have been brought into England; but this was accidental; for had not the crops failed in the neighbouring countries, there would have been no demand for the produce of England, ſo that the quantity here grown muſt have reduced the price ſo low, as to have almoſt ruined the farming intereſt; nor is it poſſible to contrive any ſcheme, in a country circumſtanced as this, whereby the public may not, at times, ſuffer from the extravagant price, which, in a ſcarcity, this commodity may be raiſed to; or, on the other hand, the farmers are ſometimes almoſt undone by the low price which it is often reduced to in times of plenty; and ſurely there can be no one thing more worthy of the ſerious attention of every perſon, who has the leaſt regard for the public welfare, than this, of always making ſuch proviſion of Corn, againſt accidental ſcarcities, as that the inhabitants may never be diſtreſſed for want of the ſtaff of life, or the price be ſo high, as that the common people cannot purchaſe it. If I am not greatly miſtaken, there has been, within the ſpace of three or four years, ſuch a diſproportion in the price of Corn, as can hardly be conceived, and this within the memory of numbers of perſons; the time I mean is between 1705 and 1709, in the compaſs of which time the peck loaf of fine bread was riſen from fourteen pence to four ſhillings and twopence; the low price of this commodity was as detrimental to the farmers, as the extravagant price was afterward to the public, neither of which would have ſo ſeverely felt the effects, had there been public granaries where the Corn might have been depoſited, and this purchaſed from the farmer, at a price by which he might live, at the public expence, and ſold out again at an eaſy rate in times of ſcarcity; but I fear this is not an age for encouraging any ſcheme for public utility, when in every thing of this kind, however beneficial it may be to the country, and though propoſed as ſuch to the public, if it meets with any reception, it is with a view to turn it to private intereſt; the practice of turning all things into private jobs, has ſo much prevailed of late years, as to have almoſt extinguiſhed every ſocial virtue;

virtue; but I fear I may have incurred the censure of many for this digression; but, be it as it will, I could not omit it, when it so properly came in my way; and as it is from a sincere love and regard to my country, that I have mentioned this, so it may be hoped, that if any harsh expression has been used, it will be forgiven. But to return to my subject; as the quantity of Land now in tillage is very great in England, from the destruction of woods, the ploughing up of downs, the inclosing of commons, &c. so that, unless there happens a failure in the crops of Corn in great part of England, the markets must be so low, as that the farmer will always find it difficult to support his family, and pay his rent; the first must be done, let the landlord fare as he will, for the farmers know, that when the farms are occupied by the landlords, few of them can make the produce of the Land and pay their expence, so that the whole rent of the farm is often sunk, beside the trouble and fatigue of managing the farms; and it is greatly to be feared, from the present condition of the farmers in general, that many landlords will be obliged to undertake this disagreeable affair, which will be the more so, as their Lands will be left without stock, and the soil exhausted, and overgrown with weeds, which will require some years to put into proper condition, and will be attended with great expence.

The extraordinary price which Corn bore some years since, tempted the farmers to break up the downs in many parts of England; and the landlords were brought to comply with the request of the farmer, for the sake of a little advance of the rent, not considering the future consequence of it; so that hereby great extents of downs have been ruined, and not likely to be recovered again; for the soil in many places was not more than four or five inches deep, upon beds of flint or chalk, which, in ploughing, were turned up on the surface, and the little soil which covered them, was in a few years so much exhausted, as not to produce the quantity of grain which was sown upon them; and as there was no probability of procuring dressing for the Lands, the farmers have been obliged to throw them up, which now lie waste, and appear like quarries of flints, or beds of chalk, without Grass, or almost any other plant growing upon them. By this passion for ploughing, the farmers have lessened their stock of cattle, and, of consequence, their quantity of manure has been lessened in proportion, so that they have either been obliged to purchase dressing at a great expence, or destroy their Lands of their vegetative quality: by the former method, when grain bears a low price, the farmer is ruined, and by the latter, every one must know what will be the consequence to both tenant and landlord; therefore it is a matter of great concern to the proprietors of Lands, to see that no more ground in their farms is kept in tillage, than the tenant can supply with dressing, so as to maintain the Land in heart; and that a proper stock of cattle be kept up, in proportion to the size of the farms, which cannot be done where there is not a proportion of pasture kept to that of the arable Land in each farm. There are many persons, who, by a mistake in the article of inclosing Lands, are likely to fall into a great error, by supposing, that the inclosing of commons will be a great advantage to their estates, and perhaps there may be tenants on their estates, who may encourage the gentlemen so to do, from a present interest of their own; but wherever this has been done, the estates have soon fallen in their rents, much lower than the addition made by inclosing the commons, which must always be the case; for if there is not common pasture, where the farmers can turn out their cattle in summer, it cannot be supposed they can keep up a stock of live cattle upon their inclosed pasture; so that, although the dividing and inclosing the Lands in the common fields would be a very great benefit, yet the destroying of pasture commons would on the other extreme be a national disadvantage and loss. There are many other particulars, which might be here enumerated, to shew the cause of the low condition of the farmers in general; but these few hints may probably lead some persons of abler heads to the consideration of this affair, so I shall not enlarge upon them here.

LANIGEROUS TREES are such as bear a woolly or downy substance, as is commonly contained in the katkins of Willows, &c.

LANTANA. Lin. Gen. Plant. 683. Camara. Plum. Nov. Gen. 32. tab. 2. American Viburnum, or Camara.

The CHARACTERS are,

*The empalement of the flower is cut into four segments. The flower is monopetalous, of an irregular shape, having a cylindrical tube, which extends beyond the empalement, and is spread open at the brim, where it is divided into five segments. In the center of the flower is situated the pointal, supporting a crooked stigma, attended by four stamina, two being longer than the other. The pointal afterward changes to a roundish fruit, opening into two cells, and inclosing a roundish seed.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, which includes those plants whose flowers have two long and two shorter stamina, and the seeds are inclosed in the capsule.

The SPECIES are,

1. LANTANA (*Aculeata*) foliis oppositis, caule aculeato ramoso, floribus capitato-umbellatis. Lin Sp. 874. *Lantana with leaves growing opposite, a branching prickly stalk, and umbellated flowers growing in heads.* Viburnum Americanum odoratum, urticæ foliis latioribus spinosum, floribus miniatis. Pluk. Alm. 285. tab. 223. *Sweet prickly American Viburnum, with broad Nettle leaves, and carmine flowers.*
2. LANTANA (*Inerma*) caule inermi, foliis lanceolatis dentatis alternis, floribus corymbosis. *Lantana with a smooth stalk, spear-shaped indented leaves placed alternate, and flowers growing in round bunches.* Periclymenum rectum, salviæ foliis majoribus oblongis, mucronatis, subtus villosis, alternatim sitis, flore & fructu minoribus. Sloan. Cat. Jam. 164. *Upright Honeysuckle with larger, oblong, acute-pointed Sage leaves, which are hairy on their under side, placed alternate, and a smaller flower and fruit.*
3. LANTANA (*Lanuginosa*) caule ramoso lanuginoso, foliis orbiculatis crenatis oppositis, floribus capitatis. *Lantana with a hairy branching stalk, round crenated leaves placed opposite, and flowers collected in heads.* Periclymenum rectum, salviæ folio rugoso minore, subrotundo. Cat. Jam. 164. *Upright Honeysuckle with a smaller rough roundish leaf.*
4. LANTANA (*Trifolia*) foliis ternis, caule inermi spicis oblongis imbricatis. Lin. Sp. Plant. 873. *Lantana with leaves placed by threes round the stalk, without spines, and oblong imbricated spikes of flowers.* Camara trifolia, purpurascente flore. Plum. Nov. Gen. 32. *Three-leaved Camara, with a purplish flower.*
5. LANTANA (*Urticæfolia*) caule aculeato, foliis oblongo-cordatis serratis oppositis, floribus corymbosis. *Lantana with a prickly stalk, oblong, heart-shaped sawed leaves, and flowers growing in a corymbus.* Periclymenum rectum urticæ folio hirsuto majore, flore flavo. Sloan. Cat. Jam. 163. *Upright Honeysuckle with a larger Nettle leaf, and a yellow flower.*
6. LANTANA (*Camara*) caule inermi, foliis ovato-lanceolatis, serratis, rugosis, floribus capitatis lanuginosis. *Lantana with a smooth stalk, oval, spear-shaped, rough, sawed leaves, and flowers growing in woolly heads.* Periclymenum rectum, salviæ folio rugoso, majore, subrotundo & bullato. Sloan. Cat. Jam. 163. *Upright Honeysuckle with a large, rough, Sage leaf, which is roundish and studded.*
7. LANTANA (*Bullata*) foliis oblongo-ovatis acuminatis serratis rugosis alternis, floribus capitatis. *Lantana with oblong, oval-pointed, sawed leaves, which are rough, placed alternate, and flowers growing in heads.* Periclymenum rectum, salviæ folio rugoso, minore, bullato, flore

flore albo. Sloan. Cat. 163. *Upright Honeyſuckle with a ſmaller rough Sage leaf, which is ſtudded, and a white flower.*

8. Lantana (*Alba*) caule inermi, foliis ovatis ſerratis, floribus capitatis alaribus ſeſſilibus. *Lantana with a ſmooth ſtalk, oval ſawed leaves, and flowers growing in heads proceeding from the wings of the leaves, ſitting cloſe to the ſtalks.* Camara foliis urticæ, floribus minoribus albis, ex alis foliorum prodeuntibus. Houſt. *Camara with a Nettle leaf, and ſmaller white flowers proceeding from the wings of the leaves.*

9. Lantana (*Annua*) foliis quaternis, caule aſpero, ſpicis oblongis. *Four-leaved Lantana with a rough ſtalk, and oblong ſpikes of flowers.* Periclymenum rectum humilius, folio rugoſo majore, flore purpureo, fructu oblongo, eſculento purpureo. Sloan. Cat Jam. 164. *Lower upright Honeyſuckle with a larger rough leaf, a purple flower, and an oblong, purple, eſculent fruit.*

10. Lantana (*Anguſtifolia*) caule inermi, foliis ovato-lanceolatis oppoſitis, floribus capitatis pedunculis longiſſimis. *Lantana with a ſmooth ſtalk, oval ſpear-ſhaped leaves placed oppoſite, flowers collected in heads, and very long foot-ſtalks.* Periclymenum rectum, ſalviæ folio rugoſo, longo & anguſtiſſimo. Sloan. Cat. 164. *Upright Honeyſuckle with a rough Sage leaf, which is long and narrow.*

11. Lantana (*Africana*) foliis alternis ſeſſilibus, floribus ſolitariis. Hort. Cliff. 320. *Lantana with alternate leaves ſitting cloſe to the ſtalks, and flowers growing ſingly.* Jaſminum Africanum, illicis folio, flore ſolitario ex foliorum alis proveniente albo. Com. Plant. Rar. 6. tab. 6. *African Jaſmine with an Ilex leaf, and a ſolitary white flower coming from the wing of the leaves.*

12. Lantana (*Salvifolia*) foliis oppoſitis ſeſſilibus, floribus racemoſis. Lin. Sp. 875. *Lantana with leaves placed oppoſite cloſe to the ſtalks, and flowers in a racemus.* Frutex Africanus, foliis conjugatis ſalviæ anguſtis, floribus hirſutis. Herm. Afr. 10.

The firſt ſort is pretty common in thoſe Engliſh gardens, where there are collections of exotic plants; this grows naturally in Jamaica, and moſt of the other iſlands in the Weſt-Indies, where it is called wild Sage, as are ſeveral of the other ſorts which are not diſtinguiſhed by the inhabitants. It riſes with a woody ſtalk five or ſix feet high, ſending out many branches, which have four angles, armed with ſhort crooked ſpines. The leaves are placed oppoſite; they are oval, ſpear-ſhaped, about an inch and a half long, and three quarters of an inch broad, hairy, and ſtand upon ſhort foot-ſtalks; toward the end of the branches the flowers come out from the wings of the ſtalks, two foot-ſtalks ariſing from the ſame joint, one on each ſide; they are near two inches long, and are terminated by roundiſh heads of flowers, thoſe which are on the outſide and form the border, are firſt of a bright red, or ſcarlet colour; theſe change to a deep purple before they fall. Thoſe flowers which are in the center are of a bright yellow, but after ſome time fade to an Orange colour. The flowers are ſucceeded by roundiſh berries, which, when ripe, turn black, having a pulpy covering over a ſingle hard ſeed. This plant in the Weſt-Indies continues to flower moſt part of the year; but in England they begin to flower in June, and continue in ſucceſſion till near Chriſtmas, and the early flowers are ſucceeded by ripe ſeeds.

The ſecond ſort grows naturally in Jamaica; this riſes with a ſlender, ſmooth, ſhrubby ſtalk, about four feet high, dividing into many ſmall quadrangular branches which grow erect, garniſhed with ſpear-ſhaped leaves about two inches long, and one inch broad, indented on their edges, and hoary on their under ſide, ſtanding alternate upon ſhort foot-ſtalks. Toward the end of the branches the foot-ſtalks of the flowers ariſe alternately from the wings of the leaves; theſe are very ſlender, and ſupport ſmall heads of pale purple flowers, which are ſucceeded by ſmall purple berries, each having one ſeed. This flowers at the ſame time with the former ſort. The ſeeds of this ſort were firſt ſent me by the late Dr. Houſtoun, from La Vera Cruz, but I have ſince received them from Jamaica.

The third ſort was ſent me from La Vera Cruz, by the late Dr. Houſtoun; this riſes with a ſhrubby ſtalk about three feet high, dividing into ſeveral upright branches. The leaves are oblong, and ſawed on their edges, ſtanding oppoſite, on the lower part of the branches, but toward the upper part they are placed by threes round the branches. The foot-ſtalks of the flowers come out from the wings of the leaves; they are near three inches long, ſuſtaining an oblong ſpike of purple flowers, which come out from imbricated ſcales, which end in acute points. The flowers are ſucceeded by pretty large purple berries. This flowers at the ſame time with the former ſorts.

The ſeeds of the fourth ſort were ſent me from the Havanna, by the late Dr. Houſtoun; this riſes with a ſhrubby ſtalk about three feet high, covered with a gray bark, which is woolly. It divides into branches by pairs, which are garniſhed with round leaves, indented on their edges, whoſe upper ſurface is corrugated and rough, like thoſe of Sage; they are placed oppoſite, ſtanding upon ſhort foot-ſtalks. At the end of the branches ariſe the foot-ſtalks of the flowers, which are ſhort, and ſuſtain a globular head of purple flowers; theſe are ſucceeded by pretty large purple berries containing one ſeed. This flowers at the ſame time with the former ſorts.

There is a variety of this with white flowers, whoſe leaves are not quite ſo round, nor are they crenated on their edges; but I ſuſpect they both come from the ſame ſeeds, ſo I have not enumerated it as a diſtinct ſpecies.

The fifth ſort was ſent me from La Vera Cruz, by the late Dr. Houſtoun; this riſes with a woody branching ſtalk four or five feet high, garniſhed with oblong heart-ſhaped leaves, which are ſawed on their edges, and end in acute points. At the end of the branches the flowers come out in round bunches, ſtanding upon ſlender upright foot-ſtalks, about one inch long. The flowers are yellow, and grow in looſer bunches or heads than thoſe of the former ſorts, but flowers at the ſame time.

The ſixth ſort riſes with a woody branching ſtalk five or ſix feet high, covered with a dark brown bark. The branches are more divided than thoſe of the other ſorts, and are much more ligneous. The leaves are two inches and a half long, and one inch and a quarter broad, deeply ſawed on their edges, and their upper ſurface very rough, and many of them cloſely ſet with white prominent ſpots as if ſtudded; theſe are placed alternately on the branches. The flowers come out from the wings of the ſtalk, ſtanding upon pretty long foot-ſtalks; they are white, and are collected in ſmall woolly heads. This flowers about the ſame time with the former ſorts.

The ſeventh ſort riſes with a branching ſhrubby ſtalk about four feet high, covered with a dark brown bark, and garniſhed with ſmall, oblong, oval leaves, ending in acute points; they are an inch long, and half an inch broad, very much veined on their upper ſide, ſtanding alternately pretty cloſe to the branches. The flowers come out at the end of the branches upon ſhort foot-ſtalks, in cloſe ſmall heads; theſe are white, and make but little appearance. It flowers at the ſame time with the former.

The eighth ſort was ſent me by the late Dr. Houſtoun, from Campeachy; this hath a ſlender ſhrubby ſtalk which riſes three or four feet high, dividing into many ſlender, ſmooth, ſquare branches, which are garniſhed with ſmall, oval, ſawed leaves placed oppoſite; from the wings of the ſtalk, at every joint, come out the flowers; they are ſmall, white, and are collected in cloſe heads; theſe come out by pairs, and ſit cloſe to the branches. This flowers at the ſame time with the former.

The ninth ſort is annual; this was firſt ſent me by the late Dr. Houſtoun from La Vera Cruz, but I have ſince received the ſeeds from the north ſide of the iſland of Jamaica; it riſes with a ſtrong, upright, rough

rough stalk near three feet high, dividing toward the top into two or three erect branches, which are garnished with oblong, oval, sawed leaves, ending in acute points; they are placed by fours at each joint, and are a little woolly on their under side. The flower-stalks arise by pairs, and sometimes three come out at the same joint; they are from two to three inches long, and sustain a thick spike of large purple flowers, which are succeeded by large purple berries that are very succulent, and are frequently eaten by the inhabitants. This sort flowers in July, provided the plants are raised early in the spring and brought forward, and the seeds will ripen in autumn, soon after which the plants decay.

The tenth sort grows naturally in Jamaica, from whence the late Dr. Houstoun sent me the seeds; this rises with a slender, smooth, branching stalk three feet high. The branches are garnished with oval spear-shaped leaves two inches long, and one inch broad; they are crenated on their edges, and rough on their upper side, standing by pairs opposite, upon very short foot-stalks, having an agreeable odour. The flowers come out from the wings of the stalk, upon very long foot-stalks; they are placed opposite the whole length of the young branches, sustaining small round heads of white flowers; these appear at the same time with the other sorts, but rarely produce seeds in England.

These plants are all of them easily propagated by cuttings except the ninth, which is an annual plant, so can only be propagated by seeds. They may also be propagated by seeds, which several of the sorts produce in England, and the others may be easily procured from the West-Indies, where there are a greater variety of these plants growing naturally, than are at present known in Europe; they are all of them called Wild Sage, by the inhabitants of the British Islands, but they do not distinguish the sorts. These seeds should be sown in pots filled with light earth, and plunged into a hot-bed of tan; the reason for my advising them to be sown in pots, is, because the seeds frequently remain long in the ground before they vegetate; therefore if the plants should not come up the same year, the pots should be placed in the stove in winter, and the following spring plunged into a new hot-bed, which will bring up the plants. When these are fit to remove they should be each planted in a small pot, and plunged into another hot-bed, observing to shade them till they have taken new root; then they should have air admitted to them every day, in proportion to the warmth of the season, to prevent their being drawn up with weak stalks; afterward they must be treated in the same manner as other plants from the same country, till they have obtained strength; then they may be removed into an airy glass-case, or a dry stove, where they may have a large share of air in warm weather, but protected from the cold. This is necessary for the young plants, which should not the first year be exposed to the open air, but afterward they may be placed abroad in the warmest part of summer, and in winter placed upon stands in the dry stove, where they will continue long in flower, and many of the sorts will ripen their seeds; but in winter they should be sparingly watered, for much moisture will rot their roots.

If they are propagated by cuttings, the best time for planting them is in July, after the plants have been exposed to the open air for about a month, by which time the shoots will be hardened so as to be out of danger of rotting with a little moisture. These cuttings should be planted in small pots filled with light earth, and plunged into a moderate hot-bed; and if they are screened from the violence of the sun in the middle of the day, they will be rooted in about six weeks time, when they must be hardened gradually to bear the open air, and afterward treated as the old plants.

The eleventh sort has been long in the English gardens, and is commonly called the Ilex-leaved Jasmine. This sort rises with a shrubby stalk five or six feet high, sending out many irregular branches, which are closely garnished with thin oval leaves ending in points, and sawed on their edges, which embrace the branches with their base, and from the bosom of each leaf comes out one solitary white flower, which is cut at the top into five parts, and at first sight has the appearance of a Jasmine flower; but when closer viewed, the tube will be found curved in the same manner with those which Dr. Linnæus titles ringent flowers. The flowers are not succeeded by seeds in England, but the plants are easily propagated by cuttings, which, if planted upon an old hot-bed any time in July, and covered with a bell or hand-glass, and shaded from the sun, will put out roots in a month or five weeks; then they may be planted in pots, and placed in the shade till they have taken fresh root; after which they may be removed to a sheltered situation, where they may remain till the frosts come on. This plant was brought from the Cape of Good Hope, so is not very tender, therefore may be preserved in a good green-house in winter; but during that season it must have a large share of air in mild weather, otherwise it is apt to grow mouldy, and this will cause the tender branches to decay. In the summer season it may be exposed in the open air, with other green-house plants, in a sheltered situation, where it will add to the variety; and although the flowers are small, and are produced singly from between the leaves, so do not make any great appearance; yet as there is a succession of these flowers most part of the year, and the leaves continuing green throughout the year, it is rendered worthy of a place in every collection of plants.

The last sort is a native of Africa; this rises with a shrubby four-cornered stalk eight or ten feet high, covered with a pale loose bark, sending out many side branches, garnished with rough leaves five or six inches long, whose base embrace the stalks, but they end with sharp points, and are downy on their under side; the branches are terminated by loose spikes of pale purple flowers, covered with a meally down; these appear in summer, but are rarely succeeded by seeds in England.

This is propagated by cuttings in the same manner as the eleventh sort, and the plants require the same treatment.

LANUGINOUS, signifies downy, or to be covered with a soft down, as a Quince.

LAPATHUM. See Rumex.

LAPSANA. Lin. Gen. Plant. 823. Lampsana & Rhagadiolus. Tourn. Inst. R. H. 479. tab. 272. Nipplewort.

The Characters are,

*The flower is composed of several hermaphrodite florets, which are included in one common imbricated empalement. The florets have one petal, which is tubulous and stretched out at the top, in shape of a tongue; these have each five short hairy stamina, terminated by cylindrical summits which coalesce. The germen is situated at the bottom of the floret, supporting a slender style, crowned by a reflexed bifid stigma; the germen afterward becomes an oblong three-cornered seed, situated in the scale of the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, intitled Syngenesia Polygamia Æqualis, in which he ranges those plants with hermaphrodite flowers which are fruitful, whose stamina and style are connected together; and to this genus he has joined the Rhagadiolus and Zacintha of Tournefort, making them only species of the same genus.

The Species are,

1. Lapsana (*Communis*) calycibus fructûs angulatis, pedunculis tenuibus ramosissimis. Hort. Cliff. 384. *Nipplewort with angular empalements to the fruit, and very narrow branching foot-stalks.* Lampsana. Dod. p. 675. *Common Nipplewort.*

2. Lapsana (*Rhagadiolus*) calycibus fructûs undique patentibus, radiis subulatis, foliis lyratis. Hort. Upsal. 245. *Nipplewort with empalements to the fruit spreading open every way, awl-shaped rays, and spear-shaped undivided*

vided

*vided leaves.* Rhagadiolus alter. Cæfalp. 511. *Another Rhagadiolus.*

3. Lapsana (*Lampsanæfoliis*) calycibus fructûs undique patentibus, radiis fubulatis, foliis lyratis. Hort. Upfal. 245. *Nipplewort with empalements to the fruit fpreading open every way, awl-fhaped rays, and harp-fhaped leaves.* Rhagadiolus Lampfanæ foliis. Tourn. Cor. 36. *Rhagadiolus with a Nipplewort leaf.*

4. Lapsana (*Zacintha*) calycibus fructûs torulofis depreffis obtufis feffilibus. Lin. Sp. Plant. 811. *Nipplewort with a depreffed knotted empalement which is obtufe, and fits clofe to the branches.* Zacintha five cichorium verrucarium. Tourn. Inft. 476. *Zacintha, or warted Cichory.*

The firft fort is a common weed, which grows by the fide of foot-paths and hedges in moft parts of England, fo is not permitted to have room in gardens.

The fecond and third forts grow naturally in Portugal, from whence I have received their feeds. Thefe are annual plants, of no beauty or ufe, but are preferved in botanic gardens for the fake of variety. If the feeds of thefe are permitted to fcatter, the plants will come up without trouble, and two or three of them will be enough to leave to keep the forts.

The fourth fort grows naturally in Italy; this is alfo an annual plant, of neither ufe or beauty, but is like the others kept for variety. If the feeds of this fort fcatter in the autumn, the plants will come up better than if fown in the fpring. The plants require no culture, but will thrive like weeds.

LARIX. Tourn. Inft. R. H. 586. tab. 353. Pinus. Lin. Gen. Plant. 956. The Larch-tree; in French, *Melefe.*

The Characters are,

*It hath male and female flowers growing feparate on the fame tree. The male flowers are difpofed in a fcaly katkin; thefe have no petal, but a great number of ftamina which are connected in a column below, but are feparated at their points, and are terminated by erect fummits. The female flowers are difpofed in a conical fhape, having no petals; thefe are placed by pairs under each fcale, having a fmall germen, fupporting an awl-fhaped ftyle, crowned by a fingle ftigma. The germen afterward becomes a nut with a membraneous wing, inclofed in the fcales of the cones.*

This genus of plants is ranged in the ninth fection of Linnæus's twenty-firft clafs, intitled Monœcia Monodelphia, the fame tree having male and female flowers in different parts, and the ftamina of the male flowers are united in one clufter. Dr. Linnæus has joined this genus, and the Abies of Tournefort, to the genus of Pinus, which, according to his fyftem, may very well be brought together; but as Tournefort and all former botanifts have feparated them by the form of their leaves, thofe of the Abies coming out fingle from the branches, thofe of the Pine coming out by two, three, or five out of each fheath, and thofe of this genus arifing in clufters in the bottom, but are fpread above like a painter's pencil; fo thefe diftinctions being pretty generally known by gardeners, I have chofen to continue them under their former feparate titles to prevent confufion.

The Species are,

1. Larix (*Decidua*) foliis deciduis, conis ovatis obtufis. *Larch-tree with deciduous leaves, and oval obtufe cones.* Larix folio deciduo, conifera. J. B. 1. p. 265. *Common Cone-bearing Larch-tree.*

2. Larix (*Chinenfis*) foliis deciduis, conis mucronatis fquamis acutis. *Larch-tree with deciduous leaves, and pointed cones having acute fcales.*

3. Larix (*Cedrus*) foliis acutis perennantibus, conis obtufis. *Larch-tree with acute evergreen leaves and obtufe cones.* Cedrus conifera, foliis laricis. C. B. P. 490. *Cone-bearing Cedar with a Larch-tree leaf, or the Cedar of Lebanus.*

The firft fort grows naturally upon the Alps and Apennines, and of late years has been very much propagated in England. This tree is of quick growth, and will rife to the height of fifty feet; the branches are flender, and their ends generally hang downward. Thefe are garnifhed with long narrow leaves, which arife in clufters from one point, and fpread open above like the hairs of a painter's brufh; they are of a light green, and fall away in autumn like other deciduous trees. In the month of April the male flowers appear, which are difpofed in form of fmall cones; the female flowers are collected into oval obtufe cones, which in fome fpecies have bright purple tops, and in others they are white: thefe differences are accidental, for I have found the feeds taken from either of thefe varieties, will produce plants of both forts; the cones are about one inch long, obtufe at their points, and the fcales lie over each other, and are fmooth; under each fcale there is generally lodged two feeds which have wings.

There are two other varieties of this tree, one of which is a native of America, and the other of Siberia; the latter requires a colder climate than England, for they are very apt to die in fummer here, efpecially if they are planted on a dry foil. The cones of this fort which have been brought to England, feem to be in general larger than thofe of the common kind; but there is fo little difference between the trees in their characteriftic notes, as not to be diftinguifhed as different fpecies, though by the growth of the trees there is a remarkable difference.

The cones of the fecond fort were fent from China, to the Right Hon. the Earl of Northumberland, who was fo good as to communicate fome of the feeds to me, which were fown in the Chelfea garden, where they fucceeded, as they alfo did in his Lordfhip's garden at Stanwick. The cones of this fort were much larger than thofe of the common fort, and ended in acute points; the fcales were prominent like thofe of the Scotch Pine, and had fo little refemblance to thofe of the Larch, as that every one who faw them, imagined they were a fort of Pine; they were titled, Fir good to keep up banks. As thefe plants make but little progrefs the firft year, fo they were weak, and in the autumn cafting off their leaves, they were fuppofed to be dead, and moft of the plants were thereby loft; but thofe which efcaped, afterward fhot their branches out horizontally, fpreading clofe to the ground, and by their prefent appearance, feem to be a fhrub which never will rife upright. This fort is fo hardy, as to thrive in the open air without any protection.

The common Larch is now very plenty in moft of the nurferies in England, and of late years there has been great numbers of the trees planted; but thofe which have been planted in the worft foil and in bad fituations, have thriven the beft; for where trees of equal fize have been planted in good garden earth at the fame time, the others on the cold ftiff land, have in twelve years been twice the height of thofe planted in good ground; which is an encouragement to plant thefe trees, fince they will thrive in the moft expofed fituations, provided they are planted in clumps near each other, and not fingle trees; nor fhould the plants which are planted in very open expofed places be taken from warm nurferies, but rather raifed as near to the fpot where they are to remain as poffible; nor fhould the plants be more than three or four years growth when planted, where they are defigned to grow large; for though trees of greater fize will remove very well, and grow feveral years as well as if they had not been tranfplanted; yet after twenty or thirty years growth they will frequently fail, where the young planted trees have continued very vigorous.

Thefe trees are raifed from feeds, which moft years ripen well in England; the cones fhould be gathered about the end of November, and kept in a dry place till the fpring, when they fhould be fpread on a cloth and expofed to the fun, or laid before a fire, which will caufe the fcales of the cones to open and emit their feeds. Thefe feeds fhould be fown on a border expofed to the eaft, where the morning fun only comes on it; or if they are fown on a bed more expofed to the fun, they fhould be fcreened with mats from the fun in the middle of the day; for when the plants firft appear above ground, they are very impatient of heat;

and

and when the bed is much exposed to the sun, the surface of the ground will dry so fast, as to require to have water very often, which frequently rots the tender stems of the plants; which will be prevented by properly shading them while young, and afterward they will be in no danger. These young plants should be constantly kept clean from weeds, and if they have made good progress, they may be transplanted the following autumn, otherwise they may remain in the seed-bed another year, especially if the plants are not too close together. When they are transplanted, it should be performed in the autumn as soon as their leaves decay; they may be planted in beds at about six inches asunder each way, which will be distance enough for the growth of the plants the two following years, by which time they will be fit to transplant where they are to remain.

When the young trees are planted out for good, they need not be more than eight or ten feet distant from each other, always planting them closer on exposed situations, than where they are more defended; after the trees are planted, they will require no other care but to keep them clean from weeds for three or four years till the trees have obtained strength, when they will over-top the weeds and prevent their growth; but the ground between these trees should not be dug, for that I have found has greatly stopped their growth.

The Siberian Larch is of slow growth in this country, for when the spring is mild, the trees will begin to shoot in February, or early in March; and there are frequently sharp frosts after, whereby these shoots are often killed, and this stops the growth of the trees. Likewise when they are planted on a warm dry soil, they are frequently killed by drought in the summer; therefore this is a very improper tree for this country, unless for some cold, moist, peaty land, where they may probably thrive, and in such situations few other trees will grow.

The American or black Larch, thrives pretty well upon moist land, but on dry ground will make but little progress. A few of these trees by way of variety, may be allowed to have place in every collection of trees designed for pleasure; but for profit, the common Larch is to be preferred to any other species.

In Switzerland, where these trees abound, and they have a scarcity of other wood, they build most of their houses with it; and great part of their furniture is also made of the wood, some of which is white, and some red, but the latter is most esteemed. The redness of the wood is by some supposed to be from the age of the trees, and not from any difference between them, but is rather owing to the quantity of turpentine contained in them. They frequently cut out the boards into shingles of a foot square, with which they cover their houses, instead of tiles or other covering; these are at first very white, but after they have been two or three years exposed, become as black as charcoal; and all the joints are stopped by the resin, which the sun draws out from the pores of the wood, which is hardened by the air, and becomes a smooth shining varnish, which renders the houses so covered impenetrable to either wind or rain; but as this is very combustible, the magistrates have made an order of police, that the houses so covered should be built at a distance from each other to prevent fire, which has often done great damage in villages.

In most countries where this wood is in plenty, it is preferred to all the kinds of Fir for every purpose; and in many places there are ships built of this wood, which they say are durable; therefore this may be a very proper tree for planting upon some of the cold barren hills in many parts of England, which at present produce nothing to their proprietors, and in one age may be large estates to their posterity, and a national advantage; which might be effected without a great expence, where the business is properly conducted.

The best method for doing this, would be by making small nurseries on or near the place where the plantation is intended to be made, in those nurseries the seeds should be sown; and if there are any poor cottagers there, these may be employed in raising of the plants, keeping of them clean, and afterward in transplanting them. This will lessen the number of indigent poor, and by employing them in this sort of husbandry, they may be brought to have a love and regard for trees of their own planting, so will not be tempted to destroy them themselves, or suffer others to do it; and as the season for planting happens at a time of year when the farmers have little employment for their labourers, so the finding them useful employment this way, will be of infinitely more advantage than the giving them alms from the parish; and the children may be taught to weed and keep the young plants clean in summer, whereby they may be rendered useful, and kept from being burdensome to the parishes.

From the Larch-tree is extracted the Venice turpentine, which the inhabitants of the valley of St. Martin near Lucern, make a considerable merchandize of. They collect this by boring holes in the trunk of the trees, at about two or three feet from the ground, into which they fix narrow troughs about twenty inches long; the end of these are hollowed like a ladle, and in the middle is a small hole bored for the turpentine to run into a receiver, which is placed below it; as the turpentine runs from the trees, it passes along the sloping gutter or trough to the ladle, and from thence runs through the holes into the receiver. The people who gather this visit the trees morning and evening, from the end of May to September, to collect the turpentine from out of the receivers.

The third sort is the Cedar of Libanus, which is a tree of great antiquity; and what is remarkable, this tree is not found as a native in any other part of the world, so far as hath come to our knowledge.

The cones of this tree are frequently brought from the Levant, which, if preserved entire, will preserve their seeds good for several years. The time of their ripening is commonly in the spring, and so consequently are near one year old before we receive them, for which they are not the worse, but rather the better; the cones having discharged a great part of their resin by lying, and the seeds are much easier to get out of them than such as are fresh taken from the tree.

The best way to get the seeds out is to split the cones, by driving a sharp piece of iron through the center lengthways, which will split the cone; then you may pull the seeds out with your fingers, which you will find are fastened to a thin leafy substance called wings, as are those of the Fir-tree: but before the seeds are taken out, it will be proper to put the cones in water for twenty-four or thirty hours, which will render them easier to split, so that the seeds may be taken out with greater safety; for there will require care in the doing of it, otherwise many of the seeds will be spoiled, as they are very tender, and will bruise where there is any force employed to get them out.

These seeds should be sown in boxes or pots of light fresh earth, and treated as was directed for the Firs (to which I refer the reader) but only shall observe, that these require more shade in summer while young than the Firs, and should be frequently refreshed with water.

When the plants come up they must be guarded from the birds, otherwise they will pick off their tops, as they do of the young Firs where they are not guarded; they must also be constantly kept clean from weeds, and not placed under the drip of trees. The plants may remain in these boxes or pots in which they were sown till the following spring, but it will be proper to place them under a frame in winter, or cover them with mats; for while they are young they are in danger of losing their tops, if they are pinched by frost, for the young plants often shoot late in the autumn. In the spring, before the plants begin to shoot, they should be carefully taken up and transplanted into beds at about four inches distance, closing the earth

gently to their roots; these beds should be arched over with hoops, and covered with mats in the heat of the day, to shade the plants from the sun till they have taken new root; and if the nights prove frosty, it will be proper to keep the mats over them in the night, but in cloudy or moist weather they must be always open. After the plants are well rooted, they will require no other care but to keep them clean from weeds, unless the season should prove very dry, in which case it will be proper to give them some water once or twice a week; but it must be but in small quantities, for too much wet is often very injurious to them; so that it will be better to screen them from the sun in hot weather, to prevent the earth from drying too fast, or cover the surface of the ground with moss to keep it cool, than to water the plants often.

In these beds the plants may stand two years, then they should be either transplanted to the places where they are designed to remain, or to a nursery where they may grow two years more; but the younger these plants are when they are planted out for good, the better the trees will thrive, and the longer they will continue.

When these plants begin to shoot strong, you will generally find the leading shoot incline to one side; therefore, if you intend to have them strait, you must support them with stakes, observing to keep the leader always close tied up, until you have got them to the height you design them, otherwise their branches will extend on every side, and prevent their growing tall.

These trees are by many people kept in pyramids, and sheared as Yews, &c. in which form they lose their greatest beauty; for the extension of the branches is very singular in this tree, their shoots for the most part are declining, and thereby shewing their upper surface, which is constantly clothed with green leaves in so regular a manner, as to appear at some distance like a green carpet; and these waving about with the wind, make one of the most agreeable prospects that can be to terminate a vista, especially if planted on a rising ground.

It is matter of surprise to me, that this tree hath not been more cultivated in England formerly, for till within a few years past, there were but few here; since it would be a great ornament to barren bleak mountains, where few other trees will grow so well, it being a native of the coldest parts of Mount Libanus, where the snow continues great part of the year. And from the observations I have made of those now growing in England, I find they thrive best on the poorest soil; for such of them as have been planted in a strong, rich, loamy earth, have made but a poor progress, in comparison to such as have grown upon a stony meagre soil. And that these trees are of quick growth, is evident from four of them now growing in the physic garden at Chelsea, which (as I have been credibly informed) were planted there in the year 1683, and at that time were not above three feet high; two of which trees are at this time (viz. 1766) upwards of twelve feet and a half in girt, at two feet above ground, and their branches extend more than twenty feet on every side their trunks; which branches (though they are produced twelve or fourteen feet above the surface) do at every termination hang very near the ground, and thereby afford a goodly shade in the hottest season of the year.

The soil in which these trees are planted, is a lean hungry sand mixed with gravel, the surface of which is scarcely two feet deep before a hard rocky gravel appears. These trees stand at four corners of a pond, which is bricked up within two feet of their trunks, so that their roots have no room to spread on one side, and consequently are cramped in their growth; but whether their standing so near the water may not have been advantageous to them, I cannot say, but sure I am, if their roots had had full scope in the ground, they would have made a greater progress. I have also observed, that lopping or cutting of these trees is very injurious to them (more, perhaps, than to any other of the resinous trees) in retarding their growth; for two of the four trees above-mentioned, being unadvisedly planted near a green-house, when they began to grow large had their branches lopped, to let the rays of the sun into the house, whereby they have been so much checked, as at present they are little more than half the size of the other two.

These trees have all of them produced, for several years, large quantities of katkins (or male flowers,) though there are but three of them which have as yet produced cones; nor is it above thirty-five years that these have ripened their cones, so as to perfect the seed; but now the seeds which fall out of the cones on the ground near them, produce plants in plenty, which come up naturally without care: and since we find that they are so far naturalized to our country as to produce ripe seeds, we need not fear being soon supplied with enough, without depending on those cones which are brought from the Levant; as there are many trees of this kind in England, which already do, and abundance more which in a few years must certainly bear: but I find they are more subject to produce and ripen their cones in hard winters than in mild ones; which is a plain indication, that they will succeed, even in the coldest parts of Scotland, where, as well as in England, they might be propagated to great advantage.

What we find mentioned in scripture of the lofty Cedars, can be no ways applicable to the stature of this tree; since, from the experience we have of those now growing in England, as also from the testimony of several travellers, who have visited those few remaining trees on Mount Libanus, they are not inclined to grow very lofty, but, on the contrary, extend their branches very far; to which the allusion made by the Psalmist agrees very well, when he is describing the flourishing state of a people, and says, They shall spread their branches like the Cedar-tree.

Rauwolf, in his Travels, says, there were not at that time (i. e. anno 1574) upon Mount Libanus more than 26 trees remaining, 24 of which stood in a circle; and the other two, which stood at a small distance, had their branches almost consumed with age; nor could he find any younger trees coming up to succeed them, though he looked about diligently for some. These trees (he says) were growing at the foot of a small hill, on the top of the mountains, and amongst the snow. These having very large branches, commonly bend the tree to one side, but are extended to a great length, and in so delicate and pleasant order, as if they were trimmed and made even with great diligence, by which they are easily distinguished at a great distance from Fir-trees. The leaves (continues he) are very like to those of the Larch-tree, growing close together in little bunches upon small brown shoots.

Maundrel in his Travels, says, there were but sixteen large trees remaining when he visited the mountains, some of which were of a prodigious bulk, but that there were many more young trees of a smaller size; he measured one of the largest, and found it to be 12 yards 6 inches in girt, and yet sound, and 37 yards in the spread of its boughs. At about five or six yards from the ground it was divided into five limbs, each of which was equal to a great tree. What Maundrel hath related, was confirmed to me by a worthy gentleman of my acquaintance, who was there in the year 1720, with this difference only, viz. in the dimensions of the branches of the largest tree, which he assured me he measured, and found to be twenty-two yards diameter. Now, whether Mr. Maundrel meant thirty-seven yards in circumference of the spreading branches, or the diameter of them, cannot be determined by his expressions, yet either of them well agrees with my friend's account.

Monsieur Le Brun reckons about 35 or 36 trees remaining upon Mount Libanus when he was there, and would persuade us it was not easy to reckon their numbers (as is reported of our Stonehenge on Salisbury Plain.) He also says, their cones do some of them grow dependent. Which is abundantly confuted by the above-mentioned travell rs, as also from our own experience,

experience, for all the cones grow upon the upper part of the branches, and ſtand erect, having a ſtrong, woody, central ſtyle, by which it is firmly annexed to the branch, ſo as with difficulty to be taken off; which central ſtyle remains upon the branches after the cone is fallen to pieces, ſo that they never drop off whole, as the Pines do.

The wood of this famous tree is accounted proof againſt all putrefaction of animal bodies; the ſawduſt of it is thought to be one of the ſecrets uſed by thoſe mountebanks, who pretend to have the embalming myſtery. This wood is alſo ſaid to yield an oil, which is famous for preſerving books and writings; and the wood is thought by my Lord Bacon, to continue above a thouſand years ſound. It is alſo recorded, that in the temple of Apollo at Utica, there was found timber of near two thouſand years old. And the ſtatue of the goddeſs, in the famous Epheſian temple, was ſaid to be of this material alſo, as was moſt of the timber work of that glorious ſtructure.

This ſort of timber is very dry and ſubject to ſplit, nor does it well endure to be faſtened with nails, from which it uſually ſhrinks, therefore pins of the ſame wood are much preferable.

LARKSPUR. See Delphinium.

LASERPITIUM. Tourn. Inſt. R. H. 324. tab. 172. Lin. Gen. Plant. 306. Laſerwort.

The Characters are,

*It hath an umbellated flower, compoſed of many ſmall umbels; both the ſmall and principal umbels have a many-leaved involucrum. The general umbel is uniform; the flowers have five equal petals, whoſe points are heart-ſhaped and inflexed; they have five ſtamina which are as long as the petals, terminated by ſingle ſummits; the roundiſh germen is ſituated under the flower, ſupporting two thick acuminated ſtyles, crowned by obtuſe ſpreading ſtigmas. The germen afterward becomes an oblong fruit with eight longitudinal wings or membranes, reſembling the fliers of a water-mill; the fruit divides into two parts, each containing one ſeed.*

This genus of plants is ranged by Dr. Linnæus's in the ſecond ſection of his fifth claſs, intitled Pentandria Digynia, which includes thoſe plants whoſe flowers have five ſtamina and two ſtyles.

The Species are,

1. Laserpitium (*Commune*) foliolis oblongo-cordatis, inciſo-ſerratis. *Laſerwort with oblong heart-ſhaped lobes, which are cut like a ſaw.* Laſerpitium foliis latioribus lobatis. Mor. Umbel. 29. *Laſerwort with broader leaves, having lobes.*

2. Laserpitium (*Latifolium*) foliolis-cordatis inciſo-ſerratis. Hort. Cliff. 96. *Laſerwort with heart-ſhaped lobes cut like a ſaw.* Laſerpitium foliis amplioribus, ſemine criſpo. Inſt. R. H. 324. *Laſerwort with large leaves and curled ſeeds.*

3. Laserpitium (*Paludapifolium*) foliolis ovatis obtuſis acutè ſerratis. *Laſerwort with oval obtuſe lobes ſharply ſawed.* Laſerpitium humilius, paludapii folio, flore albo. Inſt. R. H. *Lower Laſerwort, with a Smallage leaf and a white flower.*

4. Laserpitium (*Gallicum*) foliolis cuneiformibus furcatis. Lin. Sp. Plant. 248. *Laſerwort with wedge-ſhaped forked lobes.* Laſerpitium Gallicum. 156. C. B. P. *French Laſerwort.*

5. Laserpitium (*Anguſtifolium*) foliolis lanceolatis integerrimis ſeſſilibus. Hort. Cliff. 96. *Laſerwort with ſpear-ſhaped entire leaves ſitting cloſe to the branches.* Laſerpitium anguſtiſſimo & oblongo folio. Inſt. R. H. 324. *Laſerwort with a very narrow oblong leaf.*

6. Laserpitium (*Selinoides*) foliolis trifidis acutis. *Laſerwort with acute trifid lobes.* Laſerpitium ſelinoides, ſemine criſpo. Inſt. R. H. *Laſerwort reſembling ſweet Smallage, with a curled ſeed.*

7. Laserpitium (*Trilobum*) foliolis trilobis inciſis. Lin. Sp. 357. *Laſerwort with trifid leaves.* Libanotis latifolia aquilegiæ folio. C. B. P. 157.

8. Laserpitium (*Prutenicum*) foliolis lanceolatis integerrimis extimis coalitis. *Laſerwort with ſpear-ſhaped entire lobes, whoſe outer ones coaleſce.* Laſerpitium daucoides prutenicum viſcoſo ſemine. Breyn. Cent. 167.

9. Laserpitium (*Peucedanoides*) foliolis lineari-lanceolatis venoſo-ſtriatis diſtinctis Amœnit. Acad. 4. p. 310. *Laſerwort with linear ſpear-ſhaped leaves, which are diſtinct and veined.* Laſerpitium exoticum, lobis anguſtiſſimis integris. Pluk. Phyt. tab. 96. f. 2.

10. Laserpitium (*Siler*) foliolis ovato-lanceolatis integerrimis petiolatis. Hort. Cliff. 96. *Laſerwort with oval, ſpear-ſhaped, entire leaves, having foot-ſtalks.* Siler Montanum. Mor. Hiſt. 3. p. 276.

11. Laserpitium (*Chironium*) foliolis oblique cordatis, petiolis hirſutis. Lin. Sp. 358. *Laſerwort with oblique heart-ſhaped lobes, having hairy foot-ſtalks.* Panax Heracleum. Mor. Hiſt. 3. p. 315. *Herculus's All-heal.*

12. Laserpitium (*Ferulaceum*) foliolis linearibus. Lin. Sp. 358. *Laſerwort with linear leaves.* Cachrys Orientalis, ferulæ folio tenuiore, fructu alato plano. Tourn. Cor. 23.

There are ſome other varieties, if not diſtinct ſpecies of this plant; ſome of which have been put down as diſtinct ſpecies, which differ only in the colour of their flowers, therefore ſhould not be regarded as ſuch; but the number of ſpecies has been greatly leſſened by ſome late writers, who have erred as much in leſſening, as thoſe before them had done in multiplying of the ſpecies: which miſtake they may have fallen into by ſowing of the ſeeds near old plants of the ſame genus, or on ground where ſome of theſe ſorts have grown, ſo that their ſeeds have been ſcattered and buried in the ground, where they will remain two or three years, and afterward grow; ſo that unleſs their ſeeds are ſown at a diſtance from any of the other ſpecies, there will commonly ſome other ſpecies come up, whereby people have been often confuſed in diſtinguiſhing theſe plants; nay, I have frequently obſerved the ſeeds of one ſpecies fall, and the plants come up on the head of another plant which grew near it; and this young plant, if not timely rooted out, has gotten the better of the old plant, and deſtroyed it; therefore where there is not great care taken to prevent this, the different ſorts cannot be preſerved in gardens where the ſpecies grow near each other.

Theſe plants grow naturally in the ſouth of France, in Italy, and Germany, and are preſerved in botanic gardens for the ſake of variety; but as they have no great beauty, ſo are ſeldom cultivated in other gardens: they require much room, for their roots extend far every way, and the leaves of many ſorts will ſpread three feet, when the plants are ſtrong; their flower-ſtalks riſe four or five feet high, and their umbels of flowers are very large; they have all of them perennial roots but annual ſtalks. They flower in June, and the ſeeds ripen in September.

It is generally ſuppoſed, that the Silphium of the antients was procured from one ſpecies of this genus, but from which of them we are at preſent ignorant. All the ſpecies, if wounded, drop a very acrid juice, which turns to a reſinous gummy ſubſtance, very acrimonious. This was externally applied by the antients to take away black and blue ſpots that came by bruiſes and blows, as alſo to take away excreſcences; it was alſo by ſome of the antients preſcribed in internal medicines, but others have cautioned people not to make uſe of it this way, from the effects which they mention to have ſeen produced from the violence of its acrimony.

All theſe plants are extreme hardy, except the laſt, which requires a warmer ſituation, otherwiſe will be killed in ſharp winters; the other ſorts will thrive in moſt ſoils and ſituations; they are propagated by ſeed, which if ſown in autumn, the plants will come up the following ſpring; but when they are ſown in the ſpring, the ſeeds commonly remain in the ground a whole year. The plants ſhould be tranſplanted the following autumn where they are deſigned to remain, for they ſend out long deep roots, which are frequently broken by tranſplanting if they are large; when the plants are removed, they ſhould be planted

three feet asunder, for they grow very large; they decay to the ground every autumn, and come up again the following spring, but the roots will continue many years, and require no other culture but to clear them from weeds, and to dig between the roots every spring.

LATHYRUS. Tourn. Inst. R. H. 394. tab. 216, 217. Lin. Gen. Plant. 781. Chichling Vetch; in French, *Gesse*.

The Characters are,

*The flower has a bell-shaped empalement of one leaf, cut into five parts at the top, the two upper being short, and the under longer. The flower is of the butterfly kind. The standard is heart-shaped, large, and reflexed at the point. The wings are oblong and blunt; the keel is half round, the size of the wings. It hath ten stamina, nine of them joined, and one separate, crowned by roundish summits. It hath an oblong, narrow, compressed germen, supporting a rising style, which is flat, and the upper part broad, with an acute point, crowned by a hairy stigma. The germen afterward becomes a long compressed pod, ending in a point, having two valves, and filled with roundish seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria which includes those plants whose flowers have ten stamina formed in two bodies.

The Species are,

1. Lathyrus (*Sativus*) pedunculis unifloris, cirrhis diphyllis, leguminibus ovatis compressis dorso bimarginatis. Hort. Cliff. 367. *Chichling Vetch with one flower upon a foot-stalk, tendrils having two leaves, and oval compressed pods with two borders on their back part.* Lathyrus annuus, flore cæruleo, Ochri siliquâ. H. L. *Annual Chichling Vetch with a blue flower, and a pod like Ochrus.*

2. Lathyrus (*Cicera*) pedunculis unifloris, cirrhis diphyllis, leguminibus ovatis compressis, dorso canaliculatis. Lin. Sp. Plant. 730. *Chichling Vetch with one flower upon a foot-stalk, two-leaved tendrils, and an oval compressed pod a little channelled on the back.* Lathyrus sativus flore purpureo. C. B. P. 344. *Cultivated Chichling Vetch with a purple flower.*

3. Lathyrus (*Setifolius*) pedunculis unifloris, cirrhis diphyllis, foliolis setaceo-linearibus. Lin. Sp. 1031. *Chichling Vetch with one flower upon a foot-stalk, a two-leaved tendril, and linear bristly lobes.* Lathyrus foliis angustis, floribus singularibus coccineis. Seg. Pl. Veron. *Chichling Vetch, with narrow leaves and single scarlet flowers.*

4. Lathyrus (*Parisiensis*) pedunculis unifloris, cirrhis polyphyllis, stipulis lanceolatis. Hort. Cliff. 368. *Chichling Vetch with one flower upon a foot-stalk, a many-leaved tendril, and spear-shaped stipulæ.* Clymenum Parisiense flore cæruleo. Tourn. Inst. R. H. 396. *Chichling Vetch of Paris with a blue flower.*

5. Lathyrus (*Hispanicus*) pedunculis bifloris, cirrhis polyphyllis, foliolis alternis. Hort. Cliff. *Chichling Vetch with two flowers upon a foot-stalk, a many-leaved tendril, and the lobes placed alternate.* Clymenum Hispanicum, flore vario siliquâ articulatâ. Tourn. Inst. R. H. 296. *Spanish Chichling Vetch, with a variable flower and jointed pod.*

6. Lathyrus (*Odoratus*) pedunculis bifloris, cirrhis diphyllis, foliis ovato-oblongis, leguminibus hirsutis. Hort. Cliff. 368. *Chichling Vetch with two flowers on a foot-stalk, a two-leaved tendril, oblong oval leaves, and hairy pods.* Lathyrus distoplatyphyllos hirsutus, mollis, magno & peramæno flore odore. Hort. Cath. *The sweet-scented Pea.*

7. Lathyrus (*Hirsuta*) pedunculis bifloris, cirrhis diphyllis, foliolis lineari-lanceolatis, leguminibus hirsutis, seminibus scabris. Flor. Leyd. Prod. 363. *Chichling Vetch with two flowers on a foot-stalk, a two-leaved tendril, narrow spear-shaped lobes, hairy pods, and rough seeds.* Lathyrus angustifolius siliquâ hirsutâ. C. B. P. *Narrow-leaved Chichling Vetch with a hairy pod.*

8. Lythyrus (*Tingitanus*) pedunculis bifloris, cirrhis diphyllis foliolis alternis lanceolatis. Flor. Leyd. Prod. 263. *Chichling Vetch with two flowers on a foot-stalk, a two-leaved tendril, and spear-shaped alternate leaves.* Lathyrus Tingitanus siliquis orobi flore amplo ruberrimo. Mor. Hist. 2. 55. *Chichling Vetch of Tangier, with a bitter Vetch pod, and a large red flower.*

9. Lathyrus (*Annuus*) pedunculis bifloris, cirrhis diphyllis, foliolis ensiformibus, leguminibus glabris, stipulis bipartitis. Amœn. Acad. 3. p. 417. *Chichling Vetch with two flowers on a foot-stalk, a two-leaved tendril, sword-shaped lobes, smooth pods, and a bifid stipula.* Lathyrus luteus latifolius. Bot. Monsp. *Yellow broad-leaved Chichling Vetch.*

10. Lathyrus (*Tuberosus*) pedunculis multifloris, cirrhis diphyllis, foliolis ovalibus, internodis nudis. Hort. Cliff. 367. *Chichling Vetch with many flowers on a foot-stalk, a two-leaved tendril, oval leaves, and naked between the joints.* Lathyrus arvensis repens tuberosus. C. B. P. 344. *Creeping Field Chichling Vetch with a tuberous root.*

11. Lathyrus (*Pratensis*) pedunculis multifloris, cirrhis diphyllis, foliolis lanceolatis cirrhis simplicissimis. Hort. Cliff. 367. *Chichling Vetch with many flowers on a foot-stalk, a two-leaved tendril, spear-shaped leaves, and single tendrils.* Lathyrus luteus sylvestris dumetorum. J. B. 2. p. 304. *Yellow wild Chichling Vetch of the woods.*

12. Lathyrus (*Heterophyllus*) pedunculis multifloris, cirrhis diphyllis tetraphyllisque, foliolis lanceolatis. It. W. Goth. 75. *Chichling Vetch with many flowers on a foot-stalk, a two-leaved, and sometimes four-leaved tendril, and spear-shaped leaves.* Lathyrus major Narbonensis angustifolius. J. B. 2. 304. *Greater Chichling Vetch of Narbonne with narrow leaves.*

13. Lathyrus (*Latifolius*) pedunculis multifloris, cirrhis diphyllis, foliolis lanceolatis, internodiis membranaceis. Hort. Cliff. 367. *Chichling Vetch with many flowers on a foot-stalk, a two-leaved tendril, spear-shaped leaves, and a membranaceous stalk between the joints.* Lathyrus latifolius. C. B. P. 344. *Broad-leaved Chichling Vetch, commonly called Everlasting Pea.*

14. Lathyrus (*Magnoflore*) pedunculis multifloris, cirrhis diphyllis foliolis ovato-lanceolatis, internodiis membranaceis. *Chichling Vetch with many flowers on a foot-stalk, a two-leaved tendril, oval spear-shaped leaves, and a membranaceous stalk between the joints.* Lathyrus latifolius minor flore majore. Boerh. Ind. alt. 2. p. 42. *Smaller broad-leaved Chichling Vetch with a larger flower, or large, red, flowering, Everlasting Pea.*

15. Lathyrus (*Pisiformis*) pedunculis multifloris, cirrhis polyphyllis, stipulis ovatis, basi acutis. Hort. Upsal. 217. *Chichling Vetch with many flowers on a foot-stalk, a many-leaved tendril, and oval stipulæ acute at the base.*

16. Lathyrus (*Nissolia*) pedunculis unifloris, foliis simplicibus stipulis subulatis. Lin. Sp. Plant. 729. *Chichling Vetch with one flower on a foot-stalk, single leaves, and awl-shaped stipulæ.* Nissolia vulgaris. Tourn. Inst. 656. *Crimson Grass Vetch.*

17. Lathyrus (*Amphicarpos*) pedunculis unifloris calyce longioribus, cirrhis diphyllis simplicissimis subtus venosis. *Chichling Vetch with single flowers upon a foot-stalk, which are longer than the empalement, and a two-leaved single tendril.*

18. Lathyrus (*Aphaca*) pedunculis unifloris, cirrhis aphyllis, stipulis sagitto-cordatis. Lin. Sp. 1029. *Chichling Vetch with one flower on each foot-stalk, a tendril without leaves, and a heart arrow-shaped stipula.* Aphacha. Lob. Ic. 2. p. 70.

19. Lathyrus (*Americana*) pedunculis bifloris, foliis reniformibus simplicissimis subtus venosis. *Chichling Vetch with two flowers upon a foot-stalk, and kidney-shaped single leaves, which are veined on their under side.* Nissolia Americana procumbens, folio rotundo, flore luteo. Houst. MSS. *Trailing American Nissolia, with a round leaf and a yellow flower.*

The first sort grows naturally in France, Spain, and Italy; this is an annual plant, with a climbing stalk about two feet high. The leaves come out at each joint alternate; they are composed of two long narrow lobes,

lobes, with a tendril or clasper rising between, which fastens to any support near. The flowers come singly upon foot-stalks at each joint; they are blue, and shaped like those of the Pea; these are succeeded by oval compressed pods, with a double membrane or wing running longitudinally on the back. This flowers in June and July, and the seeds ripen in September. It is seldom cultivated, unless in botanic gardens for the sake of variety.

The second sort is cultivated in some countries for the seeds, which are used for feeding of poultry; this grows wild in Italy and Spain. It does not rise so high as the first sort. The leaves are longer, the pods are near twice the length of those, and are channelled on their back side; this is cultivated in the same manner as Vetches or Tares.

The third sort was sent me from Verona, where it grows naturally; this is an annual plant, which seldom rises more than six or eight inches high. The two lobes of the leaves are small, and end with claspers. The flowers are of a bright scarlet, and are succeeded by taper pods, filled with roundish seeds. This is only kept for variety in some botanic gardens.

The fourth sort grows naturally about Paris; this is an annual plant, with a slender stalk about one foot high, garnished with leaves, composed of several narrow lobes placed alternate along the midrib, which end in claspers. The flowers come out singly upon pretty long foot-stalks; they are blue, and about the size of those of the common Tare. It grows naturally in some parts of England, particularly on Windsor forest, in moist meadows, and has often a variable flower.

The fifth sort grows naturally in Spain and Italy; it is an annual plant, with a climbing stalk which rises near three feet high, garnished with leaves composed of several lobes, which are spear-shaped, placed alternately along the midrib, which is terminated by very long claspers. The foot-stalks of the flowers are five or six inches long, upon which stand two flowers one above the other, shaped like those of the Pea. The standard, which is large, is of a bright red colour, but the keel and wings are white. The flowers are succeeded by pretty long jointed pods, filled with roundish seeds. This flowers in June and July, and the seeds ripen in autumn.

The sixth sort is commonly known by the title of Sweet Pea; this grows naturally in Ceylon, but is hardy enough to thrive in the open air in England. It is an annual plant with a climbing stalk, which rises from three to four feet high, garnished with leaves composed of two large oval lobes, whose midrib is terminated by long claspers. The foot-stalks come out at the joints; they are about six inches long, and sustain two large flowers with dark purple standards; the keel and wings are of a light blue colour. The flowers have a strong sweet odour, and are succeeded by oblong inflated pods, which are hairy, containing four or five roundish seeds in each.

There are two other varieties of this sort, one of which has a Pink-coloured standard with a white keel, and the wings of a pale blush colour; this is commonly called Painted Lady Pea. The flowers of the other are all white, which are the only differences between them.

The seventh sort grows naturally in Essex. I have found it in places which were spread over with Brambles, near Hockerel; this hath a perennial root, sending out three or four weak stalks, which are near two feet long, garnished with leaves composed of two oblong lobes, whose midrib is terminated by claspers. The foot-stalks are about four inches long, and sustain two purple flowers, which are succeeded by rough hairy pods, little more than an inch long, containing three or four roundish seeds. This sort is very rarely preserved in gardens.

The eighth sort was originally brought from Tangier to England; this is an annual plant, whose stalk rises four or five feet high, garnished with leaves composed of two oval veined lobes, whose midrib ends with claspers. The foot-stalks are short, and sustain two large flowers with purple standards, whose wings and keel are of a bright red; these are succeeded by long jointed pods, containing several roundish seeds. This is sometimes titled by the gardeners Scarlet Lupine.

The ninth sort is an annual plant, which grows naturally about Montpelier. I have also received the seeds from Siberia; this rises with a climbing stalk five or six feet high, which has two membranes, or wings, running along from joint to joint. The leaves are composed of two long narrow lobes, whose midrib ends with claspers. The flowers stand upon long foot-stalks, each sustaining two pale yellow flowers, which are succeeded by long taper pods, containing several roundish seeds.

The tenth sort grows naturally amongst the Corn in the South of France, and in Italy, but is cultivated in the Dutch gardens for the roots, which are there sold in the markets, and are commonly eaten: this hath an irregular tuberous root about as big as those of the Pignut, covered with a brown skin; these shoot up several weak trailing stalks, garnished with leaves composed of two oval lobes, ending with claspers. The foot-stalks of the flowers are weak, about three inches long, each sustaining two deep red flowers, which are seldom succeeded by pods, but the roots increase plentifully in the ground. This sort will grow in most soils, but will thrive best on light ground.

The eleventh sort grows naturally on the banks and under thickets in most parts of England; this hath a perennial creeping root, whereby it propagates so fast as to be a very troublesome weed, so should not be admitted into gardens.

The twelfth sort grows naturally by the side of hedges, and in thickets, in several parts of England; this hath a perennial creeping root, which sends out many climbing stalks which rise five or six feet high, garnished with leaves, which have sometimes two, and at others four long narrow lobes, terminated by claspers. The foot-stalks sustain several small flowers with pale standards, whose wings and keels are blue; these are succeeded by long taper pods, containing several roundish seeds. It flowers in June and July, and the seeds ripen in autumn.

The thirteenth sort has been found growing naturally in several parts of England, but is frequently cultivated in gardens for ornament, therefore it is doubtful if it is a native here; this hath a perennial root, from which arise several thick climbing stalks from six to eight feet high, which have membranaceous wings on each side between the joints. The leaves are composed of two spear-shaped lobes, and the midrib is terminated by claspers. The foot-stalks are eight or nine inches long, and sustain several large red flowers, which are succeeded by long taper pods, containing several roundish seeds. It flowers in June, July, and August, and the seeds ripen in autumn, soon after which the stalks die to the root, and new ones arise in the spring, from whence it is called Everlasting Pea.

The fourteenth sort differs from the last in the stalks, being much shorter and stronger. The leaves are broader, and of a deeper green. The flowers are much larger, and of a brighter red colour, so make a better appearance; these differences are lasting from seeds, for I have raised many plants from seeds within forty years past, and have always found them them to be the same as the parent plant.

The fifteenth sort grows naturally in Siberia; this hath a perennial root and an annual stalk, which is garnished with leaves, composed of six or eight pair of oblong acute lobes. The flowers are blue, and many of them stand upon each foot-stalk; these are succeeded by pods, shaped like those of the Pea. It flowers in June, and the seeds ripen in August.

The sixteenth sort grows naturally in moist meadows in many parts of England; this rises with an upright stalk one foot high, which is garnished with

long, narrow, single leaves at each joint. The foot-stalks of the flowers come out from the joints toward the upper part of the stalk; they are slender, about three inches long, some having but one, and others have two bright red flowers on their tops. It flowers in May and June, and the seeds ripen in autumn. This is rarely kept in gardens.

The seventeenth sort grows naturally in Syria; this is an annual plant with a trailing stalk, garnished with leaves composed of two lobes, whose midrib is terminated by a single tendril. The foot-stalk supports one flower of a pale purple colour, and when the flowers decay, the germen is thrust into the ground, where the pods are formed, and the seeds ripen.

The eighteenth sort was discovered by the late Dr. Houstoun, growing naturally at La Vera Cruz in New Spain; this is annual plant, with a trailing stalk a foot long, garnished with a single kidney-shaped leaf at each joint. The flowers grow two together upon very short foot-stalks; they are small, and of a deep yellow colour; these are succeeded by short taper pods, including three or four small roundish seeds.

This sort is tender, so the seeds should be sown upon a hot-bed in the spring, and when the plants are fit to remove, they should be each planted into a small pot filled with light earth, and plunged into a tan-bed, where they should constantly remain, treating them in the same manner as other tender plants from warm countries; if they are brought forward in the spring, they will flower in July, and their seeds will ripen in autumn.

Several of the other sorts are preserved in curious gardens for the variety of their flowers, some of which make a fine appearance, and continue long in flower. These may all be propagated by sowing their seeds, either in spring or autumn; but those which are sowed in autumn should have a light soil and a warm situation, where the plants will abide the winter, and come to flower early the following spring, and their seeds will ripen in July; but those which are sown in the spring should have an open exposure, and be planted upon almost any soil, if not too wet, for they are not tender plants, nor do they require much culture: these sorts should all of them be sown where they are designed to remain, for they seldom succeed when they are transplanted, unless it is done while the plants are young; so that where they are sown for ornament, there should be four or five seeds sown in a small patch, in different parts of the borders of the flower-garden; and when the plants come up, they should be carefully kept clear from weeds; but when they are grown two or three inches high, there should be some sticks put down by them to support them, otherwise they will trail on the ground, or on whatever plants stand near them, and become unsightly.

The sixth sort, with the two varieties of it, are deserving room in every good garden for the beauty and odour of their flowers; and the eighth sort is by some cultivated for the colour of the flowers; but there are few of the other sorts worthy of room in gardens, except the thirteenth and fourteenth sorts, which, if they are planted in a proper situation, and are rightly trained, will make a fine appearance.

LATIFOLIOUS trees and plants are such as have broad leaves.

LAVATERA. Tourn. Act. Gal. 1706. tab. 3. Dill. Gen. 10. Lin. Gen. Plant. 752.

The CHARACTERS are,

*The flower has a double empalement; the outer is of one leaf, short, obtuse, and trifid; the inner is of one leaf, and quinquefid; they are both permanent. The flower hath five petals, which are joined at their base, plain, and spread open above. It has many stamina, which are joined in a column below, but above are loose; they are inserted in the petal, and terminated by kidney-shaped summits. It has an orbicular germen, supporting a short cylindrical style, crowned by many bristly stigmas. The empalement afterward becomes a fruit with several capsules, covered in front by a hollow shield, each capsule having one kidney-shaped seed.*

This genus of plants is by Dr. Linnæus ranged in the fifth order of his sixteenth class, intitled Monodelphia Polyandria, which includes those plants whose flowers have many stamina joined in a column.

The SPECIES are,

1. LAVATERA (*Althææfolia*) foliis infimis cordato-orbiculatis, caulinis trilobis acuminatis glabris, pedunculis unifloris, caule herbaceo. *Lavatera whose lower leaves are orbicularly heart-shaped, those on the stalks set with three acute smooth lobes, and one flower upon a foot-stalk, and an herbaceous stalk.* Lavatera folio & facie althææ. Act. R. P. 1706. *Lavatera with the leaves and appearance of Marshmallow.*
2. LAVATERA (*Africana*) foliis infimis cordato-angulatis, supernè sagittatis, pedunculis unifloris, caule herbaceo hirsuto. *Lavatera with the lower leaves angularly heart-shaped, the upper ones arrow-pointed, a single flower upon each foot-stalk, and a hairy herbaceous stalk.* Lavatera Africana, flore pulcherrimo. Boerh. Ind. alt. *African Lavatera with a beautiful flower.*
3. LAVATERA (*Trimestris*) foliis glabris, caule scabro herbaceo, pedunculis unifloris, fructibus orbiculo tectis. Hort. Upsal. 203. *Lavatera with smooth leaves, a rough herbaceous stalk, one flower upon a foot-stalk, and an orbicular closed fruit.* Malva folio vario. C. B. P. *Mallow with a variable leaf.*
4. LAVATERA (*Thuringiaca*) caule herbaceo, fructibus denudatis, calycibus incisis. Hort. Upsal. 203. *Lavatera with an herbaceous stalk, naked fruit, and a cut empalement.* Althæa flore majore. C. B. P. 316. *Marshmallow with a larger flower.*
5. LAVATERA (*Hirsuta*) foliis quinquelobatis hirsutis, caule erecto fruticoso. Icon. tab. 161. *Lavatera with hairy leaves having five lobes, and a shrubby upright stalk.*
6. LAVATERA (*Veneta*) caule arboreo, foliis septemangularibus tomentosis plicatis, pedunculis confertis unifloris axillaribus. Hort. Upsal. 202. *Lavatera with a tree-like stalk, woolly plaited leaves having seven angles, and foot-stalks with single flowers arising in clusters from the wings of the leaves.* Malva arborea veneta dicta, parvo flore. C. B. P. 215. *Tree Mallow with a small flower.*
7. LAVATERA (*Triloba*) caule fruticoso, foliis subcordatis subtrilobis rotundatis crenatis stipulis cordatis, pedunculis unifloris. Lin. Sp. Plant. 691. *Lavatera with a shrubby stalk, heart-shaped leaves having three round indented lobes, which are crenated, heart-shaped stipulæ, and foot-stalks with single flowers.* Althæa frutescens, folio rotundiore incano. C. B. P. 316. *Shrubby Marshmallow with a rounder hoary leaf.*
8. LAVATERA (*Olbia*) caule fruticoso, foliis quinquelobo-hastatis. Hort. Upsal. 202. *Lavatera with a shrubby stalk, and leaves having five arrow-pointed lobes.* Althæa frutescens, folio acuto, parvo flore. C. B. P. 316. *Shrubby Marshmallow with an acute leaf, and a small flower.*
9. LAVATERA (*Hispanica*) caule fruticoso, foliis orbiculatis crenatis tomentosis, pedunculis confertis unifloris axillaribus. *Lavatera with a shrubby stalk, round, crenated, woolly leaves, and foot-stalks growing in clusters at the wings of the stalk, each sustaining a single flower.* Althæa frutescens Hispanica folio rotundiori. Tourn. Inst. R. H. 97. *Spanish shrubby Marshmallow with a rounder leaf.*
10. LAVATERA (*Undulata*) caule fruticoso tomentoso, foliis orbiculato-cordatis undatis incanis, serrato-crenatis, pedunculis sæpius trifloris. *Lavatera with a shrubby woolly stalk, round heart-shaped hoary leaves, which are waved, sharply indented, and foot-stalks which have frequently three flowers.* Althæa frutescens Lusitanica, folio rotundiori undulato. Tourn. Inst. 97. *Portugal shrubby Marshmallow with a rounder waved leaf.*
11. LAVATERA (*Bryonifolia*) caule fruticoso, foliis quinquelobatis acutis crenatis tomentosis, racemis terminalibus. *Lavatera with a shrubby stalk, woolly leaves having five acute lobes, and long spikes of flowers terminating*

*nating the stalks.* Althæa frutescens, folio bryoniæ. C. B. P. 316. *Shrubby Althæa with a Briony leaf.*

The first sort grows naturally in Syria; it is an annual plant, with an erect, branching, herbaceous stalk, rising two feet high; the under leaves are orbicularly heart-shaped, smooth, and stand upon long foot-stalks, the upper are divided into three acute lobes; the flowers come out upon long foot-stalks from the wings of the leaves; they are very large, and spread open like those of the Marshmallow, and are of a pale red or Rose colour. These come out in July, the seeds ripen in September, and the plants decay in autumn.

There is a variety of this with white flowers, which has accidentally risen from seeds.

The second sort grows naturally at the Cape of Good Hope, from whence the seeds were brought to Holland, and the plants there cultivated, and the seeds have since been communicated to most parts of Europe. This differs from the first in the shape of the leaves, the lower having angles, and the upper being arrow-pointed; the stalks are hairy, the flowers larger, and of a brighter red colour.

This sort is annual, and flowers at the same time with the former, and the seeds are ripe in the autumn.

The third sort grows naturally in Spain and Sicily; this is an annual plant, which rises with slender herbaceous stalks about two feet high, covered with a brown bark; the lower leaves are roundish, and the upper are angular, and some arrow-pointed. The flowers are not half so large as those of either of the former, and are of a pale red colour; these stand upon short foot-stalks, and appear about the same time with the former. This is certainly a distinct species, for I have cultivated it more than forty years, and I have never found it vary.

The fourth sort hath a perennial root and an annual stalk, which rises five or six feet high, is woolly, garnished with angular heart-shaped leaves, standing upon long foot-stalks. The flowers come out from the wings of the leaves toward the top, sitting close to the stalks at every joint; they are of a purplish colour, and shaped like those of the Marshmallow, but are larger. These appear in July and August, and the seeds ripen in the autumn, then the stalks decay to the root. It grows naturally in Austria and Bohemia.

The fifth sort grows naturally at the Cape of Good Hope, the seeds of it were sent me by the ingenious Mr. Storm, gardener at Amsterdam. This rises with a shrubby branching stalk to the height of eight or ten feet, garnished with large hairy leaves, deeply divided into five roundish lobes, which are indented on their edges, of a bright green, standing alternately upon long foot-stalks; as the plants become more shrubby the leaves decrease in size, so that the upper leaves are not more than a sixth part of the bigness of the first or lower leaves. The flowers come out singly at the wings of the leaves at every joint, so that as the branches extend there is a succession of flowers, whereby the plants are seldom destitute of them the whole year. The flowers are of a bright purple colour, but are not very large; these are succeeded by capsules having many partitions, in each of these is one kidney-shaped seed, which ripen in succession as the flowers are produced.

The sixth sort is commonly called Mallow-tree; this rises with a very strong thick stalk the height of eight or ten feet, dividing into many branches at the top, which are garnished with soft woolly leaves that are plaited, and the edges cut into several angles. The flowers are produced in clusters at the wings of the leaves, each standing upon a separate foot-stalk; they are of a purple colour, and shaped like those of the common Mallow, and are succeeded by seeds of the same form. This sort flowers from June to September, and the seeds are ripe in the autumn.

The seventh sort rises with a shrubby stalk seven or eight feet high, sending out several long branches, garnished with woolly leaves, differing greatly in size and shape, the lower being partly heart-shaped at their base, but divide into five roundish lobes; the upper, which are small, have three lobes, which are indented on their edges. The flowers come out from the wings of the stalk, three or four at each joint, upon very short foot-stalks; they are of a light purple colour, and shaped like those of Marshmallow. There is a succession of these flowers from June to the autumn.

The eighth sort is a shrub which grows to the same size as the seventh, and differs from it in the shape of the leaves, which are divided into three or five acute-pointed lobes; the flowers are smaller, but of the same shape and colour, it continues in flower at the same time. This grows naturally in the south of France.

The ninth sort rises with a shrubby stalk six or eight feet high, sending out many branches, garnished with roundish, crenated, woolly leaves, standing upon long foot-stalks; the foot-stalks of the flowers come out in clusters from the wings of the leaves, each sustaining one large pale blue flower, of the same shape with those of the other species. This flowers at the same time with them, and the seeds ripen in the autumn.

The tenth sort hath a soft, shrubby, woolly stalk, which rises to the height of four or five feet; these stand more erect than either of the former sorts, and do not branch so much; the leaves are heart-shaped at their base, but round on their edges, very hoary and waved, standing upon long foot-stalks. The flowers come out in clusters from the wings of the leaves, standing upon foot-stalks of different lengths; these generally support but one flower, but sometimes they have two or three; the flowers are large, and of a pale blue colour. They appear at the same time with the former, and their seeds ripen in the autumn. It grows naturally in Portugal.

The eleventh sort rises with a shrubby stalk six or seven feet high, sending out several shrubby branches, which are garnished with woolly leaves, divided into five lobes, which end in acute points, and are crenated on their edges; the lower part of the branches are adorned with a single flower at each joint, sitting close to the stalk, but the branches are terminated by loose spikes of flowers, which are of a pale blue colour, and shaped like those of the former.

The six last mentioned sorts, though they have shrubby stalks, yet are but of short duration here; the sixth, tenth, and eleventh sorts, seldom continue longer than two years, unless when they happen to grow upon dry rubbish, where they make but little progress, and their stalks and branches being firmer, so are better able to resist the cold; for when they are in good ground, they are very vigorous and full of sap, so are killed by the frost in common winters. The other three sorts are not quite so tender, nor of so short duration; these will continue three or four years, and sometimes longer, provided the winters are not very severe; or if the plants stand in a warm situation and on a dry soil, but in moist rich ground they seldom continue long.

All these shrubby sorts are easily propagated by seeds, which should be sown in the spring upon a bed of light earth; and when the plants are about three or four inches high, they should be transplanted to the places where they are designed to remain; for as they shoot out long fleshy roots which have but few fibres, so they do not succeed well if they are transplanted after they are grown large. If the seeds of these plants are permitted to scatter on the ground, the plants will come up the following spring; and when they happen to fall into dry rubbish, and are permitted to grow therein, they will be short, strong, woody, and produce a greater number of flowers than those plants which are more luxuriant. As these plants continue a long time in flower, so a few plants of each sort may be allowed a place in all gardens where there is room.

The three first sorts are annual plants, which are propagated by seeds: the season for sowing them is the end of March or the beginning of April, upon a bed of fresh light earth; and when the plants are come up, you must carefully clear them from weeds; and in very dry weather they must be now and then refreshed with water. When they are about two inches high, you must transplant them into the places where they are designed to remain, which should be in the middle of the borders in the flower-garden; for if the soil is good, they will grow two or three feet high; in transplanting them, you must take them up very carefully, preserving a ball of earth to their roots, otherwise they are apt to miscarry; and also water and shade them until they have taken root, after which they will require no other care but to clear them from weeds, and to fasten them to stakes, to prevent their being injured by strong winds. You may also sow their seeds in autumn, and when the plants are come up, transplant them into small pots, which, towards the end of October, should be placed in a common hot-bed frame, where the plants being defended from severe frosts, will abide the winter very well; and in the spring, you may shake them out of the pots, and plant them into larger, or else into the full ground, where they may remain to flower. The plants thus managed will be larger, and flower stronger and earlier than those sown in the spring, and from these you will constantly have good seeds, whereas those sown in the spring sometimes miscarry. The seeds of the third sort should be sown in the spring in the place where they are to remain, for they do not well bear removing in the summer.

The two first sorts are very ornamental plants in a fine garden, when placed among other annuals, either in pots or borders.

The fourth sort hath a perennial root which abides several years, but the stalks decay in the autumn, and new ones arise in the spring. This is propagated by seeds, which should be sown upon a bed of light earth in the spring, and when the plants are fit to remove, they should be either transplanted to the places where they are to remain, or into pots where they may stand to get more strength, before they are planted in the full ground. After the plants are well rooted, they will require no other care but to keep them clear from weeds. And if the winter should prove very severe, it will be proper to cover the ground about them with old tanners bark to keep out the frost; but they will endure the cold of our ordinary winters very well, and will produce their flowers and ripen their seeds annually.

The fifth sort will not live through the winter in the open air in England, so the seeds should be sown in the same manner as those of the other sorts; and when the plants are fit to remove, they should be each planted into a small pot filled with light earth, and placed in the shade till they have taken new root; then they may be removed to a sheltered situation, and mixed with other hardy exotic plants. As the plants advance in their growth, so they will require larger pots, and must be treated in the same way as other exotic plants; in the autumn they must be removed into the green-house, and placed with Myrtles and the other kinds of plants, which only require protection from hard frost, but must have as much free air as possible in mild weather.

LAVENDULA. Tourn. Inst. R. H. 198. tab. 93. Lin. Gen. Plant. 630. Lavender; in French, *Lavende.* [It takes its name of Lavando, *Lat.* washing, because it was used to be thrown into baths for the fragrancy of the scent; or because used in lye, to give a fragrancy to linen; and because it is very good to wash the face with, and give it both beauty and a grateful scent.]

The CHARACTERS are,

*The flower hath an oval permanent empalement of one leaf, which is obscurely indented at the brim. The flower is of the lip kind, with one petal, having a cylindrical tube longer than the empalement, but spreading above; the upper lip is large, bifid, and open; the under lip is cut into three equal segments. It hath four short stamina situated within the tube of the petal, two being shorter than the other, terminated by small summits. It hath a germen divided in four parts, supporting a slender style the length of the tube, crowned by an obtuse indented stigma. The germen afterward turns to four oval seeds, sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, intitled Didynamia Gymnospermia, which includes those plants whose flowers have two short and two longer stamina, and have four naked seeds sitting in the empalement.

The SPECIES are,

1. LAVENDULA (*Spica*) foliis lanceolatis integerrimis spicis nudis. Hort. Cliff. 303. *Lavender with entire spear-shaped leaves and naked spikes.* Lavendula latifolia. C. B. P. 216. *Broad-leaved Lavender.*
2. LAVENDULA (*Angustifolia*) foliis lanceolato-linearibus, spicis nudis. *Lavender with spear-shaped narrow leaves, and naked spikes.* Lavendula angustifolia. C. B. P. 216. *Narrow-leaved Lavender.*
3. LAVENDULA (*Multifida*) foliis duplicato-pinnatifidis. Vir. Cliff. 56. *Lavender with leaves doubly wing-pointed.* Lavendula folio dissecto. C. B. P. 216. *Lavender with a cut leaf.*
4. LAVENDULA (*Canariensis*) foliis duplicato-pinnatifidis hirsutis, spicis fasciculatis. *Lavender with doubly wing-pointed hairy leaves, and spikes of flowers growing in clusters.* Lavendula folio longiore tenuius & elegantius dissecto. Tourn. Inst. R. H. 198. *Lavender with a longer, narrower, and more elegant cut leaf.*

The first sort is cultivated in several of the English gardens, and has been generally known by the title of Spike, or Lavender Spike; the leaves of this sort are much shorter and broader than those of the common Lavender, and the branches are shorter, more compact, and fuller of leaves. This sort doth not often produce flowers, but when it does, the flower-stalks are garnished with leaves very different from those on the other branches, approaching nearer to those of the common sort, but are broader; the stalks grow taller, the spikes of the flowers are larger, the flowers are smaller, and are in looser spikes. It generally flowers a little later in the season. This has been frequently confounded with the common Lavender, and has been supposed the same species, but is undoubtedly a different plant.

This I believe to be the same with what Dr. Morisson calls Lavendula latifolia sterilis, for the plants will continue several years without producing flowers; during which time they have a very different appearance from those of the common Lavender, as those branches of the same plant always have which do not flower; but I have planted slips taken from those flowering branches with narrow leaves, and others from those with the broad leaves, but have always found the plants so propagated return to their original sort, the cuttings with the narrow leaves have become broad again.

The second sort is the common Lavender, which is so well known as to require no description. Both these sorts flower in July, at which time the spikes of the second sort are gathered for use; there is a variety of this with white flowers.

These are propagated by cuttings or slips; the best season for which is in March, when they should be planted in a shady situation, or at least they should be shaded with mats until they have taken root, after which they may be exposed to the sun; and when they have obtained strength, may be removed to the places where they are designed to remain. These plants will abide much longer in a dry, gravelly, or stony soil, in which they will endure our severest winters; though they will grow much faster in the summer, if they are planted upon a rich, light, moist soil, but then they are generally destroyed in winter; nor are the plants half so strong scented, or fit for medicinal uses, as those which grow upon the most barren rocky soil.

These plants were formerly in use to make edgings to borders in gardens, for which purpose they are by no means proper, for they will grow too large for such designs; and if they are often cut in very dry weather, they are subject to decay; and in hard winters they are very often killed, so that the edging will not be complete: besides, these plants greatly exhaust the goodness of the soil, whereby the plants in the borders will be deprived of their nourishment; so that they should never be planted in a fine garden amongst other choice plants and flowers, but rather be placed in beds in the physic-garden, or in any part of the kitchen-garden, if the soil is dry.

The third sort grows naturally in Andalusia; this is an annual plant, which rises with an upright branching stalk two feet high; the stalks are woolly, and garnished with hoary leaves growing opposite, which are cut into many divisions to the midrib; these segments are again divided on their borders toward the top, into three obtuse segments, so that they end in many points. The foot-stalk of the flower is continued from the end of the branches, which is naked, and about six inches long, having four corners or angles, and is terminated by a close spike of flowers about one inch long; the spike has the rows of flowers twisted spirally: under this spike there are commonly two small ones proceeding from the side of the stalk, at about an inch distance from the middle spike. This sort flowers in July, and the seeds ripen in autumn. There are two varieties of this, one with blue, and the other with white flowers.

This sort is sown every spring on borders or beds of light fresh earth, and when the plants come up, they may be transplanted into other borders of the flower-garden, or into pots, to remain for good; where they will require no farther care, but to keep them clean from weeds. These are pretty plants to place in large borders, amongst other plants, for variety, but they are never used with us; they may also be preserved over the winter, if placed in a green-house in autumn; but they never continue longer than two years with us, and many times (if they have produced seeds the first year) they will not continue longer. Nor do those plants which are thus preserved, appear handsome the following summer, so that, unless in bad seasons, when the seeds do not ripen in the open air, it is not worth while to preserve the plants. If the seeds of this sort are permitted to scatter, the plants will come up the following spring without care, and may be treated in the manner before directed.

The fourth sort grows naturally in the Canary Islands, from whence the seeds were sent to the Bishop of London, which were sown in his Lordship's garden at Fulham, where this plant was first raised. This rises with an upright, branching, square stalk four feet high, garnished with leaves which are longer, and cut into narrower segments than those of the third sort. They are of a lighter green and almost smooth; the naked flower-stalk is also much longer than those of the former, and terminated with a cluster of spikes of blue flowers; at two or three inches below these, are two small spikes of flowers, standing one on each side the stalk. The flowers are smaller than those of the common Lavender, but are of the same shape.

This sort is tenderer than either of the former, so the seeds of this must be sown on a moderate hot-bed in the spring; and when the plants come up, they should be each planted into a separate small pot filled with light earth, and plunged into another hot-bed, to bring the plants forward; and in the beginning of June, they should be inured to the open air, when they should be placed in a sheltered situation toward the end of that month; in July the plants will flower, and if the autumn proves warm, the seeds will ripen in September; but when they do not perfect seeds, the plants may be preserved through the winter in a good green-house, where they will produce flowers most part of that season, whereby good seeds may be obtained.

LAUREOLA. See Thymelæa.

LAUROCERASUS. See Padus.

LAURUS. Tourn. Inst. R. H. 597. tab. 367. Lin. Gen. Plant. 452. The Bay-tree; in French, *Laurier.*

The Characters are,

*It hath male and hermaphrodite flowers on different plants, the male flowers have no empalement: they have one petal, which is cut into six segments at the top, and nine stamina which are shorter than the petal, standing by threes, terminated by slender summits. The hermaphrodite flowers have noempalement; they have one petal, which is slightly cut into six segments at the top. In the bottom is situated an oval germen, supporting a single style of the same length with the petal, crowned by an obtuse stigma, attended by six or eight stamina: there are two globular glands, standing upon very short foot-stalks, fixed to the base of the petal. The germen afterward becomes an oval berry with one cell, inclosing one seed of the same form.*

This genus of plants is ranged in the first section of Linnæus's ninth class, intitled Enneandria Monogynia, which includes those plants whose flowers have nine stamina and one style; but it should be ranged in his twenty-second class, which includes those plants whose male and female flowers are upon different plants.

The Species are,

1. Laurus (*Nobilis*) foliis lanceolatis venosis perennantibus, floribus quadrifidis dioeciis. Hort. Cliff. 105. *Bay-tree with evergreen, spear-shaped, veined leaves, and flowers cut into four points, which are male and female on different plants.* Laurus latifolia Discoridis. C. B. P. *The broad-leaved Bay of Dioscorides.*
2. Laurus (*Undulatis*) foliis lanceolatis venosis perennantibus, marginibus undatis. *Bay-tree with evergreen spear-shaped leaves, which are veined and waved on their edges.* Laurus vulgaris folio undulato. H. R. Par. *Common Bay-tree with waved leaves.*
3. Laurus (*Tenuifolia*) foliis lineari-lanceolatis venosis perennantibus, floribus quinquefidis dioeciis. *Bay-tree with narrow spear-shaped leaves which are evergreen and veined, flowers cut into five points, which are male and female on different plants.* Laurus tenuifolia. Tab. Icon. 925. *Narrow-leaved Bay.*
4. Laurus (*Indica*) foliis venosis lanceolatis perennantibus planis, ramulis tuberculatis cicatricibus, floribus racemosis. Hort. Cliff. 154. *Bay-tree with evergreen, veined, spear-shaped, plain leaves, branches having tubercles and cicatrices, and flowers growing in bunches.* Laurus Indica. Ald. Hort. Farnes. 61. *The Indian Bay.*
5. Laurus (*Borbonia*) foliis venosis lanceolatis calycibus fructus baccatis. Lin. Sp. 529. *Bay-tree with veined spear-shaped leaves, and the empalement becomes berries.* Laurus Caroliniensis, foliis acuminatis, baccis cæruleis, pediculis longis rubris insidentibus. Catesb. Carol. 1. p. 63. *Carolina Bay-tree with pointed leaves, and blue berries sitting upon long red foot-stalks.*
6. Laurus (*Benzoin*) foliis ovato-lanceolatis obtusis integris annuis. *Bay-tree with oval, obtuse, spear-shaped, entire leaves, which are annual.* Arbor Virginiana, citreæ vel limonii folio, Benzoinum fundens. Hort. Amst. 1. p. 168. *The Benjamin-tree.*
7. Laurus (*Sassafras*) foliis integris trilobisque. Hort. Cliff. 154. *Bay-tree with entire leaves, or having three lobes.* Cornus mas odorato, folio trifido, margine plano, sassafras dicta. Pluk. Alm. 120. *The Sassafras.*
8. Laurus (*Enervius*) foliis venosis oblongis acuminatis annuis, subtus rugosis. *Bay-tree with oblong, acute-pointed, veined, annual leaves, which are rough on their under side.* Laurus foliis lanceolatis enervibus annuis. Flor. Virg. 159. *Bay-tree with spear-shaped, winged, unveined, annual leaves.*
9. Laurus (*Camphora*) foliis trinerviis lanceolato-ovatis, nervis supra basin unitis. Lin. Mat. Med. 192. *Bay-tree with oval spear-shaped leaves, having three veins which unite above the base.* Camphora officinarum. C. B. P. 500. *The Camphire-tree.*
10. Laurus (*Americana*) foliis ovatis planis integerrimis, pedunculis racemosis, floribus in capitulum collectis. *Bay-tree with plain, oval, entire leaves, branching foot-*

*foot-stalks, and flowers collected into heads.* Laurus Americana, foliis subrotundis, floribus in capitulum collectis. Houst. MSS. *American Bay-tree with roundish leaves, and flowers collected into heads.*

11. Laurus (*Cinnamomum*) foliis trinerviis ovato-oblongis nervis versus apicem evanescentibus. Flor. Zeyl. 145. *Laurel with oblong leaves which diminish toward their end.* Cinnamomum foliis latis ovatis frugiferum. Burm. Zeyl. 62. *Cinnamon-tree.*

12. Laurus (*Canella*) foliis triplinerviis lanceolatis. Flor. Zeyl. 146. *Laurel with spear-shaped leaves, having three veins.* Cinnamomum, sc. Canella Malabarica, sc. Javanensis. C. B. P. 409. *Cassia or Wild Cinnamon.*

13. Laurus (*Persea*) foliis venosis ovatis coriaceis perennantibus, floribus corymbosis. Lin. Sp. 529. *Bay-tree with oval, thick, veined leaves, which continue through the year, and flowers growing in a corymbus.* Persea. Clus. Hist. 1. p. 2.

The first sort is the broad-leaved Bay, which grows naturally in Asia, Spain and Italy; from all those places I have received the berries several times. This is almost too tender to thrive in the open air in England, for in severe winters they are frequently killed, or their branches are so much injured as to appear so for a long time; therefore they are generally planted in tubs, and removed into the green-house in winter. The leaves of this sort are much broader than those of the common Bay, and are smoother: there are male and female plants of this, as there are also of all the other sorts.

The second is the common Bay; of this there are plants with plain leaves, and others which are waved on their edges, but they seem to be the same species; for the young plants which I have raised from the berries of one, have been a mixture of both sorts; but this is undoubtedly a different species from the first, for this sort thrives well in the open air, and is seldom hurt, except in very severe winters; whereas the first will scarce live abroad, while young, in common winters, without shelter.

The third sort hath very long narrow leaves which are not so thick as those of the two former, and are of a light green; the branches are covered with a purplish bark, and the male flowers come out in small clusters from the wings of the leaves sitting close to the branches. This sort is too tender to thrive in the open air in England, so the plants are generally kept in pots or tubs, and housed in winter as the first sort.

The fourth sort grows naturally at Madeira and the Canary Islands, from whence it was formerly brought to Portugal, where it has been propagated in so great plenty, as to appear now as if it was a native of that country. In the year 1620, this plant was raised in the Farnesian garden, from berries which were brought from India, and was supposed to be a bastard sort of Cinnamon. This grows to the height of thirty or forty feet in temperate countries, but it is too tender to thrive in the open air in England, so the plants are kept in pots and tubs, and removed into the green-house in winter.

The leaves of this sort are much larger than those of the common Laurel; they are thick, smooth, and of a light green, the foot-stalks inclining to red; the branches are regularly disposed on every side, and the male flowers are disposed in long bunches; they are of a whitish green colour; the berries are much larger than those of the other sorts. It is called by some the Royal Bay, and by others the Portugal Bay.

The fifth sort grows naturally in Carolina in great abundance, where it is called the Red Bay; it also is found in some other parts of America, but not in so great plenty. In some situations near the sea, this rises with a strait trunk to a considerable height, and their stems are large, but in the inland parts of the country they are of an humbler stature. The wood of this tree is much esteemed, being of a fine grain, so is of excellent use for cabinets, &c.

The leaves of this sort are much longer than those of the common Bay, and are a little woolly on their under side, their edges are a little reflexed; the veins run transversly from the midrib to the sides, and the male flowers come out in long bunches from the wings of the leaves. The female trees produce their flowers in loose bunches, standing upon pretty long foot-stalks, which are red; these are succeeded by blue berries sitting in red cups.

This sort is also too tender to thrive in the open air in England; for although some plants have lived abroad in a mild winter, which were planted in a warm situation, yet the first sharp winter has destroyed them, so that these plants must be kept in pots or tubs, and housed in winter like the former.

These five sorts may be propagated by layers, and the common sort is generally propagated by suckers; but those plants never keep to one stem, but generally send out a great number of suckers from their roots, and form a thicket, but do not advance in height; therefore the best way to have good plants, is to raise them from the berries, when they can be procured, for the plants which come from seeds, always grow larger than the others, and do not put out suckers from their roots, so may be trained up with regular stems. The best way is to sow the berries in pots, and plunge them into a moderate hot-bed, which will bring up the plants much sooner than if they are sown in the full ground, so they will have a longer time to get strength before winter; but the plants must not be forced with heat, therefore they should be inured to bear the open air the beginning of June, into which they should be removed, where they may remain till autumn; then the pots should be placed under a common frame, that the plants may be protected from hard frost, but in mild weather they may enjoy the free air; for while the plants are so young, they are in danger of suffering in hard frost, even the common sort of Bay. The spring following, those sorts which will not live in the open air, should be each transplanted into separate pots; but the common sort may be planted in nursery-beds six inches asunder each way, where they may grow two years, by which time they will be fit to plant where they are designed to grow. The other sorts must be constantly kept in pots, so should every year be new potted, and as they advance in growth, they must have larger pots. As these plants require shelter in winter, a few of each sort will be enough for a large green-house.

The common Bay will make a variety in all ever-green plantations; and as it will grow under the shade of other trees, where they are not too close, so it is very proper to plant in the borders of woods, where it will have a good effect in winter.

The sixth sort grows naturally in North America, where it rises to the height of ten or twelve feet, dividing into many branches, garnished with oval spear-shaped leaves near three inches long, and one inch and a half broad, smooth on their upper surface, but with many transverse veins on their under side; these leaves fall off in the autumn like other deciduous trees. The flowers I have but once seen, those were all male, and of a white herbaceous colour; but if I remember right, they had but six stamina in each.

The Sassafras-tree is also very common in most parts of North America, where it spreads greatly by its roots, so as to fill the ground with suckers wherever they are permitted to grow; but in England this shrub is with difficulty propagated. In America it is only a shrub, seldom rising more than eight or ten feet high; the branches are garnished with leaves of different shapes and sizes, some them are oval and entire, about four inches long and three broad; others are deeply divided into three lobes; these are six inches long, and as much in breadth from the extremity of the two outside lobes; they are placed alternately upon pretty long foot-stalks, and are of a lucid green; these fall off in the autumn, and in the spring, soon after the leaves begin to come out, the flowers appear just below them, upon slender foot-stalks, each sustaining

ſuſtaining three or four ſmall yellow flowers, which have five oval concave petals, and eight ſtamina in the male flowers, which are upon different plants from the hermaphrodite flowers, which have an oval germen, that afterward becomes an oval berry, which, when ripe, is blue, but thoſe plants do not produce fruit in England.

The eighth ſort grows naturally in North America, in ſwampy lands; this riſes with a ſhrubby branching ſtalk eight or ten feet high, covered with a purple bark. The leaves are placed oppoſite, and are near two inches long and one broad, ſmooth on their upper ſide, but are veined on their under, where they are rough. This hath not as yet produced flowers here, but the berries which were ſent me from Maryland were red, and nearly the ſize and ſhape of the common Bay-berry.

The Camphire-tree grows naturally in Japan, and in ſeveral parts of India, and alſo at the Cape of Good Hope, where it riſes to a tree of middling ſtature, dividing into many ſmall branches, garniſhed with oval ſpear-ſhaped leaves, ſmooth on their upper ſide, having three longitudinal veins which unite above the baſe; if theſe are bruiſed, they emit a ſtrong odour of Camphire, as alſo the branches when broken. Theſe are male and hermaphrodite on different trees; I have only ſeen thoſe of the male, which has flowered plentifully in England; theſe were ſmall, and compoſed of five concave yellow petals, very like thoſe of the Saſſafras-tree, and were produced three or four upon each foot-ſtalk, in like manner.

The tenth ſort was diſcovered by the late Dr. Houſtoun at La Vera Cruz; this riſes with a woody ſtalk to the height of twenty feet, dividing into many branches, which are covered with a gray rough bark; at the extremity of the branches are produced the foot-ſtalks, which are unequal in length, but divide into ſeveral ſmaller, each ſuſtaining a cluſter of ſmall white flowers, which are collected into a head or ſmall umbel, having one general involucrum; theſe are male and hermaphrodite on different trees. The hermaphrodite flowers are ſucceeded by oval berries, not quite ſo large as thoſe of the common Bay. The leaves of this tree are about two inches long and one broad, rounded at the top and entire, ſtanding upon very ſhort foot-ſtalks.

The Saſſafras-tree is commonly propagated by the berries, which are brought from America; but theſe berries generally lie in the ground a whole year, and ſometimes two or three years before they grow, when they are ſown in the ſpring; therefore the ſureſt method of obtaining the plants will be, to get the berries put into a tub of earth ſoon after they are ripe, and ſent over in the earth; and as ſoon as they arrive, to ſow the berries on a bed of light ground, putting them two inches in the earth; and if the ſpring ſhould prove dry, the bed muſt be frequently watered, and ſhaded from the great heat of the ſun in the middle of the day; with this management many of the plants will come up the firſt ſeaſon, but as a great many of the berries will lie in the ground till the next ſpring, ſo the bed ſhould not be diſturbed, but wait until the ſeaſon after, to ſee what will come up. The firſt winter after the plants come up, they ſhould be protected from the froſt, eſpecially in the autumn; for the firſt early froſt at that ſeaſon is apt to pinch the ſhoots of theſe plants, which, when young, are tender and full of ſap, ſo will do them more injury than the ſevere froſt of the winter; for when the extreme part of the ſhoots are killed, it greatly affects the whole plant.

When the plants have grown a year in the ſeed-bed, they may be tranſplanted into a nurſery, where they may ſtand one or two years to get ſtrength, and may then be tranſplanted into the places where they are to remain for good.

There have been ſome of theſe plants propagated by layers, but theſe are commonly two, and ſometimes three years before they put out roots; and if they are not duly watered in dry weather, they rarely take root; ſo that it is uncertain, whether one in three of theſe layers do ſucceed, which makes theſe plants very ſcarce in England at preſent.

The wood of this ſhrub is frequently uſed to make tea, which is eſteemed a great antiſcorbutic; and in Carolina they frequently give a decoction of the wood and leaves in intermitting fevers; but the flowers of the ſhrub are gathered, and dried by the moſt curious, and are uſed for tea.

The Benjamin-tree, as it is falſly called, may be propagated in the ſame manner as the Saſſafras, by ſowing of the berries: theſe generally lie long in the ground, ſo that unleſs they are brought over in earth, in the ſame way as before directed, they often fail, or at leaſt remain long in the ground; but this is now frequently propagated by layers in England, which put out roots pretty freely, when the young ſhoots are choſen to make layers.

The eighth ſort is alſo a native of the ſame country with the laſt, and may be propagated by ſeeds in the ſame manner as thoſe, and require the ſame treatment. This may alſo be propagated by layers, which put out roots pretty freely; and as the ſhrubs do not produce ſeeds in England, ſo this is the beſt method to propagate them.

Theſe three ſorts will live in the open air in England, but the Saſſafras is often injured by very ſevere froſts, eſpecially if they are in an expoſed ſituation; therefore theſe plants ſhould have a warm ſituation and a looſe ſoil; and in moiſt ground this, and alſo the eighth ſort, will thrive much better than in a dry ſoil; for when they are planted on a hot gravelly ſoil, they frequently die in ſummer when the ſeaſon proves dry. They are all of them now much cultivated in England, to add to the variety of ſhrubs, but they are not very ornamental plants; though indeed the Saſſafras makes a good appearance in ſummer, when it is fully clothed with its large leaves, which being of different ſhapes, makes an agreeable variety, when intermixed with ſhrubs of the ſame growth.

The Camphire-tree is very near a-kin to the Cinnamon-tree, from which it differs in the leaves, thoſe of the Cinnamon-tree having three ribs running longitudinally from the foot-ſtalk to the point, where they ſoon diminiſh; whereas the ribs of the leaves of this tree are ſmall, and extend toward the ſides, and have a ſmooth ſhining ſurface: they are both male and hermaphrodite in different trees.

In Europe this tree is propagated by layers, which are generally two years, and ſometimes longer, before they take root, ſo that the plants are very ſcarce; and as all thoſe which I have ſeen flower are male trees, ſo there can be no hopes of procuring ſeeds from them here: but if the berries of this, and alſo of the Cinnamon-tree, were procured from the places of their growth, and planted in tubs of earth, as hath been directed for the Saſſafras-tree, there may be a number of theſe plants procured in England: and if they were ſent to the Britiſh colonies in America, they might be there cultivated, ſo as to become a public advantage; eſpecially the Cinnamon-tree, which will grow as well in ſome of our iſlands in the Weſt-Indies, as it does in the native places of its growth, and in a few years the trees might be had in plenty; for they propagate eaſily by the berries, as the French experienced in their American iſlands. The Portugueze brought ſome of the Cinnamon-trees from the Eaſt-Indies, and planted them on the iſland of Princes, on the coaſt of Africa, where they now abound, having ſpread over a great part of the iſland; there is alſo one tree now growing at the Madeiras, which I have been informed is a male, ſo never produces berries.

The Camphire-tree does not require any artificial heat in winter, ſo that if they are placed in a warm dry green-houſe they will thrive very well. During the winter ſeaſon they muſt be ſparingly watered, and in the ſummer they ſhould be placed abroad in a warm ſituation, where they may be defended from ſtrong winds, and not too much expoſed to the direct rays

of

of the sun; but during this season, they must be frequently refreshed with water.
They may be propagated by laying down the young branches in autumn, which should be treated in the same manner as is before directed for the Benjamin.
The tenth sort requires a stove to preserve it through the winter in England; this is propagated by seeds, which must be procured from the country where it grows naturally.
This plant requires the same treatment as the Coffee-tree, so should be planted in a stove, with that and other tender plants of those warm countries, and always remain there.
The eleventh and twelfth sorts have been generally confounded by most, if not all the writers who have treated of them; though their bark, which is the material part of these trees in use, is pretty easily distinguished by the dealers in these commodities.
Dr. Linnæus is certainly mistaken in referring the latter to the figure of Dr. Burman, which he has given in his History of Ceylon plants, by the title of Cinnamomum perpetuo florens, &c. which is a true representation of the male Cinnamon-tree, and is not the Cassia Lignea; but as there are plants of all these sorts now in the British Islands of America, so we may hope soon to have their species better ascertained.
The plants of both these kinds are not so tender as most people do imagine, and the treating of those plants which have been brought to England so tenderly has destroyed them; for so far as I have made trial of their culture it has appeared, that great heat is very prejudicial to them; therefore I would advise those persons who may have any of the plants come under their care, to treat them in a different manner, otherwise there will be little hopes of keeping them; for when the plants have taken new root in the pots, they should in summer be placed in a glass-case, where they may have plenty of air in warm weather, and in winter placed in a stove kept moderately warm.

LAURUS ALEXANDRINA. See Ruscus.

LAURUS TINUS. See Tinus.

LAWN is a great plain in a park, or a spacious plain adjoining to a noble seat.
As to the dimensions of it, it should be as large as the ground will permit; but never less, if possible, than thirty or forty acres; but this is to be understood of Lawns in large parks, for in gardens a Lawn of six or eight acres is a reasonable size for gardens of a moderate extent, ten or twelve acres for those of the largest size.
As to the situation of a Lawn, it will be best to be in the front of the house, and to lie open to the neighbouring country, and not pent up too much with trees.
If the house front the east, or south-east, it will be most convenient, because the rooms will be shaded in the afternoon, and so the objects to be viewed from the house will be much better seen, by the sun's shining upon them at that time of the day; for if the best room of the house front the Lawn, as it always should do, the afternoon being the most usual time for people of fashion to solace themselves in such rooms, the sun will not be offensive to those rooms, nor will the prospect be interrupted, but rendered more pleasant; whereas, were it on the west side of the house, the sun, by shining from the object, and directly against those rooms, would, by both, hinder the prospect, for the generality of prospects are most pleasant when the sun shines upon the objects.
Besides, there is another inconvenience, if the Lawn be on the west side of the house, it will give the more way to the west wind (which is commonly the greatest) to injure the house, by its having a free passage to it.
If the Lawn be on the south side of the house, it may do well enough, for the reasons before-mentioned, for the sun's rays being then darted obliquely, will not so much interrupt the prospect, and the sun shining most part of the day on that side of the house, will still add to the beauty of that front, which ought to be the best front in the house, therefore a Lawn on that side will much help the prospect of the house.
But the most desirable aspect for a Lawn is that of the south-east, which is generally the most favourable point in England; for as the sun rises upon the front of the house facing this point, so it will add a chearfulness to the rooms in the morning, and by noon the rays will be oblique to this front, and in the afternoon will have entirely left these apartments.
It will not be at all convenient to have the Lawn on the north side of the house, because it will lay the house too open to the cold north winds, &c. therefore it will be more eligible to plant wildernesses and woods on the west and north sides of the house, by way of screen to it, provided these do not shut out agreeable objects.
As to the figure of the Lawn, some contend for an exact square, others an oblong square, some an oval, and others a circular figure; but neither of these are to be regarded, for it will be much better if contrived so as to suit the figure of the ground; and as there should be trees planted for shade on the boundaries of the Lawn, so the sides may be broken by irregular plantations of trees; for if there are not some good prospects beyond the Lawn, it will be proper to have it bounded on every side by plantations, which may be brought round pretty near to each end of the house, so that persons may soon get into shade, which is a very desirable thing in hot weather; for where that is wanting, few persons care to stir abroad when the sun shines warm.
If in the plantations round the Lawn, the trees are placed irregularly, some breaking much forwarder on the Lawn than others, and not crowded too close together, they will make a much better appearance than any regular plantations can possibly do; and if there are varieties of trees properly disposed, they will have a good effect; but it should be observed, that no other but those which make a fine appearance, and that grow large, strait, and handsome, should be admitted here, as they are placed in the constant view from the house.
Many persons have preferred the Lime-tree for this purpose, on account of their regular growth; but as the leaves of this tree often change their colour, and begin to fall very soon in autumn, occasioning a great litter in the garden; and from the end of July the trees make but an indifferent appearance, so they are not to be esteemed for these plantations.
The Elm, Oak, Beech, and Chestnut, among the deciduous trees, are to be preferred to all others, as they keep their leaves late in autumn; and these are all of them large growing trees, so are very proper for this purpose.
If there are some clumps of Evergreen trees intermixed with the deciduous trees in this plantation, if they are properly disposed, it will add to the beauty, especially in the winter season; the best sorts for this purpose are Lord Weymouth's Pine, the Silver and Spruce Firs, which will grow fast, and become large trees; and as the two latter sorts always grow pyramidically, so they will have a good effect to the sight, if they are rightly placed, but they should not be intermixed in the same clumps with the deciduous trees; but as these generally feather out their branches near the ground, they should be planted where they do not obstruct the view of any distant objects.
But as most persons who take pleasure in beautifying their seats in the country, are in haste for shade, they generally plant the trees too close together, and often in such a manner as to render it difficult when the trees are advanced to reduce their number, without injury to the design; therefore those trees should be first planted, which are designed to remain, and then there may be some few others planted for present shade, which may afterward be taken away. When persons who are beautifying their seats meet with full grown trees on the spot, it is a great pleasure, for these should not be destroyed, if they can possibly stand without prejudice.

**LAWSONIA.** Lin. Gen. Plant. 433. Henna. Ludw. 143.

The Characters are,

*The flower has a small permanent empalement, divided into four parts at the top. The flower is composed of four oval spear-shaped petals, which spread open, and eight slender stamina the length of the petals, which stand by pairs between them, terminated by roundish summits. It hath a roundish germen, supporting a slender permanent style, crowned by a headed stigma. The germen afterward becomes a globular capsule ending in a point, having four cells, filled with angular seeds.*

This genus of plants is ranged in the first section of Linnæus's eighth class, intitled Octandria Monogynia, which includes those plants whose flowers have eight stamina and one style.

The Species are,

1. Lawsonia (*Inermis*) ramis inermibus. Flor. Zeyl. 134. *Lawsonia whose branches have no spines.* Ligustrum Ægyptiacum latifolium. C. B. P. 476. *Broad-leaved Egyptian Privet, called Alhenna, or Henna, by the Arabians.*
2. Lawsonia (*Spinosa*) ramis spinosis. Flor. Zeyl. 134. *Lawsonia with prickly branches.* Rhamnus Malabaricus Mail-anski. Pluk. Alm. 38. tab. 220. *Malabar Buckthorn, called Mail-anski.*

The first sort grows naturally in India, Egypt, and other warm countries, where it rises with a shrubby stalk eight or ten feet high. The branches come out by pairs opposite; these are slender, and covered with a whitish yellow bark, and garnished with oblong small leaves of a pale green, ending in acute points, placed opposite. The flowers are produced in loose bunches at the end of the branches; they are of a gray or dirty white colour, and are composed of four small petals which turn backward at the top. The flowers are succeeded by roundish capsules with four cells, filled with angular seeds.

The leaves of this shrub are much used by the Egyptian women to colour their nails yellow, which they esteem an ornament.

The second sort grows naturally in both Indies, for I have received specimens of it from the Spanish West-Indies, where it was found growing naturally in great plenty.

This rises with a woody trunk eighteen feet high or more. The wood is hard and close, covered with a light gray bark. The branches come out alternate, and are garnished with oblong oval leaves, which stand without order; and at the joints where the leaves are placed, come out single, strong, sharp thorns. The flowers are produced in loose bunches from the side of the branches; they are of a pale yellow colour, and of a disagreeable scent; they have four petals, which spread open; between each of these are situated two pretty strong stamina, terminated by roundish summits. After the flowers are past, the germen becomes a roundish capsule with four cells, including many angular seeds.

These plants are both propagated by seeds, which should be sown on a hot-bed early in the spring, that the plants when they come up may have time to get strength before winter. When the plants are fit to remove, they should be each planted in a small pot filled with light sandy earth, and plunged into a hot-bed of tanners bark, where they must be screened from the sun till they have taken new root; then their treatment should be the same as that of the Coffee-tree, with this difference only, not to let these plants have so much water; but especially in the winter, during which season it should be given to them very sparingly, for by over-watering these plants I have known many of them destroyed; these plants are too tender to thrive in the open air in England, so they must constantly remain in the stove, but in hot weather they should have plenty of free air admitted to them.

**LAYERS.** Many trees and shrubs may be propagated by Layers, which do not produce seeds here, so are not easily increased by any other method.

This is to be performed by slitting the branches a little way upward, and laying them under the mould about half a foot; the ground should first be well digged and made very light, and after they are laid they should have a little water given them.

If they do not comply well in the laying of them down, they must be pegged down with a forked stick cut in form of a hook to keep them down; if the Layers have taken sufficient root by the next winter, they must be cut off from the main plants, and planted in the nursery, as is directed about seedlings.

Some twist the branch or bare the rind, and if it be out of the reach of the ground, they fasten a tub or basket near the branch, which they fill with good mould, and lay the branch in it.

### Laying of Trees.

This operation is thus performed:

1st, Take some of the most flexible boughs and lay them into the ground about half a foot deep in fine fresh mould, fastening them down with forked sticks, leaving them with the end of the Layer about a foot or a foot and a half out of the ground, and keep them moist during the summer season, and they will probably have taken root and be fit to remove in autumn, and if they have not by that time taken root they must lie longer.

2dly, Tie a piece of wire hard round the bark of the bough, at the place you intend to lay in the ground, and twist the ends of the wire, so that they may not untie, and prick the place above the wire through the bark, with an awl in several places, and then lay it in the ground as before directed; this will often succeed when the other fails.

3dly, Cut a slit upwards at a joint, as is practised in laying of Carnations, which by gardeners is called tonguing the Layers.

4thly, Twist the part of the branch designed to lay in the ground like a withy, if it is pliable, and lay it into the ground as directed in the first way of laying.

5thly, Cut a circle almost round about the bough (that is designed to be laid) half an inch, at the place that is most convenient to lay into the ground, and manage it as is directed in the first method of laying.

The season for laying hardy trees that shed their leaves is in October, but for such as are tender in the beginning of March; for Evergreens, June or July are good seasons.

Though Layers may be laid at any time in the year, yet the before-mentioned seasons are most proper, for the reasons following, because they have the whole winter and summer to prepare and draw root; for at these times of the year the sun has sufficient power on the sap of the tree to feed the leaf and bud, but has not power sufficient to make a shoot.

And if that small quantity of sap that does arise be hindered, as it will by some of the preceding ways of laying, the leaves and buds will gently crave of the Layer, and by that means will prepare the Layer to take root, or put forth roots a little to maintain itself, finding it cannot have it from the mother plant. And therefore, because it wants but little nourishment at that time of the year, it is better to lay Layers of trees, or to set cuttings than at other times, either in the autumn, when the sap stirs but little, or in the spring when it begins to rise, because it is then apt to come too suddenly to draw sap from the Layer, before the Layer has drawn or prepared for root; but for some sorts the middle of summer is best.

However, the spring or summer may do well for small plants, because such plants being but short-lived draw root the quicker.

If you would lay young trees from a high standard, the boughs of which cannot be bent down to the ground, then you must make use of Osier baskets, boxes, or pots, filled with fine mould, mixed with a little rotten Willow dust, which will keep moisture to assist the Layer in taking root; this basket, box, &c. must be set upon a post or tressel, &c. and the bough must

be laid according to either of the four firſt ways of laying, but too much head muſt not be left on, leſt that be injured by the wind, or by its own motion rub off the tender root; and the ſmaller the boughs are, the leſs way they ſhould be left out of the ground, and care muſt be taken to keep them clear from weeds.

The harder the wood of the tree is, the young ſhoots will take root beſt; but if the wood be ſoft, the older boughs will take root the beſt.

There are many kinds of trees and plants which will not put out roots from their woody branches, though laid down with the utmoſt care; yet if the young ſhoots of the ſame year are laid in July, they will often put out roots very freely, ſo that when any plants are found difficult to propagate by Layers in the common way, they ſhould be tried at this ſeaſon; but as theſe ſhoots will be ſoft and herbaceous, they muſt not have too much wet, for that will cauſe them to rot; therefore it will be a better method to cover the ſurface of the ground over the Layers with Moſs, which will prevent the ground from drying too faſt, ſo that a little water now and then will be ſufficient.

LEAVES. A Leaf is defined to be a part of a plant extended into length and breadth, in ſuch a manner as to have one ſide diſtinguiſhable from the other; they are properly the moſt extreme part of a branch, and the ornament of the twigs, and conſiſt of a very glutinous matter, being furniſhed every where with veins and nerves; one of their offices is, to ſubtilize and give more ſpirit to the abundance of nouriſhing ſap, and to convey it to the little buds.

We ſhall firſt conſider the diſtinctions which are made by botaniſts in their definitions of the ſhape and form of Leaves in their titles and deſcriptions of plants, and afterward conſider their uſes in vegetation.

The Leaf of a plant or tree is diſtinguiſhed from that of flowers, the firſt is called Folium in Latin, and the other Petalum; therefore what is to be underſtood here of Leaves, are thoſe which are ranged on the branches and ſtalks of plants, and have no connection with the flower.

Theſe Leaves are either ſimple or compound.

Simple Leaves are thoſe of which the foot-ſtalk or petiole ſupports but one, compound are thoſe of which the foot-ſtalk ſuſtains many Leaves or ſmall foliola.

Simple Leaves differ in reſpect to circumſcription, angles, ſinus, apices, margin, ſuperficies and ſubſtance; circumſcription conſiders the form of the circumference of Leaves where there are no angles or ſinuations; in which reſpect Leaves are,

Orbiculate, or round Leaves (*Orbiculatum*) are ſuch whoſe breadth are equal to their length, and every part of their edges equally diſtant from the center, as in fig. 1.

A roundiſh Leaf (*Subrotundum*) when the Leaf is nearly orbiculate, as in fig. 2.

An oval or egg-ſhaped Leaf (*Ovatum*) when the length of the Leaf exceeds the breadth, and the baſe or lower part of it forms a ſegment of a circle; but the upper extremity is not in proportion, but ſmaller, as in fig. 3.

An obverſe oval Leaf is one whoſe foot-ſtalk is fixed to its ſmaller end.

An oval or elliptic Leaf (*Ovale ſive ellipticum*) is one whoſe length exceeds its breadth, and both ends are narrower than the ſegments of circles, as fig. 4.

A parabolical Leaf (*Parabolicum*) is one whoſe length exceeds its breadth, and is narrowed from the baſe upward, ſo becomes half egg-ſhaped, fig. 5.

A ſpatulated Leaf (*Spatulatum*) is of a roundiſh figure, but narrow at the baſe, and linearly lengthened, fig. 6.

A wedge-ſhaped Leaf (*Cuneiforme*) is one whoſe length exceeds the breadth, and is narrowed to the baſe, fig. 7.

An oblong Leaf (*Oblongum*) is one whoſe length greatly exceeds its breadth, and each extremity is narrower than a ſegment of a circle, fig. 8.

A ſpear-ſhaped or ſpear-pointed Leaf (*Lanceolatum*) is oblong, and grows narrower toward both ends, and terminates in a point, fig. 9.

A linear Leaf (*Lineare*) is one whoſe two ſides run almoſt parallel to each other; they are uſually narrow, and ſomewhat broader in the middle than at the two ends, fig. 10.

A chaffy Leaf (*Acerosum*) is when the linear Leaf ſtays on the tree, and is evergreen, as in the Fir, Yew, &c. fig 11.

An awl-ſhaped Leaf (*Subulatum*) is one which is linear below, but gradually contracting towards the top, fig. 12.

A triangular Leaf (*Triangulare*) is when the diſk is ſurrounded by three prominent angles, fig. 13.

A quadrangular and quinquangular Leaf, only differ from the former in the number of their ſides or angles, fig. 14.

A deltoide Leaf is one with four angles, of which thoſe of the extremities are farther diſtant from the center than thoſe of the ſides, fig. 15.

A round Leaf (*Rotundum*) is one without any angles.

A ſinus (*or Hollow*) is uſed to expreſs thoſe openings or cavities in Leaves which diſtinguiſh them into parts.

A kidney-ſhaped Leaf (*Reniforme*) is of a roundiſh figure, and hollowed a little at the baſe, but without any angles, fig. 16.

A heart-ſhaped Leaf (*Cordatum*) when they are ovate and hollowed a little at the baſe, but without any angles, fig. 17.

A moon-ſhaped Leaf (*Lunulatum*) is a roundiſh Leaf hollowed at the baſe, with two curvilinear angles in form of ſickles, fig. 18.

An arrow-ſhaped Leaf (*Sagittatum*) is one which is triangular, and hollowed at the baſe for the inſertion of the foot-ſtalk, fig. 19.

A heart arrow-ſhaped Leaf (*Cordatum-ſagittatum*) is like the former, but the ſides of it are convex, fig. 20.

A ſpear-pointed Leaf (*Haſtatum*) is of a triangular form, the ſides and baſe of which are hollowed, and the angles ſpreading ſo as to reſemble a Leaf compoſed of three parts, fig. 21.

A fiddle-ſhaped Leaf (*Panduræ forme*) is oblong, larger at both ends than in the middle, the two ſides being compreſſed like the body of a violin, fig. 22.

A cleft or divided Leaf (*Fiſſum*) is divided by linear ſinuations and ſtrait margins; from the number of the diviſions they are termed a two, three, or many pointed leaf, fig. 23.

A lobated Leaf (*Lobatum*) is one which is divided almoſt to the midrib, into parts which ſtand diſtant from each other, and have convex margins according to the number of theſe parts; it is called bilobed, trilobed, or quadrilobed, &c. fig. 24.

A handed Leaf (*Palmatum*) is one which is divided into ſeveral longitudinal ſegments down to the baſe, where they are united, and reſemble an open hand, fig. 25.

A wing-pointed Leaf (*Pinnatifidum*) is one which is tranſverſly divided into oblong horizontal diviſions, fig. 26.

A lyre-ſhaped Leaf (*Lyratum*) is one which is divided into tranſverſe ſegments, the upper ones being larger than the lower, which are farther aſunder, fig. 27.

A laciniated or jagged Leaf (*Laciniatum*) is one whoſe ſides are variouſly divided into jags, which are again divided without any order, fig. 28.

A ſinuated Leaf (*Sinuatum*) is one which has many ſinuations on its ſides, but is not indented or notched on its edges, fig. 29.

An indented ſinuated Leaf (*Dentato-ſinuatum*) is one like the former, but the ſide lobes are of a linear figure.

A divided Leaf (*Partitum*) is one which is divided into many parts to the baſe, ſo as to appear like many Leaves till cloſely examined. Theſe are called bipartite, tripartite, &c. according to the number of parts, fig. 30.

An entire Leaf (*Integrum*) is one that is undivided, and has ſmooth edges.

Apex tip, is the extremity in which the Leaf terminates; Leaves in respect to these are termed,

A truncated Leaf (*Truncatum*) is one whose summit seems as though it were cut off by a strait line, in a transverse direction.

A bitten Leaf (*Præmorsum*) is one which is terminated by very blunt unequal cuts, fig. 31.

A blunt Leaf (*Retusum*) is one whose extremity is terminated by an obtuse sinus, fig. 32.

A nicked Leaf (*Emarginatum*) is one whose extremity is a little notched, fig. 33.

An obtuse Leaf (*Obtusum*) is one whose point is terminated bluntly, or by a segment of a circle, fig. 34.

A sharp Leaf (*Acutum*) is one whose point is terminated in an acute angle, fig. 35.

An acuminated Leaf (*Acuminatum*) is one which is terminated by an awl-shaped point, fig. 36.

A pointed obtuse Leaf (*Obtusum acumine*) is one whose upper part is rounded, but draws to an acute point, fig. 37.

A clasper Leaf (*Cirrhosum*) is one which terminates with a tendril, fig. 38. as in Gloriosa, Flagellaria, &c.

The margin of a Leaf is the outermost boundary of its sides, exclusive of its disk or middle, so in respect to their margin are,

A spinous Leaf (*Spinosum*) is one whose edge or border ends with hard stiff prickles, fig. 39.

An indented Leaf (*Dentatum*) is one whose edge has horizontal points of the same consistence with the Leaf, but are separated from each other, fig. 40.

A sawed Leaf (*Serratum*) is one whose edges are sharply notched like the teeth of a saw, which make acute angles bending toward the top, fig. 41.

A backward sawed Leaf (*Retrorso-serratum*) is one whose serratures or teeth, are bent toward the base of the Leaf.

A double sawed Leaf (*Duplicato-serratum*) is one whose edges are sawed with larger teeth, and the edges of these are again sawed in the same manner.

A notched Leaf (*Crenatum*) is one whose edges are indented with angles, which neither turn toward the point nor base. When these indentings terminate obtusely, it is called obtuse crenated; when acutely, acute crenated; when the indentures are again indented, it is called double crenated (*Duplicato-crenatum,*) fig. 42.

A bowed or serpentine Leaf (*Repandum*) is one whose margin has several obtuse sinuses which are inscribed with the segments of circles, fig. 43.

A cartilaginous or grisly Leaf (*Cartilagineum*) is one whose edge is furnished with a firm cartilage of a different substance with the Leaf, fig. 44.

A ciliated Leaf (*Ciliatum*) is one whose edge is set with parallel hairs, so as to resemble the hairs of the eye-lid, fig. 45.

A torn Leaf (*Laceratum*) is one whose edges are cut into segments of irregular shapes.

A gnawed Leaf (*Erosum*) is one which is sinuated, and the sinuses have their edges again indented with small obtuse sinuations, fig. 46.

A very entire Leaf (*Integerrimum*) is one whose margin is entirely free of all notches or indentures.

The surface (*Superficies*) is the outside, or what covers the disk of the Leaf, and respects both the upper and under surface, so are termed,

A viscous Leaf (*Viscidum*) has its superfices covered with a clammy moisture which is not fluid, but sticky.

A downy Leaf (*Tomentosum*) is one whose surface is covered with a nap of interwoven hairs so short and fine, that the eye does not distinguish them singly, though the Leaf is evidently downy both to the sight and touch, fig. 47.

A woolly Leaf (*Lanatum*) is one whose surface is covered with a kind of woolly substance, like a spider's web, as in Salvia, Sideritis, &c.

A hairy Leaf (*Pilosum*) has its surface furnished with long distinct hairs, fig. 48.

A rough or stinging Leaf (*Hispidum*) is one whose surface is covered with rigid hairs, which either sting or prick on being touched, fig. 49.

A rough Leaf (*Scabrum*) is one whose surface has on it several little irregular prominences.

A prickly Leaf (*Aculeatum*) is one whose surface is covered with strong sharp points or thorns, which adhere lightly to the surface.

A streaked or channelled Leaf (*Striatum*) is when its surface has a number of parallel longitudinal furrows.

A pimpled Leaf (*Papillosum*) is one whose surface has many little roundish protuberances like nipples or bladders, fig. 50.

A punctuated Leaf (*Punctatum*) is one whose surface has many hollow points dispersed over it.

A bright or splendent Leaf (*Nitidum*) is one whose surface is smooth and shining, as if polished by art.

A plaited Leaf (*Plicatum*) is one which has several angular risings and hollows towards its borders, as if folded up, as in Alchimilla, fig. 51.

A waved Leaf (*Undulatum*) is one whose surface toward the edges rises and falls convexly like the waves of the sea.

A curled Leaf (*Crispum*) is when the circumference of the Leaf grows larger than the disk will admit, so that the whole surface is raised in waves, fig. 52.

A rough leaf (*Rugosum*) is one whose veins are contracted and sunk below the disk, and the intermediate fleshy parts rise in irregular forms, so as to appear rough, fig. 53.

A hollow or concave Leaf (*Concavum*) is one whose margin contracts, so is less than the middle, and is sunk down or hollowed.

A veined Leaf (*Venosum*) is one whose veins are branched, and appear to the naked eye.

A convex Leaf (*Convexum*) is one whose middle rises into a protuberant form.

A nervous Leaf (*Nervosum*) is when the veins are extended lengthways from the base toward the summit without branching, fig. 54.

A coloured Leaf (*Coloratum*) is one which has other colours than green.

A smooth Leaf (*Glabrum*) is one whose surface is smooth, without any inequalities.

The substance of a Leaf respects the conditions of its sides, in this respect Leaves are,

A taper Leaf (*Teres*) is one of a thick substance, and for the most part of a cylindrical form.

A half taper Leaf (*Semicylindraceum*) is one which is of a cylindrical form, flatted on one side.

A hollow Leaf (*Tubulosum*) is one which is hollow like a pipe, as those of the Onion.

A fleshy Leaf (*Carnosum*) is one that is succulent or full of pulp.

A compressed Leaf (*Compressum*) is one whose marginal sides are pressed, so that the substance of the Leaf is larger than the disk.

A plane Leaf (*Planum*) is one whose surfaces are every where parallel.

A gibbous Leaf (*Gibbum*) is one which is convex on both sides, the middle being fuller of pulp.

A depressed Leaf (*Depressum*) is one whose disk is more depressed than the sides.

A guttered Leaf (*Canaliculatum*) is one which has a longitudinal deep furrow running through the middle of the Leaf, and is almost cylindrical, fig. 55.

A double-faced Leaf (*Ancipites*) is one whose disk is convex, and has two prominent longitudinal angles.

A sword-shaped Leaf (*Ensiforme*) is one with thin edges, with a prominent rib running from the base to the point in the middle.

A faulchion or scymiter-shaped Leaf (*Acinaciforme*) is one which is fleshy and compressed, with one of its edges convex and narrow, the other thick and strait, fig. 56.

An ax-shaped Leaf (*Dolabriforme*) is one which is roundish, obtuse, and compressed, gibbous on the outside, the inside sharp-edged and taper below, fig. 57.

A tongue-shaped Leaf (*Linguiforme*) is linear, fleshy, and obtuse, convex on the under side, and has often cartilaginous edges, fig. 58.

A two-edged Leaf (*Anceps*) is one which has two prominent angles, running lengthways on a convex disk.
A three-cornered Leaf (*Triquetrum*) has three longitudinal plain sides like an awl-shaped Leaf.
A three-edged Leaf (*Trigonal*) is much like the former, but in this the ribs are sharp and membranaceous, the surface of the Leaf being channelled. When a Leaf has four or five angles, it is called tetragonal and pentagonal, &c.
A furrowed Leaf (*Sulcatum*) is one that has several ridges running lengthways, which have obtuse sinusus, fig. 59.
A keel-shaped Leaf (*Carinatum*) is one that has the under part of the disk prominent the whole length, and the upper concave like the keel of a boat.
A membranaceous Leaf (*Membranaceum*) is one wholly composed of membranes, without any apparent pulp between.
A compound Leaf (*Compositum*) in general means one, which is formed of several small Leaves standing upon one foot-stalk, but these Leaves are divisible again to the structure and position of the small Leaves.
1st, Into such as are properly and distinctly called compound Leaves; 2dly, the decompound; 3dly, the supradecompound, of each of these in its place.
In describing these kinds of Leaves, the whole Leaf which is the result of the combination, is considered as one Leaf, called (*Folium*) and the small leaves which together compose it (*Folioli*) or lobes.
A simple compound Leaf, is one whose simple foot-stalk bears more than one Leaf.
A jointed one (*Articulatum*) is when one Leaf grows out of the point of another, fig. 60.
A fingered Leaf (*Digitatum*) is one which is composed of several small Leaves joining to one foot-stalk at their base, spreading open like the fingers of a hand, fig. 61.
A two-lobed Leaf (*Binatum*) is one with two small Leaves on one foot-stalk, fig. 62.
A three-lobed Leaf (*Ternatum*) is one with three small leaves, which is frequently called a trifoliate Leaf, fig. 63.
A cinquefoil Leaf (*Quinatum*) has five small Leaves on the same foot-stalk.
A winged Leaf (*Pinnatum*) is one which has many small Leaves, ranged on each side a single foot-stalk like wings; of these there are several kinds.
An unequal winged Leaf (*Pinnatum cum impare*) is a winged Leaf, terminated by an odd lobe or (*Folioli*) fig. 64.
A clasper-winged Leaf (*Pinnatum cum cirrho*) is a winged Leaf ending with a tendril or clasper, fig. 65.
An abrupt-winged Leaf (*Abruptum*) is a winged Leaf not terminated by an odd lobe or clasper, fig. 66.
An opposite-winged Leaf (*Opposite pinnatum*) is when the small Leaves or lobes are placed opposite on the midrib.
An alternate-winged Leaf (*Alternatim pinnatum*) is when the small Leaves stand alternate.
An interrupted-winged Leaf (*Interruptè pinnatum*) is when there are smaller lobes intermixed with larger upon the same midrib, fig. 67.
A jointed-winged Leaf (*Articulatè pinnatum*) is when the common foot-stalk is jointed, fig. 68.
A running-winged Leaf (*Decursivè pinnatum*) is one whose small Leaves run along the foot-stalk from one to another, fig. 69.
A conjugated Leaf (*Conjugatum*) is one which has but two small Leaves on the same foot-stalk.
We next proceed to the decompounded Leaves.
A decompounded Leaf (*Decompositum*) is one whose foot-stalk is once divided, and joins together many small Leaves.
A double conjugated Leaf (*Bigeminatum*) is one whose foot-stalk divides in forks, and connects four small Leaves on the top, or it is composed of two conjugations.
A double trifoliate Leaf (*Biternatum*) is one whose foot-stalk is divided, and each division sustains three small Leaves, fig. 70.

A double-winged Leaf (*Bipinnatum*) is one whose foot-stalk is divided, and these divisions have small Leaves ranged on their side like wings, fig. 71.
A foot-shaped or branched Leaf (*Pedatum*) is one whose foot-stalk is divided, and has some small Leaves placed on the inner side, as in Passiflora and Arum, fig. 72.
A greater compounded Leaf (*Supra decompositum*) is one whose foot-stalk is many times divided, and each division is garnished with small Leaves.
A triternate Leaf (*Triternatum*) is one whose foot-stalk connects three double trifoliate Leaves.
A triple-winged Leaf (*Tripinnatum*) is one composed of several double-winged Leaves; if these are terminated by two small Leaves, they are said to be abrupt, fig. 73. but when they are terminated by an odd one, they are called an irregular, triple, winged Leaf, fig. 74.
We next come to consider the distinctions of Leaves from their place, position, insertion, or their direction, when joined to the other parts of plants.
A seed Leaf (*Seminale*) is the first Leaf of the plant, and is what former writers called cotyledones; these are different in form and substance from the other Leaves, fig. 75.
A bottom Leaf (*Radicale*) is one whose foot-stalk rises immediately from the root.
An upper or stalk Leaf (*Caulinum*) is one which grows from the stalk of the plant, fig. 76.
An axillary Leaf (*Axillare*) is one which grows from the insertions of the branches, fig. 77.
A flower Leaf (*Florale*) is one that is inserted near the flower, and never appears but with it, fig. 78.
A starry Leaf (*Stellate*) fig. 79. or whorled Leaf (*Verticillata*) is when several Leaves are disposed in whorls round the stalk, fig. 80.
Opposite Leaves (*Opposita*) are when those upon the stalks stand by pairs on each side, fig. 81.
Alternate Leaves (*Alterna*) are when they stand alternate above each other, fig. 82.
Sparsed Leaves (*Sparsa*) are such as stand without order over the whole plant.
Cluster Leaves (*Conferta*) are such as come out from the side of the branches in clusters, and are so close to one another, that it is not easy to discover their exact situation, fig. 83.
Imbricated Leaves (*Imbricata*) are such as are placed over each other like tiles on a house, or the scales of fishes, fig. 84.
Fasciculated Leaves (*Fasciculata*) are such as grow in clusters from the same point, fig. 85.
*Disticha* is when the Leaves are ranged along only upon two sides of the branches, as in the Fir-tree.
A target or shield-shaped Leaf (*Peltatum*) is one whose foot-stalk is fixed to the disk, and not to the base or edge of the Leaf, fig. 86.
*Petiolatum* is when the foot-stalk is inserted to the base of the margin, fig. 87.
*Sessile* is when the Leaf sits close to the stalk or branch, and has no foot-stalk, fig. 88.
A running Leaf (*Decurrens*) is when the Leaf adheres to the stalk or branch, and is extended along the stalk from the base, so as to form a leafy border on each side the stalk, fig. 89.
*Amplexicaule* is when the base of the Leaf environs or embraces the sides of the stalk entirely, fig. 90.
*Semiamplexicaule*, is when the base of the Leaf reach but half round the stalk.
A perfoliate Leaf (*Perfoliatum*) is one which is perforated by the stalk or branch, which do not touch the margin, fig. 91.
*Connatum*, is when the two opposite Leaves cohere at their base, so as to form one body embracing the stalk, fig. 92.
*Vaginans*, is when the base of the Leaf forms a kind of cylinder, embracing the stalk like a sheath, as in Corn, Grass, fig. 93.
The direction of Leaves.
An adverse Leaf (*Adversum*) is one whose sides respect the meridian and not the heavens, as the Ginger, &c.

I. Miller Sculp.

An oblique Leaf (*Obliquum*) is when the baſe of the Leaf regards the ſky, and the ſummit the horizon.
An inflexed or incurved Leaf (*Inflexum*) is one which grows in form of a bow, turning its point toward the ſtalk again, fig. 94.
*Adpreſſum*, is when the diſk of the Leaf approaches near the ſtalk.
An erect Leaf (*Erectum*) is one ſo ſituated as to make a very acute angle with the ſtalk, fig. 95.
*Patens*, is when the Leaf does not make ſo acute an angle with the ſtalk as the former, and yet does not ſtand horizontal, fig. 96.
An horizontal Leaf (*Horizontale*) is one which ſtands perfectly at right angles with the ſtalk, fig. 97.
A reclined Leaf (*Reclinatum*) is one whoſe ſummit is lower than the baſe, fig. 98.
A rolled Leaf (*Revolutum*) is one whoſe upper part is rolled downward, fig. 99.
A dependent Leaf (*Dependens*) is one whoſe ſummits point to the earth.
A rooting Leaf (*Radicans*) is one which puts out roots.
A floating Leaf (*Natans*) is one which floats on the ſurface of the water, as the Water Lily, &c.
*Demerſum*, is uſed to expreſs a Leaf ſunk below the ſurface of the water.

Having explained the ſeveral forms of Leaves, by which botaniſts diſtinguiſh them, and alſo their poſition, both in regard to the other parts of the tree, or plant, and that of the earth, we ſhall next proceed to their ſtructure and uſes; for theſe were not deſigned by the wiſe Creator only for ornament, but they are of more important uſe in vegetation, and are as variouſly conſtructed in their ſeveral parts, as their ſeveral uſes for which they are deſigned.

Some plants have very thick fleſhy Leaves, whoſe pulpy ſubſtance is always moiſt; theſe are ſuch plants as naturally grow upon dry barren rocky places, and for the moſt part are natives of warm countries; and as they perſpire very little in compariſon of moſt other plants, they are adapted to grow in ſuch places where they can receive very little nouriſhment from the earth. Moſt of the Leaves of theſe plants have a thin compact ſkin over their ſurface, with very ſmall minute pores, whereby the deſcending moiſture is thrown off, which, if admitted into the ſubſtance of the Leaves, or ſtalks, would in a very ſhort time cauſe a mortification, and deſtroy the plant.

The Leaves of all thoſe trees and ſhrubs which continue their verdure all the year, have alſo a thin compact ſkin or cover over their ſurfaces, as is eaſily diſcovered by macerating them in water, in order to ſeparate the parenchyma from the veſſels of the leaves, which cannot be effected in any of theſe Evergreens, till the thin parchment-like cover is taken off; theſe trees and ſhrubs are found, by experiment, to imbibe and perſpire but little in the ſame ſpace of time, when compared with the deciduous trees and ſhrubs; and it is principally owing to this cloſe covering, as alſo to the ſmall proportion of moiſture contained in their veſſels, that they retain their verdure, and continue through the winter on the trees. The nutritive juices of theſe plants always abound more or leſs with an oily or terebinthinous quality, which ſecures them from the injury of froſt, ſo that many of theſe evergreen trees are adapted to grow in the coldeſt parts of the habitable world.

In all the Leaves of trees and plants which I have examined, there are two orders of veins or nerves, one belonging to each ſurface; and I have generally obſerved, that the lower lamina or under ſide of the Leaf, had the ramifications larger, and were capable of admitting a liquid to paſs through them, which thoſe of the upper ſurface would not; theſe two orders of veins are inoſculated at ſeveral places, but not ſo cloſely connected, but that they may be eaſily ſeparated, after they have been macerated in water a proper time, for ſome Leaves require a much longer time than others, to render the parenchyma ſoft enough to ſeparate eaſily from the veins without tearing them.

Theſe two laminæ, or orders of veins, are ſuppoſed to be deſtined for different purpoſes; the upper lamina is thought to be air-veſſels, or trachæ, through which the perſpiring matter is protruded, and by which the air is inſpired; that theſe are pores through which that ſubſtance paſſes, which is thrown out of the plants, is pretty evident; for the clammy ſubſtance which is commonly called honey-dew, is always found ſticking to the upper ſurface of Leaves, from whence many have ſuppoſed that this ſubſtance fell from above, and lodged upon the Leaves in the night. This is the Manna which is collected from Aſh-trees in Calabria, and from the Alhagi in Perſia, &c. and is no other than the nutritive juices, or a ſubſtance ſeparated from that, which iſſues from the pores of the Leaves, and is concreted on the ſurface of the Leaves by the cold air; but whenever this is found in quantity upon the Leaves, it is a ſure ſign of a diſeaſed plant.

The lower lamina of veins are ſuppoſed to be deſtined for another purpoſe, which is that of receiving, preparing, and conveying the moiſture imbibed from the riſing vapours of the earth, by which trees and plants are greatly nouriſhed; and for this uſe we ſee how differently the two ſurfaces are formed; the upper one is commonly ſmooth and lucid, and the under is frequently covered with hairs, or a ſoft down, the better to ſtop and detain the riſing vapours, and tranſmit them to the inner veſſels; and where the ſtructure of the Leaves are different, it is found by experience, that their functions alter; for thoſe Leaves, whoſe upper ſurfaces are garniſhed with down or hairs, are found to be the receivers and conveyers of the moiſture, and not the under ones, as in the other plants.

If the ſurfaces of theſe Leaves are altered, by reverſing the branches on which they grow, the plants are ſtopped in their growth, until the foot-ſtalks are turned, and the Leaves recover their former poſition. This ſhews how neceſſary it is to ſupport all thoſe weak ſhoots of plants, which are naturally diſpoſed for upright growth, and that either twine about the neighbouring trees for ſupport, or that put out claſpers, by which they take hold of whatever trees or plants grow near them, and are thereby ſupported; and, on the contrary, how abſurd is that practice of tying up the ſhoots of thoſe plants which are naturally diſpoſed to trail upon the ground; for, in both theſe caſes, nature is reverſed, and conſequently the growth of both ſorts of plants is greatly retarded.

This is one of the great functions for which the Leaves of trees and plants are deſigned; but, beſides this, there are others of equal importance to the well-being of plants and fruits; the firſt is that of the foot-ſtalks of Leaves nouriſhing and preparing the buds of the future ſhoots, which are always formed at the baſe of theſe foot-ſtalks, and during the continuance of the Leaves in perfect health, theſe buds increaſe in their magnitude, and, in the deciduous trees, are brought to maturity before the foot-ſtalks ſeparate from the buds in autumn; but if by accident the Leaves are blighted, or if the entire ſurface of the Leaves are cut off, and the foot-ſtalks are left remaining, yet the buds will decay, or not arrive to their proper ſize, for want of that nouriſhment which is conveyed to them from the Leaves; ſo that whenever trees are diveſted of their Leaves, or thoſe Leaves are cut, or otherwiſe impaired, though it may in either caſe happen when the buds may be nearly formed; yet if it is before the foot-ſtalks ſeparate naturally from the branches, the future ſhoots will be weakened in proportion to the time when this is done; therefore, as from all the experiments which have been made in order to know how ſerviceable the Leaves of trees and plants are to their well-being, it has been found, that where the plants have been diveſted of their Leaves, or their Leaves have been eaten, or cut, during their growth, the plants have been remarkably weakened thereby. This ſhould teach us not to pull, or cut off the Leaves of trees, or plants, on any account, while they retain their verdure or are in health.

health. As alſo how abſurd that common practice is, of feeding down Wheat in the winter and ſpring with ſheep; for by ſo doing, the ſtalks are rendered very weak, and the ears are in proportion ſhorter; nor are the grains of Corn ſo plump and well nouriſhed, as that which is not fed down upon the ſame ground: this is a fact which I can aſſert from many years experience; for when Corn or Graſs is fed down cloſe to the root, the ſucceeding blades will be much finer than if the firſt Leaves had been left remaining; which is evident from all ſheep paſtures, where the Graſs is much finer and ſhorter than in other places; as alſo upon lawns and bowling-greens, where the Graſs is often mowed, the blades will be rendered finer in proportion to the frequency of mowing it, yet the ſpecies of Graſs is the ſame with that on the richeſt paſtures; ſo that although this may be a deſirable thing for lawns, &c. in gardens, yet where regard is had to the produce, this ſhould be avoided.

Beſides theſe, there are other uſes for which Leaves are deſigned, one of which is that of ſhading the buds for the future ſhoots from the ſun, which would exhale and dry up all their moiſture, as alſo the ſhading of the young fruit, which is abſolutely neceſſary during the time of their growth; for I have ſuſpended the Leaves of trees which were growing againſt walls, ſo as to expoſe the fruit to the ſun, and not taken any of them off the branches, yet I have always found thoſe fruits ſo expoſed, have been greatly ſtinted in their growth, and have never arrived to near the ſize of others above and below them on the ſame branches, nor were they ſo well taſted, or replete with juice.

In making this experiment, I was as careful as poſſible not to reverſe the ſurfaces of the Leaves, having been thoroughly convinced, from many repeated experiments, how prejudicial that is to all plants; but notwithſtanding this precaution, the event was as before-mentioned.

Another principal uſe of the Leaves is to throw off by tranſpiration, what is unneceſſary for the growth of the plants, anſwering to the diſcharge made by ſweat in animal bodies; and as plants receive and tranſpire much more, in equal time than large animals, ſo it appears how neceſſary the Leaves are to preſerve the plants in perfect health; for it has been found by the moſt exact calculations, made from repeated experiments, that a plant of the Sun-flower receives and perſpires, in twenty-four hours, ſeventeen times more than a man.

As naturaliſts have generally aſcribed a four-fold uſe to Leaves, I ſhall beg leave to mention them here, and then ſhall give an account of the moſt accurate experiments which have been made to aſcertain the truth of their hypotheſes.

1. Chiefly, that they do in the ſpring time receive the crude humours into themſelves, divide them very minutely, and move them ſtrongly in the utricles, and perhaps draw in from the air what is neceſſary, though unknown to us, and carry back great plenty of elaborate juice to the plant.

2. That there may be a tranſpiration of what is unprofitable, anſwering to the diſcharge made by ſweat; for ſometimes thoſe excretory veſſels of the Leaves are ſo overcharged by the great plenty of diſtending humour [juice,] that they burſt in the middle, and let go the more ſubtile parts; nor is it ſeldom, that, in a hot ſeaſon, great plenty of juices are this way diſcharged and imbibed. Thus Manna is found to exſude [ſweat forth] from the Leaves of certain trees, if a cold night ſhould follow a hot day; and the ſame thing frequently happens in divers other plants and trees, as we learn from the bees flying to the Lime-tree, that they may gather that gumous ſubſtance from their Leaves; and it is from the ſurfaces of the Leaves, as well as from the flowers, thoſe animals collect their honey; but if the heat ſhould be leſs, all the ſuperfluous humours, except thoſe which, perhaps, are tranſmitted by inſenſible tranſpiration thro' the arterial veſſels, exhaling naturally, are ſeen to return into the trunk.

3. That the bibulous veſſels, dried by the diurnal heat, and for this reaſon to be compared to veins, may imbibe, in the night-time eſpecially, thoſe watery parts, which, among others, lie hid in the air under the form of a very thin dew, and ſo make amends for the loſs made by the arteries, by the new moiſture received.

4. Laſtly, the Leaf ſerves chiefly for this purpoſe, that it may keep and nouriſh the eye, or gem, until the gem, by degrees growing out to a greater bulk, preſſes together the veſſels of the foot-ſtalk, from whence the humour is by little and little ſtopped in the Leaf, till it cannot any more return to the foot-ſtalk; which, by the ceaſing of the afflux and reflux of the nutritive juice, grows putrid, whence a conſumption being cauſed, the Leaf dies, and falls off, which is the chief cauſe of the falling of the Leaves in autumn.

The Rev. Dr. Hales, in his excellent Treatiſe of Vegetable Statics, ſpeaking of the perſpiration of plants, gives an account of the following experiments, viz.

That in July or Auguſt he cut off ſeveral branches of Apple-trees, Cherry-trees, Pear-trees, and Apricot-trees, two of a ſort; they were of ſeveral ſizes, from three to ſix feet long, with proportional lateral branches, and the tranſverſe cut of the largeſt part of the ſtems was about an inch diameter.

That he ſtripped off the Leaves of one bough of each ſort, and then ſet their ſtems in ſeveral glaſſes, pouring in known quantities of water.

The boughs with Leaves on them imbibed ſome fifteen ounces, ſome twenty, twenty-five, or thirty, in twelve hours day, more or leſs, in proportion to the quantity of Leaves they had, and when he weighed them at night, they were lighter than in the morning. While thoſe without Leaves imbibed but one ounce, and were heavier in the evening than in the morning, they having perſpired little.

The quantity imbibed by thoſe with Leaves decreaſed very much every day, the ſap-veſſels being probably ſhrunk at the tranſverſe cut, and too much ſaturate with water, to let any more paſs, ſo that uſually in four or five days the Leaves faded and withered much.

He adds, that he repeated the ſame experiments with Elm branches, Oak, Oſier, Willow, Sallow, Aſpen, Currant, Gooſeberry, and Filbert branches, but none of theſe imbibed ſo much as the foregoing, and ſeveral ſorts of Evergreens very much leſs.

He adds alſo another experiment: That on the 15th of Auguſt, he cut off a large Pippin with two inches ſtem, and its twelve adjoining Leaves: that he ſet the ſtem in a little phial of water, which imbibed and perſpired in three days one third of an ounce.

And that at the ſame time he cut off from the ſame tree another bearing twig of the ſame length, with twelve Leaves, no Apple on it, which imbibed in the ſame three days near three-fourths of an ounce.

That about the ſame time, he ſet in a phial of water a ſhort ſtem of the ſame tree, with two large Apples on it, without leaves, and they imbibed near three-fourths of an ounce in two days.

So in this experiment, the Apples and Leaves imbibed four-fifths of an ounce, the Leaves alone near three-fifths, but the two large Apples imbibed and perſpired but one third part ſo much as the twelve Leaves, then the one Apple imbibed the one-ſixth part of what was imbibed by the twelve Leaves; therefore two Leaves imbibe and perſpire as much as one Apple; whence their perſpirations ſeem to be proportionable to their ſurfaces, the ſurface of the Apple being nearly equal to the ſum of the upper and under ſurfaces of the two Leaves.

Whence it is probable that the uſe of theſe Leaves (which are placed juſt where the fruit joins to the tree) is to bring nouriſhment to the fruit.

And

And accordingly he obſerves, that the Leaves next adjoining to the bloſſoms are in the ſpring very much expanded, when the other Leaves on barren ſhoots are but beginning to ſhoot, and that all Peach Leaves are very large before the bloſſom goes off.

And that, in Apples and Pears, the Leaves are one-third or half grown, before the bloſſom opens, ſo provident is nature in making timely proviſion for the nouriſhing the yet embryo fruit.

He alſo adds another experiment: he ſtripped the Leaves of an Apple-tree branch, and then fixed the great end of the ſtem in the gage, it raiſed the mercury 2 + ½ inches, but it ſoon ſubſided, for want of the plentiful perſpiration of the Leaves, ſo that the air came in almoſt as faſt as the branch imbibed water.

And as a farther proof of the influence of the Leaves in raiſing the ſap, he alſo made the following experiment.

On the ſixth of Auguſt, he cut off a large Ruſſet Pippin, with a ſtalk 1 + ½ inch long, and twelve adjoining Leaves growing to it.

He cemented the ſtalk faſt in the upper end of a tube, which tube was ſix inches long, and one-fourth diameter; as the ſtalk imbibed the water, it raiſed the mercury four inches high.

That he fixed another Apple of the ſame ſize in the ſame manner, but firſt pulled off the Leaves, and it raiſed the mercury but one inch; that in the ſame manner he fixed a like-bearing twig, with twelve Leaves on it, but no Apple, and it raiſed the mercury three inches.

He then took a like-bearing twig, without either Leaves or Apple, and it raiſed the mercury one-fourth of an inch.

So a twig, with an Apple and Leaves, raiſed the mercury four inches; one with Leaves, only three inches; one with an Apple without Leaves, only one inch.

A Quince, which had two Leaves juſt at the twig's inſertion, raiſed the mercury 2 + ½ inches, and held it up a conſiderable time.

A ſprig of Mint, fixed in the ſame manner, raiſed the mercury 3 + ½ inches, = to 4 feet 5 inches height of water.

Theſe, and many more experiments of the Rev. Dr. Hales, that curious enquirer into the cauſes, ſtate, and progreſs of vegetation, evidently ſhew the great perſpiration of the Leaves of plants, and their great uſe in raiſing the ſap, and other functions of vegetable nature; to whoſe excellent treatiſe before-mentioned, I refer the curious enquirer.

I ſhall add, That nature has directed us as to the true diſtance we ought to train the branches of trees againſt walls or eſpaliers, which ſhould always be in proportion to the ſize of their Leaves; for if we regard her progreſs in the great varieties of trees, which are within our obſervation, we ſhall always find their branches grow diſtant from each other in proportion to the breadth of their Leaves; and it was upon this account that the Romans ſo much admired the Platanus, becauſe the Leaves, being large, afforded them a kindly ſhade in ſummer, but in winter, when they are deſtitute of Leaves, their branches growing at a great diſtance, eaſily admitted the beams of the ſun.

I ſhall next beg leave to mention a few, out of the many experiments which have been made by Monſ. Bonnet, of Geneva, to prove that moſt Leaves imbibe the moiſture of the air on their under ſurface, and not from their upper: they are as follow:

He gathered the Leaves of ſixteen ſorts of herbaceous plants when fully grown; of each he put ſeveral Leaves upon the ſurface of water in glaſs vaſes, ſome were poſited with their upper ſurface, and others with their under ſurface upon the water; theſe were adjuſted exactly to the ſurface of the water, with great care not to let any moiſture reach their oppoſite ſurfaces, and the ſame care was taken to prevent their foot-ſtalks from receiving any moiſture. The glaſſes in which theſe Leaves were thus placed, were kept in a cloſet, where the air was very temperate; and as the water in the glaſſes evaporated, there was from time to time a ſupply of freſh, which was added with a ſyringe, ſo that the Leaves were not diſturbed. The Leaves were taken from the following plants; the Plantain, the Mullein, the Wake Robin, the great Mallow, the Nettle, the Marvel of Peru, the Kidney-bean, the Sun-flower, the Cabbage, the Balm, the Cock's-comb, the purple-leaved Amaranth, Spinach, and the ſmaller Mallow.

Six of theſe ſorts he found continued green a long time, and theſe were with different ſurfaces upon the water; they were of the following ſorts, the Wake Robin, the Kidney-bean, the Sun-flower, the Cabbage, the Spinach, and ſmall Mallow; among the others the following ſorts were found to draw the moiſture better with their upper ſurface than their under, the Plantain, the Mullein, the great Mallow, the Nettle, the Cock's-comb, and the purple Amaranth.

The Leaves of the Nettle whoſe under ſurface was upon the water, were decayed in three weeks, whereas thoſe whoſe upper ſurface was next the water continued two months.

The Leaves of Mullein, whoſe under ſurface was next the water, did not continue freſh more than five or ſix days, but thoſe whoſe upper ſurface was next the water laſted five weeks.

The Leaves of the purple Amaranth, whoſe upper ſurface was next the water, continued freſh three months, whereas thoſe whoſe under ſurface was next the water, were decayed in a week.

The Leaves of the Marvel of Peru and the Balm, appeared to have the advantage, whoſe under ſurfaces were next the water.

The Leaves of Wake Robin and of the Cock's-comb, whoſe foot-ſtalks only were put into the water, continued freſh a longer time than thoſe which were placed with either ſurface next the water.

The Leaves of the Great Mallow, the Nettle, the Sun-flower, the Marvel of Peru, and Spinach, whoſe foot-ſtalks were plunged into the water, continued freſh a ſhorter time than thoſe which had either of their ſurfaces next the water.

The Leaves of the Mullein, of Plantain, and Amaranth, which received the water at their foot-ſtalk, continued freſh much longer than thoſe, whoſe under ſurface was next the water.

It is not difficult to explain the reaſon of this fact, for the orifices of the ſap-veſſels in the foot-ſtalk, are much larger than thoſe of either ſurface, ſo that the moiſture inſinuates in greater quantities, and with more eaſe, the firſt than by the ſecond way.

After this the ſame gentleman made experiments on the Leaves of ſixteen ſorts of trees and ſhrubs of the following ſorts, the Lilac, the Pear-tree, the Vine, the Aſpen, the Laurel, the Cherry-tree, the Plumb-tree, the Horſe Cheſnut, the White Mulberry, the Lime-tree, the Poplar, the Apricot, the Walnut, the Filbert, the Oak, and the Creeper.

Among theſe ſpecies, he found that the Lilac and the Aſpen imbibed the moiſture on their upper ſurface, equally with the under ſurface; but in all the other ſorts, the under ſurface imbibed it in much greater quantities than the oppoſite. The difference was very remarkable in the Leaves of the White Mulberry, for thoſe whoſe upper ſurface was laid upon the water, faded in five days, whereas the other whoſe under ſurface was next the water, preſerved their verdure near ſix months.

The Vine, the Poplar, and Walnut-tree are very remarkable inſtances, how little diſpoſed the upper ſurfaces of the Leaves of ligneous plants are to imbibe the moiſture; for thoſe of theſe three ſorts, whoſe upper ſurfaces were applied to the water, decayed almoſt as ſoon as thoſe which had no nouriſhment.

In all the experiments made by this curious gentleman upon the various Leaves of trees and herbs, it is remarkable, that all thoſe Leaves which imbibed the moiſture by their upper ſurface, were ſuch as had

that ſurface covered with either hairs or down; and on the contrary, where the under ſurface was garniſhed with either hairs or down, the moiſture was imbibed by that ſurface. He likewiſe mentions many experiments made by himſelf, and alſo by Monſ. du Hamel de Monceau, of the Royal Academy of Sciences at Paris, in rubbing the Leaves over with varniſh, oil, wax, and honey, to ſee the effect of theſe upon various Leaves, ſome of which were rubbed over on both ſurfaces, others only upon one; ſome only a part of the ſurface, others the edges of the Leaves were rubbed over, and in ſome only the foot-ſtalks of the Leaves were rubbed with theſe. They likewiſe anointed the trunks of ſome trees and ſhrubs, and left the Leaves and branches in their natural ſtate.

The reſult of theſe experiments was, that where the Leaves were anointed on both ſurfaces with varniſh, they decayed preſently; and where they were anointed with the other things, in proportion as thoſe were moſt penetrating, ſo the Leaves continued a ſhorter time than the others; and where one ſurface only was anointed, they continued much longer than thoſe which were anointed on both; and where the pedicle only was anointed, they continued ſtill longer; but the anointing of the trunks, made no ſenſible alteration, excepting in very hot weather; when they both imagine, that the anointing them was of ſervice, by hindering the too great tranſpiration which might weaken the trees; for they obſerved, that thoſe trees which were varniſhed, ſuffered leſs from the violent heat, than the trees which were left in their natural ſtate.

Monſ. Bonnet alſo obſerved, that thoſe Leaves which were varniſhed, the tender parts of the Leaves were deſtroyed by it, and the tough fibres only were left remaining.

As it would ſwell this work much beyond its intended bulk, were I to mention more of theſe curious experiments, I ſhall refer the curious to his book, where they will find a great number of the moſt accurate and well conducted experiments related, to aſcertain the uſes of the Leaves of plants in vegetation.

The before-mentioned Rev. Dr. Hales, in his Treatiſe of Vegetation, ſays, it is plain from many experiments and obſervations he had before mentioned, that Leaves are very ſerviceable in this work of vegetation, by being inſtrumental in bringing nouriſhment from the lower parts, within the reach of the attraction of the growing fruit, which, like young animals, is furniſhed with proper inſtruments to ſuck it thence; but the Leaves ſeem alſo deſigned for many other noble and important ſervices; for nature admirably adapts her inſtruments, ſo as to be at the ſame time ſerviceable to many good purpoſes.

Thus the Leaves, in which are many excretory ducts in vegetables, ſeparate and carry off the redundant watery fluid, which, by being long detained, would turn rancid, and prejudicial to the plant, leaving the more nutritive parts to coaleſce; part of which nouriſhment, we have good reaſon to think, is conveyed into vegetables through the Leaves, which plentifully imbibe the dew which contain ſalt, ſulphur, &c.

For the air is full of acid and ſulphureous particles, which, when they abound much, do, by the action and reaction between them and the elaſtic air, cauſe that ſultry heat which uſually ends in lightning and thunder; and theſe new combinations of air, ſulphur, and acid ſpirit, which are conſtantly forming in the air, are doubtleſs very ſerviceable in promoting the work of vegetation; when, being imbibed by the Leaves, they may not improbably be the materials, out of which the more ſubtile and refined principles of vegetables are formed; for ſo fine a fluid as the air ſeems to be a more proper medium, wherein to prepare and combine the more exalted principles of vegetables, than the groſſer watery fluid of the ſap: and for the ſame reaſon it is likely that the moſt refined and active principles of animals are alſo prepared in the air, and thence conveyed through the lungs into the blood; and that there is plenty of theſe ſulphureo-aereal particles in the Leaves, is evident from the ſulphureous exſudations that are found in the edges of Leaves, of which bees are obſerved to make their waxen cells, as well as of the duſt of flowers. And that wax abounds with ſulphur, is plain from its burning freely, &c.

We may therefore reaſonably conclude, that one great uſe of Leaves is what has been long ſuſpected by many, viz. to perform, in ſome meaſure, the ſame office for the ſupport of the vegetable life, as the lungs of animals do for the ſupport of animal life; plants, very probably, drawing through their Leaves ſome part of their nouriſhment from the air.

LEDUM. Raii Syn. 1—142. Lin. Gen. Plant. 483. Marſh Ciſtus, or wild Roſemary.

The CHARACTERS are,

*The flower has a ſmall empalement of one leaf, indented in five parts. It hath five oval, concave, ſpreading petals, and ten ſlender ſtamina the length of the petals, which ſpread open, terminated by oblong ſummits, and a roundiſh germen ſupporting a ſlender ſtyle, crowned by an obtuſe ſtigma. The germen afterward becomes a roundiſh capſule with five cells, opening at the baſe in five parts, and filled with ſmall, narrow, acute-pointed ſeeds.*

This genus of plants is by Dr. Linnæus ranged in the firſt ſection of his tenth claſs, intitled Decandria Monogynia, which includes thoſe plants whoſe flowers have ten ſtamina and one ſtyle.

We have but one SPECIES of this genus, viz.

LEDUM (*Paluſtre*) foliis linearibus ſubtus hirſutis, floribus corymboſis. Flor. Suec. 341. *Ledum with very narrow leaves, hairy on their under ſide, and flowers growing in a corymbus.* Roſmarinum ſylveſtre minus noſtras. Park. Hiſt. 76. *Our ſmall wild Roſemary.*

This plant grows naturally upon moſſes and bogs in many parts of Yorkſhire, Cheſhire, and Lancaſhire, where it riſes with a ſlender ſhrubby ſtalk about two feet high, dividing into many ſlender branches, which are garniſhed with narrow leaves not much unlike thoſe of Heath. The flowers are produced in ſmall cluſters at the end of the branches, which are ſhaped like thoſe of the Strawberry-tree, but ſpread open wider at the top. Theſe are of a reddiſh colour, and appear in May, and in the natural places of their growth, are ſucceeded by ſeed-veſſels filled with ſmall ſeeds, which ripen in the autumn.

It is with great difficulty this plant is kept in a garden, for as it naturally grows upon bogs, ſo unleſs the plants have ſome ſuch ſoil and a ſhady ſituation, they will not thrive. The plants muſt be procured from the places of their growth, and taken up with good roots, otherwiſe they will not live. They cannot be propagated in gardens, but in the moſſes their roots ſpread and propagate pretty freely.

LEEKS. See PORRUM.

LEGUMES, or LEGUMENS, are a ſpecies of plants which are called pulſe, ſuch as Peas, Beans, &c. and are ſo called, becauſe they may be gathered by the hand without cutting. Mr. Ray reckons all thoſe plants which have a papilionaceous flower, among the Legumes; but the French comprehend moſt ſorts of eſculent plants, under this general title of Legumes.

LEGUMINOUS, of or belonging to pulſe.

LEMNA. Lin. Gen. 1038. Lens Paluſtris, Duck-Meat. This is a very common plant, growing upon ſtanding waters in moſt parts of England; where, if it is not diſturbed, it will ſoon cover the whole ſurface.

LEMON-TREE. See LIMON.

LENS. See ERVUM.

LENTISCUS. See PISTACIA.

LEONTICE. Lin. Gen. Plant. 423. Leontopetalon. Tourn. Cor. 49. tab. 484. Lion's Leaf.

The CHARACTERS are,

*The empalement of the flower is made up of six very narrow leaves, which are alternately smaller and drop off. The flower has six oval acute petals, which are twice the length of the empalement, and six nectariums which are fixed by small foot-stalks to the base of the petals. It has six short slender stamina, terminated by erect summits. In the center is placed an oblong oval germen, supporting a short taper style, inserted obliquely to the germen, crowned by a simple stigma. The germen afterward becomes a globular swollen berry a little succulent, with one cell, inclosing two or three globular seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes those plants whose flowers have six stamina and one style.

The SPECIES are,

1. LEONTICE (*Chrysogonum*) foliis pinnatis, petiolo communi simplici. Hort. Cliff. 122. *Lion's Leaf, with winged leaves having one common single foot-stalk.* Leontopetalon foliis costæ simplici innascentibus. Tourn. Cor. 49. *Lion's Leaf with a single foot-stalk to the leaves.*
2. LEONTICE (*Leontopetalum*) foliis decompositis, petiolo communi trifido. Hort. Cliff. 122. *Lion's Leaf with decompounded leaves, and a common trifid foot-stalk.* Leontopetalon foliis costæ ramosæ innascentibus. Tourn. Cor. 49. *Lion's Leaf with a branching foot-stalk to the leaves.*

These plants both grow naturally in the islands of the Archipelago, and also in the Corn fields about Aleppo, where they flower soon after Christmas. They have large tuberous roots about the size of those of Cyclamen, covered with a dark brown bark; the leaves arise upon slender foot-stalks immediately from their roots, which grow about six inches high; that of the first sort is single, having many small folioli ranged along the midrib, but the footstalks of the second sort are branched into three smaller; upon each of these are ranged several folioli or small leaves, in the same form as the winged leaves. The flowers sit upon naked foot-stalks, those of the first sort sustain many yellow flowers, but the flowers of the second are smaller and of a paler colour. These in their native country appear soon after Christmas, but in England they do not flower till the beginning of April, and are never succeeded by seeds here.

Both these plants are propagated by seeds, which require to be sown soon after they are ripe, otherwise they seldom succeed; but as they are brought from distant countries, they should be preserved in sand to be sent to England. I received a few of the seeds from the Duke D'Ayen, which were sent him from Aleppo, put up in sand, and these came up better than any of those which came over dry; for of several parcels of these seeds which I have sown of both kinds for three years successively, I had not more than two plants arise.

The plants are very difficult to preserve in England, for the roots will not thrive in pots; and when they are planted in the full ground, the frost frequently destroys them in winter, especially where the roots are young. Of late years the winters have proved so very unfavourable, as to kill all the young roots which I had raised in the Chelsea garden: but before the severe winter in 1740, I had some of the roots which were planted in a south-west border that flowered several years, and without any shelter survived the winters; but although I covered many of those roots which I had lately raised, yet I could not preserve them.

The leaves of these plants decay about Midsummer, and the roots remain in an inactive state till the following spring, at which time the flowers and leaves come up nearly at the same time.

When the seeds are procured from abroad, the best way is to sow them as soon as they arrive, and cover them with glasses in the winter to protect them from frost; and in the spring, when the plants begin to appear, they must have the free air admitted to them at all times when the weather is mild, otherwise they are very subject to draw up tall with weak stems, and their roots do not increase in their bulk. If the plants are not too close, it will be best to let them remain in the place unremoved till the second year; but where they are too close, part of the roots may be taken up in October, and transplanted close to a warm wall, being very careful not to disturb the roots which are left standing; and in November, before the hard frost sets in, it will be a good way to lay some old tanners bark over the surface of the ground, three or four inches thick, to prevent the frost from penetrating to the roots; but this should be most of it taken off in March, before the roots begin to push out their leaves; and if this is removed in part soon after the hard frost is over in February, and another part three weeks or a month after, it will be better than taking it all off at the same time; and if a thin covering of the tan is left at the last over the surface of the ground, it will prevent the drying winds of the spring from drying the ground, which will be of great service to the roots. These roots should have a dry loose soil, and must be seldom removed; but when that is done, October is the best time, for then the roots are inactive.

LEONTODON. Lin. Gen. Plant. 817. Dens leonis. Tourn. Inst. R. H. 468. Dandelion; in French, *Dent de Lion.*

There are four or five species of this genus, which grow naturally in the fields either in England or France, so are seldom cultivated in gardens; but as some people in the spring gather the roots out of the fields, and blanch them in their gardens for a sallad herb, so I have mentioned the genus, but shall forbear saying any thing more of them, than that they are very bad weeds both in gardens and fields; so should be rooted out before their seeds are ripe, otherwise they will spread to a great distance, as they have down adhering to them, by which they are wafted about by the wind.

LEONTOPODIUM. See PLANTAGO.

LEONURUS. Tourn. Inst. R. H. 187. tab. 87. Phlomis. Lin. Gen. Plant. 642. [Λεώνυρος, of Λέων, a lion, and οὐρὰ, a tail, because the crest of this flower seems to resemble the tail of a lion.] Lion's Tail.

The CHARACTERS are,

*The flower has a tubulous, five-cornered, permanent empalement of one leaf; the flowers have one petal, of the lip or ringent kind; the upper lip is long, cylindrical, hairy, and entire; the lower is short, reflexed, and cut into three parts. It hath four stamina situated under the lower lip, two of which are shorter than the other; these are terminated by oblong compressed summits. In the bottom of the tube are situated four germen supporting a slender style, situated with the stamina, crowned by a bifid acute stigma. The germen afterward become four oblong angular seeds, sitting in the empalement.*

This genus of plants is ranged in the second section of Tournefort's fourth class, which includes the herbs with a lip flower of one leaf, whose upper lip is hollowed like a spoon. Dr. Linnæus has joined the species of this genus to the Phlomis, and has applied this title to the Cardiaca, from which he separates these plants, because they have no punctures on their summits. These he ranges in the first section of his fourteenth class, which includes the plants with a ringent (or grinning) flower, that have two long and two shorter stamina, and naked seeds succeeding, sitting in the empalement.

The CHARACTERS are,

1. LEONURUS (*Africana*) foliis lanceolatis, obtuse serratis. Hort. Cliff. 312. *Lion's Tail with spear-shaped leaves which are bluntly sawed.* Leonurus perennis Africanus, sideritidis folio, flore Phœnicio majore. Breyn. Cent. 1. 171. *Perennial African Lion's Tail with an Ironwort leaf, and a larger scarlet flower.*
2. LEONURUS (*Nepetæfolia*) foliis ovatis, calycibus decagonis, septem dentatis, inæqualibus. Hort. Cliff. 312. *Lion's Tail with oval leaves, an empalement having ten corners, and seven unequal indentures.* Leonurus minor capitis Bonæ Spei, vulgò. Boerh. Ind. alt. 180. *Small Lion's Tail of the Cape of Good Hope.*

The first sort is a native of Ethiopia, but has been long cultivated in the English gardens. This rises with a shrubby stalk seven or eight feet high, sending out several branches from the side, which are four-cornered; these are garnished with oblong narrow leaves, acutely indented on their edges; they are about three inches long, and half an inch broad, hairy on their upper side, and veined on their under, standing opposite. The flowers are produced in whorls round the branches, each of the branches having two or three of these whorls toward their ends, sitting very close to the branches; they are of the lip kind, shaped somewhat like those of the Dead Nettle, but their crests are much longer and covered with short hairs; they are of a golden colour, so make a fine appearance. The flowers commonly appear in October and November, and sometimes continue till the middle of December, but are not succeeded by seeds here.

There is a variety of this sort with variegated leaves, which is by some admired; but as this seldom produces so large whorls of flowers as the plain sort, it is not so generally esteemed.

The second sort is mentioned by several authors as an annual plant; they also suppose it to be a native of America, and believe it was brought from Surinam to Holland; but it is undoubtedly a native of the Cape of Good Hope, from whence I have two or three times received the seeds; and the late Dr. Boerhaave assured me, that he frequently received the seeds from that country, as also a painting of the plant, so that he made no doubt of the plant growing naturally there.

This rises with a square shrubby stalk about three feet high, sending out several four-cornered branches, which are garnished with oval crenated leaves, rough on their upper side like the Dead Nettle, but veined on the under, which is of a pale green: these are placed opposite by pairs, as are also their branches. The flowers come out in whorls round the branches, in like manner as the former, but are not so long nor so deep coloured; they appear at the same season with the first, and continue as long in beauty.

Both these sorts are propagated by cuttings in Europe, for they do not produce any seeds here. If the cuttings are planted in July, after the plants have been so long exposed to the open air as to harden the shoots, they will take root very freely. They should be planted in a loamy border to an east aspect, and if they are covered closely with a bell or hand-glass to exclude the air, and shaded from the sun, it will forward their putting out roots; but when they begin to shoot, the glasses should be raised to admit the free air, to prevent their drawing up weak, and by degrees they must be exposed to the open air. As soon as they have taken good root they must be taken up, and each planted in a separate pot filled with soft loamy earth, and placed in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain till October, when they must be removed into the green-house, and afterward treated as the Myrtle, and other hardy green-house plants, observing to water the first sort plentifully.

**LEPIDIUM.** Tourn. Inst. R. H. 215. tab. 103. Lin. Gen. Plant. 718. Dittander, or Pepperwort.

The Characters are,

*The empalement of the flower is composed of four oval concave leaves, which fall off. The flower has four oval petals placed in form of a cross, which are much larger than the empalement, and six awl-shaped stamina the length of the empalement, two of which are shorter than the other, terminated by single summits. In the center is situated a heart-shaped germen, supporting a single style, crowned by an obtuse stigma. The germen afterward turns to a spear-shaped seed-vessel with two cells, divided by an intermediate partition, containing oblong seeds.*

This genus of plants is ranged in the first section of Linnæus's fifteenth class, intitled Tetradynamia siliculosa, the flower having four long and two shorter stamina, and the seeds being included in short pods.

The Species are,

1. Lepidium (*Latifolium*) foliis ovato-lanceolatis integris serratis. Hort. Cliff. 330. *Dittander with entire, oval, spear-shaped leaves, which are sawed.* Lepidium latifolium. C. B. P. 97. *Broad-leaved Dittander.*
2. Lepidium (*Arvense*) foliis lanceolatis amplexicaulibus dentatis. Hort. Cliff. 331. *Dittander with spear-shaped indented leaves which embrace the stalks.* Lepidium humile, incanum arvense. Tourn. Inst. R. H. 216. *Low hoary Dittander of the fields.*
3. Lepidium (*Chalepense*) foliis sagittatis sessilibus dentatis. Amœn. Acad. 4. p. 321. *Dittander with arrow-shaped indented leaves sitting close to the stalks.* Lepidium humile minus incanum, Alepicum. Tourn. Inst. 216. *Low Dittander of Aleppo with less hoary leaves.*
4. Lepidium (*Iberis*) floribus diandris tetrapetalis, foliis inferioribus lanceolatis serratis, superioribus linearibus integerrimis. Flor. Leyd. Prod. 334. *Dittander with flowers having four petals and two stamina, whose under leaves are spear-shaped and sawed, and the upper narrow and entire.* Lepidium gramineo folio sive, Iberis. Tourn. Inst. 216. *Dittander with a Grass leaf, or Iberis.*
5. Lepidium (*Perfoliatum*) foliis caulinis pinnato-multifidis, ramiferis cordatis, amplexicaulibus integris. Hort. Cliff. 331. *Dittander with lower leaves wing-pointed, and those on the branches heart-shaped, entire, and embracing the stalks.* Thlaspi verum Dioscoridis. 1 Zan. Hist. 193. *The true Mithridate Mustard of Dioscorides.*
6. Lepidium (*Virginicum*) floribus subtriandris tetrapetalis, foliis linearibus pinnatis. Lin. Gen. Plant. 645. *Dittander with flowers having four petals, chiefly with three stamina, and very narrow winged leaves.* Iberis humilior annua Virginiana ramosior. Mor. Hist. 2. p. 311. *Lower, annual, branching Sciatica Cress of Virginia.*
7. Lepidium (*Lyratum*) foliis lyratis crispis. Lin. Sp. Plant. 644. *Dittander with curled lyre-shaped leaves.* Lepidium Orientale nasturtii crispi folio. Tourn. Cor. 15. *Eastern Dittander with a leaf like curled Cress.*
8. Lepidium (*Nudicaule*) scapo nudo simplicissimo, floribus tetrandris. Lœfl. It. 155. *Dittander with a single naked stalk, and flowers with four stamina.* Nasturtium minimum vernum, foliis tantum circa radicem. Magn. Montp. 187.
9. Lepidium (*Petræum*) foliis pinnatis integerrimis, petalis emarginatis calyce minoribus. Flor. Suec. *Dittander with entire winged leaves, and indented petals to the flowers which are smaller than the empalement.* Nasturtium pumilum vernum. C. B. P. 105.
10. Lepidium (*Sativum*) floribus tetradynamis, foliis oblongis multifidis. Vir. Cliff. 63. *Dittander with six stamina in the flowers, and oblong leaves with many points.* Nasturtium hortense. *Garden Cress.*
11. Lepidium (*Subulatum*) foliis subulatis indivisis sparsis, caule suffruticoso. Lin. Sp. 899. *Dittander with awl-shaped undivided leaves, and a shrubby stalk.* Lepidium capillaceo folio, fruticosum Hispanicum. Tourn. Inst. 216.
12. Lepidium (*Ruderale*) floribus diandris apetalis, foliis radicalibus dentato-pinnatis, ramiferis linearibus integerrimis. Flor. Suec. 534. *Dittander with two stamina in the flowers, fugacious petals, the bottom leaves indented, and those on the branches linear and entire.* Nasturtium sylvestre Osyridis folio. C. B. P. 105.
13. Lepidium (*Bonariense*) floribus diandris tetrapetalis, foliis omnibus pinnato-multifidis. Lin. Sp. 901. *Dittander with two stamina and four petals to the flowers, and all the leaves wing-pointed.* Thlaspi Bonariense multicissum flore invisibili. Hort. Elth. 286.

The first sort grows naturally in moist places in many parts of England, so is now seldom cultivated in gardens. It hath small, white, creeping roots, by which it multiplies very fast, so as to render it difficult to eradicate the plant, after it has grown long in any place; the lower leaves are oval, spear-shaped, about three inches long, and one and a half broad toward the base, sawed upon the edges, having long foot-stalks. The stalks rise two feet high, they are smooth,

and ſend out many ſide branches; the leaves upon the ſtalks are longer, narrower, and more acute-pointed than the lower, and are not ſawed on their edges. The flowers grow in cloſe bunches toward the top of the branches, which come out from the ſide; they are ſmall, and are compoſed of four ſmall white petals, which appear in June and July, and the ſeeds ripen in the autumn. The whole plant has a hot biting taſte like Pepper, and the leaves have been often uſed by the country people to give a reliſh to their viands inſtead of Pepper, from whence it had the appellation of Poor Man's Pepper.

This plant is eaſily propagated, for every piece of the root will grow and multiply wherever it is planted, ſo will become troubleſome to root out after growing for ſome time in a garden. The leaves of this plant bruiſed and mixed with hog's lard, and applied as a cataplaſm to the hip, help the ſciatica; and chewed in the mouth, cauſe a great defluxion of rheum, ſo is ſaid to help ſcrophulous tumours in the throat.

The ſecond ſort grows naturally in Auſtria and Italy; this hath a fleſhy fibrous root, from whence ariſe ſeveral weak ſtalks about a foot and a half high, which are garniſhed with ſpear-ſhaped leaves, three inches long and one and a half broad, deeply cut in upon the edges; theſe are ſmooth, a little hoary, and embrace the ſtalks with their baſe; the flowers are ſmall, white, and grow in looſe bunches at the end of the branches. They flower from June till the beginning of September, and the ſeeds ripen in the autumn.

This is a perennial plant, which propagates very faſt by its roots, and is ſeldom admitted into gardens.

The third ſort grows naturally about Aleppo; this hath creeping roots, which extend to a great diſtance, ſo will ſoon ſpread over a large piece of ground. The leaves of this are longer and narrower than thoſe of the former, and are leſs hoary; the flowers grow in looſe bunches at the end of the branches; they are ſmall and white like thoſe of the firſt. This is a hardy perennial plant, which propagates by its creeping roots in as great plenty as either of the former.

The fourth ſort grows naturally in the ſouth of France, Italy, and Sicily, but is preſerved in ſome Engliſh gardens for variety. This hath a long fleſhy root, which runs deep into the ground, and ſends out many oblong leaves, which are ſawed on their edges, and ſpread flat on the ground; the ſtalks are ſlender, ſtiff, and branch out horizontally on every ſide; they riſe about two feet high, and are garniſhed with very narrow entire leaves. The flowers come out in cloſe ſmall cluſters at the ends of the branches; they are white, and appear in June and July, and the ſeeds ripen in the autumn. If the ſeeds are permitted to ſcatter, the plants will come up early in the ſpring, and require no other care but to keep them clean from weeds; the roots will abide ſeveral years if they are in a dry ſoil. This plant is alſo commended for its virtues in ſciaticas, if bruiſed and mixed with hog's lard as the firſt, and from its virtues it obtained the title of Sciatica Creſs.

The fifth ſort grows naturally in Perſia and Syria; this is ſuppoſed to be the true Mithridate Muſtard of Dioſcorides. It is an annual plant, whoſe lower leaves are winged, and finely cut into many ſegments; the ſtalks riſe a foot high, dividing into many ſlender branches, which are garniſhed with heart-ſhaped leaves that are entire, and embrace the ſtalks with their baſe. The flowers grow in long looſe ſpikes from the end of the branches; they are ſmall, yellow, and appear in June and July, and the ſeeds ripen in September, ſoon after which the plant decays.

The ſeeds of this plant ſhould be ſown in the autumn, for thoſe which are ſown in the ſpring ſeldom flower the ſame year, and are often killed by the froſt in winter; whereas thoſe which are ſown in the autumn, or the plants that riſe from ſcattered ſeeds, will always flower about Midſummer, and the ſeeds ripen in Auguſt and September following. The plants require no other care but to thin them, and keep them clean from weeds.

The ſixth ſort is an annual plant, which grows naturally in Virginia, and alſo in all the iſlands of the Weſt-Indies, where the inhabitants gather the leaves, and eat them in their ſallads, as we do the Garden Creſs.

The lower leaves of this ſort are three inches long and one broad, ſawed on their edges, and are of a light green, with a biting taſte like Creſs. The ſtalk riſes a foot and a half high, ſending out a great number of ſmall ſide branches, which are garniſhed with narrow leaves regularly ſawed on their edges, ſo as to reſemble winged leaves; theſe ſit cloſe to the branches. The flowers are produced at the end of the branches in looſe ſpikes; they are ſmall and white, and are ſucceeded by roundiſh or heart-ſhaped compreſſed ſeed-veſſels, which have a border round them. It flowers in June and July, and the ſeeds ripen in the autumn; this ſort is eaſily propagated by ſeeds, which may be ſown upon an open bed in April, where the plants are deſigned to remain; and when they come up, they will require no other care but to thin them where they are too cloſe, and keep them conſtantly clean from weeds; or if the ſeeds are permitted to ſcatter in the autumn, the plants will come up very well, and may be treated in the ſame way as the other.

The ſeventh ſort grows naturally in Aſia, and alſo in Spain, from whence I have received the ſeeds. This is a biennial plant; the lower leaves which ſpread on the ground, are near two inches long, and about half an inch broad, indented on both ſides in ſhape of a lyre, and curled on the edges; the ſtalks riſe a foot high, and divide into a great number of ſlender branches, garniſhed with ſmall oblong leaves, which are cut on their ſides, and a little curled on their edges; the ſtalks and leaves are of a gray colour, inclining toward hoarineſs. The flowers are produced in cluſters at the end of the branches; they are very ſmall and white, appearing in July, and are ſucceeded by roundiſh bordered ſeed-veſſels, which are compreſſed, and have two cells each, containing two ſmall oblong ſeeds, which are ripe in the autumn.

This ſort may be propagated by ſeeds in the ſame manner as the former; or if the ſeeds are permitted to ſcatter in the autumn, the plants will come up without care, and ſhould be treated in the ſame way as the former ſort; but this does not flower till the ſecond year, ſo the plants ſhould be left farther aſunder.

The eighth ſort grows naturally about Montpelier. It is a ſmall annual plant, having a few wing-pointed leaves which ſpread on the ſurface of the ground; between which ariſes a naked ſtalk two or three inches high, ſupporting five or ſix ſmall white flowers, each having four petals placed croſswiſe, and four ſtamina placed near the ſtyle; the germen afterward becomes a ſhort capſule, including four or five roundiſh ſeeds.

If the ſeeds of this ſort are ſown in the autumn, the plants will flower in April and their ſeeds ripen in May; which, if permitted to ſcatter, the plants will come up in autumn, and require no other care but to thin them where they are too cloſe, and weed them.

The ninth ſort is alſo a low annual plant, which grows naturally on Putney-heath; the leaves of this are winged and entire, theſe are placed near the ground; the flower-ſtalks riſe two inches high, ſupporting a few white flowers, whoſe petals are leſs than the empalement, and are indented at their points. This flowers in May and June, and if their ſeeds are permitted to ſcatter, the plants will come up as the former.

The tenth ſort is the Garden Creſs, ſo much uſed in winter and ſpring ſallads, and being ſo well known requires no deſcription. There are three varieties of this, one with broad leaves, another with curled leaves, and the common ſort which is uſed; the ſeeds of

of this ſhould be ſown in drills pretty cloſe, in winter, on moderate hot-beds, but in ſpring and autumn on borders, and will ſoon be fit for uſe; therefore ſhould be cut while young, otherwiſe it will be too rank.

The eleventh ſort is a low ſhrubby plant, garniſhed with entire awl-ſhaped leaves, which are very narrow; theſe are placed alternately on the ſtalks; the foot-ſtalks of the flowers proceed from the wings, and alſo terminate the ſtalks; the flowers are white, and ſhaped like thoſe of the other ſpecies.

This ſort may be propagated by ſeeds or cuttings; the ſeeds ſhould be ſown in the ſpring on a bed of light earth, in the open air; and when the plants are fit to tranſplant, a few of them ſhould be planted in pots, which may be ſheltered in winter under a common frame; for in ſharp winters, thoſe plants which are expoſed in the open air are frequently killed: the remaining plants ſhould be planted in a ſheltered ſituation in a dry rubbiſhing ground, where they will grow ſlowly, ſo will become more ſhrubby, and in leſs danger of ſuffering by cold.

The twelfth ſort is an annual plant, which grows naturally in ſeveral parts of England, ſo is rarely preſerved in gardens, being a plant of no great beauty or uſe; yet I have known it eaten in ſallads, though the taſte is very rank. The plants, when young, have ſome reſemblance to the Swine's Creſs. The ſtalks riſe eight or ten inches high, ſupporting a number of ſmall white flowers, ſhaped like thoſe of the other ſpecies, which are ſucceeded by ſeeds like thoſe of the Garden Creſs, which, if permitted to ſcatter, will abundantly ſupply the place with young plants.

The thirteenth ſort grows naturally in many warm countries, for it has come up in the earth which came from the Braſils, and from ſeveral parts of America, ſo that it may be found in many other parts. The leaves and ſtalks are much like thoſe of the Garden Creſs, but are more divided, and differ in ſmell and taſte from it: the petals of the flowers are ſo ſmall as to be almoſt imperceptible, and there appears but two ſtamina in each.

This ſort is only cultivated in botanic gardens for variety; the ſeeds ſhould be ſown on a moderate hot-bed in the ſpring, and when the plants have obtained ſtrength, they may be tranſplanted on a warm border, where they will flower and perfect their ſeeds.

LEPIDOCARPODENDRON. See PROTEA.

LETTUCE. See LACTUCA.

LEUCANTHEMUM. See ANTHEMIS.

LEUCOJUM. Lin. Gen. Plant. 363. Narciſſo-leucojum. Tourn. Inſt. R. H. 387. tab. 208. [Λευκόϊον, of λευκὸν, white, and Ἴον, a Violet; i. e. White Violet,] Snowdrop; in French, *Perce-neige.*

The CHARACTERS are,

*It hath an oblong, obtuſe, compreſſed ſpatha or ſheath, which opens on the ſide. The flower is of the ſpreading bell ſhape, cut into ſix parts, which join at their baſe. It hath ſix ſhort briſtly ſtamina, terminated by oblong, obtuſe, four-cornered ſummits, which are erect. The roundiſh germen is ſituated under the flower, ſupporting a ſtyle which is thick and obtuſe at the top, crowned by an erect briſtly ſtigma. The germen afterward becomes a turbinated capſule with three cells, opening with three valves, and filled with roundiſh ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's ſixth claſs, which includes the plants whoſe flowers have ſix ſtamina and one ſtyle.

The SPECIES are,

1. LEUCOJUM (*Vernum*) ſpathâ uniflorâ, ſtylo clavato. Lin. Sp. Plant. 289. *Snowdrop with a ſheath incloſing one flower, with a key-ſhaped ſtyle.* Narciſſo-leucojum vulgare. Tourn. Inſt. R. H. 387. *Common great Snowdrop.*
2. LEUCOJUM (*Æſtivum*) ſpathâ multiflorâ, ſtylo clavato. Lœfl. Lin. Sp. Plant. 289. *Snowdrop with many flowers in a ſheath, and a key-ſhaped ſtyle.* Narciſſo-leucojum pratenſe multiflorum. Tourn. Inſt. R. H. 387. *Meadow Snowdrop with many flowers, commonly called the tall late Snowdrop.*

The firſt ſort grows naturally in Switzerland and Germany, as alſo upon the mountains near Turin. This hath an oblong bulbous root, ſhaped like that of the Daffodil, but ſmaller; the leaves are flat, of a deep green, four or five in number, broader and longer than thoſe of the ſmall Snowdrop; between theſe ariſe an angular ſtalk near a foot high, which is naked, hollow, and channelled; toward the top comes out a ſheath, which is whitiſh, opening on the ſide, out of which come two or three white flowers, hanging upon ſlender foot-ſtalks; theſe have but one petal, which is cut into ſix parts almoſt to the bottom, which are much larger than thoſe of the ſmall Snowdrop, and the ends of the ſegments of the petal are tipped with green, where they are of a thicker ſubſtance than in any other part. Theſe flowers appear in March, ſoon after thoſe of the ſmall ſort; they have an agreeable ſcent, not much unlike that of the flowers of Hawthorn; after the flower is paſt, the germen which is ſituated below the flower, ſwells to a Pear-ſhaped capſule with three cells, incloſing ſeveral oblong ſeeds.

The leaves of this ſort decay toward the end of May, after which time the roots may be taken up and tranſplanted, for they ſhould not be long kept out of the ground. It is propagated here by offſets, which the roots put out pretty plentifully when they are in a ſituation agreeable for them, and when they are not too often removed. They ſhould have a ſoft, gentle, loamy ſoil, and an expoſure to the eaſt; the roots ſhould be planted ſix inches aſunder, and four or five inches deep, and muſt not be tranſplanted oftener than every third year.

The ſecond ſort is generally known by the title of late, or tall Snowdrop; this grows naturally in the meadows near Piſa in Italy, in Hungary, and alſo near Montpelier.

The root of this ſort is nearly as large as thoſe of the common Daffodil, and are very like them in ſhape; the leaves alſo are not unlike thoſe of the Daffodil, and are more in number than thoſe of the other ſort; they are of a pale green, and keel-ſhaped at the bottom, where they fold over each other, and embrace the ſtalk, which riſes a foot and a half high; at the top is ſituated a ſpatha (or ſheath) which opens on one ſide, and lets out three or four flowers, which hang downward, upon pretty long foot-ſtalks; theſe are cut into ſix oval concave ſegments almoſt to the bottom, and are of a clear white, with a large green tip to each ſegment, which is of a thicker conſiſtence than any other part of the petal; within are ſituated ſix awl-ſhaped ſtamina, with oblong yellow ſummits, ſtanding erect round a very ſlender ſtyle, crowned by an obtuſe ſtigma. Theſe flowers appear the latter end of April or the beginnning of May, and as all flowers in each ſheath do not come out together, but following each other, ſo there is a ſucceſſion of them for three weeks or longer, in cool weather. The flowers are ſucceeded by large triangular ſeed-veſſels, having three cells, each containing two rows of ſeeds.

This ſort is generally propagated in England by offſets, for the plants raiſed by ſeeds will not come to flower in leſs than four years; and as the roots put out offſets in plenty, ſo that is the more expeditious method. Theſe roots may be treated in the ſame way as the firſt ſort, and ſhould have a ſoft loamy ſoil, and be expoſed only to the morning ſun, where they will flower ſtronger, and continue longer in beauty, than when they are in an open ſituation, though they will thrive in almoſt any ſoil or ſituation.

LEUCOJUM INCANUM. } See CHEIRANTHUS.
LEUCOJUM LUTEUM. }

LEUCOJUM BULBOSUM. See GALANTHUS.

LEVEL, a mathematical inſtrument ſerving to draw a line parallel to the horizon, not only for various uſes in maſonry, &c. but alſo to meaſure the difference of aſcent and deſcent between ſeveral places, for the conveying of water, draining of fens, &c.

A water Level ſhews the horizontal line, by means of a ſurface of water, or other liquid, founded on this principle, That water always naturally places itſelf level.

The moſt ſimple inſtrument for this uſe is made of a long wooden trough, or canal, whoſe ſides are parallel to its baſe, ſo that, being equally filled with water, the ſurface thereof ſhews the line of Level.

This Level is alſo made with two cups fixed to the two ends of a pipe three or four feet long, about an inch in diameter; by means whereof, the water communicates from the one to the other cup, and this pipe being moveable on its ſtand, by means of a ball and ſocket, when the two cups become equally full of water, the two ſurfaces mark the line of Level.

Inſtead of cups, this inſtrument may be made with two ſhort cylinders of glaſs three or four inches long, faſtened to each end of the pipe with wax or maſtich; then the pipe, being filled either with common or coloured water, will ſhew itſelf through the cylinder, by means of which the line of Level is determined, the height of the water, with reſpect to the center of the earth, being always the ſame in both cylinders.

This Level is very commodious in levelling ſmall diſtances.

If you would level any piece of ground that you can ſee from ſide to ſide, or from the middle to any ſide, ſet up your inſtrument in the middle of it, whether it be a water Level, or a ground Level with ſights; place it ſo high, that you may ſee over the higheſt part of the ground half a foot or a foot; then ſet up a ſtake in the middle, ſo that the top may be exactly level with the ſights, and another ſtake on the higheſt ſide, the top of which muſt be level with the middle ſtake; then either turn the Level, or look-back ſight, and ſet up another ſtake on the lower ground level with the two firſt; then you will have three ſtakes ſtanding in a Level.

Then keeping your Level true to the middle ſtake, turn it till it makes right angles with the three ſtakes, and ſet up two ſtakes on each ſide one Level with thoſe three, then you will have five ſtakes in two lines ſet true level.

If the ground be large, you may ſet up two rows more by the Level, but five ſtakes are enough in a ſmall ground.

When this is done, you may lay your Level aſide, and look over the head of one to the head of another, and cauſe the perſon who aſſiſts you to put down ſtakes between two and two, till you have ſet as many ſtakes level in the ground as you think convenient; or you may uſe a rule, which being placed level with the head of the ſtake, you may look over that to the head of the other, and put ſtakes down between you and the other ſtake, to what number you pleaſe.

The ground being thus ſtaked out with all the ſtakes heads level, and half a foot higher than the higheſt ground, in ſome grounds the middle ſtake, and the ſtakes in the croſs line, will be the Level line the ground muſt be brought to; that is, abating the hill, and filling up the low ſide to the Level of the mid-line. But if the ground be very uneven, then you muſt meaſure over all the ſtakes, and take them middle high for their mean of Level, and, by the rule of three, proportion your ground to that.

As for inſtance: If a valley be ten poles in length, and two feet in depth from the ſtrait line, and there be a hill five poles long; how many feet deep muſt a perſon ſink thoſe five poles to fill up the valley? This queſtion may be reſolved by the inverſe or back rule of three, and will ſtand thus: As 5 to 2, ſo is 10 to 4.

5 —— 2 —— 10
2
5)20(4

So that a perſon muſt go four feet deep in ſuch a hill to make good ſuch a valley.

If you are to abut the top of the hill four feet deep, and two poles from the top of that hill, thoſe four feet are to come out.

To perform this, ſet up a ſtake on the top of a hill two or three feet above ground, and another of the ſame height where the depth comes out, ſet down a ſtake three rods from that, till the head comes to be in a line with theſe two, and at that ſtake you muſt be one foot deep.

At ſix poles ſtake down another as before, and there you muſt be two feet deep: then ſtake down another at nine poles, and there you muſt be three feet deep, and you may ſet more ſtakes at equal diſtances, which will direct you ſo as that you cannot go amiſs.

LEVITY is the privation or want of weight in any body, when compared with another which is heavier, in which ſenſe it is oppoſed to gravity.

The ſchoolmen maintain, that there is ſuch a thing as poſitive and abſolute Levity, and impute this to the riſe and emergency of bodies lighter in ſpecie than the fluids wherein they riſe.

But, beſides that the common ſenſe of mankind diſcovers, that Levity is only a relative term, we find that all bodies tend towards the earth, ſome ſlower, and ſome faſter, in all fluids or mediums, whether water, air, &c.

Thus cork is ſaid to be lighter than gold, becauſe under equal dimenſions of bulk the gold will ſink in, and the cork ſwim upon the water.

Archimedes has demonſtrated, That a ſolid body will float any where in a fluid of the ſame ſpecific gravity, and that a lighter body will keep above a heavier.

The reaſon of this is, becauſe bodies falling towards the earth, thoſe which have a like number of equal parts, have equal gravity, ſince the gravity of the whole is the ſum of the gravity of all its parts.

Now, two bodies having an equal number of equal parts, if under the ſame dimenſions there are no intervals deſtitute of matter; whence it follows, that as no portion of matter is ſo ſmall, but that body wherein it is contained may be wholly divided into parts equally ſmall, there can be no reaſon for the deſcent of theſe, which will not hold equally for the deſcent of that.

Hence it may be concluded, that thoſe bodies which do not equally gravitate under the ſame dimenſions, do not contain the ſame equal portions of matter, and therefore when we ſee, that a cube of gold ſubſides in water, at the ſame time that an equal bulk of cork ſwims upon it, it is evident, that the gold muſt have a greater number of equal parts of matter under the ſame bulk than the cork, or the cork muſt have a greater number of vacuities than the gold, and that there are alſo in the water a greater number of vacuities than in the gold.

Hence we have a clear idea both of denſity or gravity, and of Levity, and know, that in a ſtrict ſenſe the latter cannot be accounted any thing poſitive, but a mere negation, or abſence of body, which determines that body to be lighter than another which contains more matter.

LICHEN. Liverwort.

There being two ſorts of this plant which are uſed in medicine, and one of thoſe being accounted a ſovereign remedy for the bite of mad dogs, I thought it would not be improper to mention them here, though they are plants which cannot be propagated by any method, except by paring up the turf of Graſs whereon they grow, and laying it down on ſome moiſt ſhady place, where, if the turf takes root, and thrives, the plants will ſpread and do well.

The two Sorts are,

1. Lichen (*Petræus*) petræus latifolius, ſive Hepatica fontana. C. B. P. *Common broad-leaved Liverwort.*
2. Lichen (*Officinarum*) terreſtris cinereus. Raii Syn. *Aſh-coloured Ground Liverwort.*

The firſt ſort grows on the ſides of wells, and in moiſt ſhady places, not only on the ground, but on ſtones, bricks, or wood. Of this there are ſeveral varieties,

which are distinguished by the curious in botany; but as they are plants of no use, I shall not enumerate them.

The second sort (which is used to cure the bite of mad dogs) grows on commons and open heaths, where the Grass is short, and the ground almost bare, in most parts of England, especially on declivities, and on the sides of pits. This spreads on the surface of the ground, and, when in perfection, is of an Ash-colour, but as it grows old, it alters, and becomes of a dark colour. This is often carried into gardens with the turf which is laid for walks and slopes, and where the soil is moist and cool, it will spread, and be difficult to destroy, so that it renders the Grass unsightly; but this is the only method yet known to have it grow in gardens, where it is desired. This is esteemed a sovereign remedy for the bite of mad dogs, and hath been for many years used with great success. It was communicated to the Royal Society by Mr. George Dampier, whose uncle had long used this plant, to cure the bite of mad dogs on men and animals, with infallible success. The method of taking it he has delivered as followeth: "Take of the herb, and dry it either in an oven, by the fire, or in the sun; then powder it, and pass it through a fine sieve; mix this with an equal quantity of fine powdered pepper. The common dose of this mixture is four scruples, which may be taken in warm milk, beer, ale, or broth." He also advises, that the part bitten be well washed, as also the clothes of the person who was bit, lest any of the snivel, or drivel of the mad dog should remain. If the person bitten be full grown, he advises, that he be blooded before the medicine is taken, and to use the remedy as soon after the bite as possible, as also to repeat the dose two or three several mornings fasting.

LIGHT is used in various senses: 1. Sometimes it signifies that sensation which is occasioned in the mind by the view of luminous bodies.

2. For those properties in those bodies, whereby they are fitted to excite those sensations in us.

3. A certain action of the luminous body on the medium between that and the eye, by the means of which the one is supposed to act on the other, and this is called secondary Light, or derived Light, in distinction to that of luminous bodies, which is called primary or innate Light.

As to the phænomenon of light, philosophers have explained it several ways; Aristotle by supposing some bodies to be transparent, as air, water, ice, &c. The Cartesians have considerably refined upon this notion of Light, and own, that Light, as it exists in the luminous body, is nothing else but a power or faculty of exciting in us a very clear and vivid sensation; and Father Malebranche explains the nature of Light by a supposed analogy between it and sound, the latter of which is allowed to be produced by the shaking or vibration of the insensible parts of the sonorous body.

But the greatest discoveries into this wonderful phænomenon have been made by Sir Isaac Newton, that the primary light consists wholly in a certain motion of the particles of the lucid body, whereby they do not propel any fictitious matter supposed to be lodged in the hidden pores of transparent bodies, but throw off from the luminous body certain very small particles, which are emitted every way with great force.

And the secondary or derived Light, not in a conatus, but in a real motion of these particles receding every way from the luminous body in right lines, and with an incredible velocity.

For it has been demonstrated by Mr. Reaumur, from the observation on the satellites of Jupiter, that the progress of Light from the sun to our earth is not above ten minutes, and therefore, since the earth is at least 10,000 of its own diameters distant from the sun, Light must run 10,000 of those diameters in a minute, which is above 100,000 miles in a second.

And if a bullet, moving with the same celerity with which it leaves the muzzle of a cannon, requires twenty-five years to pass from the earth to the sun, as Mr. Huygens has computed; then the velocity of Light will be to that of a cannon ball, as twenty-five years is to ten minutes, which is above 10,000 to 1: so that the particles of Light move above a million of times swifter than a cannon ball, from which rapidity of motion very strange effects may be produced; but Sir Isaac Newton has shewn, past contradiction, that the Light of the sun is near seven minutes in its passage to the earth, which is the space of 50,000,000, a velocity 10,000,000 times greater than that wherewith a ball flies out of the mouth of a cannon.

Sir Isaac Newton also observes, that bodies and Light act mutually on one another: bodies on Light, in emitting, reflexing, refracting, and inflecting it, and Light on bodies, by heating them, and putting their parts into a vibrating motion, wherein heat principally consists; for he observes, that all fixed bodies, when heated beyond a certain degree, emit Light and shine, which shining, &c. appears to be owing to the vibrating motion of the parts, and all bodies abounding in earthy and sulphureous particles, if they be sufficiently agitated emit Light, which way soever the agitation be effected.

The same great author observes, that there are but three affections of Light wherein the rays differ, viz. refrangibility, reflexibility, and colour; and those rays which agree in refrangibility, agree also in the other two, whence they may be well defined homogeneal. Again, the colours exhibited by homogeneal Light, he calls homogeneal colours, and those produced by heterogeneal Light, heterogeneal colours; from which definitions he advances several propositions:

1. That the sun's Light consists of rays differing by indefinite degrees of refrangibility.

2. That rays, which differ in refrangibility, when parted from one another, do proportionably differ in the colours which they exhibit.

3. That there are as many simple and homogeneal colours, as there are degrees of refrangibility, for to every degree of refrangibility belongs a different colour.

4. Whiteness, in all respects, like that of the sun's immediate Light, and of all the usual objects of our senses, cannot be compounded of simple colours, without an indefinite variety of them, for to such a composition there are required rays endued with all the indefinite degrees of refrangibility, which infer as many simple colours.

5. The rays of Light do not act one on another in passing through the same medium.

6. The rays of Light do not suffer any alteration of their qualities from refraction, nor from the adjacent quiescent medium.

7. There can be no homogeneal colours produced out of Light by refraction, which are not commixed in it before, since refraction changes not the qualities of the rays, but only separates those that have divers qualities by means of their different refrangibility.

8. The sun's Light is an aggregate of homogeneal colours, whence homogeneal colours may be called primitive or original.

Hence proceeds the whole theory of colours in plants and flowers.

Those parts, v. g. which are the most refrangible, constitute Violet colour, the dimmest and most languid of all colours.

And, on the contrary, those particles that are the least refrangible, constitute a ray or a red colour, which is the brightest and most vivid of all colours; the other particles being distinguished into little rays, according to their respective magnitudes and degrees of refrangibility, excite intermediate vibrations, and so occasion the sensations of the intermediate colours. See Sir Isaac Newton's Doctrine of Colours.

Perhaps these observations of Light may to some persons seem foreign to the subject matter of this book, yet, if thoroughly understood might probably be found very useful. The learned and curious enquirer into the business of vegetation, the Rev. Dr.

Hales, in his treatise on that head, does, upon the query put by Sir Isaac Newton [" Are not gross bodies and Light convertible into one another? And " may not bodies receive much of their activity " from the particles of Light which enter their composition? The change of bodies into Light, and " of Light into bodies, is very conformable to the " course of nature, which seems delighted with transmutations,"] add this query, " And may not " Light also, by freely entering the expanded surfaces of leaves and flowers, contribute much to the " ennobling the principles of vegetables?"

That Light has been found to be of infinite service to the growth of vegetables, has been fully proved by many experiments: 1. By painting the walls of the inside of a green-house black, whereby there will be no reflected rays of Light, when the weather becomes so cold, as that the shutters to the windows have been obliged to be kept shut a few days, the leaves of those plants which have been placed therein have dropped off.

And plants which have been placed in dark rooms, have been found to do the same. The earthing up plants to blanch them, whereby they become tender, and better for use; yet if these are not used, when properly blanched, will soon decay: the like will happen if plants are covered close, so as no Light can come to them, they will soon grow pale and sicken, and afterward decay.

How much the fine 'racy flavour of fruits is owing to Light is hard to say, but from a few experiments it appears, most of their rich juices are beholden to Light for their excellence; therefore we may truly aver, that Light is as necessary to promote vegetation as for animal œconomy.

LIGUSTICUM. Tourn. Inst. R. H. 323. tab. 171. Lin. Gen. Plant. 308. [takes its name of Liguria, because this plant, in old time, grew in greatest plenty near a river of Genoa, called Liguria.] Lovage; in French, *Livèche*.

The Characters are,

*It hath an umbellated flower. The general umbel is composed of several smaller, which are also composed of other yet smaller. The general umbel has an involucrum composed of seven unequal leaves. The perianthium of the flower is indented in five parts, sitting upon the germen. The flower hath five equal petals, which are inflexed at their points, and keel-shaped within. It hath five hairy stamina, which are shorter than the petals, terminated by simple summits. The germen, which is situated under the flower, supports two simple styles, crowned by simple stigmas. The germen afterward turns to an oblong fruit, divided into two parts, which is angular and channelled, containing two oblong smooth seeds.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and two styles.

The Species are,

1. Ligusticum (*Levisticum*) foliis multiplicibus, foliolis superne incisis. Hort. Cliff. 97. *Lovage with many leaves, whose lobes are cut outward toward the top.* Levisticum vulgare. Mor. Hist. 3. p. 275. *Common Lovage.*
2. Ligusticum (*Scoticum*) foliis biternatis. Lin. Sp. Plant. 250. *Lovage with double trifoliate leaves.* Ligusticum Scoticum Apii folio. Tourn. Inst. R. H. 324. *Scotch Lovage with a Smallage leaf.*
3. Ligusticum (*Austriacum*) foliis bipinnatis, foliolis confluentibus incisis integerrimis. Lin. Sp. 360. *Lovage with double winged leaves, whose lobes run together, and have entire segments.* Ligusticum cicutæ folio glabrum. Tourn. Inst. R. H. 323. *Lovage with a smooth Hemlock leaf.*
4. Ligusticum (*Lucidum*) foliis pinnatifidis, foliolis linearibus planis. *Lovage with wing-pointed leaves, whose lobes are very narrow and plain.* Ligusticum Pyrenaicum, fœniculi folio lucidum. Tourn. Inst. 324. *Lovage of the Pyrenees, with a shining Fennel leaf.*
5. Ligusticum (*Peloponnasiacum*) foliis multiplicato-pinnatis, foliolis pinnatim incisis. Lin. Sp. 36. *Lovage with leaves many times winged, and lobes cut like wings.* Cicutaria latifolia fœtida. C. B. P. 161. *Broad-leaved, stinking, Bastard Hemlock.*

The first sort is the common Lovage of the shops; this was formerly cultivated in the kitchen-gardens as an esculent herb, but has been long disused as such in England. It grows naturally upon the Appenines, and also near the river Liguria not far from Genoa; this hath a strong, fleshy, perennial root, which strikes deep into the ground, and is composed of many strong fleshy fibres covered with a brown skin, and has a strong, hot, aromatic smell and taste. The leaves are large, winged, and composed of many large lobes shaped like those of Smallage, but are larger, and of a deeper green. The lobes toward the top are cut into acute segments. The stalks rise to the height of six or seven feet; they are large and channelled, dividing into several branches, each being terminated by a large umbel of yellow flowers, which are succeeded by oblong striated seeds. It flowers in June and July, and the seeds ripen in autumn.

This is easily propagated by seeds, which should be sown in autumn soon after they are ripe; for when they are kept out of the ground till spring, they seldom grow the first year; when the plants come up and are fit to remove, they may be transplanted into a moist rich border, at about three feet distance from each other; and after they have taken new root, they will require no other care but to keep them clean from weeds. The roots will abide many years, and where the seeds are permitted to scatter, the plants will come up without care.

The roots, leaves, and seeds of Lovage, are heating and drying; they warm and comfort the stomach, expel wind, and provoke urine.

The second sort grows naturally near the sea in many parts of Scotland; this hath a biennial root, but of much less size than the former; the leaves are composed of broader and shorter lobes, each leaf having two or three trifoliate leaves, whose lobes are indented on their edges. The stalk rises about a foot high, sustaining a small umbel of yellow flowers on the top, shaped like those of the former; these appear in June, and are succeeded by oblong channelled seeds, which ripen in autumn. This plant may be cultivated in the same manner as the former.

The third sort grows naturally on the Alps; this is a perennial plant. The stalks rise about two feet high, and at every joint are bent alternately, first to one side, then to the opposite; at every joint they are garnished with doubly winged leaves, composed of small lobes which run into each other, and just above each leaf comes out a side branch; these, as also the principal stalks, are terminated by umbels of white flowers, which appear in June, and are succeeded by oblong channelled seeds, which ripen in autumn.

The fourth sort grows naturally on the Pyrenean Mountains; this hath a biennial root. The leaves are doubly winged. The lobes are very narrow, and finely divided. The stalks are strong, and rise a foot and a half high, garnished with shining winged leaves, and are terminated by pretty large umbels of whitish flowers, which appear in June, and the seeds ripen in September.

The fifth sort grows naturally on the Peloponesian Mountains; this hath a very thick fleshy root like that of Parsnep, which strikes deep in the ground. The leaves are very large, being composed of many winged leaves, whose lobes are cut into acute points; these are of a deep green, and, when bruised, emit a fœtid odour. The stalks rise three or four feet high; they are very large and hollow, like those of Hemlock, and sustain at their top large umbels of yellowish flowers, in shape of a corymbus; these appear in June, and are succeeded by oblong channelled seeds which ripen in autumn.

This has by some persons been thought to be the Hemlock of the antients, their conjectures being founded upon the plant answering in many particulars

lars to the description, and also from the poisonous quality of this together with its fœtid scent; and as this grows naturally in many parts of Asia, so they have been induced to believe it might be the same plant.

All these plants are preserved in botanic gardens for the sake of variety, but are seldom cultivated any where else; they rise easily from seeds, which should be sown in autumn, and the plants afterward treated in the same way as the first; they love a moist soil and a shady situation.

LIGUSTRUM. Tourn. Inst. R. H. 596. tab. 367. Lin. Gen. Plant. 18. Privet; in French, *Troëne.*

The CHARACTERS are,

*The flower has a small tubular empalement, cut at the top into four obtuse segments. It hath one funnel-shaped petal, with a cylindrical tube cut into four oval segments at the top, which spread open. It hath two stamina which stand opposite, terminated by erect summits which are the length of the tube of the petal, and one roundish germen supporting a short style, crowned by an obtuse bifid stigma. The germen afterward turns to a smooth round berry with one cell, inclosing two oblong seeds, flat on one side, but convex on the other.*

This genus of plants is ranged in the first section of Linnæus's second class, which includes those plants whose flowers have two stamina and one style.

The SPECIES are,

1. LIGUSTRUM (*Vulgare*) foliis lanceolato-ovatis obtusis. *Privet with spear-shaped, oval, obtuse leaves.* Ligustrum Germanicum. C. B. P. 475. *The common Privet.*
2. LIGUSTRUM (*Italicum*) foliis lanceolatis acutis. *Privet with spear-shaped leaves.* Ligustrum foliis majoribus & magis acuminatis toto anno folia retinens. Pluk. Alm. 217. *Privet with larger and more acute-pointed leaves, which continue all the year, commonly called the Italian ever-green Privet.*

The first sort grows common in the hedges in most parts of England, where it rises fifteen or sixteen feet high, with a woody stem, covered with a smooth gray bark, sending out many lateral branches which are garnished with spear-shaped, oval, smooth leaves, ending with obtuse points; they are placed by pairs opposite, sitting close to the branches, and are of a dark green. The flowers are produced in thick spikes at the end of the branches; they are white, with one tubular petal cut at the top into four parts, which spread open. These come out in June, and are succeeded by small round black berries, which ripen in the autumn; each of these contain two seeds. The leaves of this sort frequently remain green till after Christmas, when they alter their colour and fall off. There are two varieties of this sort, one whose leaves are variegated with white, and the other hath leaves variegated with yellow; but in order to preserve these varieties, they should be planted in poor land; for if they are in a rich soil, they will grow vigorous and soon become plain.

The other sort grows naturally in Italy; this rises with a stronger stalk than the former, the branches are less pliable and grow more erect; their bark is of a lighter colour; the leaves are much larger, and end in acute points; they are also of a brighter green, and continue upon the shrubs in verdure, till they are thrust off by the young leaves in the spring, as the Phillyrea and most other Evergreens do; so that it is undoubtedly a distinct sort, though many have supposed they were the same. The flowers of this are rather larger than those of the common sort, and are not often succeeded by berries in this country.

The leaves and flowers of the first sort are used in medicine; they are reckoned to be cooling, drying, and restringent, good for ulcers and inflammations of the mouth and throat, bleeding of the gums, and relaxation of the uvula.

This shrub is frequently cultivated in the nurseries near London, to furnish the small gardens and balconies in the city, it being one of the few plants which will thrive in the smoke of London; but although it will live some years in the close part of the town, yet it seldom produces flowers there after the first year, unless it is in some open places, where there is a free air. In the country, the leaves of this plant will continue green great part of the winter. It flowers in June, and the berries ripen in autumn, which generally hang upon the branches till Christmas.

The Italian sort is now generally preferred to the common sort for planting in gardens, the leaves being larger and continuing green all the year, renders it more valuable; and being so hardy as to resist the greatest cold in this country, it may be planted in any situation where the common sort will thrive. I have frequently planted it under the dropping of large trees, where I find it will thrive better than most other shrubs.

I cannot but think this sort which is the most common in Italy, is the Ligustrum mentioned by Virgil in the second Eclogue: and my reason for it is, that as the flowers of this shrub are of a pure white, but fall off very soon, they are by no means proper to gather for garlands, &c. and the berries being of a fine black colour, and continuing long upon the plants, make a fine appearance. To confirm that these berries were gathered for use, we find in several authors of undoubted credit, that they were used in dyeing, as also that the best ink was made of these berries.

Besides, is it not much more reasonable to suppose, that Virgil would rather draw his comparison from the flowers and fruit of the same plant, when he is warning the youth not to trust to his beauty, than to mention two different plants, as has been generally supposed? for here are the white flowers of the Privet appearing early in the spring, which is an allusion to youth; but these are of short duration, soon falling away; whereas the berries, which may be applied to mature age, are of long continuance, and are gathered for use.

These plants are easily propagated by laying down their tender shoots in autumn, which in one year's time will be rooted enough to transplant; when they may be removed to the places where they are designed to remain, or planted in a nursery for two or three years, where they may be trained for the purposes designed.

They are also propagated by suckers, which these plants send forth in great plenty; but these are too apt to put out a great number of suckers from their roots, so are not easily kept within bounds; nor do the plants rise so high as those which are propagated by layers, therefore this method should be preferred.

They may also be propagated by cuttings, which, if planted in the autumn on a shady border and in a loamy soil, will take root very freely, and may be afterward treated in the same way as the layers.

But the strongest and best plants, are those which are raised from seeds; indeed, this is a much more tedious method than the other, so is seldom practised, for the seeds generally lie a year in the ground before they vegetate; therefore, whoever would propagate the plants in this method, should gather the berries when ripe, and put them into a pot with sand between them, and bury the pot in the ground, as is practised for Holly berries and Haws; and after they have laid a year in the ground, take them up in the autumn, and sow them on a border exposed to the east, where the plants will come up the following spring, and these will make great progress after they have gotten some strength, so will grow upright, and not send out suckers like the other.

Formerly these plants were greatly in use for hedges, but since so many others of great beauty have been introduced, which are much preferable to these for such purposes, they have been entirely rejected, the trouble of keeping them in order being very great; nor are the hedges made with them ever so thick and handsome, as those made with divers other plants.

The two variegated kinds are pretty varieties amongst other striped shrubs. These may be propagated by budding, or inarching them upon the plain sort, as

also by laying down their branches; but as they seldom shoot so fast, as to produce any branches proper for layers, the other method is chiefly used. The silver striped sort is somewhat tenderer than the plain, but will endure the open air, if planted in a dry soil and in a warm situation.

LILAC. See SYRINGA.

LILIASTRUM. See HEMEROCALLIS.

LILIO-ASPHODELUS. See HEMEROCALLIS and CRINUM.

LILIO-FRITILLARIA. See FRITILLARIA.

LILIO-HYACINTHUS. See SCILLA.

LILIO-NARCISSUS. See AMARYLLIS.

LILIUM. Tourn. Inst. R. H. 369. tab. 191. Lin. Gen. Plant. 371. [takes its name of λεῖος, smooth, polished, because its leaves are, as it were, polished; or of λειρὸν, which signifies the same thing,] the Lily; in French, *Lis*.

The CHARACTERS are,

*The flower has no empalement; it hath six petals, which are narrow at their base, but are broad, obtuse, and reflexed at their points. The flower is of the open bell-shape, the petals are thick, obtuse, and keel-shaped; on their back each petal has a narrow longitudinal nectarium at their base. It hath six stamina which are erect and shorter than the petals, terminated by oblong prostrate summits, with a cylindrical oblong germen having six furrows, supporting a cylindrical style the length of the petals, crowned by a thick triangular stigma. The germen afterward becomes an oblong capsule with six rough furrows hollowed at the top, having three cells which are filled with flat half round seeds, lying above each other in a double order.*

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes those plants whose flowers have six stamina and one style.

The SPECIES are,

1. LILIUM (*Candidum*) foliis sparsis, corollis campanulatis erectis, intus glabris. Hort. Cliff. 120. *Lily with sparsed leaves, and a bell-shaped erect flower which is smooth within.* Lilium album, flore erecto & vulgare. C. B. P. 76. *Common white Lily with an erect flower.*

2. LILIUM (*Peregrinum*) foliis sparsis, corollis campanulatis cernuis, petalis basi angustioribus. *Lily with sparsed leaves, and a bell-shaped nodding flower, whose petals are narrower at their base.* Lilium album, floribus dependentibus, sive peregrinum. C. B. P. 76. *White foreign Lily with pendent flowers.*

3. LILIUM (*Bulbiferum*) foliis sparsis, corollis campanulatis erectis, intus scabris. Hort. Cliff. 120. *Lily with sparsed leaves, and an erect bell-shaped flower, rough within.* Lilium purpureo-croceum majus. C. B. P. 76. *Greater Lily with a purple Saffron-coloured flower, commonly called Orange Lily.*

4. LILIUM (*Humile*) humile, foliis linearibus sparsis, corollis campanulatis erectis, caule bulbifero. *Dwarf Lily with narrow sparsed leaves, erect bell-shaped flowers, and a stalk bearing bulbs.* Lilium bulbiferum minus. C. B. P. 77. *Smaller bulb-bearing Lily, by some called the fiery Lily.*

5. LILIUM (*Pomponium*) foliis sparsis subulatis, floribus reflexis, corollis revolutis. Hort. Cliff. 120. *Lily with awl-shaped sparsed leaves and reflexed flowers, whose petals are turned backward.* Lilium rubrum angustifolium. C. B. P. 78. *Narrow-leaved red Lily or Martagon.*

6. LILIUM (*Angustifolium*) foliis linearibus sparsis, pedunculis longissimis. *Lily with narrow sparsed leaves, and very long foot-stalks to the flowers.* Lilium brevi & gramineo folio. C. B. P. 79. *Lily with a short Grass leaf, commonly called Martagon of Pompony.*

7. LILIUM (*Chalcedonicum*) foliis sparsis lanceolatis, floribus reflexis, corollis revolutis. Hort. Cliff. 120. *Lily with sparsed spear-shaped leaves, and reflexed flowers whose petals turn backward.* Lilium Byzantinum miniatum. C. B. P. 78. *Lily of Byzantium with a carmine flower, commonly called the scarlet Martagon.*

8. LILIUM (*Superbum*) foliis sparsis lanceolatis, floribus pyramidatis reflexis, corollis revolutis. *Lily with sparsed spear-shaped leaves, and pyramidal reflexed flowers, whose petals turn backward.* Martagon multis & magnis floribus luteis alios superans. Suvert. Icon. Pl. 57. *The great yellow Martagon.*

9. LILIUM (*Martagon*) foliis verticillatis, floribus reflexis, corollis revolutis. Hort. Cliff. 120. *Lily with leaves growing in whorls, and reflexed flowers whose petals turn backward.* Lilium floribus reflexis montanum. C. B. P. 77. *Mountain Lily with reflexed flowers, commonly called purple Martagon.*

10. LILIUM (*Hirsutum*) foliis verticillatis hirsutis, floribus reflexis, corollis revolutis. *Lily with hairy leaves growing in whorls, and reflexed flowers whose petals turn backward.* Lilium floribus reflexis alterum lanugine hirsutum. C. B. P. 718. *Another Lily with reflexed flowers which is hairy and downy, commonly called the red Martagon.*

11. LILIUM (*Canadense*) foliis verticillatis, floribus reflexis corollis campanulatis. Lin. Sp. Plant. 303. *Lily with leaves growing in whorls, and reflexed bell-shaped flowers.* Lilium, sc. martagon Canadense maculatum. Mor. Hist. 2. p. 408. *Lily, or Martagon of Canada with spotted flowers.*

12. LILIUM (*Campschatense*) foliis verticillatis, floribus erectis, corollis campanulatis. Amœn. Acad. 2. p. 348. *Lily with leaves growing in whorls, and an erect bell-shaped flower.*

13. LILIUM (*Philadelphicum*) foliis verticillatis brevibus, corollis campanulatis, unguibus petalorum angustioribus, floribus erectis. Icon. tab. 165. *Lily with very short leaves growing in whorls, and bell-shaped flowers whose petals are very narrow at their base.*

There is a greater variety of Martagons than are here mentioned, but as they are supposed to be only accidental arising from culture, so I thought it would be to little purpose to insert them here; therefore I shall only give their common titles hereafter.

The common white Lily is so well known as to need no description; this grows naturally in Palestine and Syria, but has been long cultivated in all the gardens of Europe. It is so hardy that no frost ever injures the roots in England, and it propagates so fast by offsets from the roots, that it is become so common as to be little regarded, though there is great beauty in the flowers, and they emit an agreeable odour. Of this sort there are the following varieties:

The white Lily striped with purple.

The white Lily with variegated leaves.

The white Lily with double flowers.

These are varieties which have accidentally risen from culture; the sort with variegated flowers has not been in England much more than thirty-five years, but is now very common in most of the gardens, and is by some persons esteemed for the variety of its purple stripes; but as the pure white of the flower is stained by the purple, so as to appear of a dull colour, therefore many prefer the common white Lily.

The sort with variegated leaves is chiefly valued for its appearance in winter and spring, for as the leaves come up early in the autumn, which spread themselves flat on the ground, and being finely edged with broad yellow stripes, they make a pretty appearance during the winter and spring months. The flowers are the same as those of the common sort, but appear earlier in summer, which may be occasioned by the roots being weaker than those of the plain sort, for all variegated plants are weaker than those which are plain.

The white Lily with double flowers is less valuable than either of the other, because their flowers never open well, unless they are covered with glasses to shelter them from the rain and dew, so often rot without expanding. These flowers have none of the agreeable odour which the single sort is valued for, even when they open the fairest; for as by the multiplicity of petals in the flowers, the parts of generation are destroyed, so there is a want of the fecundating powder from whence the odour is sent out.

The roots, leaves, and flowers of the common white Lily are used in medicine; the roots are frequently used to soften, ripen, and digest tumours and hard swellings. Matthiolus says, that the distilled water of

of the flowers, is properly and successfully given to women in hard labour; and the distilled water of the leaves is of great use in distempers of the lungs.

The white Lily with dependent flowers, was originally brought from Constantinople. This is by some supposed to be only a variety of the common sort, but is undoubtedly a distinct species; the stalk is much slenderer than the common, the leaves are narrower and fewer in number; the flowers are not quite so large, and the petals are more contracted at their base; these always hang downward, whereas those of the common sort grow erect. The stalks of this kind sometimes are very broad and flat, and appear as if two or three were joined together; when this happens, they sustain from sixty to a hundred flowers, and sometimes more; this has occasioned many to think it a different sort, who have mentioned this with broad stalks and many flowers as a distinct species, though it is accidental, for the same root scarce ever produces the same two years.

These sorts are easily propagated by offsets, which the roots send out in so great plenty, as to make it necessary to take them off every other, or at most every third year, to prevent their weakening the principal roots. The time for removing the roots is at the end of August, soon after the stalks decay; for if they are left longer in the ground, they will soon put out new fibres and leaves, when it will be improper to remove them, because that will prevent their flowering the following summer. They will thrive in almost any soil or situation, and as they grow tall and spread, so they must be allowed room; therefore in small gardens they take up too much space, but in large borders they are very ornamental.

The common Orange or red Lily, is as well known in the English gardens as the white Lily, and has been as long cultivated here. This grows naturally in Austria and some parts of Italy. This sort multiplies very fast by offsets from the roots, and is now so common, as to be almost rejected; however, in large gardens these should not be wanting, for they make a good appearance when in flower, if they are properly disposed. Of this sort there are the following varieties:

The Orange Lily with double flowers.
The Orange Lily with variegated leaves.
The smaller Orange Lily.

These varieties have been obtained by culture, and are preserved in the gardens of florists. They all flower in June and July, and their stalks decay in September, when the roots may be transplanted, and their offsets taken off, which should be done once in two or three years, otherwise their bunches will be too large, and the flower-stalks weak. This doth not put out new leaves till toward spring, so that the roots may be transplanted at any time after the stalks decay till near Christmas. It will thrive in any soil or situation, but will be strongest in a soft gentle loam not too moist.

The bulb-bearing fiery Lily seldom rises much more than half the height of the former; the leaves are narrower, the flowers are smaller, and of a brighter flame colour; they are few in number, and stand more erect. These come out a month before the common sort, and the stalks put out bulbs at most of the joints, which, if taken off, when the stalks decay, and planted, will produce plants, so that it may be propagated in plenty. There are several varieties of this, which are mentioned as distinct species, but are supposed to have been produced by culture. These are,

The greater broad-leaved bulb-bearing Lily.
The many-flowered bulb-bearing Lily.
The small bulb-bearing Lily.
The hoary bulb-bearing Lily.

All these sorts of Lilies will thrive under the shade of trees, so may be introduced in plantations, and on the borders of woods, where they will have a good effect during the time they are in flower.

There is a great variety of the Martagon Lily; these differ from the common Lilies, in having their petals reflexed backward in form of a Turk's turbant, from whence many give them the title of Turk's Cap. In the gardens of the florists, particularly those in Holland, they make a great variety of these flowers, amounting to the number of thirty or upward; but in the English gardens, I have not observed more than half that number, and most of these are accidental, for those before enumerated, are all that I think may be supposed specifically different. However, for the sake of such as are curious in collecting these sorts of flowers, I shall here mention all those varieties which are to be found in the English gardens.

The common Martagon with double flowers.
The white Martagon.
The double white Martagon.
The white spotted Martagon.
The Imperial Martagon.
The early scarlet Martagon.
The Constantinople Vermillion Martagon.

The common Martagon with red flowers, which is the fifth sort before enumerated, has very narrow leaves, growing without order. The stalk rises near three feet high, sustaining at the top eight or ten bright red flowers, which stand at a distance from each other. These appear in June, and the stalks decay in August, soon after which time the roots may be transplanted.

The sixth sort is called Martagon of Pompony; the stalks of this rise higher than those of the former, the leaves are shorter, and set closer upon the stalks; each of these stalks sustain from fifteen to thirty flowers, of a very bright red, approaching to scarlet. The foot-stalks of the flowers are very long, so that the head of flowers spreads out very wide; these hang downward, but their petals are reflexed quite back. This flowers soon after the fifth sort.

The seventh sort is commonly known by the title of Scarlet Martagon; this rises with a stalk from three to four feet high; the leaves are much broader than those of the former sorts, and appear as if they were edged with white; they are placed very closely upon the stalks, but without any order. The flowers are produced at the top of the stalk; they are of a bright scarlet, and are seldom more than five or six in number. This flowers late in July, and in cool seasons will continue in beauty great part of August.

The eighth sort rises with a strong stalk from four to five feet high, garnished with leaves as broad as those of the last mentioned, which stand without order; the flowers are produced in form of a pyramid, on the upper part of the stalk. When the roots of this kind are strong, they produce forty or fifty flowers upon each stalk; they are large, of a yellow colour, spotted with dark spots, so make a fine appearance; but the flowers have so disagreeable strong scent, that few persons can endure to be near them, which has occasioned their being thrown out of most English gardens. This flowers the latter end of June.

The ninth sort is frequently called the Purple Martagon, though in most of the old gardens it is known simply by the title of Turk's Cap. This rises with a strong stalk from three to four feet high, garnished by pretty broad leaves, which stand in whorls round the stalk, at certain distances. The flowers are of a dark purplish colour, with some spots of black; they are produced in loose spikes on the top of the stalks. This flowers in June; the flowers of this sort have a very disagreeable odour when near, but it is not so offensive as the former sort.

The tenth sort is very like the former, but the leaves are narrower; the whorls stand farther asunder, the leaves and stalks are somewhat hairy, and the buds of the flowers are covered with a soft down: the flowers are of a brighter colour with few spots, and come out earlier in the summer, though the stalks appear much later above ground. This flowers early in June, and the stalks decay in August.

The eleventh sort is commonly called the Canada Martagon, as it was first brought to Europe from thence,

but it grows naturally in most parts of North America. The roots of this are oblong and large, made up of scales like the other sorts; the stalks rise from four to five feet high, garnished with oblong pointed leaves placed in whorls round the stalk. The flowers are produced toward the top of the stalk; they are large, of a yellow colour, spotted with black, which are shaped like the flowers of the Orange Lily; the petals of them are not turned backward so much as those of the other sorts of Martagon. This flowers the beginning of August, and when the roots are large, the stalks have a good number of flowers, so make a fine appearance. There are two varieties of this, one with larger and deeper coloured flowers than the other, but they are supposed to have accidentally come from seeds.

The twelfth sort grows naturally in North America, and is also mentioned to grow at Campschatski. This hath erect flowers shaped like those of the Canada Martagon, but the petals of this are oval, not narrowed at their base as are those, and sit close to the foot-stalk; the flowers are of a deeper colour, and not so much spotted as the other sort. It flowers in July, and the stalks decay in the autumn.

This sort is at present rare in England, being in very few gardens. It was sent me a few years ago from Maryland, but after it had flowered the root perished.

The thirteenth sort was sent me from Pensylvania by Mr. John Bartram, who found it growing naturally in that country. The root of this is smaller than those of the other sorts; it is scaly and white; in the spring it sends out one upright stalk near a foot and a half high; the leaves come out in whorls round the stalks, at distances; they are short, pretty broad, and have obtuse points. The stalk is terminated by two flowers which stand erect, upon short separate foot-stalks; they are shaped like the flowers of the bulb-bearing fiery Lily, but the petals are narrower at their base, so that there are spaces between each, but upward they enlarge and join, forming a sort of open bell-shaped flower; their petals are spear-shaped, so are contracted at the top, where they terminate in acute points. The flowers are of a bright purple colour, marked with several dark purple spots toward their base. In the center of the flower is situated a six-cornered germen, supporting a strong style, crowned by a three-cornered stigma; round this are situated six awl-shaped stamina, terminated by oblong prostrate summits; these are a little shorter than the style. The germen afterward turns to an oblong capsule with three angles, blunt at the top, divided into three cells, filled with flat seeds lying over each other. It flowers in July, and the seeds ripen the latter end of September.

This sort is at present very rare in the English gardens, but as it has ripened seeds the last season here, so it may in a few years become very common. As this sort grows in a small compass, and the flowers have no ill scent, it is proper furniture for the borders of small gardens. The stalks of this decay soon after the seeds are ripe, when it will be a proper time to remove the roots, for these do not put out new fibres till after Christmas. The roots of this kind do not put out many offsets, so that unless it is propagated by seeds, it cannot be increased in any plenty.

All the sorts of Martagon may be propagated by offsets from the roots, in the same way as the common Lily, which some of the sorts produce in as great plenty; but there are others which send out very few offsets, which occasion their present scarcity. The roots of all the sorts of Martagon may be safely taken up when their stalks decay; and if there is a necessity for keeping the roots out of the ground, if they are wrapped in dry Moss, they will keep perfectly well for two months; so that if the roots are to be transported to a distant place, this precaution of wrapping them up is necessary; but where they are to be planted in the same garden, there will be no occasion for this, especially if they are not kept too long out of the ground; for if the place is ready to receive the roots, they should be planted the beginning of October; so if the roots are put in a dry cool place, they will keep very good without any further care; but if the ground is not ready to receive them till later in the year, then it will be proper to cover the roots with dry sand, or wrap them in Moss to exclude the air, which, if they are much exposed to, will cause their scales to shrink, which weakens the roots, often causing a mouldiness, and is sometimes the occasion of their rotting.

These roots should be planted five or six inches deep in the ground, especially if the soil is light and dry; but where the ground is moist, it will be proper to raise the borders in which these are to be planted, five or six inches above the level of the surface of the ground; for if the water rises so high in winter as to come near the roots, it will cause them to rot; and where the soil is naturally stiff and subject to bind, there should be a good quantity of sea-coal ashes or rough sand, well mixed in the border, to separate the parts, and prevent the ground from binding in the spring, otherwise the roots will not send up very strong stalks, nor will they make so good increase.

As the Canada Martagon, the Martagon of Pompony, and the last sort, are somewhat tenderer than the others, so if in very severe winters the surface of the ground over them is covered with old tanners bark or sea-coal ashes, it will be a good way to secure them from being injured by the frost; and in the spring the covering may be removed, before the roots shoot up their stalks.

The tall growing sorts of these are only proper for large gardens, so they may be intermixed with the white and Orange Lilies, the tall growing Irises, and other flowers of the same growth; where, if they are not too much crowded, and are properly disposed, they will make a good appearance; and as they flower one after another, so they may be disposed according to their seasons of flowering. There are some of the common Martagons hardy enough to thrive under the shade of trees, so they may be disposed in wilderness quarters, with the common sort of Lilies, where they will have a good effect.

The roots of all these kinds must never be transplanted after they have made any shoots, for that will so much weaken them (if it does not entirely kill them) as not to be recovered in less than two or three years, as I have experienced to my cost; for being obliged to remove a fine collection of these roots early in the spring, I lost a great part of them, and the others were long recovering their strength.

All the sorts of Lilies and Martagons may be propagated by sowing their seeds, by which method some new varieties may be obtained, provided the seeds are saved from the best sorts; especially the Martagons, which are more inclinable to vary than the other Lilies. The manner of sowing them is as follows:

You must be provided with some square boxes about six inches deep, which should have holes bored in their bottoms to let the wet pass off: these boxes should be filled with fresh light sandy earth, and in the beginning of October, soon after the seeds are ripe, you must sow them thereon pretty thick, covering them over with light sifted earth about half an inch; then place the boxes where they may have the morning sun only, observing if the season should prove dry, to refresh them often with water, as also to pull out all weeds which may be produced. In this situation the boxes should remain until the beginning of November, when you must remove them where they may have as much sun as possible, as also be screened from the cold north and east winds during the winter season; but in the spring of the year, about the beginning of April, you must remove the boxes into their former position; for now the young plants will appear above ground, which are impatient of too much heat; besides, the earth in the boxes will dry too fast at this season, if exposed to the full sun at noon. You must also observe at this season to keep them entirely

entirely clear from weeds, as also to refresh them gently with water, if the season should prove dry, but this must be done sparingly and with caution. In this place you should let the boxes remain until the beginning of August; at which time you should prepare some beds of the above mentioned fresh light earth, which must be levelled very even; then take the earth out of the boxes, together with the small bulbs, and strew it equally over the beds, covering it over about half an inch thick with fine sifted earth; and if the season should prove very hot and dry, you would do well to shade the beds in the middle of the day from the great heat of the sun, and refresh them now and then with water.

You must also observe to keep them entirely clear from weeds, and if the following winter should prove very cold, you must cover the beds with Peas-haulm, or some other light covering, to keep out the frost, which would prejudice the roots, if suffered to enter deep into the ground (especially while they are so young:) but you must never let the covering remain on in mild weather, which would also be very injurious to them.

The end of February, or the beginning of March, when the hard frosts are over, you should gently clear off the earth upon the surface of the beds (which, during the winter season, will often have contracted a mossiness;) and sift a little fresh earth equally over the beds, which will greatly encourage the roots; but in doing this, you must be very careful not to stir the ground so deep as to disturb or injure the roots; nor should you defer doing it too late, lest the shoots should be coming up, which, by this operation might be broken and greatly hurt; and as the season advances, you must be careful to clear them from weeds, and in dry weather to water them gently, but they should not have it in great plenty; and in very hot days, if you shade them from the sun, it will be of great service to them; but this need not be done till the latter end of April or the beginning of May, when the season is sometimes very hot and dry.

When their leaves are quite decayed, you should stir the surface of the beds again (but do not go too deep) which will prevent the weeds from growing very fast, and be of service to the roots; and in September you must sift some more fresh earth over the beds about half an inch thick, and in winter and spring you must manage them as was directed for the preceding year.

In September following these roots will require to be transplanted to a greater distance, when you must prepare some beds of the same fresh light earth as was before directed, making them level; then take up the roots and transplant them into the beds, placing them about eight inches asunder, observing to put the roots with their buds uppermost, and about four inches below the surface.

This work should be done when the weather is moist, for if the roots are transplanted in a very dry season, and there doth not happen rain soon after, they will take a mouldiness which many times rots them.

You must also observe, as was before directed, to keep the beds entirely clear from weeds; and in winter, if the frost should be very severe, you must cover them with Peas-haulm or decayed tan, to prevent the roots from being injured thereby; and in the spring you should take off the covering, also the earth from the surface of the beds, as before, laying some fresh thereon, and so continue the summer and winter's work, as before.

The second year after being planted in these beds, the strongest roots will begin to flower; at which time, if you observe any peculiar varieties, you should put down a stick by each of these roots to mark them; which may be taken up when their leaves are decayed, and removed into the borders of the flower-garden, or transplanted into other beds at a greater distance, to encourage them to flower strong. But you cannot be so good a judge which of those will be good by their first flowers, therefore you should never reject any of them until they have flowered two years; for many times, some of these flowers will make but a mean appearance the first year, and afterwards become fair handsome flowers when they have obtained strength; so that you should suffer all such, of whose worth you are not assured, to remain undisturbed two years, that you may be ascertained which of them are worth preserving; these should be removed into the flower-garden at a proper season, but the ordinary ones may be rejected, or planted in shady outer walks, where, though they are mean flowers, they will appear well enough.

LILIUM CONVALLIUM. See Convallaria.

LILIUM PERSICUM. See Fritillaria.

LILIUM SUPERBUM. See Gloriosa.

LIME-TREE. See Tilia.

LIMODORUM. Flor. Virg. 110. Lin. Gen. Plant. 904. Helleborine. Tourn. Inst. R. H. 436. tab. 249. Bastard Hellebore.

The Characters are,

*It hath a single naked flower-stalk, arising immediately from the root. The flowers have no empalement, but a spatha (or sheath) situated below them. The flower is composed of five oval petals, which are dissimilar. The side petals spread open, but the two upper are connected together; the lower one is keel-shaped, so that it has much the appearance of a butterfly flower. Within the petals is situated a concave nectarium of one leaf, which is as long as the petals. It has two stamina, which are as long as the petals, terminated by two oval summits. It hath a column-shaped germen situated under the flower, which is as long as the petals, supporting a slender style, fastened to the stamina, crowned by a funnel-shaped stigma. The column-shaped germen afterward turns to a capsule of the same form, opening with three valves, having one cell, in which are lodged four or five roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's twentieth class, which includes those plants whose flowers have but two stamina, which are connected with the style.

We have but one Species of this genus at present in England, viz.

Limodorum (*Tuberosum*) foliis longis angustis sulcatis & acuminatis, pedunculis longissimis. *Limodorum with long narrow leaves ending in acute points, and a very long foot-stalk to the flower.* Helleborine Americana, radice tuberosâ, foliis longis angustis, caule nudo, floribus ex rubro pallidè-purpurascentibus. Martyn. Cent. 1. Pl. 50. Icon. tab. 165. *American Bastard Hellebore with a tuberose root, long narrow leaves, a naked stalk, and flowers of a red and pale purplish colour.*

This plant grows naturally in Jamaica, especially on the north side of that island, from whence many of the roots were sent me by the late Dr. Houstoun, with the following title, Helleborine purpurea, tuberosa radice. Plum. Cat. 9. so that it is the same plant with Plumier's. It also grows naturally in the French Islands of America. The roots of this were afterward brought me from the Bahama Islands, where it was found growing naturally; and it was since sent me from Pensylvania, by Mr. John Bartram, who found it growing naturally in that country.

The root of this plant is shaped like that of the true Saffron Crocus, but the outer cover is of a darker brown colour; from this comes out two or three leaves, according to the size and strengthof the root; these are nine or ten inches long, and near three quarters of an inch broad in the middle, being contracted toward both ends, terminating with long acute points, folding over each other at their base; they have five longitudinal furrows, like the first leaves of young Palms; these leaves come out in the spring, and frequently decay the following winter; but when the plants are kept in a warm stove, they are not very long destitute of leaves. The flower-stalk arises immediately from the root, on one side of the leaves; this is naked, smooth, and of a purplish colour toward the top. It is near a foot and a half high, and terminated by a loose spike of purplish red flowers,

standing

standing upon short foot-stalks; they are composed of five or six petals, the two upper are connected together, forming a sort of helmet, the two side petals expand like the wings of a butterfly flower, and the lower forms a sort of keel. In the center of the petals is situated a column-shaped germen, which rises from the base of the petals, supporting a slender style, to which adhere two stamina, terminated by oval summits, as the style is by a funnel-shaped stigma; after the flowers are faded, the germen becomes a three-cornered column-shaped capsule, with one cell, opening with three valves, containing several roundish seeds, but these seeds are rarely produced in England.

This plant is not constant to any particular season of flowering; for sometimes it has flowered in April and May, and in other years it has not flowered till September or October; but the most usual time of its flowering is in June and July, when the flowers appear early in the spring; they are succeeded by seed-vessels, which sometimes ripen in this country.

There are several other species of this genus mentioned by Father Plumier, but I have only seen one more than this here mentioned, which had oval obtuse leaves, furrowed in the same manner as the leaves of this sort, but were of a thicker consistence; the flowers of this I have not yet seen. The root was sent me from Maryland, where it grew naturally in a thicket.

The sort here described is too tender to thrive in the open air in England, and although with care it may be preserved in a warm green-house, yet it seldom flowers in such a situation; so that to have it in perfection, it is necessary to keep it in the tan-bed in the stove in winter; and if in summer the pots are plunged in a tan-bed under a deep frame, the plants will thrive, and flower as strong as in their native soil.

It is propagated by offsets from the root, which are sent out pretty freely when the plants are in vigour; these should be taken off, and the roots transplanted when they are the most destitute of leaves. The roots should have a soft loamy soil, and must have but little water, especially in winter.

LIMODORUM. See ORCHIS.

LIMON. Tourn. Inst. R. H. 621. Citrus. Lin. Gen. Plant. 807. [so called of λειμὼν, a meadow, because the leaves of this tree are of a green colour, as is likewise the fruit before it comes to maturity.] The Lemon-tree; in French, *Limonier*.

The CHARACTERS are,

*The flower is composed of five oblong thick petals, which are a little concave, spreading open; these sit in a small empalement of one leaf, indented at five parts at the top. It hath about ten or twelve stamina, which are joined in three or four bodies, which are terminated by oblong summits. It hath an oval germen, supporting a cylindrical style the length of the stamina, crowned by a globular summit. The germen afterward becomes an oval fruit with a fleshy rind, inclosing a thin pulpy fruit with several cells, each having two hard seeds.*

This genus of plants is ranged in the sixth section of Tournefort's twenty-first class, which includes the trees and shrubs with a Rose-shaped flower, whose pointal becomes a fleshy fruit with hard dry seeds. Dr. Linnæus has joined the Citron, Orange, and Lemon together, making them only different species of the same genus; but if we admit of the fruit being a characteristic note to distinguish the genus, the Limon cannot be joined with the Orange, for the Orange has a globular fruit, compressed at both ends, but the Limon has an oval fruit, prominent at the top, and the latter hath not so many cells as the former. It is placed in the second section of Linnæus's eighteenth class, which includes the plants whose flowers have about twenty stamina joined in several bodies.

The SPECIES are,

1. LIMON (*Vulgaris*) foliis ovato-lanceolatis acuminatis, subserratis. *Limon-tree with oval, spear-shaped, acute-pointed leaves, which are little sawed.* Limon vulgaris. Ferr. Hesp. 193. *The common Limon.*
2. LIMON (*Spinosum*) foliis ovatis integris, ramis subspinosis. *Limon with oval entire leaves, and branches which are somewhat spiny.* Limon acris. Ferr. Hesp. 331. *The sour Limon, commonly called Lime.*
3. LIMON (*Racemosum*) foliis ovato-lanceolatis subserratis, fructu conglomerato. *Limon with oval spear-shaped leaves, which are somewhat sawed, and fruit growing in clusters.* Limon fructu racemoso. Tourn. Inst. R. H. 621. *Limon with fruit growing in bunches.*

There are great varieties of this fruit, which are preserved in some of the Italian gardens, and in both the Indies there are several which have not yet been introduced to the European gardens; but these, like Apples and Pears, may be multiplied without end from seeds, therefore I shall only mention the most remarkable varieties which are to be found in the English gardens at present, as it would be to little purpose to enumerate all those which are mentioned in the foreign catalogues.

The Limon-tree with variegated leaves.
The sweet Limon.
The Pear-shaped Limon.
The imperial Limon.
The Limon called Adam's Apple.
The furrowed Limon.
The childing Limon.
The Limon with double flowers.

The common Limon and the sweet Limon are brought to England from Spain and Portugal in great plenty, but the fruit of the latter are not much esteemed. The Lime is not often brought to England, nor is that fruit much cultivated in Europe, but in the West-Indies it is preferred to the Limon, the juice being reckoned wholesomer, and the acid is more agreeable to the palate; there are several varieties of this fruit in the West-Indies, some of which have a sweet juice, but those are not greatly esteemed; and as the inhabitants of those islands do not propagate these fruits by grafting or budding, being contented with sowing their seeds, so there is no doubt but a great variety of them may be found by any person who is curious in distinguishing them.

As I have never known the common Limon ever vary to the Lime, when raised from seeds, nor the Lime vary to the Limon, I suppose they are specifically different, for I have frequently raised both from seeds, and have always found them continue their difference in leaf and branch, for I never waited to see their fruit, as they were only designed for stocks, to bud other sorts into them.

The Pear-shaped Limon is a small fruit with very little juice, so is not much propagated any where; the curious, who have room and convenience for keeping many of these trees, may preserve a plant or two of this sort for the sake of variety.

The fruit of the Imperial Limon is sometimes brought to England from Italy, but I do not remember to have se n any of this sort imported from Spain or Portugal, so that I suppose they are not much propagated in either of these countries; for the inhabitants of both those fine countries are so very incurious, especially in horticulture, as to trust almost entirely to nature, that the products of their gardens are inferior both in numbers and quality, to many other parts of Europe, where the climate is much less favourable for these productions. And in the article we are now upon, there are many strong instances of the slothfulness, or incuriosity of the Portugueze particularly, for they had many of the most curious sorts of Orange, Limon, and Citron-trees, brought from the Indies to Portugal formerly, which seemed to thrive almost as well there, as in their native soil, and yet they have not been propagated; there are a few trees of these sorts still remaining in some neglected gardens near Lisbon, almost unnoticed by the inhabitants. As there are also several curious trees and plants, which were formerly introduced from both Indies, some of which thrive and produce fruit amidst the wild

bushes and weeds, with which those gardens are spread over.

All these sorts are propagated by budding or inarching them either on stocks of Lemons or Citrons, produced from seeds, but they will not so readily unite on Orange stocks, for which reason the Citrons are preferable to either Oranges or Lemons for stocks, as they readily join with either sort, and being of larger growth, cause the buds of the other sorts to shoot much stronger than if they were on stocks of their own kind. The method of raising these stocks, and the manner of budding them, being already exhibited under the article of AURANTIUM, it would be superfluous to repeat it here.

The culture of the Lemon being the same with that of the Orange-tree, it would be needless to repeat it here; therefore I shall only observe, that the common Lemons are somewhat hardier than the Oranges, and will bring their fruit to maturity with us better than they will do, and require to have a greater share of fresh air in winter; for which reason, they should always be placed nearer to the doors or windows of the green-house; and in some curious gardens, these trees have been planted against walls, where, by covering them with glasses in winter, and protecting them from severe frost, they have produced plenty of large fruit: as these trees do generally produce stronger shoots, they require more water to be given them than the Orange; but as to the tender sorts, they must be treated with a little more care, otherwise their fruit will fall in winter, and come to nothing; these things being fully exhibited before, I refer the reader (as I hinted) to the article AURANTIUM, where their culture is fully set forth.

LIMONIUM. Tourn. Inst. R. H. 341. tab. 177. Statice. Lin. Gen. Plant. 348. [takes its name of λειμῶν, a marsh, as growing in marshes.] Sea Lavender.

The CHARACTERS are,

*The flowers have an imbricated perianthium, rising one above another. The flower is funnel-shaped, composed of five petals, which are narrow at their base, but are broad and spreading at the top. It hath five awl-shaped stamina which are shorter than the petals, crowned by prostrate summits. It hath a small germen, supporting five slender styles, crowned by pointed stigmas. The empalement of the flower afterward becomes a capsule, shut close at the neck, but expanded above where the seeds are lodged.*

This genus of plants is ranged in the second section of Tournefort's eighth class, which includes the herbs with a Clove Gilliflower flower, whose pointal becomes the seed inclosed in the empalement. Dr. Linnæus has joined this genus to the Statice of Tournefort, and places it in the fifth section of his fifth class, which contains the plants whose flowers have five stamina and five styles. As the flowers of this genus are ranged one above another in form of spikes, and those of the Statice are collected in globuar heads, they may, without impropriety, be kept separate; and as there are several species of each genus, therefore I have the rather been inclined so to do, than by joining them, to swell the genus.

The SPECIES are,

1. LIMONIUM (*Vulgare*) foliis ovato-lanceolatis, caule tereti nudo paniculato. *Sea Lavender with oval spear-shaped leaves, and a taper paniculated stalk.* Limonium maritimum majus. C. B. P. 192. *Common great Sea Lavender.*

2. LIMONINM (*Narbonense*) foliis oblongo-ovatis, caule paniculato patulo, spicis florum brevioribus. *Sea Lavender with oblong oval leaves, a spreading paniculated stalk, and shorter spikes of flowers.* Limonium maritimum majus alterum serotinum Narbonense. H. R. Par. *Another large late flowering Sea Lavender of Narbonne.*

3. LIMONIUM (*oleæfolium*) foliis ovatis obtusis, petiolis decurrentibus, caule paniculato, spicis florum erectioribus. *Sea Lavender with oval obtuse leaves, running foot-stalks, a paniculated stalk, and more upright spikes of flowers.* Limonium maritimum minus, oleæ folio. C. B. P. 192. *Small Sea Lavender, with an Olive leaf.*

4. LIMONIUM (*Humile*) foliis lanceolatis, caule humile patulo, spicis florum tenuioribus. *Sea Lavender with spear-shaped leaves, a low spreading stalk, and slender spikes of flowers.* Limonium Anglicum minus, caulibus ramosioribus, floribus in spicis rariùs sitis. Raii Hist. 217. *Lesser English Sea Lavender, with more branched stalks, and flowers seldom growing in a spike.*

5. LIMONIUM (*Tartaricum*) foliis lineari-lanceolatis, caule ramoso patulo, floribus distantibus uno versu dispositis. *Sea Lavender with narrow spear-shaped leaves, a branching spreading stalk, and flowers placed asunder on one side the stalk.* Limonium Orientale, plantaginis folio, floribus umbellatis. T. Cor. *Oriental Sea Lavender with Plantain leaves, and flowers growing in an umbel.*

6. LIMONIUM (*Sinuatum*) foliis radicalibus alternatim pinnato-sinuatis, caulinis ternis triquetris subulatis decurrentibus. *Sea Lavender with the lower leaves alternately sinuated like wings, and those upon the stalks three-cornered, awl-shaped, and running along the foot-stalk.* Limonium peregrinum, foliis asplenii. C. B. P. *Foreign Sea Lavender with Spleenwort leaves.*

7. LIMONIUM (*Siculum*) caule fruticoso patulo, foliis lineari lanceolatis crassis, floribus solitariis distantibus. *Sea Lavender with a spreading shrubby stalk, narrow, thick, spear-shaped leaves, and flowers growing singly at a distance from each other.* Limonium Siculum lignosum, gallas ferens, & non ferens. Bocc. Rar. *Woody Sicilian Sea Lavender, sometimes producing galls, at other times not.*

8. LIMONIUM (*Africanum*) foliis inferioribus lanceolatis hirsutis serratis caulinis ternis linearibus acutis decurrentibus. *Sea Lavender with spear-shaped lower leaves which are hairy and sawed, but growing by threes on the stalks, narrow, acute-pointed, and running along the stalk.* Limonium Africanum caule alato, foliis integris hirsutis, petalo pallidè flavo calyce amœnè purpureo. Martyn. Cent. 48. tab. 48. *African Sea Lavender with a winged stalk, entire hairy leaves, pale yellow petals to the flower, and a beautiful purple empalement.*

9. LIMONIUM (*Reticulatum*) foliis cuneiformibus, caule erecto paniculato, ramis inferioribus sterilibus nudis. *Sea Lavender with wedge-shaped leaves, an upright paniculated stalk, and the under branches sterile and naked.* Limonium minus flagellis tortuosis. Bocc. Mus. *Small Sea Lavender with twisted shoots.*

10. LIMONIUM (*Cordatum*) caule nudo paniculato, foliis spathulatis retusis. *Sea Lavender with a paniculated naked stalk, and spatule-shaped blunt leaves.* Limonium maritimum minus, foliolis cordatis. C. B. P. *Small Sea Lavender with little leaves, which are heart-shaped.*

11. LIMONIUM (*Echoideum*) caule nudo paniculato, tereti, foliis tuberculatis. *Sea Lavender with a naked, taper, paniculated stalk, and leaves set with tubercles.* Limonium minus annuum, bullatis foliis vel echioides. Bot. Monsp. *Small annual Sea Lavender with studded leaves.*

12. LIMONIUM (*Fruticosum*) caule erecto fruticoso, foliis lineari-lanceolatis obtusis, floribus alternis. *Sea Lavender with an upright shrubby stalk, narrow spear-shaped leaves, ending in obtuse points, and flowers ranged alternately.* Limonium Egyptiacum fruticosum, foliis lanceolatis obtusis. *Shrubby Egyptian Sea Lavender with blunt spear-shaped leaves.*

The first sort grows naturally in the marshes which are flowed by the sea, in several parts of England. The roots of this plant are thick, of a reddish colour, and an astringent taste, sending out many strong fibres, which strike deep in the ground; and from the upper part of the root comes out several oval spear-shaped leaves, from four to five inches long, and more than two inches broad in the middle; they are smooth, of a pretty thick consistence, and of a dark green. The stalks rise upward of a foot high, is naked of leaves, divided into many branches, which are again divided into smaller toward the top; these are terminated by slender spikes of pale blue flowers, ranged on one side the stalk above each other, coming out of narrow covers like sheaths; these appear in July, and are succeeded by oblong seeds, which are inclosed in the empalement, ripening in autumn.

The

The second sort grows naturally in the south of France on the sea-coast. The leaves of this sort are of an oblong oval form; they are six inches long, and three broad, smooth, entire, and of a deep green. The stalk rises fifteen or sixteen inches high, dividing into several spreading branches, which are divided again into smaller, and are terminated by several short spikes of pale blue flowers, ranged on one side the foot-stalk. This sort seldom flowers till the end of August, so never produces any good seeds in England.

The third sort grows naturally in Narbonne and Provence; this hath small, oval, obtuse leaves, about two inches long, and one broad, with pretty long foot-stalks, which are bordered, or winged with part of the leaves, which runs close to, and partly embrace the upper part of the root; these are of a lighter green than either of the former. The stalk rises a foot and a half high, sending out branches alternately on each side; the lower ones being long, the others gradually diminishing to the top, so as to form a loose kind of pyramid: these all point upward, and toward their ends send out spikes of pale blue flowers, which are erect. This sort flowers late in August, so never perfects seeds in England.

The fourth sort grows naturally in England. It was first discovered on the sea banks near Walton, in Essex, afterward near Malden, in the same county, and since at the mouth of the river that runs from Chichester, in Sussex. The leaves of this sort are spear-shaped, about three inches long, and one broad in the middle, lessening gradually to both ends. The stalk rises four or five inches high, dividing into many spreading branches, which are very thick set with short spikes of whitish blue flowers. These appear in August, and the seeds ripen in October.

The fifth sort was discovered by Dr. Tournefort in the Levant, from whence he sent the seeds to the Royal Garden at Paris, where they grew, and have produced seeds many years, which have been communicated to many of the curious gardens in Europe. The seeds of this sort were sent me from the Dardanelles, where the plants grow in plenty. The leaves of this sort are abo[illegible] inches long, and three quarters of an inch broad in the middle, diminishing gradually to both ends. The stalks rise about five or six inches high, dividing into several spreading branches, which are again divided into smaller; these are terminated by spikes of pale blue flowers, ranged on one side the foot-stalk; the whole, when growing, being spread wide, has somewhat the appearance of an umbel of flowers. This sort flowers in August, so never ripens seeds here.

The sixth sort grows naturally in Sicily and Palestine; this is a biennial plant. The lower leaves which spread on the ground, are indented almost to the middle rib; these indentures are alternate and blunt. The stalks rise a foot and a half high, dividing upward into several branches, garnished at each joint with three narrow leaves sitting close to the stalks, from whose base proceeds a leafy membrane, or wing, which runs along on both sides the stalk; these are rough, and a little hairy. The stalks are terminated by panicles of flowers, which sit upon winged foot-stalks, each sustaining three or four flowers of a light blue colour, which continue long without fading. This sort flowers in July and August, but unless the summer is very warm and dry, the seeds do not ripen in England.

The seventh sort grows naturally in Sicily; this hath a shrubby stalk, which rises about two feet high, dividing into several ligneous branches, which spread out on every side; the lower part of these are closely garnished with gray leaves, like those of the Sea Purslain, and are of a thick consistence. The branches are terminated by panicles of blue flowers, having one funnel-shaped petal, which come out singly at a distance from each other, having long tubes, but divide into five segments upward, which spread open. This flowers from June till autumn, but never produces seeds in England: there is a variety of this, which bears galls like those upon the Oak, which grows naturally in Sicily, but I do not know if it is a different species, for those plants which are in the English gardens have no appearance of any.

The eighth sort was raised in the Chelsea garden, from seeds which were brought me from Africa; this is a biennial plant, which dies soon after it has produced flowers and seeds. The lower leaves are but few in number; they are spear-shaped, hairy, and slightly sawed on their edges, about two inches long, and half an inch broad. The stalk rises about fifteen inches high, which at each joint is garnished with three narrow leaves, ending in acute points; from the base of these leaves is continued a leafy membrane, or wing, running along the stalk on each side; these stalks branch out but little, and are terminated by short panicles of flowers, whose foot-stalks are not winged as in the former; each foot-stalk sustains two or three flowers of a bright blue colour, out of the middle of which arises another small flower of a pale yellow colour. This sort flowered in July and August, 1757, but did not ripen seeds.

The ninth sort grows naturally in Sicily, and was found growing on the border of the sea in Norfolk, by Mr. Henry Scott, a gardener, and has since been found in plenty in Lincolnshire, by —— Banks, Esq; The lower leaves of this sort are narrow at their base, but enlarge upward, where they are broad, and rounded at the top, in shape of a wedge. The stalks are slender and stiff, rising from seven to fourteen inches high, sending out many slender side branches; all those which proceed from the lower part of the stalk are barren, having no flowers; but toward the top they have short panicles of whitish flowers, which are small, and sit three or four together upon one foot-stalk. This sort flowers in July and August.

The tenth sort grows naturally near the sea, about Marseilles and Leghorn; this hath many thick fleshy leaves, which are shaped like a spatula, growing near the root, and spread on the ground; they are smooth, and of a grayish colour. The stalks are naked, and rise about six inches high, dividing toward the top into many smaller branches, which are terminated by short crooked panicles of small flowers, of a pale red colour. This sort flowers in August, but never produces seeds in this country.

The eleventh sort grows naturally about Montpelier and in Italy; this is an annual plant, with long narrow leaves, which are set with rough tubercles like the leaves of Viper's Buglos. The stalks rise about eight inches high, dividing into two or three small branches, which are terminated by reflexed short spikes of pale blue flowers; these come out late in August, and the seeds are seldom perfected in England.

The twelfth sort grows naturally in Egypt, from whence the seeds were sent to the Royal Garden at Paris, part of which were sent me by Dr. Bernard de Jussieu, which grew in the Chelsea garden, where there are several plants, which have produced flowers many years. This rises with an upright shrubby stalk to the height of eight or ten feet, divided upward into many branches, garnished with narrow spear-shaped leaves, placed without order; they are of a thick consistence, and of a gray colour, sitting close to the branches. The flowers are produced at the end of the branches in loose panicles, standing alternate on each side the stalk, one above another, with intervals between them; they have pretty long tubes, which enlarge upward, where they are cut into five obtuse segments, which spread open; these are of a bright sky blue, but fade to a purple before they fall off. The flowers begin to appear in July, and there is a succession of them till winter.

The first, second, third, fourth, fifth, and eighth sorts, are abiding plants, which will thrive in the open air in England; such of these as grow naturally in England, may be easily procured from the places where they grow; these plants may be transplanted at almost any time of the year, provided they are carefully

carefully taken up, preserving some earth to their roots, and in hot weather to shade them till they have taken new root; after which time they will require no other culture but to keep the ground clean from weeds, and in the spring to stir up the ground between them to loosen it. As these plants do not require much culture, nor do they take up much room, so a few of each sort may be allowed to have a place in gardens, where there is room, for the sake of variety. These plants do not propagate very fast in gardens, so the roots need not be removed oftener than every third or fourth year, at which time they may be slipped to increase them; the best time for this is in the autumn, that the plants may be well rooted before the spring, otherwise they will not flower very strong the following summer. They should be planted in a loamy soil, on an east aspected border, where they may enjoy the morning sun, but screened from the great heat in the middle of the day; in such a situation the roots will continue several years, and flower as well as in their native soil.

These plants may also be propagated by seeds, so that such of them as do not grow naturally in England, may be obtained by procuring their seeds from abroad. These should be sown upon a border exposed to the morning sun, and on a soft loamy soil, early in the spring, for the seeds lie a considerable time in the ground before the plant comes up; therefore the ground must be kept entirely clean from weeds, and if the season should prove very dry, the border should be watered two or three times a week, otherwise the seeds will lie a whole year before they vegetate; when the plants come up, they must be kept clean from weeds, and in very dry weather watered, and in the autumn they may be transplanted where they are designed to remain.

The sixth and eighth sorts are biennial plants, which rarely perfect their seeds in England, so that unless fresh seeds can be procured from warm countries, where they ripen well, it will be very difficult to continue the sorts. If the seeds of these can be obtained time enough to sow them in the autumn, the plants will come up the following spring; but when they are sown in the spring, they seldom grow the same year. These seeds should be sown on a border of loamy earth, not stiff or moist, and exposed to the south; but when the sun is warm, the border should be shaded with mats, to prevent the earth from drying too fast. When the plants come up, they must be kept clean from weeds; and if they are too close, some of them should be carefully taken out as soon as they are fit to remove, and planted in small pots, placing them in the shade till they have taken new root; then they may be placed where they may enjoy the morning sun till autumn, when they should be put into a hot-bed frame, where they may be screened from hard frost, but enjoy the free air in mild weather; and those plants which are left in the border where they were sown, must be covered with mats in hard frost; for though they will often live through the winter in mild seasons, yet hard frost will always destroy them. The following summer the plants will flower, and if the season proves warm and dry, they will ripen seeds, and the roots soon after decay.

The seventh and twelfth sorts are shrubby plants, which are too tender to live through the winter in the open air in England, so the plants must be removed into shelter in the autumn, but they only require protection from hard frost: these plants may be placed with Myrtles, Oleanders, and other hardy green-house plants, where they often continue to flower great part of winter, and make a pretty variety. These sorts are easily propagated by cuttings, which, if planted in July on a shady border, and duly watered, will take root in six or seven weeks, when they should be taken up and planted into pots filled with light loamy earth, placing them in the shade till they have taken root; then they may be exposed till October, at which time they must be removed into shelter.

The eleventh sort is annual, and rarely ripens seeds here, so these must be procured from abroad, and sowed in the same way as the sixth and eighth sorts.

LINARIA. Tourn. Inst. R. H. 168. tab. 76. Antirrhinum. Lin. Gen. Plant. 668. [so called of Linum, *Lat.* flax, because its leaves resemble flax.] Toad-flax; in French, *Linaire*.

The Characters are,

*The flower hath a permanent empalement of one leaf, divided into five parts almost to the bottom. The flower hath one petal, and is of the ringent (or grinning) kind, with an oblong swelling tube, having two lips above, with the chaps shut. The upper lip is bifid and reflexed on the sides, the lower lip is trifid and obtuse. It hath an oblong nectarium, which is awl-shaped and prominent behind, and four stamina, which are included in the upper lip, two of which are shorter than the other, and a roundish germen supporting a single style, crowned by an obtuse stigma. The germen afterward turns to a roundish obtuse capsule with two cells, filled with small seeds.*

This genus of plants is ranged in the fourth section of Tournefort's third class, which includes the herbs with a tubulous, anomalous, personated flower, of one petal. Dr. Linnæus joins this genus, and also the Asarina of Tournefort to the Antirrhinum, and places that genus in the second section of his fourteenth class, in which are contained the plants whose flowers have two long and two short stamina, and the seeds are included in a capsule. The plants of this genus agree in their general characters with those of the Antirrhinum, or Calve's Snout, except in one particular, which is in the nectarium of the Linaria, which, from the base of the petal, stretches out like a heel; whereas the flowers of the Antirrhinum, have their nectarium lodged withinside the base of the petal: this being so very obvious, and both genera having many species, I thought it might be easier for students in botany to range them under different genera, than to join them under one.

The Species are,

1. Linaria (*Vulgaris*) foliis lanceolato-linearibus confertis caule erecto, spicis terminalibus sessilibus. *Toad-flax with spear-shaped linear leaves growing in clusters, and an upright stalk terminated by spikes of flowers, sitting close to the stalk.* Linaria vulgaris lutea, flore majore. C. B. P. 212. *Common yellow Toad-flax with a larger flower.*
2. Linaria (*Triphylla*) foliis ternis ovatis. *Toad-flax with oval leaves placed by threes.* Linaria triphylla minor lutea. C. B. P. 212. *Smaller three-leaved yellow Toad-flax.*
3. Linaria (*Lusitanica*) foliis quaternis lanceolatis, caule erecto ramoso, floribus pedunculatis. *Toad-flax with spear-shaped leaves placed by fours, an upright branching stalk, and flowers upon foot-stalks.* Linaria latissimo folio Lusitanica. H. R. Par. *Broadest-leaved Portugal Toad-flax.*
4. Linaria (*Alpina*) foliis subquaternis linearibus caule diffuso, floribus racemosis. *Toad-flax with linear leaves placed by fours on the lower part of the stalk, a diffused stalk and branching flowers.* Linaria quadrifolia supina. C. B. P. 213. *Low four-leaved Toad-flax.*
5. Linaria (*Purpurea*) foliis lanceolato-linearibus sparsis, caule florifero erecto spicato. *Toad-flax with spear-shaped linear leaves, and the flower-stalks erect and spiked.* Linaria purpurea major odorata. C. B. P. 213. *Greater sweet-scented purple Toad-flax.*
6. Linaria (*Repens*) foliis linearibus confertis, caule erecto ramoso, floribus spicatis terminalibus. *Toad-flax with linear leaves in clusters, an erect branching stalk, and flowers in spikes terminating the stalks.* Linaria cærulea, foliis brevioribus & angustioribus. Raii Syn. 3. 282. *Blue Toad-flax with shorter and narrower leaves.*
7. Linaria (*Multicaulis*) foliis inferioribus quinis linearibus. *Toad-flax with linear leaves, placed by fives at the lower part of the stalks.* Linaria Sicula multicaulis, folio molluginis. Bocc. Rar. 38. *Sicilian Toad-flax with many stalks and a Bedstraw leaf.*

8. Linaria (*Tristis*) foliis lanceolatis sparsis, inferioribus oppositis, nectariis subulatis, floribus subsessilibus. *Toad-flax with spear-shaped sparsed leaves, which on the lower part of the stalk are opposite, awl-shaped nectariums, and flowers sitting almost close.* Linaria Hispanica procumbens, foliis uncialibus glaucis, flore flavescente pulchrè striato, labiis nigro-purpureis. Act. Phil. N° 412. *Trailing Spanish Toad-flax with gray leaves an inch long, yellow flowers beautifully striped, and dark purple lips.*

9. Linaria (*Monspesulana*) foliis linearibus confertis, caule nitido paniculato, pedunculis spicatis nudis. *Toad-flax with linear leaves in clusters, a paniculated stalk, and flowers in spikes on naked foot-stalks.* Linaria capillaceo folio, odora. C. B. P. 213. *Sweet Toad-flax with hair-like leaves.*

10. Linaria (*Villosa*) foliis lanceolatis hirtis alternis, floribus spicatis, foliolo calycino supremo maximo. *Toad-flax with alternate, hairy, spear-shaped leaves, flowers in spikes, and the upper leaf of the empalement very large.* Linaria latifolia villosa, laciniis calycinis inæqualibus, flore majore pallido striato rictu aureo. Horteg. Icon. *Broad-leaved hairy Toad-flax, whose empalement is unequally cut, and a large pale striped flower with a golden snout.*

11. Linaria (*Pelisseriana*) foliis caulinis linearibus sparsis, radicalibus rotundis. *Toad-flax with linear leaves placed sparsedly on the stalks, and on the lower leaves round.* Linaria annua purpureo violacea, calcaribus longis, foliis imis rotundioribus. Vaill. Bot. Par. 118. *Annual purple Violet Toad-flax, with long spurs and rounder leaves at bottom.*

12. Linaria (*Chalepensis*) foliis lineari-lanceolatis alternis, floribus racemosis, calycibus corollâ longioribus. *Toad-flax with linear spear-shaped leaves placed alternate, branching flowers, and empalements longer than the petals.* Linaria annua angustifolia, flosculis albis, longiùs caudatis. Triump. 87. *Narrow-leaved annual Toad-flax, with white flowers having long tails.*

13. Linaria (*Dalmatica*) foliis lanceolatis alternis, caule suffruticoso. *Toad-flax with spear-shaped alternate leaves, and an under shrub stalk.* Linaria latifolia Dalmatica, magno flore. C. B. P. 212. *Broad-leaved Toad-flax of Dalmatia with a large flower.*

14. Linaria (*Genistifolia*) foliis lanceolatis acuminatis, paniculâ virgatâ. *Toad-flax with spear-shaped acute-pointed leaves, and a rod-like panicle.* Linaria genistæ folio glauco, flore luteo. Par. Bat. App. 9. *Toad-flax with a gray Dyer's Weed leaf and a yellow flower.*

15. Linaria (*Spuria*) foliis ovatis alternis, caule flaccido procumbente. *Toad-flax with oval leaves placed alternate, and a weak trailing stalk.* Elatine folio subrotundo. C. B. P. 253. *Fluellin with a roundish leaf.*

16. Linaria (*Elatina*) foliis hastatis alternis, caule flaccido procumbente. *Toad-flax with arrow-pointed leaves placed alternate, and a weak trailing stalk.* Elatine folio acuminato. C. B. P. 253. *Fluellin with an acute-pointed leaf.*

17. Linaria (*Cymbalaria*) foliis cordatis quinquelobatis alternis glabris. *Toad-flax with heart-shaped leaves having five lobes, which are alternate and smooth.* Linaria hederaceo folio glabro, seu Cymbalaria vulgaris. Tourn. Inst. R. H. 169. *Toad-flax with a smooth Ivy leaf, or common Cymbalaria.*

There are several other species of this genus which are well known and described, which are of less note, so are very rarely admitted into gardens, for which reason I have not enumerated them here.

The first of these plants grows in great plenty upon the sides of dry banks in most parts of England, and is seldom cultivated in gardens; for it is a very troublesome plant to keep within bounds, the roots being very apt to spread under ground, and rise at a great distance from the mother plant, whereby it greatly injures whatever plants stand near it. This is one of the plants mentioned in the catalogue of simples at the end of the College Dispensatory, to be used in medicine.

This hath a great number of slender white roots, which creep far on every side, from which arise several erect branching stalks a foot and a half high, garnished with narrow gray leaves in clusters, and terminated by spikes of yellow flowers, sitting close to the stalk. The flowers are of one petal, with a long tube, to which is fixed a spur or heel, called a nectarium; the fore parts of the flower has the appearance of the mouth of an animal, the under lip is hairy within; the chaps are of a golden colour, but the other parts of the flower are of a pale yellow; these are succeeded by roundish capsules with two cells, filled with flat black seeds. It flowers in July and August, when it makes a pretty appearance, so that a few plants might be allowed a place in gardens, were it not for their creeping roots, which spread too much, and become troublesome weeds; therefore the roots should be confined in pots to keep them within bounds.

There is an ointment made of this herb and hog's-lard, which is accounted excellent for the piles, being mixed with the yolk of an egg at the time of using it. The plant is reckoned to be aperitive and diuretic, opening obstructions of the liver and spleen, helping the dropsy and jaundice.

The second sort grows naturally about Valencia and in Sicily; this is an annual plant, which rises with an upright branching stalk near a foot and a half high, garnished with oval, smooth, gray leaves, placed often by threes, and sometimes by pairs opposite at the joints; the flowers grow in short spikes at the top of the stalks; they are shaped like those of the common sort, but have not so long tubes; they are yellow, with Saffron-coloured chaps. This sort flowers in July and August, and the seeds ripen in the autumn, and the plants soon after decay.

There is a variety of this whose flowers have a purple standard and spur, which makes a pretty appearance in a garden; but it is generally supposed to be only an accidental variety which has risen from seeds of the former, for which reason I have not enumerated it here; though from many years culture of both sorts, I have never yet perceived either of them alter. The leaves of this are longer than those of the yellow, but in other respects they do not differ.

This sort may be propagated by seeds, or by the roots; the seeds should be sown in the spring, on the borders of the flower-garden where they are designed to remain; and when the plants come up, they should be thinned where they are too close, and kept clean from weeds, which is all the culture they require. If some of the seeds are sown in autumn upon a warm dry border, the plants will live through the winter, unless the frost proves very severe; and these autumnal plants will grow larger, flower earlier, and from these good seeds may always be obtained: the first sort is seldom admitted into gardens.

The third sort rises with upright stalks near two feet high, which are garnished with spear-shaped smooth leaves, placed sometimes by fours round the stalk, and at others by pairs opposite; the stalks are terminated by large purple flowers with long spurs, standing upon foot-stalks. This flowers in July, but seldom ripens seeds in England; it grows naturally in Portugal and Spain.

This sort is tenderer than the last, so should be planted in a dry soil and a warm situation, otherwise the plants are often destroyed in winter. This plant is propagated by seeds in the same manner as the former, as also by parting the roots; but it is adviseable always to keep some of these plants in pots, that they may be removed into shelter in winter, otherwise in hard frosts they will be killed.

The fourth sort grows naturally about Verona, from whence I received the seeds. This is a perennial plant, from whose roots arise several diffused stalks about eight inches long, garnished with narrow, short, gray leaves, placed by fours round the stalks at bottom, but upward they are opposite; the stalks are terminated by short branching tufts of pale yellow flowers with golden chaps. This sort flowers in June, and in warm seasons sometimes the seeds will ripen here in the autumn.

The fifth sort grows naturally in the south of France and Italy; this hath a perennial root, sending out many stalks; those of them which support the flowers are erect, and near three feet high, but the other stalks are weaker, and hang loosely on every side the plants; these are garnished with long, narrow, spear-shaped leaves placed sparsedly; they are smooth, and of a gray colour. The stalks are terminated by long loose spikes of blue flowers, which appear in June, July, and August, and the seeds ripen in the autumn, which, if permitted to scatter, will produce plenty of young plants without any further care.

The sixth sort grows naturally about Henley in Oxfordshire, and also in some parts of Hertfordshire. This hath a perennial root, from which arise several stalks near two feet high, which branch out on every side, and are garnished with narrow leaves growing in clusters toward the bottom, but upward they are sometimes by pairs, and at others single. The flowers are produced in loose spikes at the end of the stalks; they are of a pale blue colour, which appear in June and July, and the seeds ripen in the aurumn; which, if permitted to scatter, will produce plenty of plants. When the seeds happen to fall upon old walls, the plants will grow there and continue longer than those planted in the ground.

I received a specimen of this sort from abroad, by the title of Linaria arvensis cærulea. C. B. P.

The seventh sort grows naturally in Sicily; this is an annual plant, from whose root arises many stalks which are very slender and about a foot high, which on their lower part are garnished with five very narrow leaves at each joint, but upward they are sometimes by pairs, and at others they are single: the stalks are divided into many small branches, which are garnished with small yellow flowers, coming out single at distances from each other; these are shaped like those of the other species. The flowers appear in July, and the seeds ripen in the autumn. There are two varieties of this, one with a deep yellow, and the other a sulphur-coloured flower.

This is propagated by seeds in the same manner as the second sort; if the seeds are permitted to scatter, the plants will come up without care, and if they are kept clean from weeds, will produce their flowers early in the summer.

The eighth sort grows naturally on the rocks about Gibraltar, from whence the late Sir Charles Wager brought the seeds, which were sown in his curious garden at Parson's Green near Fulham, where they succeeded, and from thence many curious gardens were furnished with the plants. This has a perennial root, from which come out many slender succulent stalks about eight or nine inches long, which are weak and hang down on every side the root; they are garnished with short, narrow, spear-shaped leaves, of a gray colour, and succulent, standing without order; they are about one inch long, and a fifth part of an inch broad. The flowers are produced at the end of the stalks in small bunches; they are yellow, marked with purple stripes, and the chaps of the flower, as also the spur, are of a dark purple colour; the flowers sit close upon the top of the stalk. They appear in June and July, but do not produce seeds in England.

This plant is easily propagated by planting cuttings in any of the summer months, which, if watered and shaded, will soon take root, and may be afterwards planted in pots, filled with fresh, light, undunged earth, in which they will succeed much better than in a richer soil; for if they are planted in a fine rich earth, it, causes them to grow very fast for a short time, but they seldom fail to rot soon after. These must be removed into shelter in winter, where they must have as much free air as possible in mild weather, and be only protected from severe cold; so that if the pots are placed under a hot-bed frame, the plants will succeed better than in a green-house, where they are apt to draw too much, which will cause them to decay.

The ninth sort grows naturally in Wales, particularly near Penryn. This hath a perennial root, from which arise many branching stalks near two feet high, garnished with very narrow leaves growing in clusters, which are of a grayish colour. The flowers are produced in loose spikes at the end of the branches; they are of a pale blue colour, and smell sweet. These appear in June, and there is often a succession of flowers on the plants till winter. The seeds ripen in the autumn, which, if permitted to scatter, will furnish a supply of young plants without any further care. If the seeds of this sort get on a wall, the plants will come up, and continue there a much longer time than when they are planted in the ground.

The tenth sort grows naturally in Spain; the seeds of it were sent me by Dr. Hortega from Madrid. This is an annual plant, which rises with a single stalk about a foot and a half high, garnished with hairy spear-shaped leaves, sitting close to the stalk, which are placed alternate. The flowers grow on the top of the stalks in loose spikes; they are of a pale yellow colour, with a few dark stripes, and the chaps are of a gold colour; the upper segment of the empalement is much larger than the lower. The flowers of this sort are as large as those of the common sort; they appear in July, and the seeds will in warm seasons ripen in autumn in England.

The seeds of this sort should be sown in the spring, upon a border of light earth where the plants are designed to remain; and when the plants come up, they must be treated in the same way as those of the second sort.

The eleventh sort grows naturally in France; this is an annual plant, having round leaves at the root; the stalks are slender, branching, and rise a foot high, garnished with very narrow leaves at each joint. The flowers are produced in loose spikes at the end of the branches; they are of a bright blue colour, and appear in July; the seeds ripen in the autumn, at which time they should be sown; for those which are sown in the spring frequently lie in the ground till the spring following, before the plants appear. When the plants come up, they must be thinned where they are too close, and kept clean from weeds, which is all the culture they require.

The twelfth sort grows naturally in Sicily; this is an annual plant, which rises with a branching stalk two feet high, garnished with very narrow spear-shaped leaves placed alternately. The flowers are produced singly all along the branches the greatest part of their length; they are small, white, and have very long tails or spurs. This flowers in July, and the seeds ripen in the autumn. If the seeds of this sort are permitted to scatter, the plants will come up and succeed better than if sown with care, and require no other culture but to keep them clean from weeds.

The thirteenth sort grows naturally in Crete, and also in Dalmatia. This rises with a strong ligneous stalk three feet high, garnished with smooth spear-shaped leaves placed alternate, sitting close to the stalk. The flowers are produced at the end of the branches in short loose spikes; they are of a deep yellow colour, and much larger than those of the common sort, standing upon short foot-stalks. This sort flowers in July, but the seeds very rarely ripen in England, so that the plants are seldom seen in any gardens here. It is propagated by seeds, which should be sown early in the spring upon a border of light earth; and when the plants come up and are fit to remove, some of them should be planted in pots filled with light sandy earth, and placed in the shade till they have taken new root; then they may be exposed with other hardy exotic plants till the end of October, when they should be put into a common hot-bed frame, where they may be protected from hard frost; but in mild weather they should enjoy the free air, for these plants only require to be protected from hard frost, for in mild winters they will live abroad without shelter, if they are upon a dry soil; therefore a part of the plants may be planted on a warm border of poor sandy soil, where they will live through our common winters

very well; and those plants which grow in rubbish and are stinted, will endure much more cold than the others.

The fourteenth sort grows naturally in Siberia; this is a biennial plant, which rises with an upright branching stalk from three to four feet high, garnished with spear-shaped leaves, ending in acute points, of a grayish colour; these are placed alternate. The flowers are produced at the end of the branches, in loose panicles; they are of a bright yellow colour, and shaped like those of the other sorts. This flowers in June and July, and the seeds ripen in the autumn, which, if permitted to scatter, the plants will come up the following spring, and require no other care but to thin them where they are too close, and keep them clear from weeds. The plants always decay after they have ripened their seeds, therefore there should be a supply of young ones annually raised.

The fifteenth sort grows naturally amongst Wheat and Rye, in several parts of England. It is an annual plant with weak trailing stalks, which spread on the ground, and are a foot and a half long; they are hairy, and garnished with oval leaves, placed alternately; from the setting on of the foot-stalks of the leaves; at each joint comes out one flower, shaped like those of the other species. The upper lip is yellow, and the under is purple; these appear in June and July, and the seeds ripen in autumn, which should be then sown, or permitted to scatter; for if it is sown in the spring, it seldom grows the same year, for it is rarely seen among spring-sown Corn, in those lands where it commonly grows.

This plant is used in medicine, and is esteemed vulnerary, and good for old cancerous sores and ulcers; it is accounted good for hæmorrhages of all sorts.

The sixteenth sort differs from the fifteenth, in nothing but the shape of the leaves, which in this are shaped like the point of an arrow, and those of the other are oval; this is more commonly found in England than the other.

The seventeenth sort was brought from Italy to England, where it now grows in as great plenty in the neighbourhood of London, as if it was in its native country, growing from the joints of walls, wherever the seeds happen to scatter. It is a perenial plant, which will thrive in any soil or situation, so that where it is once established, it will be difficult to root out, for the seeds will get into any joints of walls, or the decayed parts of pales, as also in the hollow of trees, where they grow and propagate plentifully; for the stalks put out roots at their joints, so spread themselves to a great distance. It flowers all the summer, and the seeds ripen in succession. It is never cultivated in gardens, but is supposed to be an excellent wound herb.

**LINGUA CERVINA.** Hart's Tongue.

These plants commonly grow out from the joints of old walls and buildings, where they are moist and shady, and also upon shady moist banks, but are seldom cultivated in gardens. There is a very great variety of these plants, both in the East and West-Indies, but there are very few species of them in Europe; all the hardy sorts may be propagated by parting their roots, and should have a moist soil and shady situation.

**LINUM.** Tourn. Inst. R. H. 339. tab. 170. Lin. Gen. Plant. 349. Flax; in French, *Lin*.

The Characters are,

*The flower hath a permanent empalement, composed of five small, spear-shaped, acute leaves. It is composed of five large oblong petals, which are narrow at their base, but broader upward, and spread open. It hath five awl-shaped erect stamina, terminated by arrow-shaped summits. In the center is situated an oval germen, supporting five slender styles, crowned by reflexed stigmas. The germen afterward turns to a globular capsule with ten cells, opening with five valves; in each cell is lodged one oval, plain, smooth seed, with an acute point.*

This genus of plants is ranged in the fifth section of Linnæus's fifth class, intitled Pentandria Pentagynia, which contains those plants whose flowers have five stamina and five styles.

The Species are,

1. Linum (*Usitatissimum*) calycibus capsulisque mucronatis petalis crenatis, foliis lanceolatis alternis caule subsolitario. Lin. Sp. Plant. 277. *Flax with empalements, and capsules ending in acute points, crenated petals to the flower, spear-shaped alternate leaves, and the stalks commonly single.* Linum sativum. C. B. P. 214. *Manured Flax.*

2. Linum (*Humile*) calycibus capsulisque mucronatis, petalis emarginatis, foliis lanceolatis alternis, caule ramoso. *Flax with sharp-pointed empalements and capsules, the petals of the flower indented, spear-shaped alternate leaves, and a branching stalk.* Linum sativum humilius flore majore. Bobart. Boerh. Ind. alt. 1. p. 284. *Low manured Flax with a larger flower.*

3. Linum (*Narbonense*) calycibus acuminatis, foliis lanceolatis sparsis strictis scabris acuminatis, caule tereti basi ramoso. Lin. Sp. Plant. 278. *Flax with acute-pointed empalements, rough spear-shaped leaves placed without order, ending in acute points, and a taper stalk branching at the base.* Linum sylvestre, cæruleum, folio acuto. C. B. P. 107. *Wild blue Flax with an acute leaf.*

4. Linum (*Tenuifolium*) calycibus acuminatis, foliis sparsis linearibus setaceis retrorsum scabris. Lin. Sp. Plant. 278. *Flax with acute-pointed empalements, and narrow bristly leaves placed without order, which are rough on their outside.* Linum sylvestre angustifolium, floribus dilutè purpurascentibus vel carneis. C. B. P. 214. *Narrow-leaved wild Flax, with a pale purplish or flesh-coloured flower.*

5. Linum (*Anglicum*) calycibus capsulisque acuminatis, caule subnudo scabro, foliis acuminatis. *Flax with acute-pointed empalements, an almost naked rough stalk, and acute-pointed leaves.* Linum perenne, majus, cæruleum, capitulo majore. Mor. Hist. 2. 573. *Greater blue perennial Flax with larger heads.*

6. Linum (*Perenne*) calycibus capsulisque obtusis, foliis alternis lanceolatis acutis, caulibus ramosissimis. Plat. 166. *Flax with obtuse empalements and capsules, alternate, spear-shaped, acute leaves, and very branching stalks, commonly called Siberian perennial Flax.*

7. Linum (*Hispanicum*) calycibus acutis, foliis lineari-lanceolatis sparsis, caule paniculato procumbente. *Flax with acute empalements, linear spear-shaped leaves placed without order, and a paniculated stalk.*

8. Linum (*Bienne*) calycibus patulis acuminatis, foliis linearibus alternis, caule ramoso. *Flax with spreading acute-pointed empalements, linear alternate leaves, and a branching stalk.*

9. Linum (*Hirsutum*) calycibus hirsutis acuminatis sessilibus alternis, caule corymboso. Lin. Sp. Plant. 277. *Flax with hairy acute-pointed empalements, placed alternate close to the stalks, whose flowers are formed in a corymbus.* Linum sylvestre, latifolium, hirsutum cæruleum. C. B. P. 339. *Broad-leaved, hairy, wild Flax, with a blue flower.*

10. Linum (*Strictum*) calycibus foliisque lanceolatis strictis mucronatis, margine scabris. Lin. Sp. Plant. 279. *Flax with spear-shaped leaves, and empalements which end in acute points, and have rough edges.* Passerina Lobelii. J. B. 3. p. 454.

11. Linum (*Fruticosum*) calycibus acutis, petalis integris, foliis inferioribus linearibus fasciculatis, superioribus alternis, caule suffruticoso. *Flax with acute empalements, entire petals to the flower, linear under leaves growing in clusters, the upper ones alternate, and a shrubby stalk.* Linum sylvestre acutis foliis fruticans. Barrel. Icon. 1008. *Wild Flax with a shrubby stalk and acute leaves.*

12. Linum (*Nodiflorum*) foliis lanceolatis alternis, floribus alternis sessilibus caule simplici. *Flax with spear-shaped leaves placed alternate, flowers growing alternate, and close to the stalks, which are single.* Linum luteum ad singula genicula floridum. C. B. P. 214. *Yellow Flax with single flowers growing from the joints.*

13. Linum (*Catharticum*) foliis oppositis ovato-lanceolatis, caule dichotomo, corollis acutis. Hort. Cliff. 372. *Flax with spear-shaped leaves placed opposite, a stalk divided by pairs, and acute petals to the flower.* Linum pratense, flosculis exiguis. C. B. P. 214. *Meadow Flax with small flowers, commonly called Mountain Flax.*

14. Linum (*Maritimum*) calycibus ovatis acutis muticis, foliis lanceolatis inferioribus oppositis. Lin. Sp. Plant. 280. *Flax with oval, acute, chaffy empalements, and spear-shaped leaves, the lower of which grow opposite.* Linum maritimum luteum. C. B. P. 214. *Yellow maritime Flax.*

The first sort is the Flax which is cultivated in most parts of Europe, but particularly in the northern parts; this is an annual plant, which usually rises with a slender unbranched stalk a foot and a half high, garnished with narrow spear-shaped leaves placed alternate, ending in acute points, and are of a gray colour. The flowers are produced on the top of the stalks, each stalk sustaining four or five blue flowers, composed of five petals, which are narrow at their base, but broad at the top, where they are slightly crenated. The empalement of the flower is cut into five parts, which end in acute points. The flowers appear in June, and are succeeded by roundish capsules which have ten cells, opening with five valves, which are terminated by acute points; each cell contains one smooth flattish seed, ending in a point, of a brownish colour. The seeds ripen in September, and the plants soon after perish.

When this plant is cultivated in the fields after the usual method, it seldom rises higher than is before mentioned; nor do the stalks branch out, but when they are allowed more room, they will rise more than two feet high, and put out two or three side branches toward the top, especially if the soil is pretty good where it is sown.

The second sort differs from the first, in having stronger and shorter stalks branching out much more. The leaves are broader, the flowers are larger, and the petals are indented at their extremities. The seed-vessels are also much larger, and the foot-stalks are longer; these differences are lasting, for I have cultivated this and the common Flax on the same ground upward of thirty years, and have never found either of them alter.

The third sort grows naturally in the south of France, in Italy, and Spain; this rises from a foot to eighteen inches high, branching out almost to the bottom into many long slender branches, which are garnished with narrow, spear-shaped, acute-pointed leaves, placed without order; these are rough to the touch. The flowers are produced at the end of the branches, almost in form of an umbel; they are smaller than those of the manured sort, and are of a pale blue colour. The seed-vessels are much smaller, and not so round. It flowers and seeds about the same time as the former.

The fourth sort grows naturally about Vienna and in Hungary; this sort seldom rises more than a foot high, with a slender stalk, which divides into three or four slender naked foot-stalks at the top, each sustaining two or three flowers, which are of a pale blue colour. The stalks are garnished with short, narrow, bristly leaves, standing erect, which are rough on their outside. This flowers and seeds about the same time as the former, and the plant soon after decays.

There are two or three varieties of this, which differ in the colour of their flowers, but in other respects are the same.

The fifth sort grows naturally in some parts of England, particularly in Cambridgeshire; this hath a perennial root, from which arise three or four inclining stalks, garnished with short narrow leaves toward their base, but upward have scarce any. The flowers are produced at the end of the stalks, sitting very close; they are of a blue colour, and about the size of those of the manured kind, and are succeeded by pretty large round seed-vessels, ending in acute points. This flowers about the same time as the common Flax, but the roots will continue four or five years.

The sixth sort grows naturally in Siberia; it hath a perennial root, from which arise several strong stalks, in number proportional to the size of the root, and in height according to the goodness of the soil where it grows; for in rich moist ground they will rise near five feet high, but in middling ground about three feet; these divide into several branches upward, and are garnished with narrow spear-shaped leaves, placed alternate; they are not much more than an inch long, and an eighth of an inch broad, of a deep green, ending in acute points. The flowers are produced at the end of the branches, forming a kind of umbel, the stalks rising nearly of the same height. The flowers are large, and of a fine blue colour; these appear in June, and are succeeded by obtuse seed-vessels, which ripen in September.

The seventh sort grows naturally in Spain, from whence I received the seeds; this hath a perennial root, from whence come out several trailing stalks, which are closely garnished with leaves; these never rise much from the ground, but between these come out upright stalks, which rise upward of two feet high, garnished with pretty long, narrow, spear-shaped leaves, placed without order. The flowers grow in a sort of panicle toward the upper part of the branches; they are about the size of those of the common sort, and are of the same colour. It flowers and ripens its seeds about the same time, and the roots continue several years.

The eighth sort I received from Istria; this hath a biennial root, from which arise two or three stalks, which divide into several branches, at about six inches from the root, which divide again into smaller toward the top; they are garnished with short, narrow, acute-pointed leaves, placed alternately. The flowers come out from the side of the branches, standing upon long foot-stalks. The empalement of the flower is composed of five broadish leaves ending in acute points, which spread open; the flowers are of the same size and colour as the common Flax, and appear at the same season. The seeds ripen in the autumn, and the roots abide several years.

The ninth sort grows naturally in Hungary and Austria; this hath a perennial root, from which arise several stalks near two feet high, which are thick, firm, and hairy, dividing at the top into several branches, and are garnished with broader leaves than the other species, which are hairy. The flowers grow along the stalks alternately; they are large, and of a deep blue colour, appearing at the same time with the common sort, and the seeds ripen in the autumn.

The tenth sort grows naturally in Germany and the south of France, amongst the Corn. This is an annual plant, rising with an upright stalk near a foot and a half high, garnished with spear-shaped acute-pointed leaves, which are rough on their edges; they are about the same length of those of the common Flax, but a little broader, placed alternately. The stalks divide toward the top into several branches, each sustaining two or three yellow flowers, sitting in spear-shaped acute-pointed empalements. These appear in July, but unless the autumn proves favourable, the seeds never ripen in England.

The eleventh sort grows naturally in Spain; the seeds of it were sent me from Madrid by Dr. Hortega. This hath a shrubby stalk which rises a foot high, sending out several branches which are garnished with very narrow leaves coming out in clusters; but the flowering branches are garnished with broader and longer leaves, placed alternately at every joint. The flowers are produced at the end of the branches, standing erect upon long slender foot-stalks; they have acute-pointed empalements. The petals of the flower are large, entire, and white, but before the flowers open, they are of a pale yellow colour. These flowers appear in July, but

but unless the autumn proves favourable, the seeds do not ripen in England. The flower-stalks of this sort decay in the autumn, but the lower shrubby stalk continues with the other branches all the year.

The twelfth sort grows naturally upon the Alps; this hath a perennial root, from whence arise two or three slender stiff stalks, which divide at the top into two or three slender branches, garnished with spear-shaped leaves placed alternately. The flowers come out singly at the joints, and sit close to the stalks; their empalements are cut into five slender segments, which are longer than the petals of the flower. The flowers are yellow, and appear about the same time with the common sort, and the seeds ripen in the autumn.

The thirteenth sort grows common in many parts of England, upon dry barren hills. It is commonly called Linum catharticum, purging Flax, and also Mountain Flax. This rises with several branching slender stalks about seven or eight inches high, garnished with small, oval, spear-shaped leaves placed opposite. The flowers are small and white, standing upon pretty long foot-stalks, which come out from the side of the branches, and also where they are divided. They appear in July, and are succeeded by small round capsules, containing small flat seeds which ripen in the autumn. This is one of those plants which refuses culture. I have frequently sown the seeds both in autumn and spring, but could seldom get up any of the plants, and others who have made the trial have found the same.

The fourteenth sort grows naturally about Montpelier, and in some parts of Italy near the sea. This rises with upright stalks near two feet high, the lower part of which are garnished with spear-shaped leaves placed opposite, but on the upper part they are alternate. The stalks divide upward into several branches, the tops of which are garnished with yellow flowers about the size of those of common Flax, which hang downward; these are succeeded by small oval capsules, containing smaller seeds than those of the common Flax. The flowers appear in July, and the seeds ripen in the autumn.

There are several other species of Flax which grow wild in the different parts of Europe, but those here enumerated are all I have seen growing in the English gardens.

The first sort is that which is cultivated for use in divers parts of Europe, and is reckoned an excellent commodity; the right tilling and ordering of which, is esteemed a good piece of husbandry.

This should be cultivated upon a rich soil, that has not been ploughed for several years, upon which Flax always makes the best improvement; but as it draws greatly from the soil, it should not be sown two years together upon the same ground, nor in less than after five or six years interval.

This ground should be as clean from weeds as possible; in order to have it so, it should be fallowed two winters and one summer, observing to harrow the ground well between each ploughing, particularly in summer, to destroy the young weeds soon after they appear, that the smallest of them may not stand to ripen their seed; this will also break the clods, and separate their parts so, that they will fall to pieces on being stirred. If the land should require dung, that should not be laid on till the last ploughing, when it must be buried in the ground; but this dung should be such as is clear from the seeds of weeds, which it always will be where there is care taken to keep the dunghills clean from weeds, and the places near it; for supposing there should be any seeds at first among the dung, yet when it is laid in a heap and well fermented, that will destroy the seeds; but there are few persons who are careful to keep their dunghills, and the places near them, clean from weeds; and the seeds of these falling on the dung, are carried upon the land; from whence sprung that vulgar error, that dung produces weeds, which it can never do, if there is not the seeds mixed with it. Just before the season for sowing of the Flax seed, the land must be well ploughed, laid flat and even, upon which the seeds should be sown about the latter end of March, or the beginning of April, when the weather is mild and warm.

The common way is to sow the seed in broad-cast, and to allow from two to three bushels of seeds to one acre of land; but from many repeated trials, I have found it is a much better method to sow the seeds in drills, at about ten inches distance from each other, by which half the quantity of seed which is usually sown, will produce a greater crop; and when the Flax is thus sown, the ground may be easily hoed to destroy the weeds; which, if twice repeated in dry weather, will keep the ground clean till the Flax is ripe: this may be performed at half the expence which the hand weeding will cost, and will not tread down the plants nor harden the ground, which by the other method is always done; and it is absolutely necessary to keep the Flax clean from weeds, otherwise they will overbear and spoil the crop.

There are some people who recommend the feeding of sheep with Flax, when it is a good height; and say, they will eat away the weeds and Grass, and do the Flax good; and if they should lie in it, and beat it down or flatten it, it will rise again the next rain: but this is a very wrong practice, for if the sheep gnaw or eat the Flax, the plants will shoot up very weak, and never come to half the size they would have done, if not cropped: and as to the sheep destroying the weeds, they never are so nice distinguishers, for if they like the crop better than the weeds, they will devour that and leave the weeds untouched.

Toward the latter end of August or the beginning of September, the Flax will begin to ripen, when you must be careful that it does not stand to be over ripe; therefore you must pull it up as soon as the heads begin to change brown and hang downwards, otherwise the seeds will soon scatter and be lost; so that the pluckers must be nimble, and tie it up in handfuls, setting them upright till they be perfectly dry, and then house them. If the Flax be pulled when it first begins to flower, it will be whiter than if it stand till the seed is ripe, but then the seed will be lost; but the thread will be stronger when Flax is left till the seed is ripe, provided it does not stand too long, but the colour of it will not be so good.

The Siberian perennial Flax has been made trial of, and answers very well for making of common strong linen, but the thread spun from this is not so fine or white as that which is produced from the common sort; but as the roots of this sort will continue many years, so there will be a great saving in the culture, as it will require no other care but to keep it constantly clean from weeds; which cannot be well done, unless the seeds are sown in rows, that the ground may be constantly kept hoed to destroy the weeds when young; for if they are suffered to grow large, it will be difficult to get the ground clean, and they will weaken the roots. This sort must have the stalks cut off close to the ground when ripe, and tied up in small bundles, managing them afterward in the same way as the common sort; but this seldom produces more than three crops, which will pay for standing.

The eighth sort I received from Istria, which produced the finest thread of all the sorts which I have tried; and this grows taller than the common Flax, and having a biennial root, may be worthy of trial to see how it will thrive in the open fields; for in gardens it lives through the winter without receiving the least injury from the frost, the roots having survived through the winter in the Chelsea garden several years; and in order to make trial of its goodness, I gave a parcel of the stalks of this, as also of the Spanish and Siberian perennial sorts, to a person who is well skilled in watering, breaking, and dressing of Flax, who prepared them, and assured me, that the Istrian Flax was by much the finest of the three, and was in goodness preferable to any he had seen.

There is annually great quantities of the seed of Flax imported into Scotland and Ireland, from the East Country, particularly from Riga, to the amount of many thousand pounds sterling, per ann. which might be saved to the public, by encouraging the growth of Flax in the northern colonies of America, where the summers are warmer than in England, so that the seeds would ripen perfectly there, and the change of seeds from thence would be greater than that from Riga, but it should be confined to the most northern parts of America; for such seeds as are saved in the warmer parts will not succeed well here, as I have experienced in many other kinds of plants, whose seeds I have sent to Carolina, where they have grown two or three years, after which some of the seeds have been sent me back, which I have always found to be much longer in growing to perfection than before.

The other sorts which are here mentioned, are preserved in gardens for the sake of variety, but none of them are used, except the Mountain Flax, which is esteemed a good purger in dropsical disorders, and has of late years been often prescribed.

They are all of them propagated by seeds, which may be sown in the spring, in the places where they are to remain, and will require no other culture but to keep the plants clean from weeds. The annual sorts will flower and perfect their seeds the same year, but the roots of the perennial sorts will continue several years, putting out fresh stalks every spring. The shrubby sorts will live through the winter in the open air, provided it is in a dry soil and a warm situation; but these rarely produce seeds in England.

The method of watering, piling, braking, &c. being a particular business, and foreign to my design, I shall not pretend to give any directions about it in this place.

The common sort is a plant of the greatest use, in several of the most essential parts of life; from the seeds an expressed oil is drawn, which is of great use in medicine, painting, &c. from the bark of the stalks is made linen, and from the rags of linen is made paper; so that this plant may be esteemed as one of the most valuable, and absolutely necessary in many of the principal conveniencies of life.

LINUM UMBILICATUM. See Cynoglossum.

LIPPIA. Houst. Gen. Nov. Lin. Gen. Plant. 699.

This plant was so named by the late Dr. William Houstoun, who discovered it at La Vera Cruz, where it grows naturally, in honour of Dr. Augustus Lippi, a famous botanist, who travelled to Egypt, and discovered many new plants.

The Characters are,

*The empalement of the flower is permanent, roundish, and compressed. The flower hath one petal, which is of the ringent kind; the upper lip is divided into two parts, which are reflexed; the under lip is smaller, and cut into two roundish segments. It hath four short stamina, two of which are a little longer than the other, terminated by single summits, and an oval germen supporting a slender style the length of the stamina, crowned by an indented stigma. The germen afterward turns to a compressed capsule with one cell, opening with two valves, which appear like the scales of the empalement, inclosing two seeds which are joined.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, intitled Didynamia Angiospermia, which includes those plants whose flowers have two long and two shorter stamina, and the seeds are included in capsules.

The Species are,

1. Lippia (*Americana*) arborescens foliis conjugatis oblongis, capitulis squamosis & rotundis. Houst. *Tree Lippia with oblong leaves growing by pairs, having round scaly heads.* Lippia capitulis pyramidatis. Lin. Sp. 883. *Lippia with pyramidal heads.*

2. Lippia (*Hemisphærica*) capitulis hemisphæricis. Jacq. Amer. 25. *Lippia with hemispherical heads.*

The first sort in the country of its native growth, commonly rises to the height of sixteen or eighteen feet, with a rough bark: the branches come out by pairs opposite, as do also the leaves, which are oblong, pointed, and a little sawed on their edges. From the wings of the leaves come out the foot-stalks, which sustain many pyramidal scaly heads, about the size of a large gray Pea, in which are many small yellow flowers appearing between the scales, which are succeeded by the seed-vessels.

The second sort grows naturally in Carthagena in New Spain, where it rises with shrubby stalks ten or twelve feet high, sending out slender branches toward their top, garnished with oval spear-shaped leaves three inches long, ending in acute points, smooth on their upper surface, which are placed opposite; the foot-stalks of the flowers come out opposite just above the leaves, each supporting a pyramidal head of white flowers, which peep out from the scales of the head; these are succeeded by capsules having two cells, including small seeds.

The seeds of the first sort were sent by Dr. Houstoun to several curious gardens in Europe, where some of the plants have been raised; but as the country from whence they came is very warm, so the plants will not thrive in this climate, unless they are preserved in a warm stove. The seeds should be sown on a hot-bed, and the plants may be treated in the same manner as other shrubby plants which are natives of warm countries: which is, to keep them always in the stove, plunged in the bark-bed, observing to give them a large share of air in warm weather, and frequently refresh them with water; but in winter they must be watered more sparingly, and be kept in a moderate degree of warmth, otherwise they will not live through the winter, especially while they are young; but when they have acquired strength, they may be preserved with a less share of warmth.

As the plants advance in their growth, they should be shifted into larger pots, but this should not be too often repeated; for if they are removed into new pots every spring, it will be as often as they will require; so that when these, and many other exotic plants, are too often removed, they do not thrive so well as when they are permitted to fill the pots with their roots. The best time to shift these plants is in April, at which time the tan of the hot-bed should be stirred, and fresh tan mixed with it, to increase the heat. The earth in which these plants are placed, should be fresh and light, but not too rich.

LIQUIDAMBER. Mitch. Gen. 12. Lin. Gen. Plant. 955. Liquidamber, Sweet Gum, or Storax-tree.

The Characters are,

*It hath male and female flowers sometimes on the same plant, at other times upon different plants; the male flowers are numerous, disposed in long, loose, conical katkins; these have four-leaved empalements, but no petals. They have a great number of short stamina joined in one body, which are convex on one side, but plain on the other, terminated by erect twin summits, with four furrows. The female flowers are often situated at the base of the male spike, collected in a globe; these have a double empalement like that of the male, and each of them has a bell-shaped, angular, distinct empalement, with many protuberances. They have no petals, but an oblong germen fastened to the empalement, supporting two awl-shaped styles, to which is also fixed the recurved stigmas, which are hairy and as long as the styles. The empalement afterward turns to a roundish capsule of one cell, with two valves at the top, which are acute, and collected in a ligneous globe, containing oblong acute-pointed seeds.*

This genus of plants is ranged in the eighth section of Linnæus's twenty-first class, which includes those plants with male and female flowers, whose male flowers have many stamina.

The Species are,

1. Liquidamber (*Styraciflua*) foliis quinquelobatis serratis. *Liquidamber with sawed leaves having five lobes.* Styrax aceris folio. Raii Hist. 1681. *Maple-leaved Storax-tree.*

2. Liquidamber (*Orientalis*) foliis quinquelobatis, sinuatis obtusis. *Liquidamber with leaves having five lobes, which are sinuated and obtuse.*

The first sort has by some writers been ranged with the Maple, but on no other account, except from the similitude of the leaves; for in flower and fruit it is very different from the Maple, and most other genera: nor has it any affinity to the Storax-tree, but the gum which issues from this tree being transparent, and having a great fragrancy, has by some ignorant persons been taken for that.

It grows plentifully in Virginia and several other parts of North America, where it rises with a strait naked stem to the height of fifteen or sixteen feet, and afterward branches out regularly to the height of forty feet or upward, forming a pyramidal head. The leaves are angular, and shaped somewhat like those of the lesser Maple, having five lobes, but are of a dark green colour, and their upper surfaces shining; a strong, sweet, glutinous substance exsudes through the pores of the leaves in warm weather, which renders them clammy to the touch.

The flowers are generally produced early in the spring of the year, before the leaves are expanded, which are of a Saffron colour, and grow in spikes from the extremity of the branches; after these are past, the fruit swells to the size of a Walnut, being perfectly round, having many protuberances, each having a small hole and a short tail, which extends half an inch.

The planks of this tree being beautifully veined, are often used in America for wainscotting rooms; but it requires a long time to season the boards, otherwise they are apt to shrink.

In Europe this tree is cultivated in the gardens of the curious, for the sake of variety; it is hardy enough to endure the severest cold of this country in the open air, and there are some of them upward of twenty feet high, though I have not heard of any of them which has produced fruit.

This is commonly propagated by layers in England, but those plants which are raised from seeds grow to be much fairer trees.

The seeds of this tree, if sown in the spring, commonly remain in the ground a whole year before the plants come up; so that the surest way to raise them is, to sow the seeds in boxes or pots of light earth; which may be placed in a shady situation during the first summer, and in autumn they may be removed where they may have more sun; but if the winter should prove severe, it will be proper to cover them with Peas-haulm, or other light covering, which should be taken off constantly in mild weather. In the following spring, if these boxes or pots are placed upon a moderate hot-bed, it will cause the seeds to come up early, so that the plants will have time to get strength before the winter; but during the first and second winters, it will be proper to screen the plants from severe frost, but afterward they will bear the cold very well.

The seeds of the second sort were sent by Mr. Peyssonel from the Levant, to the French king's garden at Marli, a few of which were sent me by Mr. Richard, the king's gardener, which succeeded in the Chelsea garden. The leaves of this sort differ from those of the first, in having their lobes shorter, and much more sinuated on their borders; they end in blunt points, and are not serrated; but as I have not seen the fruit of this, so I do not know how it differs from the other.

LIRIODENDRUM. See Tulipifera.

LITHOSPERMUM. Tourn. Inst. R. H. 137. tab. 55. Lin. Gen. Plant. 166. [of Λίθος, a stone, and Σπέρμα, seed; q. d. Stone-seed; because the seed of this plant is hard, and good against the stone.] Gromwell, Gromill, or Graymill; in French, *Gremil.*

The Characters are,

*The flower hath an oblong, erect, acute-pointed, permanent, empalement, which is cut into five parts. It hath one petal with a cylindrical tube the length of the empalement, divided into five obtuse points at the brim, which are erect; the chaps are perforated. It hath five short stamina terminated by oblong summits, which are shut up in the chaps of the petal. It hath four germen, with a slender style the length of the tube, crowned by a bifid obtuse stigma. The germen afterward turn to so many oval, hard, smooth, acute-pointed seeds, sitting in the spreading empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes the plants whose flowers have five stamina and one style.

The Species are,

1. Lithospermum (*Officinale*) seminibus lævibus, corollis calycem vix superantibus, foliis lanceolatis. Hort. Cliff. 46. *Gromwell with smooth seeds, the petal of the flower scarce longer than the empalement, and spear-shaped leaves.* Lithospermum majus erectum. C. B. P. 258. *Greater upright Gromwell.*
2. Lithospermum (*Arvense*) seminibus rugosis, corrollis vix calycem superantibus. Hort. Cliff. 46. *Gromwell with rough seeds, whose petals are scarce longer than the empalement.* Lithospermum arvense, radice rubrâ. C. B. P. 258. *Field Gromwell with a red root.*
3. Lithospermum (*Purpurocæruleum*) seminibus lævibus, corollis calycem multoties superantibus. Hort. Cliff. 46. *Gromwell with smooth seeds, and the petal many times longer than the empalement.* Lithospermum minus repens latifolium C. B. P. 258. *Smaller, creeping, broad-leaved Gromwell.*
4. Lithospermum (*Virginianum*) foliis subovalibus nervosis, corollis acuminatis, Lin. Sp. Plant. 132. *Gromwell with veined leaves which are almost oval, and acute-pointed petals.* Lithospermum latifolium Virginianum, flore albido longiore. Mor. Hist. 3. p. 447. *Broad-leaved Gromwell of Virginia with a longer whitish flower.*
5. Lithospermum (*Fruticosum*) fruticosum, foliis linearibus hispidis, staminibus corollam subæquantibus. Lin. Sp. 190. *Shrubby Gromwell with rough linear leaves, and the stamina almost equal to the petal.* Buglossum samium frutescens, foliis Rorismarini obscure virentibus lucidis & hirsutis. Tourn. Cor. 6.

The first sort grows naturally upon the banks, and in dry fields in many parts of England, so is seldom admitted into gardens. This hath a biennial root, from which arise two or three upright stalks two feet high, which branch out toward the top, garnished with spear-shaped, rough, hairy leaves, placed alternate, sitting close to the stalks. The flowers come out singly at every joint of the small branches; they are white, of one petal, cut into four parts at the top, and stand within the empalement; these are succeeded by four hard, white, shining seeds, which ripen in the empalement. It flowers in May, and the seeds ripen in August.

The seeds of this plant are accounted a powerful diuretic, and a cleanser of the reins and urethers, being boiled in wine and water, and are of great service against gravel or stoppage of urine.

The second sort is an annual plant, which grows among winter Corn in many parts of England. This rises with a slender branching stalk a foot and a half high, garnished with narrow, spear-shaped, rough leaves placed alternately. The flowers are produced singly on the upper parts of the stalks. They are small and white; these are succeeded by four rough seeds, which ripen in the empalement. It flowers in June, and the seeds ripen in August, soon after which the plants decay.

The third sort grows naturally in woods in many parts of England; this hath a perennial root, from which come out two or three trailing stalks scarce a foot long, garnished with long, narrow, spear-shaped leaves, placed alternately; these are smoother than those of the other sorts. The flowers are produced at the end of the stalks from amongst the leaves; they are white, and the petals are much longer than the empalements. These appear the latter end of May, and each is succeeded by four smooth seeds, which ripen in the empalement.

The

The fourth sort grows naturally in North America; this hath a perennial root, from which arise several very hairy stalks about a foot and a half high, garnished with rough, hairy, veined leaves, which are almost oval, sitting close to the stalks alternately. The flowers grow in short reflexed spikes at the end of the branches: these are white, their petals being longer than the empalement, ending in acute points. It flowers in June, and the seeds ripen in autumn.

The fifth sort grows naturally in the south of France, and also in the Levant. This hath a perennial root, which runs deep in the ground, from which comes out in the spring a shrubby erect stalk two or three feet high, which is pretty closely set with hairs, and garnished with narrow leaves placed alternately. The flowers are produced in short reflexed spikes at the end of the stalk, standing in hairy empalements; they are of a reddish purple colour, but as they decay change to a deep purple; they are tubulous, but cut at the top into four or five segments; the upper two are reflexed. It flowers in June, but the seeds rarely ripen in England.

These plants may be cultivated by sowing their seeds in rows soon after they are ripe, in a bed of fresh earth, allowing the rows at least a foot distance from each other, observing to keep them clear from weeds, and they will thrive in almost any soil or situation.

LOAM is a common superficial earth, that is a mixture of sand and clay, commonly of a yellowish colour, though there is some Loam that is blackish. Some call Loam the most common superficial earth met with in England, without any regard to the proportion it bears to sand or clay; but most generally the appellation of Loam is applied to a soft fat earth, partaking of clay, but easy to work.

It is found by experience, that plants of most sorts will grow in it; and wherever it is found, it appears to be a more beneficial soil to plants than any other. A clay used in grafting is also called Loam.

LOBELIA. Plum. Nov. Gen. 21. tab. 31. Lin. Gen. Plant. 897.

The CHARACTERS are,

*The empalement of the flower is small, of one leaf, indented in five parts, and grows about the germen. The flower has but one petal, which is tubulous, and a little ringent, cut into five parts at the brim; two of the upper segments are smaller than the other, are more reflexed and deeper cut, these constitute the upper lip; the three lower are spread open, and larger. It hath five awl-shaped stamina the length of the tube, terminated by oblong cylindrical summits, divided at their base into five parts. It has a pointed germen under the petal, supporting a cylindrical style, crowned by an obtuse prickly stigma. The germen afterward becomes an oval fleshy berry with two cells, each containing a single seed.*

This genus of plants is ranged in the fifth section of Linnæus's nineteenth class, to which he has joined the Rapuntium of Tournefort; but although the form of theflowers, and the number of their stamina, agree pretty well, yet as the fruit of this is a pulpy berry, inclosing but two seeds, and the Rapuntii have dry capsules including many small seeds, I shall keep them separate.

We know but one SPECIES of this genus, viz.

LOBELIA (*Frutescens*) frutescens, foliis ovati-oblongis integerrimis. Flor. Zeyl. 313. *Shrubby Lobelia with oblong, oval, entire leaves.* Lobelia frutescens portulacæ folio. Plum. Nov. Gen. 21. *Shrubby Lobelia with a Purslane leaf.*

This plant rises with a succulent stalk five or six feet high, garnished with oval, oblong, succulent leaves, which are placed alternately; these sit close to the stalk. The flowers are produced upon long foot-stalks, which come out from the side of the stalk, and sustain two or three white flowers of one petal, cut into five acute segments at the brim; these are succeeded by two oval berries as large as Bullace, containing a stone with two cells, in each of which is lodged a single seed.

The seeds of this plant were sent to England by Mr. Catesby, in the year 1724, who gathered them in the Bahama Islands, where the plants grow in plenty, near the shore of the sea; and since that time the seeds have been sent to England by Dr. William Houstoun, who gathered them at La Vera Cruz; so that I believe the plant is common in most of the warm parts of America.

It is propagated by seeds, which must be procured from the countries of its natural growth, for the plants will not produce them in Europe; these seeds should be sown in pots filled with light sandy earth, and plunged into a hot-bed of tanners bark, where the plants will come up in about a month or five weeks, provided the bed is warm, and the earth often watered. When the plants are up, they should be kept in a temperate hot-bed, and frequently refreshed with water, but it must not be given them in large quantities, for they are very succulent, and subject to perish with much moisture, especially while they are young. When the plants are about two inches high, they should be carefully taken out of the pots in which they were sown, and each planted in a separate small pot filled with fresh light sandy earth, and then plunged into the hot-bed again, observing to shade them in the heat of the day until they have taken new root. In this hot-bed the plants may remain until the middle, or latter end of September, when they must be removed into the stove, and plunged into the tan-bed, in the warmest part of the stove, for they are very tender plants while young, therefore must be kept very warm, otherwise they will not live through the first winter in this country. In the spring following the plants may be shifted into somewhat larger pots, and then plunged into a fresh hot-bed to forward their growth; for if they are not pushed on while they are young, they seldom grow to any size, nor will they ever flower; so that in order to have them in any beauty, they must be carefully managed. The leaves of this plant are very subject to contract filth, by being constantly kept in the stove, therefore they should be washed with a sponge frequently, to keep them clean, otherwise they will appear unsightly.

LOBUS ECHINATUS. See GUILANDINA.

LOCULAMENTS are little distinct cells, or partitions, within the seed-vessels of plants.

LOLIUM. Darnel Grass.

Of this sort of Grass we have two or three species, which grow naturally in England; some in dry Grass grounds, and one which is an annual Grass, is frequently found in arable land; but as neither of them are cultivated for use, so I shall not trouble the reader with any farther account of them.

LONCHITIS [so called of Λόγχη, a lance or spear, because the leaves are so sharp-pointed as to resemble the point of a spear.] Rough Spleenwort.

The CHARACTERS are,

*The leaves are like those of the Fern, but the pinnulæ are eared at their base; the fruit also is like that of the Fern.*

The SPECIES are,

1. LONCHITIS aspera. Ger. *Rough Spleenwort.*
2. LONCHITIS aspera major. Ger. Emach. *Greater rough Spleenwort.*

The first of these plants is very common in shady woods, by the sides of small rivulets, in divers parts of England; but the second sort is not quite so common, and has been brought into several curious botanic gardens from the mountains in Wales. There are also great variety of these plants in America, which at present are strangers in the European gardens; they are seldom cultivated but in botanic gardens for the sake of variety, where they must have a moist soil and shady situation.

LONGITUDINAL VESSELS, in plants, are such as are extended in length through the woody parts of trees and plants, into which the air is supposed to enter, and mix with the juices of the plant, and thereby augment its bulk.

LONICERA. Lin. Gen. Plant. Chamæcerasus. Tourn. Inst. R. H. 609. tab. 379. *Upright Honeysuckle.*

The Characters are,

*The flower has a small empalement, cut into five parts, upon which the germen sits. It hath one petal, with an oblong tube, cut into five parts at the brim, and five awl-shaped stamina, almost the length of the petal, terminated by oblong summits. Under the petal is situated a roundish germen, supporting a slender style the length of the petal, crowned by an obtuse stigma. The germen afterward turns to two berries, which join at their base.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style; and to this genus he has joined the Caprifolium, Periclymenum, and Xylosteum of Tournefort, and the Symphoricarpos of Dillenius. Tournefort places this genus in the sixth section of his twentieth class, in which he ranges the trees and shrubs with a flower of one petal, whose empalement becomes a berry.

The Species are,

1. Lonicera (*Xylosteum*) pedunculis bifloris, baccis distinctis, foliis integerrimis pubescentibus. Prod. Leyd. 238. *Lonicera with two flowers on each foot-stalk, distinct berries, and entire woolly leaves.* Chamæcerasus dumetorum fructu gemino rubro. C. B. P. 451. *Dwarf Cherry with twin red fruit, commonly called Fly Honeysuckle.*
2. Lonicera (*Alpigena*) pedunculis bifloris, baccis coadunatis didymis. Lin. Sp. Plant. 174. *Lonicera with two flowers upon a foot-stalk, and twin berries which are joined together.* Chamæcerasus Alpina, fructu gemino rubro duobus punctis notato. C. B. P. 451. *Dwarf Alpine Cherry with a red twin fruit, marked with two points, commonly called red-berried upright Honeysuckle.*
3. Lonicera (*Cærulea*) pedunculis bifloris, baccis coadunatis globosis, stylis indivisis. Lin. Sp. Plant. 174. *Lonicera with two flowers on a foot-stalk, globular berries, which are joined, and undivided styles.* Chamæcerasus montana, fructu singulari-cæruleo. C. B. P. 451. *Mountain Dwarf Cherry with a single blue fruit, commonly called single, blue-berried, upright Honeysuckle.*
4. Lonicera (*Nigra*) pedunculis bifloris, baccis distinctis, foliis serratis. Prod. Leyd. 238. *Lonicera with two flowers on a foot-stalk, distinct berries, and sawed leaves.* Chamæcerasus Alpina, fructu nigro gemino. C. B. P. 451. *Alpine Dwarf Cherry with a black twin fruit, called black-berried upright Honeysuckle.*
5. Lonicera (*Tartarica*) pedunculis bifloris, baccis distinctis, foliis cordatis obtusis. Hort. Upsal. 42. *Lonicera with two flowers on a foot-stalk, distinct berries, and blunt heart-shaped leaves.* Chamæcerasus fructu gemino rubro, foliis glabris cordatis. Amm. Ruth. 184. *Dwarf Cherry with a twin red fruit, and smooth heart-shaped leaves.*
6. Lonicera (*Pyrenaica*) pedunculis bifloris, baccis distinctis, foliis oblongis glabris. Lin. Sp. Plant. 174. *Lonicera with two flowers on a foot-stalk, distinct berries, and oblong smooth leaves.* Xylosteum Pyrenaicum. Tourn. Inst. 609. *Pyrenean Dwarf Cherry.*
7. Lonicera (*Symphoricarpos*) capitulis lateralibus pedunculatis, foliis petiolatis. Lin. Sp. Plant. 175. *Lonicera with lateral heads of flowers growing upon foot-stalks, and leaves having foot-stalks.* Symphoricarpos foliis alatis. Dill. Hort. Elth. 371. *commonly called shrubby St. Peterswort.*

The first sort has been many years cultivated in the English gardens under the title of Fly Honeysuckle. It grows naturally upon the Alps, and in other cold parts of Europe. It rises with a strong woody stalk six or eight feet high, covered with a whitish bark, dividing into many branches, which are garnished with oblong oval leaves placed opposite; they are entire, and covered with short hairy down. The flowers come out on each side of the branches opposite, standing upon slender foot-stalks, each sustaining two white flowers standing erect; these have one petal, which is cut into five parts; the three lower being narrow, are reflexed, the two broader stand upright; these appear in June, and are succeeded by two red clammy berries, which are joined at their base, and ripen the beginning of September.

The second sort grows naturally upon the Alps; this has been long cultivated in the English gardens, by the title of red-berried upright Honeysuckle; this hath a short, thick, woody stem, which divides into many strong woody branches growing erect, garnished with spear-shaped leaves placed opposite, standing upon foot-stalks; they are entire, their under side being of a pale green, but their upper of a dark green. The flowers stand upon very long slender foot-stalks, which come out opposite on each side the branches, at the base of the leaves; they are red on their outside, but pale within, shaped like those of the former sort, but are a little larger, standing erect; these appear the latter end of April, and are commonly succeeded by two oval red berries, joined at their base, which have two punctures; they ripen the beginning of August. Sometimes there is but one berry succeeding each flower, which is frequently as large as a Kentish Cherry; this I believe has led some to suppose it was a distinct species, as I thought myself, when I saw all the fruit upon the shrub were single; but the following years, I found they had twin fruit like the others.

The third sort grows naturally upon the Appenines; this is a shrub of humbler growth than either of the former, seldom rising more than four or five feet high. The branches are slender, covered with a smooth purplish bark. The joints are distant, where the leaves come out opposite, and sometimes there are two on each side. The foot-stalks of the flowers are very short, each sustaining two white flowers, shaped like those of the former sorts; these are succeeded by blue berries, which are single and distinct. The flowers appear in May, and the berries ripen in August.

The fourth sort grows naturally on the Alps and Helvetian Mountains; this is a shrub very like the former, but the branches are slenderer. The leaves are a little sawed on their edges. The flowers have two berries succeeding them, in which consists their difference. It flowers at the same time with the former.

The fifth sort grows naturally in Tartary, from whence the seeds were sent to the Imperial Garden at Petersburgh, where they succeeded, and from thence the seeds were sent to me; this is a shrub which grows about the same height with the two former, to which this has a great resemblance in its branches; but the leaves of this are heart-shaped, and the berries are red, growing sometimes single, at others double, and frequently there are three joined together, which are about the same size with the former. It flowers in April, and the fruit is ripe in July.

The sixth sort grows naturally on the Pyrenean Mountains, and also in Canada, from whence the seeds were brought to Duke D'Ayen, which were sown in his curious garden at St. Germain, where they succeeded, and his highness was so good as to furnish me with a plant; this seldom rises more than three or four feet high, dividing into several spreading irregular branches, which are garnished with oblong smooth leaves, placed opposite. The flowers come out from the side of the branches upon slender foot-stalks, each sustaining two white flowers, which are cut into five segments almost to the bottom; these are succeeded by berries as the other sorts. It flowers in April.

The seventh sort grows naturally in North America, but has been many years propagated in the English gardens; this hath a shrubby stalk which rises about four feet high, sending out many slender plain branches, garnished with oval hairy leaves, placed by pairs opposite, having very short foot-stalks. The flowers are produced in whorls round the stalk; they are of an herbaceous colour, and appear in August. The fruit, which is hollow, and shaped like a pottage pot, ripens in the winter. Dr. Dillenius, in his Hortus Elthamensis, has titled this plant, Symphoricarpos foliis alatis, supposing the leaves to be winged;

 but

but as the leaves fall off single, and the branches remain upon which they were fixed, they cannot be called winged leaves.

These shrubs are now propagated in the nursery-gardens near London, for sale, and are commonly intermixed with other flowering shrubs for the sake of variety; but as there is little beauty in some of their flowers, a few of them only should be admitted, to set off those which are preferable; they are all of them very hardy plants, so will thrive in a cold situation better than in a warm one; they love a moist soil, in which they will thrive, and produce a greater quantity of fruit than in dry ground.

They may be propagated either by seeds or cuttings. The seeds commonly lie in the ground a year before they vegetate, but require no particular culture; if they are sown in autumn, many of them will grow the following spring. The cuttings should be planted in autumn in a shady border, where they will put out roots the following spring, and in the following autumn they may be removed into a nursery, to grow two years to get strength, after which they should be transplanted where they are designed to remain.

LOPPING. It is very observable, that most old trees are hollow within, which does not proceed from the nature of the trees, but is the fault of those who have the management of them, who suffer the tops to grow large before they lop them, as the Ash, Elm, Hornbeam, &c. and persuade themselves, that they may have the more great wood; but, in the mean time, do not consider that the cutting off great tops, or branches, endangers the life of a tree, or, at best, wounds it so, that many trees yearly decay more in their bodies, than the yearly tops come to; and at the same time that they furnish themselves with more great wood, they do it at the loss of the owner. And, indeed, though the Hornbeam and Elm will bear great tops when the body is little more than a shell, yet the Ash, if it comes to take wet at the head, very rarely bears more top after the body of the tree decays; therefore, if once these trees decay much in the middle, they will be worth little but for the fire, so that if you find a timber tree decay, it should be cut down in time, that the timber be not lost.

The Lopping of young trees, that is, at ten or twelve years old at most, will preserve them much longer, and will occasion the shoots to grow more into wood in one year, than they do in old tops at two or three. But when great boughs are ill taken off, it often spoils many a tree, for which reason they should always be spared, unless there is an absolute necessity. When they must be cut off, it should be close and smooth, and not parallel to the horizon, and cover the wound with loam and horse-dung mixed, to prevent the wet from entering the body of the tree.

When trees are at their full growth, there are several signs of their decay, as, the withering or dying of many of their top branches; or if the wet enters at any knot, or they are any-wise hollow, or discoloured, if they make but poor shoots, or if woodpeckers make any holes in them.

This Lopping of trees is only to be understood for pollard trees, because nothing is more injurious to the growth of timber trees, than that of Lopping or cutting off great branches from them; whoever will be at the trouble of trying the experiment upon two trees of equal age and size, growing near each other, to lop or cut off the side branches from one of them, and suffer all the branches to grow upon the other, will, in a few years, find the latter to exceed the other in growth every way, and this will not decay near so soon.

All sorts of resinous trees, or such as abound with a milky juice, should be lopped very sparingly, for they are subject to decay when often cut. The best season for Lopping these trees, is soon after Bartholomew tide, at which time they seldom bleed much, and the wound is commonly healed over before the cold weather comes on.

LORANTHUS. Vaill. Act. R. Sc. 1792. Lin. Gen. Plant. 400. Lonicera. Plum. Nov. Gen. 17. tab. 37.

The Characters are,

*The empalement of the flower is entire, concave, and crowns the germen. The flower is tubulous, and cut into five narrow segments almost to the bottom, which are reflexed. It hath four stamina which are longer than the tube of the flower, terminated by globular summits. The germen, which is situated below the empalement, supports a single style which is longer than the stamina, crowned by an oval stigma. The germen afterward becomes an oval pulpy fruit with one cell, including several compressed seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, but it should be placed in his fourth class, for the flower has but four stamina and one style.

There are several species of this genus, which grow naturally upon trees, in several parts of America; but as the plants cannot be cultivated in gardens, so it will be to no purpose to enumerate them.

LOTUS. Tourn. Inst. R. H. 402. Lin. Gen. Plant. 803. Bird's-foot Trefoil; in French, *Lotier*.

The Characters are,

*The empalement of the flower is of one leaf, permanent, and cut at the top into five parts. The flower is of the butterfly kind. The standard is roundish, and reflexed backward. The wings are broad, roundish, and shorter than the standard, closing together at the top. The keel is closed on the upper side, and convex on the under, rising a little. It hath ten stamina, nine joined and one separate, terminated by small summits, with an oblong taper germen, supporting a single style, crowned by an inflexed stigma. The germen afterward becomes a close cylindrical pod with one cell, opening with two valves, having many transverse partitions, in each of these is lodged one roundish seed.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, which contains the plants whose flowers have ten stamina in two houses.

The Species are,

1. Lotus (*Corniculatus*) capitulis depressis, caulibus decumbentibus, leguminibus cylindricis patentibus. Lin. Sp. Plant. 775. *Bird's-foot Trefoil with depressed heads, trailing stalks, and cylindrical spreading pods.* Lotus corniculata glabra, minor. J. B. 2. 356. *Lesser, smooth, corniculated Bird's-foot Trefoil.*
2. Lotus (*Angustissimus*) leguminibus subbinatis linearibus strictis erectis, caule erecto, pedunculis alternis. Lin. Sp. Plant. 774. *Bird's-foot Trefoil with erect, linear, strait pods, growing in pairs, an erect stalk, and alternate foot-stalks.* Lotus pentaphyllos, minor, hirsutus, siliquâ angustissimâ. C. B. P. 332. *Smaller, five-leaved, hairy Bird's-foot Trefoil, with very narrow pods.*
3. Lotus (*Glabrus*) capitulis depressis, caulibus decumbentibus, foliis linearibus glabris, leguminibus linearibus. *Bird's-foot Trefoil with depressed heads, trailing stalks, smooth linear leaves, and very narrow pods.* Lotus pentaphyllos frutescens, tenuissimis glabris foliis. C. B. P. 332. *Shrubby five-leaved Bird's-foot Trefoil, with very narrow smooth leaves.*
4. Lotus (*Rectus*) capitulis subglobosis, caule erecto, leguminibus rectis glabris. Hort. Upsal. 221. *Bird's-foot Trefoil with globular heads, an erect stalk, and strait smooth pods.* Lotus villosus, altissimus, flore glomerato. Tourn. Inst. R. H. 403. *Tallest hairy Bird's-foot Trefoil with a glomerated flower.*
5. Lotus (*Cretica*) leguminibus subternatis, caule fruticoso, foliis sericeis nitidis. Hort. Cliff. 372. *Bird's-foot Trefoil with generally three pods on each foot-stalk, a shrubby stalk, and shining leaves.* Lotus argentea Cretica. Pluk. Alm. 226. *Silvery Bird's-foot Trefoil of Crete.*

6. LOTUS (*Hirsutus*) capitulis hirsutis, caule erecto hirsuto, leguminibus ovatis. Hort. Upsal. 220. *Bird's-foot Trefoil with hairy heads, an erect hairy stalk, and oval pods.* Lotus pentaphyllos siliquosus villosus. C. B. P. 332. *Five-leaved, hairy, podded Bird's-foot Trefoil.*

7. LOTUS (*Candidus*) capitulis subglobosis hirsutis, caule erecto ramoso, hirsuto, foliis tomentosis. *Bird's-foot Trefoil with globular heads, which are hairy, an upright branching hairy stalk, and woolly leaves.* Lotus hæmorrhoidalis humilior & candidior. Tourn. Inst. 403. *Lower bird's-foot Trefoil, having whiter leaves.*

8. LOTUS (*Ornithopodioides*) leguminibus subquinatis arcuatis compressis, caulibus diffusis. Hort. Cliff. 372. *Bird's-foot Trefoil with five arched compressed pods, and diffused stalks.* Lotus siliquis ornithopodii. C. B. P. 332. *Bird's-foot Trefoil with pods like birds feet.*

9. LOTUS (*Peregrinus*) leguminibus subbinatis linearibus compressis nutantibus. Hort. Cliff. 372. *Bird's-foot Trefoil with two narrow compressed nodding pods.* Lotus siliquis geminis peregrina. Boerh. Ind. 2. p. 38. *Foreign Bird's-foot Trefoil with twin pods.*

10. LOTUS (*Pratensis*) leguminibus solitariis rectis teretibus terminalibus, caule erecto. Sauv. Monsp. 189. *Bird's-foot Trefoil with an erect stalk, terminated by a single, taper, erect pod.* Lotus pratensis siliquosa lutea. C. B. P. 332. *Yellow, meadow, podded Bird's-foot Trefoil.*

11. LOTUS (*Edulis*) leguminibus subsolitariis gibbis incurvis. Hort. Cliff. 370. *Bird's-foot Trefoil with single, convex, incurved pods.* Lotus pentaphyllos, siliquâ cornutâ. C. B. P. 332. *Five-leaved Bird's-foot Trefoil with horned pods.*

12. LOTUS (*Maritimus*) leguminibus solitariis membranaceo-quadrangulatis, bracteis lanceolatis. It. Oel. 143. Flor. Suec. 610. *Bird's-foot Trefoil with single pods which are quadrangular by a membrane, and a spear-shaped bracteæ.* Lotus maritima lutea siliquosa, folio pingui glabro. Bot. Monsp. *Podded, yellow, maritime Bird's-foot Trefoil with a smooth leaf.*

13. LOTUS (*Conjugatus*) leguminibus conjugatis membranaceo quadrangulis, bracteis oblongo-ovatis. Lin. Sp. Plant. 774. *Bird's-foot Trefoil with conjugated pods which are quadrangular by a membrane, and oblong oval bracteæ.* Lotus lutea, siliquâ angulosâ. Boerh. Ind. alt. 2. p. 37. *Yellow Bird's-foot Trefoil with angular pods.*

14. LOTUS (*Tetragonolobus*) leguminibus solitariis membranaceo-quadrangulatis, bracteis ovatis. Hort. Upsal. 220. *Bird's-foot Trefoil with single pods which are quadrangular, with a membrane, and oval bracteæ.* Lotus ruber siliquâ angulosâ. C. B. P. 332. *Red Bird's-foot Trefoil with angular pods, commonly called winged Pea.*

15. LOTUS (*Cytisoides*) capitulis dimidiatis, caule diffuso ramosissimo, foliis tomentosis. Prod. Leyd. 387. *Bird's-foot Trefoil with heads divided into two equal parts, a very branching diffused stalk, and woolly leaves.* Lotus siliquosa maritima lutea, Cytisi facie. Barrel. Icon. 1031. *Podded, yellow, maritime Bird's-foot Trefoil with the appearance of Cytisus.*

16. LOTUS (*Jacobæus*) leguminibus subternatis, caule herbaceo erecto, foliis linearibus. Hort. Cliff. 372. *Bird's-foot Trefoil with three pods, an erect herbaceous stalk and narrow leaves.* Lotus augustifolia, flore luteo purpurascente, insulæ St. Jacobi. Hort. Amst. 2. p. 165. *Narrow-leaved Bird's-foot Trefoil of St. James's island, with a yellow purplish flower.*

17. LOTUS (*Dorycnium*) capitulis aphyllis, foliis sessilibus quinatis. Lin. Sp. Plant. 776. *Bird's-foot Trefoil with naked heads, and leaves placed by fives sitting close to the branches.* Dorycnium Monspeliensium. Lob. Icon. 51. *Dorycnium of Montpelier.*

The first, second, and third sorts grow naturally in many parts of England, so are rarely admitted into gardens. When these grow in moist land and a shady situation, they send out stalks near two feet long; but upon dry chalky and gravelly ground, their stalks are not more than four or five inches long, and lie flat upon the ground. I have always observed in those pastures where these plants have grown, that the cattle of all sorts have avoided eating them, but the Grass all round them has been eaten very bare. I have cut the plants when young, and given it to various kinds of animals, but could never get them to eat it; and yet the seeds of these have been gathered and sold by some quacks in husbandry, under the title of Lady's Finger Grass, to be sown as an improvement to land for pasture.

The roots of these are perennial, so are difficult to get out when they have had long possession of the land; and they produce great quantities of seeds, which is cast about by the elasticity of the pods when ripe, to a considerable distance; they flower in June, and the seeds ripen in September.

The fourth sort grows naturally in the south of France, in Italy, and Sicily; this has by some been supposed the Cytisus of Virgil, but without foundation, for it does not answer the description given of that plant. This hath a strong perennial root, from which arise many upright strong stalks from three to four feet high, covered with a purplish bark, and toward the top send out a few side branches; these are garnished at every joint by a trifoliate leaf, whose lobes are wedge-shaped; at the base of the foot-stalk are placed two heart-shaped lobes sitting close to the branch; the leaves are hairy on their under side; the flowers are produced at the end of the branches almost in globular heads, sitting close to the foot-stalk: these are of a pale flesh colour and appear in June, and are succeeded by smooth strait pods almost an inch long, which change to a brown colour when ripe, and contain several roundish seeds which ripen in September. It is rarely cultivated but in botanic gardens for variety, but if any person has an inclination to cultivate this plant for feeding of cattle, it may be done in the same way as the Lucern, for which there is full directions in the article MEDICAGO. It rises easily from seeds, is very hardy, and will thrive on any light dry poor ground. Cows and horses will eat this plant when green, but I have not tried if they will feed on it when made into hay.

The fifth sort grows naturally in Syria and Crete; this rises with slender stalks which require support, from three to four feet high, sending out a few side branches; these are garnished at each joint with neat shining silvery leaves which are trifoliate, and have two appendages at the base of their foot-stalks, as the other sorts; they are in shape like the former, but a little smaller, and have an acute point at their top. The foot-stalks of the flowers, which are from two to three inches long, arise from the side of the branches, and sustain heads of yellow flowers, which part in the middle, each head containing four or six flowers; these appear in May, June, and July, and are succeeded by long taper pods filled with roundish seeds which ripen in the autumn.

This sort has a perennial stalk, but is too tender to live through the winter in the open air in England, so is kept in pots and removed into the green-house in autumn, and treated like other hardy exotic plants which only require protection from frost, so want no artificial heat. It may be propagated by seeds, which if sown on a bed of light earth in April, the plants will come up in about a month after, and in another month will be fit to remove; when they should be each put into a separate small pot filled with fresh light earth, placing them in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain till autumn.

It may be also propagated by cuttings, which may be planted during any of the summer months, upon a bed of light earth, covering them close with a bell or hand-glass, and screening them from the sun; in about five or six weeks they will have taken root, when they must be inured to bear the open air, and soon after may be planted in pots, and treated in the same way as the seedling plants.

The

The sixth sort grows naturally in the south of France and Italy; this hath a perennial stalk, which rises three feet high; when the roots are large, they frequently send up several of these stalks, especially if the old ones are cut down; the stalks are hairy, and divide into several branches, which are closely garnished with hoary trifoliate leaves, having two appendages at the base of the stalk; the flowers are collected into heads sitting upon pretty long foot-stalks, which come out of the side of the stalks. They have very hairy empalements, and are of a dirty white colour with a few marks of pale red. They appear in June and July, and are succeeded by short thick pods of a Chestnut colour, containing several roundish seeds which ripen in the autumn. This is propagated by seeds in the same way as the last sort; the plants will live through the winter in the open air in moderate winters, but it will be proper to keep one or two plants in pots to be sheltered in winter, lest those abroad should be destroyed by severe frost.

The seventh sort grows naturally in Sicily; this rises with an upright woody stalk near three feet high, garnished with leaves like the sixth, but they are much whiter, covered with a short woolly down, as are also the stalks; the flowers grow in close heads like the last, and are succeeded by short pods, which contain many yellow seeds. It flowers in summer, and the seeds ripen in autumn. This is too tender to live in the open air in England through the winter, so the plants must be kept in pots and housed during that season. It is propagated in the same way as the fifth sort, and requires the same culture.

The eighth sort grows naturally in Sicily; this is an annual plant, which sends out from the root many stiff stalks from one to two feet high, which divide into many branches growing diffused without any order, and are garnished with trifoliate leaves, having two appendages at their base; the foot-stalks of the flower rise from the wings of the stalks; they are two or three inches long, terminated by a cluster of yellow flowers, which are succeeded by flat pods two inches long, which are bent like an arch, and have many joints, separating the cells in which the seeds are lodged. It flowers in July, and the seeds ripen in autumn, and the plants decay soon after.

This is propagated by seeds, which should be sown early in April upon an open bed or border exposed to the sun, where the plants are to remain: when they come up they must be thinned, leaving them near two feet asunder, and afterwards they must be kept clean from weeds, which is all the culture they require.

The ninth sort grows naturally in Spain and Portugal: this is an annual plant like the former, but doth not branch so much; the small leaves are rounder at their ends, and they are smoother; the foot-stalks are shorter, and seldom sustain more than two flowers; these are succeeded by two very narrow pods about two inches long, which hang downward. This requires the same culture as the former.

The tenth sort grows naturally in the south of France; this hath a perennial root, from which is sent out several hairy stalks near a foot long, garnished with trifoliate hairy leaves, standing upon short foot-stalks, with two appendages at the base of the foot-stalk; the flowers stand upon pretty long foot-stalks singly, which rise from the end of the branches; they have long hairy empalements, with two oblong acute-pointed leaves immediately under them. The flowers are yellow, standing erect, and are succeeded by taper erect pods an inch and a half long. It flowers in June and July, and the seeds ripen in the autumn. It is propagated by seeds, which should be sown where the plants are to remain, and must be treated as the two former sorts, but the roots of this will continue several years.

The eleventh sort grows naturally in Sicily and Crete, where the pods are eaten by the poorer inhabitants when they are young. It also grows about Nice, from whence I received the seeds. This is an annual plant, from whose roots come out several trailing stalks a foot long, garnished at each joint with trifoliate roundish leaves, having appendages. The flowers stand singly upon long foot-stalks, which arise from the side of the branches; they are yellow and small, and are succeeded by single pods, which are thick, and arched with a deep furrow on the outside. The flowers appear in June and July, and in warm seasons the seeds ripen in the autumn, but in cold summers they will not ripen here. This must have the same culture as the annual sorts before mentioned.

The twelfth sort grows near the borders of the sea in France, Spain, and Italy; this hath a perennial root, sending out many slender stalks about a foot and a half long, which trail upon the ground, and are garnished with trifoliate leaves at each joint, which are smooth, and have two appendages to the base of the foot-stalk. The flowers stand singly, upon very long foot-stalks arising from the wings of the stalk; they are yellow, and are succeeded by single pods near two inches long, having four leafy membranes running longitudinally at the four corners. This flowers in June and July, and the seeds ripen in the autumn. It is propagated by seed in the same way as the tenth sort.

The thirteenth sort grows naturally in the south of France and Italy; this is an annual plant, from whose roots are sent forth several branching stalks a foot long, garnished with trifoliate leaves, whose lobes are acute-pointed, and have two oblong oval appendages at the base of their foot-stalks: the foot-stalks of the flower arise from the wings of the branches, each sustaining two yellow flowers, which are succeeded by taper pods near two inches long, having four leafy membranes running longitudinally their length. It flowers in July, and the seeds ripen in autumn. It is propagated by the seeds in the same way as the annual sorts before mentioned.

The fourteenth sort grows naturally in Sicily, but has been long cultivated in the English gardens; it was formerly cultivated as an esculent plant. The green pods of it were dressed and eaten as Peas, which the inhabitants of some of the northern counties still continue, but they are very coarse, so not agreeable to the taste of those who have been accustomed to better fare.

It is an annual plant which is cultivated in the flower-gardens near London for ornament. This sends out from the root several decumbent stalks about a foot long, garnished at each joint with trifoliate oval leaves, having oval appendages at the base of their foot-stalks; from each joint arise alternately the foot-stalks of the flowers, which are from two to three inches long, each sustaining one large red flower at the top, with three leaves just under the flower. After the flower fades, the germen becomes a swelling taper pod two inches long, having four leafy membranes or wings running longitudinally. It flowers in June and July, and the seeds ripen in autumn.

The seeds of this sort are commonly sown in patches, five or six seeds being sown near each other, in the borders of the pleasure-garden, where they are designed to remain. If the seeds all grow, some of the plants may be pulled up, leaving only two or three in each patch, and afterward they will require no other care but to keep them clean from weeds.

The fifteenth sort grows near the borders of the sea, in the south of France and Spain. This is a perennial plant, sending out from the root many stalks, which branch out their whole length, and are garnished with roundish trifoliate leaves with two appendages; they are covered with a woolly down: the flowers stand upon short foot-stalks, four or six growing in a divided head; they are yellow, and appear in July, and are succeeded by taper pods filled with roundish seeds, which ripen in autumn. This is propagated by seeds, which should be sown in the spring in the place where the plants are to remain, and must be treated

treated in the same manner as the hardy perennial sorts before mentioned.

The sixteenth sort grows naturally in the Island of St. James, from whence the seeds were first brought to Europe, but I have since received the seeds from the Cape of Good Hope. This hath a slender stalk which is woody, rising from two to three feet high, sending out many slender herbaceous branches, garnished with narrow white leaves, which are sometimes trifoliate, and at others there are five narrow lobes to each; these sit close to the branches, and are hoary. The flowers are produced from the side of the stalks towards their upper part, upon very slender foot-stalks, each sustaining four or five flowers collected in a head, of a yellowish deep purple colour, which are succeeded by taper slender pods little more than an inch long, containing five or six small roundish seeds. This plant flowers all the summer and autumn, and many times great part of the winter, especially if the plants are placed in a dry airy glass-case, where they may be free from damp, for nothing is more prejudicial to them. It is too tender to live abroad in England, so the plants must be kept in pots; and in the winter placed in a warm airy glass-case, but in the summer they should be placed abroad in a sheltered situation. It may be easily propagated by cuttings, during the summer season, in the same way as the fifth sort, and also by seeds; but the plants which have been two or three times propagated by cuttings, seldom are fruitful.

The seventeenth sort grows naturally about Montpelier; it rises with weak shrubby stalks three or four feet high, sending out many slender branches, which are thinly garnished with small hoary leaves, growing with five lobes in form of a hand; they sit close to the branches. The flowers are produced at the extremity of the branches in small heads; they are very small and white, so make no great appearance; they appear in June, and are succeeded by short pods containing two or three small round seeds which ripen in the autumn. This shrub will live in the open air, if it be planted in a dry soil and a warm situation. It is propagated by seeds, which will come up in any common border.

LOTUS ARBOR See CELTIS.

LOVE-APPLE. See LYCOPERSICON.

LUDVIGIA. Lin. Gen. Plant. 142.

This title was given to this genus of plants by Dr. Linnæus, in honour of M. Christ. Ludwig, of Leipsic, who published Remarks on Rivinus's Method of classing Plants, at Leipsic, in 1737.

The CHARACTERS are,

*The empalement of the flower is of one leaf, cut into four segments at the top, and sits upon the germen. The flower consists of four spear-shaped petals, which are equal, and spread open. In the center of the flower is situated the four-cornered pointal, attended by four stamina: the germen afterward becomes a four-cornered fruit, crowned with the empalement, and has four cells which are full of small seeds.*

This genus of plants is ranged in the first section of Linnæus's fourth class, which includes those plants whose flowers have four stamina and one style.

We have but one SPECIES of this genus in the English gardens at present, which is

LUDVIGIA (*Alternifolia*) foliis alternis lanceolatis. Lin. Sp. Plant. 118. *Ludvigia with alternate spear-shaped leaves.* Ludvigia capsulis subrotundis. Hort. Cliff. 491. *Ludvigia with roundish capsules.*

We have no English name for this plant, but it is very near akin to the Onagra, or Tree Primrose, from which it differs in the number of stamina.

This plant grows naturally in South Carolina, from whence the late Dr. Dale sent me the seeds. It is annual, and rises with an upright branching stalk a foot high, garnished with spear-shaped leaves placed alternate. The flowers come out singly at the foot-stalks of the leaves; they are composed of four small yellow petals, which spread open, standing upon short foot-stalks, and have four stamina; the flowers are succeeded by roundish seed-vessels with four leafy membranes they open in four cells, including many small seeds. It flowers in July, and the seeds ripen in the autumn.

The plants must be raised in a hot-bed in the spring, and treated in the same manner as hath been directed for the Amaranthus; for if they are not brought forward in the spring, they seldom produce good seeds in England.

LUFFA. Tourn. Act. R. S. 1709. Momordica. Lin. Gen. 967. Egyptian Cucumber.

The CHARACTERS are,

*It hath a bell-shaped flower consisting of one leaf, which is divided into five parts to the center; there are male and female flowers on the same plant. The male flowers are produced on short foot-stalks, having no embryos; but the female flowers rest on the top of the embryos, which afterward become a fruit like a Cucumber to outward appearance, but is not fleshy; the inner part consisting of many fibres, which are elegantly netted; and there are three cells which are filled with seeds, which are almost of an oval shape.*

We have but one SPECIES of this plant, viz.

LUFFA (*Ægyptiaca*) Arabum. Tourn. Act. R. 170. *The Luffa of the Arabians.*

There are two varieties of this plant, one having white, and the other black seeds; but these are not distinct species.

This plant may be propagated after the same manner as Cucumbers and Melons, by sowing the seeds on a hot-bed the beginning of March; and when the plants are come up, they must be pricked into a fresh hot-bed to strengthen the plants, observing to let them have fresh air every day in warm weather, and to refresh them frequently with water. When the plants have four or five leaves, they should be planted out upon a hot-bed where they are designed to remain, which should be under frames, and but one plant put into each light; for as these plants send forth a great number of side-shoots, so where they are planted too close, they will entangle one into the other, and become so thick, as to cause the fruit to drop. In the management of these plants, after they are planted out for good, there must be the same care taken as for Melons and Cucumbers, with this difference only, that these require a larger share of air in warm weather; otherwise the Vines will grow weak, and will not produce fruit.

When the plants have spread, so as to fill the frames on every side, the frames should be raised on bricks, and the ends of the plants drawn out, that they may have room to grow; for when these plants are in a vigorous state, they will spread eight or ten feet; so that if they are confined, they will become so thick, as to rot the tender branches which are covered from the air, and there will be no fruit produced.

The fruit, when it is young, is by some people eaten, and made into Mangoes, and preserved in pickle; but it hath a very disagreeable taste, and is not accounted very wholesome: wherefore these plants are seldom cultivated in Europe, except by such persons as are curious in botany, for variety.

LUNARIA. Tourn. Inst. R. H. 218. tab. 105. Gen. Plant. 725. [so called of Luna, *Lat.* the moon. because the seed-vessels resemble the form of the moon.] Moonwort, Sattin Flower, or Honesty; in French, *Bulbonac.*

The CHARACTERS are,

*The empalement of the flower is composed of four oblong, oval, small leaves, which are obtuse and fall off; the flower has four petals in form of a cross, which are large, obtuse, and entire: it hath six awl-shaped stamina, four of these are the length of the empalement; the other two are shorter, terminated by erect summits. It has an oblong oval germen sitting upon a small foot-stalk, supporting a short style, crowned by an entire obtuse stigma. The germen afterward becomes an erect, plain, compressed, elliptical pod, sitting upon the small foot-stalk, terminated by the style, having two cells opening with two valves, which are parallel, inclosing several compressed kidney-shaped seeds, which are bordered, sitting in the middle of the pod.*

This genus of plants is ranged in the second section of Linnæus fifteenth class, intitled Tetradynamia siliculosa, which includes those plants whose flowers have four long and two shorter stamina, and the seeds are included in short pods.

The SPECIES are,

1. LUNARIA (*Rediviva*) siliculis oblongis. Lin. Sp. Plant. 653. *Sattin Flower with oblong pods.* Lunaria major, siliquâ longiore. J. B. 2. 881. *Greater Moonwort with longer pods, commonly called Honesty, or White Sattin.*
2. LUNARIA (*Annua*) siliculis subrotundis. Lin. Sp. Plant. 653. *Sattin Flower with roundish pods.* Lunaria major, siliquâ rotundiore. J. B. *Greater Moonwort with a rounder pod.*
3. LUNARIA (*Ægyptiaca*) foliis suprà decompositis, foliolis trifidis, siliculis oblongis pendulis. *Moonwort with leaves decompounded whose lobes are trifid, and oblong hanging pods.* Cardamine foliis suprà decompositis, siliquis unilocularibus pendulis. Lin. Sp. Plant. 656. *Lady's Smock with leaves decompounded above, and hanging pods containing one cell.*
4. LUNARIA (*Perennis*) perennis, siliculis oblongis, foliis lanceolatis incanis. *Perennial Moonwort, with oblong pods and spear-shaped hoary leaves.* Lunaria perennis, lutea, folio leucoii, ramis expansis. Vaill. *Yellow perennial Moonwort, with a Stock Gilliflower leaf and expanded branches.*

The first sort grows naturally in Hungary, Istria, and Austria, but has been long an inhabitant of the English gardens. It is a biennial plant, which perishes soon after the seeds are ripe; it rises with a branching stalk from two to three feet high, covered with a reddish hairy bark, sending out branches on every side from the ground upward; these are garnished with heart-shaped leaves placed alternately, ending in acute points indented on their edges, and are a little hairy; the lower standing upon pretty long foot-stalks, but the upper sit close to the branches. The flowers are produced at the top and from the side of the branches toward their ends, in clusters; they are composed of four purplish heart-shaped petals, placed in form of a cross. These appear in May, and are succeeded by large flat roundish pods with two cells, inclosing two rows of flat kidney-shaped seeds, which have a border round them. These pods, when ripe, turn to a clear white or sattin colour, from whence the title of Sattin Flower has been given to it, and are transparent.

The seed-vessels of this plant, when they are full ripe, become very transparent, and of the appearance of white sattin, at which time the branches are cut off and dried; after which they are preserved to place in the chimneys of halls and large rooms, where they continue a long time in beauty.

This is propagated by seeds, which should be sown in the autumn; for those which are sown in the spring often miscarry, or lie a long time in the ground before they appear. The plants will grow in almost any soil, but love a shady situation; it requires no other culture, but to keep it clean from weeds. If the seeds are permitted to scatter, the plants will rise without any farther care; and if they are left unremoved, they will grow much larger than those which are transplanted; the roots of this sort perish soon after the seeds are ripe.

The second sort grows naturally upon the mountains in Italy; this hath stalks and leaves very like the first, but the flowers are rather larger, and of a lighter purple colour; but the principal difference is in the pods of this being longer and narrower than those of the other. It flowers and seeds at the same time with the first, and requires the same culture.

The third sort is an annual plant, which grows naturally in Egypt. This rises with a smooth branching stalk little more than a foot high, garnished with winged leaves, composed of several pair of lobes ranged along the midrib, terminated by an odd one; these lobes are of unequal sizes, and vary in their form; some of them are almost entire, and others are cut at their extremities into three parts; they are smooth, and of a lucid green. The flowers stand each upon pretty long slender foot-stalks, which come out from the side, and also at the end of the branches, in loose small clusters; they are of a purple colour, and are succeeded by oblong compressed pods, which hang downward. This sort flowers in June and July, the seeds ripen the beginning of September, and the plants decay soon after.

This is propagated by seeds, which should be sown upon an open border where the plants are to remain; if they are sown soon after they are ripe, the plants will come up in the autumn, and live through the winter in a sheltered situation; these will flower early the following summer, whereby ripe seeds may be obtained; they may also be sown in the spring in like manner. When the plants come up, they will require no other care but to keep them clean from weeds, and thin them where they are too close. If the seeds are permitted to scatter in the autumn, the plants will rise without care, and may be treated in the same way, which is much preferable to the sowing the seeds in the spring.

The fourth sort grows naturally in the Archipelago; this hath a perennial root, from which arise two or three ligneous stalks a foot high, covered with a white hairy bark, dividing upward into several smaller branches, garnished with spear-shaped leaves sitting close to the stalks, which are a little hoary. The branches are terminated by loose spikes of yellow flowers which appear in June, and are succeeded by oblong flat pods, containing flat kidney-shaped seeds, which ripen in the autumn.

This sort is propagated by seeds, which, if sown in the autumn, will succeed better than in the spring; they should be sown on a warm border, and on a dry poor soil, otherwise they will not live through the winter; but in a rubbishing soil the plants will continue two or three years.

LUPINUS. Tourn. Inst. R. H. 392. tab. 213. Lin. Gen. Plant. 774. Lupine; in French, *Lupin.*

The CHARACTERS are,

*The empalement is bifid and of one leaf; the flower is of the butterfly kind; the standard is roundish, heart-shaped, indented at the top, and the sides reflexed and compressed. The wings are nearly oval, and almost as long as the standard; they are not fixed to the keel, but close at their base; the keel is as long as the wings, but is narrow, falcated, and ends in a point. It hath ten stamina joined at their base in two bodies, but as they rise are distinct above, terminated by five oblong summits. In the center is situated a hairy, compressed, awl-shaped germen, supporting a rising style, terminated by an obtuse stigma. The germen afterward becomes a large, oblong, thick pod with one cell, ending with an acute point, including several roundish compressed seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, which includes those plants whose flowers have ten stamina joined in two bodies.

The SPECIES are,

1. LUPINUS (*Varius*) calycibus semiverticillatis appendiculatis, labio superiore bifido, inferiore subtridentato. Hort. Cliff. 499. *Lupine with empalements half whorled, having appendages, whose upper lip is bifid, and the under one almost trifid.* Lupinus sylvestris, purpureo flore, semine rotundo vario. J. B. 2. 291. *Wild Lupine, with a purple flower and a round variegated seed, commonly called the lesser blue Lupine.*
2. LUPINUS (*Angustifolius*) calycibus verticillatis appendiculatis, labio superiore bipartito, inferiore integro. Lin. Sp. Plant. 721. *Lupine with empalements having alternate appendages, whose upper lip is divided into two, and the under one entire.* Lupinus angustifolius cœruleus elatior. Raii Hist. 908. *Narrow-leaved taller blue Lupine.*
3. LUPINUS (*Luteus*) calycibus verticillatis appendiculatis, labio superiore bipartito, inferiore tridentato. Hort. Cliff. 499. *Lupine with empalements growing in whorls, having appendages to them, whose upper lips are cut into two parts, and the under one into three.* Lupinus sylvestris, flore luteo. C. B. P. 348. *The common yellow Lupine.*

4. LU-

4. Lupinus (*Hirsutis*) calycibus verticillatis appendiculatis, labio superiore inferioreque integris. Hort. Cliff. 499. *Lupine with whorl-shaped empalements having appendages, and the upper and under lip entire.* Lupinus peregrinus major, vel villosus, cœruleus, major. C. B. P. *Foreign, greater, hairy Lupine, with a large blue flower, commonly called the great blue Lupine.*

5. Lupinus (*Albus*) calycibus alternis inappendiculatis, labio superiore integro, inferiore tridentato. Hort. Cliff. 499. *Lupine with alternate empalements having no appendages, and the upper lip entire, but the under cut into three parts.* Lupinus sativus, flore albo. C. B. P. 347. *Garden or manured Lupine, with a white flower.*

6. Lupinus (*Perennis*) calycibus alternis inappendiculatis, labio superiore emarginato, inferiore integro. Lin. Sp. Plant. 721. *Lupine with alternate empalements having no appendages, the upper lip indented, and the under entire.* Lupinus cœruleus, minor, perennis, Virginianus, repens. Mor. Hist. 2. p. 87. *Smaller perennial, creeping, blue Lupine of Virginia.*

The first sort grows naturally among the Corn in the south of France and Italy, and in great abundance in Sicily. This is an annual plant, which rises with a firm, strait, channelled stalk near three feet high, divided toward the top into several branches, which are garnished with hand-shaped leaves, composed of five, six, or seven oblong lobes, which join in one center at their base, and are hairy. The flowers are produced in spikes at the end of the branches, standing half round the stalk in sort of whorls; they are of a light blue colour, shaped like those of Peas, and are succeeded by strait taper pods with one cell, inclosing a row of roundish seeds. This sort flowers in June and July, and the seeds ripen in the autumn.

It is propagated in the borders of the pleasure-garden for ornament, by sowing the seeds in April, in the places where they are to remain; and when the plants come up they should be thinned where they are too close, and kept clean from weeds, which is all the culture they require.

The second sort has much the appearance of the first, but the stalks rise higher; the leaves have more lobes, and stand upon longer foot-stalks; the lobes are blunt-pointed, and the seeds are variegated. This requires the same culture as the first, and flowers at the same time.

The third sort is the common yellow Lupine, which has been long cultivated in the English gardens for the sweetness of its flowers. This grows naturally in Sicily; it rises about a foot high, with a branching stalk garnished with hand-shaped leaves, composed of nine narrow hairy lobes, which join at their base to the foot-stalks; these are four or five inches long. The flowers are yellow, and are produced in loose spikes at the end of the branches, standing in whorls round the stalks, with spaces between them, terminated by three or four flowers, sitting close at the top; these are succeeded by flattish hairy pods about two inches long, standing erect, inclosing four or five roundish seeds, a little compressed on their side, of a yellowish white, variegated with dark spots. This sort flowers at the same time as the former, but to have a succession of the flowers, the seeds are sown at different times, viz. in April, May, and June; but those only, which are first sown, will ripen their seeds. It may be cultivated in the same manner as the two former, and is equally hardy.

The fourth sort is supposed to be a native of India, but has been many years in the English gardens. It is an annual plant, which rises with a strong, firm, channelled stalk from three to four feet high, covered with a soft brownish down, dividing upward into several strong branches, garnished with hand-shaped leaves, composed of nine, ten, or eleven wedge-shaped hairy lobes, which are narrow at their base where they join the foot-stalk, but enlarge upward, and are rounded at the top where they are broadest; the foot-stalks of the leaves are three or four inches long. The flowers are placed in whorls round the stalks above each other, forming a loose spike, which proceeds from the end of the branches; they are large, and of a beautiful blue colour, but have no scent. These appear in July, and the seeds ripen in the autumn. The pods of this sort are large, almost an inch broad, and three inches long, inclosing three large roundish seeds compressed on their sides, very rough, and of a purplish brown colour. There is a variety of this with flesh-coloured flowers, which is commonly called the Rose Lupine; it differs from the blue only in the colour of the flower, but this difference is permanent, for neither of the sorts vary.

This is generally late in ripening the seeds, so that unless the autumn proves warm and dry, they do not ripen; therefore the best way to have good seeds, is to sow them in September close to a warm wall on dry ground, where they will live through our ordinary winters; and these plants will flower early the following summer, so there will be time for the seeds to ripen before the rains fall in the autumn, which frequently causes the seeds to rot which are not ripe. If a few of the seeds of both these varieties are sown in small pots the beginning of September, and when the frosts begin, the pots are removed into a common hot-bed frame, where they may be protected from hard frost, but enjoy the free air in mild weather, the plants may be thus secured in winter; and in the spring they may be shaken out of the pots, preserving the earth to their roots, and planted in a warm border, where they will flower early, and produce very good seeds.

The fifth sort grows naturally in the Levant, but is cultivated in some parts of Italy, as other pulse, for food. This hath a thick upright stalk about two feet high, which divides toward the top into several smaller hairy branches, garnished with hand-shaped leaves, composed of seven or eight narrow oblong lobes, which are hairy, and join at their base, of a dark grayish colour, and have a silvery down. The flowers are produced in loose spikes at the end of the branches; they are white, and sit close to the stalk; these are succeeded by hairy strait pods about three inches long, a little compressed on the sides, containing five or six flattish seeds which are white, having a little cavity like a navel, in that part which is fixed to the pod. This sort flowers in July, and the seeds ripen in the autumn. It is an annual plant, which is cultivated for ornament in the pleasure-garden. The seeds must be sown in the places where the plants are to remain, and may be treated in the same way as the first sort.

The sixth sort grows naturally in Virginia, and other of the northern parts of America. This hath a perennial creeping root, from which arise several erect channelled stalks a foot and a half high, sending out two or three small side branches, garnished with hand-shaped leaves, composed of ten or eleven narrow spear-shaped lobes, which join at their base, standing upon very long foot-stalks, having a few hairs on their edges. The flowers grow in long loose spikes, which terminate the stalks, and are placed without order on each side; they are of a pale blue colour, having short foot-stalks. These appear in June, and the seeds ripen in August, which are soon scattered if they are not gathered when ripe; for after a little moisture, the sun causes the pods to open with an elasticity, and cast out the seeds to a distance all round. This sort is propagated by seeds as the former, which should be sown where the plants are to remain; for although the root is perennial, yet it runs so deep into the ground as that it cannot be taken up entire; and if the root is cut or broken, the plant seldom thrives well after. I have traced some of the roots of this plant, which have been three feet deep in the ground in one year from seed, and spread out as far on every side, so that they must have room, therefore the young plants should not be left nearer than three feet asunder. If this plant is in a light dry soil, the roots will continue several years, and produce many spikes of flowers; and although the usual season of flowering is in June and July,

July, yet when rain happens to fall in Auguſt, there are frequently freſh ſtalks ariſe from the roots, which flower the end of September, or beginning of October.

The ſeeds of the fifth ſort are uſed in medicine; they have a bitter taſte, ſo open, digeſt, diſſolve, and cleanſe; and if they are ſteeped in water for ſome days, till they have loſt their bitterneſs, they may be eaten out of neceſſity, but they are ſuppoſed to breed groſs humours, and are hard of digeſtion. Some women uſe the flower of the ſeed mixed with the juice of Lemons, and a little Alumen ſaccharinum, made into the form of ſoft ointment, to make the face ſmooth, and look more amiable.

The ſmall blue Lupine is frequently ſown in Italy, to dreſs and manure the ground, eſpecially that which is intended for vineyards; where, if they have time, the ground is ſown with Lupines, which grow till they begin to flower; then they cut them down and plough them into the ground, where the ſtalks rot with the winter's rain; but it is doubtful whether this is any real benefit to the ground, for there are few plants which draw and impoveriſh the ground ſo much as Lupines; therefore the dreſſing they yield, is ſcarce an equivalent for what they have drawn from the ground: but when there is not time for this operation, they parboil the ſeeds to prevent their growing, and ſow them upon the ground before it is ploughed, allowing ſixteen buſhels to an acre of land; and this dreſſing is preferable to the former.

All the ſorts of Lupines make a pretty appearance when they are in flower, but the yellow ſort is preferred for its ſweetneſs, though the flowers of this are of ſhort duration, eſpecially in warm weather; therefore the ſeeds of this ſhould be ſown at ſeveral times, that there may be a ſucceſſion of flowers through the ſeaſon, for they will continue flowering till they are ſtopped by hard froſt; and thoſe which come in the autumn to flower, will continue in beauty a longer time than the early ones. If ſome of the ſeeds are ſown in the autumn on a warm border, the plants will often live through the winter, and flower early in the ſpring.

LUPULUS. Tourn. Inſt. R. H. 535. tab. 309. Humulus. Lin. Gen. Plant. 989. [This plant takes its name of Lupus, *Lat.* a wolf, becauſe the antients had a notion, that wolves were wont to hide themſelves under this plant.] The Hop; in French, *Houblon.*

The Characters are,

*The male and female flowers are upon different plants. The empalement of the male flower is compoſed of five ſmall, concave, obtuſe leaves; it hath no petal, but has five ſhort hairy ſtamina, terminated by oblong ſummits. The female flowers have a general, four-pointed, acute peranthium, and a ſeparate oval one of four leaves, including eight flowers; each of theſe have an empalement of one leaf, which is cloſed at the baſe. Theſe have neither petal or ſtamina, but a ſmall germen ſituated in the center, ſupporting two awl-ſhaped ſtyles, crowned by acute, reflexed, ſpreading ſtigmas. The germen afterward turns to a roundiſh ſeed covered with a thin ſkin, incloſed in the baſe of the empalement.*

This genus of plants is ranged in the fifth ſection of Linnæus's twenty-ſecond claſs, intitled Diœcia Pentandria, which includes thoſe plants whoſe male and female flowers are upon different plants, and the male flowers have five ſtamina.

We have but one Species of this genus, viz.

Lupulus (*Humilus*) mas & femina. C. B. P. 298. *Male and female Hop.*

The male Hop grows wild by the ſide of hedges and upon banks, in many parts of England: the young ſhoots of theſe plants are often gathered in the ſpring by the poor people, and boiled as an eſculent herb; but theſe muſt be taken very young, otherwiſe they are tough and ſtringy; it is eaſily diſtinguiſhed by the flowers, which are ſmall, and hang in long looſe bunches from the ſide of the ſtalks, abounding with farina on their ſummits; theſe have no Hops ſucceeding to the flowers.

The female Hop is the ſort which is cultivated for uſe; of this ſort, the people who cultivate them reckon three different varieties: as firſt, the long and ſquare Garlick Hop, the long white Hop, and the oval Hop, all which are indifferently cultivated in England, but of the male Hop there is no different varieties.

There being the greateſt plantation of Hops in Kent that are in any county of England, it is very probable, that their method of planting and ordering them ſhould be the beſt.

As for the choice of their Hop-grounds, they eſteem the richeſt and ſtrongeſt grounds as the moſt proper; they chuſe a warm dry ſoil, that has a good depth of hazel mould; and if it be rocky within two or three feet of the ſurface, the Hops will proſper well; but they will by no means thrive on a ſtiff clay, or ſpongy wet land.

If it may be, chuſe a piece of meadow or lay ground to plant Hops on, ſuch as has not been tilled or ſown with other crops for many years, or an old decayed orchard; for land that is worn out by long bearing of Corn, will require abundance of dung to bring it into any tolerable condition to bear a crop of Hops.

The Kentiſh planters accounting new land beſt for Hops, they plant their Hop-gardens with Apple-trees at a large diſtance, and with Cherry-trees between; and when the land hath done its beſt for Hops, which they reckon it will in about ten years, the trees may begin to bear. The Cherry-trees laſt about thirty years, and by that time the Apple-trees are large, they cut down the Cherry-trees.

The Eſſex planters account a moory land the propereſt for Hops, though there are ſeveral other ſorts of ſoil that are eſteemed very good.

Some account that land which has a roſſelly top, and a brick earth bottom, the beſt; a true roſſel or light ſand, is what they generally plant in, whether it be white or black.

Moory land is of different ſorts, ſome being ſtrong and heavy, ſo as to crack in ſummer; and ſome ſo light, that in dry ſeaſons it will blow away with the wind; and ſome are of a middle conſiſtence, being compoſed of both.

Theſe moors for goodneſs and value, are according to the nature and goodneſs of the ſoil that is underneath them; which being flung up upon the ſurface, will make a very good mixture, it being beſt to fling the under ſoil downward for Hops, becauſe they naturally root downwards, ſometims four or five yards deep, and therefore the deepeſt and richeſt ſoil is beſt for them.

Few are acquainted with the value of moors, becauſe they do not ſearch into the bottom of them, by reaſon of the expenſiveneſs of doing it, and the difficulty of carrying off the water.

If the land be moiſt, it ought to be laid up in high ridges, and to be well drained, and the drains kept clear and open, eſpecially in winter, that the water do not rot or too much chill the roots.

If the land be ſour or cold, it will be very much helped by burning it; and if the haulm and ſtrings of the Hops be burnt every year, and ſome of the paring or ſides of the garden or other earth be laid on them as they burn, and then more haulm be laid over that, and ſo continued layer upon layer, it will make an excellent compoſt to make the hills with.

As to the ſituation of a Hop-ground, one that inclines to the ſouth or weſt is the moſt eligible; but if it be expoſed to the north-eaſt or ſouth-weſt winds, there ſhould be a center of ſome trees at a diſtance; becauſe the north-eaſt are apt to nip the tender ſhoots in the ſpring, and the ſouth-weſt frequently break and blow the poles at the latter end of the ſummer, and very much endanger the Hops.

Hops require to be planted in an open ſituation, that the air may freely paſs round and between them to dry up and diſſipate the moiſture, whereby they will not

be

be so subject to fire blasts, which often destroy the middles of large plantations, while the outsides remain unhurt.

As for the preparation of the ground for planting, it should, the winter before, be ploughed and harrowed even; and then lay upon it in heaps a good quantity of fresh rich earth, or well rotted dung and earth mixed together, sufficient to put half a bushel in every hole to plant the Hops in, unless the natural ground be very fresh and good.

Then lay a line across it from the hedge, in which knots have been tied, at the distance you design your Hop-hills to be at, about eight or nine feet distance the whole length of the ground, and place a sharp pointed stick at every knot; then lay aside the line, and with two forked sticks of about eight or nine feet long, you may from the first row set out the whole ground, by applying the two forks to two of the sticks which were first set up, and placing another row at the ends, where the forked sticks meet triangular-wise; then you should dig a hole at every stick about a foot and a half wide, and fill it full of the good earth you brought in.

If you plough the ground with horses between the hills, it will be best to plant them in squares chequer-wise; but the quincunx form is the most beautiful, and it will also be better for the Hop; but if the ground is intended to be cultivated by the breast-plough, it will be best to plant them in squares; but which way soever you make use of, a stake should be stuck down at all the places where the hills are to be made.

Persons ought to be very curious in the choice of the plants and sets, as to the kind of the Hop; for if the Hop-garden be planted with a mixture of two or three sorts of Hops that ripen at different times, it will cause a great deal of trouble, and be a great detriment to the owner.

The two best sorts are the white and the gray bind; the latter is a large square Hop, more hardy, and is the more plentiful bearer, but ripens later than the former.

There is also another sort of the white bind, which ripens in a week or ten days before the common; but this is tenderer, and a less plentiful bearer, but it has this advantage, it comes first to market.

But if three grounds, or three distant parts of one ground, be planted with these three sorts, there will be this conveniency, that they may be picked successively as they become ripe.

The sets ought to be procured out of grounds that are entirely of the same sort you would have, they should be five or six inches long, with three or more joints or buds on them, all the old bind and hollow part of the set being cut off.

If there be a sort of Hop you value, and would increase plants and sets from, the superfluous binds may be laid down when the Hops are tied, cutting off the tops, and burying them in the hill; or when the Hops are dressed, all the cuttings may be saved, and laid in rows in a bed of good earth; for almost every part will grow, and become a good set the next spring.

Some have tried to raise a Hop-ground by sowing seeds, but that turns to no account, because that way is not only tedious, but the Hops so produced are commonly of different kinds, and many of them wild and barren.

As to the seasons of planting Hops, the Kentish planters best approve the months of October and March, both which succeed very well; but the common sets are not to be had in October, unless from some ground that is to be digged up and destroyed; and likewise there is some danger that the sets may be rotted, if the winter prove very wet; but the most usual time of procuring them is in March, when the Hops are cut and dressed.

As to the manner of planting the sets, you should put two or three good sets in every hole with a setting stick, at about four inches distance, placing them sloping; they must stand even with the surface of the ground; let them be pressed close with the hand, and covered with fine earth, and a stick should be placed on each side the hill to secure it.

The ground being thus planted, all that is to be done more that summer, is to keep the hills clear from weeds, and to horse-hoe the ground about the month of May, gathering up the stones, if more are turned up by ploughing, and to raise a small hill round about the plants; and in June you must twist the young binds or branches together in a bunch or knot, for if they are tied up to small poles the first year, in order to have a few Hops from them, it will not countervail the weakening the plants.

A mixture of compost or dung being prepared for your Hop-ground, the best time for laying it on, if the weather prove dry, is about Michaelmas, that the wheels of the dung-cart may not injure the Hops, nor furrow the ground: if this be not done then, you must be obliged to wait till the frost has hardened the ground, so that it will bear the dung-cart; and this is also the time to carry on your new poles, to recruit those that are decayed, and to be cast out every year.

If you have good store of dung, the best way will be to spread it in the alleys all over the ground, and to dig or plough it in the winter following. The quantity they will require, will be forty loads to an acre, reckoning about thirty bushels to the load.

If you have not dung enough to cover all the ground in one year, you may lay it on one part one year, and on the rest in another, or a third; for there is no occasion to dung the ground after this manner, oftener than once in two or three years.

Those who have but a small quantity of dung, usually content themselves with laying on about twenty loads upon an acre every year; this they lay only on the hills, either about November, or in the spring; which last some account the best time, when the Hops are dressed, to cover them after they are cut; but if it be done at this time, the compost or dung ought to be very well rotted and fine.

As to the dressing of the Hops, when the Hop-ground is dug or ploughed in January or February, the earth about the hills, and very near them, ought to be taken away with a spade, that you may come the more conveniently at the stock to cut it.

About the end of February, if the Hops were planted the spring before, or if the ground be weak, they ought to be dressed in dry weather; but else, if the ground be strong and in perfection, the middle of March will be a good time; and the latter end of March, if it be apt to produce over rank binds, or the beginning of April, may be soon enough.

Then having with an iron picker cleared away all the earth out of the hills, so as to make the stock bear to the principal roots, with a sharp knife you must cut off all the shoots which grew up with the binds the last year; and also all the young suckers, that none be left to run in the alley and weaken the hill. It will be proper to cut one part of the stock lower than the other, and also to cut that part low, that was left highest the preceding year. By pursuing this method, you may expect to have stronger buds, and also keep the hill in good order.

In dressing those Hops that have been planted the year before, you ought to cut off both the dead tops, and the young suckers which have sprung up from the sets, and also to cover the stocks with fine earth a finger's length in thickness.

About the middle of April the Hops are to be polled, when the shoots begin to sprout up; the poles must be set to the hills deep into the ground, with a square iron pitcher or crow, that they may the better endure the wind; three poles are sufficient for one hill. These should be placed as near the hills as may be, with their bending tops turned outwards from the hill, to prevent the binds from entangling; and a space between two poles ought to be left open to the south, to admit the sun beams.

The poles ought to be in length sixteen or twenty feet, more or less, according as the ground is in

ſtrength; and great care is to be taken not to over-pole a young or weak ground, for that will draw the ſtock too much, and weaken it. If a ground be over-polled, you are not to expect a good crop from it; for the branches which bear the Hops will grow very little, till the binds have over-reached the poles, which they cannot do when the poles are too long. Two ſmall poles are ſufficient for a ground that is young.

If you wait till the ſprouts or young binds are grown to the length of a foot, you will be able to make a better judgement where to place the largeſt poles; but if you ſtay till they are ſo long as to fall into the alleys, it will be injurious to them, becauſe they will entangle one with another, and will not claſp about the pole ſo readily.

Maple or Aſpen poles are accounted the beſt for Hops, on which they are thought to proſper beſt, becauſe of their warmth; or elſe, becauſe the climbing of the Hop is furthered by means of the roughneſs of the bark. But for laſtingneſs, Aſhen or Willow poles are preferable; but Cheſtnut poles are the moſt durable of all.

If, after the Hops are grown up, you find any of them have been under-polled, taller poles may be placed near thoſe that are too ſhort, to receive the binds from them.

As to the tying of Hops, the buds that do not claſp of themſelves to the neareſt pole when they are grown to three or four feet high, muſt be guided to it by the hand, turning them to the ſun, whoſe courſe they will always follow. They muſt be bound with withered Ruſhes, but not ſo cloſe as to hinder them from climbing up the pole.

This you muſt continue to do till all the poles are furniſhed with binds, of which two or three are enough for a pole; and all the ſprouts and binds that you have no occaſion for, are to be plucked up; but if the ground be young, then none of theſe uſeleſs binds ſhould be plucked up, but ſhould be wrapt up together in the middle of the hill.

When the binds are grown beyond the reach of your hands, if they forſake the poles, you ſhould make uſe of a ſtand ladder in tying them up.

Some adviſe, that if the binds be very ſtrong, and overgrow the poles very much, you ſtrike off their heads with a long ſwitch, to increaſe their branching below.

Towards the latter end of May, when you have made an end of tying them, the ground muſt have the ſummer ploughing or digging, which is done by caſting up with the ſpade ſome fine earth into every hill, and a month after it muſt be again repeated, and the hills made up to a convenient bigneſs.

It is not at all to be doubted, but that a thorough watering would be of very great advantage to Hops in a hot dry ſummer; but it is ſo much charge and trouble to do this, that unleſs you have a ſtream at hand to flow the ground, it is ſcarce practicable.

When the Hops blow, you ſhould obſerve if there be any wild barren hills among them, and mark them, by driving a ſharpened ſtick into every ſuch hill, that they may be digged up and replanted.

Hops as well as other vegetables, are liable to diſtempers and diſaſters, and among the reſt, to the fen. The Rev. Dr. Hales, in his excellent Treatiſe of Vegetable Statics, treating of Hops, gives us the following account of the ſtate of Hops in Kent in the year 1725, that he received from Mr. Auſten of Canterbury, which is as follows:

In mid April not half the ſhoots appeared above ground, ſo that the planters knew not how to pole them to the beſt advantage.

This defect of the ſhoot, upon opening the hills, was found to be owing to the multitude and variety of vermin that lay preying upon the roots; the increaſe of which, was imputed to the long and almoſt uninterrupted ſeries of dry weather for three months before. Towards the end of April many of the Hop-vines were infeſted with flies.

About the 20th of May there was a very unequal appearance, ſome Vines being run ſeven feet, others not above three or four; ſome juſt tied to the poles, and ſome not viſible; and this diſproportionate inequality in their ſize, continued through the whole time of their growth.

The flies now appeared upon the leaves of the forwardeſt Vines, but not in ſuch numbers here, as they did in moſt other places. About the middle of June the flies increaſed, yet not ſo as to endanger the crop; but in diſtant plantations they were exceedingly multiplied, ſo as to ſwarm towards the end of the month.

June the 27th ſome ſpecks of fen appeared. From this day to the 9th of July was very dry weather. At this time, when it was ſaid, that the Hops in moſt parts of the kingdom looked black and ſickly, and ſeemed paſt recovery, ours held it out pretty well, in the opinion of the moſt ſkilful planters.

The great leaves were indeed diſcoloured, and a little withered, and the fen was ſomewhat increaſed. From the 9th of July to the 23d, the fen increaſed a great deal; but the flies and lice decreaſed, it raining much daily. In a week more the fen, which ſeemed to be almoſt at a ſtand, was conſiderably increaſed, eſpecially in thoſe grounds where it firſt appeared.

About the middle of Auguſt the Vines had done growing both in ſtem and branch, and the forwardeſt began to be in the Hop, the reſt in bloom; the fen continued ſpreading where it was not before perceived, and not only the leaves, but many of the burs were alſo tainted with it.

About the 20th of Auguſt ſome of the Hops were infected with the fen, and whole branches corrupted by it. Half the plantations had pretty well eſcaped hitherto, and from this time the fen increaſed but little; but ſeveral days wind and rain the following week ſo diſtorted them, that many of them began to dwindle, and at laſt came to nothing; and of thoſe that then remained in bloom, ſome never turned to Hops; and of the reſt which did, many of them were ſo ſmall, that they very little exceeded the bigneſs of a good thriving bur.

We did not begin to pick till the 8th of September, which is eighteen days later than we began the year before; the crop was little above two hundred on an acre round, and not good. The beſt Hops ſold this year at Way-hill, for 16 l. the hundred.

The Rev. Dr. Hales, in his aforeſaid Treatiſe, gives us an account of the following experiment that he made on Hop-vines. He tells us, that in July he cut off two thriving Hop-vines near the ground, in a thick ſhady part of the garden, the pole ſtill ſtanding; he ſtripped the leaves off from one of theſe Vines, and ſet their ſtems in known quantities of water in little bottles; that with leaves imbibed in a twelve hours day four ounces, and that without leaves three-fourths of an ounce.

He took another Hop-pole with its Vines on it, and carried it out of the Hop-ground into a free and open expoſure; theſe imbibed and perſpired as much more as the former in the Hop-ground, which is, doubtleſs, the reaſon why the Hop-vines on the outſides of plantations, where they are moſt expoſed to the air, are ſhort and poor, in compariſon of thoſe in the middle of the ground, viz. becauſe being much dried, their fibres harden ſooner, and therefore they cannot grow ſo kindly as thoſe in the middle of the ground, which, by ſhade, are always kept moiſter, and more ductile.

The ſame curious author proceeds as followeth: Now there being 1000 hills in an acre of Hop-ground, and each hill having three poles, and each pole three Vines, the number of Vines will be 9000, each of which perſpiring four ounces, the ſum of all the ounces perſpired by an acre in twelve hours day will be 36000 ounces = 15750000 grains = 62007 cube inches, or 220 gallons, which divided by 6272640, the number of ſquare inches in an acre, it will be found, that the quantity of liquor perſpired by all the Hop-vines will be equal to an area of liquor as broad as an acre, and

$\frac{1}{101}$ part of an inch deep, besides what evaporated from the earth.

And this quantity of moisture, in a kindly state of the air, if daily carrried off, is a sufficient quantity to keep the Hops in a healthy state; but in a rainy moist state of air, without a due mixture of dry weather, too much moisture hovers about the Hops, so as to hinder, in some measure, the kindly perspiration of the leaves, whereby the stagnating sap corrupts, and breeds mouldy fen, which often spoils vast quantities of flourishing Hop-grounds.

This was the case in the year 1723, when for ten or fourteen days almost continual rains fell, about the latter half of July, after four months dry weather, upon which the most flourishing and promising Hops were all infected with mould, or fen, in their leaves and fruit, while the then poor and unpromising Hops escaped, and produced plenty, because they, being small, did not perspire so great a quantity as others, nor did they confine the perspired vapour, so much as the large thriving Vines did in their shady thickets.

This rain on the then warm earth, made the Grass shoot out as fast as if it were in a hot-bed, and the Apples grew so precipitately, that they were of a flashy constitution, so as to rot more remarkably than had ever been remembered.

The planters observe, That when a mould, or fen, has once seized any part of the ground, it soon runs over the whole, and that the Grass, and other herbs under the Hops, are infected with it, probably, because the small seeds of this quick-growing mould, which soon come to maturity, are blown over the whole ground; which spreading of the seed may be the reason why some grounds are infected with fen for several years successively, viz. from the seeds of the last year's fen. Might it not then be advised to burn the fenny Hop-vines, as soon as the Hops are picked, in hopes thereby to destroy some of the seed of the mould?

Mr. Austen, of Canterbury, observes fen to be more fatal to those grounds that are low and sheltered, than to the high and open grounds, to those that are shelving to the north, than to those shelving to the south; to the middle of grounds than to the outsides; to the dry and gentle grounds, than to the moist and stiff grounds.

This was very apparent throughout the plantations where the land had the same workmanship and help bestowed upon it, and was wrought at the same time. But if in either of these cases there was a difference, it had a different effect, and the low and gentle grounds, that lay neglected, were then seen less distempered than the open and moist, which were carefully managed and looked after.

The honey dews are observed to come about the 11th of June, which, by the middle of July, turn the leaves black, and make them stink.

The said Dr. Hales relates, That in the month of July (the season for fire-blasts, as the planters call them) he has seen the Vines in the middle of the Hop-ground scorched up almost from one end of a large ground to the other, when a hot gleam of sun-shine has come immediately after a shower of rain, at which time vapours are all seen with the naked eye, but especially with reflecting telescopes, to ascend so plentifully as to make a clear and distinct object become immediately very dim and tremulous; nor was there any dry gravelly vein in the ground along the course of this scorch; it was therefore, probably, owing to the much greater quantity of scorching vapours in the middle, than the outsides of the ground, and that being a denser medium, it was much hotter than a more rare medium.

And, perhaps, the great volume of ascending vapours might make the sun-beams converge a little towards the middle of the ground, that being a denser medium, and thereby increase the heat considerably; for he observed, That the course of the scorched Hops was in lines at right angles to the sun-beams about eleven o'clock, at which time the hot gleam was.

The Hop-ground was in a valley which ran from south-west to north-east, and to the best of his remembrance, there was but little wind, and that in the course of the scorch; but had there been some other gentle wind, either north or south, it is not improbable but that the north wind gently blowing the volume of rising wreak on the south side of the ground, that side might have been most scorched, and so vice versa.

As to particular fire-blasts, which scorch here and there a few Hop-vines, or one or two branches of a tree, without damaging the next adjoining, what astronomers observe, may hint to us no very improbable cause of it, viz. They frequently observe (especially with reflecting telescopes) small separate portions of pellucid vapours floating in the air, which, though not visible to the naked eye, are yet considerably denser than the circumambient air; and vapours of such a degree of density may very probably either acquire such a scalding heat from the sun as will scorch what plants they touch, especially the more tender.

(An effect which the gardeners about London have too often found to their cost, when they have incautiously put bell-glasses over their Cauliflowers early in a frosty morning, before the dew was evaporated off them; which dew, being raised by the sun's warmth, and confined within the glass, did there form a dense, transparent, scalding vapour, which burned and killed the plants:)

Or, perhaps, the upper or lower surface of these transparent, separate, flying volumes of vapours, may, among the many forms they revolve into, sometimes approach so near to an hemisphere, or hemicylinder, as thereby to make the sun-beams converge, so as often to scorch the more tender plants they shall fall on, and sometimes also parts of the more hardy plants and trees, in proportion to the greater or lesser convergency of the sun's rays.

The learned Boerhaave, in his Theory of Chymistry, p. 245, Shaw's edition, observes, That those white clouds which appear in summer time, are, as it were, so many mirrours, and occasion excessive heat. These cloudy mirrours are sometimes round, sometimes concave, polygonous, &c. When the face of heaven is covered with such white clouds, the sun shining among them, must, of necessity, produce a vehement heat, since many of his rays, which would otherwise, perhaps, never touch our earth, are hereby reflected to us. Thus, if the sun be on one side, and the clouds on the opposite one, they will be perfect burning-glasses, and hence the phænomena of thunder.

I have sometimes (continues he) observed a kind of hollow clouds full of hail and snow, during the continuance of which the heat was extreme, since, by such condensation, they were enabled to reflect more strongly. After this came a sharp cold, and then the clouds discharged their hail in great quantity, to which succeeded a moderate warmth. Frozen concave clouds, therefore, by their great reflexions, produce a vigorous heat, and the same, when resolved, excessive cold.

From which the Rev. Dr. Hales observes as follows: Hence we see, that blasts may be occasioned by the reflexions of the clouds, as well as by the above-mentioned refraction of dense transparent vapours.

About the middle of July Hops begin to blow, and will be ready to gather about Bartholomew-tide. A judgment may be made of their ripeness, by their strong scent, their hardness, and the brownish colour of their seed.

When by these tokens they appear to be ripe, they must be picked with all the expedition possible; for if at this time a storm of wind should come, it would do them great damage, by breaking the branches, and bruising and discolouring the Hops; and it is very well known, that Hops, being picked green and bright, will sell for a third part more than those which are discoloured and brown.

The most convenient way of picking them is into a long square frame of wood, called a bin, with a cloth hanging on tenter-hooks within it, to receive the Hops as they are picked.

The frame is composed of four pieces of wood joined together, supported by four legs, with a prop at each end to bear up another long piece of wood, placed at a convenient height over the middle of the bin; this serves to lay the poles upon which are to be picked.

This bin is commonly eight feet long, and three feet broad; two poles may be laid on it at a time, and six or eight persons may work at it, three or four on each side.

It will be best to begin to pick the Hops on the east or north side of your ground, if you can do it conveniently; this will prevent the south-west wind from breaking into the garden.

Having made choice of a plot of the ground containing eleven hills square, place the bin upon the hill which is in the center, having five hills on each side; and when these hills are picked, remove the bin into another piece of ground of the same extent, and so proceed till the whole Hop-ground is finished.

When the poles are drawn up to be picked, you must take great care not to cut the binds too near the hills, especially when the Hops are green, because it will make the sap to flow excessively.

And if the poles do not come up without difficulty, they should be raised by a piece of wood in the nature of a lever, having a forked piece of iron, with teeth on the inside, fastened within two feet of the end.

The Hops must be picked very clean, i. e. free from leaves and stalks, and, as there shall be occasion, two or three times in a day the bin must be emptied into a Hop-bag made of coarse linen cloth, and carried immediately to the oast, or kiln, in order to be dried; for if they should be long in the bin, or bag, they will be apt to heat, and be discoloured.

If the weather be hot, there should no more poles be drawn than can be picked in an hour, and they should be gathered in fair weather, if it can be, and when the Hops are dry; this will save some expence in firing, and preserve their colour better when they are dried.

The best method of drying Hops is with charcoal on an oast or kiln, covered with hair-cloth, of the same form and fashion that is used for drying malt. There is no need to give any particular directions for the making it, since every carpenter, or bricklayer, in those countries where Hops grow, or malt is made, knows how to build them.

The kiln ought to be square, and may be of ten, twelve, fourteen, or sixteen feet over at the top, where the Hops are laid, as your plantation requires, and your room will allow. There ought to be a due proportion between the height and breadth of the kiln, and the beguels of the steddle where the fire is kept, viz. if the kiln be twelve feet square on the top, it ought to be nine feet high from the fire, and the steddle ought to be six feet and a half square, and so proportionable in other dimensions.

The Hops must be spread even upon the oast a foot thick or more, if the depth of the curb will allow it, but care is to be taken not to overload the oast, if the Hops be green or wet.

The oast ought to be first warmed with a fire before the Hops are laid on, and then an even steady fire must be kept under them; it must not be too fierce at first, lest it scorch the Hops; nor must it be suffered to sink or slacken, but rather be increased till the Hops be near dried, lest the moisture, or sweat, which the fire has raised, fall back, or discolour them. When they have lain about nine hours, they must be turned, and in two or three hours more they may be taken off the oast. It may be known when they are well dried by the brittleness of the stalks, and the easy falling off of the Hop leaves.

The Dutch and Flemings have another method of drying their Hops: they make a square kiln, or room, about eight or ten feet wide, built of brick or stone, having a door at one side, and a fire-place in the middle of the room, on the floor, about thirteen inches wide within, and thirteen inches high in length from the mouth of it, almost to the back part of the kiln, a passage being left just enough for a man to go round the end of it; this they call a horse, such as is commonly made in malt-kilns, the fire passing out at the holes at each side, and at the end of it.

The bed, or floor, on which the Hops lie to be dried, is placed about five feet high above; about that is a wall near four feet high, to keep the Hops from falling.

A window is made at one side of the upper bed, to shove off the dry Hops down into a room prepared to receive them. The beds are made of laths, or rails, sawn very even, lying a quarter of an inch distant from one another, with a cross beam in the middle, to support them; the laths are let in even with the top of the beam, and this keeps them even in the places; this they call an oast.

The Hops are laid on this bed by baskets full, without any oast-cloth, beginning at one end, and so going on till all is covered, half a yard thick, without treading them; then they even them with a rake, that they may lie of equal thickness.

This being done, they kindle the fire below, either of wood or charcoal, but the latter is accounted the better fuel for Hops; this fire is kept as much as may be at an equal or constant heat, and only at the mouth of the furnace, for the air will sufficiently disperse it.

They do not stir them till they are thoroughly dried, i. e. till the top is as fully dried as the bottom; but if they find any place not to be so dry as the rest, (which may be known by reaching over them with a stick or wand, and touching them in several places,) they observe where they do not rattle, and where they do; and where they do not rattle, they abate them there, and dispose of them where the places were first dry.

They know when they are thoroughly dry, by the brittleness of the inner stalk, if it be short when it is rubbed; which when they find, they take out the fire, and shove out the Hops at the window that is made for that purpose, into the room made to receive them, with a coal-rake made with a board at the end of a pole, and then go in at a door below, and sweep up the Hops and seeds that fall through, and put them to the other Hops; then they lay another bed of green Hops, and renew the fire, and proceed as before.

This method is disapproved by some, because (they say) the Hops lying so thick, and not being turned, the under part of them must needs dry before the upper; and the fire passing through the whole bed to dry the uppermost, must necessarily over-dry, and much prejudice the greatest part of the Hops, both in strength and weight, besides the unnecessary expence of firing, which must be long continued to dry thoroughly so many together.

Therefore some have improved on this method, and advised to make the kiln much as is before directed as to the Dutch way.

First to make a bed of flat ledges about an inch thick, and two or three inches broad, sawn, and laid across one another the flat way, chequerwise, at about three or four inches distance one from the other, the edges being so entered one into the other, that the floor may be even and smooth; this bed may be made to rest on two or three joists, set edgewise, to support it from sinking.

This bed is to be covered with large double tin, soldered together at each joint, and the ledges must be so ordered, before they are laid, that the joints of the tin may always lie over the middle of the ledge, the bed being wholly covered over with tin: boards must be fitted about the edges of the kiln, to keep up the Hops, but one side must be made to remove, that the Hops may be shoved off as before.

On

On this bed, or floor of tin, the Hops may be turned without such hazard or loss, as upon the hair-cloth: and also it will require a less expence of fuel, and, besides, any sort of fuel will serve in this kiln, as well as charcoal, because the smoke does not pass through the Hops as it does the former ways; but then care is to be taken, that there be passages made for it at the several corners and sides of the kiln.

It is found by experience, that the turning of Hops, though it be after the most easy and best manner, is not only an injury and waste to the Hops, but also an expence of fuel and time, because they require as much fuel, and as long a time, to dry a small quantity, by turning them, as a large one.

Now, this may be prevented, by having a cover (to be let down and raised at pleasure) to the upper bed whereon the Hops lie.

This cover may also be tinned, by nailing single tin plates over the face of it, so that when the Hops begin to dry, and are ready to burn, i. e. when the greatest part of their moisture is evaporated, then the cover may be let down within a foot, or less, of the Hops (like a reverbatory) and will reflect the heat upon them, so that the top will soon be as dry as the lowermost, and every Hop be equally dried.

As soon as the Hops are taken off the kiln, lay them in a room for three weeks or a month to cool, give, and toughen; for if they are bagged immediately, they will powder, but if they lie a while (and the longer they lie the better, provided they be covered close with blankets to secure them from the air,) they may be bagged with more safety, as not being liable to be broken to powder in treading, and this will make them bear treading the better, and the harder they are trodden, the better they will keep.

The common method of bagging is as follows; they have a hole made in an upper floor, either round or square, large enough to receive a Hop-bag (which consists of four ells and a half of ell-wide cloth, and also contains ordinarily two hundred and a half of Hops) they tie a handful of Hops in each lower corner of the bag, to serve as handles to it, and they fasten the mouth of the hole, so placed that the hoop may rest upon the edges of the hole.

Then he that is to tread the Hops down into the bag, treads the Hops on every side, another person continually putting them in as he treads them, till the bag is full, which being well filled and trodden, they unrip the fastening of the bag to the hoops, and let it down, and close up the mouth of the bag, tying up a handful of Hops in each corner of the mouth, as was done in the lower part.

Hops being thus packed, if they have been well dried, and laid up in a dry place, they will keep good several years; but care must be taken, that they be neither destroyed nor spoiled by the mice making their nests in them.

The crop of Hops being thus bestowed, you are to provide for another, first by taking care of the poles against another year, which are best to be laid up in a shed, having first stripped off the haulm from them; but if you have not that conveniency, set up three poles in the form of a triangle, or six poles (as you please) wide at the bottom, and having set them into the ground, with an iron pitcher, and bound them together at top, set the rest of your poles about them; and being thus disposed, none but those on the outside will be subject to the injuries of the weather, for all the inner poles will be kept dry, unless at the top; whereas, if they were on the ground, they would receive more damage in a fortnight, than by their standing all the rest of the year.

In the winter time provide your soil and manure for the Hop-ground against the following spring.

If the dung be rotten, mix it with two or three parts of common earth, and let it incorporate together till you have occasion to make use of it in making your Hop-hills; but if it be new dung, then let it be mixed as before, till the spring come twelvemonths, for new dung is very injurious to Hops.

Dung of all sorts was formerly more commonly made use of than now it is, especially when rotted, and turned to mould, and they who have no other manure must use it; which, if they do, cows or hogs dung, or human ordure mixed with mud, may be a proper compost, because Hops delight most in a manure that is cool and moist.

Some recommend chalk, or lime, as the best manure, except in cold lands, and in such, pigeons dung will do best; a little of which laid to a hill, and so mixed, that it may not be too hot in a place, is of great advantage.

LUTEOLA. See Reseda.

LYCHNIDEA. See Phlox.

LYCHNIS. Tourn. Inst. R. H. 333. tab. 175. Lin. Gen. Plant. 517. [so called of Λύχνος, a candle, or light, because the flowers of this plant imitate the flame or rays of light.] Campion.

The Characters are,

*The flower has a permanent swollen empalement of one leaf, indented in five parts at the top. It hath five petals, whose tails are the length of the empalement, their upper part plain, broad, and frequently cleft in laminæ. It hath ten stamina which are longer than the empalement, alternately ranged, and fastened to the tails of the petals, terminated by prostrate summits. In the center is situated an almost oval germen, supporting five awl-shaped styles, crowned by reflexed hairy stigmas. The empalement afterward becomes an oval capsule with one cell, opening with five valves, filled with roundish seeds.*

This genus of plants is ranged in the fifth section of Linnæus's tenth class, intitled Decandria Pentagynia, which includes those plants whose flowers have ten stamina and five styles.

The Species are,

1. Lychnis (*Chalcedonica*) floribus fasciculatis fastigiatis. Hort. Cliff. 174. *Campion with flowers gathered into a pyramid.* Lychnis hirsuta, flore coccineo, major. C. B. P. 203. *Greater hairy Campion with a scarlet flower.*
2. Lychnis (*Viscaria*) petalis integris. Lin. Sp. Plant. 436. *Campion with entire petals.* Lychnis sylvestris viscosa, rubra, angustifolia. C. B. P. 205. *Wild viscous Lychnis with a red flower and narrow leaves, commonly called the Single Catchfly.*
3. Lychnis (*Diœci*) floribus diœcis. Hort. Cliff. 171. *Campion with male and female flowers on different plants.* Lychnis sylvestris, sive aquatica purpurea, simplex. C. B. P. 204. *Wood or aquatic Lychnis with a single purple flower, frequently called Bachelors Button.*
4. Lychnis (*Alba*) floribus diœcis, calycibus inflatis hirsutis. *Campion with male and female flowers growing on different plants, and swollen hairy empalements.* Lychnis sylvestris, alba, simplex. C. B. P. 204. *Wild campion with a single white flower.*
5. Lychnis (*Floscuculi*) petalis quadrifidis, fructu subrotundo. Hort. Cliff. 174. *Campion with quadrifid petals, and a roundish fruit.* Lychnis pratensis flore laciniato simplici. Mor. Hist. 2. p. 537. *Meadow Campion with a single jagged flower, commonly called Ragged Robin.*
6. Lychnis (*Alpina*) petalis bifidis corymbosis. Lin. Sp. Plant. 436. *Campion with bifid petals, and flowers growing in a corymbus.* Silene floribus in capitulum congestis. Haller. Helv. 376. *Lychnis with flowers collected in a head.*
7. Lychnis (*Siberica*) petalis bifidis, caule dichotomo, foliis subhirtis. Lin. Sp. Plant. 437. *Campion with bifid petals, a stalk divided by pairs, and leaves which are somewhat hairy.*
8. Lychnis (*Lusitanica*) caule erecto, calycibus striatis acutis, petalis dissectis. Plat. 170. *Campion with an erect stalk, striped acute empalements, and petals cut into many parts.*
9. Lychnis (*Apetala*) calyce inflato, corollâ calyce breviore, caule subunifloro. Lin. Sp. Plant. 437. *Campion with a swollen empalement, the petals of the flower shorter than the cup, and stalks having chiefly one flower.* Lychnis sylvestris alba, calyce amplo vesi-

cario. Vaill. *Wild white Campion with a large inflated empalement.*

The first sort is commonly known by the title of Scarlet Lychnis; of which there is one with double flowers, which is most esteemed for the size of the flowers and multiplicity of the petals; as also for the duration of the flowers, which continue much longer in beauty than the single flowers, so that the latter is not much cultivated at present, though the flowers of this are very beautiful; and as the plants are so easily propagated by seed, they may soon be had in greater plenty than those with double flowers, which do not produce seeds. Of the single sort there are three varieties, the deep scarlet, the flesh-colour, and the white, but the first is the most beautiful.

This is easily propagated by seeds, which should be sown on a border exposed to the east, in the middle of March. The plants will appear in April, when if the season is dry, they should be refreshed with water two or three times a week. By the beginning of June the plants will be fit to remove, when there should be a bed of common earth prepared to receive them; into which they should be planted at about four inches apart, observing to water and shade them till they have taken root; after which time they will require no other care but to keep them clean from weeds till the following autumn, when they should be transplanted into the borders of the pleasure-garden, where they are to continue. The summer following these plants will flower and produce ripe seeds, but the roots will abide several years and continue to flower. This sort flowers in June and July, and the seeds ripen in autumn. It may also be propagated by offsets, but as the seeds ripen so freely, few persons trouble themselves to propagate the plants any other way. The French call this plant Jerusalem Cross.

The sort with double flowers is a valuable plant, the flowers are very double, and of a beautiful scarlet colour. This hath a perennial root, from which arise two, three, or four stalks, according to the strength of the roots; these in rich moist land, grow upwards of four feet high; the stalks are strong, erect, and hairy. They are garnished the whole length with spear-shaped leaves sitting close to the stalks, placed opposite; and just above each pair of leaves, there are four smaller leaves standing round the stalk. The flowers are produced in close clusters sitting upon the top of the stalk; when the roots are strong, the clusters of flowers will be very large, so they make a fine appearance, the flowers being very double, and of a bright scarlet colour. They appear the latter end of June, and in moderate seasons continue near a month in beauty. The stalks decay in autumn, and new ones arise in the spring. This was originally produced from the seeds of the single sort, and is propagated by slips taken from the roots in autumn; but as this is a slow method of increasing the plants, the best way to have them in plenty, is to cut off the flower-stalks in June before the flowers appear, which may be cut into small lengths, each of which should have three or four joints, which should be planted on an east border of soft loamy earth, putting three of the joints into the ground, leaving one eye just level with the surface; these must be watered, and then covered close with bell or hand-glasses, so as to exclude the outward air, and shaded with mats when the sun shines hot upon them. The cuttings so managed will put out roots in five or six weeks, when they must be exposed to the open air, and in very dry weather they should be now and then refreshed with water, but it must not be repeated too often, nor given in large quantities, for too much moisture will cause them to rot. These will make good plants by the following autumn, when they may be transplanted into the borders of the pleasure-garden, where they will flower the following summer.

Some people who are covetous to have their plants flower, suffer the stalks to remain till the flowers are decayed, and then cut them off to plant; but by that time the stalks are grown hard, so but few of them succeed, and those which do, will not be near so good plants as those which are planted earlier; therefore it will be better to sacrifice the flowers of some roots for this purpose. These plants delight in a soft, rich, loamy soil, not too moist or stiff, in which they will thrive and flower very strong, but they do not care for much dung, which very often causes the roots to canker and rot, so that in the rich dunged lands about London, they do not thrive well. As these plants grow tall, they should be planted in the middle of large borders, and not crowded with other plants, for their roots extend to a large distance; so if they are incommoded by other roots, it will stint their growth.

I have not seen any double flowers of the two other varieties, but have been informed that there are of both the white and the flesh-colour with double flowers in some of the French gardens. These make a variety, but are not so beautiful as the scarlet, so are not much esteemed.

The second sort is commonly called Red German Catchfly. This hath been found growing naturally upon the rocks in Edinburgh Park, and in some places in Wales. It was formerly cultivated in flower-gardens for ornament, but since this sort with double flowers hath been produced, the single has been almost banished out of the gardens. This hath long, narrow, Grass-like leaves, which come out from the root without order, sitting close to the ground; between these come up strait single stalks, which in good ground rise a foot and half high; at each joint of the stalk come out two leaves opposite, of the same form as the lower, but decrease in their size upward; under each pair of leaves, for an inch in length, there sweats out of the stalk a glutinous liquor, which is almost as clammy as birdlime, so that the flies which happen to light upon these places, are fastened to the stalk, where they die, from whence it had the title of Catchfly. The stalk is terminated by a cluster of purple flowers, and from the two upper joints come out on each side of the stalk a cluster of the same flowers, so that the whole form a sort of loose spike. These appear in the beginning of May, and the single flowers are succeeded by roundish seed-vessels, which are full of small angular seeds ripening in July.

It may be propagated in plenty by parting of the roots in autumn, at which time every slip will grow; or if the seeds are sown in the same manner as is directed for the first sort, the plants with single flowers may be raised in plenty. This delights in a light moist soil and a shady situation.

The double flowering of this sort was accidentally obtained from the seeds of the single. This hath not been known forty years in the English gardens, but it is now so common as to have excluded that with single flowers; it differs only from that in the doubleness of the flowers. As this never produces seeds, so it can only be propagated by parting and slipping of the roots; the best time for this is in autumn, at which time every slip will grow. If this is performed in September, the slips will have taken good root before the frost, and will flower well the following summer; but if they are expected to flower strong, the roots must not be divided into small slips, though for multiplying the plants, it matters not how small the slips are. These should be planted on a border exposed to the morning sun, and shaded when the sun is warm till they have taken root. If the slips are planted in the beginning of September, they will be rooted strong enough to plant in the borders of the flower-garden by the middle or latter end of October. The roots of this sort multiply so fast, as to make it necessary to transplant and part them every year; for when they are let remain longer, they are very apt to rot. This sort requires the same soil and situation as the former.

The third sort grows naturally by the side of ditches and in moist pastures in many parts of England, so is seldom admitted into gardens; it hath a perennial root, from which arise many branching diffused stalks from

from two to three feet high, garnished with oval acute-pointed leaves, placed by pairs at each joint, and are terminated by clusters of purple flowers, which appear in April and May. The male flowers grow upon separate plants from the female. The latter produces seeds which ripen in July; the stalks decay in autumn, but the roots continue several years.

There is a variety of this with double flowers, which is cultivated in gardens, by the title of Red Bachelor's Button. This is an ornamental plant, and continues long in flower. It is propagated by slips, which should be planted the beginning of August in a shady border of loamy earth, where they will take root in about six weeks or two months, and may then be transplanted into the borders of the flower-garden. These roots should be annually transplanted, otherwise they frequently rot; and young plants must be propagated by slips to supply the decay of the old roots, which are not of very long duration. This sort thrives best in a soft loamy soil, and in a shady situation, where they have only the morning sun.

The fourth sort is very common upon dry banks on the side of roads in most parts of England, so is not admitted into gardens; there is a variety of this with purple flowers, which I find is by some supposed to be the same as the third, but is very different, for the stalks of this are branched out much more; the leaves are longer and more veined, and the flowers of this stand singly upon pretty long foot-stalks, so are not produced in clusters like those of the third. This is also very hairy, and the empalement of the flowers is swollen like inflated bladders. This flowers near a month after the other, but the male and female flowers grow upon different plants, as in the former.

There is a variety of this with double flowers, which is propagated in gardens by the title of Double white Bachelor's Button, and is an ornamental plant in the flower-garden; though being white it doth not make so good an appearance as the other, however it adds to the variety. This is propagated in the same way as the double sort before-mentioned, but the plants will thrive in a drier soil, and a more open exposure than that.

The fifth sort grows very common in moist meadows, and by the side of rivers in most parts of England, where it is intermixed with the Grass. This rises with upright unbranched stalks near a foot and a half high, garnished with narrow spear-shaped leaves, placed by pairs opposite at each joint. The stalks are slender, channelled, and are terminated by six or seven purple flowers upon pretty long foot-stalks, which branch out. The empalement of the flower is striped with purple, and the petals of the flowers are deeply jagged in four narrow segments, which appear as if torn; from whence the country people have given it the appellation of Ragged Robin. It flowers in May, and the seeds ripen in July. This sort is never kept in gardens, but there is a variety of it with very double flowers, which is propagated by the gardeners for ornament. It only differs from the single in the multiplicity of the petals, and produces no seeds, so is propagated by slips in the same manner as the second sort. It is commonly known by the title of Double Ragged Robin.

The sixth sort grows naturally on the Alps, in Lapland, and the other cold parts of Europe. This is a perennial plant which delights in a moist soil. The stalks of this are erect, half a foot high, garnished with narrow spear-shaped leaves placed by pairs opposite, like the former sort, but are a little shorter and broader; the bottom leaves are broader than those upon the stalks, and sit close to the ground; they are smooth, and of a deep green: the flowers are produced in a corymbus on the top of the stalk, sitting close together; they are of a purple colour, and the petals are cut in the middle. This flowers the beginning of June, and the seeds ripen in August. It is propagated by seeds, and also by parting of the roots; it must have a moist soil and a shady situation, otherwise the plants will not thrive. The time for transplanting the plants, and parting the roots, is the same as for the second sort, and the seeds may be sown upon a shady border in March. In dry weather the ground must be kept moist, otherwise the seeds will not grow. When the plants come up, and are fit to remove, they should be transplanted into a shady border, where they may remain to flower.

The seventh sort grows naturally in Siberia: this hath a perennial root, from which arise many narrow leaves sitting close to the ground. The stalks rise a foot high, dividing into branches by pairs. The flowers grow out from the division of the branches, as also at the top of the stalks. They are composed of five white petals, which are divided in the middle; these appear in June, and are succeeded by roundish capsules filled with small angular seeds, which ripen in August. This requires the same treatment as the former sort.

The eighth sort was brought from Portugal to England, and is probably a variety of one with single flowers, which grows naturally in that country, but is different from any we have in England. This approaches nearest to the Double Ragged Robin, but is different from that. It hath a perennial root, from which arise many oblong narrow leaves sitting close to the ground. It divides into separate heads like the second sort, and from each of these come out an upright stalk about nine inches high, which divides upwards by pairs, and from the middle of each division comes out a slender foot-stalk two inches long, sustaining one double purple flower at the top, whose petals are very much jagged at their points; the empalements of the flowers are marked with deep purple stripes. From the side of the stalks there are also foot-stalks come out at the wings, which for the most part sustain but one flower, though sometimes they have two; these flowers being very double, are never succeeded by seeds. The usual time of this plant flowering is in June, but sometimes it sends out fresh stalks, which have flowers in the autumn. It is propagated by slips in the same manner as the third and fourth sorts, but coming from a warm country, it is impatient of much cold, and requires a particular treatment, for it does not thrive well in pots; nor will it live through the winter in open borders, so that the only situation in which I have seen it thrive, was where it was planted as close as possible to a south wall in dry undunged earth; for in rich or moist ground the roots presently rot, as they also do when they are watered. If they are planted in brick rubbish, they will still do better. I was favoured with this plant by John Browning, Esq; of Lincoln's-inn, who received it from Portugal.

The ninth sort grows naturally in the northern parts of Europe. It is like the fourth sort, but the petals of the flowers do not extend beyond the empalement, and the empalements are much larger and more swollen.

The other Species of Lychnis are now ranged under the following genera, viz.

Agrostemma, Cucubalus, Saponaria, and Silene, to which articles the reader is desired to turn for those which are not here enumerated.

**LYCIUM.** Lin. Gen. Plant. 232. Jasminoides. Nissol. Act. R. Par. 1711. Rhamnus. C. B. P. 477. Boxthorn.

The Characters are,

*The flower hath a small, obtuse, permanent empalement, which is erect, and divided into five parts at the top; the flower is funnel-shaped, of one petal, with an incurved tube, whose brim is cut into five obtuse segments, which spread open. It has five awl-shaped stamina, which are a little inclined and shorter than the tube, terminated by erect summits. In the center is situated a roundish germen supporting a single style, which is longer than the stamina, crowned by a thick bifid stigma; the germen afterwards becomes a roundish berry with two cells, inclosing kidney-shaped seeds fastened to the middle partition.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, which

which includes those plants whose flowers have five stamina and one style.

The Species are,

1. Lycium (*Afrum*) foliis lineari-longioribus, tubo florum longiori, segmentis obtusis. *Boxthorn with longer linear leaves, a longer tube to the flower, and obtuse segments.* Lycium foliis linearibus. Hort. Cliff. 57. *Boxthorn with linear leaves.*
2. Lycium (*Italicum*) foliis lineari-brevioribus, tubo florum breviori, segmentis ovalibus patentissimis. *Boxthorn with shorter linear leaves, a shorter tube to the flower, and oval segments spreading open.*
3. Lycium (*Salicifolium*) foliis cuneiformibus. Vir. Cliff. 14. *Boxthorn with wedge-shaped leaves.* Jasminoides aculeatum, salicis folio, flore parvo ex albo purpurascente. Mitchel. Gen. 224. *Prickly Bastard Jasmine with a Willow leaf, and a small purplish white flower.*
4. Lycium (*Barbarum*) foliis lanceolatis crassiusculis, calycibus trifidis. Lin. Sp. Plant. 192. *Boxthorn with spear-shaped thick leaves, and trifid empalements.* Jasminoides aculeatum, polygoni folio, floribus parvis albidis. Shaw. Afr. 349. f. 349. *Prickly Bastard Jasmine, with a Knot-grass leaf, and small whitish flowers.*
5. Lycium (*Chinense*) foliis ovato-lanceolatis, ramis diffusis, floribus solitariis patentibus alaribus, stylo longiori. *Boxthorn with oval spear-shaped leaves, diffused branches, and single spreading flowers proceeding from the sides of the branches, with a longer style.*
6. Lycium (*Halimifolium*) foliis lanceolatis acutis. *Boxthorn with spear-shaped acute leaves.* Jasminoides Sinense halimi folio longiore & angustiore. Du Ham. 306. *China Bastard Jasmine with a narrower and longer leaf.*
7. Lycium (*Capense*) foliis oblongo-ovatis, crassiusculis, confertis, spinis robustioribus. *Boxthorn with oblong, oval, thick leaves growing in clusters, and stronger spines.*
8. Lycium (*Angustifolium*) foliis lineari-lanceolatis confertis, calycibus brevibus acutis. *Boxthorn with linear spear-shaped leaves growing in clusters, and short acute empalements.*
9. Lycium (*Inerme*) inermis, foliis lanceolatis, alternis, perennantibus. *Smooth Boxthorn, with spear-shaped evergreen leaves placed alternate.*
10. Lycium (*Cordatum*) foliis cordato-ovatis, sessilibus, oppositis perennantibus, spinis crassis bigeminis, floribus confertis. *Lycium with oval heart-shaped leaves placed opposite, which are ever-green, and sit close to the stalks, with thick double spines, and flowers growing in clusters.* Arbor Africana spinosa, foliis crassis cordatis & conjugatis, spinis crassis bigeminis. Herm. Cat. 4. *Prickly African-tree with thick heart-shaped leaves growing by pairs, and thick double spines.*

The first sort grows naturally in Spain, Portugal, and at the Cape of Good Hope. This rises with irregular shrubby stalks ten or twelve feet high, sending out several crooked knotty branches, covered with a whitish bark, and armed with long sharp spines, upon which grow many clusters of narrow leaves; these thorns often put out one or two smaller on their sides, which have some clusters of smaller leaves upon them; the branches are garnished with very narrow leaves an inch and a half long, and at the base of these come out clusters of shorter and narrower leaves. The flowers come out from the side of the branches, standing upon short foot-stalks; they have a short permanent empalement of one leaf, which is tubulous, and cut into five segments at the brim; it is funnel-shaped, of one petal, with a long incurved tube, cut into five obtuse segments at the brim; they are of a dull purple colour, and have five stamina almost as long as the tube, with erect summits. In the center is situated a roundish germen, supporting a style which is longer than the stamina, crowned by a bifid stigma. The germen afterward turns to a roundish fleshy berry, of a yellowish colour when ripe, inclosing several hard seeds. This usually flowers in June and July, and the seeds ripen in the autumn; but there is frequently a few flowers come out in all the summer months.

It may be propagated either by seeds, cuttings, or layers. If by seeds, they should be sown in the autumn soon after they are ripe; for if they are kept out of the ground till spring, they seldom come up the first year. If the seeds are sown in pots, the pots should be plunged into some old tan in the winter, and in very severe frost covered with Peas-haulm or straw, but in mild weather should be open to receive the wet; in the spring the pots should be plunged into a moderate hot-bed, which will soon bring up the plants; these must be inured to bear the open air as soon as the danger of frost is over, and when they are three inches high, they may be shaken out of the pots, and each planted in a small separate pot, filled with loamy earth, and placed in the shade till they have taken new root, when they may be removed to a sheltered situation, where they may remain till the autumn; then they should be either removed into the green-house, or placed under a hot-bed frame to shelter them from hard frost; for these plants are too tender to live in the open air in England, so they must be kept in pots and treated in the same way as Myrtles, and other hardy green-house plants; but when the plants are grown strong, there may be a few of them planted in the full ground in a warm situation, where they will live in moderate winters, but in hard frosts they are commonly destroyed. If the cuttings of these plants are planted in a shady border in July, and duly watered, they will take root, and may then be treated in the same way as the seedling plants.

The second sort was raised in the Chelsea garden from seeds which came from the Cape of Good Hope. This hath an irregular shrubby stalk like the former, but seldom rise more than four or five feet high; the large leaves are shorter and a little broader than those of the first, but the tufts of small leaves are narrower; the tube of the flower is shorter, the brim is deeper cut into oval segments which spread open; the empalement is shorter, and cut into acute segments; the flowers and fruit are also smaller. These differences are permanent, in all the plants which I have two or three times raised from seeds. It flowers about the same time as the first, and may be propagated in the same way; the plants also require the same culture.

The third sort grows naturally in the hedges in the south of France, in Spain and Italy. This hath many irregular shrubby stalks, which rise eight or nine feet high, sending out several irregular branches, covered with a white bark, and armed with pretty strong thorns; the leaves are narrow at bottom, growing broader upward, and are of a pale green colour. The flowers come out from the side of the branches; they are of a purplish white colour and small, so make no great appearance. This sort flowers in June and July, but rarely produces any seeds in this country. The leaves of this remain till winter, when they fall off.

It may be propagated by cuttings or layers, in the same manner as the first sort. The plants will live abroad in a sheltered warm situation, but in very hard frost they should be covered with straw or litter, otherwise the branches will be killed, and sometimes the roots are destroyed where they have not some cover.

The fourth sort was brought from Africa by the late Dr. Shaw, where it grows naturally. This hath a shrubby stalk which rises seven or eight feet high, sending out several irregular branches, which are armed with strong spines, and garnished with short, thick, spear-shaped, oval leaves, which stand without order. The flowers come out from the side of the branches; they are small and white, so make little appearance. This flowers in July and August, but does not produce seeds in England. It may be propagated by cuttings in the same way as the first sort, but is too tender to live in the open air in winter in this country, so the plants must be kept in pots, and removed into the green-house in autumn, and treated in the same way as other hardy kinds of green-house plants.

The fifth sort grows naturally in China, from whence the seeds were brought to England a few years past, and the plants were raised in several gardens, and by some were thought to be the Thea. This rises with weak, irregular, diffused branches to a great height, but require support, otherwise they will trail upon the ground: I have measured some of these branches, which in one year has been upward of twelve feet long: the lower leaves are more than four inches long, and three broad in the middle: they are of a light green and a thin consistence, placed without order on every side the branches; as the shoots advance in length, so the size of the leaves diminish, and toward the upper part they are not more than an inch long, and a quarter of an inch broad; they sit close to the stalks on every side. The flowers come out singly at every joint toward the upper part of the branches, standing upon short slender foot-stalks; they are of a pale colour, with short tubes; the brims are spread open broader than either of the former sorts, and the style is considerably longer than the tube of the flower. This sort flowers in August, September, and October; the plant is very hardy, and retains its leaves till November before they decay. It propagates fast enough by its creeping roots, which send out suckers at a great distance, and the cuttings thrust into the ground will take root as freely as Willows.

The sixth sort grows naturally in China, from whence the seeds were brought to the Royal Garden at Paris, and the seeds were sent me by Dr. Bernard de Jussieu, demonstrator of the plants in that garden. This rises with a shrubby stalk to the height of four or five feet, sending out many irregular branches, covered with a very white bark, and armed with a few short spines; the leaves are about three inches long, and one broad in the middle; they are placed alternately on the branches, and are of a pale green colour. The flowers of this sort appear in June and July, which are succeeded by small round berries that ripen in the autumn, when they are as red as coral. This sort is propagated by cuttings, which should be planted in the spring before they begin to shoot, in a border exposed to the morning sun, where they will take root very freely; but these should not be removed till the autumn, when they may be planted to cover walls, for the branches are too weak to support themselves; and as the leaves continue green as long as any of the deciduous plants, so they are proper plants for such purposes.

The seventh sort was raised in the Chelsea garden from seeds, which were brought me from the Cape of Good Hope. This rises with shrubby branching stalks seven or eight feet high, which are armed with long strong thorns, that have several clusters of leaves upon them; the branches are garnished with small, oblong, oval leaves, which are placed without order; sometimes they come out in small clusters from one point, at others they are single, standing on every side the stalk; these are of a light green, and a pretty thick consistence, continuing green all the year. These plants have not as yet flowered here, so I can give no account of them; but by the fruit which I received entire, I make no doubt of its belonging to this genus.

This sort is pretty hardy, for it has lived abroad four winters, where it was planted against a south-east wall. It may be propagated either by layers or cuttings, in the same manner as the first; and when the plants have obtained strength, they may be planted in a warm situation, where they will live with very little shelter in severe frost. The branches of this sort are stronger than those of the former, so will not require the same support. It will be proper to keep a plant of this in shelter to preserve the kind, lest those in the open air should be destroyed.

The eighth sort has much the appearance of the first, but the branches are not so strongly armed with thorns; they have also a whiter bark, the leaves are broader and of a lighter green, standing in clusters at every joint. The flowers are smaller, of a deeper purple colour, and have much shorter empalements, which are cut into acute segments. It flowers at the same time with the first sort, but does not produce any seeds in this country; it is not so hardy as the former sort, so requires protection from very hard frost; therefore the plants should be kept in pots and housed in the winter, treating them in the same way as other hardy green-house plants. It may be propagated by cuttings or layers, in the same way as the first sort.

The ninth sort has been long an inhabitant of the Chelsea garden; it was raised from seeds which came from China, and was for many years taken for the Tea-tree, till it produced some flowers, which discovered its true genus. This rises with a strong woody stalk six or seven feet high, sending out many smooth branches, which are covered with a brown bark having no thorns; they are garnished with spear-shaped leaves about three inches long, and near three quarters of inch broad, placed alternately on the branches, standing upon short foot-stalks; they are of a deep green, and continue all the year. The flowers are white, and of the same shape with the others of this genus, but there has not been any seeds of this sort as yet produced in England.

This plant will live in the open air, if it is planted in a warm situation and a dry soil; but it is of slow growth, seldom shooting more than three or four inches in a season; it is also difficult to propagate, for the branches which are laid down will not take root in less than two years, and the cuttings are with difficulty made to grow. The best time to plant them is in May, in pots filled with light loamy earth, plunging them into an old bed of tanners bark, covering the pots close with bell or hand-glasses, to exclude the external air; these should be shaded every day from the sun; these cuttings should be refreshed with water once a week, but it must not be given to them in too great plenty. Those cuttings which succeed, will have put out roots by the beginning of August, when they may be taken up and planted in small pots, placing them in the shade till they have taken new root; and then they may be placed with other hardy exotic plants in a sheltered situation, till the end of October, when they may be put under a common frame to shelter them in winter. When the plants have acquired strength, they may be shaken out of the pots, and planted in the full ground in a warm situation, where, if they are sheltered in severe frosts, they will thrive better than in pots.

The tenth sort grows naturally at the Cape of Good Hope, from whence the seeds were sent to Holland a few years past, where the plants were raised. This is a low shrubby plant, which sends out branches from the ground upward, which are covered with a dark green bark, and are armed with short strong thorns, which come out by pairs, and sometimes there are double pairs upon the same foot-stalk; these are situated just below the leaves, and where there are four, two of them point upward, and the other two downward. The leaves are heart-shaped, not much larger than those of the Box-tree, of the same consistence and colour, terminating in acute points; they are placed by pairs opposite, upon very short foot-stalks, standing pretty close together; these continue green all the year. The flowers come out from the side of the branches upon short slender foot-stalks, each supporting five or six small white flowers, which grow in a cluster at the top; these have very short empalements, and pretty long tubes, divided at the brim into five acute segments. These flowers have an agreeable odour; they appear in July and August, but are seldom succeeded by seeds in England.

This sort may be propagated by cuttings in the same manner as the first sort, which, if planted in July, and shaded from the sun, will take root very freely; then they should be planted into separate small pots, and placed in the shade till they have taken

taken new root, after which they may be treated in the same manner as the former sort. This plant has not as yet been planted in the full ground in England, but it lives through the winter under a common frame.

The other species which were included in this genus, are now removed to CELASTRUS.

LYCOPERSICON. Tourn. Inst. R. H. 150. tab. 63. Solanum. Lin. Gen. Plant. 224. [of Λύκος, a wolf, and Persica, *Lat.* a Peach.] Love Apples, or Wolf's Peach.

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, which is cut into five acute segments at the top, and is permanent. The flower has one petal, which is wheel-shaped, with a very short tube, and a large five-cornered brim, which spreads open and is plaited. It hath five small awl-shaped stamina, terminated by oblong summits which close together. It hath a roundish germen, supporting a slender style the length of the stamina, crowned by an obtuse stigma. The germen afterward becomes a roundish fleshy fruit or berry, divided into several cells, inclosing many flat seeds.*

This genus of plants is ranged in the seventh section of Tournefort's second class, which includes the herbs with a wheel-shaped flower of one leaf, whose pointal becomes a soft fruit. Dr. Linnæus has joined this genus, and also the Melongena of Tournefort, to the Solanum, which he places in the first section of his fifth class, which includes those plants whose flowers have five stamina and one style; but as there are numerous species of Solani, so it is much better to keep these separate, to avoid confusion, which if we allow the fruit as a characteristic note, should be done; for as the fruit of the Solanum has but two cells, and the fruit of this many, so that distinction may be allowed to separate the genera.

The SPECIES are,

1. LYCOPERSICON (*Galeni*) caule inermi herbaceo, foliis pinnatis incisis, fructu rotundo glabro. *Love Apple with an herbaceous unarmed stalk, pinnated cut leaves, and a smooth round fruit.* Lycopersicon Galeni. Ang. 217. *The Wolf Peach of Galen.*
2. LYCOPERSICON (*Esculentum*) caule herbaceo hirsutissimo, foliis pinnatis, incisis, fructu compresso sulcato. *Love Apple with a very hairy herbaceous stalk, winged cut leaves, and a compressed furrowed fruit.* Solanum pomiferum, fructu rotundo striato molli. C. B. P. 167. *Apple-bearing Nightshade, with a soft, round, striated fruit, commonly called Tomatas by the Spaniards.*
3. LYCOPERSICON (*Æthiopicum*) caule inermi herbaceo, erecto, foliis ovatis dentato angulatis, subspinosis fructu subrotundo sulcato. *Love Apple with an herbaceous, erect, unarmed stalk, oval angular leaves indented, having a few spines, with a roundish furrowed fruit.* Lycopersicon fructu striato duro. Tourn. Inst. R. H. 150. *Wolf's Peach with a hard striated fruit.*
4. LYCOPERSICON (*Pimpinellifolium*) caule inermi herbaceo, foliis inæqualiter pinnatis, foliolis obtuse-dentatis, racemis simplicibus. *Love Apple with an herbaceous unarmed stalk, leaves unequally winged, whose lobes are bluntly indented, and simple branches of flowers.* Licopersicon inodorum. Juss. *Wolf's Peach having no scent.*
5. LYCOPERSICON (*Peruvianum*) caule inermi herbaceo, foliis pinnatis tomentosis incisis, racemis bipartitis foliosis. *Love Apple with an unarmed herbaceous stalk, winged cut leaves, which are downy, and a leafy double spike of flowers.* Lycopersicon pimpinellæ sanguisorbæ foliis. Feuill. Obs. 3. p. 37. *Wolf's Peach with leaves like Burnet.*
6. LYCOPERSICON (*Procumbens*) caule herbaceo, procumbente, foliis pinnatifidis, glabris, floribus solitariis alaribus. *Love Apple with an herbaceous trailing stalk, wing-pointed smooth leaves, and flowers growing singly from the wings of the stalk.*
7. LYCOPERSICON (*Tuberosum*) caule inermo herbaceo, foliis pinnatis integerrimis. *Love Apple with an unarmed herbaceous stalk, and winged leaves which are entire.* Solanum tuberosum esculentum. C. B. P. 167. *Esculent tuberous Nightshade, commonly called Potatoe, by the Indians Batatas.*

The first sort here mentioned is supposed to be the Lycopersicon of Galen. This is an annual plant, with an herbaceous, branching, hairy stalk, which will rise to the height of six or eight feet, if supported, otherwise the branches will fall to the ground; these are garnished with winged leaves of a very rank disagreeable odour, composed of four or five pair of lobes terminated by an odd one; these are cut on their edges, and end in acute points. The flowers come out from the side of the branches upon pretty long foot-stalks, each sustaining several yellow flowers, ranged in a single long bunch or thyrse, and are succeeded by round, smooth, pulpy fruit, about the size of a large Cherry. There are two varieties of this, one with yellow, and the other with red fruit. The plants flower from June till the frost stops them, and the fruit ripens in succession from the end of July, till the frost kills the plants; this sort is used in medicine.

The second sort is very like the first, excepting the fruit, which differ greatly; for those of the second sort are very large, compressed at both ends, and deeply furrowed all over the sides. This sort never varies to the other, so that it is undoubtedly a distinct species. This is the sort which is commonly cultivated to put into soups; and the Portugueze, Spaniards, and some others, use them in many of their sauces, to which they give an agreeable acid flavour.

The third sort is also annual; this rises with an erect herbaceous stalk a foot and a half high, dividing into several branches, garnished with oval angular leaves, from three to four inches long, and almost three inches broad in the middle; they are placed alternately upon pretty long foot-stalks, which have one or two short spines upon them, as there also is upon the midrib of the leaves. The flowers come out singly upon foot-stalks from the side of the branches; they are white, and are succeeded by red striated fruit, which are firmer than those of the other sorts, and about the size of Cherries. This fruit ripens in the autumn, and the plants decay soon after.

The fourth sort is somewhat like the first, but the leaves are unequally winged, having some smaller lobes placed between the large ones; the lobes of this are shorter, broader, and not cut like those of the first, but have some obtuse indentures toward their base. The leaves of this sort have not that rank disagreeable odour which the two first have; the fruit of it is not so large as those of the first, but they are round and smooth, and are very late before they ripen here; so that unless the plants are raised early in the spring, they will not produce ripe fruit.

The fifth sort is also annual; this hath a very branching herbaceous stalk, spreading out into many divisions, and is not so hairy as the two first; the leaves are composed of a greater number of lobes, which are much shorter and more indented on their edges, where they are a little waved, and are downy. The flowers stand upon very long foot-stalks, which branch out and support a large number of flowers at the top; these have a longer style than those of the other species, which is permanent, remaining on the top of the fruit. This sort is late in ripening the fruit, so that unless the plants are raised early in the spring, the fruit will not ripen in England.

The seeds of these two sorts were sent from Peru by Mr. Joseph de Jussieu to the Royal Garden at Paris, part of which was sent me by his brother Dr. Bernard de Jussieu, of the Royal Academy of Sciences.

The sixth sort was raised by Mr. James Gordon, gardener at Mile-end, who gave me some of the seeds, but from what country it came I could not learn. This hath very weak, trailing, smooth stalks, not more than a foot long, garnished with smooth leaves, standing by pairs opposite; these are regularly cut on the sides almost to the midrib, in form of a winged leaf; and these segments are also indented on their edges, and at their points. The flowers come

out on the side of the stalks singly; they are of a whitish yellow colour, and have a pretty large spreading empalement, which is deeply cut at the brim into many acute segments which spread open. The flowers are succeeded by small roundish berries a little compressed at the top, of an herbaceous yellow colour when ripe.

These plants are all propagated by sowing their seeds on a moderate hot-bed in March, and when the plants are come up two inches high, they should be transplanted into another moderate hot-bed, at about four inches distance from each other, observing to shade them until they have taken root; after which they must have frequent waterings, and a large share of fresh air; for if they are too much drawn while young, they seldom do well afterwards.

In May these plants should be transplanted either into pots filled with rich light earth, or into borders near walls, pales, or Reed-hedges, to which their branches may be fastened to support them from trailing on the ground, which they otherwise will do, and then the fruit will not ripen; so that where these plants are cultivated for the sake of their fruit, they should be planted to a warm aspect, and the branches regularly fastened as they extend, that the fruit may have the advantage of the sun's warmth to forward them, otherwise it will be late in the season before they are ripe, and they are unfit for use before; but when the plants are brought forward in the spring, and thus regularly trained to the south sun, the fruit will ripen by the latter end of July, and there will be a succession of it till the frost kills the plants.

Some persons cultivate these plants for ornament, but their leaves emit so strong offensive an odour on being touched, which renders them very improper for the pleasure-garden, and their branches extend so wide and irregular, as to render them very unsightly in such places; for as their branches cannot be kept within bounds, especially when they are planted in good ground, so they will appear very unsightly in such places; therefore the borders in the kitchen-garden, where these plants are placed for their fruit, must not be too rich, for in a moderate soil they will not be so luxuriant and more fruitful.

The Italians and Spaniards eat these Apples, as we do Cucumbers, with pepper, oil, and salt; and some eat them stewed in sauces, &c. and in soups they are now much used in England, especially the second sort, which is preferred to all the other. This fruit gives an agreeable acid to the soup, though there are some persons who think them not wholesome, from their great moisture and coldness, and that the nourishment they afford must be bad.

The third sort is never used either in the kitchen or for medicine, but the plants are preserved for the sake of variety, especially by those persons who are lovers of botany. This sort is propagated by seeds, which should be sown upon a hot-bed in the spring, and the plants afterward treated in the same manner as hath been directed for the Capsicum, with which this plant will thrive and produce plenty of fruit annually.

The seventh sort is the common Potatoe, which is a plant so well known now, as to need no description. Of this there are two varieties, one with a red and the other with a white root; that whose roots are red, have purplish flowers, but the white root has white flowers; these are supposed to be only accidental variations, and not distinct species.

The common name of Potatoe, seem to be only a corruption of the Indian name Batatas. This plant has been much propagated in England within thirty or forty years past, for although it was introduced from America about the year 1623, yet it was but little cultivated in England till of late; these roots being despised by the rich, and deemed only proper food for the meaner sort of persons; however, they are now generally esteemed by most people, and the quantity of them which are cultivated near London, I believe, exceeds that of any other part of Europe.

This plant was always ranged in the genus of Solanum, or Nightshade, and is now brought under that title again by Dr. Linnæus; but as Lycopersicon has been established as a distinct genus, on account of the fruit being divided into several cells, by intermediate partitions; and as the fruit of this plant exactly agrees with the characters of the other species of this genus, I have inserted it here.

This is generally propagated by its roots, which multiply greatly if planted in a proper soil. The common way is, either to plant the small roots or offsets entire, or to cut the larger roots into pieces, preserving a bud or eye to each; but neither of these methods is what I would recommend, for when the smaller offsets are planted, they generally produce a greater number of roots, but these are always small; and the cuttings of the larger roots are apt to rot, especially if wet weather happens soon after they are planted; therefore what I would recommend is, to make choice of the fairest roots for this purpose, and to allow them a larger space of ground, both between the rows, as also in the rows, plant from plant; by which method I have observed, the roots have been in general large the following autumn.

The soil in which this plant thrives best, is a light sandy loam, not too dry or over moist; this ground should be well ploughed two or three times, in order to break and divide the parts; and the deeper it is ploughed, the better the roots will thrive. In the spring, just before the last ploughing, there should be a good quantity of rotten dung spread on the ground, which should be ploughed into the ground the beginning of March, if the season proves mild, otherwise it had better be deferred till the middle or latter end of that month; for if it should prove hard frost after the roots are planted, they may be greatly injured, if not destroyed thereby: but the sooner they are planted in the spring, after the danger of frost is over, the better it will be, especially in dry land. In the last ploughing, the ground should be laid even, and then the furaows should be drawn at three feet distance from each other, about seven or eight inches deep. In the bottom of this furrow the roots, should be laid at about one foot and a half asunder; then the furrow should be filled with the earth which came out, and the same continued through the whole field or parcel of land, intended to be planted.

After all is finished, the land may remain in the same state till near the time when the shoots are expected to appear above ground, when the ground should be well harrowed over both ways, which will break the clods, and make the surface very smooth; and by doing of it so late, it will destroy the young weeds, which, by this time, will begin to make their appearance; and this will save the expence of the first hoeing, and will also stir the upper surface of the ground, which, if much wet has fallen after the planting, is often bound into a hard crust, and will retard the appearance of the shoots.

As I have allotted the rows of Potatoes at three feet distance, it was in order to introduce the hoe-plough between them, which will greatly improve these roots; for by twice stirring and breaking the ground between these plants, it will not only destroy the weeds, but also loosen the ground, whereby every shower of rain will penetrate to the roots, and greatly improve their growth; but these operations should be performed early in the season, before the stems or branches of the plants begin to fall and trail upon the ground, because after that, it will be impossible to do it without injuring the shoots.

If these ploughings are carefully performed between the rows, and the ground between the plants in the rows hand-hoed, it will prevent the growth of weeds, till the haulm of the plants cover the ground; so that afterward there will be little danger of weeds growing

ſo as to injure the crop; but as the plough can only go between the rows, it will be neceſſary to make uſe of a hoe to ſtir the ground, and deſtroy the weeds in the rows; and if this is carefully performed in dry weather, after the two ploughings, it will be ſufficient to keep the ground clean until the Potatoes are fit to take up.

In places where dung is ſcarce, many perſons ſcatter it only in the furrows, where the roots are planted; but this is a very poor method, becauſe when the Potatoes begin to puſh out their roots, they are ſoon extended beyond the width of theſe furrows, and the new roots are commonly formed at a diſtance from the old, ſo will be out of the reach of this dung, and conſequently will receive little benefit from it. And as moſt of the farmers covet to have a crop of Wheat after the Potatoes are taken off the ground, ſo the land will not be ſo thoroughly dreſſed in every part, nor ſo proper for this crop, as when the dung is equally ſpread, and ploughed in all over the land, nor will the crop of Potatoes be ſo good. I have always obſerved, where this method of planting the Potatoes has been practiſed, the land has produced a fine crop of Wheat afterward, and there has ſcarce one ſhoot of the Potatoe appeared among the Wheat the following ſeaſon, which I attribute to the farmers planting only the largeſt roots; for when they have forked them out of the ground the following autumn, there have been ſix, eight, or ten large roots produced from each, and often many more, and ſcarce any very ſmall roots among them; whereas, in ſuch places where the ſmall roots have been planted, there has been a vaſt number of very ſmall roots produced; many of which were ſo ſmall as not to be diſcovered when the roots were taken up, ſo have grown the following ſeaſon, and have greatly injured whatever crop was on the ground.

The haulm of theſe Potatoes is generally killed by the firſt froſt in the autumn, when the roots ſhould be taken up ſoon after, and may be laid up in ſand in any ſheltered place, where they may be kept dry, and ſecure from froſt. Indeed the people who cultivate theſe roots near London, do not wait for the decaying of the haulm, but begin to take up part of them as ſoon as their roots are grown to a proper ſize for the market, and ſo keep taking up from time to time, as they have vent for them. There are others likewiſe, who do not take them up ſo ſoon as the haulm decays, but let them remain much longer in the ground; in which there is no hurt done, provided they are taken up before hard froſt ſets in, which would deſtroy them, unleſs where the ground is wanted for other crops; in which caſe, the ſooner they are taken up the better, after the haulm is decayed. When theſe roots are laid up, they ſhould have a good quantity of ſand or dry earth laid between them, to prevent their heating; nor ſhould they be laid in too large heaps, for the ſame reaſon.

The kitchen-gardeners and farmers who live in the neighbourhood of Mancheſter, cultivate great quantities of this root, as the inhabitants of that populous town conſume abundance of them, and are much fonder of them than of any other eſculent plants; which has occaſioned an emulation among the cultivators, of endeavouring to outvie each other, in getting the roots of a proper ſize for the table early in the ſeaſon: in order to obtain this, they have made choice of thoſe roots which produced the firſt flowers, and have left them to ripen their ſeeds, which they have ſowed with great care; and the plants ſo raiſed, have generally been forwarder than the other; and by frequently repeating of this, they have ſo much improved the forwarding of the roots, as to have them fit for uſe in two months after planting; ſo that great improvements may be made by this practice, of many eſculent plants, by perſons who are curious and careful in trying the experiments.

LYCOPUS [Λυκόπȣς, of Λύκ@, a wolf, and Πȣ̃ς, a foot; q. d. Wolf's-foot; becauſe the ancients fancied, that the leaves of this plant reſembled the foot of a wolf,] it is commonly called Water Horehound.

This plant grows in great plenty on moiſt ſoils by the ſides of ditches and ponds in moſt parts of England, but is never cultivated in gardens, ſo that it would be needleſs to ſay any thing more of it in this place.

LYSIMACHIA. Tourn. Inſt. R. H. 141. tab. 59. Lin. Gen. Plant. 188. [this plant was ſo called of Lyſimachus, the ſon of a king of Sicily, who is ſaid to have firſt found the virtues of it.] Looſtrife; in French, *Corneille*.

The CHARACTERS are,

*The empalement of the flower is permanent, and is cut into five acute ſegments, which are erect. The flower is of one petal, cut into five oblong oval ſegments to the bottom, which ſpread open. It hath five awl-ſhaped ſtamina about half the length of the petal, terminated by acute-pointed ſummits. In the center is ſituated a roundiſh germen, ſupporting a ſlender ſtyle the length of the ſtamina, crowned by an obtuſe ſtigma. The germen afterward turns to a globular capſule with one cell, opening with ten valves, and filled with ſmall angular ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, intitled Pentandria Monogynia, which includes the plants whoſe flowers have five ſtamina and one ſtyle.

The SPECIES are,

1. LYSIMACHIA (*Vulgaris*) paniculata, racemis terminalibus. Lin. Sp. Plant. 209. *Paniculated Looſtrife, with bunches of flowers terminating the ſtalks.* Lyſimachia lutea, major, quæ Dioſcoridis. C. B. P. 245. *Greater yellow Looſtrife of Dioſcorides.*
2. LYSIMACHIA (*Thyrſiflora*) racemis lateralibus pedunculatis. Lin. Sp. Plant. 147. *Looſtrife with lateral ſpikes of flowers growing upon foot-ſtalks.* Lyſimachia bifolia flore globoſo, luteo. C. B. P. 242. *Two-leaved Looſtrife with a yellow globular flower.*
3. LYSIMACHIA (*Atropurpurea*) ſpicis terminalibus petalis, lanceolatis, ſtaminibus corolla longioribus. Lin. Sp. Plant. 147. *Looſtrife with ſpear-ſhaped ſpreading ſpikes of flowers terminating the branches, and ſtamina longer than the petals.* Lyſimachia Orientalis anguſtifolia flore purpureo. Tourn. Cor. 7. *Narrow-leaved Eaſtern Looſtrife with a purple flower.*
4. LYSIMACHIA (*Ephemerum*) racemis ſimplicibus terminalibus, petalis obtuſis, ſtaminibus corollâ brevioribus. Lin. Sp. Plant. 146. *Looſtrife with ſpikes of flowers terminating the ſtalks, obtuſe petals to the flower, and ſtamina ſhorter than the petal.* Lyſimachia Orientalis minor, foliis glaucis, annuentibus, flore purpureo. Hort. Piſſ. *Smaller Eaſtern Looſtrife, with nodding grayiſh leaves and a purple ſpike of flowers.*
5. LYSIMACHIA (*Ciliata*) petiolis ciliatis, floribus cernuis. Lin. Sp. Plant. 147. *Looſtrife with hairy foot-ſtalks and nodding flowers.* Lyſimachia Canadenſis Jalappæ foliis. Sarr. Canad. *Canada Looſtrife with a Jalap leaf.*
6. LYSIMACHIA (*Salicifolia*) ſpicâ ſimplici erecto terminali, petalis ovatis, ſtaminibus corollâ longioribus. *Looſtrife with a ſingle erect ſpike terminating the ſtalk, oval petals, and ſtamina longer than the flower.* Lyſimachia ſpicata, flore albo, ſalicis folio. Tourn. Inſt. R. H. 141. *Looſtrife with a ſpike of white flowers and a Willow leaf.*
7. LYSIMACHIA (*Nummularia*) foliis ſubcordatis, floribus ſolitariis, caule repente. Vir. Cliff. 13. *Looſtrife with leaves nearly heart-ſhaped, flowers growing ſingly, and a creeping ſtalk.* Nummularia lutea major. C. B. P. 309. *Greater yellow Moneywort.*
8. LYSIMACHIA (*Tenella*) foliis ovatis acutiuſculis, pedunculis folio longioribus, caule repente. Lin. Sp. Plant. 148. *Looſtrife with oval acute-pointed leaves, foot-ſtalks longer than the leaf, and a creeping ſtalk.* Nummularia minor, purpuraſcente flore. C. B. P. 310. *Smaller Moneywort with a purpliſh flower.*
9. LYSIMACHIA (*Nemorum*) foliis ovatis acutis, floribus ſolitariis, caule procumbente. Hort. Cliff. 52. *Looſtrife with oval acute-pointed leaves, flowers growing ſingly, and a trailing ſtalk.* Anagallis lutea nemorum. C. B. P. 252. *Yellow Pimpernel of the woods.*

10. Lysimachia (*Quadrifolia*) foliis subquaternis, pedunculis verticillatis unifloris. Lin. Sp. Plant. 147. *Loosestrife with leaves generally placed by fours, and foot-stalks placed in whorls round the stalks, each sustaining a single flower.* Lysimachia lutea minor, foliis nigris punctatis notatis. C. B. P. 245. *Smaller yellow Loosestrife with leaves marked with black spots.*

The first sort grows by the side of ditches and rivers in many parts of England, so is not often admitted into gardens, because the roots creep far in the ground, and send up stalks at a great distance, whereby it becomes often a troublesome plant; otherwise for the variety of its flowers, it might deserve a place in large gardens, especially in moist places, where better things will not thrive. It rises with upright stalks from two to three feet high, garnished with smooth spear-shaped leaves placed sometimes by pairs opposite; at others there are three, and frequently four of these leaves placed round the stalk at each joint. The upper part of the stalk divides into several foot-stalks, which sustain yellow flowers growing in a panicle; these have one petal which is deeply cut into five segments, spreading open. They appear in June and July, and are succeeded by roundish seed-vessels, filled with small seeds which ripen in the autumn. This is placed in the list of medicinal plants, but is not often used, If the roots of this plant are taken up from the places where it grows naturally in the autumn, and planted in a moist soil, they will thrive fast enough without care.

The second sort grows naturally in the northern parts of England; this hath a perennial creeping root, which sends up several erect stalks near a foot and a half high, garnished at every joint by two pretty long narrow leaves placed opposite, whose base sits close to the stalk; they are about three inches long, and more than half an inch broad toward their base, lessening gradually to the end, which terminates in acute points; the foot-stalks of the flowers come out opposite on each side of the stalks; they are an inch long, sustaining at their top a globular or oval thyrse of yellow flowers, whose stamina are much longer than the petals. This flowers at the same time with the former sort, but seldom produces seeds, for the roots creep so much as to render it barren. It is but seldom kept in gardens, for the same reason as the former is rejected; but those who are desirous to have it, may procure the roots and plant them in a moist soil, where it will soon spread.

The third sort is a biennial plant, which was discovered by Dr. Tournefort in the Levant, from whence he sent the seeds to the Royal Garden at Paris, where they succeeded, and many of the European gardens have from thence been furnished with it. This rises with an upright stalk about a foot high, garnished with spear-shaped leaves ending in acute points; these are placed by pairs opposite; they are smooth, and of a lucid green. The flowers grow in a loose spike, terminating the stalks; the flowers stand horizontally, spreading out on each side the stalk; they have longer tubes than the other species, and are of a purple colour. These appear in June, and the seeds ripen in September, soon after which the plants decay.

It is propagated by seeds, which should be sown on a moderate hot-bed in the spring, often watering the ground to bring up the plants; and if the season should prove warm, the glasses of the hot-bed should be shaded in the heat of the day; when the plants are up, they should have a large share of fresh air admitted to them in warm weather, to prevent their drawing up weak, and should be frequently refreshed with water. When they are fit to remove, they should be each planted in a separate pot, plunging them into a moderate hot-bed to forward their taking new root: after which they should be gradually inured to bear the open air, into which they should be removed by the beginning of June, where they may remain till October, when they should be removed into a common frame, where they may be sheltered from frost in winter, but should always enjoy the free air in mild weather. The spring following some of the plants should be shaken out of the pots, and planted in borders; but a few of them should be put into larger pots, where they may flower and seed: this is called Ephemerum by Linnæus, but is not so.

When the plants come up, they must have plenty of air admitted to them in warm weather, to prevent their drawing up weak; then they may be planted into the borders of the pleasure-garden, where they will flower and produce ripe seeds the following summer.

The fourth sort is an annual plant, which is too tender to rise in the open air in this country, therefore the seeds should be sown on a moderate hot-bed in the spring, and the plants afterward treated in the same manner as hath been directed for the third sort.

The fifth sort was first brought from Canada, where it grows naturally; this hath a perennial creeping root, sending up many erect stalks about two feet high, garnished with oblong, oblique, smooth leaves, placed opposite; they are veined on their under side, and end in acute points. The flowers are produced from the wings of the stalks, each sitting upon a long slender foot-stalk; there are three or four of these arising from the short branches, which come out on each side the stalk, at all the upper joints. The flowers are like those of the first sort, but smaller, and hang downward; these appear in June and July, but are seldom succeeded by any seeds in England.

This sort spreads and propagates by roots, in as great plenty as the first, and is equally hardy, so requires no other culture.

The sixth sort grows naturally in Spain, and was formerly titled by John Bauhin and others, Ephemerum; this hath a perennial root, from which arise several upright stalks upward of three feet high, garnished with narrow, smooth, spear-shaped leaves, which stand opposite, and at the base of these come out short side branches, garnished with smaller leaves of the same shape. The flowers are produced in a long, close, upright spike, at the top of the stalk; they are cut into five oval segments, which are white, spreading open, and the stamina stand out longer than the petal. It flowers in June, and the seeds ripen in autumn.

This is the finest species of this genus, and as the roots of it do not spread like those of the other, so deserves a place in the pleasure-garden, where it is a very ornamental plant for shady borders. It loves a moist soil and a shady situation, where it will continue long in beauty. It may be propagated by parting the roots in autumn, but by this method it increases slowly; so that the only way to have it in plenty, is by sowing the seeds: these should be sown upon an east-aspected border in autumn, soon after they are ripe, then the plants will come up the following spring; but those which are sown in the spring will not grow the same year. When the plants come up they should be kept clean from weeds, and if they are too close, some of them may be drawn out and transplanted on a shady border, which will give the remaining plants room to grow till autumn, when they may be transplanted into the borders of the flower-garden where they are designed to flower; after which they will require no other culture but to keep them clean from weeds, and dig the ground between them every spring.

The seventh sort is commonly called Moneywort, or Herb Two-pence; this is a perennial plant, which grows naturally in moist shady places in most parts of England, so is not cultivated in gardens. The stalks of this trail upon the ground, and put out roots, by which it soon spreads to a great distance. The leaves are almost heart-shaped, and placed by pairs. The flowers come out singly from the side of the stalks; they are yellow, appearing in June and July.

The eighth sort is a small trailing plant, which grows upon bogs in mossy places in most parts of England, but cannot be cultivated on dry ground. The stalks seldom are more than three or four inches long, and

are terminated by three or four small flowers, of a bright purple colour, growing in a bunch. This flowers in June, but is rarely planted in gardens.

The ninth sort is a perennial plant with trailing stalks, which grow naturally in moist woods in most parts of England, so is not cultivated in gardens. The leaves stand opposite at each joint; they are smooth, oval, and acute-pointed. The flowers come out singly from the side of the stalk, upon long foot-stalks; they are yellow, and spread open like the flowers of Chickweed. This flowers in May and June, and the seeds ripen in autumn.

The tenth sort grows naturally among Rushes and Reeds, by the rivers sides in Holland; this hath a perennial creeping root like the first. The stalks rise a foot high; they are slender, and are garnished by spear-shaped leaves an inch and a half long, and a quarter of an inch broad in the middle, placed sometimes by pairs, at others by threes, and often four at each joint, surrounding the stalk. The flowers also come out at each joint, four of them standing round the stalk in whorls, each having a distinct slender footstalk an inch long. The flowers are small and yellow; they appear in June, and are sometimes succeeded by seeds which ripen in autumn; it may be treated in the same manner as the first sort, and is equally hardy.

LYSIMACHIA GALERICULATA. See Scutellaria.

LYSIMACHIA NON PAPPOSA. See Œnothera.

LYSIMACHIA SILIQUOSA. See Epilobium.

LYTHRUM. Lin. Gen. Plant. 532. Salicaria. Tourn. Inst. R. H. 253. tab. 129. *Willow Herb, or purple Loostrife.*

The Characters are,

*The flower hath a cylindrical striated empalement of one leaf, indented at the brim in twelve parts, which are alternately smaller. It has six oblong blunt petals which spread open, whose tails are inserted in the indentures of the empalement, and ten slender stamina the length of the empalement, the upper being shorter than the lower, terminated by single rising summits. In the center is situated an oblong germen, supporting an awl-shaped declining style, crowned by a rising orbicular stigma. The germen afterward turns to an oblong acute capsule with two cells, filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's eleventh class, intitled Dodecandria Monogynia, which includes those plants whose flowers have twelve stamina and one style.

The Species are,

1. Lythrum (*Salicaria*) foliis oppositis cordato-lanceolatis, floribus spicatis dodecandris. Lin. Sp. Plant. 446. *Lythrum with heart spear-shaped leaves placed opposite, and flowers growing in spikes, having twelve stamina.* Salicaria vulgaris, purpurea, folis oblongis. Tourn. Inst. R. H.. 253. *Common purple Willow Herb with oblong leaves.*
2. Lythrum (*Tomentosum*) foliis cordato-ovatis, floribus verticillato-spicatis tomentosis. *Lythrum with oval heart-shaped leaves, and flowers growing in whorly spikes, which are woolly.* Salicaria purpurea, foliis subrotundis. Tourn. Inst. R. H. 253. *Purple Willow Herb with roundish leaves.*
3. Lythrum (*Hyssopifolia*) foliis alternis linearibus, floribus hexandris. Hort. Upsal. 118. *Lythrum with linear alternate leaves, and flowers having six stamina.* Salicaria hyssopi folio angustiore. Tourn. Inst. R. H. 253. *Willow Herb with a narrow Hyssop leaf.*
4. Lythrum (*Lusitanicum*) foliis lanceolatis ternis glabris, floribus spicatis decandris. *Lythrum with smooth spear-shaped leaves placed by threes, and flowers growing in spikes, which have ten stamina.* Salicaria Lusitanica, angustiore folio. Tourn. Inst. R. H. 253. *Portugal Willow Herb with a narrower leaf.*
5. Lythrum (*Hispanicum*) foliis oblongo-ovatis infernè oppositis supernè alternis floribus hexandris. *Lythrum with oblong oval leaves placed opposite below, but above alternate, and flowers having six stamina.* Salicaria Hispanica, hyssopifolia, floribus oblongis saturatè cæruleis. Tourn. Inst. 253. *Spanish Willow Herb with a Hyssop leaf, and oblong, deep, blue flowers.*
6. Lythrum (*Verticillatum*) foliis oppositis, subtus tomentosis subpetiolatis, floribus verticillatis lateralibus. Lin. Sp. Plant. 446. *Willow Herb with opposite leaves, which are woolly on their under side, and flowers growing in whorls round the stalks.*
7. Lythrum (*Petiolatum*) foliis oppositis linearibus petiolatis, floribus dodecandris. Lin. Sp. Plant. 446. *Willow Herb with linear leaves placed opposite, having foot-stalks, and flowers with twelve stamina.*
8. Lythrum (*Lineare*) foliis oppositis linearibus, floribus oppositis hexandris. Lin. Sp. Plant. 447. *Willow Herb with linear opposite leaves, and flowers having six stamina, which are placed opposite.*
9. Lythrum (*Americanum*) foliis oblongo-ovatis infernè oppositis supernè alternis, floribus hexandris, caule erecto. *Willow Herb with oblong leaves placed opposite below, and above alternate, with flowers having six stamina and an erect stalk.* Salicaria Americana, hyssopi folio latiore, floribus minimis. Houst. MSS. *American Willow Herb with a broader Hyssop leaf, and very small flowers.*

The first sort grows naturally by the side of rivers and ditches in most parts of England. It has a perennial root, from which come forth several upright angular stalks, which rise from three to four feet high; they are of a purple colour, and are garnished with oblong leaves, placed sometimes by pairs opposite, at others there are three leaves at each joint, standing round the stalk. The flowers are produced in a long spike at the top of the stalk; they are of a fine purple colour, and make a fine appearance. This flowers in July, and the seeds ripen in autumn: although this plant is despised, because it grows common, yet it merits a place in gardens better than many other which are propagated with care, because they are more rare. It is easily cultivated by parting the roots in autumn, and should be planted in a moist soil, where it will thrive and flower without any other care than the keeping it clean from weeds.

There is a variety of this with an hexangular stalk, and generally with three leaves at each joint; but this is only accidental, for the roots of this, when removed into a garden, come to the common sort.

The second sort hath perennial roots like the first, from which come out upright branching stalks three feet high, garnished with oval heart-shaped leaves about one inch long, and three quarters of an inch broad; they are downy, and placed by threes round the stalk. The flowers are produced in long spikes at the top of the stalks, but they are disposed in thick whorls, with spaces between each; they are of a fine purple colour, and appear at the same time with the former. This may be propagated in the same way as the first sort, and is equally hardy.

The third sort grows naturally in moist bogs in many parts of England, so is seldom admitted into gardens; this hath a perennial root, sending up two or three branching stalks about a foot high, garnished with narrow leaves, placed alternate. The upper part of the stalk is garnished with flowers, which come out from the side singly at each joint, standing close to the base of the leaves; they are small, and of a light purple colour, appearing in June, and the seeds ripen in autumn.

The fourth sort grows naturally in Spain and Portugal, in moist places by the side of waters; this has a perennial root and stalks like the first, which seldom grow more than one foot high, garnished with narrower and shorter leaves than the first, which are smooth, and placed by threes round the stalk. The flowers grow in spikes at the top of the stalks; they are of a light purple colour, and appear in July. The seeds ripen in autumn. This sort is hardy, and may be propagated in the same way as the first.

The fifth sort grows naturally in Spain and Portugal, from both which countries I have received the seeds.

The root of this is perennial. The stalks are slender, not more than nine or ten inches long, spreading out on every side. The lower part of the stalks are garnished with oblong oval leaves, placed opposite. On the upper part of the stalks the leaves are narrower, and placed alternate. The flowers come out singly from the side of the stalks at each joint; they are larger than those of the common sort, and of a deeper purple colour, so make a fine appearance in July, when they are in beauty.

This sort has never produced any seeds in England, and the severe frost in 1740, killed all the plants here, since which time I have not seen any of them in the English gardens.

The sixth sort grows naturally in the northern parts of America; this rises with a stiff branching stalk a foot and a half high, garnished with oblong leaves, which are downy, and placed opposite, standing upon very short foot-stalks. The flowers are produced in whorls round the stalks; they are of a pale purple colour, and appear in July; these are succeeded by capsules with two cells, filled with seeds which ripen in autumn.

The seventh sort grows naturally in Virginia, from whence I received the seeds; this rises with an upright woolly stalk near two feet high, garnished with linear leaves placed opposite, upon short foot-stalks. The flowers come out from the wings of the stalks singly; they are small, tubulous, and of a pale purple colour, so make no great appearance; these appear in July, and in warm seasons only will perfect seeds; but the roots of this sort will increase so fast, as to render the propagating the plants by seeds unnecessary, when once obtained.

The eighth sort grows naturally in North America. It has a perennial root. The stalks are slender, about a foot high, garnished with linear leaves placed opposite, which are entire. The flowers come out singly from the wings of the leaves, on the upper part of the stalks; they are small, white, and have six petals. The empalement is streaked, and cut at the top into six parts, and the flower has six stamina. This flowers in June, and the seeds ripen in autumn.

The ninth sort was discovered by the late Dr. Houstoun at La Vera Cruz, growing in swamps, where the water had stagnated. This hath a ligneous root, from which arise two or three slender stalks upward of two feet high, garnished with oblong, oval, smooth leaves, which, on the lower part of the stalks are opposite, but those on the upper part are narrow and alternate. The flowers come out from the wings of the leaves, on the upper part of the stalk singly; they are small and white, having six petals and six stamina; these do not appear till the second year from seed, and have not produced any good seeds in England.

This sort is tender, so will not live in the open air in England. It is propagated by seeds, which should be sown in pots, and plunged into an old hot-bed the first season; for the seeds never rise the first year, unless they are sown in autumn; the pots should be sheltered in winter, and the spring following placed on a hot-bed to bring up the plants; these must be treated in the same way as other tender plants from the same country.

All the other sorts, when raised from seeds, should be sown in autumn, otherwise the seeds will remain a year in the ground, so that those seeds which are brought from America, never grow the same year they are sown; for which reason the ground should not be disturbed in which the seeds are sown, but left till the following spring, when the plants will come up if the seeds were good.

# M.



MACALEB. See Cerasus.

MADDER. See Rubia Tinctorum.

MAGNOLIA. Plum. Nov. Gen. 38. tab. 7. Lin. Gen. Plant. 610. The Laurel-leaved Tulip-tree, vulgò.

The Characters are,

*The empalement is composed of three oval concave leaves like petals, which soon fall away. The flower is composed of nine oblong blunt petals, which are concave. It hath a great number of short stamina which are compressed, and inserted into the germen, terminated by linear summits, adhering to every side of the stamina. It hath many oblong oval germina fastened to the receptacle, supporting recurved, contorted, short styles, with longitudinal hairy stigmas. The germen afterward become oval cones, with roundish compressed capsules almost imbricated, having one cell, opening with two valves, inclosing one kidney-shaped seed, hanging by a slender thread from the scale of the cone.*

This genus of plants is ranged in the seventh section of Linnæus's thirteenth class, intitled Polyandria Polygynia, which includes those plants whose flowers have many stamina and styles. If Father Plumier's figure of the section of his fruit is exact, his must be a different genus from this; for the seeds of his are represented within the fruit, lying round a column.

The Species are,

1. Magnolia (*Glauca*) foliis ovato-lanceolatis subtus glaucis. Lin. Sp. 755. *Magnolia with oval spear-shaped leaves, which are gray on their under side.* Magnolia lauri folio subtus albicante. Catesb. Hist. Car. 1. p. 39. *Magnolia with a Bay leaf, which is whitish on the under side, commonly called Small Magnolia, or Laurel-leaved Tulip-tree.*
2. Magnolia (*Grandiflora*) foliis lanceolatis persistentibus, caule erecto arboreo. Fig. Plant. tab. 172. *Magnolia with spear-shaped leaves which are evergreen, and an erect tree-like stalk.* Magnolia altissima, flore ingenti candido. Catesb. Carol. 2. p. 61. *Tallest Magnolia, with a very large white flower, commonly called Greater Magnolia, or Tulip-tree, with a Laurel leaf.*
3. Magnolia (*Tripetala*) foliis lanceolatis amplissimis annuis, petalis exterioribus dependentibus. *Magnolia with very large spear-shaped leaves which are annual, and the outer petals of the flower declining.* Magnolia amplissimo flore albo, fructu coccineo. Catesb. Car. 2. p. 80. *Magnolia with a very large white flower and a scarlet fruit, commonly called Umbrella-tree.*
4. Magnolia (*Acuminata*) foliis ovato-lanceolatis acuminatis annuis, petalis obtusis. *Magnolia with oval, spear-shaped, pointed leaves, which are annual, and obtuse petals to the flower.* Magnolia flore albo, folio majore acuminato, haud albicante. Catesb. Car. 3. p. 15. *Magnolia with a white flower, and a larger acute-pointed leaf, not whitish.*

The first sort grows pretty common in Virginia, Carolina, and in most other parts of North America, where it is found in moist places, near brooks; this usually grows about fifteen or sixteen feet high, with a slender stem. The wood is white and spongy, the

the bark is ſmooth and white, the branches are garniſhed with thick ſmooth leaves, reſembling thoſe of the Bay, but are of an oval ſhape, and ſmooth on their edges, being white underneath. The flowers are produced in May and June at the extremity of the branches, which are white, compoſed of ſix petals which are concave, and have an agreeable ſweet ſcent. After theſe are paſt, the fruit increaſes in ſize to be as large as a Walnut with its cover, but of a conical ſhape, having many cells round the outſide, in each of which is lodged a flat ſeed, about the ſize of a Kidney-bean. This fruit is at firſt green, afterward red, and, when ripe, of a brown colour. The ſeeds, when ripe, are diſcharged from their cells, and hang by a ſlender thread.

In the natural places of its growth, there is a ſucceſſion of the flowers on the trees for two months or more, during which time the woods are perfumed with them; but all thoſe trees which have produced flowers in England, ſeldom have more than twelve or fourteen flowers upon each, which are of ſhort duration, and are not ſucceeded by others; the leaves of this ſort fall off in winter.

The young plants of this ſort frequently retain their leaves through the greateſt part of winter, and often do not fall off till the young ſhoots thruſt them off, which has occaſioned ſome perſons to believe the plants were evergreen; but when they are three or four years old, they conſtantly caſt their leaves by the beginning of November.

When theſe trees are tranſplanted from the places of their growth into dry ground, they make handſomer trees, and produce a greater number of flowers; this is to be underſtood of America, for in Europe they do not thrive ſo well in a dry ſoil as in a moiſt loamy land. The greateſt number of theſe trees, which are now growing in England, are at his Grace the Duke of Norfolk's, at Workſop Manor, in Nottinghamſhire.

The ſecond ſort grows in Florida and South Carolina, where it riſes to the height of eighty feet or more, with a ſtrait trunk upward of two feet diameter, having a large regular head: the leaves of this tree reſemble thoſe of the common Laurel, but are much larger, and of a ſhining green on their upper ſide, and, in ſome trees, they are of a ruſſet, or buff colour, on their under ſide; theſe leaves continue all the year, ſo that this is one of the moſt beautiful evergreen trees yet known. The flowers are produced at the end of the branches; they are compoſed of eight or ten petals, which are narrow at their baſe, but broad at their extremity, where they are rounded, and a little waved; theſe ſpread open wide, and are of a pure white colour. In the center is ſituated a great number of ſtamina and ſtyles, faſtened to one common receptaculum; theſe flowers are ſucceeded by oblong ſcaly cones in the places where it grows naturally, but the ſummers are not warm enough in England to produce any fruit to perfection, though ſome old plants do often form cones. Theſe trees in their native places of growth begin to produce their flowers in May, and continue a long time in flower, ſo that the woods are perfumed with their odour the greateſt part of ſummer; but thoſe which have flowered in England, ſeldom begin till the middle or latter end of June, and do not continue long in beauty. The largeſt tree of this kind, which I have met with in England, is in the garden of Sir John Colliton, of Exmouth, in Devonſhire, which has produced flowers for ſeveral years; there are alſo many pretty large plants of this ſort in the gardens of his Grace the Duke of Richmond, at Goodwood, in Suſſex, one of which has has produced flowers ſeveral years; and in the nurſery of Mr. Chriſtopher Gray, near Fulham, there is one very handſome plant, which has alſo produced many flowers ſeveral years.

As this ſort is a native of a warm country, it is a little impatient of cold, eſpecially while young, therefore the plants ſhould be kept in pots, and ſheltered in winter for ſome years, until they have acquired ſtrength, when they may be ſhaken out of the pots, and planted in the full ground, but they muſt be planted in a warm ſituation, where they may be defended from the ſtrong winds, and ſcreened from the north and eaſt, otherwiſe they will not live abroad.

There were a great number of young plants in England before the year 1739; but a great part of them were deſtroyed by that ſevere winter, and ſince then, there have been few good ſeeds ſent to England, ſo that there are not many of the plants at preſent to be ſold in the nurſeries; and as almoſt every perſon who is curious in gardening, is deſirous to have ſome of theſe beautiful trees in their gardens, the demand for them of late has greatly increaſed their value. If this tree can be ſo far naturalized as to endure the cold of our ſevereſt winters abroad, it will be one of the greateſt ornaments to our gardens; and this we may hope, will, in time, be effected, by diligent obſervation and care; for the time when theſe plants ſuffer moſt, is in autumn, by the early froſts; for the extremity of the ſhoots being then tender, as they are then generally growing freely, a ſmall froſt will pinch them, and afterward the whole ſhoot frequently decays; ſo that the plants ſhould be guarded againſt theſe early froſts, by covering their tops with mats until the ſhoots are hardened, after which time they will not be in ſo much danger of ſuffering; for I have conſtantly obſerved, that if theſe plants eſcape the early froſts of the autumn, they are ſeldom injured afterward: in the ſevere winter in the year 1739-40, I had a pretty large plant growing in the open air, which was killed down by the froſt, and I ſuppoſed was entirely deſtroyed, as there was not the leaſt appearance of life in the ſtem; ſo that after Midſummer I cut it down to the ground, but left the root remaining, which, to my great ſurprize, ſhot up again the year after. This I mention, to caution people from being too haſty in deſtroying plants after hard froſt, but to have them wait until there can be no hopes of their recovery.

The third ſort grows in Carolina pretty frequent, but in Virginia it is pretty rare; this uſually grows from ſixteen to twenty feet high, with a ſlender trunk; the wood is ſoft and ſpongy; the leaves of this tree are remarkably large, and are produced in horizontal circles, ſomewhat reſembling an umbrella, from whence the inhabitants of thoſe countries have given it the title of Umbrella-tree. The flowers are compoſed of ten or eleven white petals, which hang down without any order; the fruit is very like that of the former ſort; the leaves of this ſort drop off at the beginning of winter.

This tree is as yet very rare in Europe, but as it is propagated from ſeeds, we may hope to have it in greater plenty ſoon, if we can obtain good ſeeds from Carolina, for it is rarely met with in Virginia.

The fourth ſort is alſo very rare in England; there are but few of the plants at preſent here, nor is it very common in any of the habitable parts of America: ſome of theſe trees have been diſcovered by Mr. John Bartram, growing on the north branch of Suſquehannah river. The leaves of this tree are near eight inches long and five broad, ending in a point. The flowers come out early in the ſpring, which are compoſed of twelve white petals, ſhaped like thoſe of the ſecond ſort; the fruit of this tree is longer than thoſe of the other ſpecies, but in other reſpects agrees with them. The wood of this tree is of a fine grain, and an Orange colour.

All theſe ſorts are propagated by ſeeds, which muſt be procured from the places of their natural growth; theſe ſhould be put up in ſand, and ſent over to England as ſoon as poſſible; for if they are kept long out of the ground, they very rarely grow, therefore the ſeeds ſhould be ſown as ſoon as poſſible, when they arrive here.

Some years paſt I received a good quantity of theſe ſeeds from Carolina, which I ſowed in pots as ſoon as I received them, and plunged the pots into an old hot bed of tanners bark; and with this management I raiſed

I raised a great number of plants, but from the seeds which have been lately brought over, there have been but few plants produced; whether the seeds were not perfectly ripe when they were gathered, or from what other cause this has happened, I cannot say, but it is certain the fault must be in the seeds, because those before-mentioned were differently sown and managed by the several persons who received them, and the success was nearly alike every where.

There have been several plants of the first and second sort raised from layers, and some from cuttings; but these do not thrive so well as those which come from seeds, nor will they grow to near the size of those, so that it is much the best way to procure their seeds from America, and propagate them that way.

The first sort frequently comes up well from seeds, but the young plants are very difficult to keep the two first years; for if they are exposed much to the sun, their leaves change yellow and the plants decay; so the best way is to keep the pots plunged in a moderate hot-bed, and shade them every day from the sun with mats, giving them air in plenty when the weather is warm, and frequently refresh them with water; during the winter season they must be screened from frost, and in mild weather they must enjoy the free air, to prevent their growing mouldy, and they should have but little wet in winter. With this management the plants may be trained up, and when they have acquired strength, they may be planted in the open air, where they will thrive and flower, if they have a warm sheltered situation.

The second sort is not so difficult to train up as the first, but in order to get them forward, it will be proper when they are removed out of the seed-pots, to plant them each into a separate small pot, filled with soft loamy earth, and plunge them into a gentle hot-bed of tanners bark, observing to shade them from the sun, and admit proper air to them; but at Midsummer, if they are well rooted, they should be inured to the open air gradually, and then placed in a sheltered situation, where they may remain till autumn; but on the first approach of frost, they should be removed under shelter, otherwise the early frosts will pinch their tender shoots, which often occasions their dying downward after. When the plants have got strength, some of them may be turned out of the pots, and planted in the full ground in a warm sheltered situation, but part of them should be kept in pots, and sheltered in the winter, to preserve them, lest, by severe frost, the other should be killed.

If the plants make good progress, they will be strong enough to plant in the full ground in abour six or seven years from seeds. The time for removing or shifting these plants is in March, before they begin to shoot, which may sometimes happen to be too soon to turn them out of the pots into the full ground, especially if the season proves late; but as there will be no danger in removing them out of the pots, the ball of earth being preserved to their roots, so it is best to defer this till the month of April; but it will be necessary to harden those plants which are intended to be planted out, by exposing them to the air as much as possible before, which will keep the plants backward, and prevent their shooting; for if they make shoots in the green-house, those will be too tender to bear the sun, until they are by degrees hardened to it, and the least frost will greatly pinch them, and such frosts frequently happen very late in the spring.

The two or three winters after these are planted out, it will be necessary to lay some mulch on the surface of the ground about their roots, as also to throw some mats over their heads, especially at the beginning of the morning frosts in autumn, for the reasons before given; but in doing this, the heads of the plant should never be too closely covered up, lest thereby the shoots should grow mouldy, for that will certainly kill the leading buds of every shoot, and prove to the full as injurious to them as the frost. As the plants get strength, they will be better able to endure the cold of our climate, though it will be proper to lay some mulch about their roots every winter; and, in very severe frost, to cover their heads and stems.

It is the first sort which requires the most care, being much tenderer than any of the other, for they will endure the cold very well, without much care, after they have acquired strength; for as these lose their leaves in the winter, the frost will not have so much force upon them as of the first sort, whose leaves are frequently tender toward the end of the shoots, especially when they grow freely, or shoot late in the autumn.

MAHALEB. See CERASUS.

MAJORANA. See ORIGANUM.

MALABAR NUT. See JUSTICIA.

MALA ÆTHIOPICA. See LYCOPERSICON.

MALA ARMENIACA. See ARMENIACA.

MALACOIDES. See MALOPE.

MALA COTONEA. See CYDONIA.

MALA INSANA. See MELONGENA.

MALLOW. See MALVA.

MALLOW-TREE. See LAVATERA.

MALOPE. Bastard Mallow.

The CHARACTERS are,

*The flower, which is shaped like that of the Mallow, hath a double empalement, the outer being composed of three heart-shaped leaves, and the inner is of one leaf cut into five segments; the flower is of one petal, divided into five parts at the bottom, where they are joined, but so near the bottom as to have the appearance of five petals. In the center arises the pointal, having a great number of stamina surrounding it, which are joined closely, and form a sort of column. The pointal afterward becomes a fruit composed of many cells, which are collected into a head, in each of which is lodged a single seed.*

We have but one SPECIES of this plant, viz.

MALOPE (*Malacoides*) foliis ovatis crenatis glabris. Lin. Hort. Cliff. 347. *Bastard Mallow, with oval smooth leaves, which are notched.*

This plant was by Dr. Tournefort separated from the Mallow, and made a distinct genus, by the title of Malacoides; but Dr. Linnæus has altered the title of this for Malope, being an enemy to all names which are compounded of oides.

The whole plant has greatly the appearance of the Mallow, but differs from it, in having the cells collected into a button, somewhat like a Blackberry; the branches spread, and lie almost flat upon the ground, extending themselves a foot or more each way. The flowers are produced singly upon long foot-stalks, which arise from the wings of the leaves, which are in shape and colour like those of the Mallow.

This is propagated by seeds, which should be sown in the place where they are designed to remain, for they do not bear transplanting well. If these seeds are sown upon a warm border in August, the plants will frequently stand through the winter, and flower early the following season, so that good seeds may be obtained; for those which are sown in the spring, rarely ripen seeds the same year in England; and these plants being large, are often destroyed in winter, unless they are sheltered under a frame; it seldom continues longer than two or three years, so that young plants should be annually raised.

MALPIGHIA. Plum. Nov. Gen. 46. tab. 36. Lin. Gen. Plant. 38. Barbadoes Cherry, vulgò.

The CHARACTERS are,

*The flower hath a small permanent empalement of five leaves, which are closed together. It hath two oval mellous glands, adhering to the small leaves within and without. It has five kidney-shaped petals, which are concave, and spread open, having long narrow tails, and ten broad awl-shaped stamina, which are erect, terminated by heart-shaped summits. It has a small roundish germen, supporting three slender styles, crowned by obtuse stigmas. The germen afterward turns to a large furrowed globular berry with one cell, inclosing three rough stony seeds, which are angular.*

This genus of plants is ranged in the third section of Linnæus's tenth class, intitled Decandria Trigynia, which includes the plants whose flowers have ten stamina and three styles.

The SPECIES are,

1. MALPIGHIA (*Glabra*) foliis ovatis integerrimis glabris, pedunculis umbellatis. Hort. Cliff. 169. *Malpighia with smooth, oval, entire leaves, and umbellated foot-stalks.* Cerasus Jamaicensis, fructu tetrapyreno. Hort. Amst. 1. p. 145. *Jamaica Cherry with a fruit having four seeds, commonly called Barbadoes Cherry.*
2. MALPIGHIA (*Punicifolia*) foliis ovato-lanceolatis, acuminatis, glabris, pedunculis umbellatis. *Malpighia with oval, spear-shaped, smooth leaves, ending in acute points, and umbellated foot-stalks.* Malpighia mali punici facie. Plum. Nov. Gen. 46. *Malpighia with the appearance of Pomegranate.*
3. MALPIGHIA (*Incana*) foliis lanceolatis subtus incanis, pedunculis umbellatis alaribus. *Malpighia with spear-shaped leaves, hoary on their under side, and umbellated foot-stalks, proceeding from the wings of the stalk.*
4. MALPIGHIA (*Urens*) foliis cordato-lanceolatis, setis decumbentibus rigidis, racemis lateralibus. *Malpighia with spear heart-shaped leaves, having rigid declining bristles, and bunches of flowers proceeding from the sides of the stalks.* Malpighia latifolia, folio subtus spinoso. Plum. Nov. Gen. 46. *Broad-leaved Malpigha, with spines growing on the under side of the leaf.*
5. MALPIGHIA (*Nitida*) foliis ovatis acutis glabris, pedunculis umbellatis alaribus terminalibusque. *Malpighia with oval, smooth, acute-pointed leaves, and umbellated foot-stalks, proceeding from the sides and at the ends of the branches.*
6. MALPIGHIA (*Paniculata*) foliis oblongo-cordatis acuminatis glabris, pedunculis paniculatis, alaribus terminalibusque. *Malpighia with oblong, heart-shaped, smooth leaves, ending in acute points, and paniculated foot-stalks proceeding from the sides and ends of the branches.* Apocynum fruticosum, folio oblongo acuminato, floribus racemosis. Sloan. Cat. 89. *Shrubby Dogsbane with an oblong acute-pointed leaf, and flowers growing in clusters.*
7. MALPIGHIA (*Angustifolia*) foliis lineari-lanceolatis, setis decumbentibus rigidis, pedunculis unbellatis alaribus. *Malpighia with linear spear-shaped leaves, rigid declining bristles, and foot-stalks having umbels of flowers proceeding from the sides of the branches.* Malpighia angustifolia, folio subtus spinoso. Plum. Nov. Gen. 46. *Narrow-leaved Malpighia with spines under the leaves.*
8. MALPIGHIA (*Illicifolia*) foliis lanceolatis dentato-spinosis subtus hispidis. Lin. Sp. Plant. 426. *Malpighia with spear-shaped leaves, indented and prickly, whose under sides are set with spiny hairs.* Malpighia angustis & acuminatis aquifolii foliis. Plum. Nov. Gen. 46. *Malpighia with narrow and acute-pointed Holly leaves.*
9. MALPIGHIA (*Lucida*) foliis oblongo-ovatis obtusis glabris, pedunculis racemosis alaribus. *Malpighia with oblong oval leaves, which are obtuse and smooth, and branching foot-stalks of flowers proceeding from the sides of the branches.*
10. MALPIGHIA (*Coccigrya*) foliis subovatis dentato-spinosis, pedunculis unifloris. *Malpighia with leaves nearly oval, indented, and prickly, and foot-stalks with one flower.* Malpighia humilis, ilicis cocci-glandiferæ foliis. Plum. Nov. Gen. 46. *Low Malpighia with leaves like the Kermes Oak.*

The first sort is commonly cultivated in the West-Indies for the sake of its fruit; this tree usually grows to the height of sixteen or eighteen feet, having a slender stem, covered with a light brown bark. The leaves are produced opposite; they are oval, smooth, ending in acute poins, and continue all the year. The flowers are produced in bunches upon pretty long foot-stalks, which come out from the side and at the end of the branches; these are composed of five roundish petals, which are of a Rose colour, joined at their base. The flowers are succeeded by red fruit, shaped like those of the small wild Cherry, and of the same size, having several furrows, each inclosing four angular furrowed stones, surrounded by a thin pulp, which has an agreeable acid flavour; the fruit of this often ripens in England.

The second sort grows naturally in Jamaica; this rises with a shrubby stalk ten or twelve feet high, dividing into several slender spreading branches, covered with a light brown bark, garnished with oval, spear-shaped, smooth leaves placed opposite, ending in acute points. The flowers are produced in small umbels at the end of the branches, upon short foot-stalks; they are of a pale Rose colour, and composed of five obtuse concave petals which are indented, having long narrow tails, by which they are joined; these spread open, and in the center is situated the roundish germen, supporting three styles, attended by ten stamina which spread asunder. The germen afterward turns to a roundish pulpy berry with many furrows, red when ripe, inclosing three or four hard angular seeds. The fruit of this sort is eaten by the inhabitants of the isles in America.

The third sort grows naturally at Campeachy, from whence it was sent me by the late Mr. Robert Millar. This rises with a strong woody stalk eighteen or twenty feet high, dividing into many branches, covered with a brown spotted bark, garnished with spear-shaped leaves placed opposite, which are hoary on their under side. The flowers come out in umbels from the side of the branches; they are of a Rose colour, and are succeeded by oval channelled fruit, like those of the former sort.

The fourth sort grows naturally in Jamaica, from whence the late Dr. Houstoun sent me the seeds. This rises with a woody stalk from fifteen to eighteen feet high, dividing into many pretty strong branches, which are furrowed, and covered with a brown bark. The leaves are from three to four inches long, and one broad at their base, where they are rounded in form of a heart, lessening gradually to the point; they are covered on their under sides with stinging bristly hairs so closely, as to render it very troublesome to handle them, for these hairs fasten themselves into the flesh, and are difficult to get out again. The flowers are produced in umbels from the side of the branches; they are of a light purple colour, and shaped like those of the other species; they are succeeded by oval furrowed fruit like that of the former sort. This is called in the West-Indies, Couhage, or Cowitch Cherry.

The fifth sort grows naturally at Carthagena in New Spain, from whence the late Dr. Houstoun sent me the seeds. This rises with a shrubby stalk about ten feet high, covered with a light brown spotted bark, branching out regularly at the top on every side; the leaves are oval, smooth, and end in acute points, standing opposite, of a light green on the upper side, but paler on the under. The flowers come out from the side of the stalks in small umbels, standing erect; the foot-stalks of the umbels are scarce an inch long. They are of a pale blush colour, shaped like those of the former sorts; these are succeeded by roundish furrowed berries with a red skin, covering three hard angular seeds.

The sixth sort grows naturally in Jamaica, from whence the late Dr. Houstoun sent the seeds to England. This rises with several slender shrubby stalks from five to six feet high, garnished with oblong heart-shaped leaves, four inches long and one inch and a quarter broad at the base, where they are rounded in two heart-shaped lobes, gradually diminishing to the point; they are smooth, and of a pale yellowish green, placed opposite. The flowers are produced in loose panicles from the side and at the end of the branches; they are of a light purple colour, shaped like those of the other species, but smaller; the fruit is more pointed, and not so much furrowed.

The seventh sort was sent me from the island Barbuda: this rises with a shrubby stalk seven or eight feet high, covered with a bright purplish bark which is spotted and furrowed, dividing toward the top into

ſeveral ſmaller branches, garniſhed with narrow ſpear-ſhaped leaves, about two inches long and a quarter of an inch broad, of a lucid green on their upper ſide, but of a ruſſet brown on their under, where they are cloſely armed with ſtinging briſtles, which faſten themſelves into the fleſh or clothes of thoſe who touch them; theſe leaves are placed oppoſite. The flowers are produced from the ſide and at the end of the branches in ſmall umbels; they are of a pale purple colour, of the ſame form of the other ſpecies, but ſmaller; and are ſucceeded by ſmall, oval, furrowed fruit, of a dark purple colour when ripe.

The eighth ſort was ſent me from the iſland Berbuda in the Weſt-Indies, where it grows naturally. This riſes with a ſtrong woody ſtem from fifteen to twenty feet high, dividing into many ſpreading branches, covered with a gray bark, garniſhed with oblong oval leaves of a firm conſiſtence; they are about an inch long, and half an inch broad, rounded at their ends, of a lucid green, and placed oppoſite. The flowers come out from the ſide, and alſo at the end of the branches, upon pretty long foot-ſtalks, which branch in form of a racemus, or long bunch. They are of the ſame form with thoſe of the other ſpecies, but vary in their colour, ſome of them being of a bright red, and others of an Orange colour in the ſame bunch; theſe are ſucceeded by ſmall oval berries, which are leſs furrowed than thoſe of the other ſpecies, and, when ripe, change to a dark purple colour.

The ninth ſort grows naturally in the iſland of Cuba, where the late Dr. Houſtoun found it in plenty. This riſes with a ſhrubby ſtalk to the height of ſeven or eight feet, ſending out branches the whole length, which are covered with a gray bark, garniſhed with narrow prickly leaves like thoſe of the Holly, which have many ſtinging briſtles on their under ſide. The flowers are produced in ſmall cluſters from the ſide of the branches, they are of a pale bluſh colour, and ſhaped like thoſe of the other ſpecies, but ſmaller; the fruit is more pointed than thoſe of the common ſort, and turns to a dark purple colour when ripe.

The tenth ſort grows naturally near the Havanna, from whence the late Dr. Houſtoun ſent the ſeeds. This is a very low ſhrub, ſeldom riſing more than two or three feet high; the ſtalk is thick and woody, as are alſo the branches, which come out on every ſide from the root upward; they are covered with a rough gray bark, garniſhed with lucid leaves half an inch long, and almoſt as much broad; they appear as if cut at their ends, where they are hollowed in, and the two corners riſe like horns ending in a ſharp thorn, as do alſo the indentures on the ſides. The flowers come out from the ſide of the branches, upon foot-ſtalks an inch long, each ſuſtaining one ſmall pale bluſh flower, of the ſame form with thoſe of the other ſpecies; the fruit is ſmall, conical, and furrowed, changing to a purple red colour when ripe.

There are two other ſpecies of this genus, which have been lately introduced from America, but as neither of them have yet flowered here, ſo I have not enumerated them; and if thoſe warm parts of America were ſearched by perſons of ſkill, there might be many more ſpecies diſcovered; for from a large number of imperfect ſpecimens which were ſent me from the Spaniſh Weſt-Indies, I have ſelected many which have the appearance of the other ſpecies of this genus, but as they are without flowers or fruit, they cannot be aſcertained.

The fruit of ſeveral of the ſpecies here mentioned, are promiſcuouſly gathered and eaten by the inhabitants of the countries where they naturally grow; but the firſt ſort is cultivated in ſome of the iſlands for its fruit, though that is but indifferent: the pulp which ſurrounds the ſtones is very thin, but has a pleaſant acid flavour, which renders it agreeable to the inhabitants of thoſe warm countries, where, to ſupply the want of thoſe Cherries which are cultivated in Europe, they are obliged to eat the fruit of theſe ſhrubs.

Theſe plants are preſerved in the gardens of thoſe perſons who are ſo curious in botanical ſtudies, as to erect hot-houſes for maintaining foreign plants: and where there are ſuch conveniencies, theſe plants deſerve a place; becauſe they retain their leaves all the year, and commonly continue flowering from December to the end of March, when they make a fine appearance at a ſeaſon, when there is a ſcarcity of other flowers, and many times they produce ripe fruit here. Thoſe ſorts whoſe leaves are armed with ſtinging briſtles, like the Cowitch, are the leaſt worthy of a place in ſtoves, becauſe they are ſo troubleſome to handle, nor do their flowers make ſo good an appearance as many of the other ſorts. The tenth ſort is the moſt valuable for its flowers, which are produced in larger bunches than thoſe of any of the other, and there being flowers of different colours in the ſame bunches, they make a fine variety; and this ſort grows more like a tree than the others, the leaves are alſo of a ſtronger conſiſtence and of a lucid green.

As theſe plants are natives of the warmeſt parts of America, they will not live through the winter in England, unleſs they are preſerved in a warm ſtove; but when the plants have obtained ſtrength, they may be expoſed in the open air in a warm ſituation, from the middle or latter end of June, till the beginning of October, provided the weather continues ſo long mild; and the plants ſo treated, will flower much better than thoſe which are conſtantly kept in a ſtove.

They are all propagated by ſeeds, which muſt be ſown upon a good hot-bed in the ſpring; and when the plants are fit to tranſplant, they muſt be each put into a ſeparate ſmall pot filled with rich earth, and plunged into a hot-bed of tanners bark, and muſt be treated in the ſame manner as hath been directed for other tender plants of the ſame country; and for the two firſt winters, it will be proper to keep them in the bark-bed in the ſtove; but afterward they may be placed upon ſtands in the dry ſtove in winter, where they may be kept in a temperate warmth, in which they will thrive much better than in a greater heat; theſe muſt be watered two or three times a week, when they are placed in the dry ſtove, but it muſt not be given to them in large quantities.

MALT-DUST is accounted a great enricher of barren ground; it contains in it a natural heat and ſweetneſs, which gives the earth whereon it is laid a proper fermentation, as thoſe who live in malting countries have found by experience.

Some are of opinion, that there is not a greater ſweetener than Malt-duſt, where the grounds are natural clay, and have contracted a ſourneſs and auſterity, whether by reaſon of its having lain long untilled and unexpoſed to the air, or by reaſon of water having ſtood long thereon.

MALVA. Tourn. Inſt. R. H. 94. tab. 23. Lin. Gen. Plant. 751. [ſo called of μαλακίζω, or μαλάσσω, to ſoften, becauſe it is good to ſoften the belly.] Mallows; in French, *Mauve*.

The CHARACTERS are,

*The flower has a double empalement; the outer is compoſed of three ſpear-ſhaped leaves, and is permanent; the inner is of one leaf, cut into five broad ſegments at the brim. The flower is, according to Tournefort, Ray, &c. of one petal; but according to Linnæus, it has five; they are joined at the baſe, and ſpread open, and fall off joined. It has a great number of ſtamina which coaleſce at bottom in a cylinder, but ſpread open above, and are inſerted in the petal, terminated by kidney-ſhaped ſummits. In the center is ſituated an orbicular germen ſupporting a ſhort cylindrical ſtyle, with many briſtly ſtigmas the length of the ſtyle. The empalement afterward turns to ſeveral capſules, which are joined in an orbicular depreſſed head faſtened to the column, opening on their inſide, each containing one kidney-ſhaped ſeed.*



This

This genus of plants is ranged in the fifth section of Linnæus's sixteenth class, intitled Monodelphia Polyandria, which contains those plants whose flowers have many stamina joined with the style in one body.

The SPECIES are,

1. MALVA (*Sylvestris*) caule erecto herbaceo, foliis septem lobatis acutis pedunculis petiolisque pilosis. Lin. Sp. Plant. 969. *Mallow with an erect herbaceous stalk, with seven acute lobes to the leaves, and hairy foot-stalks both to the leaves and flowers.* Malva sylvestris, folio sinuato. C. B. P. 314. *Wild Mallow with a sinuated leaf.*

2. MALVA (*Rotundifolia*) caule prostrato, foliis cordato-orbiculatis obsoletè quinquelobis, pedunculis fructiferis declinatis. Lin. Sp. 969. *Mallow with prostrate stalks, roundish heart-shaped leaves with five obsolete lobes, and the foot-stalks of the fruit declining.* Malva vulgaris, flore minore, folio rotundo. J. B. 2. p. 949. *Common Mallow with a small flower and a round leaf.*

3. MALVA (*Orientalis*) annua, caule erecto herbaceo, foliis lobatis obtusis & crenatis. *Annual Mallow with an erect herbaceous stalk, and obtuse lobed leaves which are crenated.* Malva orientalis erectior, flore magno suavè rubente. Tourn. Cor. 3. *Eastern Mallow with a more upright stalk, and a large, soft, red flower.*

4. MALVA (*Crispa*) caule erecto, foliis angulatis crispis, floribus axillaribus glomeratis. Lin. Sp. 970. *Mallow with an erect stalk, angular curled leaves, and flowers in clusters on the side of the stalks.* Malva foliis crispis. C. B. P. 315. *Furbelowed Mallow.*

5. MALVA (*Verticillata*) caule erecto, foliis angulatis, floribus axillaribus glomeratis sessilibus, calycibus scabris. Vir. Cliff. 356. *Mallow with an erect stalk, angular leaves, and flowers growing in whorls at the wings of the stalks.*

6. MALVA (*Chinensis*) annua, caule erecto herbaceo, foliis suborbiculatis obsoletè quinquelobatis, floribus confertis alaribus sessilibus. *Annual Mallow with an erect, herbaceous, single stalk, leaves almost round, with five indented lobes, and flowers growing in clusters, which sit close to the stalks.* Malva Sinensis erecta, flosculis albis minimis. Boerh. Ind. alt. *Upright annual China Mallow, with very small white flowers.*

7. MALVA (*Cretica*) caule erecto ramoso hirsuto, foliis angulatis, floribus alaribus pedunculis brevioribus. *Mallow with an erect, branching, hairy stalk, angular leaves, and flowers proceeding from the wings of the stalks, which grow upon shorter foot-stalks.* Malva Cretica annua altissima, flore parvo ad alas umbellato. Tourn. Cor. 2. *Tallest annual Mallow of Crete, with small flowers growing in umbels on the sides of the stalk.*

8. MALVA (*Peruviana*) caule erecto herbaceo, foliis lobatis, spicis secundis axillaribus seminibus denticulatis. Lin. Sp. Plant. 968. *Mallow with an erect herbaceous stalk, leaves having lobes, and spikes of flowers in fruitful clusters proceeding from the sides of the stalks, and indented seeds.*

9. MALVA (*Alcea*) caule erecto, foliis multipartitis scabriusculis. Hort. Cliff. 347. *Mallow with an erect stalk, and rough leaves divided into many parts.* Alcea tenuifolia crispa. J. B. 2. 953. *Narrow-leaved curled Vervain Mallow.*

10. MALVA (*Moschata*) foliis radicalibus reniformibus incisis, caulinis quinque partitis pinnato-multifidis. Hort. Upsal. 202. *Mallow with kidney-shaped lower leaves which are cut, and those on the stalks divided into five parts, ending in winged points.* Alcea folio rotundo laciniato. C. B. P. 316. *Round cut-leaved Vervain Mallow.*

11. MALVA (*Ægyptia*) foliis palmatis dentatis, corollis calyce minoribus. Lin. Sp. Plant. 690. *Mallow with hand-shaped indented leaves, and petals less than the empalement.* Alcea Ægyptia, geranii folio. Juss. *Egyptian Vervain Mallow with a Crane's-bill leaf.*

12. MALVA (*Bryonifolia*) foliis palmatis scabris, caule tomentoso fruticoso, pedunculis multifloris. Prod. Leyd. 356. *Mallow with rough hand-shaped leaves, a shrubby woolly stalk, and foot-stalks with many flowers.* Althæa frutescens bryoniæ folio. C. B. P. 316. *Shrubby Vervain Mallow with a Briony leaf.*

13. MALVA (*Tournefortia*) foliis radicalibus quinque partitis, trilobis linearibus, pedunculis folio caulino longioribus, caule procumbente. Amœn. Acad. 4. p. 283. *Mallow with cut leaves having three lobes, which are linear, and a declining stalk.* Alcea maritima Galloprovincialis, geranii folio. Tourn. Inst. 98. *Maritime Vervain Mallow of Provence, with a Crane's-bill leaf.*

14. MALVA (*Capensis*) foliis subcordatis laciniatis hirsutis, caule arborescente. *Mallow with hairy cut leaves, almost heart-shaped, and a tree-like stalk.* Malva Africana frutescens, flore rubro. Hort. Amst. 2. p. 171. *African shrubby Mallow with a red flower.*

15. MALVA (*Americana*) foliis cordatis crenatis, floribus lateralibus solitariis, terminalibus spicatis. Prod. Leyd. 359. *Mallow with heart-shaped crenated leaves, and flowers growing singly from the sides of the stalks, and in spikes at the top.* Althæa Americana, pumila, flore luteo spicato. Breyn. Cent. 124. *Low American Marshmallow, with a yellow spiked flower.*

The two first sorts are found wild in most parts of England, so are rarely cultivated in gardens. The first is the sort commonly used in medicine, with which the markets are supplied by the herbfolks, who gather it in the fields. These are both so well known, as to need no description. There is a variety of the first with white flowers, which continues the same from seeds; but as it only differs in the colour of the flower, so it cannot be reckoned a distinct species.

The third sort was discovered by Dr. Tournefort in the Levant, this is an annual plant with an erect stalk; the flowers are larger than those of the common sort, and are of a soft red colour. This is preserved in some curious gardens for the sake of variety.

The fourth sort is annual; this rises with an upright stalk four or five feet high; the leaves are curled on their edges, for which variety it is preserved in gardens.

The fifth sort was discovered first by Dr. Tournefort, and afterward by Dr. Sherard, in the Levant, who sent the seeds to several gardens, where the plants have produced flowers and seeds; which having scattered in those gardens so plentifully, as to become as common as our native sorts.

The sixth sort was formerly sent from China as a pot-herb, and hath been cultivated in some curious gardens in England; though it is not likely to obtain here as an esculent plant, since we have many others which are preferable to it for that purpose. This is an annual plant, which will propagate itself fast enough, provided it be permitted to scatter its seeds, when they seldom fail to grow, and are often very troublesome when they have gotten possession of the ground.

The seventh sort grows naturally in Crete; this plant is annual, the stalks rises rather higher than that of our common Mallow, and the branches extend farther, and are in greater plenty; the leaves are angular, and the flowers stand on short foot-stalks. This will be very common, provided the seeds are permitted to scatter.

The eighth sort grows naturally in Peru, from whence the seeds were sent to the Royal Garden at Paris, by Mr. Joseph de Jussieu. This is an annual plant, rising with an upright branching stalk near two feet high, garnished with broad hairy leaves, having three lobes. The flowers grow in spikes from the wings of the stalks; they are small, of a pale blue, and set very closely on the spikes. These appear in June, and are succeeded by seeds, which, if permitted to scatter, will come up plentifully the following spring without care.

The ninth sort is the common Vervain Mallow, which is found growing naturally near London. It is a biennial plant; the stalks rise higher than those of the former, the leaves are cut into obtuse lobes which are indented. The flowers are large, appearing in June and July, and the seeds ripen in autumn.

The tenth sort differs from the ninth, in having taller hairy stalks, and the leaves being kidney-shaped, and

and finely cut into narrow segments. This grows naturally in the middle counties of England, and about Paris.

The eleventh sort was sent from Egypt to the Royal Garden at Paris, and hath since been communicated to many other gardens. This is an annual plant, whose stalks are about a foot long; they are smooth, and decline toward the ground. The leaves stand upon pretty long foot-stalks, they are shaped like a hand, having five divisions which join at their base to the foot-stalk, and are indented on their sides. The flowers come out single from the wings of the stalk, and at the top in clusters; they have pretty large acute empalements; the flowers are small, and of a pale blue colour. These appear in June, and the seeds ripen in autumn.

The twelfth sort grows naturally in Spain; this rises with a shrubby woolly stalk four or five feet high, sending out branches on every side, garnished with angular woolly rough leaves; the foot-stalks arise from the wings of the leaves, each supporting four or five flowers of a bright purple colour, shaped like those of the common Mallow, which appear in July, and the seeds ripen in autumn. This sort seldom continues more than two or three years, but if the seeds are permitted to scatter, young plants will come up the following spring.

The thirteenth sort grows naturally in the south of France; this is an annual plant, which has some resemblance of the former, but the stalks are longer and more branched; the leaves are cut into five obtuse lobes almost to the bottom, and these are deeply cut on their side. The flowers stand upon very long foot-stalks; the empalement of the flower is large, prickly and acute-pointed; the flowers are blue, and larger than those of the other sort. It flowers and ripens its seeds about the same time.

The fourteenth sort grows naturally at the Cape of Good Hope; this rises with a woody stalk ten or twelve feet high, sending out branches from the side the whole length; the stalks and branches are closely covered with hairs, and are garnished with hairy leaves, which are indented on the sides, so as to have the appearance of a trilobate leaf; these on the young plants are three inches long and two broad at their base, but as the plants grow older, they are scarce half that size. The flowers come out from the side of the branches, upon foot-stalks an inch long; they are of a deep red colour, and shaped like those of the common Mallow, but are smaller. This plant continues flowering great part of the year, which renders it valuable.

There are two other varieties of this plant, which have been mentioned by some authors as distinct species. The first is, Alcea Africana frutescens, grossulariæ folio ampliore, unguibus florum atro-rubentibus. Act. Phil. 1729. *Shrubby African Vervain Mallow, with a larger Gooseberry leaf, and the bottoms of the flower of a dark red.* The other is, Alcea Africana frutescens, folio grossulariæ flore parvo rubro. Boerh. Ind. alt. 1. 271. *Shrubby African Vervain Mallow, with a Gooseberry leaf, and a small red flower.* The leaves of the last appear very different from either of the other, being deeply divided into three lobes, which are also deeply indented, so that any person upon seeing it would suppose it to be a different species; but I have frequently raised all these, with some other intermediate varieties, from the seeds of one plant.

This plant is easily propagated by seeds, which, if sown in a common border in the spring, the plants will come up; but as it is too tender to live abroad in the winter, so when the plants are three or four inches high, they should be each planted into a separate pot of light fresh earth, placing them in the shade till they have taken fresh root; then they may be removed to a sheltered situation, intermixing them with other hardy exotic plants, where they may remain till autumn; when the frost comes on they should be removed into the green-house, and afterward treated in the same way as the hardy plants from the same country, always allowing them plenty of free air in mild weather.

The fifteenth sort grows naturally in most of the islands in the West-Indies. This is an annual plant, which rises about a foot high, sending out a few short branches from the side, which are woolly, and garnished with heart-shaped woolly leaves which are crenated on their edges, and are placed alternately upon pretty long foot-stalks. The flowers are produced singly from the side of the stalk, and in a close spike at the top; they are small, and of a pale yellow colour. They appear in July, and the seeds ripen in autumn.

This is propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be each planted in a separate small pot filled with light fresh earth, and plunged into a new hot-bed, shading them until they have taken fresh root; then they must have free air admitted to them in proportion to the warmth of the season, and the latter end of June they may be placed in the open air in a sheltered situation, where they will flower and produce ripe seeds.

The seeds of the other species should be sown the end of March, upon a bed of fresh light earth, and when the plants are up three or four inches high, they should be transplanted where they are designed to be continued, allowing them a good distance; for if they are planted too close, they do not appear so well; but they are best when intermixed with other flowers of the same growth, where they afford an agreeable variety.

These seeds may also be sown in August, for the plants will endure the greatest cold of our climate, if placed on a dry soil, and will grow larger, and flower sooner than those sown in the spring; or if the seeds are permitted to scatter, they will come up as the former sorts, and thrive equally well.

MALVA ARBOREA. See LAVATERA.

MALVA ROSEA. See ALCEA.

MALUS. The Apple-tree.

The CHARACTERS are,

*The empalement of the flower is of one leaf, cut into five segments. The flower consists of five leaves, which expand in form of a Rose, whose tails are inserted into the empalement. The fruit is hollowed about the foot-stalk, is for the most part roundish, and umbellated at th top; it is fleshy, and divided into five cells or partitions, in each of which is lodged one oblong seed.*

Dr. Linnæus has joined the Pear, Apple, and Quince together, making them all of the same genus, and has reduced all the varieties of each to one species. The Apple he distinguishes by the title of Pyrus foliis serratis, pomis basi concavis. Hort. Cliff. i. e. *Pear with sawed leaves, and the Apple hollow at the base.* But where the fruit is admitted as a distinguishing character of the genus, the Apple should be separated from the Pear, this distinction being founded in nature; for these fruits will not take by budding or grafting upon each other, though it be performed with the utmost care. Indeed I have sometimes succeeded so far, as to have the bud or graft of an Apple shoot when grafted on a Pear, but they soon decayed, notwithstanding all possible care was taken of them; therefore I shall beg leave to continue the separation of the Apple from the Pear, as hath been always practised by the botanists before his time.

The SPECIES are,

1. MALUS (*Sylvestris*) foliis ovatis serratis, caule arboreo. *Apple with oval sawed leaves, and a tree-like stalk.* Malus sylvestris, fructu valde acerbo. Tourn. Inst. R. H. 635. *Wild Apple with a very sour fruit, commonly called Crab.*
2. MALUS (*Coronaria*) foliis serrato-angulosis. *Apple with angular sawed leaves.* Malus sylvestris Virginiana, floribus odoratis, Cat. Hort. *Wild Crab of Virginia, with a sweet-scented flower.*
3. MALUS (*Pumila*) foliis ovatis serratis, caule fruticoso. *Apple with oval sawed leaves and a shrubby stalk.* Malus

pumila quæ potiùs frutex quam arbor. C. B. P. 433. *Dwarf Apple, which is rather a shrub than a tree, commonly called Paradise Apple.*

Of the first sort there are two varieties of fruit, one is white, and the other purple toward the sun, but these are accidental variations. There is also a variety of this with variegated leaves, which has been propagated in some of the nurseries near London; but when the trees grow vigorous, their leaves soon become plain.

The second sort grows naturally in most parts of North America, where the inhabitants plant them for stocks to graft other sorts of Apples upon; the leaves of this are longer and narrower than any of the other sorts, and are cut into two acute angles on their sides. The flowers of this have a fragrant odour, which perfumes the American woods at the time they appear.

The third sort is undoubtedly a distinct species from all the others, for it never rises to any height; the branches are weak, scarce able to support themselves, and this difference is permanent when raised from seeds.

I have not distinguished the Apples from the Crab, as distinct species, though I have never seen any Apples produced from the seeds of Crabs. I shall next mention a few of those sorts of Apples which have been introduced from France, which were most of them grafted on Paradise stocks, so were for some time much esteemed, and shall mention those of our own growth afterward.

There is also a sort of Apple, called the Fig Apple, which is common to England and North America, but the fruit is not greatly esteemed; however, as some persons are fond of variety, so I have mentioned it.

Pomme de Rambour. The Rambour is a very large fruit, of a fine red next the sun, and striped with a pale or yellowish green. This ripens very early, commonly about the end of August, and soon grows meally, therefore is not esteemed in England.

Pomme de Courpendu, the hanging body. This is a very large Apple, of an oblong figure, having some irregular rising or angles, which run from the base to the crown; it is of a red cast on the side toward the sun, but pale on the other side; the foot-stalk is long and slender, so that the fruit is always hanging downward, which occasioned the French gardeners to give it this name.

The Rennette-blanche, or White Renette, or French Rennette. This is a large fine fruit, of a roundish figure, and of a pale green, changing a little yellowish when ripe, having some small gray spots; the juice is sugary, and it is good for eating or baking; it will keep till after Christmas sound.

The Rennette-grise. This is a middle sized fruit, shaped like the Golden Rennette, but is of a deep gray colour on the side next the sun; but on the other side intermixed with yellow; it is a very juicy good Apple, of a quick flavour. It ripens in October, and will not keep long.

Pomme d'Api. This is a small hard fruit, of a bright purple colour on the side next the sun, and of a yellowish green on the other side; it is a very firm fruit, but hath not much flavour, so is only preserved by some persons by way of curiosity. It keeps a long time sound, and makes a variety in a dish of fruit.

Le Calville d'Automne, the Autumn Calville. This is a large fruit of an oblong figure, of a fine red colour toward the sun. The juice is vinous, and much esteemed by the French.

Fenouillat ou Pomme d'Anis, the Fennel, or Anise Apple. This is a middle sized fruit, a little longer than a Golden Pippin, of a grayish colour. The pulp is tender, and has a spicy taste like Anise-seed; the wood and the leaves are whitish.

Pomme Violette, the Violet Apple. This is a pretty large fruit, of a pale green, striped with deep red to the sun. The juice is sugary, and has a flavour of Violets, which occasioned the name.

The Crab, which is the first sort here mentioned, has been generally esteemed as the best stock for grafting Apples upon, being very hardy, and of long duration; but of late years there have been few persons who have been curious enough to raise these stocks, having commonly sown the kernels of all sorts of cyder Apples for stocks without distinction, as these are much easier to procure than the other; so the gardeners generally call all those Crabs, which are produced from the kernels of any sort of Apple which has not been grafted; but were the kernels of the Crabs sown, I should prefer those for stocks, because they are never so luxuriant in their growth as those from Apple kernels, and they will continue longer sound; beside, these will preserve some of the best sort of Apples in their true size, colour, and flavour; whereas the other free stocks produce larger fruit, which are not so well tasted, nor will they keep so long.

The Paradise Apple for some years past was greatly esteemed for stocks, to graft or bud the other sorts upon; but these are not of long duration, nor will the trees grafted upon them ever grow to any size, unless they are planted so low as that the cion may strike root into the ground, when it will be equal to no stock; for as the graft will draw its nourishment from the ground, so the stocks will become useless after; therefore it is only by way of curiosity, or for very small gardens, that these stocks are proper, since there can never be expected any considerable quantity of fruit from such trees.

These trees have been much more esteemed in France, where they were frequently brought to the table in the pots, growing with their fruit upon them; but this being only a curiosity, it never obtained much in England, so that the gardeners do not propagate many of them here at present.

There is another Apple, which is called the Dutch Paradise Apple, much cultivated in the nurseries for grafting Apples upon, in order to have them dwarfs; and these will not decay or canker as the other, nor do they stint the grafts near so much, so are generally preferred for planting espaliers or dwarfs, being easily kept within the compass usually allotted to these trees.

Some persons have also made use of the Codlin stocks to graft Apples upon, in order to make them dwarf; but the fruit which are produced on such trees are not so firm, nor do they last near so long as those upon Crab stocks; therefore the winter fruits should never be grafted upon them.

The Virginian Crab-tree with sweet flowers, is often preserved by such persons as are curious in collecting great variety of trees; it may be propagated by budding or grafting it upon the common Crab or Apple-tree, but it is somewhat tender while young; wherefore it should be planted in a warm situation, otherwise it will be subject to suffer by an extreme hard winter. The flowers of this tree are said to be exceeding sweet in Virginia, where it grows in the woods in great plenty; but I could not observe much scent in some of them which have flowered in England, so that I am in doubt whether the sort at present in the gardens is the very same with that of Virginia; or perhaps it may have degenerated by sowing the seeds, which is the way it was first obtained in England.

The Fig Apple is supposed by many persons to be produced without a previous flower. But this opinion is rejected by more curious observers, who affirm, there is a small flower precedes the fruit, which is very fugacious, seldom continuing above a day or two. Now, which of these opinions is the right, I have not, as yet, had an opportunity to determine, not having a tree in my own possession which is arrived at maturity to produce fruit; though it might reasonably be expected, that such who have had trees of this kind several years, might have determined this point long before this time.

I remember an account of a tree of this kind, mentioned in a letter from New England, written by Paul Dudley, Esq; to the Royal Society, and published in the Philosophical Transactions, N° 385. which was

exceeding large, and produced great quantities of fruit, without any previous flowers; but it grew at ſome diſtance from his habitation, and he having no other opportunity to obſerve it ſtrictly himſelf, but by viſiting the place two or three times about the ſeaſon of flowering, and not being apprized of the ſudden decay of the flowers, they might eaſily be ſuppoſed to have appeared and dropped off, between the times of his viſiting the place.

The other ſorts which are above-mentioned, are what have been introduced from France, but there are not above two or three of them, which are much eſteemed in England, viz. the French Rennette, the Rennette-griſe, and the Violet Apple; the other being early fruit, which do not keep long, and their fleſh is generally meally, ſo they do not deſerve to be propagated, as we have many better fruits in England: but as there may be ſome perſons who are willing to have all the ſorts, I have mentioned them here for their inſtruction; but I ſhall next put down thoſe ſorts of Apples which are beſt eſteemed in England, placing them in the order according to their time of ripening.

The firſt Apple which is brought to the markets, is the Codlin. This fruit is ſo well known in England, that it is needleſs to deſcribe it.

The next is the Margaret Apple: this fruit is not ſo long as the Codlin, of a middling ſize; the ſide next the ſun changes to a faint red, when ripe; the other ſide is of a pale green; the fruit is firm, of a quick pleaſant taſte, but doth not keep long.

The Summer Pearmain is an oblong fruit, ſtriped with red next the ſun; the fleſh is ſoft, and in a ſhort time is meally, ſo that it is not greatly eſteemed.

The Kentiſh Fill Baſket is a ſpecies of Codlin, of a large ſize, and ſomewhat longer ſhaped than the Codlin; this ripens a little later in the ſeaſon, and is generally uſed for baking, &c.

The Tranſparent Apple: this was brought to England a few years ſince, and was eſteemed a curioſity; it came from Peterſburgh, where it is affirmed to be ſo tranſparent, as that the kernels may be perfectly ſeen, when the Apple is held to the light; but, in this country, it is a meally inſipid fruit, ſo not worth propagating.

Loan's Pearmain: this is a beautiful fruit, being of a middling ſize; the ſide next the ſun is of a beautiful red, and ſtriped with the ſame colour on the other; the fleſh is vinous, but as it ſoon grows meally, it is not greatly eſteemed.

The Quince Apple: this is a ſmall fruit, ſeldom larger than the Golden Pippin, but is in ſhape like the Quince, eſpecially toward the ſtalk; the ſide next the ſun is of a ruſſet colour, on the other ſide inclining to yellow: this is an excellent Apple for about three weeks in September, but will not keep much longer.

The Golden Renette is a fruit ſo well known in England, as to need no deſcription; this ripens about Michaelmas, and for about a month is a very good fruit, either for eating raw or baking.

The Aromatic Pippin is alſo a very good Apple: it is about the ſize of a Nonpareil, but not ſo flat, it is a little longer; the ſide next the ſun is of a bright ruſſet colour; the fleſh is breaking, and hath an aromatic flavour. It ripens in October.

The Hertfordſhire Pearmain, by ſome called the Winter Pearmain: this is a good ſized fruit, rather long than round, of a fine red next the ſun, and ſtriped with the ſame colour on the other ſide; the fleſh is juicy, and ſtews well, but is not eſteemed for eating by any nice palates. This is fit for uſe in November and December.

The Kentiſh Pippin is a large handſome fruit, of an oblong figure; the ſkin is of a pale green colour; the fleſh is breaking, and full of juice, which is of a quick acid flavour. This is a very good kitchen fruit, and will keep till February.

The Holland Pippin is larger than the former; the fruit is ſomewhat longer, the ſkin of a darker green, and the fleſh firm and juicy. This is a very good kitchen fruit, and will keep late in the ſeaſon.

The Monſtrous Renette is a very large Apple, of an oblong ſhape, turning red toward the ſun, but of a dark green on the other ſide; the fleſh is apt to be meally, ſo it is not much valued by thoſe who are curious, and only preſerved for the magnitude of the fruit.

The Embroidered Apple is a pretty large fruit, ſomewhat ſhaped like the Pearmain, but the ſtripes of red are very broad, from whence the gardeners have given it this title: it is a middling fruit, and is commonly uſed as a kitchen Apple, though there are many better.

The Royal Ruſſet, by ſome called the Leather Coat Ruſſet, on account of the deep ruſſet colour of the ſkin; this is a large fair fruit, of an oblong figure, broad toward the baſe; the fleſh is inclinable to yellow. This is one of the beſt kitchen Apples we have, and is a very great bearer: the trees grow large and handſome, and the fruit is in uſe from October till April, and is alſo a pleaſant fruit to eat.

Wheeler's Ruſſet is an Apple of a middling ſize, flat, and round; the ſtalk is ſlender, the ſide next the ſun of a light ruſſet colour, and the other ſide inclining to a pale yellow, when ripe; the fleſh is firm, and the juice has a very quick acid flavour, but is an excellent kitchen fruit, and will keep a long time.

Pile's Ruſſet is not quite ſo large as the former, but is of an oval figure, of a ruſſet colour to the ſun, and of a dark green on the other ſide; it is a very firm fruit, of a ſharp acid flavour, but is much eſteemed for baking, and will keep ſound till April, or later, if they are well preſerved.

The Nonpareil is a fruit pretty generally known in England, though there is another Apple which is frequently ſold in the markets for it, which is what the French call Haute-bonne; this is a larger fairer fruit than the Nonpariel, more inclining to the yellow; the ruſſet colour brighter, and it is earlier ripe, and ſooner gone; this is not ſo flat as the true Nonpareil, nor is the juice ſo ſharp, though it is a good Apple in its ſeaſon; but the Nonpareil is ſeldom ripe before Chriſtmas, and where they are well preſerved they will keep till May perfectly ſound; this is juſtly eſteemed one of the beſt Apples that have been yet known.

The Golden Pippin is a fruit almoſt peculiar to England; there are few countries abroad where this ſucceeds well, nor do they produce ſo good fruit in many parts of England as were to be wiſhed; which, in ſome meaſure, is owing to their being grafted on free ſtocks, which enlarges the fruit, but renders it leſs valuable, becauſe the fleſh is not ſo firm, nor the flavour ſo quick, ſo is apt to be dry and meally; therefore this ſhould always be grafted upon the Crab ſtock, which will not canker like the others, and though the fruit will not be ſo fair to the ſight, yet it will be better flavoured and keep longer.

There are yet a great variety of Apples, which, being inferior to thoſe here mentioned, I have omitted, as thoſe which are here enumerated will be ſufficient to furniſh the table and the kitchen, during the whole ſeaſon of theſe fruits; ſo that where theſe ſorts can be had, no perſon of taſte will eat the other.

I ſhall here mention ſome of the Apples which are chiefly preferred for the making of cyder, tho' there are in every cyder country, new ſorts frequently obtained from the kernels; but thoſe hereafter mentioned, have, for ſome years, been in the greateſt eſteem.

The Red-ſtreak.
Devonſhire Royal Wilding.
The Whitſour.
Herefordſhire Under Leaf.
John Apple, or Doux-annes.
Everlaſting Hanger.
Gennet Moyle.

All the ſorts of Apples are propagated by grafting or budding upon the ſtocks of the ſame kind, for they

will

will not take upon any other ſort of fruit tree. In the nurſeries there are three ſort of ſtocks generally uſed to graft Apples upon; the firſt are called free ſtocks; theſe are raiſed from the kernels of all ſorts of Apples indifferently, and ſometimes they are alſo termed Crab ſtocks; for all thoſe trees which are produced from the ſeeds before they are grafted, are termed Crabs without any diſtinction; but, as I have before obſerved, I ſhould always prefer ſuch ſtocks as are raiſed from the kernels of Crabs, where they are preſſed for verjuice; and I find ſeveral of the old writers on this ſubject of the ſame mind. Mr. Auſten, who wrote above a hundred years ago, ſays, "The "ſtock which he accounts beſt for Apple grafts is "the Crab, which is better than ſweeter Apple-trees "to graft on, becauſe they are uſually free from "canker, and will become very large trees; and, I "conceive, will laſt longer than ſtocks of ſweeter "Apples, and will make fruits more ſtrong and hardy "to endure froſt;" and it is very certain, that by frequently grafting ſome ſorts of Apples upon free ſtocks, the fruits have been rendered leſs firm and poignant, and of ſhorter duration.

The ſecond ſort of ſtock is the Dutch Creeper, before-mentioned; theſe are deſigned to ſtint the growth of the trees, and keep them within compaſs for dwarfs or eſpaliers.

The third ſort is the Paradiſe Apple, which is a very low ſhrub, ſo only proper for trees which are kept in pots, by way of curioſity, for theſe do not continue long.

Some perſons have made uſe of Codlin ſtocks for grafting of Apples, in order to ſtint their growth; but as theſe are commonly propagated by ſuckers, I would by no means adviſe the uſing of them; nor would I chuſe to raiſe the Codlin-trees from ſuckers, but rather graft them upon Crab ſtocks, which will cauſe the fruit to be firmer, laſt longer, and have a ſharper flavour; and theſe trees will laſt much longer ſound, and never put out ſuckers, as the Codlins always do, which, if not conſtantly taken off, will weaken the trees, and cauſe them to canker: and it is not only from the roots, but from the knots of their ſtems, there are generally a great number of ſtrong ſhoots produced, which fill the trees with uſeleſs ſhoots, and render them unſightly, and the fruit ſmall and crumpled.

The method of raiſing ſtocks from the kernels of Crabs, or Apples, is, to procure them where they are preſſed for verjuice or cyder, and after they are cleared of the pulp, they may be ſown upon a bed of light earth, covering them over about half an inch thick with the ſame light earth; theſe may be ſown in November or December, where the ground is dry, but in wet ground, it will be better to defer it till February; but then the ſeeds ſhould be preſerved in dry ſand, and kept out of the reach of vermin, for if mice or rats can get at them, they will devour the ſeeds; there ſhould alſo be care taken of the ſeeds, when they are ſown, to protect them from theſe vermin, by ſetting traps to take them, &c. In the ſpring, when the plants begin to appear, they muſt be carefully weeded, and if the ſeaſon ſhould prove dry, it will be of great ſervice to water them two or three times a week; and, during the ſummer, they muſt be kept clean from weeds, which, if ſuffered to grow, will ſoon over-top the plants, and ſpoil their growth; if theſe thrive well, they will be fit to tranſplant into the nurſery the October following, at which time the ground ſhould be carefully digged, and cleanſed from the roots of all bad weeds; then the ſtocks ſhould be planted in rows three feet aſunder, and the plants one foot diſtance in the rows, cloſing the earth pretty faſt to their roots; when the ſtocks are tranſplanted out of the ſeed-bed, the firſt autumn after ſowing, they need not be headed, but where they are inclined to ſhoot downward, the tap root muſt be ſhortened, in order to force out horizontal roots; if the ground is pretty good in which theſe ſtocks are planted, and the weeds conſtantly cleared away, the ſtocks will make great progreſs, ſo that thoſe which are intended for dwarfs, may be grafted the ſpring twelve months after they are planted out of the ſeed-bed; but thoſe which are deſigned for ſtandards will require two or three years more growth, before they will be fit to graft, by which time they will be upward of ſix feet high. The other neceſſary work to be obſerved in the culture of theſe trees, while they remain in the nurſery, being exhibited under the article of NURSERY, I ſhall not repeat in this place.

I ſhall next treat of the manner of planting ſuch of theſe trees, as are deſigned for eſpaliers in the kitchen-garden, where, if there is an extent of ground, it will be proper to plant, not only ſuch ſorts as are for the uſe of the table, but alſo a quantity of trees to ſupply the kitchen; but where the kitchen-garden is ſmall, the latter muſt be ſupplied from ſtandard-trees, either from the orchard, or wherever they are planted; but as many of theſe kitchen Apples are large, and hang late in the autumn upon the trees, they will be much more expoſed to the ſtrong winds on ſtandard trees than in eſpaliers, whereby many of the fruit will be blown down before they are ripe, and others bruiſed, ſo as to prevent their keeping; therefore where it can be done, I ſhould always prefer the planting them in eſpaliers.

The diſtance which I ſhould chuſe to allow theſe trees, ſhould not be leſs than thirty feet, for ſuch ſorts as are of moderate growth (if upon Crab or free ſtocks:) but the larger growing ſorts ſhould not be allowed leſs room than thirty-five or forty feet, which will be found full near enough, if the ground is good, and the trees properly trained; for as the branches of theſe trees ſhould not be ſhortened, but trained at their full length, ſo in a few years they will be found to meet. Indeed, at the firſt planting, the diſtance will appear ſo great to thoſe perſons who have not obſerved the vigorous growth of theſe trees, that they will ſuppoſe they never can extend their branches ſo far, as to cover the eſpalier; but if theſe perſons will but obſerve the growth of ſtandard-trees of the ſame kinds, and ſee how wide their branches are extended on every ſide, they may be ſoon convinced, that as theſe eſpalier-trees are allowed to ſpread but on two ſides, they will of courſe make make more progreſs, as the whole nouriſhment of the root will be employed in theſe ſide branches, than where there is a greater number of branches on every ſide of the tree, which are to be ſupplied with the ſame nouriſhment.

The next thing to be obſerved is the making choice of ſuch ſorts of fruits as grow nearly alike; to plant in the ſame eſpalier. This is of great conſequence, becauſe of the diſtance they are to be placed, otherwiſe thoſe ſorts which make the largeſt ſhoots, may be allowed leſs room to ſpread than thoſe of ſmaller growth; beſide, when all the trees in one eſpalier are nearly equal in growth, they will have a better appearance than when ſome are tall, and others ſhort; but for the better inſtruction of thoſe perſons who are not converſant in theſe things, I ſhall divide the ſorts of Apples into three claſſes according to their different growths.

| Largest growing tree. | Middle growing tree. | Smallest growing tree. |
|---|---|---|
| All the sorts of Pearmains. | Margaret Apple. | Quince Apple. |
| Kentish Pippin. | Golden Renette. | Transparent Apple. |
| Holland Pippin. | Aromatic Pippin. | Golden Pippin. |
| Monstrous Renette. | Embroidered Apple. | Pomme d'Api. |
| Royal Russet. | Renette Grise. | Fenouillet, or Anis Apple. |
| Wheeler's Russet. | White Renette. | |
| Pile's Russet. | Codlin. | |
| Nonpareil. | | |
| Violet Apple. | | |

N. B. These are all supposed to be grafted on the same sort of stocks.

If these Apples are grafted upon Crab stocks, I would willingly place them at the following distance from each other, especially where the soil is good, viz. the largest growing trees at forty feet, the middle growing at thirty feet, and the small growing at twenty-five feet, which, from constant experience, I find to be full near enough; for in many places, where I have planted these trees at twenty-four feet distance, they have shot so strong, as that in seven years their branches have met; and in some places where every other tree hath been taken up, the branches have almost joined in seven years after; therefore it will be much the better way to plant these trees at a proper distance at first, and between these to plant some Dwarf Cherries, Currants, or other sorts of fruit, to bear for a few years, which may be cut away when the Apple-trees have extended their branches to them; for when the Apple-trees are planted nearer together, few persons care to cut down the trees, when they are fruitful, so that they are obliged to use the knife, saw, and chisel, more than is proper for the future good of the trees; and many times, where persons are inclinable to take away part of their trees, the distances will be often so irregular (where there was not this consideration in their first planting,) as to render the espalier unsightly.

When the trees are upon the Dutch Dwarf stock, the distance should be for the larger growing trees thirty feet, for those of middle growth twenty-five, and the smallest twenty feet, which will be found full near where the trees thrive well.

The next is the choice of the trees, which should not be more than two years growth from the graft, but those of one year should be preferred; you should also be careful, that their stocks are young, sound, and smooth, free from canker, and which have not been cut down once or twice in the nursery; when they are taken up, all the small fibres should be entirely cut off from their roots, which, if left on, will turn mouldy and decay, so will obstruct the new fibres, which will soon push out, in their growth; the extreme part of the roots must also be shortened, and all bruised roots cut off; and if there are any misplaced roots which cross each other, they should also be cut away. As to the pruning of the head of these trees, there need be nothing more done than to cut off any branches which are so situated, as that they cannot be trained to the line of the espalier: in the planting, there must be care taken not to place their roots too deep in the ground, especially if the soil is moist, but rather raise them on a little hill, which will be necessary to allow for the raising of the borders afterward. The best season for planting these trees (in all soils which are not very moist) is, from October, to the middle or latter end of November, according as the season continues mild; but so soon as the leaves fall, they may be removed with great safety. After the trees are planted, it will be proper to place down a stake to each tree, to which the branches should be fastened, to prevent the winds from shaking or loosening their roots, which will destroy the young fibres; for when these trees are planted pretty early in autumn, they will very soon push out a great number of new fibres, which, being very tender, are soon broken, by the wind shaking of the trees, whereby they are greatly injured. If the winter should prove severe, it will be proper to lay some rotten dung, tanners bark, or some other sort of mulch about their roots, to prevent the frost from penetrating of the ground, which might damage these tender fibres; but I would not advise the laying of this mulch before the frost begins, for if it is laid over the surface of the ground about their roots, soon after the trees are planted (as is often practised,) it will prevent the moisture entering the ground, and do much more harm than good to the trees.

The following spring, before the trees begin to push, there should be two or three short stakes put down on each side every tree, to which the branches should be fastened down as horizontally as possible, never cutting them down, as is by some practised, for there will be no danger of their putting out branches enough to furnish the espalier, if the trees are once well established in their new quarters.

In the pruning of these trees, the chief point is, never to shorten any of the branches, unless there is an absolute want of shoots to fill the spaces of the espalier; for where the knife is much used, it only multiplies useless shoots, and prevents their fruiting; so that the best method to manage these trees is, to go over them three or four times in the growing season, and rub off all such shoots as are irregularly produced, and train the others down to the stakes in the position they are to remain: if this is carefully performed in summer, there will be little left to be done in the winter, and by bending of their shoots from time to time, as they are produced, there will be no occasion to use force to bring them down, nor any danger of breaking the branches. The distance which these branches should be trained from each other, for the largest sorts of fruits should be about seven or eight inches, and for the smaller four or five. If these plain instructions are followed, it will save much unnecessary labour of pruning, and the trees will, at all times, make a handsome appearance; whereas when they are suffered to grow rude in summer, there will be much greater difficulty to bring down their shoots, especially if they are grown stubborn, when it may become necessary to slit the branches to make them pliable. All the sorts of Apples produce their fruit upon cursons, or spurs, so that these should never be cut off, for they will continue fruitful a great number of years.

The method of making the espaliers having been already exhibited under that article, I need not repeat it here, but only observe, that it will be best to defer making the espalier till the trees have had three or four years growth; for before that time, the branches may be supported by a few upright stakes, so that there will be no necessity to make the espalier, until there are sufficient branches to furnish all the lower part.

I shall now treat of the method to plant orchards, so as to have them produce the greatest profit. And first, in the choice of the soil and situation for an orchard: the best situation for an orchard is, on the ascent of the gentle hills, facing the south, or south-east; but this ascent must not be too steep, lest the earth should be washed down by hasty rains. There

are many perſons who prefer low ſituations at the foot of hills, but I am thoroughly convinced from experience, that all bottoms where there are hills on each ſide, are very improper for this purpoſe; for the air is drawn down into theſe vallies in ſtrong currents, which, being pent in renders theſe bottoms much colder than the open ſituations; and during the winter and ſpring, theſe bottoms are very damp and unhealthy to all vegetables; therefore the gentle riſe of a hill, fully expoſed to the ſun and air, is by much the beſt ſituation. As to the ſoil, a gentle hazel loam, which is eaſy to work, and that doth not detain the wet, is the beſt; if this happens to be three feet deep, it will be better for the growth of the trees, for although theſe trees will grow upon very ſtrong land, yet they are ſeldom ſo thriving, nor are their fruit ſo well flavoured, as thoſe which grow on a gentle ſoil; and on the other hand, theſe trees will not do well upon a very dry gravel or ſand, therefore thoſe ſoils ſhould never be made choice of for orchards.

The ground intended to be planted ſhould be well prepared the year before, by ploughing it thoroughly, and if ſome dung is laid upon it the year before, it will be of great ſervice to the trees; if in the preceding ſpring a crop of Peas or Beans is planted on the ground (provided they are ſown or planted in rows, at a proper diſtance, ſo as that the ground between them is horſe-hoed,) it will deſtroy the weeds, and looſen the ground, ſo that it will be a good preparation for the trees, for the earth cannot be too much wrought, or pulveriſed for this purpoſe: theſe crops will be taken off the ground long before the ſeaſon for planting of theſe trees, which ſhould be as ſoon as poſſible performed when the trees begin to ſhed their leaves.

In chuſing of the trees, I would adviſe the taking ſuch as are but of two years growth from the graft, and never to plant old trees, or ſuch as are grafted upon old ſtocks, for it is loſing of time to plant theſe; young trees being always more certain to grow, and make a much greater progreſs than thoſe which are old. As to pruning of the roots, it muſt be done in the ſame manner as hath been already directed for the eſpalier-trees; and in pruning their heads, little more is neceſſary than to cut out ſuch branches as are ill placed, or that croſs each other; for I do not approve the heading of them down, as is by ſome often practiſed to the loſs of many of their trees.

The diſtance which theſe trees ſhould be planted, where the ſoil is good, muſt be fifty or ſixty feet; and where the ſoil is not ſo good, forty feet may be ſufficient; but nothing can be of worſe conſequence, than the crowding trees too cloſe together in orchards. And although there may be ſome who may imagine this diſtance too great, yet I am ſure, when they have thoroughly conſidered the advantages attending this practice, they will agree with me. Nor is it my own opinion in this affair, for in many of the old writers on this ſubject, there is often mention made of the neceſſity for allowing a proper diſtance to the fruit-trees in orchards, particularly Auſten, upon planting before quoted, who ſays, "He ſhould chuſe to "preſcribe the planting theſe trees fourteen or ſix-"teen yards aſunder; for both trees and fruits have "many great advantages, if planted a good diſtance "one from another." One advantage he mentions is, "The ſun refreſhes every tree, the roots, body, "and branches, with the bloſſoms and fruits; where-"by trees bring forth more fruit, and thoſe fairer and "better." Another advantage he mentions is, "That "when trees are planted at a large diſtance, much "profit may be made of the ground under and about "theſe trees, by cultivating garden-ſtuff, commo-"dious as well for ſale as houſekeeping; as alſo "Gooſeberries, Raſpberries, Currants, and Straw-"berries, may be there planted." Again he ſays, "When trees have room to ſpread, they will grow "very large and great; and the conſequences of that "will be, not only multitudes of fruits, but alſo "long laſting, and theſe two are no ſmall advan-"tages." For, ſays he, "Men are miſtaken, when "they ſay, the more trees in an orchard, the more "fruits; for one or two large trees which have room "to ſpread, will bear more fruits than ſix or ten (it "may be) of thoſe that grow near together, and "crowd one another." Again he ſays, "Let men but "obſerve, and take notice of ſome Apple-trees, that "grow a great diſtance from other trees, and have "room enough to ſpread both their roots and "branches, and they ſhall ſee, that one of thoſe trees "(being come to full growth) hath a larger head, "and more boughs and branches, than (it may be) "four, or ſix, or more, of thoſe which grow near "together, although of the ſame age."

And Mr. Lawſon, an ancient planter, adviſes to plant Apple-trees twenty yards aſunder. As the two authors above quoted have written the beſt upon this ſubject, and ſeem to have had more experience than any of the writers I have yet ſeen, I have made uſe of them as authorities to confirm what I have advanced; though the fact is ſo obvious to every perſon who will make the leaſt reflection, that there needs no other proof.

When the trees are planted, they ſhould be ſtaked, to prevent their being ſhaken, or blown out of the ground by ſtrong winds; but in doing of this, there ſhould be particular care taken, to put either ſtraw, haybands, or woollen cloth, between the trees and the ſtakes, to prevent the trees from being rubbed and bruiſed, by the ſhaking againſt the ſtakes, for if their bark ſhould be rubbed off, it will occaſion ſuch great wounds, as not to be healed over in ſeveral years, if they ever recover it.

If the winter ſhould prove very ſevere, it will be proper to cover the ſurface of the ground about their roots with ſome mulch, to prevent the froſt from penetrating the ground, which will deſtroy the young fibres; but this mulch ſhould not be laid on too ſoon, as hath been before mentioned, leſt the moiſture ſhould be prevented from ſoaking down to the roots of the trees, nor ſhould it lie on too long in the ſpring for the ſame reaſon; therefore where perſons will be at the trouble to lay it on in froſty weather, and remove it again after the froſt is over, that the wet in February may have free acceſs to the roots of the trees; and if March ſhould prove dry, with ſharp north or eaſt winds, which often happens, it will be proper to cover the ground again with the mulch, to prevent the winds from penetrating and drying the ground, and will be of ſingular ſervice to the trees. But I am aware, that this will be objected to by many, on account of the trouble, which may appear to be great; but when it is conſidered, how much of this buſineſs may be done by a ſingle perſon in a ſhort time, it can have little force, and the benefit which the trees will receive by this management, will greatly recompenſe the trouble and expence.

As theſe trees muſt be conſtantly fenced from cattle, it will be the beſt way to keep the land in tillage for ſome years, that by conſtant ploughing or digging of the ground, the roots of the trees will be more encouraged, and they will make the more progreſs in their growth; but where this is done, whatever crops are ſown or planted, ſhould not be too near the trees, leſt the nouriſhment ſhould be drawn away from the trees; and as in the ploughing of the ground where it is ſo tilled, there muſt be care taken not to go too near the ſtem of the trees, whereby their roots would be injured, or the bark of their ſtems rubbed off, ſo it will be of great ſervice to dig the ground about the trees where the plough doth not come, every autumn, for five or ſix years after planting, by which time their roots will have extended themſelves to a greater diſtance.

It is a common practice in many parts of England, to lay the ground down for paſture, after the trees are grown pretty large in their orchards; but this is by no means adviſeable, for I have frequently ſeen trees of above twenty years growth, almoſt deſtroyed by horſes,

horses, in the compass of one week; and if sheep are put into orchards, they will constantly rub their bodies against the stems of the trees, and their grease sticking to the bark, will stint their growth, and in time will spoil them; therefore wherever orchards are planted, it will be much the better method to keep the ground ploughed or dug annually, and such crops put on the ground as will not draw too much nourishment from the trees.

In pruning of orchard-trees, nothing more should be done, but to cut out all those branches which cross each other, and, if left, would rub and tear off the bark, as also decayed branches, but never shorten any of their shoots. If suckers, or shoots from their stems, should come out, they must be entirely taken off annually; and when any branches are broken by the wind, they should be cut off, either down to the division of the branch, or close to the stem from whence it was produced; the best time for this work is in November, for it should not be done in frosty weather, nor in the spring, when the sap begins to be in motion.

The best method to keep Apples for winter use is, to let them hang upon the trees until there is danger of frost, and to gather them in dry weather, laying them in large heaps to sweat for three weeks or a month; afterward look them over carefully, taking out all such as have appearance of decay, wiping all the sound fruit dry, and pack them up in large oil-jars, which have been thoroughly scalded and dry, stopping them down close to exclude the external air: if this is duly observed, the fruit will keep sound a long time, and their flesh will be plump; for when they are exposed to the air, their skins will shrink, and their pulp will be soft.

MALUS ARMENIACA. See Armeniaca.

MALUS AURANTIA. See Aurantia.

MALUS LIMONIA. See Limonia.

MALUS MEDICA. See Citreum.

MALUS PERSICA. See Persica.

MALUS PUNICA. See Punica.

MAMMEA. Plum. Nov. Gen. 44. tab. 4. Lin. Gen. Plant. 583. The Mammee-tree.

The Characters are,

*The empalement of the flower is composed of two small, oval, concave leaves, which fall off. The flower has four large concave petals, which spread open. It hath many awl-shaped stamina, terminated by roundish summits, and in the center a roundish germen, with a conical style the length of the stamina, crowned by a single permanent stigma. The germen afterward turns to a large fleshy fruit, of a spherical figure, inclosing one, two, or three large almost oval stones.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, intitled Polyandria Monogynia, which includes the plants whose flowers have many stamina and one style.

There is but one Species of this tree known in the English gardens, viz.

Mammea staminibus flore brevioribus. *Mammee with the stamina shorter than the flower.* Mammea magno fructu, persicæ sapore. Plum. Nov. Gen. 44. *Mammee with a large fruit, having the taste of a Peach.*

This tree, in the West-Indies, grows to the height of sixty or seventy feet; the leaves are large and stiff, and continue green all the year; the fruit is as large as a man's fist; when ripe, it is of a yellowish green colour, and is very grateful to the taste. It grows in great plenty in the Spanish West-Indies, where the fruit is generally sold in their markets, and is esteemed one of the best fruits in the country. It also grows on the hills of Jamaica, and has been transplanted into most of the Caribbee Islands, where it thrives exceeding well.

In England there are some few of these plants, which are preserved with great care by such as are curious in cultivating exotic plants; but there are none of any considerable size, so that we cannot expect to see either fruit or flowers for some years. These plants may be propagated by planting the stones, which are often brought from the West-Indies, (which should be very fresh, otherwise they will not grow,) into pots filled with fresh light earth, and plunged into a hot-bed of tanners bark, observing to water the earth whenever it appears dry. In about a month or six weeks the plants will appear above ground, after which they must be frequently refreshed with water, and in hot weather the glasses of the hot-bed should be raised to let in fresh air. In two months the roots of the plants will have filled the pots, when you should provide some pots of a little larger size, into which you should transplant the plants, being careful to preserve as much earth to their roots as possible; then you should fill up the pots with fresh light earth, and plunge them into the bark-bed again, observing to water and shade them until they have taken root, after which they should be constantly refreshed with water as you shall find they want it, and must have air in hot weather. In this bed they may remain till Michaelmas, when they must be removed into the bark-stove, where they must be constantly kept, observing to refresh them with water, but it must be given to them sparingly at this season, as also to clean their leaves from the filth they are apt to contract in the stove; the spring following they should be shifted into fresh earth, and if they require it, into larger pots, but by no means over-pot them, for they do not produce many roots, therefore if the pots are too large the plants will not thrive; they must be constantly kept in the bark-stove, and may be treated after the manner directed for the Coffee-tree.

If, when the stones of this fruit are brought over, they are put into the tan-bed, under the bottom of any of the pots, they will sprout sooner than those which are planted in the earth.

MANCANILLA. See Hippomane.

MANDRAGORA. Tourn. Inst. R. H. 76. tab. 12. Lin. Sp. Plant. 221. Mandrake; in French, *Mandragore.*

The Characters are,

*The empalement of the flower is large, bell-shaped, erect, and permanet; it is of one leaf, cut at the top into five acute segments. The flower hath one erect bell-shaped petal which spreads open, and is a little larger than the empalement. It has five awl-shaped stamina, which are arched and hairy at their base. In the center is situated a roundish germen, supporting an awl-shaped style, crowned by a headed stigma. The germen afterward turns to a large round berry with two cells, having a fleshy receptacle convex on each side, filled with kidney-shaped seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, which contains those plants whose flowers have five stamina and one style.

We have but one Species of this genus in the English gardens, viz.

Mandragora (*Officinarum.*) Hort. Cliff. 51. *The Mandrake.* Mandragora fructu rotundo. C. B. P. 169. *Mandrake with a round fruit.*

This plant grows naturally in Spain, Portugal, Italy, and the Levant, but is preserved here in the gardens of the curious. It hath a long taper root shaped like Parsnep, which runs three or four feet deep in the ground; it is sometimes single, and at others divided into two or three branches, almost of the colour of Parsnep, but a little darker; from this arises a circle of leaves, which at first stand erect, but, when grown to their full size, spread open, and lie upon the ground; they are more than a foot in length, and four or five inches broad in the middle, growing narrow toward both ends, of a dark green colour, and a fœtid scent. These rise immediately from the crown of the root, without any foot-stalk; between them come out the flowers, each standing upon a separate foot-stalk about three inches long, which also arise immediately from the root; they are five-cornered, of an herbaceous white colour, spreading open at the top like a Primrose, having five hairy stamina, with a globular germen in the center, supporting an awl-shaped style. The germen afterward turns to a glo-

bular soft berry lying upon the leaves, which, when fully grown, is as large as a Nutmeg, of a yellowish green colour when ripe, full of pulp, in which the kidney-shaped seeds are lodged. It flowers in March, and the seeds are ripe in July.

This plant is propagated by seeds, which should be sown upon a bed of light earth soon after they are ripe, for if they are kept until the spring, they seldom succeed well; but those which are sown in autumn will come up in the spring, when they should be carefully cleared from weeds; and in very dry weather they must be refreshed with water, which will greatly promote their growth. In this bed they should remain till the latter end of August, (observing always to keep them clear from weeds) at which time they should be taken up very carefully, and transplanted into the places where they are to remain; the soil should be light and deep, for their roots always run very deep, so that if the soil is wet, they are often rotted in winter; and if it be too near the gravel or chalk, they will make but little progress; but if the soil be good and they are not disturbed, the plants will grow to a large size in a few years, and will produce great quantities of flowers and fruit; the roots will abide a great many years.

I have been informed by some persons of credit, that one of these roots will remain sound above fifty years, and be as vigorous as a young plant. I have known some plants myself near that age, which are now in great vigour, and may continue so many years longer, as there are no signs of their decay; but they should never be removed after their roots have arrived to any considerable size, which would break their lower fibres, and so stint the plants, as that if they live they will not recover their former strength in two or three years. These plants should have a warm situation, otherwise in severe winters they will be destroyed.

As to the feigned resemblance of a human form, which the roots of this plant are said to carry, it is all imposture, owing to the cunning of quacks and mountebanks, who deceive the populace and the ignorant with fictitious images, shaped from the fresh roots of Briony and other plants: and what is reported as to the manner of rooting of this plant, by tying a dog thereto, to prevent the certain death of the person who should care to attempt it, and the groans it emits upon the force offered, &c. is all a ridiculous fable; for I have taken up several large roots of this plant, some of which have been transplanted into other places, but could never observe any particular difference in this from any other deep rooting plant.

**MANGIFERA.** Lin. Gen. Plant. 278. The Mango-tree.

The CHARACTERS are,

*The empalement of the flower is cut into five spear-shaped segments; the flower hath five spear-shaped petals longer than the empalement, and five awl-shaped stamina the length of the corolla, crowned with heart-shaped summits. It hath a roundish germen, supporting a slender style the length of the empalement, terminated by a single stigma; the germen afterward becomes an oblong kidney-shaped Plumb somewhat compressed, inclosing an oblong woolly nut of the same form.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

We have but one SPECIES of this genus, viz.

MANGIFERA (*Indica.*) Lin. Sp. 290. *The Mango-tree.* Manga Indica fructu magno reniforma. Raii Hist. 1550.

This tree grows naturally in most parts of India, as also in the Brazils, and some other parts of the world, where it becomes a large tree; the wood is brittle, and the bark becomes rough by age; the leaves are seven or eight inches long, and two or more broad, terminating in points, having several transverse veins from the middle rib to the sides, which are opposite. The flowers are produced in loose panicles toward the end of the branches, each consisting of five spear-shaped petals which spread open, having five awl-shaped stamina the length of the petals, which are situated between them; the germen at the bottom of the flower afterward becomes a large oblong kidney-shaped Plumb, inclosing a rough nut of the same form.

This fruit, when fully ripe, is greatly esteemed by the inhabitants of those countries where they grow naturally, or have been transplanted; but in Europe we have only the unripe fruit brought over in pickle, which is little better than several other fruit when pickled in the same way: however, from the account given of the ripe fruit, by most people who have eaten it in the country; it has excited the curiosity of many persons in Europe to endeavour to procure young plants in their gardens, for which purpose great quantities of the nuts have been brought to several parts of Europe, but without effect; for I have not heard of one plant which has been produced in Europe from the nuts. All those which have fallen into my hands have been rotten when received, so that I am apt to think the vegetative quality of them cannot be long preserved; therefore the only method to obtain the plants in England, is to plant a good quantity of the nuts in a tub of earth in the country where they grow naturally; and when the plants are grown a foot high, to ship them for England, placing a covering over them to defend them from salt water and the spray of the sea, being very careful not to let them have much wet in their passage; as also when the ship arrives in a cold climate, to screen the plants from cold, especially if it is toward the approach of winter. By carefully observing these rules, the plants may be brought very safely over, as has been experienced by a plant of this sort, with several other sorts of plants, which were brought over by Capt. Quick, and are now in good health in the Chelsea garden.

There have been some plants brought to England before this, which were destroyed by having too much heat, for this plant will not thrive in a hot-bed of tanners bark; so that the only way to have them succeed, is to plant them in pots filled with light kitchen-garden earth, and place them in a dry stove, where in warm weather they should have fresh air daily, and in the winter the air kept up to temperate, as is marked upon the thermometers.

**MANIHOT.** See JATROPHA.

**MANURE.**

There are various kinds of Manure, which are now commonly used in different parts of England, for enriching of the several soils. Some of these have been already mentioned under the article of DUNG, so I shall not repeat them here, but proceed to take notice of some other kinds of Manure, which are at present neglected by many people, though they might be used with equal success, if not better on many lands, as most of those now commonly in use.

Oak bark, after the tanners have used it for tanning of leather, when laid in a heap and rotted, is an excellent Manure, especially for stiff cold land; in which one load of this Manure will improve the ground more, and last longer, than two loads of the richest dungs; and yet it is very common to see large heaps of this remaining in the tanners yards for many years, in several parts of England, where Manure of other kinds is very scarce, and often carried to a great distance. Of late years this tan has been much used for hot-beds in several parts of England, and is found greatly to exceed horse dung for that purpose, the fermentation being moderate and of long continuance; so that a bed of tan, when rightly made, will continue in a moderate temperature of heat for three or four months; and when the heat begins to decay, if it be stirred up with a dung fork, and some fresh tan added to it, the heat will renew again, and last for some months, so that these beds are by far the most kindly for exotic plants; and whatever plants are plunged into these beds, if they are permitted to root through the bottom of the pots, they will thrive more in one month after, than they did in four months while

they are confined to the pots. I have frequently obſerved many kinds of plants, which were rooted through the pot into the tan, and have ſent forth roots upward of twelve feet each way, in leſs than three months, and the plants have advanced in proportion; which is a plain indication, that plants are greatly nouriſhed by the rotten tan. After the tan hath been uſed for a hot-bed, I have ſpread it on the ground for Manure, and found it has greatly enriched the ground; but it is much better for cold ſtrong land, than for light hot ground, becauſe it is of a warm nature, and will looſen and ſeparate the earth; ſo that where this Manure hath been uſed three or four times, it hath made the land very looſe which before was ſtrong, and not eaſy to be wrought. When this Manure is laid upon Graſs, it ſhould be done ſoon after Michaelmas, that the winter rains may waſh it into the ground; for if it is laid on in the ſpring, it will burn the Graſs, and inſtead of improving it, will greatly injure it for that ſeaſon. Where it is uſed in Corn land, it ſhould be ſpread on the ſurface before the laſt ploughing, that it may be turned down for the fibres of the Corn to reach it in the ſpring; for if it lies too near the ſurface, it will forward the growth of the Corn in winter: but in the ſpring, when the nouriſhment is chiefly wanted to encourage the ſtems, it will be nearly conſumed, and the Corn will receive little advantage from it. Nor will it be proper to have this Manure lie too near the roots of any plants, for when this has happened, I have frequently obſerved it prejudicial to moſt plants, but eſpecially to bulbous and tuberoſe-rooted flowers, which are very ſubject to rot where it lies near their roots; yet when it is buried juſt deep enough for the fibres of their roots to reach it in the ſpring, the flowers have been exceedingly improved by it. And in ſome places, where this Manure hath been uſed in kitchen-gardens, it hath greatly improved the vegetables; ſo that it is to be wondered, that this ſhould not be employed on the land in every country where it can be obtained.

Rotten vegetables of moſt ſorts alſo will enrich land, ſo that where other Manure is ſcarce, theſe may be uſed with ſucceſs. The weeds of ponds, lakes, or ditches, being dragged out before they feed, and laid in heaps to rot, will make good Manure, as will moſt other ſorts of weeds; but wherever any of theſe are employed, they ſhould be cut down as ſoon as they begin to flower, for if they are ſuffered to ſtand until their ſeeds are ripe, the land will be ſtored with weeds, which cannot be eaſily deſtroyed; nay, ſome kinds of weeds, if they are permitted to ſtand ſo long as to form their ſeed, will perfect them after they are cut down, which may be equally prejudicial to the land: therefore the ſureſt method is, to cut them down juſt as they begin to flower; at which time moſt ſorts of vegetables are in their greateſt vigour, being then ſtronger and fuller of juice, than when their ſeeds are farther advanced; ſo that at that time they abound moſt with ſalts, and therefore are more proper for the intended purpoſe. In rotting of theſe vegetables, it will be proper to mix ſome earth, mud, or any other ſuch like ſubſtance with them, to prevent their taking fire in their fermentation; which they are very ſubject to, where they are laid in large heaps without any other mixture to prevent it; and it will be alſo proper to cover the heaps over with earth, mud, or dung, to detain the ſalts, otherwiſe many of the finer particles will evaporate in fermenting. When theſe vegetables are thoroughly rotted, they will form a ſolid maſs, which will cut like butter, and be very full of oil, which will greatly improve land.

In ſuch places where there are neither ponds, lakes, or ditches, to ſupply theſe weeds, and the ſituation being far from the ſea (from whence alſo may be obtained many ſorts of weeds for this purpoſe) there may be many ſorts of vegetables ſown, in order to plough them into the grounds when they are full grown, to enrich the land; at preſent thoſe chiefly uſed for this purpoſe are Buck Wheat, Vetches, and Spurry. And in ſome countries abroad they commonly ſow Lupines upon ſuch land as they want to improve, and when they are full grown they mow them down, and plough them into the ground, which they eſteem to be good Manure. This is chiefly uſed in the ſouth of France and in Italy, where ſome of the ſorts of Lupines grow naturally; but theſe are not proper for this climate, becauſe, if the ſeaſon ſhould prove cold or wet after the Lupines are ſown, they will rot in the ground, ſo that it is very hazardous to ſow them in this country; and there being many other ſorts of plants which are hardy, and grow to a much larger ſize with us than Lupines, they ſhould be preferred to them for this purpoſe. I have known ſome land ſown pretty thick with Horſe-beans which have been mowed down when they were in bloſſom, and ploughed in for a crop of Wheat, and it hath largely repaid the owner. Almoſt any of the pulſe kind, which grow large, are very proper to be ſown for this purpoſe; and next to theſe may be ſown Muſtard, Cole-ſeed, or any of theſe large growing plants; which, if cut before they form their ſeeds, and ploughed in, will greatly enrich the ground.

The refuſe of kitchen-gardens, when laid in heaps and rotted, will alſo afford a good ſort of Manure for Corn land; but as this is not to be obtained in any quantity, excepting near great cities, ſo, in ſuch places, dung being to be had pretty reaſonable, the other will not be much ſought after.

I have lately been informed of another improvement, which may be of great uſe in ſeveral parts of the kingdom; which is, the mowing down of Fern while it is green and tender, and laying it in heaps to rot, which will make a tolerable Manure for land; and as this is a moſt troubleſome plant in many parts of England, ſo by frequently mowing, it may be deſtroyed; and when rotted, a good quantity of this Manure may be obtained, which will more than defray the charges of cutting it down. In ſome places, where no tan or horſe-dung can be obtained, they have cut down Fern and chopped it pretty ſmall, and laid it in a heap to ferment, then have uſed it for hot-beds, for which purpoſe it has anſwered pretty well. The firſt perſon who informed me of this, was Mr. Samuel Brewer, a very curious gentleman in gardening, who made ſeveral hot-beds of Fern, which, he ſays, continued their heat for ſome months; ſo that he prefers it to dung, where a moderate laſting heat is required.

There are many kinds of weeds which infeſt the lands in many parts of England, which, if cut down at a proper time and laid to rot, might be uſed to great advantage for manuring of land; and hereby the weeds may in time be deſtroyed, and the Manure would more than pay the expence of doing it: but few perſons who are employed in huſbandry care to go out of their old beaten road to try experiments, even where they are attended with little expence and nothing hazarded; otherwiſe there is great room to make improvements of this kind, eſpecially in countries where dung, or other common Manure is very ſcarce; in which places, if ſome experiments were properly made, of rotting whatever vegetables could be procured in the neighbourhood, it might turn to good account.

The aſhes of all kinds of vegetables are an excellent Manure for land, ſo that where the ground is over-run with buſhes, brambles, &c. which are become woody, if they are grubbed up in ſummer, and ſpread abroad to dry for a little time, then gently conſumed to aſhes, and theſe ſpread on the land, it will greatly improve it. The method for doing this is already explained under the article of Land.

Rotten wood, and ſaw-duſt when rotted, is a very good Manure for ſtrong land, becauſe it looſens the parts of the earth and renders it light.

Bones, horns, and other parts of animals, alſo enrich land greatly, as do decayed fiſh; ſo that in ſome

places where these can be easily obtained, a great improvement may be made of them.

Sea-sand and shells are in several parts of England used to great advantage, especially in Devonshire, where they are at the expence of fetching the sand and shells on horses backs, twelve or fourteen miles. The land on which they lay this Manure, is a strong loam inclining to clay; so that this separates the parts, and the salts which are contained in the dressing are a very great improvement of their land. Coral, and such kinds of stony plants which grow on the rocks, are filled with salts which are very beneficial to land; but as these bodies are hard, the improvement is not the first or second year after they are laid on the ground, because they require time to pulverize them before their salts can mix with the earth to impregnate it. Therefore dressings of this kind are seldom used by tenants, who want to reap the fruit of their labour as soon as possible. But these Manures are much better for cold strong land, than for that which is light and sandy. In some countries, at a great distance from the sea, have been discovered great quantities of fossil shells, which have been dug out of the earth, and used as Manure, which have improved the ground a little, especially strong land: as these have little salts, when compared to those shells which are taken from the shore, therefore where the latter can be obtained, they other are scarce worth using.

Where the land lies near the sea, so that either sand, shells, corals, wrecks, or sea-weeds, can be obtained at an easy expence, they are by far the best kinds of Manure, because they enrich the land for several years; for as their salts are closely locked up, they are communicated by degrees to the land, as the heat and cold causes the bodies to pulverize, and fall into small parts; so that where sand and smaller kinds of sea-weeds are used, if they are laid on land in proper quantities it will enrich it for six or seven years; but shells, corals, and other hard bodies, will continue many years longer.

In dunging of land, I have frequently observed in several parts of England, but especially in Cambridgeshire, a very wrong custom continued, by carrying and laying the dung on the land about Midsummer, and spread abroad perhaps a month or six weeks before the ground is ploughed; in which time the sun exhales all the goodness of the dung, so that what remains is of little service to the land. Therefore when dung or any other Manure is used, it should not be laid on the ground until the last time of ploughing, when it should be buried as soon as possible, to prevent the evaporation of the salts. Indeed, where shells, corals, or any other hard substances, are used for Manure, if these are spread abroad some months before the ground is ploughed, the sun, rain, or frost will cause them to pulverize much sooner than when they are buried and excluded from the air.

The dressing of Grass ground in summer, soon after the crop of hay is taken off the land, is equally bad; for before Michaelmas the sun will have dried and exhaled most of the goodness, if the dressing is of dung or any other soft Manure, so that the ground will receive small advantage from it; and yet this method is too generally practised.

MAPLE. See Acer.

MARACOCK. See Passiflora.

MARANTA. Plum. Nov. Gen. 16. tab. 36. Lin. Gen. Plant. 5. Indian Arrow-root.

The Characters are,

*It hath a small three-leaved empalement sitting upon the germen; the flower hath one petal, which is of the grinning kind, having an oblong compressed tube, which is oblique and turned inward; the rim is cut into six small segments, representing a lip flower, the two side segments being the largest. It has one membranaceous stamina, appearing like a segment of the petal, with a linear summit fastened to the border. It hath a roundish germen situated under the flower, supporting a simple style the length of the petal, crowned by a three-cornered stigma. The germen afterward turns to a roundish three-cornered capsule with three valves, containing one hard rough seed.*

This genus of plants is ranged in the first section of Linnæus's first class, intitled Monandria Monogynia, which includes those plants whose flowers have but one stamina and one style.

The Species are,

1. Maranta (*Arundinacea*) culmo ramoso. Lin. Sp. 2. *Indian Arrow-root with branching stalks.* Maranta Arundinacea cannacori folio. Plum. Nov. Gen. 16. *Maranta with a leaf of the Indian flowering Reed.*
2. Maranta (*Galanga*) culmo simplici. Lin. Sp. 3. *Indian Arrow-root with a simple stalk.* Canna Indica, radice albâ alexipharmica. Sloan. Cat. Jam. 122. *Indian Arrow-root.*

The first sort was discovered by Father Plumier in some of the French settlements in America, who gave it this name, in honour of one Bartholomew Maranta, an ancient botanist. The seeds of this kind were sent to Europe by the late Dr. William Houstoun, who found the plant growing in plenty near La Vera Cruz in New Spain.

This hath a thick, fleshy, creeping root which is very full of knots, from which arise many smooth leaves, which are six or seven inches long, and three broad toward their base, lessening toward each end, terminating in points. They are of the consistence and colour of those of the Reed, and stand upon Reed-like foot-stalks, which arise immediately from the root; between these come out the stalks, which rise near two feet high; these divide upward into two or three smaller, and are garnished at each joint with one leaf of the same shape with the lower, but are smaller. The ends of the stalks are terminated by a loose bunch of small white flowers, standing upon foot-stalks which are near two inches long. The flowers are cut into six narrow segments, which are indented on their edges; these sit upon the embryo, which afterward turns to a roundish three-cornered capsule, inclosing one hard rough seed. It flowers here in June and July.

The other sort was brought from some of the Spanish settlements in America, into the islands of Barbadoes and Jamaica, where it is cultivated in their gardens as a medicinal plant, it being a sovereign remedy to cure the bite of wasps, and to extract the poison of the Manchineel-tree. The Indians apply the root to expel the poison of their arrows, which they use with great success. They take up the roots, and after cleansing them from dirt, they mash them, and apply it as a poultice to the wounded part, which draws out the poison and heals the wound. It will also stop a gangrene, if it is applied before it is gone too far, so that it is a very valuable plant.

This sort is very like the first, but has a single stalk; the flowers are smaller, and the segments of the petals are entire, in which their principal difference consists; it flowers also at the same time.

These plants being natives of a warm country, are very tender, and therefore will not live in this climate, unless they are preserved in stoves. They may be propagated by their creeping roots, which should be parted in the middle of March, just before they begin to push out new leaves. These roots should be planted in pots filled with light rich earth, and plunged into a moderate hot-bed of tanners bark, observing now and then to refresh them with water; but it must not be given to them in large quantities, for too much moisture will soon rot the roots, when they are in an unactive state. When the green leaves appear above ground, the plants will require more frequently to be watered, and they should have free air admitted to them every day, in proportion to the warmth of the season, and the heat of the bed in which they are placed. As the plants advance in strength, they should have a greater share of air, but they must constantly remain in the stove plunged in the tan, otherwise they will not thrive; for when the pots are placed on shelves in the stove, the moisture passes too soon from the fibres, which

which generally spread on the sides and bottoms of the pots, so that the plants do not receive much nourishment from the water. But where they are constantly kept in the tanners bark, and have proper air and moisture, they will thrive, so as from a small root to fill the pot in which it was planted, in one summer. About Michaelmas the first sort will begin to decay, and in a short time after the leaves will die to the ground, but the pots must be continued all the winter in the bark-bed, otherwise the roots will perish; for although they are in an unactive state, yet they will not keep very long from shrinking, when taken out of the ground; and if the pots are taken out of the tan, and placed in any dry part of the stove, the roots often shrivel and decay; but when they are continued in the tan-bed they should have but little water given to them when their leaves are decayed, lest it rot them. The first sort doth flower constantly in July or August, and will often produce ripe seeds in England; but the second sort doth not flower so constant, nor do the flowers appear so conspicuous, being very small and of a short duration. This sort never hath produced any seeds in England, nor could I ever observe any rudiment of a seed-vessel succeeding the flower. The green leaves abide on this sort most part of the winter, seldom decaying till February; and sometimes will continue green until fresh leaves come up, and thrust the old ones off; in which particular there is a more remarkable difference between the two sorts, than can be observed in the face of plants.

MARJORAM. See Origanum.

MARLE is a kind of clay, which is become fatter, and of a more enriching quality, by a better fermentation, and by its having lain so deep in the earth as not to have spent or weakened its fertilizing quality by any product.

Marle is supposed to be much of the nature of chalk, and is believed to be fertile from its salt and oily quality; and that it contracts its salts from the air, and for that reason is the better the longer it is exposed to it.

Marles are of different qualities in different counties of England. There are reckoned to be four sorts of Marles in Sussex, a gray, a blue, a yellow, and a red; of these the blue is accounted the best, the yellow the next, and the gray the next to that; and as for the red, that is the least valuable.

The Marle in Sussex is most like fullers earth, and therefore must certainly be the fattest, whereas that in the north country runs much upon the loam.

In Cheshire they reckon six sorts of Marle:

1. The cowshut Marle, which is of a brownish colour, with blue veins in it, and little lumps of chalk or lime stone; it is commonly found under clay, or low black land, seven or eight feet deep, and is very hard to dig.

2. Stone, slate, or flag Marle, which is a kind of soft stone, or rather slate, of a blue or bluish colour, that will easily dissolve with frost or rain. This is found near rivers and the sides of hills, and is a very lasting sort of Marle.

In Staffordshire they esteem the dice or slate Marle better than the clay Marle, and reckon the blue best for arable land, and the gray for pasture.

3. Peat Marle, or delving Marle, which is close, strong, and very fat, of a brown colour, and is found on the sides of hills, and in wet boggy grounds, which have a light sand in them about two feet or a yard deep. This is accounted the strongest of all Marles, and is very good for sandy land, but the land must have a double quantity laid on.

4. Clay Marle; this resembles clay, and is pretty near akin to it, but is fatter, and sometimes mixed with chalk stones.

5. Steel Marle, which lies commonly in the bottom of pits that are dug, and is of itself apt to break into cubical bits; this is sometimes under sandy land.

6. Paper Marle, which resembles leaves or pieces of brown paper, but something of a lighter colour; this lies near coals. This sort is less esteemed, it being hard to be got.

The properties of any sorts of Marles, and by which the goodness of them may be best known, are better judged of by their purity and uncompoundedness, than their colour: as if it will break in pieces like dice, or into thin flakes, or is smooth like lead ore, and is without a mixture of gravel or sand; if it will shake like slate stones, and shatter after wet, or will turn to dust when it has been exposed to the sun: or will not hang and stick together when it is thoroughly dry, like tough clay; but is fat and tender, and will open the land it is laid on, and not bind; it may be taken for granted, that it will be beneficial to it.

Some advise to try the goodness of Marle, by putting some of it in a glass of water; and they account it to be good, if it be so tender, that the lumps break, and dissolve as soon as it comes to the bottom; they also reckon it a good sign, if it sparkle in the water, and feel fat between the fingers; but the surest sign of its goodness is, if it dissolve by wet or frost. The strength of Marle may also be known, by putting a lump of it in a glass of good vinegar, where, if the fermentation is great, it is a sure sign of the goodness of the Marle.

Some approve of marling land shallow, because they say, it is apt to work downwards; others of laying it in deep at first, because the sun wastes the fatness of it.

Some recommend Marles for the improving of sandy loose land, but the surest way to know what lands it will best suit with, is to try with a little of it on lands supposed to be of a contrary nature to it.

Marles do not make so good an improvement of lands the first year as afterwards.

Some advise, first to burn the Marle before it is laid on the lands; which if it be done, one load will go as far as five.

The quantity of Marle ought to be in proportion to the depth of the earth, for over-marling has often proved of worse consequence than under-marling, especially where the land is strong; for by laying it in too great quantities, or often repeating the marling, the land has become so strong, and bound so closely, as to detain the wet like a dish, so that the owners have been obliged to drain the ground at a great expence, and have often been obliged to lower their rents; but in sandy land there can be no danger in laying on a great quantity, or repeating it often, for it is one of the best dressings for such land.

MARRUBIASTRUM, Bastard Horehound. See Sideritis.

MARRUBIUM. Tourn. Inst. R. H. 192. tab. 91. Lin. Gen. Plant. 640. Pseudodictamnus. Tourn. 188. tab. 89. Lin. Gen. Plant. 640. [some derive the name of מרור, *Heb.* Marrob, i. e. bitter juice; others from the Latin word Marcidum, because the leaves of this plant are so wrinkled, that they appear to be withering.] Horehound.

The Characters are,

*The empalement of the flower is funnel-shaped, of one leaf, and equal at the brim, which spreads open. The flower is of the lip or grinning kind, with a cylindrical tube opening at the brim, where it is divided into two lips, the upper being very narrow and acute, the under broad, reflexed, and cut into three segments, the middle one is broad and indented. It has four stamina, which are under the upper lip, two of which are a little longer than the other, terminated by simple summits. It hath a four-pointed germen, supporting a slender style of the same length, and situated with the stamina, crowned by a bifid stigma. The germen afterward turns to four oblong seeds, sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, intitled Didynamia Gymnospermia, which includes those plants whose flowers have two long and two short stamina, which are succeeded by naked seeds sitting in the empalement.

The

The Species are,

1. Marrubium (*Vulgare*) dentibus calycinis setaceis uncinatis. Hort. Cliff. 312. *Horehound with hooked bristly indentures to the empalement.* Marrubium album vulgare. C. B. P. 230. *Common white Horehound.*
2. Marrubium (*Peregrinum*) foliis ovato-lanceolatis serratis, calycum denticulis setaceis. Hort. Cliff. 311. *Horehound with oval, spear-shaped, sawed leaves, and bristly indentures to the empalement.* Marrubium album latifolium peregrinum. C. B. P. 230. *Broad-leaved, foreign, white Horehound.*
3. Marrubium (*Creticum*) foliis lanceolatis dentatis, verticillis minioribus, dentibus calycinis setaceis erectis. *Horehound with spear-shaped indented leaves, smaller whorls, and erect bristly indentures to the empalements.* Marrubium album angustifolium peregrinum. C.B. P. 230. *Narrow-leaved, foreign, white Horehound.*
4. Marrubium (*Alysson*) foliis cuneiformibus, quinque verticillis involucro destitutis. Hort. Cliff. 311. *Horehound with wedge-shaped plaited leaves, with five indentures, and the whorls destitute of covers.* Marrubium alysson dictum, foliis profundè incisis. H. L. *Horehound, called Madwort, with leaves which are deeply cut on their sides.*
5. Marrubium (*Supinum*) dentibus calycinis setaceis rectis villosis. Hort. Cliff. 312. *Horehound with hairy, erect, bristly indentures to the empalement.* Marrubium Hispanicum supinum, foliis sericeis argenteis. Tourn. 193. *Low Spanish Horehound with silken silver-coloured leaves.*
6. Marrubium (*Candidissimum*) foliis subovatis lanatis supernè emarginato-crenatis, denticulis calycinis subulatis. Hort. Cliff. 312. *Horehound with woolly leaves almost oval, the upper parts of which are indented and crenated, with awl-shaped indentures to the empalements.* Marrubium album candidissimum & villosum. Tourn. Cor. 1. *Whitest and villose Horehound.*
7. Marrubium (*Hispanicum*) calycum limbis patentibus, denticulis acutis. Hort. Cliff. 312. *Horehound with spreading borders to the empalement, and acute indentures.* Marrubium album rotundifolium Hispanicum. Par. Bat. 201. *Round-leaved Spanish Horehound.*
8. Marrubium (*Crispum*) calycum limbis planis villosis, foliis orbiculatis rugosis, caule herbaceo. *Horehound with a plain hairy border to the empalement, round rough leaves, and an herbaceous stalk.* Pseudodictamnus Hispanicus, foliis crispis & rugosis. Tourn. Inst. 188. *Spanish Bastard Dittany, with rough curled leaves.*
9. Marrubium (*Suffruticosum*) calycum limbis planis villosis, foliis cordatis rugosis incanis, caule suffruticoso. *Horehound with the border of the empalement plain and hoary, heart-shaped, rough leaves, and a shrubby stalk.* Pseudodictamnus Hispanicus, amplissimo folio candicante & villoso. Tourn. Inst. R. H. 118. *Spanish Bastard Dittany, with a very large hoary leaf.*
10. Marrubium (*Pseudodictamnus*) calycum limbis planis villosis, foliis cordatis, caule fruticoso. Hort. Cliff. 312. *Horehound with a plain hairy border to the empalement, heart-shaped leaves, and a shrubby stalk.* Pseudodictamnus verticillatus inodorus. C.B. P. 232. *Whorled unsavoury Bastard Dittany.*
11. Marrubium (*Acetabulosum*) calycum limbis tubo longioribus membranaceis, angulis majoribus rotundatis. Lin. Sp. Plant. 584. *Horehound with a membranaceous rim to the empalement longer than the tube, and larger rounder angles* Pseudodictamnus acetabulis Moluccæ. C. B. P. 222. *Bastard Dittany, with a pan or hollow of Molucca Baum.*

The first sort is the Prasium, or white Horehound of the shops. This grows naturally in most parts of England, so is seldom propagated in gardens. It hath a ligneous fibrous root, from which come out many square stalks a foot or more in length, which branch out upward, and are garnished with hoary roundish leaves, indented on the edges, placed opposite. The flowers grow in very thick whorls round the stalks at each joint; they are small, white, and of the lip kind, standing in stiff hoary empalements, cut into ten parts at the top, which end in stiff bristles; these are succeeded by four oblong black seeds sitting in the empalement. It flowers in June, and the seeds ripen in autumn.

The second sort grows naturally in Italy and Sicily; this rises with square stalks near three feet high, which branch much more than the first; the leaves are rounder, whiter, and stand farther asunder; the whorls of flowers are not so large, but the flowers have longer tubes.

The third sort grows naturally in Spain and Portugal; this rises with slender hoary stalks near three feet high; the leaves are very hoary, much longer and narrower than those of the second; the whorls of flowers are smaller, the bristly indentures of the empalement are longer and erect; the whole plant has an agreeable flavour.

The fourth sort grows naturally in Spain and Italy; this is a biennial plant, whose stalks are about the same length as those of the first; the leaves are wedge-shaped, hoary, and obtusely indented; the whorls of flowers are small, and have no covers. The flowers stand looser in the whorls, and the cuts of the empalement end in very stiff prickles, which spread open; the flowers are purple, and larger than those of the first sort.

The fifth sort grows naturally in the islands of the Archipelago; the stalks of this are seldom above eight or nine inches long, covered with a soft hoary down; the leaves are small, roundish, and very soft to the touch; they are hoary, and indented on the edges. The whorls of flowers are small, very downy, and white; the flowers are small and white.

The sixth sort grows naturally in Spain; this hath stalks about the same length as the first; the leaves are nearly oval, woolly, and crenated toward the top, and the empalement of the flowers are awl-shaped.

The seventh sort grows naturally in Istria, from whence I received the seeds. The stalks of this grow more erect than those of the common sort: the leaves are rounder and more sawed on the edges; the empalement of the flowers spread open, ending in acute segments. The flowers are like those of the common sort; the whole plant is very hoary.

The eighth sort grows naturally in Spain and Sicily; this sends out many stiff roundish stalks, which rise more than two feet high, covered with a white cottony down; the leaves are almost round, rough on their upper side, and woolly on their under; the whorls of flowers are large, the borders of the empalement are flat and hairy; the tube of the flower is scarce so long as the empalement, so the two lips are but just visible.

The ninth sort grows naturally in Spain; the stalks of this are shrubby, and rise near three feet high, dividing into small branches; the leaves are heart-shaped and rough on their upper side, but hoary on their under; the whorls of flowers are large, the borders of the empalements flat and hairy; the tube of the flower is longer, and the flowers are larger than those of the former sort; they are of a pale purple colour, and their upper lips are erect.

The tenth sort grows naturally in Sicily, and the Islands of the Archipelago. This rises with a shrubby stalk two feet high, which divides into many branches, garnished with small heart-shaped leaves, sitting pretty close to the stalks: the whorls of flowers are not so large as those of the two former sorts. The rim of the empalements are flat. The flowers are white, and the whole plant is very hoary.

The eleventh sort grows naturally in Crete; this hath very hairy stalks which rise about two feet high, garnished with heart-shaped leaves, which are rough on their upper side, but hoary on their under. The whorls of flowers are large, the border of the empalements flat, and cut into many segments, which are membranaceous, angular, and rounded at the top. The flowers are small, of a pale purple colour, but scarce appear out of their empalements, and their upper lips are erect.

The

The first sort is what the College of Physicians has directed to be used in medicine. The leaves and tops of the plants are esteemed hot and dry, pectoral, and good to free the lungs from thick viscid phlegm, and thereby to help old coughs, especially in cold moist constitutions, the juice being made into a syrup with sugar or honey; they open obstructions of the liver and spleen, and are very serviceable against the dropsy, jaundice, green sickness, and obstructions of the catamenia, and suppression of the lochia, and other distempers of the female sex, for which few herbs go beyond this. The officinal preparation is the syrupus de Prassio.

The fourth sort is supposed to be Galen's Madwort; this was by the antients greatly recommended for its efficacy in curing of madness, and some few of the moderns have prescribed it in the same disorder, but at present it is seldom used; it is a biennial plant, which generally perishes after it hath perfected seeds.

All these plants are preserved in botanic gardens for the sake of variety, but there are not above two of the sorts which are cultivated in other gardens; these are the tenth and eleventh sorts, whose stalks are shrubby; the plants are very hoary, so make a variety when intermixed with other plants; these very rarely produce seeds in England, so are propagated by cuttings, which, if planted in a shady border the middle of April, will take root pretty freely.

They are somewhat tender, so in very severe winters are killed, unless they are screened from the hard frosts, especially those plants which grow in good ground, where they grow luxuriant in summer, so their branches are more replete with juice, and very liable to suffer by cold; but when they are in a poor dry rubbish, the roots will be short, firm, and dry, so are seldom injured by cold, and will continue much longer than those in better ground.

The other sorts are easily propagated by seeds, which should be sown on a bed of poor earth in the spring, and when the plants come up they must be kept clean from weeds; and where they are too close they should be thinned, leaving them a foot and a half asunder, that their branches may have room to spread; after this they require no other culture; they may also be propagated by cuttings, in the same manner as the other two sorts. If these plants are upon a dry poor soil, they will live several years, but in rich land they seldom last above three or four.

MARRUBIUM NIGRUM. See Ballote.

MARTAGON. See Lilium.

MARTYNIA. Houst. Gen. Nov. Martyn. Dec. 1. 42. [This name was given by the late Dr. William Houstoun to this genus of plants, which he discovered in America, in honour of his friend Mr. John Martyn, who was Professor of Botany at Cambridge.]

The Characters are,

*The empalement of the flower is cut into five parts, three of them are erect, and two reflexed. The flower hath one petal, which is bell-shaped, with a large swelling tube, at the base of which is situated a gibbous nectarium. The rim of the petal is cut slightly into five obtuse segments, two of which are turned upward, the other three downward, representing a lip flower. It hath four slender incurved stamina, which are inflexed into each other, terminated by summits, which are connected together. It hath an oblong germen situated under the flower, supporting a short style, crowned by a plain stigma. The empalement afterward turns to an oblong gibbous capsule, which divides into two parts, including a hard nut, shaped like the body of a stag beetle, with two incurved strong horns at the end, having four cells, two of which are generally barren, the other two have one oblong seed in each.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, which includes the plants whose flowers have two long and two short stamina, and the seeds are included in a capsule.

The Species are,

1. Martynia (*Annua*) caule ramoso, foliis angulatis. Lin. Sp. Plant. 618. *Martynia with a branching stalk and angular leaves.* Martynia annua villosa & viscosa, folio subrotundo, flore magno rubro. Houst. *Annual, hairy, viscous Martynia, with a roundish leaf, and a large red flower.*
2. Martynia (*Perennis*) caule simplici, foliis serratis. Lin. Sp. Plant. 618. *Martynia with a single stalk and sawed leaves.* Martynia foliis serratis. Lin. Hort. Cliff. *Martynia with sawed leaves.*
3. Martynia (*Louisiana*) caule decumbente ramosa, foliis integris fructibus longissimis. *Martynia with a decumbent branching stalk, entire leaves, and very long fruit.*

The first of these plants was discovered by the late Dr. William Houstoun, near La Vera Cruz, in New Spain, from whence he sent the seeds into England, which succeeded very well in the Physic Garden at Chelsea; and in the year 1731, several of these plants were raised, which produced their beautiful flowers, and perfected their seed, from whence several plants were raised the succeeding year.

This rises with a strong, herbaceous, hairy stalk near three feet high, which divides upward into three or four large branches, garnished with oblong oval leaves, cut into angles on their sides; they are five inches long, and three inches and a half broad at their base, where they are broadest, ending in obtuse points; they are hairy, and very viscous, sticking to the fingers if handled. The flowers are produced in short spikes from the forks of the branches, and also at their tops; they are shaped like those of the Foxglove, but are of a paler purple colour; these are succeeded by oblong oval capsules, which are thick, tough, and clammy; these, when ripe, divide into two parts, leaving a large hard nut hanging on the plant, about the size, and much of the same form, as the stag beetle, with two strong crooked horns at the end. The nut has two deep longitudinal furrows on the sides, and several smaller crossing each other in the middle. It is so hard, that it is with difficulty cut open without injuring of the seeds: within are four oblong cells, two of which have generally a single oblong seed in each, but the other two are abortive. If the plants are brought forward in the spring, they will begin to shew their flowers in July, which are first produced at the division of the branches, and afterward at the extremity of each branch, so there will be a succession of flowers on the same plant till the end of October, when the plants decay.

The second sort was discovered by Mr. Robert Millar, growing naturally about Carthagena in New Spain, from whence he sent the seeds to Europe; this hath a perennial root and an annual stalk, which decays every autumn, and new ones arise in the spring. The roots of this plant are thick, fleshy, and divided into knots, which are scaly, somewhat like those of Toothwort; these send up several stalks, which grow about a foot high; they are thick, succulent, and of a purplish colour, garnished with oblong thick leaves, whose base sits close to the stalk; they are sawed on their edges, rough on their upper side, where they are of a dark green, but their under side is purplish. The stalk is terminated by a short spike of blue flowers, which are bell-shaped, and do not spread open at the rim so much as the former sort; these usually appear in July or August, but are not succeeded by seeds in England.

The first sort, being an annual plant, is only propagated by seed, which should be sown in pots filled with light rich earth, and plunged into a hot-bed of tanners bark, where (if the earth is duly watered to promote the vegetation of the seed) the plants will appear in about three weeks or a month, and will grow pretty fast if the bed is warm; they should therefore be transplanted in a little time after they come up, each into a separate pot filled with light rich earth, and then plunged into the hot-bed again, observing to water them well, as also to shade them from the sun until they have taken new root; after which time they should have a large share of fresh air admitted to them in warm weather, by raising the glasses of the hot-bed every day: with this management the plants will make great progress, so as to

fill the pots with their roots in about a month or six weeks time, when they should be shifted into pots about a foot diameter at the top, which should be filled with light rich earth, and then plunged into the hot-bed in the bark-stove, where they should be allowed room, because they put out many side branches, and will grow three feet high or more, according to the warmth of the bed, and the care which is taken to supply them constantly with water; and should be constantly kept in the tan-bed, giving them plenty of free air at all times when the weather is warm, but they will not bear to be exposed abroad in this country; when these plants thrive well they will send out many side branches, which will all of them produce small spikes of flowers; but it is only from the first spike of flowers that good seeds can be expected in this country, so that particular care should be taken, that none of these are pulled off or destroyed, because it is very difficult to obtain good seeds here; and I believe few of those that are produced on the side branches in the natural country of their growth, are duly ripened; for I have received a great quantity of these seeds from abroad, which have appeared to be very good, and yet few of them have grown.

The seeds of these plants have a strong green covering on them, as thick as the outer covering of an Almond, and when the seeds are ripe, the covering opens, and lets the seeds fall, in the same manner as the covering of Almonds, Walnuts, &c. In each covering there is one hard nut, in shape somewhat like a beetle, having two sharp crooked horns at one end. This nut contains four embryos, but there are seldom more than two seeds which are perfect in any of them. However, when they are sown, the whole nut must be planted, for it is so hard, that it is almost impossible to take out the seeds without spoiling them; so where there are two plants produced from the same nut, they are easily separated, especially if they are transplanted while young. These seeds will continue good for some years, for I saved a pretty large quantity of them in the year 1734, part of which I sowed the following year, but had not one plant produced from them; the remainder of the seeds I divided, and sowed some of them every succeeding year, without any success, until the year 1738, when I sowed all the seeds I had left, from which I had one plant produced; so that if the seeds are good, it is evident they will grow when they are four years old; therefore, whenever we receive good seeds from abroad, or save any in this country which are perfectly ripened, it will be proper to preserve some of them for a year or two, lest a bad season should happen, when the plants may not perfect their seeds; so that if this precaution be not taken, the species may be lost in Europe.

The second sort dies to the root every winter, and rises again the succeeding spring; this must be constantly preserved in the stove, and plunged into the bark-bed, otherwise it will not thrive in this country. During the winter season, when the plants are decayed, they should have but little water given to them, for at that time it will rot the roots. In the middle of March, just before the plants begin to shoot, is the proper season to transplant and part the roots, when they should be planted into pots of a middle size, filled with light rich earth, and then plunged into the bark-bed, which should at this time be renewed with some fresh tan. When the plants come up, they must be frequently refreshed with water, but it must not be given to them in large quantities, lest it rot their tender roots; and as the warmth of the season increases, it will be proper to admit a large share of fresh air, which will greatly strengthen the plants; they must also be placed in the tan-bed, where they are not over-hung, or shaded by other plants; nor should they be shifted or transplanted when they are in leaf, for that will prevent their flowering. As the roots of this plant increase very fast, there is no necessity for using other methods to propagate it; otherwise the shoots of the young stalks will take root, if they are planted in pots filled with light earth, and plunged into a hot-bed during any of the summer months.

The third sort grows naturally in Louisiana, from whence the seeds were brought to France. This is an annual plant, having a succulent viscous stalk, which divides into many branches; these thick succulent stalks become too weighty for the stalk to support them, whereby the stalk generally is brought to the ground, unless it is well supported: the leaves are large, viscous, and hairy; some of them are cut into angles, but for the most part they are entire, five or six inches long, and four broad in the middle. The flowers are produced from the forks of the stalk in short spikes; they are of a pale red colour, and in shape and size like those of the first sort; they are succeeded by fruit four or five inches long, having a thick green cover, which parts and falls off when ripe, leaving a rough beetle-shaped vessel, having two very long horns at the end, opening in two parts, containing several oval seeds, covered with a black skin, which must be taken off before the seeds are sown.

This being an annual plant, should be brought forward in the spring, by sowing the seeds on a hot-bed the latter end of March; and when the plants come up, they should be treated almost in the same manner as the first, with this difference only, that being more hardy than the first, the plants should have more air admitted to them, to prevent their drawing up weak; nor should they have too much water in summer, which is apt to rot their succulent stems before the seeds are perfected.

MARVEL OF PERU. See MIRABILIS.

MARUM. See TEUCRIUM.

MARUM VULGARE. See SATUREJA.

MARYGOLD. See CALENDULA.

MARYGOLD (AFRICAN.) See TAGETES.

MARYGOLD (FIG.) See MESEMBRYANTHEMUM.

MARYGOLD (FRENCH.) See TAGETES.

MASTERWORT. See IMPERATORIA.

MASTICHINA. See SATUREJA.

MATRICARIA. Tourn. Inst. R. H. 493. tab. 281. Lin. Gen. Plant. 867. [so called from the matrix, because this plant is very good against diseases of the womb; and for the same reason it is called Parthenium, of Παρθένος, a virgin.] Feverfew; in French, *Matricaire.*

The CHARACTERS are,

*It hath a compound flower. The ray, or border, is composed of many female half florets, and the disk, which is hemispherical, of hermaphrodite florets; these are included in one common hemispherical empalement, composed of linear scales, nearly equal. The female half florets are tongue-shaped, and indented in three parts at the end; these have a naked germen, supporting a slender style, terminated by two twisted stigmas. The hermaphrodite florets are tubulous, funnel-shaped, and cut into five parts at the brim, which spread open; they have each five hairy short stamina, terminated by cylindrical summits, and an oblong naked germen, with a slender style, crowned by a bifid spreading stigma. The germen of both turn to single, oblong, naked seeds.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, which includes the plants with compound flowers, whose stamina and styles are connected, and the florets are all fruitful.

The SPECIES are,

1. MATRICARIA (*Parthenium*) foliis compositis planis, foliolis ovatis incisis, pedunculis ramosis. Hort. Cliff. 416. *Feverfew with plain compounded leaves, whose lobes are oval and cut, having branching foot-stalks.* Matricaria vulgaris, seu sativa. C. B. P. 133. *Common, or Garden Feverfew.*
2. MATRICARIA (*Maritima*) receptaculis hemisphæricis, foliis bipinnatis subcarnosis, suprà convexis, subtus carinatis. Lin. Sp. Plant. 891. *Feverfew with hemispherical receptacles, doubly winged leaves, which are fleshy, and convex on their upper side, but keel-shaped below.* Chamæmelum maritimum perenne humilius, foliis brevoribus

brevioribus crassis obscurè virentibus. Raii Syn. Ed. 3. p. 186. *Dwarf, perennial, maritime Chamomile, with short, thick, dark green leaves.*

3. MATRICARIA (*Indica*) foliis ovatis sinuatis angulis serratis acutis. *Feverfew with oval, sinuated, angular, acutely-sawed leaves.* Matricaria latiore folio, flore pleno. Mor. Hist. 3. p. 33.

4. MATRICARIA (*Argentea*) foliis bipinnatis, pedunculis solitariis, Hort. Cliff. 415. *Feverfew with winged leaves, and single foot-stalks to the flowers.* Chamæmelum Orientale incanum, Millefolium folio. Tourn. Cor. 37.

5. MATRICARIA (*Americana*) foliis lineari-lanceolatis integerrimis, pedunculis unifloris. *Feverfew with entire spear-shaped leaves, and foot-stalks with one flower.*

The first sort is the common Feverfew, which is directed to be used in medicine. It grows naturally in lanes, and upon the side of banks in many parts of England, but is frequently cultivated in the physic-gardens to supply the markets; this is commonly a biennial plant, which decays soon after it has perfected seeds. The root of this plant is composed of a great number of fibres, which spread wide on every side. The stalks rise upward of two feet high; they are round, stiff, and striated, branching out on every side. The leaves are composed of seven lobes, which are cut into many obtuse segments; they are of a yellowish green colour. The stalks and branches are terminated by the flowers, which are disposed almost in the form of loose umbels, each flower standing upon a separate foot-stalk, about two inches long. The flowers are composed of several short rays, which are white, like those of the Chamomile, surrounding a yellow disk, composed of hermaphrodite florets, which form a hemisphere; these are inclosed in one common scaly empalement, and are succeeded by oblong, angular, naked seeds. It flowers in June, and the seeds ripen in autumn. The whole plant has a strong unpleasant odour. The leaves and flowers of this are used in medicine, and are particularly appropriated to the female sex, being of great service in all cold flatulent disorders of the womb, and hysteric affections, procuring the catamenia, and expelling the birth and secundines.

The following varieties of this plant are preserved in botanic gardens, many of which are pretty constant, if care is taken in saving the seeds; but where the seeds of these plants has been suffered to scatter, it will be almost impossible to preserve the varieties without mixture; but if the seeds are sown upon a fresh spot of ground, where there has not grown any of the plants before, I am inclinable to believe the seeds will produre the same plants as those they were taken from; however, as they are supposed to be only varieties, so I shall only just insert them here, for the use of those who are curious in collecting the varieties.

1. Feverfew with very double flowers.
2. Feverfew with double flowers, whose borders, or rays are plain, and the disk fistular.
3. Feverfew with very small rays.
4. Feverfew with very short fistular florets.
5. Feverfew with naked heads, having no rays or border.
6. Feverfew with naked sulphur-coloured heads.
7. Feverfew with elegant curled leaves.

These plants are all propagated by their seeds, which should be sown in March upon a bed of light earth, and, when they are come up, they should be transplanted out into nursery-beds, at about eight inches asunder, where they may remain till the middle of May, when they may be taken up, with a ball of earth to their roots, and planted in the middle of large borders, where they will flower in July and August; and, if the autumn be favourable, will produce ripe seeds the same year. But it is not adviseable to permit them to seed, which often weakens and decays the roots; therefore, when their flowers are past, you should cut down their stems, which will cause them to push out fresh heads, whereby the roots may be maintained.

When the different varieties of these plants are intermixed with other plants of the same growth, they make a handsome appearance during the season of flowering, which commonly continues a full month, or more, which renders them more valuable. But as their roots seldom abide more than two, or at most three years, fresh plants would be raised from seeds to supply their places; for although they may be propagated by parting their roots either in spring or autumn, yet these seldom make so good plants as those obtained from seeds; but the second variety seldom produces any good seeds, therefore that must be propagated in this manner, or by planting cuttings in the spring or summer months, which will take root, and make good plants.

The second sort grows naturally near the sea, in several parts of England. I have observed it upon the Sussex coast in great plenty, from whence I brought the plants, which were of no longer duration in the garden than two years, though in their native soil they may continue longer. The stalks of this plant branch out pretty much, and spread near the ground; they are garnished with dark green leaves, which are composed of many double wings, or pinnæ, like those of the common Chamomile, but are much thicker in substance; they have their edges turned backward, so are convex on their upper surface, and concave on their under. The flowers are white, like those of the common Chamomile, and are disposed almost in the form of an umbel; they appear in July, and the seeds ripen in autumn.

This plant is seldom cultivated but in botanic gardens for variety. It may be propagated by seeds, which may be sown either in autumn, soon after they are ripe, or in the spring, upon a bed of common earth, in almost any situation; and when the plants come up, they will require no other care but to thin them where they are too close, and keep them clean from weeds.

The third sort grows naturally in many parts of India, I received it from Nimpu, where it grows plentifully; this plant rises a foot and a half high, dividing into many branches, garnished with angular oval leaves, which are acutely sawed on their edges, and are of a pale colour; the flowers are produced on foot-stalks which arise from the wings of the leaves, and also terminate the branches; these are, in all I have yet seen, very double, and full as large as those of the double sort before-mentioned; these appear in July, and in favourable seasons are succeeded by seeds which ripen late in the autumn.

This sort is propagated by seeds, which should be sown in the spring upon a moderate hot-bed, and when the plants come up, they must be treated in the manner already directed for the Chrysanthemum Coronarium, with which culture they will thrive and flower very well.

The fourth sort grows naturally in the east; this sort rises a foot high, having winged leaves of a silver colour, which are for the most part placed opposite; the foot-stalks of the flowers arise single from the side of the branches, each supporting one white flower. This flowers in July, and in warm seasons will sometimes perfect seeds in autumn.

The seeds of this sort should be sown in April, on a bed of light earth, in a good exposure; and when the plants are grown of a proper size to remove, they should be planted in the borders of the flower-garden; where, if they are kept clean from weeds, they will flower and perfect their seeds.

The fifth sort grows naturally in North America; this is a perennial plant, whose stalks and leaves decay in the autumn, and new ones come out again in the spring; the stalks rise a foot and a half high, and divide upward into several forked branches; at each of these divisions is placed one linear spear-shaped leaf about two inches long, and a quarter of an inch broad, entire on the edges, and of a deep green. The branches are terminated by single foot-stalks, each supporting one blue flower, very like those of some kind of Starwort; but the empalement being scaly,

ſcaly, and the ſeeds having no down, occaſions its being here placed. The flowers appear in July and Auguſt, and the ſeeds ripen in the autumn.

This is propagated by ſeeds, which, if ſown in the autumn, ſoon after they are ripe, will more certainly ſucceed than when ſown in the ſpring; they ſhould be ſown in the full ground, and when the plants are fit to remove, if they are planted in the borders of the flower-garden, they will continue ſome years without protection, and annually produce flowers and ſeeds.

MATTED ROOTS are ſuch as are entangled or plaited together.

MAUDLIN. See Achillea.

MAUROCENIA. Lin. Gen. Plant. Edit. 2. 289. Frangula. Hort. Elth. 121. The Hottentot Cherry, vulgo.

The Characters are,

*The empalement of the flower is of one leaf, cut into five ſegments, and is permanent. The flower hath five oval petals, which ſpread open. It hath five ſtamina, which are ſituated betwen the petals, crowned by obtuſe ſummits. In the center is ſituated a roundiſh germen, having no ſtyle, crowned by a trifid ſtigma. The germen afterward turns to an oval berry with one or two cells, each containing a ſingle oval ſeed.*

This genus of plants is ranged in the third ſection of Linnæus's fifth claſs, which includes the plants whoſe flowers have five ſtamina and three ſtyles or ſtigmas; and in the laſt edition of his Genera, he has joined it to the Caſſine, making them the ſame; but as the flower of Caſſine has but one petal, and the flower of theſe have five; and the berries of the former three cells, and thoſe of this but one or two, therefore I have ſeparated them.

The Species are,

1. Maurocenia (*Frangula*) foliis ſubovatis integerrimis, floribus confertis lateralibus. *Maurocenia with entire leaves which are almoſt oval, and flowers growing in cluſters on the ſides of the branches.* Frangula ſempervirens, folio rigido ſubrotundo. Hort. Elth. 146. tab. 121. *Evergreen berry-bearing Alder with a roundiſh ſtiff leaf, commonly called Hottentot Cherry.*
2. Maurocenia (*Phillyrea*) foliis obverſè ovatis ſerratis, floribus corymboſis alaribus & terminalibus. *Maurocenia with obverſe, oval, ſawed leaves, and flowers growing in a corymbus at the ſides and ends of the branches.* Phillyrea capenſis, folio celaſtri. Hort. Elth. 315. tab. 236. *Phillyrea of the Cape with a Staff-tree leaf, by the Dutch called Leplehout.*
3. Maurocenia (*Ceraſus*) foliis ovatis nervoſis integerrimis. *Maurocenia with oval veined leaves, which are entire.* Ceraſus Hottentotorum. Pluk. Almag. 94. *The ſmaller Hottentot Cherry.*
4. Maurocenia (*Americana*) foliis obverſè ovatis emarginatis, floribus ſolitariis alaribus. *Maurocenia with obverſe oval leaves which are indented at the edges, and flowers growing ſingly from the ſides of the branches.* Frangula folio ſubrotundo rigido ſubtus ferrugineo. Houſt. MSS. *Berry-bearing Alder with a roundiſh ſtiff leaf, which is of an iron colour on the under ſide.*

The firſt ſort grows naturally at the Cape of Good Hope, where it riſes to a conſiderable height, but here they are rarely more than five or ſix feet high. The ſtalk is ſtrong, woody, and covered with a purpliſh bark, ſending out many ſtiff branches, garniſhed with very thick leaves, almoſt oval, ſtanding for the moſt part oppoſite; they are about two inches long, and almoſt as much in breadth, of a dark green colour, and entire. The flowers come out from the ſide of the old branches, in cluſters, three, four, or five, ſtanding upon one common foot-ſtalk, which is ſlender, compoſed of five plain equal petals, ending in acute points; they are firſt of a greeniſh yellow colour, but afterward change to white, ſpreading wide open. In the center is ſituated the oval germen, crowned by the trifid ſtigma, and between each petal is ſituated a ſtamina; theſe ſpread open in the ſame manner as the petals, and are terminated by obtuſe ſummits. The germen afterward turns to an oval pulpy berry, ſome having but one, and others two cells; in each of theſe is lodged one oval ſeed. The berries change to a dark purple when they are ripe. This plant flowers in July and Auguſt, and the berries ripen in winter.

The ſecond ſort is a native of the Cape of Good Hope; this hath a woody ſtalk, which in this country ſeldom riſes more than five or ſix feet high, ſending out many branches, covered with a dark purpliſh bark, and garniſhed with pretty ſtiff leaves, which are obverſely oval, and ſawed on their edges, ſtanding oppoſite; they are about an inch and a half long, and a little more in breadth, of a light green, having ſhort foot-ſtalks. The flowers are produced in roundiſh bunches from the ſide, and at the end of the branches; they are white, and have five ſmall petals which ſpread open; between theſe are ſituated the ſtamina, which ſpread in the ſame manner; theſe are terminated by obtuſe ſummits. In the center is ſituated the roundiſh germen, which is crowned ſometimes by a bifid, and at others by a trifid ſtigma. The flowers appear in July and Auguſt, but are not ſucceeded by berries in England.

The third ſort grows naturally at the Cape of Good Hope; this riſes with a woody ſtalk about the ſame height as the former, dividing into many branches, which are garniſhed with ſtiff oval leaves about two inches long, and nearly as much in breadth, of a lucid green colour, and entire, having three longitudinal veins; theſe are ſometimes placed oppoſite, and at others they are alternate, having a ſtrong margin, or border, ſurrounding them. This ſort hath produced its flowers in England, and I am fully convinced that the characters of the flowers are the ſame with the others.

The fourth ſort was diſcovered by the late Dr. Houſtoun, growing naturally at the Paliſadoes in Jamaica, from whence he ſent the ſeeds to Europe; this riſes with a woody ſtalk from fifteen to twenty feet high, covered with a rough brown bark, and divides into many branches, which are garniſhed with ſtiff leaves, placed alternately; they are about an inch and a half long, and a little more in breadth, indented at the top, with a ſtiff reflexed border, of a gray colour on their upper ſide, but of a ruſty iron colour on their under, ſtanding upon ſhort foot-ſtalks. The flowers come out ſingly along the ſide of the branches; they have five ſmall white petals, which end in acute points, and five ſlender ſtamina, which ſpread open, and are terminated by obtuſe ſummits. In the center is ſituated a roundiſh germen, ſupporting a long bifid ſtigma, which is permanent. The germen afterward turns to a round berry, with one or two cells, each having one oblong ſeed.

The firſt ſort is too tender to live abroad in England, but as it requires no artificial heat, ſo may be preſerved through the winter in a good green-houſe, where it deſerves a place for the beauty of its leaves, which are very thick, of a deep green, and differing in appearance from every other plant; this may be propagated by laying down thoſe ſhoots which are produced near the root, but they are long in putting out roots. The ſhoots ſhould be twiſted in the part which is laid, to facilitate their putting out roots; if theſe are laid down in the autumn, they will put out roots ſufficient to remove by the following autumn; it may alſo be propagated by cuttings, but this is a tedious method, as they are ſeldom rooted enough to tranſplant in leſs than two years. When this is practiſed, the young ſhoots of the former year ſhould be cut off, with a ſmall piece of the old wood at the bottom, in the ſpring, and planted in pots filled with loamy earth, and plunged into a moderate hot-bed, covering the pots with glaſſes, which ſhould be cloſe ſtopped down to exclude the external air; they ſhould be pretty well watered at the time they are planted, but afterward they will require but little wet; the glaſſes over them ſhould be covered every day with mats, to ſcreen the cuttings from the ſun during the heat of the

the day, but in the morning before the ſun is too warm, and in the afternoon, when the ſun is low, they ſhould be uncovered, that the oblique rays of the ſun may raiſe a gentle warmth under the glaſſes. With this care the cuttings will take root, but where it is wanting, they ſeldom ſucceed. When the cuttings or layers are rooted, they ſhould be each planted in a ſeparate ſmall pot, filled with ſoft loamy ſoil, and placed in the ſhade till they have taken new root; then they may be removed to a ſheltered ſituation, where they may remain during the ſummer ſeaſon; and, before the froſts of the autumn come on, they muſt be removed into the green-houſe, and treated in the ſame way as the other plants of that country, giving them but little water in cold weather, and in mild weather admitting the free air. In ſummer they muſt be removed into the open air, and placed in a ſheltered ſituation with other exotic plants, and in very warm weather they muſt be watered three times a week, but it muſt not be given them too freely at any time. When the plants have obtained ſtrength, they will produce flowers and fruit, which, in warm ſeaſons, will ripen perfectly; and if the ſeeds are ſown ſoon after they are ripe, in pots, and plunged into the tan-bed in the ſtove, the plants will come up the ſpring following, and may then be treated in the ſame manner as thoſe which are propagated by cuttings and layers.

The ſecond ſort is not altogether ſo hardy as the firſt, ſo muſt have a warmer place in the green-houſe in winter, and ſhould not be placed abroad quite ſo early in the ſpring, nor ſuffered to remain abroad ſo late in the autumn, but if the green-houſe is warm, the plants will require no additional heat. This may be propagated by layers and cuttings, in the ſame manner as the firſt, and requires the ſame care, for the cuttings are with difficulty made to root; nor will the branches which are laid, put out roots in leſs than a year, and if theſe are not young ſhoots, they will not take root.

As this ſort does not produce ſeeds in England, it can be only propagated by layers and cuttings, which being difficult to root, occaſions its being ſcarce at preſent in Europe.

The third ſort is yet more rare than either of the former, and is with greater difficulty propagated, for the layers and cuttings are commonly two years before they get roots ſufficient to remove, and as it never produces ſeeds here, it can be no other way propagated; this is alſo tenderer than either of the other ſorts, ſo requires a moderate degree of heat in winter, for without ſome artificial warmth, it will ſeldom live through the winters in England. In the middle of ſummer the plants may be placed abroad in a warm ſituation, but they muſt be removed into ſhelter early in the autumn, before the cold nights come on, otherwiſe they will receive a check, which they will not recover in winter; during the ſummer ſeaſon they ſhould be gently watered three times a week in dry weather, but in winter they will require to be ſeldom watered.

The fourth ſort is much more impatient of cold than either of the other, being a native of a warmer country. This is propagated by ſeeds, which muſt be procured from the country where it grows naturally, for it does not produce any here. Theſe do not grow the firſt year, ſo the ſeeds ſhould be ſown in pots filled with light earth, and plunged into a moderate hot-bed of tanners bark, where they may remain all the ſummer; and in the autumn they ſhould be removed into the bark-ſtove, and plunged into the tan-bed between the other pots of plants, in any vacant ſpaces; there they may remain till ſpring, when they ſhould be taken out of the ſtove, and plunged into a freſh hot bed, which will bring up the plants. When theſe are fit to remove, they ſhould be each tranſplanted into a ſeparate ſmall pot, filled with a ſoft loamy earth, and plunged into a hot-bed again, being careful to ſhade them from the ſun till they have taken new root, after which they muſt be treated in the ſame manner as other tender plants from the ſame country, always keeping them in the tan-bed; and in winter they muſt have a temperate warmth, otherwiſe they will not live here.

All the ſorts delight in a ſoft, gentle, loamy ſoil, not over ſtiff, ſo as to detain the wet; nor ſhould the ſoil be too light, for in ſuch they ſeldom thrive. They retain their leaves all the year, ſo make a good appearance in the winter ſeaſon, their leaves being remarkably ſtiff and of a fine green, eſpecially the firſt ſort, whoſe fruit ripens in winter, which when it is in plenty on the plants, affords an agreeable variety.

MAYS. See Zea.

MEADIA. Cateſb. Carol. 3. p. 1. Dodecatheon. Lin. Gen. Plant. 183.

The Characters are,

*It hath a ſmall involucrum of many leaves, in which are many flowers. The flower hath a permanent empalement of one leaf, cut into five long ſegments which are reflexed. The flower hath one petal, cut into five parts, whoſe tube is ſhorter than the empalement, and the limb is reflexed backward. It hath five ſhort obtuſe ſtamina ſitting in the tube, terminated by arrow-pointed ſtigmas, which are connected into a beak, with a conical germen, ſupporting a ſlender ſtyle longer than the ſtamina, crowned by an obtuſe ſtigma. The empalement afterward becomes an oblong oval capſule with one cell, opening at the top, and filled with ſmall ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and one ſtyle. The title of this genus was given to it by Mr. Mark Cateſby, F. R. S. in honour of the late Dr. Mead, who was a generous encourager of every uſeful branch of ſcience; but being himſelf no great botaniſt, Dr. Linnæus was unwilling any plant ſhould bear his name, ſo he has altered it to that of Dodecatheon, which was a title applied by Pliny to a ſpecies of Primroſe with a yellow root, and leaves like the Garden Lettuce.

We have but one Species of this genus, viz.

Meadia (*Dodecatheon.*) Cateb. Hiſt. Carol. App. 1. tab. 1. *Meadia.* Auricula urſi Virginiana, floribus boraginis, inſtar roſtratis, cyclaminum more reflexis. Pluk. Alm. 62. tab. 79. fol. 6. *Bear's-ear of Virgina, whoſe flower has a beak like that of Borage, and reflexed petals like thoſe of Sowbread.*

This plant grows naturally in Virginia, and other parts of North America, from whence it was ſent by Mr. Baniſter, many years ſince, to Dr. Compton, Lord Biſhop of London, in whoſe curious garden I firſt ſaw this plant growing in the year 1709; after which the plant was for ſeveral years loſt in England, till within a few years paſt, when it was again obtained from America, and has been propagated in pretty great plenty. It hath a yellow perennial root, from which comes out ſeveral long ſmooth leaves in the ſpring, which are near ſix inches long, and two and a half broad; at firſt ſtanding erect, but afterward they ſpread on the ground, eſpecially if the plants are much expoſed to the ſun; from between theſe leaves ariſe two, three, or four flower-ſtalks, in proportion to the ſtrength of the roots, which riſe eight or nine inches high, they are ſmooth, naked, and are terminated by an umbel of flowers, under which is ſituated the many-leaved involucrum. Each flower is ſuſtained by a pretty long ſlender foot-ſtalk which is recurved, ſo that the flower hangs downward. The flower has but one petal, which is deeply cut into five ſpear-ſhaped ſegments, which are reflexed upward like the flowers of Cyclamen or Sowbread; the ſtamina, which are five in number, are ſhort, and ſit in the tube of the flower, having five arrow-pointed ſummits, which are connected together round the ſtyle, forming a ſort of beak. The flowers are purple, inclining to a Peach bloſſom colour, and have an oblong germen ſituated in the bottom of the tube, which afterward becomes an oval capſule incloſed by the empalement, with the permanent ſtyle on its apex, which, when ripe, opens at the top to let out

the seeds, which are fastened round the style. This plant flowers the beginning of May, and the seeds ripen in July, soon after which the stalks and leaves decay, so that the roots remain inactive till the following spring.

This plant is propagated by offsets, which the roots put out pretty freely when they are ina loose moist soil and a shady situation; the best time to remove the roots, and take away the offsets, is in August, after the leaves and stalks are decayed, that they may be fixed well in their new situation before the frost comes on. It may also be propagated by seeds, which the plants generally produce in plenty; these should be sown in the autumn soon after they are ripe, either in a shady moist border, or in pots, which should be placed in the shade; in the spring the plants will come up, and must then be kept clean from weeds, and if the season proves dry, they must be frequently refreshed with water; nor should they be exposed to the sun, for while the plants are young, they are very impatient of heat, so that I have known great numbers of them destroyed in two or three days, which were growing to the full sun. These young plants should not be transplanted till their leaves are decayed, then they may be carefully taken up and planted in a shady border, where the soil is loose and moist, at about eight inches distance from each other, which will be room enough for them to grow one year, by which time they will be strong enough to produce flowers, so may then be transplanted into some shady borders in the flower-garden, where they will appear very ornamental during the continuance of their flowers.

At the first many supposed this plant to be tender, so planted it in warm situations and nursed it too much, whereby the plants were often killed; but by experience it is found to be so hardy, as not to be hurt by the severest cold of this country; but it will not thrive in a very dry soil, or where it is greatly exposed to the sun.

MEADOW.

Under the general title of Meadow, is commonly comprehended all pasture land, or at least all Grass land, which is mown for hay; but I chuse rather to distinguish such land only by this appellation, which is so low, as to be too moist for cattle to graze upon them in winter, being generally too wet to admit heavy cattle, without poaching and spoiling the sward; and those Grass lands which are drier, I shall distinguish by the title of pasture.

There are two sorts of Meadows in England, one of which is stiled Water Meadows, and the other are simply called Meadows.

Water Meadows are those which lie contiguous to rivers or brooks, from whence the water can be carried to overflow the Grass at pleasure. Of these there are large tracts in several parts of England, which, if skilfully managed, would become much more profitable to their owners than they are at present, as hath been already mentioned in another place; for nothing can be more absurd than the common practice of flowing these low grounds all the winter, whereby the roots of all the sweetest kinds of Grass are destroyed, and only such Grasses left as are natives of marshes, which are coarse and sour: and if people were curious to examine the herbage of these Water Meadows, they would find the bulk of them composed of bad weeds, such as grow by the sides of rivers, brooks, and ditches, of which the several sorts of Docks make no small share; and although many of these Meadows produce a great burden of what the country people call hay, yet this is only fit for cows, cart-horses, and other animals, which by hard labour and hunger, are driven to eat it; for horses which have been accustomed to feed on good hay, will starve before they will touch it: and after the Grass is mown off these Meadows, and cattle turned in to graze upon them, how common is it to see the land almost covered with these rank weeds, which the cattle never will eat! Which must always be the condition of such Meadows, where the water is let over them in autumn and winter; for, as the sides of rivers and brooks do every where abound with these rank weeds, whose seeds ripen in autumn, and falling into the water, they are carried by the stream, and deposited on the flowed land, where they grow and fill the ground in every part; but so incurious are the generality of farmers in this respect, that if the ground is but well covered, they care not what it is, few of them ever taking any pains to weed or clean their pastures.

The method which I propose for the management of these Meadows is, never to flow them till the middle or latter end of March, excepting once or twice in winter, when there may happen floods, which may bring down a great share of soil from the upper lands, at which times it will be of great service to let water upon the Meadows, that the soil may settle there; but the sooner the wet is drained off when this is lodged, the greater advantage the Meadows will receive by it; but from the end of March to the middle of May, in dry seasons, by frequently letting on the water, the growth of the Grass will be greatly encouraged, and at this season there will be no danger of destroying the roots of the Grass; and after the hay is carried off the ground, if the season should prove dry, it will be of great service to the Grass, if the Meadows are flowed again; but when this is practised, no cattle should be turned into the Meadows, till the surface of the ground is become firm enough to bear their weight without poaching the land, for otherwise the Grass will suffer more from the treading of the cattle, than it will receive benefit by the flowing; but these are things which the country people seldom regard, so that the Meadows are generally very unsightly, and rendered less profitable.

I would also recommend the weeding of these Meadows twice a year; the first time in April, and again in October; at which times if the roots of Docks and all bad weeds are cut up with a spaddle, the Meadows will soon be cleared of this trumpery, and the herbage greatly improved.

Another great improvement of these lands might be procured, by rolling them with a heavy roller in spring and autumn. This will press the surface of the ground even, whereby it may be mown much closer, and it will also sweeten the Grass; and this piece of husbandry is of more service to pastures than most people are aware of.

As to those Meadows which cannot be flowed, there should be the same care taken to weed and roll them, as hath been directed for the Water Meadows; as also never to let heavy cattle graze upon them in winter when they are wet; for the cattle will then poach them, and greatly injure the Grass; therefore these should be fed down as close as possible in the autumn, before the heavy rains fall to render the ground soft; and those pastures which are drier, may be kept to supply the want of these in winter; and where there are not cattle enough to eat down the Grass in time, it will be much better to cut off what is left, than to suffer it to rot upon the ground, for that will prevent the Grass from shooting early in the spring; but where people have not cattle enough of their own to eat down the Grass in time, they had much better take in some of their neighbours, than suffer their fog (as it is called) to remain all the winter. When these Meadows are fed in the autumn, the greater variety of animals are turned in, the closer they will eat the Grass; and I am fully convinced, the closer it is eaten, the better the Grass will come up the following spring; therefore, if during the time while the cattle are feeding, the Meadows are well rolled, the animals will eat the Grass much closer than they otherwise would.

Those persons who are best skilled in this part of husbandry, always dress their Meadows every other, or at least every third year, without which it is in vain to expect any good crop of hay; but the generality of the farmers are so much distressed for dressing to supply their Corn land, as not to have any to spare

for their Meadows, so that they are content with what the land will naturally produce, rather than take any part of their manure from their arable ground; but this is a very imprudent piece of husbandry; for if land is to be annually mowed far hay, can it be supposed that it will produce a good crop long, unless there are proper dressings allowed it? And when ground is once beggared for want of manure, it will be some years before it can be recovered again; but I shall reserve what is necessary to be farther enlarged on this subject, to be fully treated under the article of PASTURE.

MEADOW SAFFRON. See COLCHICUM.

MEDEOLA. Lin. Gen. Plant. 411.

The CHARACTERS are,

*The flower has no empalement; it hath six oblong oval petals which are equal, spread open, and turn backward; and six awl-shaped stamina the length of the petal, terminated by incumbent summits, and three corniculated germen terminating the style, crowned by thick recurved stigmas. The germen afterward turns to a roundish trifid berry with three cells, each containing one heart-shaped seed.*

This genus of plants is ranged in the third section of Linnæus's sixth class, which includes those plants whose flowers have six stamina and three styles.

The SPECIES are,

1. MEDEOLA (*Asparagoides*) foliis ovato-lanceolatis alternis, caule scandente. *Medeola with oval, spear-shaped, alternate leaves, and a climbing stalk.* Asparagus Africanus, scandens, myrti folio. Hort. Piss. 17. *Climbing African Asparagus, with a Myrtle leaf.*
2. MEDEOLA (*Angustifolia*) foliis lanceolatis alternis, caule scandente. *Medeola with spear-shaped alternate leaves, and a climbing stalk.* Asparagus Africanus, scandens, myrti folio angustiore. Hort. Piss. 17. *Climbing African Asparagus, with a narrower Myrtle leaf.*
3. MEDEOLA (*Virginiana*) foliis verticillatis, ramis inermibus. Lin. Sp. Plant. 339. *Medeola with leaves growing in whorls and smooth branches.* Lilium five martagon pusillum, floribus minutissimè herbaceis. Pluk. Alm. 410. tab. 328. fol. 4. *The Lily or little Martagon, with very small herbaceous flowers.*

The first sort grows naturally at the Cape of Good Hope; this hath a root composed of several dugs or oblong knobs, which unite together at the top like that of the Ranunculus, from which arise two or three stiff winding stalks, which divide into branches rising four or five feet high, if they meet with any neighbouring support to which they can fasten, otherwise they will fall to the ground; these are garnished with oval spear-shaped leaves, ending in acute points, placed alternately, and sitting close to the stalks; they are of a light green on their under side, and dark on their upper. The flowers come out from the side of the stalks, sometimes singly, and at others there are two upon a slender short foot-stalk; they have six oblong equal petals which spread open, and are of a dull white colour; within these are ranged six stamina, which are as long as the petals, terminated by incumbent summits. In the center is situated a germen with three horns, sitting upon a short style, crowned by three thick recurved stigmas; the germen afterward turns to a roundish berry with three cells, each containing one heart-shaped seed. It flowers the beginning of winter, and the seeds are ripe in the spring.

The second sort is also a native of the Cape of Good Hope, from whence I received the seeds. This hath a root like the first, but the stalks are not so strong; they climb higher, but do not branch so much; the leaves are much longer and narrower, and are of a grayish colour. The flowers come from the side of the branches, two or three upon each foot-stalk; they are of an herbaceous white colour, shaped like those of the former sort, and appear about the same time, but this has not produced any fruit here. These are undoubtedly distinct species, for they never vary when they are propagated by seeds.

Both these sorts propagate freely by offsets from the roots, so that when they are once obtained, there will be no necessity of sowing their seeds, which commonly lie a year in the ground, and the plants will not be strong enough to flower in less than two years more, whereas the offsets will flower the following season. The time for transplanting and parting of the roots is in July, when their stalks are entirely decayed, for they begin to shoot toward the end of August, and keep growing all the winter, and decay in the spring. These roots should be planted in pots filled with good kitchen-garden earth, and may remain in the open air till there is danger of frost, when they must be removed into shelter, for they are too tender to live through the winter in the open air; but if they are placed in a warm green-house, they will thrive and flower very well, but they do not produce fruit unless they have some heat in winter; therefore where that is desired, the plants should be placed in a stove kept to a moderate degree of warmth. During the winter, when the plants are in vigour, they should be frequently, but gently watered; but when the stalks begin to decay, they must have very little wet, for much moisture will rot them while they are in an inactive state; during which time, if the pots are placed where they have only the morning sun, they will require little or no water: but when they begin to shoot out their stalks, they should be removed to a warmer situation, and should then be frequently but gently watered.

The flowers of these plants make no great appearance, so the plants are not preserved for their beauty; but as their stalks are climbing, and their leaves are in full vigour in winter, during that season th y add to the variety in the green-house.

The third sort is a native of North America; it is by Dr. Linnæus joined to this genus, in which I have followed him; though, if I remember rightly, the characters of this sort do not exactly agree with those of the other, for the flower is either polypetalous, or is cut into many segments, and has but five stamina; it being some years since I saw the flowers, I cannot be very certain if I am right. This hath a small scaly root, from which arises a single stalk about eight inches high, garnished with one whorl of leaves at a small distance from the ground, and at the top there are two leaves standing opposite; between these come out three slender foot-stalks which turn downward, each sustaining one pale herbaceous flower with a purple pointal. It flowers in June, but I have not seen any fruit upon it.

This plant is hardy enough to live in the open air, but does not propagate fast here, as it produces no seeds, so can only be encreased by offsets.

MEDICA. Tourn. Inst. R. H. 410. tab. 231. Medicago. Tourn. Inst. 412. Lin. Gen. Plant. 805. [This plant takes its name from Media (as Pliny writes) because when Darius Hystaspis carried his army into Greece, he had with him a great many sacks of this seed for provender for his cattle, and so the seeds came to be scattered in Greece.] Medick, or La Lucerne.

The CHARACTERS are,

*The flower hath a bell-shaped empalement of one leaf, cut into five equal acute points. The flower is of the butterfly kind; the standard is oval, entire, and the border is reflexed; the two wings are oblong, oval, and fixed by an appendix to the keel; the keel is oblong, bifid, obtuse, and reflexed toward the standard. It has ten stamina, nine of which are joined almost to their tops, the other is single; they are terminated by small summits. It hath an oblong compressed germen which is incurved, sitting on a short style, terminated by a small stigma; this and the stamina are involved by the keel and standard. The germen afterward turns to a compressed moon-shaped pod, inclosing several kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes the herbs with a butterfly flower, having ten stamina in two houses. He also has joined the Medica and Me-

Medicago of Tournefort together, making them one genus under the title Medicago, but Tournefort makes the distinguishing character of Medicago to consist in having a falcated compressed pod. Therefore I shall here separate those plants whose pods are of that form, from the others whose pods are twisted like a screw; and as the title of Medica was first applied to the Lucern, so I shall continue it to those species as have such pods, and refer the others to the genus of Medicago.

The Species are,

1. Medica (*Sativa*) pedunculis racemosis, leguminibus contortis, caule erecto glabro. Lin. Sp. 1096. *Medick with branching foot-stalks, contorted pods, and an erect smooth stalk.* Medica major, erectior, floribus purpurascentibus. J. B. 2. 382. *Greater upright Medick with purplish flowers, commonly called La Lucerne, and by the French, Burgundy Hay.*
2. Medica (*Falcata*) pedunculis racemosis, leguminibus lunatis, caule prostrato. Flor. Suec. 620. *Medick with branching foot-stalks, moon-shaped pods, and trailing stalks.* Medica sylvestris, floribus croceis. J. B. 2. 383. *Wild Medick with Saffron-coloured flowers.*
3. Medica (*Radiata*) leguminibus reniformibus, margine dentatis, foliis ternatis. Hort. Cliff. 377. *Medick with kidney-shaped pods indented on the borders, and trifoliate leaves.* Medicago annua, trifolii facie. Tourn. Inst. R. H. 412. *Annual Medicago with the appearance of Trefoil.*
4. Medica (*Hispanica*) caule herbaceo procumbente, foliis pinnatis, leguminibus ciliato-dentatis. *Medick with a trailing herbaceous stalk, winged leaves, and pods having hairy indentures.* Medicago vulnerariæ facie Hispanica. Tourn. Inst. R. H. 412. *Spanish Medicago with the appearance of Ladies Finger.*
5. Medica (*Italica*) caule herbaceo prostrato, foliis ternatis, foliolis cuneiformibus supernè serratis, leguminibus margine integerrimis. *Medick with a prostrate herbaceous stalk, trifoliate leaves whose lobes are wedge-shaped and sawed at the top, and the borders of the pods entire.* Medicago Italica, annua maritima, trifolia, polycarpos, fructu toroso non spinoso. Mitchel. Hort. Piss. *Annual, Italian, maritime Medicago with trifoliate leaves, and bearing much fruit, which is thick and without spines.*
6. Medica (*Cretica*) caule herbaceo prostrato, foliis radicalibus integerrimis, caulinis pinnatis leguminibus dentatis. *Medick with a prostrate herbaceous stalk, the bottom leaves entire, those on the stalks winged, and indented pods.* Medicago vulnerariæ facie Cretica. Tourn. Inst. 412. *Cretan Medicago, with the appearance of Ladies Finger.*
7. Medica (*Arborea*) leguminibus lunatis margine integerrimis caule arboreo. Hort. Cliff. 376. *Medick with moon-shaped pods whose borders are entire, and a tree-like stalk.* Medicago trifolia, frutescens, incana. Tourn. Inst. R. H. 412. *Shrubby, hoary, three-leaved Medica, or the Cytisus Virgilii.*

The first sort hath a perennial root and annual stalks, which rises near three feet high in good land; these are garnished with trifoliate leaves at each joint, whose lobes are spear-shaped, about an inch and a half long, and half an inch broad, a little sawed toward their top, of a deep green, and placed alternately on the stalks. The flowers grow in spikes, which are from two to near three inches in length, standing upon naked foot-stalks which are two inches long, rising from the wings of the stalk; they are of a Pea bloom or butterfly kind, of a fine purple colour, and are succeeded by compressed moon-shaped pods, which contain several kidney-shaped seeds. It flowers in June, and the seeds ripen in September.

There are the following varieties of this plant:
One with Violet-coloured flowers.
Another with pale blue flowers.
And a third with variegated flowers.

These variations of their flowers have accidentally risen from seed, therefore are not to be supposed different plants; yet those with the pale blue and variegated flowers are never so strong as those with purple, so are less profitable to the cultivators.

This plant is supposed to have been brought originally from Media, and from thence had its name Medica: it is by the Spaniards called Alfafa; by the French, La Lucerne, and Grand Trefle; and by several botanic writers it is called Fœnum Burgundiacum, i. e. Burgundian Hay. But there is little room to doubt of this being the Medica of Virgil, Columella, Palladius, and other ancient writers of husbandry, who have not been wanting to extol the goodness of this fodder, and have given direction for the cultivation of it in those countries where they lived.

But notwithstanding it was so much commended by the antients, and hath been cultivated to so good purpose by our neighbours in France and Switzerland for many years, it hath not as yet found so good reception in our country as could be wished; nor is it cultivated in considerable quantities, though it is evident, it will succeed as well in England as in either of the before-mentioned countries, though will not bear cutting so often here, yet is extremely hardy, and resists the severest cold of our climate: as a proof of this, I must beg leave to mention, that the seeds which have have happened to be scattered upon the ground in autumn, have come up, and the plants have endured the cold of a severe winter, and made very strong plants the following season.

About the year 1650, the seeds of this plant were brought over from France, and sown in England; but whether for want of skill in its culture, whereby it did not succeed, or that the people were so fond of going on in their old beaten road, as not to try the experiment whether it would succeed here or not, was the occasion of its being entirely neglected in England, I cannot say, but it is very certain that it was neglected many years, so as to be almost forgotten. However, I hope, before I quit this article, to give such directions for its culture, as will encourage the people of England to make farther trial of this valuable plant, which grows in the greatest heat, and also in very cold countries, with this difference only, that in very hot countries, such as the Spanish West-Indies, &c. where it is the chief fodder for their cattle at this time, they cut it every week; whereas in cold countires, it is seldom cut oftener than four or five times in a year. And it is very likely that this plant may be of great service to the inhabitants of Barbadoes, Jamaica, and the other hot islands in the West-Indies, where one of the greatest things they want is fodder for their cattle; since by the account given of this plant by Pere Feuillé, it thrives exceedingly in the Spanish West-Indies, particularly about Lima, where they cut it every week, and bring it into the market to sell, and is there the only fodder cultivated.

It is also very common in Languedoc, Provence, aad Dauphiné, and all over the banks of the Rhone, where it produces abundantly, and may be mowed five or six times in a year. Horses, mules, oxen, and other domestic cattle, love it exceedingly; but above all when it is green, if they are permitted to feed on it, and especially the black cattle, which will feed very kindly upon the dried plant; the excess of which is, by many people, thought to be very dangerous; but it is said to be exceeding good for milch cattle, to promote their quantity of milk; and is also said to agree with horses the best of all, though sheep, goats, and most other cattle, will feed upon it, especially when young.

The directions given by all those who have written of this plant are very imperfect, and generally such as, if practised in this country, will be found entirely wrong; for many of them order the mixing of this seed with Oats or Barley, (as is practised for Clover) but in this way it seldom comes up well, and if it does, it will draw up so weak by growing amongst the Corn, as not to be recovered under a whole year, if ever it can be brought to its usual strength again. Others have directed it to be sown upon a low, rich, moist soil, which is found to be the worst next to a

clay, of any for this plant; in both which the roots will rot in winter, and in a year or two the whole crop will be destroyed.

But the soil in which this plant is found to succeed best in this country is, a light, dry, loose, sandy land, which should be well ploughed and dressed, and the roots of all noxious weeds, such as Couch Grass, &c. destroyed, otherwise they will overgrow the plants while young, and prevent their progress.

The best time to sow the seed is about the middle of April, when the weather is settled and fair; for if you sow it when the ground is very wet, or in a rainy season, the seeds will burst and come to little (as is often the case with several sorts of the leguminous plants;) therefore you should always observe to sow it in a dry season, and if there happens rain in about a week or ten days after it is sown, the plants will soon appear above ground.

But the method I would direct for the sowing these seeds is as follows: after having well ploughed and harrowed the land very fine, you should make a drill quite across the ground, about half an inch deep, into which the seeds should be scattered very thin by a hopper fixed to a drill plough; then cover them over half an inch thick, with the earth that came out of the drill; then proceed to make another drill about two feet and a half from the former, sowing the seeds therein in the same manner as before, and so proceed through the whole spot of ground, allowing the same distance between row and row, and scatter the seeds very thin in the drills. In this manner, an acre of land will require about six pounds of seeds; for when it is sown thicker, if the seed grows well, the plants will be so close as to spoil each other in a year or two, the heads of them growing to a considerable size, as will also the roots, provided they have room. I have measured the crown of one root, which was in my possession, eighteen inches diameter; from which I cut near four hundred shoots at one time, which is an extraordinary increase, and this upon a poor, dry, gravelly soil, which had not been dunged for many years, but the root was at least fourteen years old; so that if this crop be well cultivated, it will continue many years, and be equally good as when it was first sown; for the roots generally run down very deep in the ground, provided the soil be dry; and although they should meet a hard gravel a foot below the surface, yet their roots would penetrate it, and make their way downward, as I have experienced, having taken up some of them which were above four feet in length, and had run above two feet into a rock of gravel, which was so hard as not to be loosened without mattocks and crows of iron, and that with much difficulty.

The reason for directing this seed to be sown in rows is, that the plants may have room to grow; and for the better stirring the ground between them, to destroy the weeds, and encourage the growth of the plants, which may be very easily effected with a Dutch hoe, just after the cutting the crop each time, which will cause the plants to shoot again in a very little time, and be much stronger than in such places where the ground cannot be stirred; but when the plants first come up, the ground between them should be hoed by hand with a common hoe; and if in doing of this you cut up the plants where they are too close in the rows, it will cause the remaining to be much stronger. This hoeing should be repeated two or three times while the plants are young, according as the weeds are produced, observing always to do it in dry weather, that the weeds may the better be destroyed; for if it be done in moist weather, they will take root and grow again.

With this management, the plants will grow to the height of two feet, or more, by the beginning of August, when the flowers will begin to appear, when it should be cut for the first time, observing to do it in a dry season, especially if it is to be made into hay, and keep it often turned, that it may soon dry, and be carried off the ground; for if it lie long upon the roots, it will prevent their shooting again. After the crop is taken off, you should stir the ground between the rows with a hoe, to kill the weeds, and loosen the surface, which will cause the plants to shoot again in a short time, so that by the middle of September there will be shoots four or five inches high, when you may turn in sheep upon it to feed it down, for it will not be fit to cut again the same season; nor should the shoots be suffered to remain upon the plants, which would decay when the frosty weather comes on, and fall down upon the roots, and prevent their shooting early the succeeding spring; but these sheep should not remain so long upon it as to endanger the crowns of the roots.

So that the best way is to feed it until November, when it will have done shooting for that season; but it should not be fed by large cattle the first year, because the roots being young, would be in danger of being destroyed, either by their trampling upon them, or their pulling them out of the ground; but sheep will be of service to the roots by dunging the ground, provided they do not eat it too close.

The beginning of February, the ground between the roots should be again stirred with the hoe, to encourage them to shoot again; but in doing of this you should be careful not to injure the crown of the roots, upon which the buds are at that time very turgid, and ready to push. With this management, if the soil be warm, by the middle of March the shoots will be five or six inches high, when, if you are in want of fodder, you may feed it down till a week in April; after which it should be suffered to grow for a crop, which will be fit to cut the beginning of June, when you should observe to get it off the ground as soon as possible, and stir the ground again with a Dutch hoe, which will forward the plants shooting again, so that by the middle of July, there will be another crop fit to cut, which must be managed as before: after which it should be fed down again in autumn; and as the roots by this time will have taken deep hold in the ground, there will be little danger of hurting them, if you should turn in larger cattle; but you must always observe not to suffer them to remain after the roots have done shooting, lest they should eat down the crown of the roots below the buds, which would consideraby damage, if not destroy them. In this manner you may continue constantly to have two crops to cut, and two feedings upon this plant, and in good summers there may be three crops cut, and two feedings; which will be a great improvement, especially as this plant will grow upon dry barren soils, where Grass will produce little, especially in dry seasons, when it will be of great use, the Grass being often burnt up. And as it is an early plant in the spring, so it will be of great service when fodder falls short at that season, when it will be fit to feed at least a month before Grass or Clover; for I have had this plant eight inches high by the tenth of March, old style, at which time the Grass in the same place has scarcely been one inch high.

That the cold will not injure this plant, I am fully satisfied; for in the very cold winter, anno 1729-30, I had some roots of this plant which were dug up in October, and laid upon the ground in the open air till the beginning of March, when I planted them again, and they shot out very vigorously soon after; nay, even while they lay upon the ground, they struck out fibres from the under side of the roots, and begun to make shoots from the crown of the roots. But that wet will destroy the roots I am fully convinced, for I sowed above an acre upon a moist spot of ground for a trial, which came up very well, and flourished exceedingly during the summer season, but in winter, when the great rains fell, the roots began to rot at bottom, and before the spring most of them were destroyed. There has been lately some persons who have advised the sowing of Lucern in broad-cast, and to make use of a strong harrow, to tear up and destroy the weeds which naturally grow up among the plants; but this advice has been given too prematurely, therefore it is to be hoped will not be followed by any discreet persons, who are desired to take

a furvey of fome of thefe lands which have been fo cultivated three or four years, which I am fully perfuaded will convince them of the bad hufbandry, for no perfon who has any regard to neatnefs and utility, will ever practife this method.

The beft places to procure the feed from, are Switzerland, and the northern parts of France, for the feeds faved in thofe countries fucceed better with us than that which comes from a more fouthern climate; but this feed may be faved full as well in England, and in as great plenty, were people curious enough to let the firft crop ftand for that purpofe; in order to which, a fmall quantity of the plants fhould be fuffered to grow uncut till the feeds are ripe, which is commonly about the beginning of September, when it muft be cut, and laid to dry in an open barn, where the air may freely pafs through, but be defended from the wet; for if it be expofed thereto, it will fhoot while it remains in the pod, whereby it will be fpoiled. When it is quite dry, it muft be threfhed out, and cleanfed from the hufk, and prefeved in a dry place till the feafon for fowing it; and this feed faved in England is much preferable to any brought from abroad, as I have feveral times experienced, the plants produced from it having been much ftronger than thofe produced from French, Helvetian, and Turkey feeds, which were fown at the fame time, and on the fame foil and fituation.

I am inclinable to think, that the reafon of this plant not fucceeding, when it has been fown in England, has either been occafioned by the fowing it with Corn, with which it will by no means thrive (for though the plant be very hardy when grown pretty large, yet at its firft coming up, if it be incommoded by any other plants or weeds, it feldom does well; therefore it fhould always be fown by itfelf, and carefully cleared from weeds until it has ftrength, after which it is not eafily deftroyed;) or, perhaps, people have fown it at a wrong feafon, or in wet weather, whereby the feeds have rotted, and never come up, which hath difcouraged their attempting it again: but however the fuccefs has been, I dare aver, that if the method of fowing and managing of this plant, which is here laid down, be duly followed, it will be found to thrive as well as any other fort of plant now cultivated in England, producing a much greater crop than any other fort of fodder, and will continue much longer; for if the ground be duly ftirred after the cutting each crop, and the laft crop fed as hath been directed, the plants will continue in vigour forty years or more, without renewing, provided they are not permitted to feed, which will weaken the roots more than four times cutting it would do. The hay of this plant fhould be kept in clofe barns, it being too tender to be kept in ricks open to the air as other hay; but it will remain good, if well dried before it be carried in, three years. The people abroad reckon an acre of this fodder fufficient to keep three horfes all the year round.

And I have been affured by perfons of undoubted credit, who have cultivated this plant in England, that three acres of it have fed ten cart-horfes from the end of April to the beginning of October, without any other food, though they have been conftantly worked. Indeed, the beft ufe which can be made of this Grafs is, to cut it, and give it green to the cattle; where this hath been daily practifed, I have obferved that by the time the field has been cut over, that part which was the firft cut hath been ready to cut again; fo that there has been a conftant fupply in the fame field, from the middle of April to the end of October: when the feafon has continued long mild, and when the fummers have proved fhowery, I have known fix crops cut in one feafon, but in the drieft feafons there will be always three or four. When the plant begins to flower, it fhould then be cut; for if it ftands longer, the ftalks will grow hard, and the under leaves will decay, fo that the cattle will not fo greedily devour it. Where there is a quantity of this cultivated, fome of it fhould be cut before the flowers appear, otherwife there will be too much to cut within a proper time.

When this is made into hay, it will require a great deal of making; for as the ftalks are very fucculent, it muft be often turned, and expofed a fortnight or longer, before it will be fit to houfe; for this requires a longer time to make than Saint Foin; therefore, when it is cut, it fhould be carried to make upon fome Grafs ground, becaufe the earth in the intervals of the rows will wafh up, and mix with the hay in every fhower of rain, and by carrying it off as foon as it is cut, the plants will fhoot up again foon; but it is not fo profitable for hay, as to cut green for all forts of cattle, but efpecially horfes, which are extremely fond of it; and to them it will anfwer the purpofe both of hay and Corn, and they may be worked at the fame time juft as much as when they are fed with Corn, or dry food.

The fecond fort grows naturally in the fouth of France, in Spain, Italy, and alfo in fome more northern countries, and has been fuppofed only a variety of the firft, but I have frequently cultivated this by feeds, and have never obferved it to alter. The ftalks of this are fmaller, and never rife fo high, generally proftrating on the ground; the leaves are not half fo broad, the flowers are produced in fhort roundifh fpikes, and are of a Saffron colour. This flowers about the fame time as the firft, and the feeds ripen the latter part of fummer. It may be eafily propagated by feeds, and hath a perennial root which will continue many years, but is feldom cultivated any where.

The third fort grows naturally in Italy; this is an annual plant, having feveral flender branching ftalks a foot and a half long, which fpread on the ground, garnifhed with trifoliate leaves, whofe lobes are oval, fpear-fhaped, and entire. The flowers are produced fingly upon flender foot-ftalks, which proceed from the fide of the branches; they are fmall, of a yellow colour, and fhaped like thofe of the former fort; thefe are fucceeded by broad, flat, moon-fhaped pods, whofe borders are indented, and thefe indentures are terminated by fine hairs; in each of thefe pods is lodged four or five kidney-fhaped feeds. It flowers in June and July, and the feeds ripen in the autumn.

The fourth fort grows naturally in Spain; this is alfo an annual plant, whofe ftalks grow a foot and a half long, trailing on the ground, and are garnifhed with winged leaves compofed of two pair of fmall lobes, terminated by one large, oval, fpear-fhaped lobe, which are a little hoary, and placed alternately at the joints. The flowers ftand upon long flender foot-ftalks, each fuftaining four or five gold-coloured flowers at the top, which are fucceeded by compreffed moon-fhaped pods, not half fo large as thofe of the third fort, but have hairy indentures like thofe. This flowers and perfects its feeds about the fame time as the former.

The fifth fort grows naturally on the borders of the fea in feveral parts of Italy; it is alfo an annual plant, with proftrate herbaceous ftalks about a foot long, garnifhed with trifoliate leaves, whofe lobes are wedge-fhaped and fawed toward the top. The flowers are produced upon flender foot-ftalks arifing from the joints of the ftalk; they are about an inch long, each fuftaining five or fix pale yellow flowers, which are fucceeded by fmall, thick, moon-fhaped pods, whofe borders are entire, containing three or four fmall kidney-fhaped feeds in each. It flowers and feeds about the fame time with the two former.

The fixth fort grows naturally in the Archipelago; this is an annual plant, from whofe roots come out feveral oblong leaves about two inches and a half long, narrow at their bafe, but broad toward the top, where they are rounded; thefe fpread on the ground, and between them come out the ftalks which are flender, about a foot long, branching out into fmaller, garnifhed with winged hoary leaves: thofe on the lower part of the ftalk are compofed of two pair of lobes terminated by an odd one; thefe are equal in

fize,

ſize, but thoſe on the upper part of the ſtalks are trifoliate. The flowers are produced at the end of the ſtalks; they are ſmall, yellow, and ſhaped like thoſe of the other ſorts, and are ſucceeded by compreſſed moon-ſhaped pods, which are acutely indented on their borders, and contain three or four kidney-ſhaped ſeeds. This plant flowers and ripens its ſeeds about the ſame time as the other.

Theſe annual ſorts are preſerved in the gardens of thoſe who are curious in botany; the ſeeds of theſe ſhould be ſown upon an open bed of freſh ground, in the places where the plants are to remain, becauſe they do not bear tranſplanting well, unleſs when they are very young. As the plants ſpread their branches on the ground, ſo they ſhould not be ſown nearer than two feet and a half aſunder; when the plants come up, they will require no other care but to keep them clean from weeds. In June they will begin to flower, and as the ſtalks and branches extend, there will be a ſucceſſion of flowers produced till the autumn; but the early flowers are ſuch as will have good ſeeds ſucceed them; for thoſe which come late in ſummer, have not time to ripen before the cold weather comes on.

The ſeventh ſort grows naturally in the iſlands of the Archipelago, in Sicily, and the warmeſt parts of Italy. This riſes with a ſhrubby ſtalk to the height of eight or ten feet, covered with a gray bark, and divides into many branches, which, while young, are covered with a hoary down; theſe are garniſhed at each joint with trifoliate leaves, ſtanding upon foot-ſtalks about an inch long; there are two or three of theſe at each joint, ſo that the branches are cloſely covered with them; the lobes are ſmall, ſpear-ſhaped, and hoary on their under ſide; theſe remain all the year. The flowers are produced on foot-ſtalks which ariſe from the ſide of the branches, they are of a bright yellow, each foot-ſtalk ſuſtaining four or five flowers; theſe are ſucceeded by compreſſed moon-ſhaped pods, each containing three or four kidney-ſhaped ſeeds.

It flowers great part of the year, and when the winters are favourable all the year; or when the plants are ſheltered in winter, they are ſeldom deſtitute of flowers; but thoſe in the open air begin to flower in April, and continue in ſucceſſion till December. Thoſe flowers which appear early in ſummer will have their ſeeds ripe in Auguſt, or the beginning of September, and the others will ripen in ſucceſſion till the cold ſtops them.

This plant may be propagated by ſowing the ſeeds upon a moderate hot-bed, or a warm border of light earth, in the beginning of April; and when the plants come up, they ſhould be carefully cleared from weeds; but they ſhould remain undiſturbed, if ſown in the common ground, till September following; but if on a hot-bed, they ſhould be tranſplanted about Midſummer into pots, placing them in the ſhade until they have taken root; after which they may be removed into a ſituation where they may be ſcreened from ſtrong winds, in which they may abide till the latter end of October, when they muſt be put into a common garden frame, to ſhelter them from hard froſts; for thoſe plants which have been brought up tenderly, will be liable to ſuffer by hard weather, eſpecially while they are young. In April following theſe plants may be ſhaken out of the pots, and placed in the full ground where they are deſigned to remain, which ſhould be in a light ſoil and a warm ſituation, in which they will endure the cold of our ordinary winters extremely well, and continue to produce flowers moſt part of the year, and retaining their leaves all the winter renders them the more valuable.

Thoſe alſo which were ſown in an open border may be tranſplanted in Auguſt following, in the ſame manner; but in doing of this you muſt be careful to take them up with a ball of earth to their roots, if poſſible, as alſo to water and ſhade them until they have taken root; after which they will require little more care than to keep them clean from weeds, and to prune off the luxuriant branches to keep them within due compaſs; but you ſhould never prune them early in the ſpring, nor late in autumn, for if froſt ſhould happen ſoon after they are pruned, it will deſtroy the tender branches, and many times the whole plant is loſt thereby.

Theſe plants have been conſtantly preſerved in the green-houſe, ſuppoſing them too tender to live thro' the winter in the open air; but I have had large plants of this kind, which have remained in a warm ſituation many years without any cover, and have been much ſtronger, and flowered better, than thoſe which were houſed; though, indeed, it will be proper to keep a plant or two in ſhelter, leſt by a very ſevere winter (which ſometimes happens in England) the plants abroad ſhould be deſtroyed.

They may alſo be propagated by cuttings, which ſhould be planted in April, upon a bed of light earth, and watered and ſhaded until they have taken root, after which they may be expoſed to the open air; but they ſhould remain in the ſame bed till July or Auguſt following, before they are tranſplanted, by which time they will have made ſtrong roots, and may be removed with ſafety to the places where they are to remain, obſerving (as was before directed) to water and ſhade them until they have taken root; after which you may train them up with ſtrait ſtems, by faſtening them to ſticks, otherwiſe they are apt to grow crooked and irregular; and when you have got their ſtems to the height you deſign them, they may then be reduced to regular heads, and with pruning their irregular ſhoots every year, they may be kept in very good order.

This plant grows in great plenty in the kingdom of Naples, where the goats feed upon it, with whoſe milk the inhabitants make great quantities of cheeſe; it alſo grows in the iſlands of the Archipelago, where the Turks uſe the wood of theſe ſhrubs to make handles for their ſabres, and the Caliogers of Patmos make their beds of this wood.

This is, as hath been before obſerved, by many people, ſuppoſed to be the Cytiſus of Virgil, Columella, and the old writers in huſbandry, which they mention as an extraordinary plant, and worthy of cultivation for fodder, from whence ſeveral perſons have recommended it as worthy of our care in England. But however uſeful this plant may be in Crete, Sicily, Naples, or thoſe warmer countries, yet I am perſuaded it will never thrive in England, ſo as to be of any real advantage for that purpoſe; for in ſevere froſt it is very ſubject to be deſtroyed, or at leaſt ſo much damaged, as not to recover its former verdure before the middle or latter end of May; and the ſhoots which are produced will not bear cutting above once in a ſummer, and then will not be of any conſiderable length; and the ſtems growing very woody, will render the cutting of it very troubleſome; ſo that, upon the whole, it can never anſwer the trouble and expence in cultivating it, nor is it worth the trial, ſince we have ſo many other plants preferable to it; though in hot, dry, rocky countries, where few other plants will thrive, this may be cultivated to great advantage, ſince in ſuch ſituations this plant will live many years, and thrive very well.

But however unfit this may be for ſuch uſes in England, yet for the beauty of its hoary leaves, which will abide all the year, together with its long continuance in flower, it deſerves a place in every good garden, where, being intermixed with ſhrubs of the ſame growth, it makes a very agreeable variety.

As there are at preſent ſo many perſons inquiſitive to know which is the true Cytiſus mentioned by the antients, I have taken the pains of tranſcribing briefly what they have ſaid as to its deſcription, by which may be judged how uncertain it is to determine in an affair where there is ſo little to be found in authors to aſſiſt us.

Theophraſtus ſays, Cytiſus is ſuch an enemy to other plants, that it will kill them, by robbing them of nouriſhment, and that the medulla of it is ſo hard and thick, that it comes the neareſt of any thing to Ebenum.

The

The shrub Cytisus, by Aristomachus, the Athenian, as may be seen in Pliny [who says much the same as Varro and Columella, from whom probably he has taken it,] is highly commended for food for sheep, and, being dry, for swine; the utility [as to health and fattening, Dal.] the same as that of Ervum, but the satiety is quicker, a four-footed animal growing fat with a little of it, so that cattle set light by their Barley.

No food makes a greater quantity, nor better milk, and it excels all things as to the diseases of cattle; moreover, being given dry, or in a decoction of water mixed with wine, to nurses whose milk fails, it helps very much, and makes the children stronger, and take to their feet sooner; green, it is also good for them, or dry, if it be made moist.

Democritus and Aristomachus say, bees will never want food, if they have Cytisus enough, nor is any thing cheaper.

If, when the seed be sown, showers are wanting, Columella directs, That it be watered the fifteen following days.

It is sown [according to the antients] after the equinoxes. It is perfected in three years. It is mown in the vernal equinox [for it flourishes all the winter, Dal.] with the cheap labour of a boy, or old woman.

The Cytisus is hoary in aspect. If any one would express its likeness briefly, it is a shrub of a broader sort of Trefoil.

In winter, being moistened, ten pounds will satisfy a horse, and a less quantity other animals. Being dry, it has more virtue, and a less quantity satisfies.

This shrub was found in the isle Cythnus, thence it was translated into all the Cyclades, and afterwards into the cities of Greece, where it occasioned a great increase of cheese.

It fears not the injury of heat nor cold, nor hail nor snow, and Hyginus adds, nor of enemies, because the wood is of no value.

Also Galen, in his book de Antid. writes, "Cytisus "is a shrub. In Mysia, in that part that is nearest to "our province, there is a tract which they call Brotton, in which there is a place full of Cytisus, from "the flowers of which, all agree, the bees make very "much honey.

"It is a fruticose plant; it rises to the height of a "Myrtle."

He says, seven simple leaves have the faculty of digesting, mixed with warm water, as the leaves of Mallows: thus Galen.

Cornarus too securely writes, That Cytisus either never came among the Germans, or that it perished long ago. From what Pliny says, That it was very rare in Italy in his time, he cannot persuade me, that nothing could grow in Germany, that was scarce in Italy. Jo. Bauh.

Strabo, contrary to Dioscorides, Pliny, and Galen, will have the Cytisus to be a tree, and he likens it to the Balsamum, an odoriferous tree, which probably was the occasion, that Cornarus thought this tree came nearest to a shrub, because Pliny said the wood was of no value, therefore he persuades himself, that it produces woody branches, not tender and soft, as in an herb.

But Virgil shews it is neither a tree nor a shrub, when he says:

> "—— Non me pascente, capellæ,
> "Florentem Cytisum, & salices capretis amaras."
> [Buc. Eclog. 1.
> "Sic Cytiso pastæ distendunt ubera vaccæ."
> Eclog. 9.
> "Nec Cytiso saturantur apes, nec fronde capellæ."
> Eclog. 10.

Virgil, I say, indicates very plainly in these verses, that it is neither a tree nor a shrub, for goats do not use it; nor can they, if they were wont to eat flowery trees. Neither will what Cornarus says avail, when Pliny says the wood is of no value, that it must of necessity produce woody branches; nay, the contrary is rather true, that there is no value in the wood, that it bears viny pliable branches, with which the goats cannot be satiated.

Theocritus very plainly expresses it, That Cytisus is a very grateful food to goats:

> Ἡ αἶξ τὸν κύτισον, ὁ λύκος τὴν αἶγα διώκει.

> "Capra Cytisum, lupus capellam sequitur."

Which is thus imitated by Virgil:

> "Torva leæna lupum sequitur, lupus ipse capellam:
> "Florentem Cytisum sequitur lasciva capella."

Amatus, to avoid this difficulty, concludes Cytisus to be between trees and shrubs, by the difference of genus, to be distinguished by Pliny, that, as a tree, it may be used in the feminine gender, as a shrub in the masculine, which is not worth the minding.

Columella uses Cytisus in the feminine gender, and Theocritus and others in the masculine; as Cob. Const. in Lex. who writes that it was called ἀρνόφυλλον, and Theocritus calls this shrub χυλιλὸν, and others, κύτισον; others again τῆλις.

Of Cythnus, or, as others, of Cythisa, the name of an island, as Severius has it.

Among these words of Dioscorides in some manuscripts, there are found, falsely written, in some, Telinen Triphyllon, in others Lotum Grandem.

Dioscorides's description of the Cytisus is not so accurate, that from it the true Cytisus may be ascertained.

Although in the several species of Cytisuses it is hard to judge which is the legitimate Cytisus specified by the antients; the most skilful take it to be that which Maranthus has described, which is our Medica, which has been ranged under the genus of Cytisus, by most of the writers before Dr. Tournefort, who established the genus of Medicago, on account of the seed-vessel being like that of Medica, or Snail Trefoil.

This plant grows in great plenty at Abruzzo, where the goats feed upon it, and from their milk are made great quantities of cheese. I have had both seeds and specimens of the plant sent me from thence, by persons of the greatest skill in botany, who have assured me, that this plant is generally supposed, by all the people of learning in that country, to be the plant mentioned by Virgil.

Trifolium fruticans, according to Dodonæus, or Polemonium, according to some, is improperly called, Cytisus by many.

Trifolium candidum Dodon. by some is said to be the Cytisus of Columella, concerning which, see Lib. Hist. n. 9. 17. of Trifolious herbs.

Tragus writes, That their opinion is to be rejected, who interpret the Trifolium pratense to be a Cytisus.

Some contend the Trifolium candidum of Dodon. the Rectum Melilotum vulgarem, to be the Cytisus of the antients, as Dodonæus says, but they have not hit on the truth.

Ruellius writes, That he was afraid that Marcellus took Cytisus for Medica.

MEDICAGO. Lin. Gen. Plant. 805. Medica. Tourn. Inst. R. H. 410. tab. 231. Snail Trefoil.

The Characters are,

*The flower hath a cylindrical erect empalement of one leaf, which is cut at the brim into five equal acute segments. The flower is of the butterfly kind, having an oval erect standard, whose borders are reflexed. The wings are oblong, oval, and fixed to the keel by an appendix. The keel is oblong, bifid, obtuse, and reflexed. It hath ten stamina, nine of which are joined, and the other is single, terminated by small summits, and an oblong germen, which sits upon a short style, is involved with the stamina by the keel, and crowned by a very small stigma. The germen afterward turns to a long compressed pod, twisted into the form of a snail, inclosing many kidney-shaped seeds.*

This

This genus of plants is ranged in the ſame ſection and claſs, as the former by Tournefort and Linnæus.

The Species are,

1. Medicago (*Marina*) pedunculis racemoſis, leguminibus cochleatis, ſpinoſis, caule procumbente tomentoſo. Hort. Cliff. 378. *Medicago with branching foot-ſtalks, ſnail-ſhaped prickly pods, and a trailing woolly ſtalk.* Medica Marina. Lob. Icon. 38. *Sea Medick, or Snail Trefoil.*
2. Medicago (*Scutellata*) leguminibus chochleatis, inermibus ſtipulis dentatis caule anguloſo diffuſo, foliolis oblongo ovatis acute dentatis. *Medicago with ſmooth ſnail-ſhaped pods, indented ſtipulæ, an angular diffuſed ſtalk, and oblong, oval, ſmall leaves, which are ſharply indented.* Medica ſcutellata. J. B. 2. 384. *Snail Trefoil, commonly called Snails.*
3. Medicago (*Tornato*) leguminibus tornatis inermibus, ſtipulis acutè dentatis foliolis ſerratis. *Medicago with a turned ſmooth pod, acute indented ſtipulæ, and the ſmall leaves ſawed.* Medica tornata minor lenis. Park. Theat. 1116. *Snail Trefoil with a ſmaller, turned, ſmooth fruit.*
4. Medicago (*Intortexta*) leguminibus cochleatis ſpinoſiſſimis aculeis utrinque tendentibus. *Medicago with very prickly ſnail-ſhaped pods, whoſe ſpines point every way.* Medica magno fructu, aculeis ſurſum & deorſum tendentibus. Tourn. Inſt. R. H. 411. *Snail Trefoil with a large fruit, whoſe ſpines point upward and downward, commonly called Hedgehog.*
5. Medicago (*Laciniata*) leguminibus chochleatis ſpinoſis, foliolis acutè dentatis tricuſpidiſque. *Medicago with prickly ſnail-ſhaped pods, whoſe lobes are acutely indented, and terminate in three points.* Medica cochleata dicarpos capſulâ rotundâ ſpinoſâ, foliis eleganter diſſectis. H. L. B. *Snail-ſhaped Trefoil, having a double fruit with a round prickly capſule, and elegant cut leaves.*

There are many other ſpecies of this genus, which grow naturally in the warm parts of Europe, and are frequently preſerved in botanic gardens for the ſake of variety; but theſe are rarely cultivated in other gardens, ſo it would be beſide my purpoſe to enumerate them here.

The firſt ſort grows naturally on the borders of the Mediterranean Sea; this is a perennial plant, with trailing woolly branches about a foot long, which are divided into ſmall branches, garniſhed with ſmall, trifoliate, downy leaves at each joint, ſtanding upon ſhort foot-ſtalks. The flowers are produced from the ſide and at the ends of the branches, in ſmall cluſters; they are of a bright yellow colour, and are ſucceeded by ſmall roundiſh ſnail-ſhaped fruit, which are downy, and armed with a few ſhort ſpines. The flowers appear in June and July, and the ſeeds ripen in September.

This plant is propagated by ſeeds, which ſhould be ſown upon a warm border of dry ſoil in the ſpring, where the plants are deſigned to remain; when the plants are come up, two or three of them may be tranſplanted into ſmall pots to be ſheltered in winter, becauſe in very ſevere froſt, thoſe which are in the open air are frequently deſtroyed; though they will endure the cold of our ordinary winters, if they are growing in a dry ſoil and a ſheltered ſituation. Thoſe plants which are left remaining, will require no other culture but to thin them where they are too cloſe, and keep them clean from weeds. This ſort may be propagated by cuttings, which may be planted in June or July, in a ſhady border, covering them cloſe with a glaſs to exclude the external air; theſe will take root in about ſix weeks time, and may then be either planted in a warm border or in pots, and treated in the ſame way as the ſeedling plants.

The ſecond ſort is an annual plant, which grows naturally in the warm parts of Europe, but in England it is frequently cultivated in gardens for the oddneſs of its fruit, which is twiſted in the form of a ſnail; and as it ripens turns to a dark brown colour, ſo as to have the appearance of ſnails feeding on the plants at a diſtant view. This hath trailing branches; the flowers are of a pale yellow, and come out from the ſide of the branches. Theſe appear in June and July, and the ſeeds ripen in the autumn. It is propagated by ſeeds, which ſhould be ſown in the middle of April, where the plants are to remain; and the plants ſhould be thinned where they are too cloſe, and kept clean from weeds, which is all the culture they require.

The third ſort is alſo an annual plant, which grows in the ſame countries as the former. This hath trailing branches, and yellow flowers like the ſecond ſort, but the fruit is much longer and cloſer twiſted, ſo as to reſemble the figure of a veſſel called a pipe, being leſs at each end than in the middle. This is frequently kept in gardens for the ſake of variety, and may be propagated and treated in the ſame way as the ſecond ſort.

The fourth ſort is an annual plant, which was formerly more cultivated in the Engliſh gardens than at preſent. The ſtalks, leaves, and flowers, are like thoſe of the two former ſorts, but the fruit is much larger, and cloſely armed with long ſpines like a hedgehog, from whence it had the title; theſe ſpines point every way, ſo that it is difficult to handle the fruit without ſmarting for it. This is propagated by ſeeds in the ſame way as the ſecond ſort, and the plants require the ſame treatment. It flowers in June, and the ſeeds ripen in September.

The fifth ſort grows naturally in Syria; it is an annual plant, with trailing ſtalks like the former; the lobes of the trifoliate leaves are wedge-ſhaped, ſharply indented on the edges, and at the top have three acute points. The flowers are of a pale yellow, and the fruit is ſnail-ſhaped, but ſmall, armed with many weak ſpines. It flowers about the ſame time with the former, and may be cultivated in the ſame way.

MEDLAR. See Mespilus.

MELAMPYRUM. Tourn. Inſt. R. H. 173. tab. 78. Lin. Gen. Plant. 660. Μελάμπυρον, of μέλας, black, and πυρὸς, Wheat.] Cow Wheat.

The Characters are,

*The flower has a permanent empalement of one leaf, which is tubulous, cut into four ſegments at the brim. The flower is of the lip kind, having an oblong recurved tube compreſſed at the brim; the upper lip is formed like a helmet, and is compreſſed and indented at the top; the under lip is plain, erect, and cut into three ſegments at the top, which are equal and obtuſe. It hath four awl-ſhaped ſtamina which are curved under the upper lip, two of which are ſhorter than the other, terminated by oblong ſummits, and in the center is ſituated an acute-pointed germen, ſupporting a ſingle ſtyle crowned by an obtuſe ſtigma. The empalement afterward turns to an oblong acute-pointed capſule with two cells, incloſing two pretty large oval ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fourteenth claſs, which contains thoſe plants whoſe flowers have two long and two ſhorter ſtamina, and the ſeeds are included in a capnſule.

The Species are,

1. Melampyrum (*Pratenſe*) floribus ſecundis lateralibus, conjugationibus remotis, corollis clauſis. Flor. Suec. 513. *Cow Wheat with fruitful foot-ſtalks of flowers ſtanding at a diſtance, and the petals ſhut.* Melampyrum luteum latifolium. C. B. P. 234. *Broad-leaved yellow Cow Wheat.*
2. Melampyrum (*Criſtatum*) ſpicis quadrangularibus bracteis cordatis compactis denticulis imbricatis. Flor. Suec. 510. *Cow Wheat with quadrangular ſpikes, and heart-ſhaped bracteæ, which are imbricated.* Melampyrum luteum anguſtifolium. C. B. P. 234. *Yellow narrow-leaved Cow Wheat.*
3. Melampyrum (*Arvenſe*) ſpicis conicis laxè bracteis dentato-ſetaceis. Flor. Seuc. 511. *Cow Wheat with looſe conical ſpikes, and briſtly indented bractea.* Melampyrum purpuraſcente comâ. C. B. P. 234. *Cow Wheat with purpliſh tops.*
4. Melampyrum (*Nemoroſum*) floribus ſecundis lateralibus bracteis dentato cordato lanceolatis, ſummis, coloratis ſterilibus, calycibus lanatis. Flor. Suec. 512. *Cow Wheat with fruitful lateral flowers, heart ſpear-ſhaped bracteæ, ſterile coloured tops, and woolly empalements.*

*ments.* Melampyrum comâ cæruleâ. C. B. P. 234. *Cow Wheat with blue tops.*

These plants are seldom cultivated in gardens. The first sort grows naturally in woods in many parts of England. The second sort grows plentifully in Bedfordshire and Cambridgeshire. The fourth sort grows in the northern parts of Europe. The third sort grows naturally in some of the sandy lands in Norfolk, tho' not in great plenty; but in West Friezland and Flanders, it grows very plentifully among the Corn; and Clusius says, it spoils their bread, making it dark; and that those who eat of it used to be troubled with heaviness of the head, in the same manner as if they had eaten Darnel or Cockle: but Mr. Ray says, He has eaten of this bread very often, but could never perceive that it gave any disagreeable taste, or that it was accounted unwholesome by the country people, who never endeavour to separate it from the Corn: and Tabernæmontanus declares, he has often eaten it without any harm; and says, it makes a very pleasant bread. It is a delicious food for cattle, particularly for fattening of oxen and cows, for which purpose it may be cultivated.

The seeds of these plants should be sown in the autumn soon after they are ripe, otherwise it seldom grows the first year; when the plants come up, they must be weeded in the spring while young, and as soon as they begin to shew their flowers, the cattle may be fed upon it; but they should be confined to a certain space, and not permitted to run over the whole field to trample it down, which would destroy a great part of it.

The third and fourth sorts make a pretty appearance, with their purple and blue tops, during the months of July and August. They are all of them annual plants.

MELANTHIUM, Star-flower.

The Characters are,

*The flower has no empalement (unless the corolla is so called) it hath six oblong, oval, spreading petals, which are permanent, and six slender erect stamina inserted above the tails, with globular summits, with a streaked globular germen, supporting three curved distinct styles, crowned by obtuse stigma; the germen afterward turns to an oval capsule, having three cells, which are united within, containing several oval compressed seeds.*

This genus of plants is ranged in the third section of Linnæus's sixth class, intitled Hexandria Trigynia, the flower having six stamina and three styles.

The Species are,

1. Melanthium (*Virginicum*) petalis unguiculatis. Lin. Sp. Plant. 483. *Star-flower with tender nail-shaped petals.* Asphodelo affinis Floridana, ramoso caule, floribus ornithogali obsoletis. Pluk. tab. 434. f. 8.
2. Melanthium (*Sibericum*) petalis sessilibus. Amœn. Acad. 2. p. 349. *Star-flower with sessile petals.* Ornithogalum spicis florum longissimis ramosis. Flor. Siber. p. 45.
3. Melanthium (*Punctatum*) petalis punctatis, foliis cucullatis. Amœn. Acad. 6. *Star-flower with punctuated petals, and hooded leaves.*

The first sort grows naturally in Virginia and in other parts of North America, but being a plant of little beauty, is seldom cultivated except in botanic gardens; the flower-stalks of this rises from six to eight inches high, branching upward into three or four divisions, garnished below the flower with two or three linear leaves. The flowers are composed of six spreading petals of a dusky worn-out colour, which are rarely succeeded by seeds in England.

If the roots of this plant are planted in a border of light earth, not too dry, they will thrive and produce their flowers here, but seldom increase.

The second sort grows naturally in Siberia, so is at present a stranger in England, but may be propagated here (if once obtained) by planting the bulbous roots in an east border.

The third sort grows at the Cape of Good Hope, so is too tender to thrive in the open air in England. But if the roots are planted in a border, covered in winter with a garden frame, and treated in the same way as is directed for the Ixia, they will thrive and flower annually.

MELASTOMA. Lin. Gen. Plant. 481. Grossularia. Sloan. Hist. Jam. Plum. Sp. 18. The American Gooseberry-tree, vulgò.

The Characters are,

*The flower has a permanent empalement of one leaf, swelling like a bladder, and obtuse. It hath five roundish petals, which are inserted into the border of the empalement, and ten short stamina, terminated by long erect summits a little curved. Under the flower is situated a roundish germen, supporting a slender style, crowned by an incurved indented stigma. The germen afterward turns to a berry with five cells, covered by the empalement which crowns it, and contains many small seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, intitled Decandria Monogynia, which includes those plants whose flowers have ten stamina and one style.

The Species are,

1. Melastoma (*Plantaginis folio*) foliis denticulatis ovatis acutis. Lin. Sp. Plant. 389. *Melastoma with oval, acute-pointed, indented leaves.* Grossularia Americana, plantaginis folio amplissimo. Plum. Sp. 18.
2. Melastoma (*Acinodendron*) foliis denticulatis subtrinerviis ovatis acutis. Lin. Sp. Plant. 558. *Melastoma with oval indented leaves ending in acute points, having three veins.* Grossularia alia plantaginis folio, fructu rariore violaceo. Plum. Sp. 18.
3. Melastoma (*Hirta*) foliis denticulatis quinquenervibus, ovato-lanceolatis caule hispido. Lin. Sp. 390. *Melastoma with spear-shaped indented leaves, with five veins, and a prickly stalk.* Grossularia plantaginis folio angustiore hirsuto. Plum. Sp. 18.
4. Melastoma (*Holosericea*) foliis integerrimis trinerviis oblongo-ovatis tomentosis racemis brachiatis, spicis bipartitis. Lin. Sp. 559. *Melastoma with very entire oblong oval leaves, which are woolly on their under side, and spikes of flowers dividing in two parts.* Arbor racemosa Brasiliana, folio Malabathri. Breyn. Cent. tab. 2 & 3.
5. Melastoma (*Grossularioides*) foliis lanceolatis utrinque glabris nervis tribus ante basin coëuntibus. Hort. Cliff. 162. *Melastoma with spear-shaped leaves smooth on both sides, and three veins which join before they reach the base.* Grossularia fructu non spinoso, Malabathri foliis oblongis, floribus herbaceis racemosis, fructu nigro. Sloan. Cat. 165.
6. Melastoma (*Bicolor*) foliis lanceolatis, nervis tribus longitudinalibus, subtus glabris coloratis. Hort. Cliff. 162. *Melastoma with spear-shaped leaves having three longitudinal veins, smooth and coloured on their under side.*
7. Melastoma (*Malabathrica*) foliis lanceolato-ovatis quinquenervibus scabris. Flor. Zeyl. 171. *Melastoma with spear-shaped oval leaves which are rough, and have five veins.* Melastoma quinque nervia hirta major, capitulis sericeis villosis. Burm. Zeyl. 155. tab. 73.
8. Melastoma (*Lævigata*) foliis oblongo-ovatis minutissimè dentatis infernè sericeis quinquenervibus, floribus racemosis. *Melastoma with oblong oval leaves, having very small indentures on the edges, and silky on their under side, with five veins, and flowers growing in long bunches.* Grossulariæ fructu, arbor maximo non spinosa, Malabathri folio maximo inodora, flore racemoso albo. Sloan. Cat. Jam. 165.
9. Melastoma (*Petiolatis*) foliis denticulatis ovatis acuminatis, infernè nitidissimis, petiolis longissimis. *Melastoma with oval acute-pointed leaves, which are indented on their edges, very shining on their under side, and have very long foot-stalks.*
10. Melastoma (*Umbellata*) foliis cordatis acuminatis integerrimis, infernè incanis, floribus umbellatis. *Melastoma with heart-shaped, acute-pointed, entire leaves, hoary on their under side, and flowers growing in umbels.* Sambucus Barbadensis dicta, foliis subincanis. Pluk. Phyt. tab. 221. fol. 6.
11. Melastoma (*Racemosa*) foliis oblongo-cordatis acuminatis, denticulato-serratis, floribus racemosis sparsis.

fis. *Melastoma with oblong, heart-shaped, acute-pointed leaves, having sawed indentures, and flowers growing thinly in long bunches.*

12. MELASTOMA (*Verticillata*) foliis ovato-lanceolatis, quinquenervibus, subtus aureis, floribus verticillatis, caule tomentoso. *Melastoma with oval spear-shaped leaves having five veins, which are of a gold colour on their under side, and flowers growing in whorls, with a woolly stalk.*

13. MELASTOMA (*Acuta*) foliis lanceolatis acutis denticulatis inferne incanis trinervibus, floribus racemosis. *Melastoma with acute spear-shaped leaves which are indented on their edges, hoary on their under side, have three veins, and flowers growing in bunches.*

14. MELASTOMA (*Glabra*) foliis ovato-lanceolatis acuminatis integerrimis, utrinque glabris trinervibus, floribus racemosis. *Melastoma with entire, oval, spear-shaped leaves ending in acute points, having three veins, and smooth on both sides, with flowers growing in long bunches.* Arbor Syrinamensis, canellæ folio utrinque glabro. Pluk. Phyt. tab. 249. fol. 5.

15. MELASTOMA (*Quinquenervia*) foliis ovatis quinquenervibus scabris, floribus racemosis alaribus. *Melastoma with oval rough leaves having five veins, and flowers growing in bunches from the sides of the branches.*

16. MELASTOMA (*Octandria*) foliis lanceolatis trinervibus glabris, marginibus hispidis. *Melastoma with smooth spear-shaped leaves having three veins, and hairy prickles on the border.*

17. MELASTOMA (*Aspera*) foliis ovatis quinquenervibus glabris, marginibus hispidis. *Melastoma with oval smooth leaves, having five veins, and hairy prickly borders.*

18. MELASTOMA (*Scabrosa*) foliis ovato-lanceolatis scabris acuminatis quinquenervibus, floribus racemosis. *Melastoma with oval, spear-shaped, acute-pointed leaves, having five veins, and flowers growing in long bunches.*

The title of this genus of plants was given to it by Professor Burman, of Amsterdam, in the Thesaurus Zeylanicus; some of these plants have been titled Sambucus, others Christophoriana, and to some of the species Dr. Plukenet gave the title of Acidendron; but Sir Hans Sloane and Father Plumier, gave them the title of Grossularia, from whence I have applied the English name of Gooseberry to them, which is the name by which some of the sorts are known in America.

The first sort rises about four or five feet high, the stem and branches being covered with long russet hairs; the leaves are placed on the branches opposite; they are five inches long and two broad, and are also covered with the same russet down, having five ribs or veins running through the leaves from end to end, but the three inner join before they reach the base, with small transverse ribs; the fruit is produced at the end of the shoots, which is a pulpy blue berry, as large as a Nutmeg.

The second sort grows to be a large tree, having many crooked branches, covered with a brown bark, the leaves placed opposite on the branches; these are smooth, entire, and above five inches long, and two broad in the middle, with three deep veins running through them; both sides of these leaves are of a light green and smooth, and are sharply indented on their edges, ending in acute points. The fruit grows in loose spikes at the end of the branches; they are thinly placed on the spikes, and are of a Violet colour.

The third sort grows to the height of twenty feet, with a large trunk, covered with a russet bark: the leaves of this tree are very large, being above seven inches long, and three and a quarter broad, of a dark russet colour on their upper side, but of a yellowish russet on their under, soft to the touch, having a soft down over them; the stalks are covered with rough hairs, and the leaves are placed by pairs on the branches, which make a beautiful appearance when the trees are viewed at a distance.

The fourth sort seldom grows more than eight or ten feet high, the leaves are about four inches long, having three veins, which join before they reach the base; they are entire, and are of a sattin colour on their under side, but of a light green on their upper; these are placed by pairs on the branches.

The fifth sort seldom grows more than seven or eight feet high, spreading out into many branches, which are covered with a smooth purple bark; they are slender, and are garnished with spear-shaped leaves, five inches long and two broad in the middle, where they are broadest; they are smooth on both sides, their edges are entire, and they terminate in acute points. The flowers are produced in pretty long hanging bunches, of an herbaceous colour, with long styles which are stretched out a good length beyond the petals, and are permanent; the fruit is small, and black when ripe.

The sixth sort rises four or five feet high, dividing into many slender branches, which are smooth, and garnished with spear-shaped leaves three inches long, and one and a quarter broad, of a lucid green on the upper side, but white on the under, having three longitudinal veins which join before they reach the base; these are entire, and placed alternately on the branches. The flowers are produced in a loose panicle at the end of the branches; they are small, white, and have pretty long tubes; these are succeeded by small purple fruit.

The seventh sort rises with an angular stalk six or seven feet high, sending out branches opposite, which are garnished with spear-shaped, oval, rough leaves, placed by pairs; they are hairy, of a dark green on their upper side, but of a pale green on their under. The flowers are produced at the end of the branches, two or three standing together; they are large, and of a Rose colour, inclining to purple, sitting in large hairy empalements; these are succeeded by roundish purple fruit crowned by the empalement, which are filled with a purple pulp surrounding the seeds.

The eighth sort grows to the height of twenty feet, with a large strait stem, covered with a gray bark, and at the top divides into many angular branches; these are garnished with oblong oval leaves near a foot long, and six inches broad in the middle, of a dark green on their upper side, but silky on their under, with five strong longitudinal veins; they are indented on their edges, and placed opposite. The flowers are produced in loose long bunches at the end of the branches; these are white, and are succeeded by roundish purple fruit, filled with pulp, in which the seeds are lodged.

The ninth sort rises with a strong erect stalk near thirty feet high, covered with a gray bark, dividing at the top into several angular compressed branches, which are garnished with oval leaves indented on their edges; they are seven inches long and almost five broad, standing by pairs opposite on very long footstalks, of a lucid green on their upper side, but of a pale gold colour and sattiny on their under, with five strong longitudinal veins, and a great number of smaller transverse ones. The flowers are produced in loose panicles at the end of the branches; they are white, and are succeeded by purple fruit, about the same size as those of the former.

The tenth sort rises with a shrubby stalk ten or twelve feet high, covered with a hairy bark, and divides into many branches toward the top, which are garnished with heart-shaped leaves ending in acute points; they are five inches long and three broad toward their base, entire in their borders, of a dark green on their upper side, but hoary on their under, with five longitudinal veins, and many smaller transverse ones; these are placed opposite, and stand upon hairy footstalks, two inches and a half in length. The flowers are produced at the end of the branches, in a sort of umbel; they are of a pale Rose colour and pretty large, sitting on hairy empalements; these are succeeded by small black fruit, a little larger than Elder-berries.

The eleventh sort rises with a shrubby stalk about eight or nine feet high, covered with a dark brown bark,

bark, and divides at the top into many ſtraggling branches, which are garniſhed with oblong heart-ſhaped leaves ſix inches long, and three broad toward their baſe, ending in acute points, indented on their edges with ſharp ſerratures; they are ſmooth on both ſides, and of a light green colour. The flowers are produced in very looſe bunches at the end of the branches; they are ſmall, of an herbaceous colour, and are ſucceeded by ſmall fruit, of a dark colour when ripe.

The twelfth ſort riſes with a ſhrubby ſtalk five or ſix feet high, dividing into many ſmaller branches, which are covered with a hairy woolly bark, of a ruſty iron colour; theſe are garniſhed with oval ſpear-ſhaped leaves, one inch and a half long, and three quarters of an inch broad in the middle; they are of a dark green on their upper ſide, and of a ruſty iron colour on their under, having five longitudinal veins; they are placed oppoſite, and ſit cloſe to the branches. The flowers come out in whorls at the joints of the ſtalks; they are ſmall, of a purpliſh colour, and are ſucceeded by ſmall black fruit.

The thirteenth ſort is a low ſhrub, ſeldom riſing more than three feet high, dividing at the bottom into ſlender branches, which are garniſhed with ſpear-ſhaped leaves, ending in acute points; theſe are five inches long, and one and a half broad in the middle, ſawed on their edges, of a dark green on their upper ſide, but of a hoary white on their under, having three longitudinal veins; they are placed oppoſite, upon ſhort foot-ſtalks. The flowers are produced in looſe bunches at the end of the branches; they are white, and ſucceeded by ſmall purple fruit.

The fourteenth ſort hath a ſhrubby ſtalk eight or nine feet high, divided toward the top into many ſlender branches which are ſmooth, garniſhed with oval ſpear-ſhaped leaves, which are ſeven inches long and three broad, ending in acute points; they are entire on their edges, and ſmooth on both ſides, ſtanding oppoſite, and have three longitudinal veins. The flowers are produced in looſe panicles at the end of the branches, and are ſucceeded by very ſmall purple fruit.

The fifteenth ſort riſes with ſeveral ſhrubby ſtalks five or ſix feet high, dividing into ſeveral crooked branches, garniſhed with oval leaves three inches long, and almoſt as much broad, having five longitudinal veins; they are rough, of a dark green on their upper ſide, but of a pale green on their under, indented on their edges, ſtanding upon very hairy foot-ſtalks; they are ſometimes oppoſite, and at others alternate, on the branches. The flowers are produced in very looſe bunches, which come out from the ſide of the ſtalks; they are ſmall, of an herbaceous colour, and are ſucceeded by ſmall purpliſh fruit, filled with very ſmall ſeeds.

The ſixteenth ſort riſes with a ſhrubby ſtalk ſeven or eight feet high, and divides into many ſmooth branches, which are garniſhed with ſpear-ſhaped leaves about four inches long, and one inch and a quarter broad in the middle; they are ſmooth on both ſides, of a dark green colour, and have three longitudinal veins; the edges of theſe leaves are cloſely ſet with briſtly ſtinging hairs. The flowers are produced in looſe bunches at the end of the branches; they are ſmall, of a purpliſh colour, and are ſucceeded by very ſmall black fruit.

The ſeventeenth ſort is in many parts like the former, but the leaves are oval, a little more than two inches long, and oneand a quarter broad; theſe have five longitudinal veins, and are ſmoothon both ſides, of a dark green colour, and ſtand oppoſite on ſhort foot-ſtalks. The flowers grow in looſe bunches at the end of the branches, they are larger than thoſe of the former ſort, but are of the ſame colour. The edges of the leaves of this ſort are cloſely ſet with ſtinging hairs, as thoſe of the other.

The eighteenth ſort riſes with a ſhrubby ſtalk eight or nine feet high, dividing into branches ſtanding oppoſite, as do alſo the leaves, which are ſeven inches long and three broad, rough on their ſurface, entire on their edges, ending in acute points; they are of a light green on both ſides, and ſtand upon ſhort foot-ſtalks. The flowers are produced in pretty large looſe panicles at the end of the branches; they are ſmall, white, and are ſucceeded by ſmall, round, purple fruit.

All the ſorts are natives of the warm parts of America, where there are many more ſpecies than are here enumerated. Moſt of theſe here mentioned, were found by the late Dr. Houſtoun, growing naturally in Jamaica, from whence he ſent many of their ſeeds to Europe, ſome of which ſucceeded; but moſt, if not all the plants which were raiſed from them, were loſt in the ſevere winter in 1740, ſince which time they have not been recovered in Europe.

There is great beauty in the diverſity of the leaves of theſe plants, many of them being very large, and moſt of them are of different colours on the two ſurfaces, their under ſide being either white, gold colour, or ruſſet, and their upper of different ſhades of green, ſo that they make a fine appearance in the hot-houſe all the year; indeed, their flowers have no great beauty to recommend them, but yet for the ſingular beauty of their leaves, theſe plants deſerve a place in all curious collections, as much as moſt other ſorts.

There are very few of theſe plants at preſent in any of the European gardens, which may have been occaſioned by the difficulty of bringing over growing plants from the Weſt-Indies; and the ſeeds being ſmall when they are taken out of the pulp, ſoon become dry, ſo ſeldom ſucceed. The beſt way to obtain theſe plants is, to have the entire fruits put up in dry ſand as ſoon as they are ripe, and forwarded by the ſooneſt conveyance to England; theſe ſhould be immediately taken out when they arrive, and the ſeeds ſown in pots of light earth, and plunged into a moderate hot-bed of tanners bark. When the plants come up, and are fit to remove, they muſt be each planted into a ſmall pot of light earth, and plunged into the tan-bed; and may afterward be treated in the manner directed for the ANNONA, to which I ſhall deſire the reader to turn, to avoid repetition.

MELIA. Lin. Gen. Plant. 473. Azederach. Tourn. Inſt. R. H. 616. tab. 387. The Bead-tree.

The CHARACTERS are,

*The empalement of the flower is ſmall, erect, and of one leaf, cut into five points at the top, which are obtuſe. The flower hath five long, narrow, ſpear-ſhaped petals which ſpread open, and a cylindrical nectarium of one leaf, the length of the petals, indented at the brim in ten parts. It has ten ſmall ſtamina inſerted in the top of the nectarium, terminated by ſummits which do not appear above it, with a conical germen ſupporting a cylindrical ſtyle, crowned by an obtuſe indented ſtigma. The germen afterward turns to a ſoft globular fruit, including a roundiſh nut having five rough furrows, and five cells, each containing one oblong ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's tenth claſs, intitled Decandria Monogynia, which includes thoſe plants whoſe flowers have ten ſtamina and one ſtyle.

The SPECIES are,

1. MELIA (*Azedarach*) foliis bipinnatis. Flor. Zeyl. 162. *Melia with double winged leaves.* Azederach. Dod. Pempt. 848. *The Bead-tree, or Falſe Sycamore.*
2. MELIA (*Azedirachta*) foliis pinnatis. Hort. Cliff. 161. *Melia with winged leaves.* Olea Malabarica, fraxini folio. Pluk. Alm. 269.

The firſt ſort grows naturally in Syria, from whence it was brought to Spain and Portugal, where it is now become as common almoſt, as if it were a native of thoſe countries. This in warm countries grows to a large tree, ſpreading out into many branches, which are garniſhed with winged leaves, compoſed of three ſmaller wings, whoſe lobes are notched and indented on their edges; they are of a deep green on their upper ſide, and paler on their under. The flowers come out from the ſide of the branches in long looſe bunches;

bunches; they are composed of five long, narrow, spear-shaped petals, of a blue colour, and are succeeded by oblong fruit as large as a small Cherry, green at first, but when ripe changes to a pale yellow, inclosing a nut with five deep furrows, having four or five cells, in each of which is lodged one oblong seed. This produces its flowers in England in July, but are not often succeeded by seeds here; it drops its leaves in the autumn, and puts out fresh in the spring. The pulp which surrounds the nut, is said to have a deadly quality if eaten; and if mixed with grease, and given to dogs, it will kill them. The nuts are bored through, and strung by the Roman Catholics to serve as beads.

There has been of late years some of these plants introduced to the islands in the West-Indies, where I am informed they continue flowering, and produce their fruit most part of the year. The fruit I have received from thence by the title of Indian Lilac, from which I have raised many of the plants, and find them to be the same as that from Syria.

This sort is propagated by seeds (which may be obtained from Italy or Spain, where these trees annually produce ripe fruits in the gardens where they are planted:) the seeds or berries should be sown in pots filled with good fresh light earth, and plunged into a moderate hot-bed of tanners bark, where (if the seeds are fresh) they will come up in about a month or five weeks time. When the plants are come up they should be frequently watered, and should have a large share of free air, by raising the glasses every day; in June they should be exposed to the open air, in a well sheltered situation, that they may be hardened before winter. In October the pots should be removed under a hot-bed frame, where they may enjoy free open air when the weather is mild, and be covered in hard frost. During the winter season they must be refreshed gently with water, but by no means repeat this too often, nor give them too much at a time; for their leaves being off, they will not be in a condition to throw off a superfluity of moisture.

In March following, you may shake out the plants from the seed-pots and divide them, planting each into a separate small pot, filled with light fresh earth, plunging them into a moderate hot-bed, which will greatly promote their rooting, and increase their growth, but they must not be drawn too much; and in June you should remove them out into the open air as before, and during the three or four winters, while the plants are young, you must shelter them, to secure them from the cold; but when the plants are grown pretty large and woody, they will endure to be planted in the open air against a south wall. The best season for this is in April, at which time you should shake them out of the pots, being careful not to break the earth from the roots, but only pare off with a knife the outside of the ball of earth; then open your holes and put in the plants, closing the earth to their roots, observing if the weather is dry, to give them some water, which should be repeated twice a week until the plants have taken root; but you must observe to plant them on a dry soil, otherwise they will be liable to miscary in severe frosty weather.

The second sort grows naturally in India, where it becomes a large tree; the stem is thick, the wood of a pale yellow, and the bark of a dark purple colour and very bitter. The branches extend wide on every side, which are garnished with winged leaves, composed of five or six pair of oblong acute-pointed lobes, terminated by an odd one; these are sawed on their edges, of a light green colour, and a strong disagreeable odour; they stand upon pretty long foot-stalks, which come out sometimes opposite, and at others they are alternate. The flowers are produced in long branching panicles which proceed from the side of the branches; they are small, white, and sit in small empalements, which are cut in five acute segments; these are succeeded by oval fruit of the size of small Olives, which are green, afterward yellow, and when ripe, they change to a purple colour; the pulp which surrounds the nut is oily, acrid, and bitter; the nut is white, and shaped like that of the former. It grows in sandy land, both in India and the island of Ceylon, where it is always green, and produces flowers and fruit twice a year.

This sort is now very rare in England, and also in the Dutch gardens, where some years past it was more common; it is propagated by seeds in the same way as the other sort, but being much tenderer, the plants should be kept constantly in the tan-bed while young. In the summer they may be placed under a frame, but in winter they must be removed into the bark-stove, and treated in the same way with other plants from the same countries. When the plants have obtained strength, they may be treated more hardily, by placing them in winter in a dry stove, and in the middle of summer they may be placed abroad for two or three months in a warm sheltered situation, but they should not remain too long abroad; and during the winter season they should be sparingly watered: with this management the plants will produce flowers annually, and as they retain their leaves all the year, they are ornamental in winter in the stove.

The first sort is commonly called, Zizyphus alba, in Portugal and Spain, and in Italy, Pseudocycamorus. It was by most of the modern botanists titled, Azederach, but Dr. Linnæus has altered it to this of Melia, which was by Theophrastus applied to a species of Ash.

MELIANTHUS. Tourn. Inst. R. H. 430. tab. 245. Lin. Gen. Plant. 712. [μελίανθος, of μέλι, honey, and ἄνθος, a flower.] Honey Flower.

The CHARACTERS are,

*The flower has a large, coloured, unequal empalement, divided into five segments; the two upper are oblong and erect, the lower is short, and shaped like a bag. The middle are spear-shaped and opposite. It hath four narrow spear-shaped petals, reflexed at their points, spreading open outward, and shaped like the empalement into two lips, connected on their sides. It has a nectarium of one leaf, situated in the lower segment of the empalement, and fastened with it to the receptacle; it is short, compressed on the sides, and cut on the margin. It hath four erect awl-shaped stamina, the two under being somewhat shorter than the other, terminated by oblong heart-shaped summits. In the center is situated a four-cornered germen, supporting an erect style, crowned by a quadrifid stigma. The germen afterward becomes a quadrangular capsule with distended cells, divided by partitions in the center, each containing one almost globular seed, fixed to the center of the capsule.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and their seeds are included in empalemnets.

The SPECIES are,

1. MELIANTHUS (*Major*) stipulis solitariis petiolo adnatis. Hort. Cliff. 492. *Honey Flower with single stipulæ growing close to the foot-stalk.* Melianthus Africanus. H. L. B. 414. *Greater African Honey Flower.*
2. MELIANTHUS (*Minor*) stipulis geminis distinctis. Hort. Cliff. 492. *Smaller Honey Flower with two distinct stipulæ.* Melianthus Africanus minor fœtidus. Com. Rar. Pl. 4. tab. 4.

The first sort grows naturally at the Cape of Good Hope, from whence it was brought to Holland in the year 1672; this hath a ligneous perennial root, which spreads far on every side, from which arise many ligneous stalks which rise four or five feet high, and are herbaceous toward the top, where they are garnished with large winged leaves, which embrace the stalks with their base, where they have a large single stipulæ fastened on the upper side of the foot-stalk, with two ears at the base, which also embrace the stalk. The leaves have four or five pair of very large lobes, terminated by an odd one; these are deeply jagged on their edges into acute segments, and between the lobes runs a double leafy border or wing on the upper side of the midrib, so as to connect the base of the lobes together; these are also deeply jagged in the

the same manner as the lobes; they are of a gray colour. The flowers are produced in pretty long spikes, which arise from between the leaves toward the top of the stalks; they are of a brown or chocolate colour, and are formed like the lip flowers, but have four narrow petals, in which it differs from the other plants of this class with lip flowers; these are succeeded by oblong four-cornered capsules, divided by a central partition into four cells, each containing one roundish seed; this plant flowers in June, but unless the season proves warm, they are not succeeded by seeds in England.

This plant was formerly preserved in green-houses as a tender exotic, but if planted in a dry soil and a warm situation, it will endure the cold of our ordinary winters very well; and if in a severe frost the tops of them should be destroyed, yet the roots will abide, and put forth again the succeeding spring, so that there is no great danger of losing it; and the plants which grow in the open air always flower much better than those which are preserved in the green-house, as they are less drawn, which always is hurtful to the flowering of plants; for it rarely happens that any of the plants of this sort, which are placed in the green-house do flower, for they are apt to draw up tall and weak, which prevents their flowering, and those branches which produce flowers, generally decay soon after; so that although the stems become woody, yet they are not of long duration, but the roots spread where they have room, and send out a great number of stalks annually; and when the plants grow in the full ground, most of those stalks which are not injured by frost, seldom fail to flower the spring following, so that the surest method to have them flower, is to cover the shoots of these plants in frosty weather with Reeds or mats, to prevent their tops being killed by the cold; therefore it is the best way to plant them close to a good aspected wall, and on a dry rubbish, in which they will not shoot so vigorous as in good ground, so will be less succulent, and therefore not so liable to suffer by cold; but if the winter proves severe, the stalks may be fastened up to the wall, and covered to protect them; for want of this care the stalks are frequently killed to the ground in winter, so that there is seldom any flowers produced.

This plant may be propagated by taking off its suckers or side shoots, any time from March to September, observing to chuse such as are furnished with fibres, and after they are planted and taken root, they will require no farther care but to keep them clear from weeds: they may be also propagated by planting cuttings, during any of the summer months, which, if watered and shaded, will take root very well, and may afterwards be transplanted where they are designed to remain.

The second sort is also a native of the country about the Cape of Good Hope, from whence it was brought to Europe; this rises with round, soft, ligneous stalks five or six feet high, which send out two or three branches from their side, garnished with winged leaves like those of the former sort, but not half so large; these have two distinct stipulæ adhering to their foot-stalks; they are of a deep green on their upper side, and whitish on their under. The flowers come out from the side of the stalks in loose hanging panicles, each sustaining six or eight flowers, which are shaped like those of the first sort, but smaller; the lower part of the petals are green, their upper part are of a Saffron colour, and on the outside, in the swelling part of the petals, is a blush of fine red; these have two long and two shorter stamina, which are terminated by yellow summits. The flowers are succeeded by four-cornered seed-vessels, which are shorter than those of the first sort, in which are lodged four oval seeds in separate apartments; this flowers at the same season with the former.

This sort does not spread its roots as the first, so is not propagated with so great facility, but cuttings of this sort planted upon an old hot-bed, whose heat is over, and covered close with bell or hand-glasses to exclude the air, will take root pretty freely; these may be planted in pots, and sheltered in the winter under a common frame for a year or two till they have obtained strength, then they may be planted in a warm border, and treated in the same way as the former sort, with which management I have seen them flower much better than any of those which have been treated more tenderly, and these plants have perfected their seeds in good seasons.

MELICOCCA. See SAPINDUS.

MELILOTUS. See TRIGONELLA.

MELISSA. Tourn. Inst. R. H. 193. tab. 91. Lin. Gen. Plant. 647. [so called of μέλι, honey, because the bees procure it from this plant; it is also called Melissophyllon, μέλι, and φύλλον, a leaf, q. d. Honey Leaf.] Baum.

The CHARACTERS are,

*The empalement of the flower is of the open, bell-shape, angular kind, streaked with one leaf, whose brim is formed into two lips; the upper lip is indented in three parts, which are spread open and reflexed; the under lip is short, acute, and indented in two parts. The flower is of the lip kind, having a cylindrical tube; the chaps are gaping, the upper lip is short, erect, forked, and roundish, indented at the end. The under lip is trifid, the middle part being the largest. It hath four awl-shaped stamina, two of which are as long as the petal, but the other are but half so long; they are terminated by small summits, which join by pairs. It hath a quadrifid germen, supporting a slender style the length of the petal, which, with the stamina, are situated under the upper lip, and is crowned by a slender, bifid, reflexed stigma. The germen afterward turns to four naked seeds, sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes the plants whose flowers have two long and two short stamina, whose seeds are naked.

The SPECIES are,

1. MELISSA (*Officinalis*) racemis axillaribus verticillatis, pedicellis simplicibus. Lin. Sp. Plant. 592. *Baum with whorled bunches of flowers proceeding from the sides of the stalks, having single foot-stalks.* Melissa hortensis. C. B. P. 229. *Garden Baum, or common Baum.*
2. MELISSA (*Romana*) floribus verticillatis sessilibus, foliis hirsutis. *Baum with whorls of flowers sitting close to the stalks, and hairy leaves.* Melissa Romana, molliter hirsuta & graveolens. H. R. Par. *Roman Baum with soft hairy leaves, and a strong smell.*
3. MELISSA (*Grandiflora*) pedunculis axillaribus dichotomis longitudine florum. Lin. Sp. Plant. 592. *Baum with foot-stalks arising from the wings of the stalk, which are divided in forks, and are the length of the flowers.* Calamintha magno flore. C. B. P. 229. *Calaminth with a large flower.*
4. MELISSA (*Calamintha*) pedunculis axillaribus dichotomis longitudine foliorum. Lin. Sp. Plant. 593. *Baum with foot-stalks arising from the wings of the stalk, which are forked, and as long as the leaves.* Calamintha vulgaris & officinarum Germaniæ. C. B. P. 228. *Common officinal Calamint of the Germans.*
5. MELISSA (*Nepeta*) pedunculis axillaribus dichotomis folio longioribus, caule decumbente. Lin. Sp. Plant. 593. *Baum with foot-stalks arising from the wings of the stalk, which are forked, and longer than the leaves, with a declining stalk.* Calamintha pulegii odore sive nepeta. C. B. P. 228. *Calamint with the scent of Penny Royal, or Cat Mint.*
6. MELISSA (*Cretica*) racemis terminalibus, pedunculis solitariis brevissimis. Lin. Sp. Plant. 593. *Baum with spikes of flowers terminating the stalks, growing upon very short single foot-stalks.* Calamintha incana ocymi foliis. C. B. P. 228. *Hoary Calamint with Basil leaves.*
7. MELISSA (*Majoranifolia*) foliis ovatis glabris, floribus verticillatis sessilibus, pedunculis solitariis brevissimis. *Baum with oval smooth leaves, and flowers growing in whorls, sitting close to the branches, which have very short single stalks.* Calamintha Romana, majoranæ folio,

folio, pulegii odore. Bocc. Mus. *Roman Calamint with a Marjoram leaf, and the scent of Penny Royal.*

8. Melissa (*Fruticosa*) fruticosa, ramis attenuatis virgatis, foliis subtus tomentosis. Lin. Sp. Plant. 593. *Shrubby Baum with slender twig-like branches, and leaves which are woolly on their under side.* Calamintha Hispanica frutescens, mari folio. Tourn. Inst. 194. *Shrubby Spanish Calamint with a Marum leaf.*

The first sort grows naturally on the mountains near Geneva, and in some parts of Italy, but is cultivated here in gardens as a medicinal and culinary herb. It has a perennial root, and an annual stalk, which is square, branching, and rises from two to three feet high, garnished with leaves set by pairs at each joint, which are two inches and a half long, and almost two inches broad at their base, growing narrower toward the top, indented about their edges, and the lower ones standing upon pretty long foot-stalks. The flowers grow in loose small bunches at the wings of the stalk, in whorls, standing upon single foot-stalks; they are of the lip kind, the upper lip standing erect and is forked; the under lip is divided into three parts; the middle one is roundish, and indented at the top. The flowers are white, and appear in July. The whole plant has a pleasant scent, somewhat like Lemons.

It is reckoned to be cordial, cephalic, and good for all disorders of the head and nerves; there is a simple water of this herb. It is also used as Tea, and is by some greatly esteemed for that purpose; there is a variety of this with striped leaves.

This plant is easily propagated by parting of the root; the best time for this is in October, that the offsets may have time to get root before the frosts come on. The roots may be divided into small pieces with three or four buds to each, and planted two feet apart in beds of common garden earth, in which they will soon spread and meet together; the only culture it requires is to keep it clean from weeds, and cut off the decayed stalks in autumn, stirring the ground between the plants.

The second sort grows naturally about Rome, and in several parts of Italy; this hath a perennial root, and an annual stalk like the former. The stalks are slender, the leaves are much shorter than those of the former sort, and the whole plant is hairy, and of a strong disagreeable odour. The flowers grow in whorls, sitting pretty close to the branches, and are smaller than those of the first sort; it flowers about the same time. It is seldom preserved in gardens, but may be cultivated in the same way as the former.

The third sort grows naturally in the mountains of Tuscany and Austria, but is preserved in many English gardens for the sake of variety. It hath a perennial root, and an annual stalk, which rises about a foot high, garnished at each joint with two leaves standing opposite, which are an inch and a half long, and three quarters of an inch broad, sawed on their edges, of a lucid green on their upper side, and whitish on their under: from the wings of the stalks come out single foot-stalks half an inch long, which divide into two smaller, and each of these sustain two flowers upon short separate foot-stalks. The flowers are large, of a purple colour, and shaped like those of the other species. It flowers in June, and the seeds ripen in August. This may be propagated in the same way as the first sort, and the plants may be treated in the same manner.

The fourth sort is the common Calamint of the shops, which grows naturally in many parts of England, so is seldom kept in gardens. It hath a perennial root, from which arise several square stalks near a foot long, which are hairy, and garnished with two roundish leaves at each joint, about the size of those of Pot Marjoram, a little indented on their edges, and of a strong penetrating odour. The flowers come out in whorls on the side of the stalks, upon foot-stalks, which divide by pairs, and are as long as the leaves; these sustain several small bluish flowers, which appear in July, and are succeeded each by four small, roundish, black seeds. The herb is used in medicine, and is hotter, and abounds with more subtile and volatile parts than Mint. It provokes urine, brings down the menses, opens the liver, and is good for coughs. This may be planted in gardens, and treated in the same way as the common Baum.

The fifth sort is found in greater plenty than the fourth, growing wild in England. The stalks of this are longer and bend towards the ground. The leaves are larger, and more indented on their edges, and have a very strong scent like Penny Royal. The whorls of flowers are set closer together than those of the fourth sort, but in other respects they agree.

The sixth sort grows naturally in the south of France and in Italy; this is not of so long duration as the former sorts, seldom continuing more than two or three years. The stalks are slender, a little ligneous, and are garnished with small, roundish, hoary leaves, placed opposite at each joint. The flowers are produced in whorls toward the upper part of the stalks, which are terminated by a loose spike; they are small and white, shaped like those of the other species, and appear in June; these are succeeded by seeds, which ripen in autumn, and if they are permitted to scatter, there will be a sufficient supply of young plants.

The seventh sort grows naturally in Italy; this is a biennial plant, whose stalks are about eight inches long, declining toward the ground, and are garnished with roundish leaves about the size of Marjoram, of a light green colour. The flowers come out in close whorls on the upper part of the stalks, each standing upon a short separate foot-stalk; they are large, and of a bright purple colour, appearing in July and August, and the seeds ripen in autumn; this is propagated by seeds, which should be sown soon after they are ripe, and then the plants will come up in the spring; but when the seeds are not sown till the spring, they seldom grow till the next year. The plants may also be propagated by cuttings, which if planted in the summer, and shaded from the sun, will take root very freely. If these plants are on a warm border, they will live through the winter, but to preserve the species, a plant or two should be kept in pots, and sheltered under a frame in winter.

The eighth sort grows naturally in Spain; this hath slender shrubby stalks about nine inches long, which put out small side branches opposite, and are garnished with small, hoary, oval-pointed leaves, placed by pairs; these have much the appearance of those of the Marum. The flowers grow in whorled spikes, at the end of the stalks; they are small and white, appearing in July, and the seeds ripen in autumn. The whole plant has a strong scent of Penny Royal; this plant is of as short a duration as the seventh sort, and may be propagated either by seeds or cuttings in the same way as the seventh, and the plants require the same treatment.

MELISSA TURCICA. See Dracocephalon.

MELITTIS. Greater Dead Nettle.

The Characters are,

*It hath an erect, taper, bell-shaped empalement, having two lips; the upper is tall and indented, the under is short and bifid; the flower is ringent, the tube is longer than the empalement, the chaps are thicker; the upper lip is roundish, plain, and erect; the lower is trifid, spreading, and obtuse. It hath four stamina, which are awl-shaped, situated under the upper lip, two being a little longer than the other, terminated by bifid obtuse summits, which are placed a cross; it hath an obtuse, quadrifid, hairy germen supporting a slender style, crowned by a bifid acute stigma. The flower is succeeded by four seeds which ripen in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, intitled Didynamia Gymnospermia, the flowers having two long and two short stamina, and are succeeded by four naked seeds sitting in the empalement.

We know but one Species of this genus, viz.

Melittis (*Melyssophyllum.*) Hort. Cliff. 309. *Greater Dead Nettle.* Melissa. Fuchsii.

This plant grows naturally in some woods in the West of England and in Wales, Germany and near Montpelier. It hath a perennial root, which in the spring sends up three, four, or more stalks, according to the age and strength, which rise a foot and a half high; these are square, and garnished with leaves like those of the common Dead Nettle, but are much larger, rougher, and stand on longer foot-stalks, two being placed opposite at each joint. The flowers come out at the joints of the stalks, just above the foot-stalks of the leaves; they are in shape like those of the Dead Nettle, but are much larger, of a redder purple colour, and the upper lip grows erect. These appear in May, when the plants make a handsome appearance, and if the season does not prove hot, the flowers will continue in beauty upward of three weeks. As the plants do rarely produce good seeds in the gardens, so they are usually propagated by parting the roots; but where the plants are intended for ornament, the roots should not be disturbed oftener than every third year; nor should they then be divided into small parts, lest thereby they should not flower the first year. The best time to remove and part the roots is the beginning of October, that they may have time to get root before the frost comes on. They should have a loamy soil and an east exposure, where the plants will thrive and produce flowers in plenty.

MELO. Tourn. Inst. R. H. 104. tab. 32. Cucumis. Lin. Gen. Plant. 969. [it takes its name of Μῆλον, an Apple, because the fruit resembles an Apple.] The Melon.

The Characters are,

*It hath male and female flowers on the same plant. The male flowers have a bell-shaped empalement of one leaf, whose border is terminated by five awl-shaped bristles. The flower is of one petal, which is bell-shaped, fastened to the empalement, and cut into five segments at the brim; these are veined and rough. It hath three short stamina inserted in the empalement, and are joined together, two of which have bifid points. The summits are linear, and run up and down on the outside of the stamina, to which they adhere. The female flowers have no stamina or summits, but have a large oval germen situated below the flower, supporting a short cylindrical style, crowned by three thick gibbous stigmas. The germen afterward turns to an oval fruit with several cells, filled with oval, acute-pointed, compressed seeds, inclosed in a soft pulp.*

This genus of plants is by Dr. Linnæus joined with the Colocynthus and Anguria, to the Cucumis, making them only species of the same genus, which, according to his system, may be allowable; but whoever will admit the fruit as a characteristic note to distinguish the genera, will find marks to separate them; and however properly these may be put together in a system of botany, yet in a work of this nature it cannot be admitted.

There is a great variety of this fruit cultivated in the different parts of the world, and in this country there are too many of them propagated, which are of no value, especially by those who supply the markets, where their size is chiefly regarded; so that by endeavouring to augment their bulk, the fruit is rendered of no value; I shall therefore only mention a very few of the varieties, which are the most deserving of care, excluding the common Melons, as being unworthy of the trouble and expence in cultivating.

The sort of Melon which is in the greatest esteem among all the curious in every part of Europe, is the Cantaleupe; which is so called from a place about fourteen miles from Rome, where the pope has a country seat, in which place this fruit has been long cultivated; but it was brought thither from that part of Armenia which borders on Persia, where this fruit is in so great plenty, that a horse-load is sold for a French crown. The flesh of this Melon, when in perfection, is delicious, and does not offend the most tender stomachs, so may be eaten with safety. The Dutch are so fond of this fruit, as to cultivate very few other sorts, and by way of pre-eminence, call it only by the appellation of Cantaleupe, and never join the title of Melon to it, which they apply indifferently to all the other sorts. The outer coat of this is very rough, and full of knobs and protuberances like warts; it is of a middling size, rather round than long, and the flesh is for the most part of an Orange colour, though there are some with a greenish flesh, but I have never met with any of that colour so good as those of the other.

The Romana is by some much esteemed, and when the fruit is well conditioned, the plants in perfect health, and the season dry, it is a good Melon, and may be brought forwarder in the season than the Cantaleupe; therefore those who are desirous of early Melons may cultivate this sort.

The Succado is also a good sort, and may also be cultivated for early fruit, but these must give way to the Cantaleupe, when that is in season.

The Zatte is also a very good Melon, but very small. The fruit of this is seldom bigger than a large Orange; it is a little flatted at the two ends, and the outer coat is warted like the Cantaleupe, but there is so little flesh in one of these fruit, that they are scarce worthy the trouble of propagating.

The small Portugal Melon, which is by some called the Dormer Melon, is a pretty good fruit, and the plants generally produce them in plenty, so by many people this is preferred to most other, especially those who love a plenty, and are not so nice in distinguishing the quality: this may also be cultivated for an early crop.

But the best Melon for this purpose is the Black Galloway, which was brought from Portugal by Lord Galloway many years since, but of late years is rarely to be met with in England, it having been degenerated by growing among other sorts. The fruit of this sort will ripen in a shorter time from its first setting, than any other which I have yet seen, and when suffered to ripen naturally, is not a bad fruit.

The few varieties here mentioned, are sufficient to satisfy the curious, who may be fond of variety, for there are scarce any other which deserve the trouble; and indeed those who have a true taste for this fruit, seldom cultivate any but the Cantaleupe; but as I before observed, where this fruit is desired early in the season, the Cantaleupe is not so proper as some of the other, therefore a few plants of one of the other sorts should be raised earlier in the spring, but should be in a different part of the garden from the Cantaleupe Melons; for when two sorts of Melons grow near, they cannot be preserved perfectly right; therefore the Dutch and German gardeners are very careful in this respect, and in order to keep the sort in perfection, do not plant any other sort of Melon, Cucumber or Gourd, near these, lest, by the impregnation of the farina of those other, these fruit should be rendered bad; and in this particular, I am convinced, from long experience, they are right; and from the not observing this, many persons who are lovers of this fruit, have gradually diminished their goodness, without knowing the cause, and have imputed it to the long cultivating from the seeds saved in the same garden, believing it absolutely necessary to procure seeds from a distant place frequently to preserve them good: indeed, where a person can securely depend on the care and skill of those he procures the seeds from, it is a very good method to exchange seeds now and then; but there are so few who are exact in making choice of the fruits from which they save the seeds, or careful enough to do it themselves, but often depend on others to clean the seed, that I should advise every one to do it himself, which is the sure way to have it good; for I have frequently been deceived myself, by depending on the fidelity and skill of others; nor could I procure any of these seeds from Cantaleupe which were good, until my much honoured friend, the Chevalier Rathgeb, sent me plentifully of it from thence; though I had often been supplied

supplied with seeds by persons who I thought could not be deceived in their choice, and who lived near the place of their growth.

Before I quit this head, I beg leave to caution all persons against depending upon seeds which are brought from abroad, either by those persons who import them for sale, or gentlemen who frequently bring or send over these seeds to their friends, for it seldom happens that any of these prove tolerable. I have been so often deceived by these myself, as to determine never to make trial of any of these seeds again, unless I receive them from a person who is skilful, and who eat of the fruit himself of which he saved the seeds; for in Italy, Spain, Portugal, and many parts of France, the gardeners are very careless in the choice of all their seeds, but of the Melons they are remarkably so; and as for those which come from Constantinople, Aleppo, and other parts of Turkey, I have rarely seen one Melon produced from those seeds which was tolerable.

The seeds of Melons should not be sown until they are three years old, nor would I chuse to sow them when they are more than six; for although they will grow at ten or twelve years old, yet the fruit which are produced from those old seeds are seldom so thick fleshed, as those which come from seeds which are fresher: and it is the same of light seeds, which swim upon water, when they are taken out of the pulp, for I have made some trials of these, and have had them grow at three years old; but not one of the Melons produced on these plants was near so deep fleshed, as those which grew upon plants raised from heavy seeds taken out of the same fruit, though they grew in the same bed, and were cultivated exactly in the same manner; nor was their flesh so firm, but rather inclining to be meally; therefore I would not advise the sowing of these light seeds, nor those which are very old.

Having thus largely treated of the choice of the sorts, and of the seeds, I shall next proceed to the method of cultivating them, in order to obtain plenty of good fruit: the method which I am going to prescribe being very different from what has been constantly practised in England, will, I doubt not, be objected to by many; but it is what has been practised in all the good gardens in Holland and Germany, where the Cantaleupe Melon is produced in great plenty and perfection; and from several years experience, I have found this to be the only method in which these Melons can be cultivated with success; and I am likewise convinced of its being the best way to obtain plenty of any other sort of Melon.

It is common to hear many persons valuing themselves upon having two or three early Melons, which, when brought to the table are not better than a Pumpkin, and these are procured at a great expence and with much trouble; and in order to have them ripe a little earlier than they would naturally come, if suffered to grow to their full size, the stem upon which the fruit grows is commonly twisted, to prevent the nourishment entering the fruit, whereby the growth is checked; then the fruit is closely covered with the mowings of Grass-plats, laid of a sufficient depth to cause a fermentation, by which the fruit becomes coloured: but where this unnatural method is practised, the fruit has little flesh, and that has neither moisture, firmness, or flavour; so that after four months attendance, with a great expence of dung, &c. there may, perhaps, be three or four brace of Melons produced, which are fitter for the dunghill than the table. Therefore my advice is, never to attempt to have these fruit ripe earlier than the middle or latter end of June, which is generally soon enough for this climate; and from that time to the end of September, they may be had in plenty, if they are skilfully managed; and when the autumn has continued favourable, I have had them very good in the middle of October.

But in order to continue this fruit so long, the seeds must be sown at two or three different seasons: the first should be sown about the middle or end of February, if the season proves forward; but if it is otherwise, it will be better to defer it till the end of that month; the future success greatly depends on the raising the plants in strength, which cannot be so well effected, if the weather should prove so bad after the plants are come up, as that a sufficient quantity of fresh air cannot be admitted to them, therefore it is not adviseable to be too early in sowing the seeds.

When the season is come, these seeds may be sown on the upper side of a Cucumber-bed, where there are any; and if there are none, a proper quantity of new horse dung must be provided, which must be thrown in a heap to ferment, and turned over, that it may acquire an equal heat, in the same manner as hath been directed for Cucumbers; and the plants must be raised and managed in the same manner as hath been directed for them, until they are planted where they are to remain for good, to which article the reader is desired to turn, to avoid repetition.

The second season for sowing of these seeds is about the middle of March, and both these sowings must be understood to be planted under frames; for those which are designed for bell or hand-glasses, or to be covered with oil papers, should not be sown till about a week in April; for when these are sown earlier, if the plants are properly managed, they will grow so long, as to extend their shoots to the sides of the glasses, before it will be safe to let them run out; for it often happens in this country, that we have sharp morning frosts in the middle of May; so that if the ends of these Vines are then without the glasses, if they are not covered with mats to guard them against the frost, they will be in danger of suffering greatly therefrom; and, on the other hand, if the plants have spread so much as to fill the glasses, and not permitted to run out, they will be in equal danger of suffering by their confinement from the heat of the sun in the day time; therefore it is that I should advise the putting of the seed rather a little later into the hot-bed for the glasses, than those which are to be covered with the oil papers. Nor will the times here mentioned be found too late, for I have put the seeds of Cantaleupe Melons into a hot-bed the third of May, which were not transplanted, but remained where they were sown, and covered with oiled paper; and from this bed I cut a large crop of good fruit, which ripened about the latter end of August, and continued till the end of October. This I only mention, to shew what has and may be done, though it must not be always depended on.

But we next come to the making and preparing of the beds, or, as the gardeners term it, the ridges, into which the plants are to be put out to remain; these should always be placed in a warm situation, where they may be defended from all cold and strong winds, for the east and north winds are generally very troublesome in the spring of the year; so that if the place be exposed to those aspects, it will be difficult to admit a proper share of fresh air to the young plants; and if it is much exposed to the south-west winds, which often are very boisterous in summer and autumn, these will turn up and displace the Vines, whereby they will suffer greatly; therefore the best position for these beds is where they are open to the south, or a little inclined to the east, and sheltered at a distance by trees from the other points: this place should be inclosed with a good Reed fence, which is better for this purpose than any other inclosure, because the winds are deadened by the Reeds, and are not reverberated back again, as they are by walls, pales, and other close fences; but in making the inclosure, it should be extended to such distance every way from the beds, as not to obstruct the sun's rays during any part of the day; this should have a door wide enough to admit of wheelbarrows passing, to carry in dung, earth, &c. and it should be kept locked, that no persons should be allowed to go in but those who have business; for ignorant persons, having often curiosity to look into the beds, open the glasses and

and let the cold air to the plants, and frequently leave the glasses in part open; or sometimes when they are raised by the gardener to admit the fresh air, the tilts are thrown down, so that the air is excluded; all which are very injurious to the young plants, as is also the handling of the fruit after it is set; therefore none should be admitted, but when the person who is intrusted with the care of them is there.

The next thing is the preparation of the earth for these plants, in which the Dutch and German gardeners are very exact: the mixture which they generally prepare is of the following sorts; of hazel loam, one third part; of the scouring of ditches or ponds a third part, and of very rotten dung a third part; these are mixed up at least one, and often two years, before they make use of it, frequently turning it over, to incorporate their parts and sweeten it; but the compost in which I find these plants succeed best in England, is two thirds of fresh gentle loam, and one third of rotten neats dung; if these are mixed together one year before it is wanted, so as to have the benefit of a winter's frost and summer's heat, observing to turn it over often, and never suffer weeds to grow upon it, this will be found equal to any other compost whatever.

As these plants succeed best when they are planted young, so before the plants appear there should be a quantity of new dung thrown in a heap, proportionable to the number of lights intended, allowing about fifteen good wheelbarrows full to each light; this must be two or three times turned over, to prepare it (as hath been directed for Cucumbers) and in a fortnight it will be fit for use, at which time the trench must be dug to receive the dung, where the bed is intended; this must be made wider than the frames, and in length proportional to the number of frames intended. As to the depth, that must be according as the soil is dry or wet; but in a dry ground it should not be less than a foot, or a foot and a half deep; for the lower these beds are made the better they will succeed, where there is no danger of their suffering by wet. In the well laying and mixing of the dung, the same care must be taken as hath been advised already for Cucumbers, which in every respect must be the same for these beds. When the bed is made, the frames should be placed over it to keep out wet; but there should be no earth laid upon it till after it has been three or four days made, and is found of a proper temperature of heat; for many times these beds will heat so violently when they are first made, as to burn the earth, if covered with it; and when this happens, it is much the best way to take this earth off again, for the plants will never thrive in it. As soon as the bed is found to be of a proper warmth, the earth should be laid upon it, which at first need not be more than two inches thick, except in the middle of each light, where the plants are to be placed, where there must be a hill raised fifteen inches high or more, terminating in a flat cone; in two or three days after the earth is put on the bed, it will be of a proper temper to receive the plants; then in the evening you may transplant the plants, but always do it when there is little wind stirring: in taking up the plants, their roots should be carefully raised with a trowel, so as to preserve all their fibres; for if these are broken off, the plants do not soon recover this; or if they do, they are generally weaker, and seldom make so good Vines as those which are more carefully removed; for these plants are more nice and tender in transplanting than those of Cucumber, especially the Cantaleupe Melon; which, if it is not planted out, soon after the third, (or what the gardeners call the rough) leaf is put out, they are long recovering their vigour; so that when it happens that the beds cannot be ready for them in time, it will be a good method to plant each plant into a small pot while they are young, and these may be plunged into the hot-bed where they were raised, or into the Cucumber-bed where there is room, so that they may be brought forward; and when the bed is ready, these may be turned out of the pots, with the whole ball of earth to their roots, whereby they will receive no check in removing: and this latter method is what I should prefer to any other for the Cantaleupe, because there should never be more than one plant left to grow in each light; therefore in this method there will be no necessity of planting more, as there will be no danger of their succeeding; whereas in the common way, most people plant two or more plants in each light, for fear some should miscarry. When the plants are placed on the top of the hills, they should be gently watered, which should be repeated once or twice after till the plants have taken good root, after which they seldom require more; for when they receive too much wet, they often canker at the root, and when that happens they never produce good fruit. When the plants have established themselves well in the new beds, there should be a greater quantity of earth laid on the bed, beginning round the hills where the plants grow, that their roots may have room to strike out; and as the earth is put in from time to time, it must be trodden or pressed down as close as possible; and it should be raised at least a foot and a half thick upon the dung all over the bed, observing also to raise the frames, that the glasses may not be too near the plants, lest the sun should scorch them.

When the plants have gotton four leaves, the top of the plants should be pinched off with the finger and thumb, but not bruised or cut with a knife, because in either of these cases the wound will not so soon heal over: this pinching is to cause the plants to put out lateral branches, for these are what will produce the fruit; therefore, when there are two or more of these lateral shoots produced, they must also be pinched, to force out more; and this must be practised often, that there may be a supply of what the gardeners call runners, to cover the bed. The management of these beds must be nearly the same as hath been directed for the Cucumbers, therefore I need not repeat it here; but shall only observe, that the Melons require a greater share of air than Cucumbers, and very little water; and when it is given to them, it should be at a distance from their stems.

If the plants have succeeded well, they will spread over the bed, and reach to the frames, in about five or six weeks, at which time the alleys between the beds should be dug out; or where there is but one bed, there should be a trench made on each side, of about four feet wide, as low as the bottom of the bed, and hot dung wheeled in, to raise a lining to the same height as the dung of the bed, which should be trodden down close, and afterward covered with the same earth as was laid upon the bed, to the thickness of a foot and a half or more, treading it down as close as possible; this will add to the width of the bed, so much as to make it in the whole twelve feet broad, which is absolutely necessary, for the roots of the plants will extend themselves quite through it; and it is for want of this precaution, that it is common to see the Vines of Melons decay, before the fruit is well grown; for where there is no addition made to the width of the bed, the roots will have reached the sides of the beds by the time that the fruit appears, and having no more room to extend themselves, their extremities are dried by the sun and air, which is soon discovered by the plants hanging their leaves in the heat of the day, which is soon attended with a decay of many of those leaves which are near the stem, and the plants from that time gradually languish, so that the fruit cannot be supplied with nourishment; but when ripe, will be found to have little flesh, and that meally and ill flavoured; whereas those plants which have sufficient breadth for their roots to run, and the earth laid of a proper depth and closely trod down, will remain in vigour until the frost destroys them, so that I have had a second crop of fruit on them, which have sometimes ripened well; but all the first were excellent, and of a larger size

than these sorts usually grow: the leaves of these plants were very large, and of a strong green, so that they were in the utmost vigour; whereas, in most places where the Cantaleupe Melons have been raised in England, the beds have been no wider than they were first made, and perhaps not more than three inches thickness of earth upon them, so that the plants have decayed many times without producing a single fruit; and from thence people have imagined, that this sort of Melon was too tender for this climate, when their ill success was entirely owing to their not understanding their culture.

There is also another advantage attending this method of widening the beds, as above directed, which is that of adding a fresh warmth to the beds, by the hot dung, which is buried on each side, which will cause the dung in the bed to renew its heat; and as the plants will by this time shew their fruit, this additional heat will be of great service in setting the fruit, especially if the season should prove cold, as it often happens in this country in the month of May. When the beds are made up in the manner here directed, and the Vines have extended so far as to fill the frames, and want more room, the frames should be raised up with bricks about three inches high, to admit the shoots of the Vines to run from under them; for if the plants are strong, they will run six or seven feet each way from the stems; for which reason, I caution every one to allow them room, and to put but one plant in each light; for when the Vines are crowded, the fruit seldom will set well, but will drop off when they are as large as an egg; therefore the frames which are designed for Melons should not be made small, but rather six feet wide; for the wider these are, the better will the plants thrive, and produce a greater plenty of fruit.

There is no part of gardening, in which the practitioners of this art differ more than in the pruning and managing of these plants: nor are there any rules laid down in the several books in which the culture of Melons have been treated of, by which any person can be instructed; for there is such inconsistency in all their directions, and what is worse, the greatest part of them are absurd, so that whoever follows them can never hope to succeed; therefore I shall, in as few words as possible, give such plain directions, as I hope will be sufficient to instruct any person, who is the least conversant in these things.

I have before advised the pinching off the ends of the plants as soon as they have a joint, in order to get lateral shoots, which are by the gardeners called runners; and when these shoots have two or three joints, to pinch off their tops to force out more runners, because it is from these that the fruit is to be produced; but after a sufficient number are put out, they should not be stopped again, but wait for the appearance of the fruit, which will soon come out in plenty; at which time the Vines should be carefully looked over three times a week, to observe the fruit, and make choice of one upon each runner, which is situated nearest the stem, having the largest foot-stalk, and that appears to be the strongest fruit, and then pinch off all the other fruit which may appear on the same runner; also pinch off the end of the runner at the third joint above the fruit, and if the runner is gently pinched at the next joint above the fruit, it will stop the sap and set the fruit. There is also another method practised by some gardeners to set this fruit, which is the taking off some of the male flowers, whose farina are just ripe and fit for the purpose, laying them over the female flowers, which are situated on the crown of the young fruit, and with their nails gently strike the male flowers to shake the farina into the female flowers, whereby they are impregnated, and the fruit soon after will swell, and shew visible signs of their being perfectly set; so that where the plants are under frames, and the wind excluded from them, which is necessary to convey the farina from the male to the female flowers, this practice may be very necessary. The taking off all the other fruit will prevent the nourishment being drawn away from the fruit intended to grow, which, if they were all left on the plant, could not be supplied with sufficient nourishment; so that when they come to be as large as the end of a man's thumb, they frequently drop off, and scarce one of them sets, which will be prevented by the method before directed: but there are some persons, who are so covetous of having a number of fruit, as not to suffer any to be taken off, whereby they generally fail in their expectation. My allowing but one fruit to be left upon each runner is, because if half these stand there will be full as many fruit as the plant can nourish; for if there are more than eight upon one plant, the fruit will be small and not so well nourished: indeed, I have sometimes seen fifteen or twenty Melons upon one plant, but these have generally been of the smaller kinds, which do not require so much nourishment as the Cantaleupes, whose skins are of a thick substance; so that where a greater number are left of them than the plants can well supply, their flesh will be remarkably thin.

As I before advised the stopping or pinching off the runners three joints above the fruit, so by this there will be fresh runners produced a little below the places where the others were pinched; therefore it is, that I advise the careful looking over the Vines so often, to stop these new runners soon after they come out, as also to pull off the young fruit which will appear; and this must be repeated as often as is found necessary, which will be until those intended to stand are grown so large as to draw all the nourishment which the plants can supply, for then the plants will begin to abate of their vigour. These few directions, if properly made use of, is all the pruning which is necessary to be given them; but at the same time when this is practised, it may be necessary to give some water to the plants, but at a distance from their stems, which will be of service to set the fruit and cause it to swell, but this must be done with great caution.

The glasses of the hot-bed should also be raised high, to admit a large share of air to the plants, otherwise the fruit will not set; and if the season should prove very warm, the glasses may be frequently drawn off, especially in an evening, to receive the dews, provided there is but little wind stirring; but the glasses should not remain off the whole night, lest the cold should prove too great; but in warm weather, the glasses may be kept off from ten in the morning till evening.

When the plants have extended themselves from under the frames, if the weather should alter to cold, it will be necessary to cover their extremities every night with mats; for if these shoots are injured, it will retard the growth of the fruit, and often proves very injurious to the plants: and now what water is given to the plants, should be in the alleys between the beds; for as the roots of the Vines will by this time have extended themselves through the alleys, so when the ground there is well moistened, the plants will receive the benefit of it; and by this method, the stems of the plants will be preserved dry, whereby they will continue sound; but these waterings should not be repeated oftener than once a week in very dry warm weather, and be sure to give as much air as possible to the plants when the season is warm.

Having given full instructions for the management of those Melons which are raised under frames, I shall next proceed to treat of those which are raised under bell or hand-glasses. The plants for these must be raised in the same manner as hath been already directed, and about the latter end of Aprril, if the season proves forward, will be a good time to make the beds; therefore a sufficient quantity of hot dung should be provided, in proportion to the intended number of glasses, allowing six or eight good wheelbarrows of dung to each glass. Where there is but one bed, which is proposed to be extended in length, the trench should be dug out four feet and a half wide, and the length according to the number of glasses,

glaſſes, which ſhould not be placed nearer than four feet to each other; for when the plants are too near each other, the Vines will intermix, and fill the bed ſo cloſely as to prevent the fruit from ſetting: in digging the trench, it ſhould be ſo ſituated, as to allow for the widening of the bed three or four feet on each ſide; the depth muſt be according as the ſoil is dry or wet; but, as was before obſerved, if the ſoil is ſo dry as that there is no danger of the beds being hurt by the wet, the lower they are made in the ground the better: in the making of the beds, the ſame regard muſt be had to the well mixing and laying of the dung as was before directed; and after the dung is laid, there ſhould be a hill of earth raiſed, where each plant is to ſtand, one foot and a half high; the other part of the bed need not as yet be covered more than four inches thick, which will be ſufficient to keep the warmth of the dung from evaporating; then the glaſſes ſhould be placed over the hills, and ſet down cloſe, in order to warm the earth of the hills to receive the plants; and if the beds work kindly, they will be in a proper temperature to receive the plants in two or three days after making; then the plants ſhould be removed, in the ſame manner as was before directed; and if they are in pots, ſo that there will be no danger of their growing, there ſhould but one plant be put under each glaſs; and if they are not in pots, there ſhould be two, one of which may be afterward taken away, if they both grow. Theſe plants muſt be watered at firſt planting, to ſettle the earth to their roots, and ſhaded every day until they have taken new root; and if the nights prove cold, it will be proper to cover the glaſſes with mats, to preſerve the warmth of the bed.

Where there are ſeveral of the beds intended, they ſhould be placed at eight feet diſtance from each other, that there may be a proper ſpace left between them, to be afterward filled up, for the root of the Vines to have room for extending themſelves, for the reaſons before given.

When the plants have taken good root in the beds, their tops muſt be pinched off; and their pruning, &c. muſt, from time to time, be the ſame as for thoſe under the frames. In the day time, when the weather is warm, the glaſſes ſhould be raiſed on the oppoſite ſide to the wind, to admit freſh air to the plants; for where this is not obſerved, they will draw up weak and ſickly, therefore all poſſible care ſhould be taken to prevent this; for if the runners have not proper ſtrength, they can never ſupply the fruit with nouriſhment.

When the plants are grown ſo long as to reach the ſides of the glaſſes, if the weather proves favourable, the glaſſes muſt be ſet on three bricks, ſo as to raiſe them about two inches from the ſurface of the beds, to give room for the Vines to run out from under them; but when this is done, the beds ſhould be covered all over with earth to the depth of one foot and a half, and trod down as cloſe as poſſible; and if the nights ſhould prove cold, there ſhould be a covering of mats put over the beds, to prevent the cold from injuring the tender ſhoots of the Vines; but as the Vines of the Contaleupe Melons are impatient of wet, it will be neceſſary to arch the beds over with hoops to ſupport the mats, that they may be ready for covering at all times when they require it; which is the only ſure method to have theſe Melons ſucceed in England, where the weather is ſo very uncertain and variable; for I have had ſome beds of theſe Melons in as fine order under theſe glaſſes as could be deſired, which were totally deſtroyed by one day's heavy rain in June.

After the thickneſs of earth is laid upon the beds, if the weather ſhould prove cold, it will be adviſeable to dig trenches on each ſide of the beds, into which you ſhould lay a ſufficient quantity of hot dung, to make it of the ſame thickneſs with the bed, after the manner before directed for the frames; or if there is a ſufficient quantity of hot dung ready, the whole ſpace between the beds may be dug out and filled up with the dung, laying thereon the earth a foot and a half deep, treading it down cloſe; this new dung will add a freſh warmth to the beds, and cauſe the plants to ſhew fruit ſoon after.

The watering of theſe plants muſt be done with great caution, and not given to their ſtems; the pinching off the runners muſt alſo be duly attended to, as alſo the pulling off all ſuperfluous fruit, to encourage thoſe which are deſigned to remain: and in ſhort, every thing before directed for thoſe under frames, muſt likewiſe be obſerved for theſe; and the further care is, to cover them in all hard rains and cold nights, with mats, which, if performed with care, there will be little danger of their miſcarrying, and theſe Vines will remain vigorous until the cold in autumn deſtroys them.

There have been many perſons, who of late years have raiſed their Melons under oiled paper, and in many places they have ſucceeded well; but where this is practiſed, there muſt be great care taken not to keep theſe coverings too cloſe over them; for where that is done, the Vines will draw very weak, and rarely ſet their fruit in any plenty; therefore where theſe coverings are propoſed to be uſed, I ſhould adviſe the bringing up of the plants under hand or bell-glaſſes, in the manner before directed, until they are grown far enough to be let out from under the glaſſes; and then, inſtead of the covering with mats, to put over the oiled paper; and if this covering is prudently managed, it will be the beſt that can be uſed. The beſt ſort of paper for this purpoſe is that which is ſtrong, and not of too dark a colour; and it ſhould be done over with linſeed oil, which will dry ſoon. There ſhould be a proportionable number of ſheets of this paper paſted together, as will ſpread to the dimenſions of the frame to which it is faſtened; and if this is fixed to the frame, before the oil is rubbed over it, ſo much the better; but this ſhould be done ſo long before they are uſed, as that the oil may be thoroughly dry, and the ſtench gone off, otherwiſe it will deſtroy the plants.

There are ſome perſons who make theſe frames of broad hoops, in imitation of the covers of waggons; but as theſe are cumberſome to move, and there are no conveniencies for admitting air to the plants, but by raiſing the whole frame on one ſide, I prefer thoſe made of pantile laths, framed like the ridge of a houſe; and each ſlope having hinges, may be raiſed at pleaſure to admit the air to the plants; but as deſcriptions of theſe things are not well comprehended by perſons not ſo converſant with them, I ſhall exhibit a figure of one of theſe frames, to be added to the article of Stoves.

The further management of the Melons, after their fruit is ſet, is to keep pulling off all the ſuperfluous fruit, and to pinch off all weak runners, which may draw away part of the nouriſhment from the fruit; as alſo to turn the fruit gently twice a week, that each ſide may have equal benefit of the ſun and air; for when they are ſuffered to lie with the ſame ſide conſtantly to the ground, that ſide will become of a pale or whitiſh colour, as if it were blanched, for want of the advantages of the ſun and air. The plants will require a little water in very dry weather, but this ſhould be given them in the alleys at a diſtance from the ſtems of the plants, and not oftener than once in a week or ten days, at which time the ground ſhould be well ſoaked in the alleys. This will encourage the growth of the fruit, and cauſe the fleſh to be thick; but the great caution which is neceſſary to be obſerved, is not to over-water the plants, which is certain injury to them: alſo be ſure to give as much free air as poſſible, at all times, when the weather will permit, for this is abſolutely neceſſary to render the fruit good.

When the fruit is fully grown, they muſt be duly watched to cut them at a proper time; for if they are left a few hours too long upon the Vines, they will loſe much of their delicacy, therefore they ſhould be looked

looked over at leaſt twice every day; and if thoſe fruit which are intended for the table, are cut early in the morning, before the ſun has warmed them, they will be much better flavoured; but if any ſhould require to be cut afterward, they ſhould be put into cold ſpring water, or ice, to cool them, before they are brought to the table: and thoſe cut in the morning, ſhould be kept in the cooleſt place till they are ſerved up to table. The ſign of this fruit's maturity is, that of its beginning to crack near the foot-ſtalk, and its beginning to ſmell, which never fail; for as theſe Cantaleupe Melons ſeldom change their colour until they are too ripe, that ſhould never be waited for.

The directions here given for the management of the Cantaleupe Melons, will be found equally good for all the other ſorts, as I have fully experienced; for in the common method of managing them, where the earth is laid but three or four inches thick, the plants are very apt to decay before the fruit is ripe; for their roots ſoon reach the dung, and are extended to the ſides of the bed, where their tender fibres are expoſed to the air and ſun, which cauſe the leaves of the plants to hang down in the heat of the day, ſo it is neceſſary to ſhade them with mats, to prevent their decay; and this alſo occaſions the watering of the plants often to keep them alive, which is alſo prejudicial to their roots; whereas when the beds are made of a proper width, and earthed of a ſufficient thickneſs, the plants will bear the ſtrongeſt heat of the ſun in this climate, without ſhewing the leaſt want of moiſture, or their leaves drooping, and they will continue in health till the autumn cold deſtroys them.

In ſaving of the ſeeds I need not repeat here, that only ſuch ſhould be regarded, which are taken from the firmeſt fruit, and thoſe which have the higheſt flavour; and if theſe are taken out with the pulp entire, without diſplacing the ſeeds, and ſuffered to remain in the pulp two or three days before it is waſhed out, the better; and then to preſerve only the heavy ſeeds, which ſink in the water.

MELOCACTUS. } See CACTUS.
MELOCARDUUS. }

MELOCHIA, Jews Mallow.

The CHARACTERS are,

*It hath a permanent empalement of one leaf, cut half way into five ſegments; the flower hath five large ſpreading petals; the ſtamina are involved in the tube of the germen, and have five ſummits. It has a roundiſh germen with five awl-ſhaped erect ſtyles, which are permanent, crowned by ſingle ſtigmas. The flower is ſucceeded by five-cornered roundiſh capſules, having five cells with two horns, in each cell is lodged one angular compreſſed ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's ſixteenth claſs, intitled Monadelphia Pentandria; the flowers of this claſs have their ſtamina and ſtyles connected in one houſe, and thoſe of this ſection have but five ſtamina.

The SPECIES are,

1. MELOCHIA (*Pyramidata*) floribus umbellatis oppoſitis foliis, capſulis pyramidatis pentagonis, angulis acutis, foliis nudis. Hort. Cliff. 343. *Jews Mallow with umbellated flowers placed oppoſite to the leaves, and five-cornered pyramidal capſules.* Althæa Braſiliana fruteſcens, incarnato flore, fagopyri ſemine. Pluk. Phyt. tab. 131. f. 3.
2. MELOCHIA (*Tomentoſa*) floribus umbellatis axillaribus, capſulis pyramidatis pentagonis, angulis mucronatis, foliis tomentoſis. Lin. Sp. 943. *Jews Mallow with umbellated flowers at the wings of the ſtalk, five-cornered pyramidal capſules, and woolly leaves.* Abutilon herbaceum procumbens, betonicæ folio, flore purpureo. Sloan. Hiſt. Sp. 220.
3. MELOCHIA (*Depreſſa*) floribus ſolitariis capſulis depreſſis pentagonis, anguſtis obtuſis ciliatis. Flor. Leyd. Prod. 348. *Jews Mallow with flowers growing ſingly, and five-cornered depreſſed capſules.* Abutilon Americanum, ribeſii foliis, flore carneo, fructu pentagono aſpero. Houſt. MSS.
4. MELOCHIA (*Concatenata*) racemis confertis terminalibus, capſulis globoſis ſeſſilibus. Flor. Zeyl. 247. *Jews Mallow with cluſtered ſpikes terminating the ſtalks, and globular capſules ſitting cloſe.*
5. MELOCHIA (*Supina*) floribus capititatis, foliis ovatis ſerratis, caulibus procumbentibus. Lin. Sp. 944. *Jews Mallow with flowers in heads, oval ſawed leaves, and trailing ſtalks.* Alcea ſupina puſilla, geranii exigui maritimi folio & facie, maderaſpatenſis, fructu in ſummo caule glomerato, pericarpio duro. Pluk. Phyt. tab. 132. f. 4.

The firſt ſort grows naturally in the Brazils as a common weed, having a ſtalk ſomewhat ſhrubby, which riſes four or five feet high; the flowers are produced in umbels from the ſide of the ſtalk, oppoſite to the leaves; they are of a pale fleſh colour, and are ſucceeded by pyramidal capſules with five corners having five cells, each containing one angular ſeed.

The ſecond ſort grows naturally in Jamaica, and other warm parts of America. This has a trailing herbaceous ſtalk, garniſhed with woolly leaves ſhaped like Betony. The flowers are produced in umbels at the wings of the ſtalk; they are of a purple colour, and are ſucceeded by pyramidal capſules, having five corners.

The third ſort was diſcovered growing naturally at the Havannah, by the late Dr. Houſtoun. This riſes with a ſhrubby ſtalk five or ſix feet high, garniſhed with angular leaves reſembling thoſe of the Currant buſh; the flowers are produced ſingly from the ſide of the ſtalk: they are of a fleſh colour, and in ſhape like thoſe of the ſmall flowering Mallow; theſe are ſucceeded by rough five-cornered capſules, incloſing five Mallow-ſhaped ſeeds.

The fourth ſort grows naturally in both Indies; this hath an herbaceous ſtalk, which is terminated by ſeveral oblong bunches of flowers, which are ſucceeded by globular capſules with five cells, in each of which is lodged a ſingle ſeed.

The fifth ſort grows naturally in India; this is an annual plant with trailing ſtalks which ſpread on the ground, garniſhed with ſmall Betony-ſhaped leaves; the flowers and fruit are produced in cluſters at the end of the branches.

Theſe plants are preſerved in botanic gardens for variety, but having little beauty they are rarely cultivated in other places; they are propagated by ſeeds which muſt be ſown on a hot-bed, and when the plants come up, they ſhould be treated in the ſame way as is directed for SIDA, to which the reader is deſired to turn to avoid repetition. The firſt and third ſorts are ſhrubby, ſo may with care be preſerved thro' the winter in a ſtove, whereby good ſeeds may be obtained; for theſe ſeldom ripen their ſeeds well the firſt year, unleſs the plants are brought forward early in the ſpring, and the ſummer proves warm. The other three ſorts generally ripen their ſeeds the ſame year they are ſown.

MELON. See MELO.

MELONGENA. Tourn. Inſt. R. H. 151. tab. 65. Solanum. Lin. Gen. Plant. 224. Mad Apple, by ſome called Egg Plant; in French, *Mayenne.*

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, which is deeply cut into five acute ſegments, which ſpread open. The flower hath but one petal, which is cut into five parts, which ſpread open and are reflexed. It hath five awl-ſhaped ſtamina, terminated by oblong ſummits which converge together. In the center is ſituated an oblong germen ſupporting a ſlender ſtyle, crowned by an obtuſe ſtigma; the germen afterward becomes an oval or oblong fruit with one cell, which hath a fleſhy pulp, filled with compreſſed roundiſh ſeeds.*

This genus of plants is ranged in the ſeventh ſection of Tournefort's ſecond claſs, which includes the herbs with a wheel-ſhaped flower of one leaf, whoſe pointal changes to a ſoft fruit. Dr. Linnæus has joined this genus, and the Lycoperſicon of Tournefort, to the Solanum, making them only ſpecies of

that genus; but as the fruit of this genus has but one cell, so it should be separated from the Solanum, whose fruit have two cells, and of which there are so many species already known, that there need not be any addition of plants which can be separated with propriety added to it; he places it in the first section of his fifth class.

The Species are,

1. Melongena (*Ovata*) caule inermi herbaceo, foliis oblongo-ovatis tomentosis integris, fructu ovato. *Mad Apple with a smooth herbaceous stalk, oblong, oval, woolly leaves, which are entire, and an oval fruit.* Melongena fructu oblongo violaceo. Tourn. Inst. 151. *Mad Apple with an oblong Violet-coloured fruit.*
2. Melongena (*Tereta*) caule inermi herbaceo, foliis oblongo-ovatis tomentosis, fructu tereti. *Mad Apple with herbaceous, smooth, oblong, oval, woolly leaves, and a taper fruit.* Melongena fructu tereti violaceo. Tourn. Inst. 151. *Mad Apple with a taper Violet-coloured fruit.*
3. Melongena (*Incurva*) caule inermi herbaceo, foliis oblongis sinuatis tomentosis, fructu incurvo. *Mad Apple with a smooth herbaceous stalk, oblong sinuated leaves which are woolly, and an incurved fruit.* Melongena fructu incurvo. Tourn. Inst. R. H. 152. *Mad Apple with an incurved fruit.*
4. Melongena (*Spinosa*) spinosa, foliis sinuatis-laciniatis, fructu tereti, caule herbaceo. *Mad Apple, with a prickly stalk and leaves which are cut into sinuses, a taper fruit, and an herbaceous stalk.* Solanum pomiferum fructu spinoso. J. B. 3. 619. *Apple-beariug Nightshade with a prickly fruit.*

The first sort grows naturally in Asia, Africa, and America, where the fruit is commonly eaten by the inhabitants; and it is cultivated in the gardens in Spain as an esculent fruit, by the title of Barenkeena; the Turks who also eat the fruit, call it Badinjan, the Italians Melanzana, and the inhabitants of the British islands in America, Brown John, or Brown Jolly. It is an annual plant with an herbaceous stalk, which becomes a little ligneous, and rises near three feet high, sending out many side branches, garnished with oblong oval leaves seven or eight inches long, and four broad; they are woolly, and their borders are very slightly sinuated, but not indented, standing without order upon very thick foot-stalks. The flowers come out singly from the side of the branches, having a thick fleshy empalement of one leaf, which is deeply cut into five acute segments, which spread open, and is armed with strong prickles on the outside. The flowers have one petal, which is cut at the brim into five segments, which expand in form of a star, and are a little reflexed; they are blue, and the summits which are connected together in the bosom of the flower are yellow. The flowers are succeeded by oval fleshy fruit, about the size and shape of a swan's egg, of a dark purple on one side, and white on the other. The flowers come out in June and July, and the fruit ripens in September.

There are the following varieties of these species; one with white fruit, called by some the Egg Plant; one with yellow fruit, and another with pale red fruit; all these varieties are generally constant, the seeds producing the same fruit as those from which they were taken, but as they only differ in colour, so I chuse not to enumerate them as distinct species.

The second sort differs from the first in the shape of the fruit, which is commonly eight or nine inches long, taper and strait; in other respects they are the same, but as this never varies when propagated in gardens, so there can be no doubt of their being distinct species. There are two varieties of this sort, one with a purplish fruit, and the other white, but the latter is the most common in England.

The third sort differs from the two former in the shape of the leaves, which are deeply sinuated on their borders. The fruit is oblong and incurved, of a yellowish colour, and larger at the end than in any other part.

The seeds of the fourth sort were sent me from India; this differs greatly from either of the former. The stalks and leaves are armed with very strong thorns, and the leaves are larger, and deeply jagged on their sides. The flowers are larger, and of a deeper blue colour. The fruit is long, taper, and white.

These fruit are eaten by most of the inhabitants of the warm parts of the globe, and are esteemed a delicacy, but are supposed to have a property of provoking lust.

They are propagated by seeds, which must be sown upon a moderate hot-bed in March, and when the plants come up, they must be transplanted into another hot-bed about four inches asunder, observing to water and shade them until they have taken root; after which you must give them a great share of air when the weather is warm, otherwise they will draw up very weak. They must be also frequently watered, without which they will make but very indifferent progress; but when they are grown so strong as to fill the frame (which will be by the middle or end of May,) you must transplant them out into a rich spot of ground, at two feet distance, or in the borders of the pleasure-garden at the same distance from other plants, observing to preserve as much earth to the roots as possible when you take them up, otherwise they are subject to miscarry. You must observe to water them plentifully, and shade them until they have taken root, after which they will require but very little care, more than to keep them clear from weeds, and in very dry weather to give them some water.

About the middle of July the fruit will appear, at which time, if the weather should be very dry, you must often water them, which will cause the fruit to grow very large, and increase their number: toward the latter end of August their fruit will ripen, when you must preserve the seeds of each kind separate; but those for the table should be gathered before they are quite ripe.

These plants are only preserved as curiosities in the English gardens, the fruit being seldom eaten in this country, except by some Italians or Spaniards, who have been accustomed to eat them in their own countries.

MELOPEPO. See Cucurbita.

MELONRY, or MELON GROUND, is an apartment in the kitchen-garden for the propagation of Melons only.

This spot of ground should be open to the south-east sun, but sheltered from the west, north-west, and north-east winds, by walls, pales, or hedges, the latter of these is the best; it should also be upon a dry soil, for nothing is more injurious to these plants than much wet; for in the spring of the year it often proves very wet weather, when, if the soil is very wet, there will be no making the ridges until it is very late. This should also be contrived as near to the dung as possible, which will save a great deal of labour in wheeling the dung; and, if there should be a pond of water near it, which, in very dry weather, will be very useful to water the Melons when it is necessary, though it is not often that water is wanted for this purpose in England.

As to the size of the ground, that must be proportioned to the quantity of ridges intended, which you may easily calculate, by allowing twelve feet breadth for every ridge, and the holes placed at about four feet asunder; but it is the best way to allow room enough where you are not streightened to it.

This ground should be inclosed with a Reed fence, and kept constantly locked up during the time that the Melons are growing, for if they are exposed to every person that walks in the garden (most of whom have a curiosity to handle the Vines, and look after the fruit,) it will be of ill consequence, nothing being more injurious to these plants than frequent tumbling or disturbing their leaves.

The common practice in most gentlemens gardens is, to inclose a spot of ground either with walls or pales, which they constantly appropriate to this purpose; but

but this is by no means a good method, for it rarely happens that these succeed well longer than two years in the same place, unless the soil be removed and fresh brought in, which is very expensive; therefore the best way is, to have a sufficient parcel of Reeds made into pannels, which may be annually moved from place to place, so that you need not continue your ridges longer than one year in the same place; and if you have a piece of ground which is large enough to divide into three or four such places, the fence may be every year removed till the whole has been occupied, after which you may return to the spot where you began, which, by that time, will be as good as fresh earth; and hereby, without much trouble, you may remove them every year, for as one of the sides will remain unremoved every time the fence is carried forward, the labour will not be so great as if it were wholly removed to some distance, and these Reed fences are much preferable to either walls or pales, for this purpose.

MELOTHRIA. Lin. Gen. Plant. 48.

The title of this genus was applied to it by Dr. Linnæus in the Hortus Cliffortianus. By some authors it hath been placed under the genus of Cucumis, and by others under that of Bryonia; but the Doctor has removed this to a distance from either of those genera, on account of its having but three stamina; but Dr. Van Royen has brought it next to the genus of Bryonia again, as the plants have male and hermaphrodite flowers.

The Characters are,

*The empalement of the flower is of one leaf, bell-shaped, and cut slightly at the brim into five parts, and in the hermaphrodite flowers, rests upon the embryo. The male flower is of one leaf, wheel-shaped, having a tube the length of the empalement. In the center of the hermaphrodite flower is situated the pointal, supporting a cylindrical style, attended by three conical stamina, which are inserted in the tube of the flower, and are extended to the same length; the male flowers have three stamina, terminated by blunt styles. The pointal afterward becomes an oval small berry, having three divisions, in which are lodged small flat seeds.*

We have but one Species of this plant, viz.

Melothria (*Pendula.*) Lin. Hort. Cliff. 490. *Small creeping Cucumber.* Cucumis minima fructu ovali nigro lævi. Sloan. Hist. 1. p. 227. *Smallest Cucumber with a smooth, black, oval fruit.*

This plant grows wild in the woods in Carolina, Virginia, and also in many of the islands in America; it creeps upon the ground with slender Vines, having angular leaves, somewhat resembling those of the Melon, but much smaller. These Vines strike out roots at every joint, which fasten themselves into the ground, and thereby a larger share of nourishment is drawn to the plants, by which means their stalks extend to a great distance each way, and closely cover the ground. The flowers are very small, in shape like those of the Melon, and of a pale sulphur colour. The fruit, in the West-Indies, grow to the size of a Pea, of an oval figure, and changes black when ripe; these are by the inhabitants sometimes pickled when they are green.

In England the fruit are much smaller, and are so hidden by the leaves, as to render it difficult to find them. The plants will not grow in the open air here, but the seeds must be sown upon a hot-bed, and if the plants are permitted, will soon spread over the surface of a large bed; and when the fruit is ripe, if they scatter their seeds, the plants will come up where the earth happens to be used on a hot-bed again, and if they are supplied with water, will require no farther care. This plant is in some gardens preserved for the sake of variety, but is of no use.

MENISPERMUM. Tourn. Act. R. Par. 1705. Lin. Gen. Plant. 1131. Moonseed.

The Characters are,

*It hath male and female flowers on different plants; the male flowers have empalements composed of two short linear leaves, and have four oval spreading petals without side, and eight oval concave petals within, which are smaller than those without, ranged in four series, and many cylindrical stamina which are longer than the petals, terminated by short obtuse summits having four lobes. The female flowers have the same empalement and corolla as the male, and have eight stamina with pellucid summits, which are fruitful. These have two oval incurved germina, supporting a solitary recurved style, crowned by a bifid stigma; the germen afterward become two roundish kidney-shaped berries of one cell, inclosing a large kidney-shaped seed.*

This genus of plants is ranged in the tenth section of Linnæus's twenty-second class, which includes those plants which have male and female flowers on different plants, and the male flowers have twelve stamina.

The Species are,

1. Menispermum (*Canadense*) foliis peltatis subrotundis angulatis. Hort. Cliff. 140. *Moonseed with target-shaped, roundish, angular leaves.* Menispermum Canadense scandens, umbilicatis foliis. Tourn. Act. Par. 1705. *Climbing Moonseed of Canada, with a navel-shaped leaf.*
2. Menispermum (*Virginicum*) foliis cordatis peltatis lobatis. Flor. Virg. 40. *Moonseed with heart and target-shaped leaves, which have lobes.* Menispermum folio hederaceo. Hort. Elth. 223. tab. 178. *Moonseed with an Ivy leaf.*
3. Menispermum (*Carinianum*) foliis cordatis subtus villosis. Lin. Sp. Plant. 340. *Moonseed with heart-shaped leaves, which are hairy on their under side.*

The first sort grows naturally in Canada, and most parts of North America, in the woods; this hath a thick ligneous root, from which are sent out many climbing stalks, which become ligneous, and rise to the height of twelve or fourteen feet, twisting themselves about the neighbouring plants for support; these are garnished with large, smooth, roundish leaves, whose foot-stalks are placed almost in the middle of the back of the leaves; on the upper side there is a hollow in that part of the leaf resembling a navel. The flowers come out in loose bunches from the side of the stalks; they are of an herbaceous colour, small, and composed of two tiers of oblong oval petals, very short stamina, with ten in the male flowers, terminated by single summits; the two germen situated in the center of the female flowers turn to so many channelled berries, each containing one kidney-shaped seed. It flowers in July, and the seeds ripen in autumn.

This sort may be easily propagated by laying down of the branches, which, if performed in autumn, will have made good roots by the following autumn, when they may be separated from the old plant, and transplanted where they are designed to remain; these plants require support, for their branches are slender and weak. In the country where it grows naturally, they climb up the trees to a considerable height, so that if these are planted near trees in wilderness quarters, where their stalks may have support, they will thrive better than in an open situation.

The second sort differs from the first in the shape of its leaves, which are angular, and sometimes heart-shaped; their foot-stalks join to the base of the leaves, so they have no umbilical mark on their surface. The stalks of this become ligneous, and rise nearly as high as those of the first sort, and the flowers and berries do not differ from them. It is also propagated after the same manner.

The third sort grows naturally in Carolina, from whence the seeds were sent to England; this has by some been supposed the same with the second sort, from which it differs in its branches, not becoming woody as those do. The stalks are herbaceous; the leaves are entire and hairy, and are not more than half so large as those of the second, nor is the plant so hardy, for in severe winters, those which are exposed to the open air are sometimes killed, whereas the second sort is never injured by cold. This sort does not produce any flowers in England, unless the season proves very warm.

This may be propagated by parting of the roots, which spread out on the side, so that part of them may be cut off every other year; the best time for doing this is in the spring, a little before the plants begin to shoot; these should be planted in a warm situation and have a light soil, for in strong land, where the wet is detained in winter, the roots are apt to rot; therefore if they are planted close to a wall exposed to the south or west, their stalks may be fastened against the wall, to prevent their trailing upon the ground; and in this situation the plants will frequently flower, and by having a little shelter in severe frost, their stalks may be preserved from injury.

There is little beauty in these plants, but yet they are preserved in many gardens for the sake of variety, for which reason they are here inserted.

MENTHA. Tourn. Inst. R. H. 188. tab. 89. Lin. Gen. Plant. 633. [Μίνθη, according to the ancients, a goddess, as also according to the poets. The ancients also gave it the name of Sweet-smelling, and where this word is found, this plant is understood. Mentha is likewise so called of Mens, *Lat.* the mind, because this plant is said to strengthen the mind.] Mint; in French, *Menthe.*

The Characters are,

*It hath a lip flower of one petal, sitting on a permanent tubulous empalement of one leaf, which is erect, and cut at the brim into five equal segments. The tube of the petal is a little longer than the empalement. The chaps are cut into four almost equal segments, the upper being a little larger and indented. It hath four awl-shaped stamina, which are erect, standing asunder, the two nearest being longest; they are terminated by roundish summits, and in the bottom of the tube is situated a four-pointed germen, supporting a slender erect style, crowned by a bifid spreading stigma. The germen afterward turns to four naked seeds sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and the seeds ripen in the empalement.

The Species are,

1. Mentha (*Viridis*) floribus spicatis, foliis oblongis serratis. Hort. Upsal. 168. *Mint with spiked flowers, and oblong sawed leaves.* Mentha angustifolia spicata. C. B. P. 227. *Narrow-leaved spiked Mint, commonly called Spear Mint.*

2. Mentha (*Glabra*) floribus spicatis, foliis longioribus glabris, supernè minimè serratis. *Mint with spiked flowers, and longer smooth leaves, which are very slightly sawed toward their points.* Mentha angustifolia spicata glabra. Rand. *Narrow-leaved, smooth, spiked Mint.*

3. Mentha (*Candicans*) foliis lanceolatis serratis, subtus incanis, floribus spicatis hirsutissimis. *Mint with spear-shaped sawed leaves, which are hoary on their under side, and very hairy spiked flowers.* Mentha Sylvestris candicans, odore sativi. Doody. Raii Syn. App. *Wild Mint of a white colour, smelling like that of the garden.*

4. Mentha (*Sylvestris*) spicis confertis, foliis serratis tomentosis sessilibus. Hort. Cliff. 306. *Mint with spikes of flowers growing in clusters, and woolly sawed leaves sitting close to the stalks.* Mentha sylvestris longiore folio. C. B. P. 227. *Wild Mint with a longer leaf.*

5. Mentha (*Aquatica*) spicis crassioribus, foliis ovato-lanceolatis serratis subtus tomentosis petiolatis. *Mint with thicker spikes, and oval, spear-shaped, sawed leaves, which are woolly on their under side, and have foot-stalks.* Mentastri aquatici genus hirsutum, spicâ latiore. J. B. 3. 222. *Hairy Water Mint with a broader spike.*

6. Mentha (*Piperita*) spicis crassioribus interruptis, foliis lanceolatis acutè serratis. *Mint with thicker spikes of flowers, which are interrupted, and spear-shaped leaves which are sharply sawed.* Mentha fervida nigricans, piperis sapore. Rand. Hort. Chel. Cat. *Blackish hot Mint with a taste like Pepper, commonly called Pepper Mint.*

7. Mentha (*Crispa*) floribus spicatis, foliis cordatis dentatis undulatis sessilibus. Hort. Cliff. 306. *Mint with spiked flowers, and heart-shaped indented leaves, which are waved, and sit close to the stalks.* Mentha crispa Danica sive Germanica speciosa. Mor. Hist. 3. p. 367. *Danish or German curled Mint.*

8. Mentha (*Rotundifolia*) spicis confertis, foliis ovatis rugosis sessilibus. *Mint with spikes growing together, and oval rough leaves sitting close to the stalk.* Mentastrum folio rugoso rotundiore spontaneum, flore spicato, odore gravi. J. B. 3. 217. *Wild Mint with a rounder rough leaf, and a spiked flower, having a strong scent.*

9. Mentha (*Rubra*) spicis confertis interruptis, foliis oblongo-ovatis acuminatis dentatis sessilibus. *Mint with interrupted spikes of flowers growing together, and oblong, oval, acute-pointed, indented leaves, sitting close to the stalk.* Mentha rotundifolia rubra, aurantii odore. Mor. Hist. 3. 369. *Round-leaved red Mint, smelling like an Orange, commonly called Orange Mint.*

10. Mentha (*Chalepensa*) foliis oblongis dentatis, utrinque tomentosis sessilibus, spicis tenuioribus. *Mint with oblong indented leaves, which are woolly on both sides, set close to the stalk, and very narrow spikes of flowers.* Mentrastum chalepense, angustifolium, rarò florens. Boerh. Ind. alt. 1. p. 185. *Narrow-leaved wild Mint of Aleppo, which rarely flowers.*

11. Mentha (*Palustris*) floribus capitatis, foliis ovatis serratis petiolatis, staminibus corollâ longioribus. Hort. Cliff. 306. *Mint with flowers growing in heads, oval sawed leaves having foot-stalks, and stamina longer than the petals.* Mentha rotundifolia palustris sive aquatica major. C. B. P. 227. *Greater round-leaved Water Mint.*

12. Mentha (*Nigricans*) floribus capitatis, foliis lanceolatis serratis subpetiolatis. Lin. Sp. Plant. 576. *Mint with flowers growing in heads, and spear-shaped sawed leaves with very short foot-stalks.* Mentha fervida nigricans latifolia. Rand. *Broad-leaved blackish Pepper Mint.*

13. Mentha (*Arvensis*) floribus verticillatis, foliis ovatis acutis serratis, staminibus corollâ brevioribus. Lin. Sp. Plant. 577. *Mint with flowers growing in whorls, oval, acute, sawed leaves, and stamina shorter than the petals.* Mentha arvensis, verticillata hirsuta. J. B. 3. 2. 217. *Whorled hairy field Mint, or Calamint of the shops.*

14. Mentha (*Exigua*) floribus verticillatis, foliis ovatis dentatis, staminibus corollâ longioribus. *Mint with flowers growing in whorls, oval indented leaves, and stamina longer than the petals.* Mentha aquatica, exigua. Trag. Lib. 1. c. 6. *Smallest Water Mint.*

15. Mentha (*Gentilis*) floribus verticillatis, foliis ovatis, marginibus ciliatis, staminibus corollam æquantibus. *Mint with whorled flowers, oval leaves whose borders are hairy, and stamina equalling the petals.* Mentha verticillata, rotundiore folio, odore ocymi. Dale. *Whorled Mint with a rounder leaf, smelling like Basil.*

16. Mentha (*Hirsuta*) floribus verticillatis, foliis ovatis serratis hirsutis, staminibus corollâ longioribus. *Mint with whorled flowers, oval, sawed, hairy leaves, and stamina longer than the petals.* Mentha aquatica sive sisymbrium hirsutus. J. B. 3. 2. 224. *Water Mint, or hairy Sisymbrium.*

17. Mentha (*Verticillata*) floribus verticillatis, foliis lanceolatis acutis serratis, rugosis, staminibus corollam æquantibus. *Mint with whorled flowers, spear-shaped, acute-pointed, sawed, rough leaves, and stamina equalling the petals.* Mentha verticillata, longiori acuminato folio, odore aromatico. Rand. Hort. Chel. Cat. *Whorled Mint with a longer acute-pointed leaf, and an aromatic scent.*

There are several other varieties of this genus, which have been found growing naturally in England, of which I have twelve or more in my own collection; but as I suspect some of them to be only accidental variations, arising from the different soils and situations where they have been found, I have not enumerated them all here; those which are here mentioned, I take to be distinct species, having cultivated them more than thirty

thirty years, in which time I have not observed them to change from one to another; several of these I have propagated by seeds, and have found them keep to the kind from which the seeds were saved.

The first sort is what the gardeners cultivate to supply the markets, and is used both as a culinary herb, and for medicine; it is generally called Spear Mint, and by some Hart Mint; Parkinson and Gerard title it Roman Mint; this is a plant so well known, as to need no description. There are two varieties of this, one with a curled leaf, and the other has variegated leaves, but both these I have had run from the common sort; these are by some preserved in their gardens for the sake of variety, therefore I have mentioned them here.

This herb is greatly esteemed for all disorders of the stomach, loss of appetite, and vomiting; there is a simple water, a spirit, and compound syrup, and a distilled oil of it prepared in the shops.

The second sort hath smoother leaves than the first, and they are rather narrower, in other respects it agrees with that, so that it is frequently cultivated in the gardens for use, without distinction.

The third sort grows naturally in England; the leaves of this are shorter, and broader in the middle than either of the former, the serratures on their edges are more acute, and their under sides are woolly, and very white. The stalks divide more toward the top, so are terminated by a greater number of spikes, the lower part of which are interrupted. The scent of this sort is very like that of the Garden Mint.

The fourth sort hath longer and broader leaves than either of the former, which are woolly and white. The serratures on their edges are farther asunder, and are very sharp pointed; they sit close to the stalks, which are hairy. The spikes of flowers are slender, several of them growing together at the top of the stalk, which are hairy. This is the Mentastrum, or wild Mint of the shops, and is an ingredient in the Trochisci de Myrrha.

The fifth sort grows naturally in moist places in several parts of England, it is titled Spiked Horse Mint, or Water Mint. The stalks of this are shorter than those of either of the former, and are hairy, as are also the leaves, which are oval, spear-shaped, sawed on their edges, and of a pale colour. The flowers grow in short thick spikes at the top of the stalks, their stamina being shorter than the petal.

The sixth sort is found growing naturally in some parts of England; I have found it by the side of the river between Mitcham and Croydon, in Surry; this hath smooth purple stalks; the leaves are smaller than those of common Mint; they are spear-shaped, sawed on their edges, and of a darker green colour than either of the former; their midrib and veins are purple, and a little hairy on their under side. The spikes of flowers are shorter and thicker than those of the common Mint, and are broken or interrupted at the bottom; they are of a dark purple colour, and their stamina are longer than the petal. The whole plant has a hot biting taste like Pepper, and a pleasant scent. There is a distilled water of this plant kept in the shops, which is by most people preferred to that of the common Mint, for all the purposes which that is usually prescribed, and is esteemed an excellent remedy against the stone and gravel.

The seventh sort was originally brought from Denmark, where it was thought to grow naturally, but Dr. Linnæus fixes it as a native of Siberia. The stalks of this sort are hairy, and rise about the same height with the common. The leaves are heart-shaped, deeply indented on their edges, waved and curled, and sit close to the stalk, they are of a light green. The flowers are purple, growing in thick interrupted spikes at the top of the stalks; their empalements are cut almost to the bottom, and the style of the flower is bifid, standing out beyond the petal.

The eighth sort grows naturally in many parts of England; this rises with a strong, four-cornered, hairy stalk, about the same height as the common Mint, branching out toward the top, and garnished with oval rough leaves sitting close to the stalks; they are of a dark green, and crenated on their edges. The spikes of flowers grow in clusters at the top of the stalks, which are short and close; the flowers are of an herbaceous white colour, and their stamina are stretched out beyond the petal.

The ninth sort is commonly called Orange Mint, from its scent, which is somewhat like that of the rind of Orange. This rises with an upright smooth stalk about the same height with the common Mint, but does not branch out like that; the leaves are much broader than those of the common sort; the indentures on their edges are deep, and they end in acute points. The spikes of flowers grow in clusters on the top of the stalks, which are interrupted; they are of a pale colour, and their stamina are shorter than the petal. It is commonly cultivated in gardens for its pleasant scent.

The tenth sort grows naturally at Aleppo, but is hardy enough to thrive in the open air in England. This hath slender four-cornered stalks, which are purple at bottom, but woolly upward, seldom branching; they are garnished with oblong indented leaves, which are downy on both sides, sitting close to the stalks. The spikes of flowers are single, and very slender; these do not often appear in England, but when they do it is late in the summer. It creeps much at the root, so the only way to obtain flowers, is to confine their roots in pots.

The eleventh sort grows naturally in ditches in most parts of England, and is commonly known by the name of Water Mint. This hath hairy stalks about a foot high, which branch toward the top, and are garnished with oval sawed leaves, standing upon pretty long foot-stalks. The flowers grow in roundish spikes at the end of the branches; they are of a purple colour, and their stamina are longer than the petal. The whole plant has a very strong scent, somewhat like that of Penny Royal. This sort is sometimes used in medicine, and is reckoned hotter than the Garden Mint: it is carminative, expelling wind out of the stomach, and helping the cholick.

The twelfth sort grows naturally in ditches in several parts of England; the stalks of this are purple, smooth, and short, branching out on every side; the leaves are small, spear-shaped, of a dark colour; they are but slightly sawed on their edges, and stand upon short foot-stalks. The flowers grow in roundish heads on the top of the stalks, they are purple, and their stamina are longer than the petal. This sort has a warm biting taste, but not quite so hot as the Pepper Mint before described, but is often used for it. There is a variety of this which smells like Penny Royal.

The thirteenth sort grows naturally in arable land in most parts of England, and is rarely admitted into gardens. This is the Water Calamint of the shops, but is now seldom used in medicine. The stalks of this sort rise about a foot high and are hairy, garnished with oval leaves ending in acute points, and sawed on their edges. The flowers grow in very thick whorls round the stalks; they are small, of a purple colour, and their stamina are shorter than the petal. The plant has a strong scent like Penny Royal.

The fourteenth sort grows in watery places in many parts of England; this hath weak trailing stalks a foot and a half long, garnished with small oval leaves which are indented on their edges, and stand upon pretty long foot-stalks. The flowers grow in thick whorls round the stalks, they are purple, and their stamina are longer than the petal.

The fifteenth sort grows plentifully on the side of the road between Bocking and Gosfield in Essex; the stalks of this are much smaller, and not so long as those of the former; the leaves are shorter and rounder, and

are very little indented on their edges, but have their borders set with hairs. The whorls of flowers are smaller, and the whole plant has the scent of Basil.

The sixteenth sort grows naturally in ditches and on the sides of rivers, in many parts of England. This hath hairy four-cornered stalks, which are a foot or more in height; the leaves are oval, sawed, and very hairy. The flowers grow in large whorls toward the top of the stalks; they are purple, and their stamina are longer than the petals. This hath a pleasanter scent than the common Water Mint, so is called Sweet Water Mint by way of distinction: it stands in the list of simples in most dispensaries, but is now seldom used in medicine.

The seventeenth grows naturally by the side of the river Medway, between Rochester and Chatham. This rises with slender hairy stalks near two feet high, garnished with spear-shaped leaves, ending in acute points, which are sawed on their edges; the stalks are beset with whorls of flowers almost their whole length, so that they have frequently ten or twelve whorls on each. The flowers are purplish, and their stamina are equal with the petals; this hath a very pleasant aromatic scent.

All the sorts of Mint are easily propagated by parting the roots in the spring, or by planting cuttings during any of the summer months, but they should have a moist soil; and after the cuttings are planted, if the season should prove dry, they must be often watered until they have taken root; after which, they will require no farther care but to keep them clear from weeds: they should be planted in beds about four feet wide, allowing a path about two feet broad between the beds, to water, weed, and cut the plants. The distance they should be set is four or five inches, or more, because they spread very much at their roots; for which reason, the beds should not stand longer than three years before you plant fresh, for by that time the roots will be matted so closely, as to rot and decay each other, if permitted to stand longer. There are some people who are very fond of Mint sallad in winter and spring; in order to obtain which, they take up the roots before Christmas, and plant them upon a moderate hot-bed pretty close, covering them with fine earth about an inch thick, and cover the bed either with mats or frames of glass. In these beds the Mint will come up in a month's time, and be soon fit to cut for that purpose.

When the herb is cut for medicinal use, it should be done in a very dry season, just when it is in flower; for if it stand longer, it will not be near so handsome, nor so well tasted; and if it be cut when it is wet, it will change black and be little worth; this should be hung up to dry in a shady place, where it may remain until it be used.

If the soil be good in which these plants are set, they will afford three crops every year, but after July they seldom prove good; therefore what shoots are produced after that time should be permitted to remain till Michaelmas, when they must be cut down close; and after having cleared the beds from weeds, you should spread a little fine rich earth all over them, which will greatly encourage the roots against the succeeding spring.

As the distilled water of all the sorts of Mint is esteemed a very wholesome cordial dram, so I should think it might be substituted instead of those vile spirits with which the common people intoxicate themselves; for the Pepper Mint water is as warm on the stomach as any sort of dram, and more so than any of those noxious spirits; and if this was mixed with some other agreeable aromatic herbs, there might certainly be a distilled liquor much more palatable and wholesome than what is now vended in common; for as the generality of the lower class of people are so debauched, as not to be contented without drams, so the less hurtful those are made, the better it will be for the public; and by introducing the distilling of herbs, there will be less occasion for using of Wheat.

MENTHA CATARIA. See Nepeta.

MENTZELIA. Plum. Nov. Gen. Plant. 40. tab. 6. Lin. Gen. Plant. 595.

The name was given to this plant by Father Plumier, who discovered it in the French settlements in America, in honour of Dr. Mentzelius, who was physician to the Elector of Brandenburgh, and who published an Index of plants in Latin, Greek, and High Dutch.

The Characters are,

*The flower hath a spreading empalement cut into five parts, which sits upon a long cylindrical germen. It hath five petals which spread open, and are a little longer than the empalement, and many erect bristly stamina, terminated by single summits. From the long cylindrical germen which is situated under the flower, arises a bristly style the length of the petals, crowned by a single stigma. The germen afterward turns to a cylindrical long capsule with one cell, containing many small seeds.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, which includes those plants whose flowers have many stamina and one style.

We know but one Species of this genus, viz.

Mentzelia (*Aspera.*) Hort. Cliff. 492. Plumier titles it Mentzelia foliis & fructibus asperis. Nov. Gen. Plant. 41. *Mentzelia with prickly leaves and fruit.*

This plant grows plentifully at La Vera Cruz, from whence the seeds were sent to England by the late Dr. William Houstoun, which have succeeded in the physic garden at Chelsea.

This plant is annual; it rises with a slender smooth stalk, which is stiff, and becomes a little woody, rising more than three feet high, branching out alternately at distances; the branches are distorted, and run into one another; these are garnished with leaves shaped like the point of an halbert, standing alternately on the branches, upon short foot-stalks; they are covered with short hooded prickles, which fasten themselves into the clothes of those who rub against them; and those parts of the branches easily separate from the plants, and adhere to the clothes in like manner as the seeds of Clivers. The flowers come out singly from the joints of the stalk, resting upon a cylindrical germen, which is near an inch in length, narrow at the base, but widens upward to the top. Upon the top of it comes out the empalement, which is spread open after the same manner as those of the Onagra; then the petals of the flower spread open upon the empalement; they are of a pale yellow colour, and longer than the empalement. In the middle arises a great number of stamina which are erect, and are terminated by single summits; from the germen arises a single style, which is as long as the petals, crowned by a single stigma. The germen afterward turns to a long cylindrical capsule, armed with the like prickles as the leaves, which also fasten themselves to the clothes of those who rub against them; these have but one cell, which is filled with small seeds.

As this is an annual plant, which perishes soon after the seeds are ripe, therefore the seeds must be sown on a hot-bed early in the spring, that the plants may be brought forward early in the season, otherwise they will not produce ripe seed in this country. When the plants are come up about an inch high, they should be each transplanted into a separate halfpenny pot filled with light rich earth, and plunged into a hot-bed of tanners bark, being careful to shade them from the sun until they have taken new root; after which time they must be constantly watered every other day in warm weather, and should have fresh air every day admitted to them, in proportion to the warmth of the season, and the heat of the bed in which they are plunged. In about six weeks or two months after transplanting, if the plants have made a good progress, they will have filled the pots with their roots, when they should be shifted into larger pots, which must be filled with light rich earth, and then plunged into the bark-bed in the stove, that they may have room

room to grow in height, obferving, as before, to water them duly, as alfo to admit frefh air to them every day in warm weather: with this management the plants will rife to the height of three feet, and will produce ripe feeds the latter end of Auguft or the beginning of September.

MENYANTHES, is the Trifolium Paluftre, or Bog Bean.

This plant is common upon boggy places in divers parts of England, but is never cultivated in gardens; for which reafon I fhall not trouble the reader with any farther account of it, except the taking notice, that this plant is at prefent in great efteem, being thought an excellent remedy for the rheumatifm, gout, and many other diforders. It is frequently called Bog Bean, or Marfh Trefoil, in the markets, and grows plentifully on bogs in many parts of England, where it is gathered and brought to fupply the markets.

MERCURIALIS. Tourn. Inft. R. H. 534. tab. 308. Lin. Gen. Plant. 998. [This plant takes its name from Mercury, becaufe the ancients had a notion, that the God Mercury brought this plant into ufe.] Mercury; in French, *Mercuriale*.

The Characters are,

*It is male and female in different plants; the male flowers have a fpreading empalement, which is cut into three concave fegments; thefe have no petals, but have nine or twelve erect hairy ftamina, crowned by globular twin fummits. The female flowers have no petals, but have two awl-fhaped acute-pointed nectariums; to each of thefe there is a fingle broad germen, impreffed with a furrow between them; thefe roundifh compreffed germen have a prickly furrow on each fide, and fupport two reflexed prickly ftyles, crowned by acute reflexed ftigmas. The germen afterward turns to a twin capfule fhaped like the fcrotum, having two cells, each containing one roundifh feed.*

This genus of plants is ranged in the eighth fection of Linnæus's twenty-fecond clafs, which includes thofe plants whofe male flowers grow on different plants from the fruit, and have nine ftamina in each.

The Species are,

1. Mercurialis (*Annua*) caule brachiato, foliis glabris. Hort. Cliff. 461. *Mercury with a branching ftalk and fmooth leaves.* Mercurialis fpicata & tefticulata mas & fœmina. C. B. P. 121. *Mercury with fpiked and tefticulated flowers, which are both male and female, called French Mercury.*
2. Mercurialis (*Perennis*) caule fimpliciffimo, foliis fcabris. Hort. Cliff. 461. *Mercury with a fingle ftalk and rough leaves.* Mercurialis montana fpicata & tefticulata. C. B. P. 122. *Mountain Mercury, or Dogs Mercury, with fpiked and tefticulated flowers.*
3. Mercurialis (*Tomentofa*) caule fubfruticofo, foliis tomentofis. Hort. Cliff. 461. *Mercury with a ftalk fomewhat fhrubby, and woolly leaves.* Mercurialis fruticofa incana, fpicata & tefticulata. Tourn. Inft. R. H. 534. *Shrubby hoary Mercury, having fpiked and tefticulated flowers.*

The firft fort is commonly called French Mercury, from whence it might have been brought into England; for although it is now become a weed in gardens and upon dunghills, yet it is feldom found growing at a diftance from habitations. This is an annual plant, with a branching ftalk about a foot high, garnifhed with fpear-fhaped leaves about an inch and a half long, indented on their edges, of a pale or yellowifh green colour. The male plants have fpikes of herbaceous flowers growing on the top of the ftalks, thefe fall foon; but the female plants, which have tefticulated flowers proceeding from the fide of the ftalks, are fucceeded by feeds, which, if permitted to fcatter, will produce plenty of plants of both fexes. The leaves and ftalks of this plant are ufed in medicine, and are reckoned aperitive and mollifying.

The fecond fort grows under hedges and in woods in moft parts of England. This hath a perennial root, which creeps in the ground; the ftalks are fingle and without branches, rifing ten or twelve inches high garnifhed with rough leaves, placed by pairs at each joint; they are of a dark green colour, and indented on their edges; thefe have their male flowers growing in fpikes upon different plants, from thofe which produce feeds.

This hath a poifonous quality, there have been many late inftances of it, where people in the fpring of the year, when there has been a fcarcity of greens, have boiled the leaves of this, and have fuffered greatly by eating them.

The third fort grows naturally in the fouth of France, in Spain, and Italy. This rifes with a fhrubby branching ftalk a foot and a half high, garnifhed with oval leaves placed by pairs, which are covered with a white down on both fides. The male flowers grow in fhort fpikes from the fide of the ftalks, upon different plants from the fruit, which are tefticulated and hoary. If the feeds of thefe are permitted to fcatter, the plants will come up the following fpring; and if the feeds are fown, it fhould be performed in the autumn, for thofe which are fown in the fpring feldom grow the fame year. This plant fhould have a warm fituation and a dry rubbifhy foil, in which it will live three or four years, but in hard froft thefe plants are frequently killed.

MESEMBRYANTHEMUM. Dill. Gen. 9. Hort. Elth. 179. Ficoides. Tourn. Act. R. Par. 1705. Fig Marygold.

The Characters are,

*The flower hath a permanent fpreading empalement of one leaf, which is cut at the top into five acute parts. It hath one petal, which is cut into many linear fegments almoft to the bottom, and ranged in feveral feries, but are joined together at their bafe; within thefe are ranged a great number of hairy ftamina, terminated by incumbent fummits. Under the flower is fituated an obtufe five-cornered germen, fupporting fometimes five, and often ten or more ftyles, which are reflexed, and crowned by fingle ftigmas. The germen afterward becomes a roundifh flefhy fruit, having as many cells as there are ftyles, filled with fmall feeds.*

This genus of plants is ranged in the fourth fection of Linnæus's twelfth clafs, which includes thofe plants whofe flowers have from twenty to thirty ftamina inferted in the empalement, and five ftyles.

The Species are,

1. Mesembryanthemum (*Nodiflorum*) foliis alternis teretiufculis obtufis ciliatis. Hort. Upfal. 129. *Mefembryanthemum with taper, obtufe, hairy leaves, placed alternately.* Ficoides Neapolitana, flore candido. H. L. *Fig Marygold of Naples with a white flower, or Egyptian Kali.*
2. Mesembryanthemum (*Cryftallinum*) foliis alternis ovatis papulofis undulatis. Hort. Cliff. 216. *Mefembryanthemum with oval, obtufe, waved leaves placed alternately.* Ficoides Africana, folio plantaginis undulato, micis argenteis adfperfo. Tourn. Act. R. Par. 1705. *African Fig Marygold, with a waved Plantain leaf, marked with filvery fpots, commonly called the Diamond Ficoides, or Diamond Plant.*
3. Mesembryanthemum (*Geniculiflorum*) foliis femiteretibus papulofis diftinctis floribus feffilibus axillaribus. Lin. Sp. Plant. 481. *Mefembryanthemum with half taper leaves, and flowers fitting clofe to the wings of the ftalks.* Ficoides Capenfe, folio tereti, flore albido. Pet. Gaz. 78. fol. 3. *Fig Marygold of the Cape, with a taper leaf and a whitifh flower.*
4. Mesembryanmthemum (*Noctiflorum*) foliis femicylindraceis, impunctatis diftinctis, floribus pedunculatis calycibus quadrifidis. Lin. Sp. Plant. 481. *Mefembryanthemum with almoft cylindrical leaves, and quadrifid foot-ftalks to the flowers.* Ficoides Africana, erecta, arborefcens, lignofa, flore radiato, primo purpureo, dein argenteo, interdiu claufo, noctu aperto. Boerh. Ind. alt. 1. 290. *Upright, ligneous, tree Fig Marygold of Africa, with a radiated flower, which is at firft purple, afterward filvery, fhut in the day, and open at night.*
5. Mesembryanthemum (*Splendens*) foliis femiteretibus impunctatis recurvis diftinctis congeftis, calycibus

terminalibus

terminalibus digitiformibus. Lin. Sp. 689. *Mesembryanthemum with taper, unspotted, recurved, distinct leaves in clusters, whose empalement is finger-shaped.*

6. Mesembryanthemum (*Umbellatum*) foliis subulatis, scabrido-punctatis connatis apice patulo, caule erecto, corymbo trichotoma. Lin. Sp. Plant. 481. *Mesembryanthemum with awl-shaped leaves which join, having rough spots, an erect stalk, and a corymbus of flowers at the triple division of the stalk.* Ficoides Africana erecta teretifolia, floribus albis umbellatis. Par. Bat. 166. *Upright African Fig Marygold, with a taper leaf, and white flowers growing in umbels.*

7. Mesembryanthemum (*Calamiforme*) acaule foliis subteretibus adscendentibus impunctatis connatis, floribus octagynis. Lin. Sp. Plant. 481. *Mesembryanthemum without a stalk, almost taper leaves which join at their base, and flowers having eight styles.* Ficoides Capensis humilis, cepææ folio, flore stamineo. Brad. Suec. p. 10. fol. 19. *Low Fig Marygold of the Cape, with an Onion leaf, and a stamineous flower.*

8. Mesembryanthemum (*Tripolium*) foliis alternis lanceolatis planis impunctatis caulibus laxis simplicibus calycibus pentagonis. Hort. Cliff. 217. *Mesembryanthemum with plain spear-shaped leaves which are not spotted, a single weak stalk, and a five-cornered empalement.* Ficoides Africana, procumbens, tripolii folio, flore argenteo. Hort. Chelf. *Trailing African Fig Marygold, with a Tripolium leaf and a silvery flower.*

9. Mesembryanthemum (*Bellidiflorum*) acaule, foliis triquetris linearibus impunctatis apice trifariàm dentatis. Hort. Cliff. 218. *Mesembryanthemum without a stalk, having narrow, three-cornered, unspotted leaves, marked with three indentures at their points.* Ficoides Capensis humilis, folio triangulari in summitatem dentato, flore minore purpurascente. Brad. Suec. p. 9. tab. 18. *Dwarf Marygold of the Cape, with a triangular leaf indented at the top, and a smaller purplish flower.*

10. Mesembryanthemum (*Subulatum*) acaule foliis subulatis triquetris dorso supernè serratis. *Mesembryanthemum without a stalk, and awl-shaped three-cornered leaves, whose back part is sawed toward the top.*

11. Mesembryanthemum (*Deltoides*) foliis deltoidibus triquetris dentatis impunctatis distinctis. Hort. Cliff. 218. *Mesebryanthemum with three-cornered indented leaves, which are shaped like the Greek delta, without spots, and distinct.* Ficoides Africana, folio triangulari crasso, brevi, glauco, ad tres margines aculeato. Boerh. Ind. alt. 1. 290. *African Fig Marygold, with a short, thick, gray, triangular leaf, with prickles on the three edges.*

12. Mesembryanthemum (*Caulescens*) caulescens, foliis deltoidibus, lateribus minimè dentatis. *Stalky Mesembryanthemum, with leaves shaped like the Greek delta, whose sides are a little indented.* Ficoides Africana, folio triangulari glauco, brevissimo, crassissimo, margine non spinoso. Boerh. Ind. alt. 1. 290. *African Fig Marygold, with very thick, short, triangular, gray leaves, having no spines on their edges.*

13. Mesembryanthemum (*Barbatum*) foliis subovatis papulosis distinctis apice barbatis. Hort. Cliff. 216. *Mesembryanthemum with almost oval leaves, having distinct bladders bearded at their points.* Ficoides seu ficus aizoides Africana, folio variegato aspero, ad apicem stella spinosa armato. Boerh. Ind. alt. 1. p. 291. *African Fig Marygold, with a rough variegated leaf, whose point is armed with spines in form of a star.*

14. Mesembryanthemum (*Stellatum*) caulibus decumbentibus, foliis teretibus papulosis apice barbatis. *Mesembryanthemum with decumbent stalks and taper bladdered leaves, whose points are bearded like a star.* Ficoides Capensis frutescens, folio tumido, extremitate stellatâ, flore purpureo. Brad. Suec. Dec. 1. tab. 6. *Shrubby Fig Marygold of the Cape, with a star-pointed tumid leaf, and a purple flower.*

15. Mesembryanthemum (*Hispidum*) foliis cylindricis papulosis distinctis, caule hispido. Lin. Sp. Plant. 482. *Mesembryanthemum with a prickly stalk, and deflexed cylindrical leaves with pulpy bladders.* Ficoides Afra, fruticosa, caule lanugine argenteâ ornato, folio tereti, parvo, longo, guttulis argenteis quasi scabro, flore violaceo. Boerh. Ind. alt. 1. 291. *African shrubby Fig Marygold, having stalks adorned with silvery down, and long, small, taper leaves, spotted as it were with silvery drops, and a Violet-coloured flower.*

16. Mesembryanthemum (*Villosum*) caule foliisque pubescentibus. Hort. Cliff. 217. *Mesembryanthemum whose stalks and leaves are garnished with downy hairs.*

17. Mesembryanthemum (*Scabrum*) foliis subulatis distinctis subtus undique muricatis, calycibus muticis. Hort. Cliff. 219. *Mesembryanthemum with awl-shaped leaves, which are distinct, every where rough on their under side, and chaffy empalements.* Ficoides Afra, folio triangulari viridi longo aspero, flore violaceo. Boerh. Ind. alt. 290. *African Fig Marygold, with a long, green, rough, triangular leaf, and a Violet-coloured flower.*

18. Mesembryanthemum (*Uncinatum*) articulis caulinis terminatis in folia connata acuminata subtus dentata. Hort. Cliff. 218. *Mesembryanthemum whose joints of the stalks are terminated by acute-pointed leaves, which are joined at their base, and indented on their under side.* Ficoides Afra, folio triangulari glauco, perfoliato, brevissimo, apice spinoso. Boerh. Ind. alt. 290. *African Fig Marygold, with a short, perfoliated, triangular leaf, whose point is prickly, commonly called Buckshorn Ficoides.*

19. Mesembryanthemum (*Perfoliatum*) perfoliatum, foliis majoribus, apicibus triacanthis. Hort. Elth. 251. *Perfoliate Mesembryanthemum with larger leaves, whose points have three thorns.* Ficoides Africana frutescens perfoliata, folio triangulari glauco punctato, cortice lignoso candido tenui. Tourn. Act. Par. 1705. *Shrubby, perfoliate, African, Fig Marygold, with a triangular, gray, spotted leaf, and a thin, white, ligneous bark, commonly called Stagshorn Ficoides.*

20. Mesembryanthemum (*Spinosum*) foliis tereti-triquetris punctatis distinctis spinis ramosis. Hort. Cliff. 216. *Mesembryanthemum with taper three-cornered leaves, which have distinct spots and branching spines.* Ficoides Africana, aculeis longissimis & foliolis nascentibus ex foliorum alis. Tourn. Act. R. Par. 1705. *African Fig Marygold with long spines, and smaller leaves arising from the wings of the leaves.*

21. Mesembryanthemum (*Tuberosum*) foliis subulatis pappilosis, distinctis apice patulis radice capitatâ. Hort. Cliff. 216. *Mesembryanthemum with awl-shaped pimply leaves, and a headed root.* Ficoides Africana, folio triangulari recurvo, floribus umbellatis obsoleti coloris, externè purpureis. Tourn. Act. Par. 1705. *African Fig Marygold with a triangular recurved leaf, and umbellated flowers of a dark colour, which are purple on their outside.*

22. Mesembryanthemum (*Tenuifolium*) foliis subulatis semiteretibus glabris, distinctis internodio longioribus. Hort. Cliff. 216. *Mesembryanthemum with awl-shaped, half-taper, smooth, distinct leaves, whose joints are farther distant.* Ficoides Capensis humilis, teretifolia, flore coccineo. Brad. Suec. p. 13. *Low Fig Marygold of the Cape, with a taper leaf and a scarlet flower.*

23. Mesembryanthemum (*Stipulaceum*) foliis subtriquetris compressis incurvatis punctatis distinctis congestis basi marginatis. Lin. Sp. 693. *Mesembryanthemum with three-cornered, compressed, incurved leaves, having distinct spots, whose base are bordered and clustered.* Mesembryanthemum frutescens, flore purpureo rariore. Hort. Elth. tab. 209.

24. Mesembryanthemum (*Crassifolium*) foliis semicylindricis impunctatis connatis, apice triquetris caule repente semicylindricis. Hort. Cliff. 217. *Mesembryanthemum with a creeping cylindrical stalk, cylindrical smooth leaves, joining at their base, whose points are three-cornered.* Ficoides Africana reptans, folio triangulari, flore saturatè purpureo. Brad. Suec. p. 16. tab. 38. *Creeping African Fig Marygold with a green triangular leaf, and deep purple-coloured flower.*

25. Mesembryanthemum (*Falcatum*) foliis sub-acinaciformibus incurvis punctatis distinctis ramis teretibus. Hort. Cliff. 219. *Mesembryanthemum with distinct, smooth, falchion-shaped leaves, and taper branches.* Ficoides Afra folio triangulari ensiformi brevissimo, flore

flore dilutè purpurascente filamentoso. Brad. Suec. Dec. 5. tab. 42. *African Fig Marygold with a triangular, cimeter-shaped, short leaf, and a pale purplish flower.*

26. Mesembryanthemum (*Glomeratum*) foliis teretiusculis compressis punctatis, caule paniculato multifloro. Lin. Sp. 694. *Mesembryanthemum with taper, compressed, spotted leaves, and a panicled stalk with many flowers.* Mesembryanthemum falcatum minus, flore carneo minore. Hort. Elth. tab. 213.

27. Mesembryanthemum (*Edule*) foliis æquilateri-triquetris acutis strictis impunctatis connatis carina subserratis, caule ancipiti. Lin. Sp. 695. *Mesembryanthemum with equilateral, acute, unspotted leaves joined at their base, whose keel are sawed.* Ficoides seu ficus aizoides Africana major procumbens, triangulari folio, fructu maximo eduli. H. L. 244. *Greater trailing African Fig Marygold, with a triangular leaf and a large eatable fruit.*

28. Mesembryanthemum (*Bicolorum*) foliis subulatis lævibus punctatis distinctis caule frutescente corollis bicoloribus. Lin. Sp. Plant. 695. *Mesembryanthemum with awl-shaped smooth leaves, which have different spots, a shrubby stalk, and the flower of two colours.* Ficoides Capensis frutescens, folio tereti punctato, petalis luteis. Brad. Suec. 1. p. 8. tab. 7. *Shrubby Fig Marygold of the Cape, with a taper leaf having punctures, and yellow petals.*

29. Mesembryanthemum (*Acinaciforme*) foliis acinaciformibus impunctatis connatis, angulo carinali scabris, petalis lanceolatis. Lin. Sp. 695. *Mesembryanthemum with sharp, three-cornered, unspotted leaves, joined at their base, whose keel are rough, and spear-shaped petals of the flower.* Ficoides Africana folio longo triangulari incurvo, caule purpureo. Tourn. Act. Par. 1705. *African Fig Marygold with a long triangular leaf, which is incurved, and a purple stalk.*

30. Mesembryanthemum (*Loreum*) foliis semicylindricis recurvis congestis basi interiore gibbis connatis, caule pendulo. Lin. Sp. 694. *Mesembryanthemum with cylindrical recurved leaves, whose base are clustered and join, and a pendulous stalk.* Mesembryanthemum loreum. Hort. Elth. tab. 200.

31. Mesembryanthemum (*Serratum*) foliis subulatis triquetris punctatis distinctis angulo carinali retrorsum serratis. Lin. Sp. 696. *Mesembryanthemum with awl-shaped leaves having distinct spots, and the angle of the keel sawed.* Mesembryanthemum serratum flore acetabuliformi luteo. Hort. Elth. tab. 192.

32. Mesembryanthemum (*Tuberculatum*) acaule foliis semicylindricis connatis externè tuberculatis. Hort. Cliff. 219. *Mesembryanthemum without a stalk, and cylindrical leaves which have tubercles on their outsides, and are joined at their base.* Ficoides Afra, folio triangulari, longo, succulento, caulibus rubris. Boerh. Ind. alt. 290. *African Fig Marygold with a long, triangular, succulent leaf, and red stalks.*

33. Mesembryanthemum (*Veruculatum*) foliis triquetro-cylindricis acutis connatis arcuatis impunctatis distinctis. Hort. Cliff. 220. *Mesembryanthemum with three-cornered cylindrical leaves which are connected at their base, bowed and smooth.* Ficoides Afra arborescens, folio tereti glauco, apice purpureo crasso. Boerh. Ind. alt. 291. *African Tree Fig Marygold, with a taper gray leaf, having a thick purple top.*

34. Mesembryanthemum (*Glaucum*) foliis triquetris acutis, punctatis distinctis calycinis foliolis ovato-cordatis. Lin. Sp. 696. *Mesembryanthemum with acute three-cornered leaves marked with punctures, and oval heart-shaped empalements.* Ficoides Afra caule lignoso, erecta, folio triangulari ensiformi scabro, flore luteo magno. Boerh. Ind. alt. 289. *African Fig Marygold with an erect ligneous stalk, a triangular, cimeter-shaped, rough leaf, and a large yellow flower.*

35. Mesembryanthemum (*Corniculatum*) foliis triquetro-semicylindricis scabrido-punctatis, supra basin linea elevatis connatis. Lin. Sp. 697. *Stalky Mesembryanthemum with three-cornered, semicylindrical, rough, spotted leaves, which are connected at their base.* Ficoides Afra triangulari longissimo, marginibus obtusioribus, flore amplo, intus pallidè luteo, extus lineâ rubrâ longâ picto. Boerh. Ind. alt. 289. *African Fig Marygold with a long triangular leaf, obtuser borders, and a large flower of a pale yellow within, and marked with a long red streak on the outside.*

36. Mesembryanthemum (*Expansum*) foliis planiusculis lanceolatis impunctatis patentibus distinctis oppositis alternatisque remotis. Lin. Sp. 697. *Mesembryanthemum with plain, spear-shaped, unspotted leaves, which spread distinctly, and are opposite and alternate at a distance.* Ficoides Africana humifusa, folio triangulari longiore glauco, flore flavescente. Tourn. Acad. R. Par. 1705. *Trailing African Fig Marygold, with a longer, gray, triangular leaf, and a yellowish flower.*

37. Mesembryanthemum (*Micans*) foliis subulatis triquetris punctatis distinctis, caule scabro. Lin. Sp. 696. *Mesembryanthemum with three-cornered awl-shaped leaves, which are distinctly spotted, and a rough stalk.* Mesembryanthemum micans, flore Phœnicio, filamentis atris. Hort. Elth. tab. 215.

38. Mesembryanthemum (*Tortuosum*) foliis planiusculis oblongo-ovatis subpapillosis confertis connatis, calycibus tryphyllis bicornibus. Lin. Sp. 697. *Mesembryanthemum with plain, oblong, oval leaves joining at their base, and a three-leaved empalement with two horns.* Ficoides Capensis procumbens aleæ folio, flore albo medio croceo. Brad. Suec. Dec. 2. p. 7. tab. 16. *Trailing Fig Marygold of the Cape, with an Olive leaf, and a white flower of a Saffron colour in the middle.*

39 Mesembryanthemum (*Ringens*) subacaule, foliis ciliato-dentatis. Lin. Hort. Cliff. 218. *Mesembryanthemum with a short stalk, and leaves having hairy indentures.* Ficoides Capensis humilis, folio triangulari prope sumitatem dentato, flore luteo. Brad. Suec. Dec. 2. p. 8. tab. 17. *Low Fig Marygold of the Cape, with a triangular leaf indented toward the top, and a yellow flower, commonly called Dogs Chap Ficoides.*

40. Mesembryanthemum (*Rostratum*) acaule, foliis semicylindricis connatis externe tuberculatis. Lin. Sp. 696. *Mesembryanthemum without a stalk, having cylindrical leaves joined at their base, and tubercles on the outside.* Ficoides Afra folio triangulari, ensiformi crasso brevi, ad margines laterales multis majoribus spinis aculeato. Martyn. Cent. 30. tab. 30. *African Fig Marygold, with a triangular, cimeter-shaped, short, thick leaf, whose side borders have many large spines, commonly called Cats Chap Ficoides.*

41. Mesembryanthemum (*Dolabriforme*) foliis dolabriformibus punctatis. Hort. Cliff. 219. *Mesembryanthemum with ax-shaped spotted leaves.* Ficoides Capensis humilis foliis cornua cervi referentibus, petalis luteis, noctiflora. Brad. Suec. 1. p. 11. tab. 10. *Low Fig Marygold of the Cape, with leaves like a stag's horn, yellow petals, and a flower opening at night.*

42. Mesembryanthemum (*Difforme*) foliis difformibus punctatis connatis. Prod. Leyd. 287. *Mesembryanthemum with deformed leaves.* Ficoides Afra foliis latissimis crassimis lucidis, difformibus. Boerh. Ind. alt. 292. *African Fig Marygold, with very broad, thick, shining, deformed leaves.*

43. Mesembryanthemum (*Lucidnm*) acaule foliis linguiformibus lucidis imarginatis. *Mesembryanthemum without a stalk, and tongue-shaped lucid leaves, indented at the top.* Ficoides Afra acaulos, foliis latissimis crassis lucidis conjugatis, flore aureo amplissimo. Tourn. Acad. R. Scien. 1705. *African Fig Marygold without a stalk, broad, thick, shining leaves growing by pairs, and a very large yellow flower.*

44. Mesembryanthemum (*Linguiforme*) acaule foliis linguiformibus altero margine crassioribus impunctatis. Lin. Sp. 699. *Mesembryanthemum without a stalk, very broad tongue-shaped leaves, one edge being thicker than the other, and without spots.* Ficoides Afra acaulos, foliis latissimis crassissimis, lucidis conjugatis, flore aureo amplo, pedunculo brevi. Boerh. Ind. alt. 292. *African Fig Marygold having no stalk, very broad, thick, shining leaves placed by pairs, and a large golden flower with a short foot-stalk.*

45. Mesembryanthemum (*Albidum*) acaule foliis triquetris. *Mesembryanthemum having no stalk, and gray, entire, three-cornered leaves.* Mesembryanthemum foliis robustis albicantibus. Hort. Elth. 243. *Mesembryanthemum with strong whitish leaves.*

46. Mesembryanthemum (*Pugioneforme*) foliis alternis subulatis triquetris longissimis impunctatis. Hort. Cliff. 216. *Mesembryanthemum with alternate, awl-shaped, three-cornered leaves, which are very long, without spots.* Ficoides Capensis, caryophylli folio, flore aureo specioso. Brad. Suec. Dec. 2. p. 5. tab. 14. *Fig Marygold of the Cape, with a Clove Gilliflower leaf, and a beautiful golden-coloured flower.*

These plants are most of them natives of the Cape of Good Hope, from whence their seeds were first brought to Holland, and the plants raised in many of their curious gardens, and have since been communicated to most parts of Europe; these were at first titled Chrysanthemum by the old botanists, but afterward they were titled Ficoides by Herman and Tournefort, from their capsules being shaped like little Figs; afterward they had this title of Mesembryanthemum applied to them, which signifies a flower opening in the middle of the day, which is what most of the species do; there are three or four of them which open in the evening, and are closed all the day; these have been separated from the others by some, and have had the title of Nycterianthemum applied to them, from their flowers being expanded in the night; but as they all agree in the characters which distinguish the genus, they should by no means be separated.

Most of the plants of this genus have beautiful flowers, which appear at different seasons of the year; some of them flower early in the spring, others in summer, some in the autumn; and there are others which flower in winter; and many of them produce their flowers in such quantity, as that when they are expanded, the plants are entirely covered with them; they have all of them thick succulent leaves, but some of the species are much more so than others, and the figures of their leaves vary so much in the several species, that they afford an agreeable variety when they are not in flower.

To describe all the species which are here mentioned, would swell this work too much, and as their titles are short descriptions of the species, I shall not enlarge more on that head, but proceed to their culture.

All the sorts here mentioned are perennial plants except the two first, which are annual. The perennial sorts are easily propagated by cuttings during any of the summer months; such of them as have shrubby stalks and branches, very readily take root when planted in a bed of light soil, and covered either with mats or glasses, but when they are covered with the latter, they must be shaded every day when the sun is warm; these cuttings of the shrubby sorts need not be cut from the plant more than five or six days before they are planted, during which time they should be laid in a dry room, not too much exposed to the sun, that the part which was separated from the old plants may heal over and dry before they are planted, otherwise they are apt to rot; these may be planted at about three inches distance from each other, and the earth pressed close to them, but none of their leaves should be buried in the ground, for as they abound with moisture, so if they are covered with the earth, it will cause them to rot, and that often destroys the cuttings; therefore when the cuttings are taken from the old plants, they should be divested of their lower leaves, so far as may be necessary, to allow a naked stalk of sufficient length for planting.

When the cuttings are planted, it will be necessary to give them a little water, to settle the ground about them, but it shoold be done with caution, for too much wet will spoil them; if these are shaded every day from nine or ten o'clock till three or four, when the sun is warm, it will prevent the ground from drying too fast, so that the cuttings need not be watered oftener than once in a week; but if there should happen some gentle showers of rain, it will be proper to take off their covers, and let them receive it, but they should be screened from hard rains. The cuttings thus managed will have put out good roots in about six weeks, when they should be carefully taken up, and each planted in a separate small pot filled with light sandy earth, and then placed in a shady situation, giving them a little water to settle the earth to their roots; in this place they may remain about ten days or a fortnight, by which time they will have taken good root, and may be removed to a sheltered place, where they may have more sun, in which they may remain till autumn; during the summer months, these may be watered twice, or in very hot weather, three times a week, but it must not be given them in too great plenty; but as the sun declines in autumn, they should not have it oftener than once a week, for if they are often supplied with it, the plants will grow luxuriant; their leaves and branches will be so replete with moisture, that the early frosts in the autumn will destroy them; whereas when they are kept dry, their growth will be stinted; so that they will be hardy enough to resist small frosts, but there must be care taken that they do not shoot their roots through the holes of the pots into the ground, for when they do, the plants will grow very luxuriant; and when the pots are removed, and those roots are torn off, their leaves and branches will shrink, so will not recover it in a long time, if ever; to prevent which, the pots should be removed every fortnight, and where the roots are beginning to come through the pots, they should be cut off. The sorts which grow very freely should be shifted three times in the summer, to pare off their roots, and keep them within compass, and these should never be planted in rich earth for the reasons before given; for if the earth is fresh, there will require no dung or other compost, unless it is strong, in which case sea sand, or lime rubbish, will be a good mixture; the quantity of either must be in proportion to the stiffness of the ground, always being careful to render it so light, as that the wet may easily pass off.

We next proceed to treat of those sorts, whose stalks and leaves are very succulent. The cuttings of these should be taken from the plants ten days or a fortnight before they are planted, that they may have time for their wounded part to heal over and dry; the lower leaves of these should also be stripped off, that their naked stalks may be of a sufficient length for planting. As these are mostly plants of humble growth, so if their stalks are divested of their leaves an inch and a half, it will be sufficient. The cuttings of these sorts require to be covered with glasses, to keep off the wet; they must also have less water than the other, but in other particulars require the same treatment. The roots of these do not spread and extend so much as those of the other, so will not require to be shifted oftener than twice a year at most; they must also be kept in small pots to confine their roots; the earth in which they are planted should be rather light and not rich. During the summer season they must not have too much wet, and in the winter they must have but little water. If these succulent sorts are placed in an open airy glass-case in winter, where they may have free air admitted to them in plenty in mild weather, and screened from the frost, they will thrive much better than when they are more tenderly treated. The other shrubby kinds may be sheltered in winter under a common frame, where, if they are protected from frost and wet, it is all they require; for the hardier these are treated, the greater quantity of flowers they will produce: and some of the sorts are so hardy, as to live abroad when planted close to a good aspected wall, and in a poor dry soil; so that where there is room to dispose them against a wall, and the border is raised with lime rubbish to prevent their rooting deep and growing luxuriant, they may be preserved through the winter with very little shelter, and these will flower much better than those under cover.

The first sort grows naturally in Egypt, where they cut up the plants, and burn them for pot-ash; and this is esteemed as the best sort for making hard sope, and the best sort of glass.

This

This is an annual plant, which does not perfect ſeeds in England; for when it is placed in the ſtove, or kept in the hot-bed, their ſtalks grow long and ſlender, ſo are not productive of flowers; and thoſe which are raiſed in hot-beds, and afterward expoſed in the open air, will flower pretty freely, but do not perfect their ſeeds. As this plant will thrive in South Carolina as well as in its native ſoil, ſo it might turn to the advantage of that colony, and likewiſe become beneficial to the public, if the inhabitants could be prevailed on to cultivate this plant.

The ſecond ſort is annual; this is a native at the Cape of Good Hope. It is propagated for the oddneſs of its leaves and ſtalks, which are cloſely covered over with pellucid pimples full of moiſture, which, when the ſun ſhines on the plants, they reflect the light, and appear like ſmall bubbles of ice; from whence ſome have called it the Ice Plant, and others have named it the Diamond Plant, or Diamond Ficoides.

This ſort is propagated by ſeeds, which muſt be ſown on a hot-bed early in the ſpring; and when the plants come up, they muſt be planted on a freſh hot-bed to bring them forward; after they have taken root in the hot-bed, they ſhould have but little wet, for moiſture will rot them. When they are grown large enough to tranſplant again, they ſhould be each planted into a ſmall pot, filled with light freſh earth, but not rich, and plunged into a hot-bed of tan, obſerving to ſhade them in the heat of the day until they have taken new root; then they ſhould have plenty of freſh air admitted to them every day in warm weather, to prevent their drawing weak. In the latter end of June, ſome of the plants may be inured to bear the open air, and afterward they may be turned out of the pots, and planted into a warm border, where they will thrive, and ſpread their branches to a great diſtance upon the ground; but theſe plants will not be very productive of flowers, therefore ſome of them muſt be continued in the ſmall pots, and may at the ſame time, when the others are planted out, be removed into the ſtove or glaſs-caſe, placing them upon the ſhelves, that the roots may not get out from the bottom of the pots, ſo that they may be confined, which will cauſe them to flower plentifully, and from theſe good ſeeds may every year be obtained.

MESPILUS [Μέσπιλ☉, *Gr.*] Tourn. Inſt. R. H. 641. tab. 410. Lin. Gen. Plant. 549. *The Medlar.*

The CHARACTERS are,

*The empalement of the flower is permanent, of one leaf, cut into five ſpreading concave ſegments. The flower is compoſed of five roundiſh concave petals, which are inſerted in the empalement. The number of ſtamina are different in the ſeveral ſpecies, from ten to twenty or more; theſe are alſo inſerted in the empalement, and are terminated by ſingle ſummits. The germen is ſituated under the flower, and ſupports an uncertain number of ſtyles from three to five, which are crowned by headed ſtigmas. The germen afterward becomes a roundiſh or oval berry, carrying the empalement on its top, and incloſing four or five hard ſeeds.*

This genus of plants is ranged in the fourth ſection of Linnæus's twelfth claſs, which includes the plants whoſe flowers have twenty ſtamina inſerted to the empalement, and five ſtyles.

The SPECIES are,

1. MESPILUS (*Sylveſtris*) inermis, foliis lanceolatis dentatis acuminatis, ſubtus tomentoſis, calycibus acuminatis. *Smooth Medlar, with ſpear-ſhaped, acute-pointed, indented leaves, woolly on their under ſide, and acute-pointed empalements.* Meſpilus folio laurino major, fructu minori, rariori ſubſtantiâ. Hort. Cath. *Greater Medlar with a Bay-tree leaf, and a ſmaller leſs ſubſtantial fruit.*

2. MESPILUS (*Germanica*) inermis foliis lanceolatis integerrimis ſubtus tomentoſis, calycibus acuminatis. Hort. Cliff. 189. *Unarmed Medlar with ſpear-ſhaped entire leaves, which are downy on their under ſide, and acute-pointed empalements.* Meſpilus Germanica, folio laurino, non ſerrato, ſive Meſpilus ſylveſtris. C. B. P. 453. *German Medlar with a Bay-tree leaf which is not ſawed, or wild Medlar.*

3. MESPILUS (*Pyracantha*) ſpinoſa, foliis lanceolato-ovatis crenatis, calycibus fructûs obtuſis. Hort. Cliff. 189. *Prickly Medlar, with ſpear-ſhaped, oval, crenated leaves, and obtuſe empalements to the fruit.* Meſpilus aculeata, amygdali folio. Tourn. Inſt. 642. *Prickly Medlar with an Almond leaf, called Pyracantha.*

4. MESPILUS (*Cordato*) foliis cordata-ovatis acuminatis, acutè ſerratis, ramis ſpinoſis. Fig. Plant. tab. 179. *Medlar with heart-ſhaped, oval, acute-pointed leaves, which are ſharply ſawed, and prickly branches.*

5. MESPILUS (*Amelanchier*) inermis, foliis ovalibus ſerratis, cauliculis hirſutis. Lin. Sp. Plant. 478. *Medlar without thorns, having oval ſawed leaves, and hairy ſtalks.* Meſpilus folio rotundiori, fructu nigro ſubdulci. Tourn. Inſt. 642. *Medlar with a rounder leaf and a black ſweetiſh fruit, commonly called Amelanchier.*

6. MESPILUS (*Canadenſis*) foliis ovato-oblongis glabris ſerratis, caule inermi. Lin. Sp. Plant. 478. *Medlar with oval, oblong, ſmooth, ſawed leaves, and branches without thorns.* Meſpilus inermis, foliis ſubtus glabris obverſè-ovatis. Flor. Virg. 54. *Medlar without thorns, and obverſe oval leaves, which are ſmooth on their under ſide.*

7. MESPILUS (*Cotoneaſter*) foliis ovatis integerrimis. Hort. Cliff. 189. *Medlar with oval entire leaves.* Meſpilus folio ſubrotundo, fructu rubro. Tourn. Inſt. R. H. 642. *Medlar with a roundiſh leaf and a red fruit, commonly called Dwarf Quince.*

8. MESPILUS (*Chamæmeſpilus*) inermis, foliis ovalibus ſerratis glabris, floribus capitatis, bracteis deciduis linearibus. Lin. Sp. Plant. 479. *Medlar without thorns, having ſmooth, oval, ſawed leaves, headed flowers, and linear bracteæ which fall off.* Cotoneaſter folio oblongo ſerrato. C. B. P. 452. *Baſtard Quince with an oblong ſawed leaf.*

9. MESPILUS (*Orientalis*) foliis ovatis craſſis integerrimis, ſubtus tomentoſis, floribus umbellatis axillaribus. *Medlar with oval, thick, entire leaves, which are woolly on their under ſide, and flowers growing in umbels from the wings of the ſtalk.* Chamæceraſus Idæa. Alp. Exot. 5. *Dwarf Cherry of Mount Ida.*

10. MESPILUS (*Arbutifolia*) inermis, foliis lanceolatis crenatis ſubtus tomentoſis. Hort. Cliff. 189. *Virginia Medlar with an Arbutus leaf.* Meſpilus Virginiana, folio arbuti. H. L. 578.

11. MESPILUS (*Virginiana*) inermis, foliis oblongo-ovatis, ſubtus tomentoſis, fructu ovato, pedunculis longiſſimis. *Smooth Virginia Medlar, with oblong oval leaves, downy on their under ſide, and oval fruit on long footſtalks.*

The firſt ſort grows naturally in Sicily, where it becomes a large tree; this riſes with a ſtraiter ſtem, and the branches grow more upright than thoſe of the Dutch Medlar; the leaves are narrower and not ſawed on their edges; the flowers are ſmaller than thoſe of the Dutch Medlar, and the fruit is ſhaped like a Pear.

The ſecond ſort is generally called the Dutch Medlar; this never riſes with an upright ſtalk, but ſends out crooked deformed branches at a ſmall height from the ground; the leaves of this are very large, entire, and downy on their under ſide. The flowers are very large, as are alſo the fruit, which are rounder, and approach nearer to the ſhape of an Apple. This being the largeſt fruit, is now generally cultivated in the gardens; but there is one with ſmaller fruit, which is called the Nottingham Medlar, of a much quicker and more poignant taſte than this; which is, I ſuppoſe, only a variety, ſo I have not enumerated it as a diſtinct ſpecies.

The fifth ſort grows naturally in Auſtria, Italy, and France, particularly near Fontainbleau; this riſes with many ſlender ſtalks about three or four feet high, which put out ſmall ſide branches, covered with a dark purple bark, having no thorns, cloſely garniſhed with oval leaves, about three quarters of an inch long, and half an inch broad, ſlightly ſawed on their edges; the ſmall ſide branches which ſuſtain the flowers,

flowers, are very hairy and woolly, as are alſo the foot-ſtalks, and the under ſide of the leaves, but their upper ſides are ſmooth and green. The flowers come out in bunches at the end of the ſhoots, which have five long narrow petals, and about ten ſtamina in each. The flowers are ſucceeded by ſmall fruit, which, when ripe, are black; the gardeners call this New England Quince; there is one of this kind which grows naturally in North America, but the leaves of that are wedge-ſhaped and not ſawed on the edges, ſo I take it to be a different ſpecies.

The ſixth ſort grows naturally in Canada; this is alſo a low ſhrub, ſeldom riſing more than five feet high, dividing into ſeveral ſmooth branches, covered with a purpliſh bark. The leaves grow upon long ſlender foot-ſtalks; they are one inch and a half long, and an inch broad, ſmooth on both ſides, and a little ſawed on their edges. The flowers come out in ſmall bunches at the end of the branches; they are about the ſize of thoſe of the common Hawthorn, and are ſucceeded by ſmall fruit of a purpliſh colour when ripe.

The ſeventh ſort grows naturally on the Pyrenean mountains, and in other cold parts of Europe; this riſes with a ſmooth ſhrubby ſtalk about four feet high, dividing into a few ſmall branches, which are covered with a purple bark, and garniſhed with oval entire leaves, little more than one inch long, and about three quarters of an inch broad, having very ſhort foot-ſtalks. The flowers come out from the ſide of the ſtalks, two or three together; they are ſmall, of a purpliſh colour, and ſit cloſe to the ſtalks; theſe appear in May, and are ſucceeded by ſmall roundiſh fruit, which are of a bright red colour when ripe.

The eighth ſort grows naturally in the northern parts of Europe; this hath a ſmooth ſtalk, riſing about four or five feet high, ſending out ſlender branches, which are covered with a purpliſh bark, and garniſhed with oval ſmooth leaves about two inches long, and one inch and a half broad, ſawed on their edges, but the teeth point upward; they have pretty long ſlender foot-ſtalks, and are of a yellowiſh green on both ſides. The flowers come out from the wings of the ſtalk, four or five joined together in a cloſe head, of a purpliſh colour; between the flowers come out long narrow bractea, which are purpliſh, and fall off as the flowers begin to decay. The fruit is ſmall, and red when ripe.

The ninth ſort grows naturally upon mount Ida, in Crete, where the poor ſhepherds feed upon the fruit when ripe; this hath a ſmooth ſtalk about eight feet high, dividing into many ſmooth branches, garniſhed with oval leaves two inches and a half long, and near two inches broad, of a thick ſubſtance, and a dark green on their upper ſide, but downy on their under, ſtanding upon ſhort foot-ſtalks. The flowers come out from the ſide of the ſtalk upon ſhort ſmall branches, five or ſix growing upon each in a cloſe bunch; they are of a purple colour, the petals being but little longer than the empalement, which is woolly, and cut into five obtuſe ſegments. The fruit is large, roundiſh, and of a fine red colour when ripe.

The tenth ſort grows naturally in North America, where it rarely riſes more than five feet high, ſending out a few upright branches, garniſhed with ſpear-ſhaped leaves whoſe edges are crenated, and their under ſide downy; the flowers are produced in ſmall bunches on the ſide, and at the extremity of the branches, which are ſucceeded by ſmall roundiſh fruit a little compreſſed, of a purple colour when ripe.

The eleventh ſort is an inhabitant of the ſame country with the former; this riſes ſix or eight feet high, ſending out ſide branches, garniſhed with oblong, oval, entire leaves, downy on their under ſide; the flowers are produced in ſmall bunches, ſtanding on long foot-ſtalks, having each five narrow white petals which are contracted at their baſe, and are ſucceeded by oval fruit of a blue colour when ripe, and are by ſome of the inhabitants of America eaten in a ſcarcity of other ſorts of fruit, but are not very palatable.

All theſe ſorts are hardy enough to thrive in the open air in England, and ſome of them are very ornamental plants for gardens, where, during the ſeaſon of their flowering, they will make a fine appearance; and again, in autumn, when their fruit are ripe, they will afford an agreeable variety, and their fruit will be food for the deer and birds; ſo that if clumps of each ſort are planted in different parts of the garden, nothing can be more ornamental.

The American kinds are uſually propagated in the nurſeries, by grafting or budding them upon the common White Thorn, but the plants ſo propagated will never grow to half the ſize of thoſe which are propagated by ſeeds; ſo that thoſe plants ſhould always be choſen which have not been grafted or budded, but are upon their own roots.

But there are many who object to this method of raiſing the plants from ſeeds, on account of their ſeeds not growing the firſt year, as alſo from the tedioufneſs of the plant's growth after; but where a perſon can furniſh himſelf with the fruit in autumn, and take out their ſeeds ſoon after they are ripe, putting them into the ground immediately, the plants will come up the following ſpring, if they are kept clean from weeds, and in very dry weather ſupplied with water, they will make good progreſs; but if they are planted in the places where they are to remain, after two years growth from ſeeds, they will ſucceed much better than when the plants are of greater age; the ground ſhould be well trenched, and cleanſed from the roots of all bad weeds. The beſt time to tranſplant them is in autumn, when their leaves fall off; theſe ſhould be conſtantly kept clean from weeds, and if the ground between the plants is dug every winter, it will greatly encourage the growth of the plants, ſo that if they are cleaned three or four times in the ſummer, it will be ſufficient.

All the ſorts of Meſpilus and Cratægus will take, by budding or grafting upon each other; they will alſo take upon the Quince, or Pear ſtocks, and both theſe will take upon the Medlars; ſo that theſe have great affinity with each other, and might be with more propriety brought together under the ſame genus, than the Pear and Apple, which will not take upon each other; but although the Pear will take upon the White Thorn, yet it is not adviſeable to make uſe of theſe ſtocks, becauſe they generally cauſe the fruit to be ſmall and often to crack, and renders their fleſh ſtony; ſo unleſs it is the very ſoft melting kinds of Pears which are upon theſe ſtocks, the fruit will not be good.

METHONICA. See Gloriosa.

MEUM. See Athamanta.

MEZEREON. See Thymelæa.

MICROPUS. Lin. Gen. Plant. 892. Gnaphalodes. Tourn. Inſt. R. H. 439. tab. 261. Baſtard Cudweed.

The Characters are,

*It hath hermaphrodite and female flowers, which are included in the ſame double empalement; there are ten hermaphrodite flowers which compoſe the diſk; theſe have one petal, are funnel-ſhaped, erect, and cut into five parts at the top, and have five ſhort briſtly ſtamina, terminated by cylindrical ſummits, with an obſolete germen ſupporting a ſhort ſlender ſtyle, crowned by an obſolete ſtigma. In the ſame empalement are five female flowers in the circumference, which have each an oval germen which is compreſſed, hid under the ſcales of the interior empalement, each having a ſtyle by their ſide, which is briſtly, turning toward the hermaphrodite flowers, crowned by ſlender acute-pointed ſtigmas, divided in two parts. The female flowers have each a ſingle oval ſeed ſucceeding them, included in the ſmall leaves of the empalement, but the hermaphrodite flowers are barren.*

This genus of plants is ranged in the fourth ſection of Linnæus's nineteenth claſs, which includes thoſe plants whoſe flowers are compoſed of female fruitful flowers

flowers in the border, and barren hermaphrodite flowers in the middle.

We have but one SPECIES of this genus in the English gardens, viz.

MICROPUS (*Supinus*) caule prostrato, foliis geminis. Hort. Upsal. 275. Prod. Leyd. 145. *Micropus, or Bastard Gnaphalium, with a trailing stalk.* Gnaphalodes Lusitanica. Tourn. Inst. R. H. 439. *Portugal Bastard Cudweed.*

This is an annual plant, which grows naturally in Portugal, near the sea. The roots send out several trailing stalks about six or eight inches long, garnished with small, oval, silvery leaves, whose base embrace the stalks. The flowers come out from the wings of the stalks in small clusters; they are very small, white, and sit in a double empalement, the interior being so large, as to almost hide the flowers. It flowers in June and July, and the seeds ripen in autumn; this is frequently preserved in gardens for the beauty of its silvery leaves: if the seeds are sown in autumn, or are permitted to scatter, the plants will come up in the spring, and will require no other care but to keep them clean from weeds, and thin them where they are too close. When the seeds of this plant are sown in the spring, they seldom grow the first year.

MICROSCOPE, a dioptrical instrument, by means of which very minute or small objects are represented very large, and capable of being viewed very distinctly, according to the laws of refraction.

This instrument may be of singular use to a curious enquirer into the operation of vegetative nature, by viewing nicely the several minute vessels and parts of vegetables, in order to discover their various uses, and how the business of vegetation is carried on, as also to examine the minute parts of flowers, which are not obvious to the naked eye.

MILDEW is a disease that happens to plants, and is supposed to be caused by a dewy moisture which falls on them, and continuing, for want of the sun's heat to draw it up, and by its acrimony corrodes, gnaws, and spoils the inmost substance of the plant, and hinders the circulation of the nutritive sap, upon which the leaves begin to fade, and the blossoms and fruit are much prejudiced: but Mildew is rather a concrete substance, which exsudes through the pores of the leaves.

However, what the gardeners commonly call Mildew, is an insect, which is frequently found in great plenty, preying upon this exsudation.

Others say, That Mildew is a thick clammy vapour, exhaled in the spring and summer from plants, blossoms, and even the earth itself, in close still weather, where there is neither sun enough to draw it upwards to any considerable height, nor wind of force strong enough to disperse it, and that, hanging in the lower regions, when the cold of the evening comes on, it condenses, and falls on plants, and with its thick clammy substance stops the pores, and by that means prevents perspiration, and hinders the sap from ascending to nourish the flowers, shoots, &c.

Some say, That Mildew is a corrosive or nipping dew, proceeding from the vapours that are exhaled by the earth, which, being drawn up, and falling down again on the tender opening buds, infects them by its acrimony, and hinders the circulation of the nutritious sap in the proper vessels, upon which the leaves begin to fade, and the blossoms and fruit receive a very great prejudice.

There are others who make this observation, That the places most liable to Mildew are inclosed grounds and valleys, especially those that lie tending to the east; and the reasons that they give why those grounds which lie from the horizon to the east, are most subject to Mildew and blastings, may be by the sun's attracting those vapours towards it, after the manner that a great fire in a room draws the air to it; so the sun having set these in motion, and not having strength enough to draw them into the middle region, to form them into a cloud, he does yet draw them till he be below the horizon, and then these dews tend to the earth, from whence they were exhaled, and in motion to the west, do, as it were, fall upon the ground which lies eastward at right angles, and therefore is most offensive to them.

But I take the true cause of the Mildew appearing most upon plants which are exposed to the east, to proceed from a dry temperature in the air when the wind blows from that point, which stops the pores of plants, and prevents their perspiration, whereby the juices of the plants are concreted upon the surface of their leaves, which being of a sweetish nature, insects are incited thereto, where, finding proper nutriment, they deposit their eggs, and multiply so fast as to cover the whole surface of plants, and by their corroding the vessels, prevent the motions of their sap; and it is very probable, that the excrements of these insects may enter the vessels of plants, and by mixing with their juices, may spread the infection all over them; for it is observable, whenever a tree has been greatly affected by this Mildew, it seldom recovers it in two or three years, and many times is never entirely clear from it after.

Others suppose, That the reason why valleys afford more moisture than hills is, because of the dew which is attracted from the earth and herbs as before, and that they afford more moisture than hills (they say) is often seen by the mists, which are more frequent on them than on hills; this being drawn by the sun in the day time, and wanting wind to assist its motion, hangs in the lower region, and when the sun sets, it falls upon the plants with its thick clammy substance, and hinders the sap of the plant or tree from ascending to nourish its flowers or shoots, in those whose bark is tender and young, and the pores open with the heat of the season.

This dew has been observed in the great leaved Cherries, such as the Black Heart, the White Heart, &c. to fall upon them at the top, just at the beginning of the Midsummer shoot, which has so stopped the shoot that it has shot forth in other places below, and on the top of these shoots there have been many small flies feeding on this dew, which may plainly be seen and tasted on the leaves of Oak and Maple.

Some are of opinion, that Mildews and blights are the same thing; but others again, that Mildew is quite another thing than blastings. They say Mildews are caused from the condensation of a fat and moist exhalation in a hot and dry summer, from the blossoms and vegetables, and also from the earth itself, which is condensed into a fat glutinous matter by the coolness and serenity of the air, and falls down on the earth again, part of which rests upon the leaves of the Oak and other trees, whose leaves are smooth, and for that reason do not so easily admit the moisture into them, as the Elm, and other rougher leaves do.

Other parts of Mildew rest upon the ears and stalks of Wheat, bespotting the same with a different colour from what is natural, being of a glutinous substance, by the heat of the sun, and it binds up so close the tender ears of Wheat, that it prevents the growth, and occasions it to be very light in the harvest.

Some are of opinion, that Mildews are the principal food of bees, it being sweet, and easily converted into honey.

MILIUM. Tourn. Inst. R. H. 514. tab. 298. Lin. Gen. Plant. 73. [so called of Mille, *Lat.* a thousand, because of the multitude of its grains.] Millet.

The CHARACTERS are,

*It is of the Corn or Grass tribe, with one flower in each chaff, the chaff opening with two oval acute-pointed valves. The petal of the flower is bivalve, and smaller than the empalement. It hath three very short hairy stamina, terminated by oblong summits, and a roundish germen with two hairy styles, crowned by brush-shaped stigmas. The germen afterward turns to a roundish seed, covered by the petal of the flower.*

This genus of plants is ranged in the second section of Linnæus's third class, which includes those plants whose flowers have three stamina and two styles.

The SPECIES are,

1. MILIUM (*Panicum*) paniculâ laxâ flaccidâ, foliorum vaginis pubescentibus. *Millet with a loose hanging panicle, and the sheaths of the leaves hairy.* Milium semine luteo. C. B. P. 26. *Millet with a yellow seed.* Panicum Miliaceum. Lin. Sp.
2. MILIUM (*Sparsum*) paniculâ sparsâ erectâ, glumis aristatis. *Millet with a loose erect panicle, and bearded chaff.* Milium paniculâ amplâ erectâ sparsâ. Houst. MSS. *Millet with a large, erect, sparsed panicle.*
3. MILIUM (*Effusum*) floribus paniculatis dispersis. Flor. Suec. 55. *Millet with dispersed flowers.* Gramen sylvaticum paniculâ miliaceâ sparsâ. C. B. P. 3. *Wood Grass with a sparsed Millet-like panicle.*
4. MILIUM (*Confertum*) floribus paniculatis confertis. Prod. Leyd. 57. *Millet with panicles of flowers growing in clusters.* Gramen paniculatum Alpinum, latifolium, paniculâ miliaceâ sparsâ. Scheu. Gr. 34. *Broad-leaved, Alpine, Panicle Grass, with a sparsed Millet-like panicle.*

The first sort grows naturally in India, but is now cultivated in many parts of Europe as an esculent grain; this rises with a Reed-like stalk from three to four feet high, and is channelled; at every joint there is one Reed-like leaf, which is joined on the top of the sheath, which embraces and covers that joint of the stalk below the leaf; this sheath is closely covered with soft hairs, but the leaf which is expanded has none; that has several small longitudinal furrows running parallel to the midrib. The top of the stalk is terminated by a large loose panicle, which hangs on one side, having a chaffy flower, which is succeeded by a small round seed, which is often made into puddings, &c. There are two varieties of this, one with white, and the other hath black seeds, but do not differ in any other particular.

This plant is ranged under the title of Panicum, by Linnæus, but as it is more generally known by its former appellation, so I chuse to continue it.

The second sort was discovered growing naturally at La Vera Cruz; this has a slenderer stalk than the former, which rises about three feet high. The sheaths which surround it have no hairs, but are channelled. The leaves are shorter than those of the former. The panicle stands erect, and the chaff has shorter awns, or beards.

The other two sorts grow naturally in woods, and are never cultivated in the fields, so do not require any farther description.

The common Millet was originally brought from the Eastern countries, where it is still greatly cultivated, from whence we are furnished annually with this grain, which is by many persons greatly esteemed for puddings, &c. but is seldom cultivated in England in quantity, but by way of curiosity in small gardens, for feeding of poultry; but the seeds generally ripen very well.

They must be sown the beginning of April, upon a warm dry soil, but not too thick, because these plants divide into several branches, and should have much room; and when they come up, they should be cleared from weeds, after which they will, in a short time, get the better of them, and prevent their future growth. In August these seeds will ripen, when it must be cut down, and beaten out, as is practised for other grain; but when it begins to ripen, if it be not protected from birds, they will soon devour it.

MILLEFOLIUM. See ACHILLEA.

MILLERIA. Houst. Gen. Nov. Martyn. Cent. 4. Lin. Gen. Plant. 881.

The CHARACTERS are,

*This hath a compound flower, composed of several florets, and one half floret, which are included in one common empalement of one leaf, which is cut into three parts, and is permanent. The hermaphrodite florets have one tubulous petal, which is erect, and indented at the brim in five parts; these have five hairy stamina, with erect linear summits connected in their middle, to the side, and are the length of the petal, and an oblong narrow germen, supporting a slender style, crowned by two narrow, obtuse, spreading stigmas; these florets are barren. The female half florets is of one leaf, stretched out on one side like a tongue, and is indented at the top; this hath a large three-cornered genmen, supporting a slender style, crowned by two long bristly stigmas. The germen afterward turns to an oblong, three-cornered, obtuse seed, inclosed in the empalement.*

This genus of plants is ranged in the fourth section of Linnæus's nineteenth class, which includes those plants with compound flowers, whose hermaphrodite flowers are barren, and the female flowers are fruitful.

The SPECIES are,

1. MILLERIA (*Quinqueflora*) foliis cordatis, pedunculis dichotomis. Hort. Cliff. 426. *Milleria with heart-shaped leaves, and forked stalks.* Milleria annua, erecta, major, foliis conjugatis, floribus spicatis luteis. Houst. MSS. *Greater, upright, annual Milleria, with leaves growing by pairs, and yellow spiked flowers.*
2. MILLERIA (*Maculata*) foliis infimis cordato-ovatis acutis rugosis, caulinis lanceolato-ovatis, acuminatis. *Milleria whose lower leaves are oval, heart-shaped, acute-pointed, and rough, and the upper ones oval, spear-shaped, and pointed.* Milleria annua erecta ramosior, foliis maculatis, profundiùs serratis. Martyn. Dec. 5. *Upright, annual, branching Milleria, with spotted leaves deeply sawed.*
3. MILLERIA (*Biflora*) foliis ovatis, pedunculis simplicissimis. Hort. Cliff. 425. *Milleria with oval leaves, and single foot-stalks.* Milleria annua erecta minor, foliis parietariæ, floribus ex foliorum alis. Houst. MSS. *Smaller, upright, annual Milleria, with a Pellitory leaf, and flowers proceeding from the wings of the leaves.*
4. MILLERIA (*Triflora*) foliis ovato-lanceolatis acuminatis trinerviis, pedunculis alaribus trifloris. *Milleria with oval, spear-shaped, acute-pointed leaves, having three veins, and foot-stalks proceeding from the wings of the leaves, with three flowers.* Milleria annua erecta, foliis parietariæ longioribus, floribus ex foliorum alis. Edit. Prior. *Annual erect Milleria, with a longer Pellitory leaf, and flowers proceeding from the wings of the leaves.*

The first sort was discovered by the late Dr. William Houstoun, at Campeachy, in the year 1731, from whence he sent the seeds to Europe; and as the characters which distinguish the genus, were different from all the other genera of the class to which it belongs, so he constituted a new genus with this title. This rises with an herbaceous branching stalk from four to five or six feet high, garnished with heart-shaped leaves about four inches long, and three inches broad toward their base, drawing to a point at the end, which are slightly sawed on their edges, having two veins on each side the midrib, which diverge and join to it near the base, meeting again at the point, which generally is oblique to the foot-stalk. The leaves are of a light green, and hairy, standing opposite; their foot-stalks are about an inch long, and have a part of the leaf running on each side like wings. The stalks divide upward into forks, and the foot-stalks of the flowers come out at the divisions; these branch again by pairs, and terminate in loose spikes of yellow flowers, composed of four or five hermaphrodite florets, which are barren, and one female half floret, which is succeeded by a single, oblong, angular seed, wrapped in the empalement of the flower. It flowers in July and August, and the seeds ripen in autumn.

The second sort was discovered by Mr. Robert Millar, at Campeachy, in the year 1734; this approaches near to the first sort, but the stalks rise six or seven feet high, branching out very wide. The leaves are seven inches long, and four inches and a half broad toward their base, ending in long acute points; they are deeper sawed on their edges, and have several large

large black ſpots ſcattered over them; their ſurface is rougher, and they are of a darker green than thoſe of the firſt. The upper leaves are long and ſpear-ſhaped; the foot-ſtalks of the flowers branch out wider, and the ſpikes of flowers are ſhorter than thoſe of the firſt.

The third ſort was diſcovered at Campeachy by the late Dr. Houſtoun; this is alſo an annual plant, which riſes with an herbaceous ſtalk upward of two feet high, branching out at a ſmall diſtance from the root into three or four ſlender ſtalks, which are naked almoſt to the top, where they have two oval ſpear-ſhaped leaves placed oppoſite, which are about two inches long, and three quarters of an inch broad near their baſe, ending in points; they are hairy, and ſtand upon naked foot-ſtalks near an inch long, and are rough, having three longitudinal veins, and are ſlightly indented on their edges. The flowers come out at the foot-ſtalks of the leaves, in ſmall cluſters; the common empalement is compoſed of three orbicular leaves, which are compreſſed together; in each of theſe are ſituated two hermaphrodite florets, which are barren, and one female half floret, which is fruitful, being ſucceeded by a roundiſh angular ſeed, incloſed in the empalement. This flowers and perfects ſeeds about the ſame time with the former.

The fourth ſort was diſcovered by the late Mr. Robert Millar, at Campeachy; this is an annual plant, which riſes with an upright ſtalk three or four feet high, garniſhed the whole length with oval ſpear-ſhaped leaves near four inches long, and almoſt two broad near their baſe; they have three longitudinal veins, and toward the top there are two more which diverge from the midrib, but join again at the point. The upper ſide of the leaves are of a dark green and ſmooth, their under ſides are of a pale green, and indented on their edges. The flowers grow from the wings of the leaves in ſmall cluſters, having three hermaphrodite and one female flower in each, ſtanding upon ſhort foot-ſtalks; theſe have empalements like the former, but they are much ſmaller. This flowers and ſeeds later in the year than either of the former, ſo that unleſs the plants are brought forward in the ſpring, they will not ripen their ſeeds in England.

The ſeeds of theſe plants ſhould be ſown early in the ſpring, on a moderate hot-bed; and when the plants are come up about two inches high, they ſhould be each tranſplanted into a ſeparate pot filled with light rich earth, and plunged into a moderate hot-bed of tanners bark, being careful to ſhade them from the ſun until they have taken root, as alſo to water them frequently. After the plants are rooted, they ſhould have a large ſhare of free air admitted to them, by raiſing of the glaſſes of the hot-bed every day when the weather is warm, and in hot weather muſt be duly watered, for they are very thirſty plants. With this management, the plants will, in a month after tranſplanting, riſe to a conſiderable height; therefore they ſhould be ſhifted into larger pots, and placed in the ſtove, plunging them into the bark-bed, where they may have room to grow, eſpecially the firſt and ſecond ſorts, which uſually grow high and branch out where they are well managed. But the other ſorts ſeldom riſe above three or four feet high, and do not ſpread their branches very far, ſo theſe may be allowed leſs room.

In the middle of July theſe plants will begin to flower, and the ſeeds will be ripe about a month or ſix weeks after; therefore they muſt be gathered when they begin to change of a dark brown colour, otherwiſe they will ſoon fall off, eſpecially thoſe of the two large kinds, which will drop on the leaſt touch when they are ripe. Theſe plants will continue flowering till Michaelmas, or later, if the ſeaſon proves favourable; but when the cold of the autumn comes on, they will ſoon decay.

MIMOSA. Tourn. Inſt. R. H. 605. tab. 375. Lin. Gen. Plant. 597. The Senſitive Plant.

The CHARACTERS are,

*The empalement of the flower is ſmall, of one leaf, indented in five parts at the top: the flower has one funnel-ſhaped petal, which hath five points. It hath many long hairy ſtamina, terminated by proſtrate ſummits, and an oblong germen ſupporting a ſhort ſlender ſtyle, crowned by a truncated ſtigma. The germen afterward turns to a long jointed pod with ſeveral tranſverſe partitions, incloſing compreſſed ſeeds of various forms, and there are many male, female, and hermaphrodite flowers mixed in ſome of the ſpecies.*

This genus of plants Dr. Linnæus has joined to the Acacia of Tournefort, and the Inga of Plumier, and places it in the firſt ſection of his twenty-third claſs, which includes thoſe plants which have male, female, and hermaphrodite flowers on the ſame plant, which have many ſtamina and one ſtyle.

The SPECIES are,

1. MIMOSA (*Punctata*) inermis, foliis bipinnatis, ſpicis decandris, inferioribus caſtratis corollatis caule erecto tereti. Lin. Sp. 1502. *Senſitive Plant without ſpines, double winged leaves, ſpikes having ten ſtamina, and the lower without ſtamina, and an erect taper ſtalk.* Mimoſa Jamaicenſis. Zan. Hiſt. 144. *Senſitive Plant of Jamaica.*
2. MIMOSA (*Plena*) inermis, foliis bipinnatis, ſpicis pentandris, inferioribus plenis. Hort. Upſal. 145. *Smooth Senſitive Plant with double winged leaves, the ſpikes with five ſtamina, and the under one double.* Mimoſa non ſpinoſa, paluſtris & herbacea, procumbens, flore luteo pleno. Houſt. MSS. *Herbaceous, marſh, trailing Senſitive Plant without ſpines, and a double yellow flower.*
3. MIMOSA (*Pernambucana*) inermis decumbens, foliis bipinnatis, ſpicis cernuis, pentandris, inferioribus caſtratis. Hort. Upſal. 145. *Smooth Senſitive Plant with inclining ſtalks, double winged leaves, nodding ſpikes of flowers having five ſtamina, but the under ones without any.* Mimoſa ſpuria de Pernambuque, dicta mimoſa Italica. Zan. Hiſt. 151. *Spurious Senſitive Plant of Pernambuque, called Italian Senſitive Plant.*
4. MIMOSA (*Pudica*) aculeata, foliis pinnatis. *Prickly Senſitive Plant with winged leaves.* Mimoſa herbacea procumbens, & ſpinoſa, caule tereti & villoſo, filiquis articulatis. Houſt. MSS. *Trailing herbaceous Senſitive Plant having ſpines, with a taper and hairy ſtalk, and jointed pods.*
5. MIMOSA (*Pudica*) foliis ſubdigitatis pinnatis, caule aculeata, hiſpido. Lin. Sp. 1501. *Senſitive Plant with winged-handed leaves, a prickly declining ſtalk, and ſmall pods growing in cluſters, with prickly coverings.* Mimoſa humilis fruteſcens & ſpinoſa, filiquis conglobatis. Plum. Cat. *Low ſhrubby and prickly Senſitive Plant with cluſtered pods, commonly called the Humble Plant.*
6. MIMOSA (*Quadrivalvis*) aculeata, foliis bipinnatis, caule quadrangulo, aculeis recurvis, leguminibus quadrivalvibus. Lin. Sp. Plant. 1508. *Prickly Senſitive Plant with double winged leaves, a four-cornered ſtalk, recurved ſpines, and pods having four valves.* Mimoſa herbacea procumbens, & ſpinoſa, caule quadrangulo, filiquis quadrivalvibus. Houſt. MSS. *Trailing and prickly herbaceous Senſitive Plant, with a quadrangular ſtalk, and pods having four valves.*
7. MIMOSA (*Senſitiva*) foliis conjugatis pinnatis, partialibus bijugis, intimis minimis, caule aculeato. Lin. Sp. Plant. 1501. *Senſitive Plant with conjugated winged leaves, whoſe wings have two pair of lobes, the inner of which are the leaſt, and a prickly ſtalk.* Mimoſa ſpinoſa prima, ſive Braſiliana latifolia, filiquis, radiatis. Breyn. Cent. 1. 31. *The firſt prickly, or broad-leaved Senſitive Plant of the Brazils, with radiated pods.*
8. MIMOSA (*Aſperata*) caule fruticoſo, foliis bipinnatis, aculeatis, aculeis geminis, filiquis radiatis hirſutis. Fig. Plant. tab. 183. fol. 3. *Senſitive Plant with a ſhrubby ſtalk, double winged prickly leaves, whoſe ſpines grow in pairs, and hairy radiated pods.* Æſchynomene ſpinoſa quarta, ſive foliolis Acaciæ anguſtioribus, frondibus validiſſimas ſpinas habentibus. Breyn. Cent. 1. 43. *The fourth prickly Senſitive Plant,*

*Plant, with narrow Acacia leaves, armed with strong spines.*

9. Mimosa (*Viva*) inermis, foliis conjugatis pinnatis, partialibus quadrijugis subrotundis, caule inermi herbaceo. Lin. Sp. 1500. *Sensitive Plant with a creeping, herbaceous, unarmed stalk, conjugated winged leaves, and globular flowers proceeding from the wings of the stalks.* Mimosa herbacea, non spinosa, minima, repens. Sloan. Hist. Jam. 2. p. 58. *The least creeping herbaceous Sensitive Plant, having no spines.*

10. Mimosa (*Nilotica*) spinis stipularibus patentibus, foliis bipinnatis, partialibus extimis glandula interstinctis, spicis globosis pedunculatis. Hasselq. It. 475. *Acacia with double winged leaves, and globular spikes of flowers having foot-stalks.* Acacia Ægyptica. Hern. Mex. 866. *True Egyptian Acacia.*

11. Mimosa (*Farnesiana*) spinis stipularibus distinctis, foliis bipinnatis, partialibus octojugis, spicis globosis sessilibus. Hort. Upsal. 146. Acacia Indica foliis, scorpioidis leguminosæ, siliquis fuscis teretibus resinosis. H. L. *Indian Acacia with taper resinous pods.*

12. Mimosa (*Cornigera*) spinis stipularibus geminis connatis, foliis bipinnatis. Hort. Cliff. 208. *Acacia with two spines joined at their base, and doubly winged leaves.* Acacia similis Mexiocana, spinis cornu similibus. *The great horned Acacia.*

13. Mimosa (*Unguis cati*) spinosa, foliis bigeminis obtusis. Hort. Cliff. 207. *Prickly Acacia with four obtuse leaves.* Acacia quodammodo accedens, sive Ceratia & Acacia media Jamaicensis spinosa, bigeminatis foliis, flosculis stamineis, atronitente fructu, siliquis intortis. Pluk. Phyt. *Acacia with branching leaves and twisted pods.*

14. Mimosa (*Arborea*) inermis, foliis bipinnatis, pinnis dimidiatis acutis, caule arboreo. Lin. Sp. 1503. *Tree Acacia without thorns, doubly winged leaves, whose pinnæ are acute.* Acacia arborea maxima non spinoso, pinnis majoribus flore albo, siliqua contorta coccinea verticosa elegantissima. Sloan. Jam. 157.

15. Mimosa (*Purpurea*) inermis, foliis conjugatis pinnatis, foliis intimis minoribus. Lin. Sp. 1500. *Purple Acacia without spines, conjugated winged leaves which are smallest below.* Acacia Americana frutescens non aculeata, flore purpurascente. Plum. Cat. *Shrubby American Acacia with thorns, and a purplish flower.*

16. Mimosa (*Houstoniana*) inermis, foliis bipinnatis glabris, pinnis tenuissimis, siliquis latis villosis. Fig. Pl. 5. *Acacia without thorns, doubly winged smooth leaves, whose pinnæ are very narrow, and broad hairy pods.* Acacia Americana, non spinosa, flore purpureo, staminibus longissimis, siliquis planis villosis, pinnis foliorum tenuissimis. Houst. MSS. *American Acacia without thorns, having purple flowers, with very long filaments, flat hairy pods, and very narrow leaves.*

17. Mimosa (*Lutea*) aculeata, foliis bipinnatis glabris, floribus globosis pedunculatis, aculeis longissimis. *Prickly Acacia with smooth doubly winged leaves, globular flowers having foot-stalks, and very long spines.* Acacia spinosa, foliorum pinnis tenuissimis glabris, floribus globosis lutea, spinis longissimis. Houst. MSS. *Prickly Acacia with very narrow smooth leaves, round yellow flowers, and very long thorns.*

18. Mimosa (*Glauca*) inermis, foliis bipinnatis, partialibus sejugis, pinnis plurimis, glandula inter infima. Lin. Sp. Plant. 1502. *Acacia without thorns, doubly winged leaves, whose wings are separated, and have small glands between them.* Acacia non spinosa, flore albo, foliorum pinnis latiusculis glabris, siliquis longis planis. Houst. MSS. *White flowering Acacia without thorns, having broad smooth leaves, and long flat pods.*

19. Mimosa (*Angustissima*) inermis, foliis bipinnatis, pinnis angustissimis glabris, leguminibus tumidis. *Narrow-leaved unarmed Acacia, with doubly winged smooth leaves, and jointed pods.* Acacia non spinosa, floribus globosis albis foliorum pinnis tenuissimis glabris, siliquis ad singula grana tumidis. Houst. MSS. *Acacia without thorns, having round white flowers, with very narrow smooth leaves, and jointed pods.*

20. Mimosa (*Campeachiana*) spinosa, foliis bipinnatis, pinnis angustis, spinis singulis cornu bovinum per longitudinem fissum referentibus. *Acacia with doubly winged leaves having narrow pinnæ, and single spines like ox's horns split their length.* Acacia spinosa tenuifolia, spinis singulis cornu bovinum per longitudinem fissum referentibus. Houst. Cat. *Acacia with single thorns shaped like those of an ox's horn, and seem as if split thro' their length.*

21. Mimosa (*Cinerea*) spinis solitariis, foliis bipinnatis, floribus spicatis. Flor. Zeyl. 215. *Acacia with single spines, doubly winged leaves, and spiked flowers.* Acacia spinosa tenuifolia, siliquis latis, spinis minimis recurvis solitariis. Houst. Cat. *Prickly narrow-leaved Acacia with broad pods, and small recurved spines, which come out single.*

22. Mimosa (*Latifolia*) inermis, foliis conjugatis, pinnis terminalibus oppositis, lateralibus alternis. Lin. Sp. 1499. *Broad-leaved Acacia without thorns, conjugated leaves whose upper pinnæ are opposite, but the side ones are alternate.* Acacia non spinosa, juglandis folio, flore purpurascente. Plum. Sp. 17. *Acacia without thorns, Walnut-tree leaves, and a purple flower.*

23. Mimosa (*Circinalis*) aculeata, foliis conjugatis pinnatis, pinnis æqualibus, stipulis spinosis. Lin. Sp. 1499. *Prickly Acacia with conjugated winged leaves, which are equal, and prickly stipulæ.* Acacia foliis amplioribus, siliquis circinatis. Plum. Sp. 17. *Acacia with broad leaves and twisted pods.*

24. Mimosa (*Fagifolia*) inermis, foliis pinnatis bijugis petiolo marginato. Lin. Sp. 1498. *Broad-leaved Acacia without spines, whose wings have four lobes, and running foot-stalks.* Arbor siliquosa, faginis foliis, Americana, floribus comosis. Pluk. Phyt. tab. 141. fol. 2.

The first sort grows naturally in most of the islands in the West-Indies, and it has been found growing in some warm moist spots, as far north as Virginia. This rises with upright branching stalks six or seven feet high, which become ligneous toward the root, but are not perennial (at least they are not so here in any situation, the plants always decaying in winter;) these are smooth, and garnished with double winged leaves, composed of four or five pair of long winged lobes, which have about twenty pair of small leaves ranged along the midrib; they are smooth and rounded at their points, of a full green on their upper side, but pale on their under. These small leaves contract themselves together on their being touched, but the foot-stalks do not decline at the same time, as those do which are titled Humble Plants, so this is called the Sensitive Plant by way of distinction. The flowers are produced upon long foot-stalks, which come out from the wings of the leaves, and are disposed in globular heads which nod downward; they are yellow, and all those which have petals have ten stamina in each, but those situated round the border have neither petals or stamina; those on the upper part of the spike are succeeded by pods an inch and a half long, and a quarter of an inch broad, which change to a dark brown when ripe, inclosing three or four compressed, shining, black seeds.

The second sort was discovered by the late Dr. Houstoun at La Vera Cruz, growing in stagnant waters, where the stalks were very broad and flat, and floated on the surface, in the same way as the pond weeds do; but in those places where the water was dried up the stalks grew upright and were round, which is always the case when the plants are cultivated in gardens, so that they might easily pass for different plants, to those who never saw them growing in both situations. When this sort is cultivated in gardens, it has great resemblance to the first, but the stalks of this never grow so erect, the wings of the leaves are longer, and stand more horizontal; the heads of flowers are much larger, the stamina are longer, and the flowers on the under side of the spike which have no stamina are double: the pods of this sort are shorter, and much broader than those of the first sort. This is also an annual plant in this country. This sort was since discovered by a friend of mine, growing naturally

naturally in a marshy spot of land in the island of Barbuda, from whence he sent me the seeds, with a large branch of the plant, in a glass filled with a lixivium, which preserved it in the state it was gathered, with the flowers and pods upon it.

The third sort grows naturally in all the islands of the West-Indies, where it is titled the slothful Sensitive Plant, because the leaves do not contract on their being touched. The stalks of this sort seldom rise more than two feet and a half high, they are smooth, and garnished with double-winged leaves, composed of three or four pair of wings which are shorter, and the small leaves are much narrower than those of the two former sorts; the heads of flowers are smaller, and the pods are longer and narrower than those of the other. This sort will live through the winter in a moderate warm air.

The fourth sort was discovered by the late Dr. Houstoun, growing naturally at La Vera Cruz. This hath ligneous stalks which decline to the ground, spreading out two or three feet from the root, and send out several side branches, which are armed with short yellowish spines under the foot-stalks of the leaves, and are their whole length closely covered with bristly stinging hairs; the foot-stalks of the leaves are three inches long, and at the top sustain four single winged leaves, whose base meet in a point, but spread above like the fingers of an open hand. These wings are about three inches long, and are closely garnished with small narrow lobes, set by pairs along the midrib, which is also covered on the under side with the like bristly hairs as the stalk. The flowers come out from the wings of the leaves upon pretty long foot-stalks; they are collected into globular heads, and are of a pale yellowish colour; these are succeeded by small jointed pods, containing two or three shining black seeds.

The fifth sort is the most common of any in the islands of the West-Indies, as also in the English gardens; the seeds of this sort are frequently sold in the seed-shops, by the title of Humble Plant. The roots of this are composed of a great number of hairy fibres, which mat close together, from which come out several ligneous stalks which naturally decline toward the ground, unless they are supported; they are armed with short recurved spines, and garnished with winged leaves, composed of four, and sometimes five wings, whose base join at a point, where they are inserted to the foot-stalk, spreading upward like the fingers of a hand; these wings are shorter than those of the former sort, and the stalks are not hairy. The flowers come out from the wings of the stalks, upon short foot-stalks; they are collected in small globular heads, are yellow, and are succeeded by short, flat, jointed pods, which have two or three orbicular, bordered, compressed seeds in each: these pods are in close clusters, almost covered with stinging hairy covers.

The sixth sort grows naturally at La Vera Cruz, from whence the late Dr. Houstoun sent the seeds. This hath a perennial creeping root, which spreads and multiplies greatly in the sands, where it grows wild; the stalks are slender, and have four acute angles, armed with short recurved spines pretty closely; the leaves stand upon long prickly foot-stalks, which are thinly placed on the branches; they are composed of two pair of wings, standing about an inch asunder; the wings are short, and the small leaves are narrow, and not placed so close together, as in many of the other species. The foot-stalks of the flowers come out from the wings of the leaves, sustaining a small globular head of purple flowers; these are succeeded by four-cornered pods about two inches long, which have four cells, opening with four valves, containing several angular seeds in each.

This sort spreads so much at the root, as to render it not so productive of flowers and seeds as most of the others; and the plants which are propagated by parting of the roots, are always weak, so that the best way is to propagate them by seeds, when they can be obtained. This is one of the sorts, whose foot-stalks fall on being touched.

The seventh sort grows naturally at La Vera Cruz, from whence the late Dr. Houstoun sent the seeds. This rises with a slender ligneous stalk seven or eight feet high, armed with short recurved thorns. The leaves grow upon long foot-stalks which are prickly, each sustaining two pair of wings; the exterior pair have two lobes which join at their base, and are rounded on their outside, but strait on their inner edges, very much shaped like a pair of those shears used for shearing of sheep; these two outer pair of lobes are much larger than the inner; they are almost two inches long, and one broad in the middle. From the place where these are inserted to the stalk, come out small branches which have three or four globular heads of pale purple flowers coming out from the side, upon short foot-stalks, and the principal stalk has many of those heads of flowers on the upper part for more than a foot in length; and this, as also the branches, are terminated by the like heads of flowers: these are succeeded by broad, flat, jointed pods, which open with two valves, some having but one, others two, and some have three orbicular compressed seeds. The leaves of this sort move but slowly when they are touched, but the foot-stalks fall when they are pressed pretty hard.

The eighth sort was also found by the same gentleman, growing naturally at La Vera Cruz. This hath a shrubby erect stalk about five feet high, which is hairy, and armed with short, broad, strong thorns, which are white, standing on each side sometimes almost opposite, and at others alternately. The leaves are composed of five or six pair of wings, which are ranged opposite along a strong midrib, and between each pair are placed two short strong spines, pointing out each way. The small leaves which compose these wings are extremely narrow, and stand very close to each other. Toward the upper part of the stalk, the flowers are produced from the sides, upon short foot-stalks; they are collected into globular heads, and are of a bright purple colour; the stalks are also terminated by smaller heads of the like flowers. These are succeeded by flat jointed pods about two inches long, and a quarter of an inch broad, which spread open like rays, there being commonly five or six of these joined together at their base to the foot-stalk. These pods separate at each articulation, leaving the two side membranes or borders standing; and the seeds which are compressed and square, drop out from the joints of the pods; these pods are hairy at first, but as they ripen become smooth.

This is a perennial plant, which may be preserved through the winter in a warm stove, by which method the seeds may be obtained, for they seldom flower the first year. The foot-stalks of this sort do not fall on being touched, but the small leaves on the wings close up.

The ninth sort grows naturally in Jamaica; this hath trailing herbaceous stalks, which put out roots at every joint, which fasten in the ground and spread to a great distance, as they will also do here, when placed in a bed of tanners bark. I have had a single plant in one summer, which has spread near three feet square, whose branches were closely joined, so as to cover the surface of the bed; but when they are thus permitted to grow, they seldom produce flowers. These stalks have no thorns, but are garnished with winged leaves composed of two pair of short wings, whose small leaves or lobes are narrow; these stand upon short foot-stalks, which are smooth. The leaves of this sort contract and fall down upon the least touch, so that where the plant is extended to a distance, a person may draw any figure with a stick upon the leaves, which will be very visible till the leaves recover again. The flowers come out from the wings of the leaves, upon naked foot-stalks about an inch in length; they are of a pale yellowish colour, and are collected into small globular heads; these are succeeded by short, flat, jointed

 pods,

pods, containing three or four compressed roundish seeds.

These plants are all of them propagated by seeds, which should be sown early in the spring, upon a good hot-bed. If the seeds are good, the plants will appear in a fortnight or three weeks, when they will require to be treated with care, for they must not have much wet till they have acquired strength; nor should they be drawn too weak, so that fresh air should be admitted to them at all times when the air is temperate. In about a fortnight or three weeks after the plants come up, they will be fit to transplant, especially if the bed in which they were sown, continues in a proper degree of heat; then there should be a fresh hot-bed prepared to receive them, which should be made a week before the plants are removed into it, that the violent heat may be abated before the earth is laid upon the dung, and the earth should have time to warm before the plants are planted into it. Then the plants must be carefully raised up from the bed to preserve the roots entire, and immediately planted in the new bed, at about three or four inches distance, pressing the earth gently to their roots; then they should be gently sprinkled over with water, to settle the earth to their roots; after this they must be shaded from the sun till they have taken new root, and the glasses of the hot-bed should be covered every night to keep up the heat of the bed. When the plants are established in their new bed, they must have frequent, but gentle waterings; and every day they must have free air admitted to them, in proportion to the warmth of the season, to prevent their being drawn up weak; but they must be constantly kept in a moderate degree of heat, otherwise they will not thrive. In about a month after the plant will be strong enough to remove again, when they should be carefully taken up, preserving as much earth to their roots as possible, and each planted in a separate small pot, filled with good kitchen-garden earth, and plunged into a hot-bed of tan, carefully shading them from the sun till they have taken new root; then they must be treated in the same manner as other tender exotic plants from very warm countries.

The sorts which grow upright and tall, will soon rise high enough to reach the glasses of the hot-bed, especially if they thrive well; therefore they should be shifted into larger pots, and removed into the stove, and if they are plunged into the tan-bed there, it will greatly forward them. The first sort will often flower here, if the plants are raised early in the spring, and brought forward by their removal from one hot-bed to another; and two or three times I have had their seeds ripen, but this can only be expected in very warm seasons.

The perennial sorts will live through the winter, if they are preserved in a warm stove, and the following summer they will produce flowers and ripen their seeds. Some of these may be propagated by laying down their branches, which will put out roots, and then may be separated from the old plants; and I have sometimes propagated them by cuttings, but the plants which rise from seeds are preferable to either of these.

There is no particular management which these plants require, different from others of the same warm countries; the great care must be to keep them in a proper temperature of heat, and not to give them too much water, especially in cool weather; nor should they be kept too dry, for many of the sorts require frequent waterings, as they naturally grow in moist places. There should also be care taken that they do not root into the tan-bed, for they soon put out their roots through the holes at the bottom of the pots, which, when they strike into the tan, will cause the plants to grow very luxuriant; but when they are removed, and these roots are cut or broken off, the plants seldom survive it; therefore the pots should be frequently drawn out of the tan, and if any of the roots are beginning to get through the holes at the bottom, they should be cut off close; and when the roots are very closely matted together, they should be turned out of the pots, and pared round to reduce them, and then potted again, either in pots of the same size, or if the plants require, in pots one size larger; but they must not be over-potted, for then the plants will not thrive.

Some of those sorts whose stalks spread near the ground, may be turned out of the pots in the middle of June, and planted in a very warm border, where, if they are covered with bell or hand-glasses, they will live through the summer; but these will not grow very large, and upon the approach of cold in the autumn, they are soon destroyed: however, those who have not conveniency of stoves or tan-beds, may raise the plants on common hot-beds in the spring; and when they have acquired strength, they may be treated in this manner, whereby they will have the pleasure of these plants in summer, though not in so great perfection, as those who have the advantages before-mentioned: but these plants will not thrive in the open air in this country, nor will they retain their sensibility when they are fully exposed to the air.

It would be to little purpose to trouble the reader with the several idle stories related of these plants by travellers, nor to insert what has been said by others, who have attempted to account for the motion of the leaves of these plants on their being touched, since there has not been any thing wrote on this subject, worthy of being noticed, that I have yet seen; I shall therefore only mention what I have myself observed in these plants, for more than forty years that I have cultivated them.

The first is, that they are more or less susceptible of the touch or pressure, according to the warmth of the air in which they grow; for those plants which are kept in a warm stove, contract their leaves immediately on being touched, either with the hand, a stick, or any other thing, or by the wind blowing upon them: some of the sorts only contract their small leaves, which are placed along the midrib; others not only contract their small leaves, but the footstalk also declines downward on being touched: the first are called Sensitive, and the second Humble Plants; but when these plants are placed in a cooler situation, they do not move so soon, nor contract so closely, as those which are in a greater warmth; and those which are entirely exposed to the open air, have very little motion, but remain in one state, neither expanded nor closed, but between both, especially in cool weather; nor do these shut themselves at night, as those do which are in a warm temperature of air.

The second is, that it is not the light which causes them to expand, as some have affirmed, who have had no experience of these things; for in the longest days of summer, they are generally contracted by five or six in the evening, when the sun remains above the horizon two or three hours longer; and although the glasses of the stove in which they are placed, is covered close with shutters to exclude the light in the middle of the day, yet if the air of the stove is warm, the leaves of the plants will continue fully expanded, as I have several times observed. Nor do these plants continue shut till the sun rises in the morning, for I have frequently found their leaves fully expanded by the break of day in the morning; so that it is plain the light is not the cause of their expansion, nor the want of it that of their contraction.

I have also observed, that those plants which are placed in the greatest warmth in winter, continue vigorous, and retain their faculty of contracting on being touched; but those which are in a moderate warmth, have little or no motion.

When any of the upper leaves of these plants are touched, if they fall down and touch those which are below them, it will occasion their contracting and falling, so that by one touching another, they will continue falling for some time. When the air of the stove in which these plants stand, is in a proper temperature of warmth, the plants will recover themselves, and their leaves will be fully expanded in about eight or

or ten minutes. I have frequently watched them as they have been recovering, and have always found it has been by a vibratory motion, like the index of a clock.

Some of the sorts are so susceptible of the touch, that the smallest drop of water falling on their leaves will cause them to contract, but others do not move without a much greater pressure.

The roots of all the sorts have a very strong disagreeable odour, almost like that of a common sewer. I have met with some accounts of these plants, in which it is mentioned, that the leaves and branches have a poisonous quality, and that the Indians extract a poison from them, which kills by slow degrees, and that the root of the plant is the only remedy to expel it; but how far this is true I cannot say, having never made any experiments on the qualities of these plants; but if these plants are endowed with so deadly a quality as related, this sensibility with which they are endued, may be designed by providence to caution persons from being too free with it; and as many of them are strongly armed with thorns, so that is a guard against their being eaten by animals; for in all the enquiries which I have made of those persons who have resided in the countries where they naturally grow, I could never learn that any animal will browse upon them.

These plants are all of them natives of America, so were unknown to the other parts of the world till that was discovered, for I have not heard of any of them being found in any other country: and a few years ago I sent some of the seeds of these plants to China, which succeeded, and occasioned great admiration in all who saw the plants.

The Acacias are so nearly allied to the Mimosas in their characters, that Linnæus has joined them in the same genus; and as his system is now generally followed, so in compliance with that I have done the same.

The tenth sort of Acacia is the tree from whence the true Succus Acaciæ is taken, and the Gum Arabic exsudes from the branches of the same; which, though mentioned as a native of Egypt, yet it is also found in divers parts of America, from whence the seed of this tree have been sent into England, and there raised in several gardens near London.

This tree arrives to a large size in the countries where it grows, but in England is rarely seen more than eight or ten feet high. It frequently flowers in autumn, but never produces any seeds.

The eleventh sort is the most common kind in Jamaica and Barbadoes, and the other warm parts of America; and, for the sweetness of its flowers, has been dispersed through most parts of Europe; and though a native of the warmer parts of the Indies, it hath been made familiar to the Italian gardens, and is cultivated likewise in great plenty in Portugal and Spain.

The Italian gardeners, who bring over Orange-trees, &c. every year, generally bring also many young plants of this sort to England, under the title of Gazia; but as they are too tender to live in a common green-house in England, so few of those which are purchased of them succeed.

I have had some plants of this sort upwards of sixteen feet high, which have produced great numbers of flowers in July and August, but these were kept in a stove in winter, and in glass-cases in summer, to screen them from wet and the cold, for they will not flower in the open air in this country. The flowers are of a bright yellow colour, and smell sweet; in the West-Indies it is called Sponge-tree.

The twelfth sort is at present very rare in England, and only to be found in some curious gardens. This tree produces its spines by pairs, which are extreme large and crooked, and of a whitish colour; but I do not remember ever to have seen this flower.

In England, from the dried samples, however, which I have received from Campeachy, with many flowers upon them, there appears but little beauty in them; nor do the trees in their native soil make a better appearance, their branches always growing deformed, and being but thinly garnished with leaves, when in their greatest vigour; but for several months they are destitute of leaves, so that the only thing remarkable in this tree is, the uncommon wreathed spines with which the trunk and branches are fully beset. These have the resemblance of animal horns, and are variously twisted and contorted.

The twenty-third sort was brought from the Bahama Islands by Mr. Catesby, anno 1726. The seeds of this plant (which are flat, and one half of a beautiful red colour, the other half of a deep black) grow in long twisted pods, opening when the seeds are ripe, on one side, and letting them out, which hanging by a small thread for some time out of the pods, make a very agreeable appearance; the leaves of this tree branch out and divide into many ramifications: the lobes are roundish, and placed in a very regular order. The flowers have not as yet appeared in England, but from a painting done from the plant in the country, they seem to be very beautiful.

The thirteenth sort was brought from Jamaica, and is growing in the physic-garden at Chelsea; this hath four large lobes to each leaf; the spines are short, stiff, and crooked, and the seeds grow in twisted pods like the former. This plant is well described in Sir Hans Sloane's Natural History of Jamaica. By the inhabitants of America it is called Doctor Long, under which name the seeds are frequently brought to England.

Most of the other sorts here mentioned, were collected by the late ingenious Dr. William Houstoun, in Jamaica, at Vera Cruz and Campeachy, who sent the seeds of most of them into Europe, many of which are now growing in the physic-garden at Chelsea, where some of them have produced flowers and plenty of seeds.

These being all tender, are to be placed in stoves in the winter, and in summer must be but a short time exposed to the open air, and have a warm situation.

They are propagated by sowing their seeds on a hot-bed in the spring of the year, which will in a short time appear above ground, and in about five or six weeks after, be fit to transplant, when a fresh hot-bed is to be prepared for them, and should be pretty warm; the next thing to be provided is a quantity of small halfpenny pots, which are to be filled with fresh, light, sandy earth; these should be plunged into the hot-bed, but not into dung; for if these beds are made with warm horse dung, they ought to be covered with earth as deep as the pots, whose bottoms should rest upon the dung, for otherwise the roots of the plants may suffer by too much heat; but beds of tanners bark seldom heat so violently. As soon as the earth in the pots is warm, which will be in two or three days, you should carefully take up the young plants out of the first hot-bed, planting four or five plants into each of these pots, giving them a gentle watering to settle the earth to their roots, and screening them with mats over the glasses from the heat of the sun, until they have taken root; after which time you must give them air, by raising the glasses in proportion to the heat of the weather, or to the constitution of the plants.

The tenth, eleventh, and twelfth, sorts are very tender, especially while young, therefore should have a hot-bed of tanners bark; and as they increase in bulk, should be shifted into bigger pots. The earth for these should be a little lighter, and more inclined to a sand, than for the other sorts; but never plant them in pots that are too large, which is full as bad to these as to Orange-trees; neither give them too much water, especially in winter. The tenth sort being the hardiest of the three, will, when grown to be woody, stand in a common stove, which should be kept to the point of temperate heat in winter; and in the summer time, in warm weather, may enjoy the open free air: but the eleventh and twelfth sorts must have a bark-stove in winter; nor should they be exposed to the open air in summer, at least for four

or five years, until they are grown very woody, for they are very tender, and with great difficulty preserved in this climate. The stove in which these should be placed in winter, must be kept above the temperate point, as marked in the botanical thermometers. These should have very little water in winter, but in summer time will require frequent refreshings, though at that season it should not be given them in great quantities at one time. The eleventh sort is a very beautiful tree. The twelfth sheds its leaves just before the new ones come on, so that it is naked of leaves about a month or six weeks in the spring of the year, which has occasioned some people to throw them away as dead, when, if they had let them remain, they would have come out fresh again. This I thought proper to mention, in order to caution people not to be too hasty in throwing out trees for dead, but preserve them through the succeeding summer, to see if they will shoot again; for I have known several plants, which, after having been given over by unskilful persons for dead, have the July following shot out vigorously again; and others, which have died to the surface of the earth, have risen again from the root.

The three sorts of horned Acacias are very often destitute of leaves for two or three months, appearing to have no life; but they will put out fresh leaves towards autumn, which is commonly the season when they are most vigorous. These should be exposed in the summer season for about two months, to clear them from insects, which greatly infest them, in a place defended from strong winds; and in the winter they require a moderate degree of warmth.

All the other sorts here mentioned are propagated by seeds, which, seldom ripening in this country, must be procured from America, parttícularly at Campeachy, where there is great variety of this tree, many sorts of which have been hitherto unknown to botanical writers. In bringing over the seeds of these trees, they should be taken out of the pods when gathered, and put up in papers, and ought to have Tobacco, or some other noxious herb, put between the papers, to keep off insects, otherwise the seeds will be eaten and destroyed before they arrive in England. For the insects deposit their eggs in small punctures which they make in the pods; and as these are soon hatched, so they immediately attack the seeds for food, and eat holes through them, by which they are spoiled from growing. This has often happened to seeds which have been sent me from America.

There are several of these Acacias, which are very tender while they are young; but, after two or three years growth, become hardy enough to bear the open air in summer, though scarce any of them will live through the winter in a green-house, unless they have some warmth in very cold weather.

Acaçia Germanorum. See Prunus Sylvestris.

Acacia Virginiana. See Robinia.

Acacia, the Three-thorned. See Gleditsia.

MIMULUS. Lin. Gen. Plant. 761. Cynorrhynchium. Mitch. 3.

The Characters are,

*The flower hath an oblong, prismatical, permanent empalement of one leaf; it is of the lip or ringent kind, having one petal, whose tube is the length of the empalement, and the brim is divided into two lips. The upper lip is erect, divided at the top into two parts, which are reflexed on their side; the lower lip is broad and trifid, the middle segment is the least; the palate is convex and bifid. It has four slender stamina, two longer than the other, terminated by bifid kidney-shaped summits, and a conical germen supporting a slender style, crowned by an oval, bifid, compressed stigma. The germen afterward turns to an oval capsule with two cells, filled with small seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two short stamina, and their seeds are included in the capsule.

We know but one Species of this genus at present in England, viz.

Mimulus (*Ringens*) erectus, foliis oblongis linearibus sessilibus. Hort. Upsal. 176. tab. 2. *Upright Mimulus with oblong linear leaves sitting close to the stalk.* Digitalis perfoliata glabra, flore violaceo minore. Mor. Hist. 2. p. 479. *Smooth perfoliated Foxglove, with a small Violet flower.*

This plant grows naturally in North America in moist ground. It has a perennial root and an annual stalk, which decays in the autumn; the stalk is square, and rises a foot and a half high, garnished at each joint with two oblong smooth leaves, which are broadest at their base, where they almost join round the stalk, but end in acute points. The lower part of the stalk sends out two or three short branches, and the upper part is adorned with two flowers at each joint, coming from the bosom of the leaves on each side the stalk; these have an oblong curved empalement with five angles, indented at the top into five parts, out of which arises the flower, with a long curved tube, spreading open at the top into two lips, the upper lip standing erect, which is slightly cut into two parts at the top; the under lip turns downward, and is cut into three slight segments. The flowers are of a Violet colour, but have no scent. These appear in July, and are succeeded by oblong capsules with two cells, filled with small seeds, which in warm seasons ripen in the autumn.

This plant is very hardy in respect to cold, but should have a loamy soft soil, rather moist than dry, and not too much exposed to the sun. It may be propagated by parting of the roots in the autumn, but the slips should not be divided too small; it may also be propagated by seeds, which should be sown in autumn, soon after they are ripe, for those which are sown in the spring seldom grow the same year: these may be sown on a border exposed to the morning sun, and the plants may be afterward planted in the flower-garden.

MINT. See Mentha.

MIRABILIS. Lin. Gen. Plant. 215. Jalapa. Tourn. Inst. R. H. 129. tab. 50. Marvel of Peru, or Four o'Clock Flower.

The Characters are,

*The empalement of the flower has five, oval, spear-shaped, small leaves, and is erect, swelling, and permanent. The flower has one funnel-shaped petal, with a slender tube sitting upon the nectarium, which spreads open above, and is cut into five obtuse segments. It hath five slender stamina, which adhere to the petal, which are unequal and inclined, terminated by roundish summits, with a roundish germen within the nectarium, supporting a slender style, crowned by a globular stigma. The germen afterward becomes an oval five-cornered nut, inclosing one seed.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

The Species are,

1. Mirabilis (*Jalapa*) floribus congestis terminalibus erectis. Lin. Sp. Plant. 252. *Marvel of Peru, with bunches of flowers erect, terminating the stalk.* Admirabilis Peruviana. Clus. Hist. 2. p. 87.
2. Mirabilis (*Dichotoma*) floribus sessilibus axillaribus erectis solitariis. Amœn. Acad. 4. p. 267. *Marvel of Peru, with an erect single flower sitting close to the wings of the branches.* Jalapa officinarum. Mart. Cent. 1. f. 1. *The then supposed Jalap of the shops.*
3. Mirabilis (*Longiflora*) floribus congestis terminalibus longissimis nutantibus, foliis subvillosis. Act. Holmens. 1756. p. 176. *Long-flowered Marvel of Peru, whose flowers are in bunches, terminating the stalks and nodding, with hairy leaves.* Mirabilis Mexicana. Hern. Mex. 170. f. 2.

The first sort is the Marvel of Peru, which has been many years cultivated in the English gardens for ornament; of this there are several varieties, which differ in the colour of their flowers; two of these retain their difference, one of them has purple and white flowers, which are variable, some of them are plain purple, others are plain white, but most of them are variegated with the two colours; and all these varieties

ties are frequently upon the ſame plant, and at others on different plants; the other has red and yellow flowers, which are generally mixed in the ſame flowers, but are often with plain flowers of both colours on the ſame plant, intermixed with thoſe which are variegated; but ſome plants have only plain flowers; and I have never found that the ſeeds of the purple and white ſort, ever produced the yellow and red, nor the latter ever vary to the former, and I have conſtantly cultivated both more than forty years; but although theſe do not change from one to the other, yet as there is no other difference between them than in the colour of their flowers, I have not enumerated them as diſtinct ſpecies.

The ſecond ſort is very common in all the iſlands of the Weſt-Indies, where the inhabitants call it the Four o'Clock Flower, from the flowers opening at that time of the day. Of this ſort I have never ſeen any with variable flowers; they are of a purpliſh red colour, and not much more than half the ſize of the other. The ſtalks of this ſort have thick ſwollen joints; the leaves are ſmaller, and the fruit is very rough, ſo there can be no doubt of their being diſtinct ſpecies, for I have never ſeen any alteration in this from ſeed, and I have cultivated it many years. Tournefort was informed by Father Plumier, that the root of this plant was the officinal Jalap, upon which he conſtituted the genus, and gave that title to it; but the late Dr. Houſtoun was fully informed in the Spaniſh Weſt-Indies of the contrary, and brought over a drawing of the plant which was made by a Spaniard at Halapa, and he carried two or three of the plants to Jamaica, where he planted them in a garden, but after he left the iſland they were deſtroyed by hogs: however, he was fully ſatisfied of its being a Convolvulus, which Mr. Ray had many years before given the Jalap the title of, but upon what authority it does not at preſent appear. Some few years after I received three ſeeds of the Jalap from the Spaniſh Weſt-Indies, one of which grew, and became a large plant, having a bulbous root, as large as thoſe of the Jalap which are imported, but the plant produced no flowers in the three years it lived; and in the winter 1739-40 it died, ſince when I have not been able to procure any ſeeds; however, I am fully ſatisfied that the Jalap is a ſpecies of Convolvulus: indeed the roots of the Marvel of Peru are purgative, and when given in a double quantity for a doſe, will anſwer the purpoſe of Jalap.

The third ſort was ſent from Mexico a few years ſince. The ſeeds of this were firſt ſent me from Paris, by Dr. Monier, of the Royal Academy of Sciences, and afterward I had ſome ſent me from Madrid, by Dr. Hortega. The ſtalks of this ſort fall on the ground, if they are not ſupported; theſe grow about three feet long, and divide into ſeveral branches, which are garniſhed with heart-ſhaped leaves, placed oppoſite; theſe, as alſo the ſtalks, are hairy and viſcous, ſticking to the fingers of thoſe that handle them. The flowers come out at the end of the branches; they are white, and have very long ſlender tubes, and a faint muſky odour; theſe are like the other ſorts, cloſely ſhut all the day, but expand every evening when the ſun declines. The ſeeds of this ſort are larger than thoſe of any other ſpecies, and are as rough as thoſe of the ſecond ſort.

The two varieties of the firſt ſort are very ornamental plants in gardens, during the months of July, Auguſt, and September; and if the ſeaſon continues mild, they often laſt till near the end of October. The flowers do not open till toward the evening, while the weather continues warm, but in moderate cool weather, when the ſun is obſcured, they continue open almoſt the whole day. The flowers are ſo plentifully produced at the ends of the branches, as that when they are open, the plants ſeem entirely covered with them, and there being ſome plain, and others variegated on the ſame plants, they make a fine appearance. The plants are propagated by ſeeds, in the choice of which there ſhould be care taken not to ſave any from thoſe plants whoſe flowers are plain; and thoſe who are deſirous of having only the variegated kinds, are careful to pull off all the plain flowers from thoſe plants which they intend for ſeeds, to prevent them from bearing any ſeeds; by this method they rarely have any plants with plain flowers.

The ſeeds ſhould be ſown on a moderate hot-bed in March, and when the plants come up, they ſhould have plenty of air admitted to them, when the weather is mild, to prevent their being drawn up weak; and when they are about two inches high, they ſhould be tranſplanted on another very moderate hot-bed; or if they are each planted in a ſmall pot filled with light earth, and plunged into a moderate hot-bed, it will be a more ſecure way, for then there will be no danger in ſhaking them out of the pots, when they are to be planted in the borders, ſo as to preſerve all the earth to their roots; by this method, they will not require to be ſhaded, whereas thoſe that are to be tranſplanted from the ſecond hot-bed to the borders, often riſe with little earth to their roots, ſo muſt be carefully ſhaded, otherwiſe they often miſcarry.

When they are in the ſecond hot-bed, they ſhould be ſhaded till they have taken freſh root, after which they muſt have plenty of free air admitted to them to prevent their being drawn up weak, and in May they muſt be gradually inured to the open air. The beginning of June, if the ſeaſon is favourable, they ſhould be tranſplanted into the borders of the pleaſure-garden, giving them proper room, and after they have taken new root, they will require no further care. If theſe ſeeds are ſown in a warm border the beginning of April, they will grow very well, but the plants will be late in the ſeaſon before they flower.

As the ſeeds of theſe plants ripen very well every year, ſo there are not many who are at the trouble of preſerving their roots; but if theſe are taken out of the ground in autumn, and laid in dry ſand all the winter, ſecured from froſt, and planted again in the ſpring, they will grow much larger, and flower earlier than the ſeedling plants: or if the roots are covered in winter with tanners bark to keep out the froſt, they may remain in the borders, provided the ſoil be dry. If the roots which are taken out of the ground, are planted the following ſpring in large pots, and plunged into a hot-bed, under a deep frame, they may be brought forward, and raiſed to the height of four or five feet, as I have frequently practiſed; and theſe plants have come earlier in the ſeaſon to flower, ſo have been intermixed with other ornamental plants, to decorate halls and ſhady courts, where they have appeared very beautiful.

The other two ſpecies require the ſame treatment, but the ſecond ſort is not quite ſo hardy as the other two, ſo unleſs the plants are brought forward in the ſpring, they will not flower till very late, ſo their ſeeds will not ripen.

MISLETOE. See Viscum.

MITELLA. Tourn. Inſt. R. H. 241. tab. 126. Lin. Gen. Plant. 496. [ſo called of Mitella, *Lat.* a little mitre, becauſe the ſeed-veſſel of this plant reſembles a biſhop's mitre.] Baſtard American Sanicle.

The Characters are,

*The flower has a bell-ſhaped empalement of one leaf, cut into five points, which is permanent. It hath five petals, ending in many hairy points, and are inſerted in the empalement, as are alſo the ten awl-ſhaped ſtamina, which are ſhorter than the petals, and terminated by roundiſh ſummits. It hath a roundiſh germen, which is bifid, with ſcarce any ſtyle, crowned by two obtuſe ſtigmas. The empalement afterward becomes an oval capſule with one cell, opening with two valves, filled with ſmall ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's tenth claſs, which contains thoſe plants whoſe flowers have ten ſtamina and two ſtyles or ſtigmas.

The Species are,

1. Mitella (*Diphylla*) ſcapo diphyllo. Lin. Gen. Nov. 29. *Mitella with flower-ſtalks having two leaves.* Mitella

tella Americana, florum petalis fimbriatis. Tourn. Inst. 242. *American Mitella with fringed petals to the flowers.*

2. Mitella (*Nuda*) scapo nudo. Amœn. Acad. 2. p. 252. *Mitella with a naked stalk.*

The first sort grows naturally in the woods, in most parts of North America. It has a perennial root, from which come out many heart-shaped angular leaves, some of which are obtuse, and others end in acute points; they are indented on their edges, and of a lucid green, a little hairy, and stand upon pretty long foot-stalks. The flower-stalks arise immediately from the root, having two or three angular leaves toward the bottom, and about the middle of the stalk come out two small leaves with acute angles, placed opposite. The stalks rise eight or nine inches high, and are terminated by a loose spike of small whitish flowers, whose petals are fringed on their edges; these appear the beginning of June, and are succeeded by roundish capsules filled with small seeds.

The second sort grows naturally in the northern parts of Asia; this is of a humbler growth than the first, seldom rising more than five or six inches high. The leaves are not so angular as those of the first sort, and the flower-stalks are always naked, having no leaves. The spikes of flowers are shorter, and more compact.

Both these are propagated by parting of their roots; the best time for this is in autumn: they should be planted in a shady situation, and they love a soft loamy soil.

MITELLA MAXIMA. See Bixa.

MOLDAVICA. See Dracocephalum.

MOLLE. See Schinus.

MOLLUGO. Lin. Gen. Plant. 99.

The Characters are,

*The empalement of the flower is composed of five oblong small leaves, which are coloured on their inside, and is permanent. The flower has five oval petals, which are shorter than the empalement, and three bristly stamina, which stand near the style, and are terminated by single summits, with an oval germen having three furrows, supporting three very short styles, crowned by obtuse stigmas. The germen afterward becomes an oval capsule with three cells, filled with small kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's third class, which includes those plants whose flowers have three stamina and three styles.

The Species are,

1. Mollugo (*Verticillata*) foliis verticillatis cuneiformibus acutis, caule subdiviso decumbente, pedunculis unifloris. Hort. Upsal. 24. *Mollugo with acute wedge-shaped leaves, growing in whorls, a trailing divided stalk, and foot-stalks bearing a single flower.* Alsine procumbens, galii facie Africana. Hort. Lugd. *Trailing African Chickweed, with the appearance of Ladies Bedstraw.*

2. Mollugo (*Quadrifolia*) foliis quaternis obovatis, paniculâ dichotomâ. Hort. Cliff. 28. *Moluggo with four leaves at each joint, which are almost oval, and a panicle arising at the division of the branches.* Herniaria alsines folio. Tourn. Inst. 507. *Rupturewort with a Mouse Ear leaf.*

There are two or three species of this genus, which are rarely admitted into gardens, so I have not enumerated them here.

Both these sorts are annual; the first is a native of warm countries, so is less hardy than the second; they are both trailing plants, whose stalks lie flat on the ground; the first spreads out eight or nine inches every way, and at each joint is garnished with six or seven small leaves spread out in form of a star. The flowers are small, like those of Chickweed, one standing upon each foot-stalk; these are succeeded by oval capsules filled with small seeds, which, if permitted to scatter, the plants will come up the following spring without any care; but when the seeds happen to fall upon earth which is thrown upon a hot-bed, the plants will be forwarder and stronger than those in the open air. This is preserved in some gardens for the sake of variety, but has no great beauty.

MOLUCCELLA. Lin. Gen. Plant. 643. Molucca. Tourn. Inst. R. H. 187. tab. 88. [This plant takes its name from the Molucca Islands, because it was found there.] Molucca Balm.

The Characters are,

*The flower hath a large permanent empalement of one leaf, which is deeply indented at the brim, where it spreads open. The flower is of the lip kind, with a short tube and chaps. The upper lip is erect, concave, and entire. The under lip is trifid, the middle segment being longer than the other. It has four stamina situated under the upper lip, two of which are shorter than the other, crowned by single summits, and a germen with four parts, supporting a style situated with the stamina, crowned by a bifid stigma. The germen afterward turns to four angular convex seeds, sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two short stamina, and are succeeded by naked seeds in the empalement.

The Species are,

1. Moluccella (*Lævis*) calycibus campaniformibus subquinquedentatis, denticulis æqualibus. Lin. Sp. 821. *Molucca Balm with bell-shaped empalements, indented in five equal parts.* Molucca lævis. Dod. Pempt. 92. *Smooth Molucca Balm.*

2. Moluccella (*Spinosa*) calycibus ringentibus octodentatis. Lin. Sp. 821. *Molucca Balm whose empalements are ringent, indented in eight parts.* Molucca spinosa. Dod. Pempt. 92. *Prickly Molucca Balm.*

The first sort rises with a square stalk three feet high, spreading out into many branches, which are smooth, and come out by pairs, garnished with roundish leaves, which are deeply notched on their edges, standing upon long foot-stalks placed opposite; they are smooth, of a light green on both sides, and at the base of their foot-stalks the flowers come out in whorls; these have very large spreading empalements, which are indented in five parts, and immediately under them come out two bunches of pretty long spines, one on each side the stalk, each bunch consisting of five or six spines arising from the same point. The flowers are small, and being situated at the bottom of the large empalements, are not visible at a distance; they are white, with a cast of purple, and shaped like those of the other lip flowers, having the upper lip entire, and hollowed like a spoon, and the under lip is cut into three segments, the middle one being the longest. After the flower is past, the germen turn to four club-shaped angular seeds inclosed in the empalement. It flowers in July, but unless the season proves warm and dry, the seeds do not ripen in England. The smell of this plant is to some persons very disagreeable, and to others very pleasant.

The second sort hath square smooth stalks, of a purplish colour, which rise four feet high, and branch out in the same manner. The leaves are smaller, and stand upon shorter foot-stalks; they are deeper, and more acutely indented on their edges. The empalements of the flowers are not so large, and are cut into eight segments, each being terminated by an acute spine. The flowers are like those of the former species, as are also the seeds; this is not so hardy as the first sort.

The first grows naturally in several parts of Syria, and the second is a native o the Molucca Islands, from whence this genus received its title. They are both annual plants, which decay soon after their seeds are ripe, and being natives of warm countries, they seldom perfect their seeds in England, when they are sown in the spring; therefore the best way is to raise the plants in autumn, and plant them in small pots; these should be placed under a hot-bed frame in winter, where they may have free air in mild weather, by taking off the glasses, but covered in frosty weather, observing to keep them pretty dry, otherwise they are very subject to rot, when they are closely covered in frosty weather. In the spring the plants may be turned out of the pots, with all the earth about their roots, and planted in a warm border, defended from

from strong winds, giving them a little water to settle the earth to their roots; after this they will require no other care but to keep them clean from weeds, and to support them with stakes, to prevent their being broken by the winds. The plants thus preserved through the winter, will flower the latter end of June, so from these good seeds may be expected.

MOLY. See ALLIUM.

MOMORDICA. Tourn. Inst. R. H. 103. tab. 29, 30. Lin. Gen. Plant. 1090. Male Balsam Apple; in French, *Pomme de Marveille.*

The CHARACTERS are,

*It hath male and female flowers upon the same plant. The male flowers have a spreading empalement of one leaf. The flower hath one petal, which adheres to the empalement. It has three short awl-shaped stamina; in two of the stamina the summits are bifid, and eared on both sides; the third has a single eared summit; these are compressed in a body. The female flowers have the same empalement and petal as the male, but sit upon the germen; these have three short filaments without summits. The germen supports one taper trifid style, crowned by three oblong gibbous stigmas. The germen afterward turns to an oblong fruit, opening with an elasticity, having three membranaceous cells, filled with compressed seeds.*

This genus of plants is ranged in the tenth section of Linnæus's twenty-first class, which contains the plants with male and female flowers on the same plant, whose stamina coalesce together.

The SPECIES are,

1. MOMORDICA (*Balsamina*) pomis angulatis tuberculatis, foliis glabris patenti-palmatis. Hort. Cliff. 451. *Male Balsam Apple with angular warted fruit, and smooth open-handed leaves.* Momordica vulgaris. Tourn. Inst. R. H. 103. *Common male Balsam Apple.*
2. MOMORDICA (*Charantia*) pomis angulatis tuberculatis, foliis villosis, longitudinaliter palmatis. Hort. Cliff. 451. *Male Balsam Apple with angular warted fruit, and hairy leaves, which are longitudinally hand-shaped.* Momordica Zeylanica, pampineâ fronde, fructu longiori. Tourn. Inst. R. H. 103. *Male Balsam Apple of Ceylon, with a Vine leaf and a longer fruit.*
3. MOMORDICA (*Zeylanica*) pomis ovatis acuminatis tuberculatis, foliis glabris palmatis serratis. *Male Balsam Apple with an oval, acute-pointed, warted fruit, and smooth hand-shaped leaves, which are sawed.* Momordica Zeylanica, pampineâ fronde, fructu breviori. Tourn. Inst. 103. *Male Balsam Apple of Ceylon, with a Vine leaf and a shorter fruit.*
4. MOMORDICA (*Elaterium*) pomis hispidis, cirrhis nullis. Lin. Sp. Plant. 1010. *Male Balsam Apple with a prickly fruit, and no tendrils to the Vines.* Cucumis sylvestris asininus dictus. C. B. P. 314. *Wild Cucumber, called Asses Cucumber, and the Elaterium of Boerhaave.*

The first sort grows naturally in Asia, the second and third in the island of Ceylon; they are annual plants, which perish soon after they have ripened their fruit; these have trailing stalks like those of the Cucumber and Melon, which extend three or four feet in length, sending out many side branches which have tendrils, by which they fasten themselves to any neighbouring plants, to secure themselves from being tossed and blown about by the winds, and are garnished with leaves shaped like those of the Vine. The leaves of the first and third sorts are smooth, and deeply cut into several segments, and spread open like a hand; but those of the second sort are extended more in length, and are hairy. The fruit of the first species is oval, ending in acute points, having several deep angles, which have sharp tubercles placed on their edges; it changes to a red or purplish colour when ripe, opening with an elasticity, and throwing out its seeds.

The fruit of the second sort is much longer than that of the first, and not so deeply channelled. The tubercles are scattered all over the surface, and are not sharp like those of the other; this fruit is yellow, when ripe, and casts out its seeds with an elasticity.

The fruit of the third sort is short and pointed like that of the first, but does not swell so large in the middle. The angles of this are not deep, and the whole surface is closely set with sharp tubercles; this changes to a deep Orange colour when ripe, and casts out its seeds in the like manner.

The fourth sort is commonly called Wild or Spurting Cucumber, from its casting out its seeds, together with the viscid juice in which the seeds are lodged, with a violent force, if touched when ripe; and from hence it has sometimes the appellation of Noli me tangere, or *touch me not.* This plant grows naturally in some of the warm parts of Europe, but in England it is cultivated in gardens for the fruit, which is used in medicine, or rather the fæcula of the juice of the fruit, which is the Elaterium of the shops.

This plant hath a large fleshy root somewhat like that of Briony, from which come forth every spring several thick, rough, trailing stalks, which divide into many branches, and extend every way two or three feet; these are garnished with thick, rough, almost heart-shaped leaves, of a gray colour, standing upon long foot-stalks. The flowers come out from the wings of the stalk, these are male and female, growing at different places on the same plant, like those of the common Cucumber, but they are much less, of a pale yellow colour, with a greenish bottom: the male flowers stand on short thick foot-stalks, but the female flowers sit upon the young fruit, which, after the flower is faded, grows to be an inch and a half long, and swelling like a Cucumber, of a gray colour like the leaves, and covered over with short prickles. These do not change their colour when ripe, like most of the other fruit of this class; but if attempted to be gathered, they quit the foot-stalk, and cast out the seeds and juice with great violence; so that where any plants are growing, and the fruit permitted to stand till it is ripe, the seeds will be scattered all round to a great distance, and there will be plenty of the plants produced the following spring.

But when the fruit is designed for use, it should always be gathered before it is ripe, otherwise the greatest part of the juice will be lost, which is the only valuable part; for the juice which is expressed, with part of the parenchyma of the fruit, is not to be compared with the other for its virtues; for the Elaterium which is made from clear juice of the fruit, is much whiter, and will retain its virtues much longer, than that which is extracted by pressure.

The three first sorts are annual; their seeds must be sown on a hot-bed the beginning of March, and when the plants come up, they should be transplanted out into a fresh hot-bed, after the manner of Cucumbers or Melons, putting two plants of the same kind under each light, and the plants watered and shaded until they have taken root; after which they must be treated as Cucumbers, permitting their branches to extend upon the ground in the same manner, and observe to keep them clear from weeds.

With this management (provided you do not let them have too much wet, or expose them too much to the open air) they will produce their fruit in July, and their seeds will ripen in August and September, when you must observe to gather it as soon as you see the fruit open, otherwise it will be cast abroad, and with difficulty gathered up again.

These plants are preserved in curious gardens for the oddness of their fruit; but as they take up a great deal of room in the hot-beds, requiring frequent attendance, and being of little beauty or use, so they are not much cultivated in England, except in botanic gardens for variety.

There are some persons who put these plants in pots, and fasten them up to stakes, to support the Vines from trailing on the ground, and place the pots in stoves; where, when they are skilfully managed, they

will produce their fruit tolerably well; and in this way they make a better appearance, than when the Vines ſpread on the ground like Cucumbers and Melons. But when the plants ſpread on the ground, which is their natural way of growing, they thrive much better, and produce more fruit, than when they are ſupported; for though theſe plants have claſpers, yet theſe are not formed for climbing, but merely to faſten themſelves about any neighbouring ſupport, to ſecure them from being raiſed by the wind and broken; which would often happen, where they grow in the open air and are fully expoſed, were it not for this ſecurity.

The fourth ſort is eaſily propagated by ſeeds, which (as was before mentioned) if permitted to ſcatter, there will be a ſupply of plants come up the following ſpring; or if the ſeeds are ſown upon a bed of light earth, the plants will come up in about a month after, and may be tranſplanted to an open ſpot of ground, in rows at three or four feet diſtance, and almoſt as far aſunder in the rows; if theſe are carefully tranſplanted while young, there will be little hazard of their growing; and after they have taken new root, they will require no further care, but to keep them clear from weeds. If the ground is dry in which they are planted, the roots will continue three or four years, unleſs the winter ſhould prove very ſevere, which will kill them.

MONARDA. Lin. Gen. Plant. 34. Leonurus. Tourn. Inſt. R. H. 187. tab. 87.

The CHARACTERS are,

*The flower has a tubulous cylindrical empalement of one leaf, which is channelled, and cut into five equal parts at the brim. The flower hath one petal, and is of the lip kind, having a cylindrical tube longer than the empalement, divided at the top into two lips. The upper lip is narrow, entire, and erect; the under lip is broad, trifid, and reflexed; the middle ſegment being long and narrow, thoſe on the ſide are obtuſe. It hath two briſtly ſtamina the length of the upper lip, in which it is involved, terminated by compreſſed erect ſummits. In the bottom of the tube is ſituated a four-pointed germen, ſupporting a ſlender ſtyle involved with the ſtamina, and crowned by an acute bifid ſtigma. The germen afterward turns to four naked ſeeds, incloſed in the empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's ſecond claſs, which includes the plants whoſe flowers have two ſtamina and one ſtyle.

The SPECIES are,

1. MONARDA (*Fiſtuloſa*) capitulis terminalibus, caule obtuſ-angulo. Hort. Upſal. 12. *Monarda with heads of flowers terminating the ſtalks, which have obtuſe angles.* Leonurus Canadenſis, origani folio. Tourn. Inſt. R. H. 187. *Canada Lion's Tail, with an Origanum leaf.*
2. MONARDA (*Didyma*) floribus capitatis, ſub-didynamis, caule acutangulo. Lin. Sp. Plant. 32. *Monarda with headed flowers, whoſe ſtamina are almoſt in two bodies, and an acute angular ſtalk.* Monarda floribus capitatis verticillatiſque, caule acutangulo, foliis lanceolato-ſerratis glabris. Butt. Cun. 226. *Monarda with flowers collected in heads and whorls, an acute-angular ſtalk, and ſmooth, ſawed, ſpear-ſhaped leaves, commonly called Oſwego Tea.*
3. MONARDA (*Punctata*) floribus verticillatis, corollis punctatis. Hort. Upſal. 12. *Monarda with flowers growing in whorls, whoſe petals are ſpotted.* Clinopodium Virginianum, anguſtifolium, floribus amplis luteis, purpurâ maculâ notatis, cujus caulis ſub quovis verticillo decem vel duodecim foliolis rubentibus eſt circumcinctis. Baniſt. Raii Sup. 300. *Narrow-leaved Field Baſil of Virginia, with large yellow flowers ſpotted with purple, whoſe ſtalks have ten or twelve reddiſh leaves under each whorl of flowers.*

The firſt ſort grows naturally in Canada, and many other parts of North America. It hath a perennial root, compoſed of many ſtrong fibres, which ſpread far on every ſide. The ſtalks riſe near three feet high, which are hairy, and have obtuſe angles; theſe ſend out two or four ſmall ſide branches toward the top, garniſhed with oblong leaves, broad at their baſe, but terminate in acute points; they are hairy, a little indented on their edges, ſtanding on ſhort hairy foot-ſtalks, and are placed oppoſite. The ſtalk and branches are terminated by heads of purple flowers, which have a long involucrum, compoſed of five acute-pointed leaves. The flowers have each two ſtamina which are longer than the petal, with a ſtyle of the ſame length, crowned by a bifid ſtigma. The flowers appear in July, and are ſucceeded by ſeeds which ripen in the autumn.

The ſecond ſort grows naturally in North America, where the inhabitants frequently uſe the leaves for tea, ſo it is commonly called Oſwego Tea, by which title it was brought to England. This hath a perennial root and an annual ſtalk, which decays every autumn. The ſtalks of this ſort are ſmooth, having four acute angles; they riſe about two feet high, and are garniſhed with ſmooth, oval, ſpear-ſhaped leaves, which are indented on their edges, and ſtand oppoſite on very ſhort foot-ſtalks; theſe when bruiſed, emit a very grateful refreſhing odour; the ſtalks ſend out toward their top two or four ſmall ſide branches, which are garniſhed with ſmall leaves of the ſame ſhape with the other. The flowers are produced in large heads or whorls at the top of the ſtalk, and there is often a ſmaller whorl of flowers, growing round the ſtalk at a joint below the head; and out of the head ariſes a naked foot-ſtalk, ſuſtaining a ſmall head or whorl of flowers: the flowers are of a bright red colour; they have two lips, the upper lip is long, narrow, and entire, the under lip is cut into three parts; they have each two ſtamina which are longer than the petal, terminated by compreſſed ſummits, and many of them have two ſhorter ſtamina, without ſummits. The plant flowers in July, but in a moiſt ſeaſon, or when the plants are in a moiſt ſoil, they will continue in flower till the middle or latter end of September.

Both theſe ſorts may be propagated by parting of their roots; the firſt does not multiply ſo faſt as the ſecond, but as that produces plenty of ſeeds, ſo it may be eaſily propagated that way. If the ſeeds are ſown in the autumn ſoon after they are ripe, the plants will come up the following ſpring; but if they are not ſown till ſpring, the plants ſeldom riſe till the next year. When the plants are come up and are fit to remove, they ſhould be tranſplanted into a ſhady border about nine inches diſtance, and when they have taken new root, they will require no other care but to keep them clean from weeds till the autumn, when they ſhould be tranſplanted into the borders where they are to remain. The following ſummer they will flower and produce ripe ſeeds, but the roots will continue ſeveral years, and may be parted every other year to increaſe them. This loves a ſoft loamy ſoil, and a ſituation not too much expoſed to the ſun.

The ſecond ſort ſeldom ripens ſeeds in England, but it increaſes faſt enough by its creeping roots, as alſo by ſlips or cuttings, which, if planted in a ſhady border in May, will take root in the ſame manner as Mint or Balm; but as the roots multiply ſo faſt, there is ſeldom occaſion to uſe any other method to propagate them.

This ſort loves a moiſt light ſoil, and in a ſituation where the plants have only the morning ſun, they will continue longer in flower than thoſe which are expoſed to the full ſun. This is a very ornamental plant in gardens, and the ſcent of the leaves is very refreſhing and agreeable to moſt people, and ſome are very fond of the tea made with the young leaves.

The third ſort grows naturally in North America; this is a biennial plant, and probably in its native country may be an annual, for the roots periſh after the plants have perfected their ſeeds. This hath ſquare ſtalks which riſe about two feet high, branching out from the bottom to the top, and are garniſhed with ſpear-ſhaped leaves, which come out in cluſters at each joint, where there are two larger leaves

placed

placed opposite, and several smaller come out on each side the stalk; the larger leaves are about two inches and a half long, and three quarters of an inch broad, and are slightly indented on their edges. Toward the upper part of their stalk the flowers come out in large whorls, having to each whorl an involucrum, composed of ten or twelve small spear-shaped leaves, of a purplish red colour on their upper side; the flowers are pretty large, of the same form with those of the other sorts, of a dirty yellow colour spotted with purple; they have each two long stamina situated under the upper lip, which are terminated by bifid compressed summits, and are succeeded by four naked seeds inclosed in the empalement. It flowers in July, and if the summer proves favourable, the seeds sometimes ripen in the autumn.

This plant is propagated by seeds, which, if sown on a border of light earth exposed to the east, the plants will rise very freely; when they are fit to remove, they may be transplanted into a shady border, in the same manner as hath been directed for the first sort; and if they should shoot up stalks to flower, they should be cut down to strengthen the roots, that they may put out lateral buds, for when they are permitted to flower the first year, the roots seldom live through the winter, therefore they should be prevented: in the autumn the plants may be removed, and planted in the open borders of the pleasure-garden, where they will flower the following summer; and if the season should prove dry, they should be duly watered, otherwise they will not be near so beautiful, nor will the plants produce good seeds.

MONBIN. See Spondias.

MONTIA. See Heliocarpus.

MORÆA. Lin. Gen. Plant. 60.

The Characters are,

*The sheath of the flower has two valves; the flower is composed of six petals, the three upper are erect and bifid, the three under spread open; it hath three short stamina, terminated by oblong summits. The germen is situated below the flower, supporting a single style, crowned by a trifid erect stigma. The germen afterward becomes a three-cornered capsule, having three furrows, with three cells, containing several round seeds.*

This genus of plants is ranged in the first section of Linnæus's third class, intitled Triandria Monogynia, the flower having three stamina and one style.

The Species are,

1. Moræa (*Vegeta*) spatha uniflora, foliis gladiolatis. *Morea with one flower in each sheath, and sword-shaped leaves.* Moræa foliis canaliculatis. Lin. Sp. 59. *Morea with channelled leaves.*
2. Moræa (*Juncea*) spatha biflora, foliis subulatis. *Morea with two flowers in each sheath, and awl-shaped leaves.* Moræa foliis subulatis. Lin. Sp. 59. *Morea with awl-shaped leaves.*

These plants are both natives of the Cape of Good Hope, from whence I received their seeds, which have succeeded in the Chelsea garden, where the plants have several times produced their flowers, which differing from all the other genera of plants in the same class, I have taken the liberty of titling it Morea, in honour of Robert More, Esq; of Shrewsbury, who is well skilled in the science of botany, and also in other parts of natural history.

The first sort has fibrous roots like those of the Flag-leaved Iris, from whence arises many small sword-shaped leaves, five or six inches long, and half an inch broad in the middle, diminishing toward both ends, of a deep green colour, lying over each other at their base, in the same manner as the Iris; the flower-stalk arises between the leaves from the root, about eight inches high, having one small leaf at each joint, and is terminated by one flower, which is covered with a spatha (or sheath) having two valves; the flower is of a dirty white, each petal having a blush of purple toward their upper part, and a pretty broad spot of yellow toward their tails; within are three slender stamina terminated by oblong summits, and one style crowned by a trifid stigma. The flowers appear in June, and the seeds ripen the end of July.

The second sort hath a small bulbous root, a little compressed on the sides, with a smooth dark-coloured skin, from which arise three or four awl-shaped leaves of a pale green, some of which are five inches long, and others are seven or eight, and about half an inch broad, terminating with three angles; the foot-stalks of the flowers rise about six inches high, and generally bend at their lower joint; these are garnished with a small leaf at each joint, whose base almost surrounds the stalk, which is terminated by two flowers, encompassed with a withered sheath; the flowers are of an Orange colour; the petals are pretty broad upward, but are connected at their base. These appear in June, and the seeds ripen the end of July.

The plants are propagated either by seeds, or from offsets of the second sort, and by parting or dividing the roots of the first; the best time for transplanting of them, and separating the offsets of the second sort, and parting the roots of the first, is in August, that they may put out new fibres before winter; and that is also the right season for sowing of the seeds, for when they are sown at this time of the year in small pots, and plunged into a bed of old tanners bark, under a common frame in winter, there is little danger of these seeds miscarrying. The plants will also require this sort of shelter in winter, for as they are too tender to thrive in the open air in England, and if they are placed in a green-house, they are apt to draw up weak, therefore when they are sheltered under a frame, so as to enjoy the free open air in winter when the weather is warm, and secured from frost and hard rains, they will flower and ripen their seeds better than with any other management: in summer they should be fully exposed to the open air till October, when they should be removed into shelter.

MORINA. Tourn. Cor. 48. tab. 480. Lin. Gen. Plant. 39. Diototheca. Vaill. Mem. Acad. 1722.

The Characters are,

*It hath a double empalement; that under the fruit is tubulous, cylindrical, of one leaf, indented at the brim, and permanent; that of the flower is tubulous, bifid, of one leaf, and permanent. The flower hath one petal, with a long tube enlarged upward, and a little incurved. The top is divided into two lips; the upper lip is small and bifid, the under lip is cut into three equal obtuse segments, the middle one being extended beyond the other. It hath two bristly stamina situated near the style, terminated by heart-shaped erect summits. The globular germen is situated under the flower, supporting a slender style which is longer than the stamina, crowned by a target-shaped stigma; the germen afterward becomes a single seed, crowned by the empalement of the flower.*

This genus of plants is ranged in the first section of Linnæus's second class, which contains those plants whose flowers have two stamina and one style.

There is but one Species of this genus at present known, which is,

Morina (*Orientalis.*) Hort. Cliff. 14. Morina Orientalis, carlinæ folio. Tourn. Cor. *Eastern Morina, with a Carline Thistle leaf.*

This plant was discovered by Dr. Tournefort, in his travels in the Levant, who gave it this name in honour of Dr. Morin, a physician at Paris.

It grows naturally near Erzeron in Persia, and was in the English gardens before the severe winter in 1740, which killed all the plants that were here, also those in the garden at Paris; so the only plant remaining was in the garden of Monsieur du Hamel. The root of this plant is taper and thick, running deep into the ground, sending out several thick strong fibres as large as a finger; the stalk rises near three feet high; it is smooth, of a purplish colour toward the bottom, but hairy and green at the top, garnished at each joint by three or four prickly leaves like those of the Carline Thistle; they are four or five inches long, and an inch and a half broad, of a lucid green on their upper side, but of a pale green on their under, and a little hairy, armed on their edges with spines. The flowers come out

out from the wings of the leaves on each side the stalk; these have very long tubes, which are slender at the bottom, but are enlarged upward, and are a little incurved; the brim spreads open with two large lips, the upper lip is indented at the top and rounded, the lower lip is cut into three obtuse segments; under the lip are situated two bristly stamina which are crooked, and crowned with yellow summits. These flowers appear in July, but I never had any seeds succeed them. Some of the flowers are white, and others of a purplish red on the same plant.

This plant is propagated by seed, which should be sown soon after it is ripe in the autumn, otherwise the plants will not come up the following summer; for I have several times observed, where the seeds have been sown in the spring, they have remained in the ground fourteen or fifteen months before the plants have appeared. These seeds should be sown in the places where the plants are to remain, because they send forth tap-roots, which run very deep into the ground; and when these are broken or injured in transplanting, the plants seldom thrive after. They may be sown in open beds or borders of fresh light earth, being careful to mark the places, that the ground may not be disturbed; for it frequently happens, that the seeds do not come up the first year, when they are sown in autumn; but when they are sown in the spring, they never come up the same year. The ground where the seeds are sown must be kept clear from weeds, which is all that is necessary to be done, until the plants come up; where they are too close together, they should be thinned while young, so as to leave them near eighteen inches apart; after which time, they will require no other culture but to keep them constantly clear from weeds; and in the spring, just before the plants put out new leaves, to dig the ground gently between them, and lay a little fresh earth over the surface of the bed to encourage them.

In autumn these plants decay to the ground, and send forth new leaves the following spring, but it will be three years from the time of the plants first coming up to their flowering, though after that time they will flower every season; and the roots will continue many years, provided they are not disturbed, or killed by very severe frost.

MORUS. Tourn. Inst. R. H. 589. tab. 363. Lin. Gen. Plant. 936. [of μαυρὸς, black, because its fruit is ordinarily so.] The Mulberry-tree; in French, *Murier*.

The Characters are,

*It hath male flowers growing at separate distances from the female on the same tree. The male flowers are collected in long taper ropes or katkins; these have no petals, but have four awl-shaped erect stamina, which are longer than the empalement, terminated by single summits. The female flowers are collected into roundish heads; these have no petals, but a heart-shaped germen, supporting two long, rough, reflexed styles, crowned by single stigmas. The empalement of these afterward become large, fleshy, succulent fruit, composed of several protuberances, in each of which is lodged one oval seed.*

This genus is ranged in the fourth section of Linnæus's twenty-first class, which contains those plants which have male and female flowers at separate distances on the same plant, and the male flowers have four stamina.

The Species are,

1. Morus (*Nigra*) foliis cordatis. Hort. Cliff. 441. *Mulberry with rough heart-shaped leaves.* Morus fructu nigro. C. B. P. 459. *Mulberry with a black fruit, or the common Mulberry.*
2. Morus (*Laciniatis*) foliis palmatis hirsutis. *Mulberry with hand-shaped hairy leaves.* Morus fructu nigro minori foliis eleganter laciniatis. Tourn. Inst. R. H. 589. *Smaller black Mulberry with elegant cut leaves.*
3. Morus (*Rubra*) foliis cordatis subtus villosis, amentis cylindricis. Lin. Sp. Plant. 986. *Mulberry with heart-shaped leaves which are hairy on their under side, and cylindrical katkins.* Morus Virginiensis arbor, loti arboris instar ramosa, foliis amplissimis. Pluk. Phyt. tab. 246. fol. 4. *Virginia Mulberry branching like the Nettle-tree, having very large leaves.*
4. Morus (*Alba*) foliis obliquè cordatis lævibus. Hort. Cliff. 441. *Mulberry with oblique, smooth, heart-shaped leaves.* Morus fructu albo. C. B. P. 459. *Mulberry with a white fruit.*
5. Morus (*Tinctoria*) foliis obliquè cordatis acuminatis hirsutis. *Mulberry with oblique, heart-shaped, acute-pointed, hairy leaves.* Morus fructu viridi, ligno sulphureo tinctorio. Sloan. Hist. Jam. 2. p. 3. *Mulberry with a green fruit, whose wood dyes a sulphur colour, or Fustick wood.*
6. Morus (*Papyrifera*) foliis palmatis, fructibus hispidis. Lin. Sp. Plant. 986. *Mulberry with hand-shaped leaves and prickly fruit.* Morus sativa, foliis urticæ mortuæ, cortice papyrifera. Kæmp. Amœn. 471. *Cultivated Mulberry with leaves like Dead Nettle, and of whose bark paper is made.*
7. Morus (*Tatarica*) foliis ovato-oblongis utrinque æqualibus, inæqualiter serratis. Flor. Zeyl. 337. *Mulberry with oval oblong leaves, which are equal on both sides, but unequally sawed.* Tinda-parua. Hort. Mal. 1. p. 87. fol. 49.
8. Morus (*Zanthoxylum*) foliis ovato-oblongis acuminatis obliquis, ramis aculeatis. *Mulberry with oval, oblong, acute-pointed leaves, which are oblique to the foot-stalk, and prickly branches.* Zanthoxylum aculeatum, carpini foliis, Americanum, cortice cinereo. Pluk. Phyt. 239. fol. 3. *Prickly Zanthoxylum of America, with Hornbeam leaves and an Ash-coloured bark.*

The first sort is the common black Mulberry-tree, which is cultivated for the delicacy of its fruit. This tree grows naturally in Persia, from whence it was first brought to the southern parts of Europe, but is now become common in every part of Europe, where the winters are not very severe; for in the northern parts of Sweden, these trees will not live in the open air; and in several parts of Germany they are planted against walls, and treated in the same way as Peach, and other tender fruits are here.

These trees are generally of both sexes, having male flowers or katkins on the same tree with the fruit; but it often happens, that some of the trees which are raised from seeds, have generally male flowers, and produce no fruit; so that those who plant these trees for their fruit, should never make choice of such as have been propagated by seeds, unless they have seen them produce fruit in the nursery. It is also the surest way to mark such trees as are fruitful in the nursery, at the time when their fruit is upon them, because those trees which are propagated by layers, are sometimes of the male sort; for I have several times observed, that some of the large branches of these trees have produced only katkins, when the other parts of the trees have been very fruitful; so that unless care is taken in the choice of the branches for making the layers, there is the same hazard as in seedling trees: nor should the shoots which come out near the roots of old trees be ever laid down, for these rarely produce fruit until they have been planted many years, although the trees from which these were produced might be very fruitful. I have observed some trees which produced only katkins for many years after they were planted, and afterward have become fruitful; the same I have observed in Walnut-trees, and my honoured friend the Chevalier Rathgeb, has informed me, that he has observed the same in the Lentisk and Turpentine-trees.

The old Mulberry-trees are not only more fruitful than the young, but their fruit are much larger and better flavoured; so that where there are any of these old trees, it is the best way to propagate from them, and to make choice of those branches which are most fruitful. The usual method of propagating these trees, is by laying down their branches, which will take root in one year, and are then separated from the old trees; but as the most fruitful branches are often so far from the ground as not be layed, unless by raising of boxes or baskets of earth upon supports

for

for this purpose, so the better way is to propagate them by cuttings, which, if rightly chosen and skilfully managed, will take root very well; and in this method there will be no difficulty in having them from trees at a distance, and from the most fruitful branches. These cuttings should be the shoots of the former year, with one joint of the two years wood to their bottom; the cuttings should not be shortened, but planted their full length, leaving two or three buds above ground. The best season for planting them is in March, after the danger of hard frost is over; they should be planted in light rich earth, pressing the ground pretty close about them; and if they are covered with glasses, it will forward their putting out roots; but where there is not such conveniency, the ground about them should be covered with moss, to prevent its drying; and where this is carefully done, the cuttings will require but little water, and will succeed much better than with having much wet. If the cuttings succeed well and make good shoots, they may be transplanted the following spring into a nursery, where they should be regularly trained to stems, by fixing down stakes by each, to which the principal shoots should be fastened; and most of the lateral branches should be closely pruned off, leaving only two or three of the weakest to detain the sap, for the augmentation of the stem; for when they are quite divested of their side shoots, the sap is mounted to the top, so that the heads of the trees grow too fast for the stems, and become too weighty for their support. In about four years growth in the nursery, they will be fit to transplant where they are to remain; for these trees are transplanted with greater safety while young, than when they are of a large size.

If the cuttings are planted in a bed fully exposed to the sun, it will be proper to arch the bed over with hoops, that they may be shaded with mats in the heat of the day during the spring, till they have put out roots; after which, the more they are exposed to the sun, the better they will succeed, provided the ground is covered with moss or mulch to prevent its drying, for the sun will harden the shoots, and thereby they will be in less danger of suffering by the early frosts in autumn; for when these are in a shady situation, they are apt to grow vigorously in summer, so will be replete with moisture, and the early frosts in October frequently kill their tops; and if the following winter proves severe, they are often killed to their roots, and sometimes are entirely destroyed. I have two or three times made trial of planting the cuttings of Mulberries on a hot-bed, and have found them succeed extremely well. This I was led to by observing some sticks of Mulberry-trees which were cut for forks, and thrust into the hot-bed to fasten down the Vines of Cucumbers; which, although they had been cut from the tree a considerable time, yet many of them put out roots and shot out branches; so that where any person is in haste to propagate these trees, if the cuttings are planted on a moderate hot-bed, they will take root much sooner than in the common ground.

This tree delights to grow in rich light earth, such as is in most of the old kitchen-gardens about London, where there is also a great depth of earth; for in some of those gardens there are trees of a very great age, which are very healthy and fruitful, and their fruit is larger and better flavoured than those of younger trees. I have never yet seen any of these trees which were planted in a very stiff soil, or on shallow ground, either upon clay, chalk, or gravel, which have been healthy or fruitful, but their stems and branches are covered with moss, so that the little fruit which they sometimes produce are small, ill tasted, and late before they ripen.

If these trees are planted in a situation where they are defended from the strong south and north-west winds, it will preserve their fruit from being blown off; but this shelter, whether it be trees or buildings, should be at such a distance as not to keep off the sun; for where the fruit has not the benefit of his rays to dissipate the morning dews early, they will turn mouldy and rot upon the trees. There is never any occasion for pruning these trees, more than to cut off any of the branches which may grow across others, so as to rub and wound their bark, by their motion occasioned by the wind; for their shoots should never be shortened, because the fruit is produced on the young wood.

The second sort grows naturally in Sicily, from whence I received a parcel of the seeds, and raised a good number of the plants; all these were totally different in their leaves from the common Mulberry, so that I am certain of its being a distinct species. It is also a tree of humbler growth, but the fruit is small and has no flavour, so is not worth propagating; some of the trees produced fruit two or three years in the Chelsea garden.

The white Mulberry is commonly cultivated for its leaves to feed silk-worms in France, Italy, &c. though the Persians generally make use of the common black Mulberry for that purpose; and I have been assured by a gentleman of honour, who has made trial of both sorts of leaves, that the worms fed with those of the black sort produce much better silk than those fed with the white; but he observes that the leaves of the black sort should never be given to the worms after they have eaten for some time of the white, lest the worms should burst, which is often the case when they are thus treated.

The trees which are designed to feed silk-worms, should never be suffered to grow tall, but rather kept in a sort of hedge; and instead of pulling off the leaves singly, they should be sheared off together with their young branches, which is much sooner done, and not so injurious to the tree.

This white sort may be propagated either from seeds or layers, as the black Mulberry, and is equally hardy; but the most expeditious method of raising these trees in quantity, is from the seeds, which may be procured in plenty from the south of France or Italy: the best way to sow these seeds in England, is to make a moderate hot-bed, which should be arched over with hoops, and covered with mats; upon this bed the seeds should be sown in the end of March, and covered over with light earth about a quarter of an inch deep: in very dry weather the bed must be frequently watered, and in the heat of the day shaded with mats, and also covered in the nights when they are cold; with this management the plants will come up in five or six weeks, and as they are tender when they first appear, so they must be guarded against frosty mornings, which often happen in May, and destroy such tender plants; during the summer they must be kept clean from weeds, which is all the culture they require: but there must be care taken of them the first winter, especially to cover them in autumn, when the first frosts come, which will kill the tender plants to the ground, if they are not protected; the following March these plants should be transplanted into the nursery to get strength, where they may remain two or three years, and then should be removed where they are to continue.

There are two or three varieties of this tree, which differ in the shape of their leaves, size, and colour of their fruit; but as they are of no other use than for their leaves, the strongest shooting and the largest leaved should be preferred.

The third sort, which is the large-leaved Virginian Mulberry with black shoots, is more uncommon than either of the former; there is a large tree of this growing in the gardens of the Bishop of London at Fulham, which has been several years an inhabitant of that garden, but has never produced any fruit that I could learn, but hath some years a great number of katkins, much like those of the Hazel-nut, which occasioned Mr. Ray to give it the name of Corylus; but it may be one of the male trees which do not produce fruit, as it sometimes happens in the common

ſorts of Mulberries; the leaves of this are ſomewhat like thoſe of the common Mulberry-tree, but are rougher.

This tree has not been propagated yet in this country, for though it has been budded and grafted upon both the black and white Mulberries, yet I cannot hear that it hath ſucceeded upon either, ſo that I ſuſpect it is not of this genus; and the tree being pretty tall, cannot be laid down, which is the moſt likely method to propagate it. This is very hardy, and will endure the cold of our climate in the open air very well, and is coveted as a curioſity by ſuch as delight in a variety of trees and ſhrubs.

The fifth ſort is the tree whoſe wood is uſed by the dyers, and is better known by the title of Fuſtick, which is given to the wood, than by its fruit, which is of no eſtimation. This grows naturally in moſt of the iſlands in the Weſt-Indies, but in much greater plenty at Campeachy, where it abounds greatly. This wood is one of the commodities exported from Jamaica, where it grows in greater plenty than in any other of the Britiſh iſlands.

This tree in the countries where it grows naturally, riſes to the height of ſixty feet or upward; it has a light brown bark, which hath ſome ſhallow furrows; the wood is firm, ſolid, and of a bright yellow colour. It ſends out many branches on every ſide, covered with a white bark, and are garniſhed with leaves about four inches long, which are broad at their baſe, indented at the foot-ſtalk, where they are rounded, but one ſide is broader than the other, ſo that they are oblique to the foot-ſtalk; theſe diminiſh gradually, and end in acute points; they are rough like thoſe of the common Mulberry, of a dark green, and ſtand upon ſhort foot-ſtalks. Toward the end of the young branches come out ſhort katkins of a pale herbaceous colour, and in other parts of the ſame branches the fruit is produced, growing upon ſhort foot-ſtalks; they are as large as nutmegs, of a roundiſh form, full of protuberances like the common Mulberry, green within, and alſo on the outſide, of a luſcious ſweet taſte when ripe.

It is too tender to thrive in this country, unleſs preſerved in a warm ſtove. There are ſeveral of the plants now growing in the Chelſea garden, which were raiſed from ſeeds ſent from Jamaica, by William Williams, Eſq; with many other curious ſorts, which are natives of that iſland. The ſeeds of this plant come up freely on a hot-bed, and when the plants are fit to remove, they ſhould be each planted in a ſeparate ſmall pot filled with freſh light earth, and plunged into a hot-bed of tanners bark, and ſhaded from the ſun till they have taken new root; then they ſhould be treated in the ſame way as other plants from thoſe hot countries, always keeping them in the tan-bed in the ſtove, where they will make good progreſs. Theſe plants retain their leaves great part of the year in the ſtove.

The ſixth ſort grows naturally in China and Japan; it alſo grows naturally in South Carolina, from whence I have received the ſeeds; the inhabitants of Japan make paper of the bark; they cultivate the trees for that purpoſe on the hills and mountains, much after the ſame manner as Oſiers are cultivated here, cutting down the young ſhoots in autumn for their bark. There were ſeveral of theſe trees raiſed from ſeeds a few years paſt, in the gardens of his Grace the Duke of Northumberland, who was ſo good as to favour me with one of the plants, which thrives very well in the open air without any ſhelter, as many of the trees and plants of thoſe countries will do, if they grow on the mountains. This plant makes very ſtrong vigorous ſhoots, but ſeems not to be of tall growth, for it ſends out many lateral branches from the root upward. The leaves are large, ſome of them are entire, others are deeply cut into three, and ſome into five lobes, eſpecially while the trees are young, dividing in form of a hand; they are of a dark green, and rough to the touch, but of a pale green, and ſomewhat hairy on their under ſide, falling off on the firſt approach of froſt in autumn, as do thoſe of the common Mulberry. The deſcription which Kæmpfer gives of the fruit is, that they are a little larger than Peas, ſurrounded with long purple hairs, are compoſed of acini, or protuberances, and when ripe, change to a black purple colour, and are full of ſweet juice.

This tree may be propagated by laying down the branches, in the ſame way as is practiſed for the common Mulberry; or it may be multiplied by planting the cuttings, in the ſame manner as before directed for the common ſort.

The ſeventh ſort grows naturally in India, where it becomes a large tree. It hath ſoft, thick, yellowiſh bark, with a milky juice like the Fig, which is aſtringent. The branches come out on every ſide, which are garniſhed with oblong oval leaves, ſtanding upon ſhort foot-ſtalks; both ſides of theſe leaves are equal, but their edges are unequally ſawed; they are rough, of a dark green on their upper ſide, but pale on their under, ſtanding alternately on the branches. The flowers come out in round heads at the foot-ſtalks of the leaves, on each ſide the branches; they are of an herbaceous white colour; the male flowers have four ſtamina; the female flowers are ſucceeded by roundiſh fruit, which are firſt green, afterwards white, and when ripe turn to a dark red colour. I received the ſeeds of this plant from Bombay, which ſucceeded in the Chelſea garden. The plants are too tender to live out of a ſtove in this country; for as I raiſed a good number of the plants, ſo when they had obtained ſtrength, I placed ſome of them in different ſituations, where they were defended from the froſt, but not any of them ſurvived the winter, but thoſe which were in the bark-ſtove, where they are conſtantly kept, and treated in the ſame manner as other tender plants, giving them but little water in winter, with which management the plants thrive, and retain their leaves all the year.

The eighth ſort grows naturally in Jamaica, and alſo in the Bahama Iſlands, from both which places I have received the ſeeds. The wood of this tree is cut, and ſold for the ſame uſes as the fifth, from which this tree has not been well diſtinguiſhed by the botaniſts: this does not grow to ſo great a ſize as the fifth; the branches are ſlenderer, the leaves are narrower, and are rounded at their baſe, ſawed on their edges, and end in acute points. At the foot-ſtalk of each leaf comes out two ſharp thorns, which, in the older branches grow to the length of two inches. The fruit is ſhaped like that of the fifth ſort, but is ſmaller.

MOSCHATELLINA. See Adoxa.

MOSS. See Muscus.

MOTHERWORT. See Cardiaca.

MOULD, or earth, the goodneſs of which may be known by the ſight, ſmell, and touch.

Firſt, by the ſight: thoſe Moulds that are of a bright Cheſtnut, or hazelly colour, are counted the beſt; of this colour are the beſt loams, and alſo the beſt natural earth, and this will be the better yet, if it cuts like butter, and does not ſtick obſtinately, but is ſhort, tolerably light, breaking into ſmall clods, is ſweet, will be tempered without cruſting or chapping, in dry weather, or turning to mortar in wet.

The next to that, the dark gray and ruſſet Moulds are accounted the beſt, the light and dark Aſh-colour are reckoned the worſt, ſuch as are uſually found on common, or heathy ground; the clear tawny is by no means to be approved, but that of a yellowiſh red colour is accounted the worſt of all; this is commonly found in wild and waſte parts of the country, and for the moſt part produce nothing but Furz and Fern, according as their bottoms are more or leſs of a light and ſandy, or of a ſpewy gravel, or clayey nature.

Secondly, by the ſmell: all lands that are good and wholeſome, will, after rain, or breaking up by the ſpade, emit a good ſmell.

Thirdly, by the touch: by this means we may diſcover whether it conſiſts of ſubſtances entirely arenaceous, or clammy; or, according as it is expreſſed by Mr.

Mr. Evelyn, whether it be tender, fatty, detersive, or slippery, or more harsh, gritty, porous, or friable.

That being always the best that is between the two extremes, and does not contain the two different qualities of soft and hard mixed, of moist and dry, of churlish and mild, that is neither too unctuous or too lean, but such as will dissolve, of a just consistence, between sand and clay, and such as will not stick to the spade or fingers upon every flash of rain.

A loam, or brick Mould, is not to be disapproved, as requiring little help or improvement but the spade, and is esteemed both by the gardener and florist.

MUCILAGE is a viscous clammy substance about seeds, &c.

MUCILAGINOUS signifies, endowed with a clammy viscous matter.

MULBERRY. See Morus.

MULLEIN. See Verbascum.

MULTISILIQUOUS plants are such as have after each flower, many distinct, long, slender, and, oftentimes, crooked cases, or siliquæ, in which their seed is contained, and, which, when they ripen, open of themselves, and let the seeds drop. Of this kind is the Bear's-foot, Columbines, common House-leek, Navelwort, Orpine, &c.

MUMMY, a sort of grafting wax, made of one pound of common black pitch, and a quarter of a pound of common turpentine, put into an earthen pot, and set on the fire in the open air; in doing this you ought to hold a cover in your hand, ready to cover it, in order to quench it, by putting it thereon, which is to be done several times, setting it on the fire again, that the nitrous and volatile parts may be evaporated. The way to know when it is enough, is by pouring a little of it on a pewter plate, and if it be so, it will coagulate presently; then this melted pitch is to be poured into another pot, and a little common wax is to be added to it, mixing them well together, and then to be kept for use.

Dr. Agricola directs the using this Mummy as follows:

When you would dress roots with this wax, you must melt it, and afterwards let it cool a little; then dip in the ends of the roots you would plant (for he proposes it for the planting pieces of roots of trees, &c.) one after the other, but not too deep, and afterwards to put them in water, and to plant them in the earth, the small end downwards, so that the larger end may appear a little way out thereof, and have the benefit of the air, and then to press the earth very hard down about them, that they may not receive too much wet, because that would rot them.

Mummy for exotic plants; the same author directs the making it as follows:

Take half a pound of gum copal, beat it very fine, and searce it; take three pounds of Venice turpentine, and melt it over a slow fire in a strong earthen pot; when the turpentine is melted and liquidated, put the sifted gum into it, keep it continually stirring with a little stick, augmenting the fire gradually, and it will all dissolve insensibly; afterwards let the turpentine evaporate well, and it will thicken; and when it is become of a sufficient consistence, you may make it up into little rolls, like sealing-wax, and keep it for use.

This Mummy, he says, is an excellent vulnerary for plants, it being subject to no corruption, as other gummy things are; it hinders any rottenness between the stock and the root, by means of which the callus is formed the sooner, and spreads over all the parts, and the stock becomes entirely connected with the root. It also gives strength and vigour to the root, and likewise facilitates it.

Vegetable Mummy; the same author directs the making of this as follows:

Fill a large kettle, or earthen pot, about a third part full of common black pitch, and add to it a little fine resin, or sulphurated pitch, and a little yellow wax; melt these together till they become liquid, then take them off the fire, and let them stand till they have done smoking, and, when cool, you may, with a brush, plaster the incisions which are made for the inoculation, grafting, &c.

Garden or Forest Mummy; the same author directs the making it as follows:

Take three pounds of common turpentine, and four pounds of common pitch; melt the turpentine over the fire, and, having beaten the pitch to a powder, throw it in; when they are well mixed together, and grown pretty thick, take it off, and keep it for use.

This composition may be either made up into little sticks, like those of sealing-wax, to be made use of on little trees, or it may be kept in little pots, and melted over a slow fire, when there is occasion to use it, and, dipping a little brush in it, you may plaster the graft.

The Noble Mummy, or grafting wax; to make this the same author directs:

Take two pounds of pure pitch, such as is called at Ratisbon virgin pitch, and add to it half a pound of good turpentine; put them together in an earthen pot, and set them over the fire, that the volatile part of the turpentine may evaporate, otherwise it would be very prejudicial to trees and roots. Prove it as you did the former, to know when it is enough; then add to it half a pound of virgin wax, and half an ounce of pounded Myrrh and Aloes; when these are well mixed, make it up into little rolls or plasters, or else it may be kept in gallipots.

The time he directs when the operation of the roots is to be performed, is in the month of September, October, and November; though it may succeed well at any time of the year, yet those months are the most proper seasons for it. The only difference he says, is, what is planted in the spring, will shoot out in June or July, and what is planted in autumn comes not forth till the month of April.

The aforesaid author mentions great performances by using these Mummies; those who have a mind to be satisfied, may peruse his treatise.

MUNTINGIA. Plum. Gen. Nov. 41. tab. 6. Lin. Gen. Plant. 575.

The Characters are,

*The empalement of the flower is cut into five segments to the bottom. The flower hath five heart-shaped petals, narrow at their base, which are inserted in the empalement, and spread open like a Rose. It has a great number of stamina, which are terminated by roundish summits. In the center is situated a roundish germen, having no style, but is crowned by a stigma divided into many parts. The germen afterward turns to a soft fruit, with one cell, crowned by the stigma, like a navel, and filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, which includes those plants whose flowers have many stamina and one stigma. According to Tournefort's system, it must be ranged in the eighth section of his twenty-first class, which contains the trees and shrubs with a Rose flower, whose empalement becomes a fruit, having hard seeds.

We know but one Species of this genus, viz.

Muntingia (*Calabura.*) Jacq. Hist. tab. 107. Muntingia folio sericeo molli, fructu majori. Plum. Nov. Gen. 41. *Muntingia with a soft silky leaf, and a larger fruit.*

The title of this genus was given to it by Father Plumier, in honour of Dr Muntingius, who was professor of botany at Groningen in Holland, who published a folio book of botany, entitled, Phytographia Curiosa, in which there are many figures of plants exhibited, engraven on copper-plates; he also published two books of plants in quarto, one of which is entitled, Aloidarum, in which the figures of several sorts of Aloes are exhibited; the title of the other is, De Herba Britannica Antiquorum.

This plant is figured and described by Sir Hans Sloane, in his History of Jamaica, by the title of Loti arboris folio angustiore, rubi flore, fructu polyspermo umbilicato, 2. p. 80. This rises to the height of thirty feet or more in its native soil, sending out

many branches toward the top, which are covered with a smooth, dark, purple bark, garnished with leaves about three inches long, and three quarters broad at their base, where they are rounded to a heart-shape at the foot-stalk, but end in acute points, are very woolly on their under side, but smooth above, and of a lucid green; they are slightly sawed on their edges, and are placed alternately. The flowers come out from the wings of the stalks, standing upon long foot-stalks, composed of five heart-shaped petals, which are white, and spread open, resembling those of the Bramble, having many stamina about half the length of the petals, terminated by globular summits, and in the center is situated a roundish germen, crowned by a many-pointed stigma. The germen afterward turns to a pulpy umbilicated fruit, as large as the fruit of the Cockspur Hawthorn, and, when ripe, of a dark purple colour, inclosing many small, hard, angular seeds; this sort has produced flowers and fruit in England.

The seeds of this plant were sent by Mr. Robert Millar from Jamaica, which succeeded in some of the English gardens.

The plants are propagated by seeds, which should be sown in pots filled with light rich earth, and plunged into a moderate hot-bed of tanners bark, and in warm weather the glasses should be raised to admit fresh air. These seeds will often remain in the ground a whole year before the plants will appear; in which case the pots must be kept constantly clear from weeds, and should remain in the hot-bed till after Michaelmas, when they may be removed into the stove, and plunged into the bark-bed, between other pots of tall plants, where they may remain during the winter season. These pots should be now and then watered, when the earth appears dry, and in the beginning of March the pots should be removed out of the stove, and placed into a fresh bark-bed under frames, which will bring up the plants soon after.

When the plants are come up about two inches high, they should be carefully taken out of the pots, and each planted into a separate small pot filled with light rich earth, and then plunged into the hot-bed again, observing to shade them from the sun until they have taken new root, after which time they should be duly watered, and in warm weather they must have a large share of fresh air. In this hot-bed the plants may remain until autumn, when the nights begin to be cold; at which time they should be removed into the stove, and plunged into the bark-bed. During the winter season these plants must be kept warm, especially while they are young, and frequently refreshed with water; but it must not be given to them in large quantities, lest it rot the tender fibres of their roots. It will be proper to continue these plants in the stove all the year, but in warm weather they should have a large share of fresh air; but as the plants grow in strength, they will be more hardy, and may be exposed in summer for two or three months, and in winter will live in a dry stove, if kept in a moderate degree of heat.

MURUCUIA. See Passiflora.

MUSA. Plum. Nov. Gen. 24. tab. 34. Lin. Gen. Plant. 1010. The Plantain-tree.

The Characters are,

*It hath male and female flowers upon the same foot-stalk, some of which are hermaphrodite; these are produced on a single stalk (or spadix;) the male flowers are situated on the upper part of the spike, and the female below; these are in bunches, each bunch having a sheath, or cover, which falls off. The flowers are of the lip kind. The petals constitute the upper lip, and the nectarium the under; they have six awl-shaped stamina, five of which are situated in the petal, and the sixth in the nectarium; this is double the length of the other, terminated by a linear summit; the others have none. The germen is situated under the flower, which is long, having three obtuse angles, supporting an erect cylindrical style, crowned by a roundish stigma. The germen afterward turns to an oblong, three-cornered, fleshy fruit, covered with a thick rind, divided into three parts.*

This genus of plants is ranged in the first section of Linnæus's twenty-third class, which includes those plants with male and female flowers, which have hermaphrodite flowers on the same stalk. Plumier ranges it in Tournefort's class, with the anomalous flowers of several petals; and Garçin places it among the plants with a Lily flower.

The Species are,

1. Musa (*Paradisiaca*) spadice nutante floribus masculis persistentibus. Lin. Sp. 1477. *Musa with a nodding spike, and nodding male flowers.* Musa fructu cucumerino longiorio. Plum. Nov. Gen. 24. *Musa with a longer Cucumber-shaped fruit, commonly called Plantain-tree.*
2. Musa (*Sapientum*) spadice nutante floribus masculis deciduis. Lin. Sp. 1477. *Musa with a nodding spike, and deciduous male flowers.* Musa fructu cucumerino, breviore. Plum. Nov. Gen. 24. *Musa with a shorter Cucumber-shaped fruit, commonly called Bonana.*

The first sort is cultivated in all the islands of the West-Indies, where the fruit generally serves the negroes for bread, and some of the white people also prefer it to most other sorts, especially to the Yams, and Cassada bread.

This plant rises with a soft herbaceous stalk fifteen or twenty feet high, and upward; the lower part of the stalk is often as large as a man's thigh, diminishing gradually to the top, where the leaves come out on every side, which are often more than six feet long, and near two feet broad, with a strong fleshy midrib, and a great number of transverse veins running from the midrib to the borders. The leaves are thin and tender, so that where they are exposed to the open air, they are generally torn by the wind; for as they are large, the wind has great power against them: these leaves come out from the side of the principal stalk, inclosing it with their base; they are rolled up at their first appearance, but when they are advanced above the stalk, they expand quite flat, and turn backward; as these leaves come up rolled in the manner before mentioned, their advance upward is so quick, that their growth may be almost discerned by the naked eye; and if a line is drawn across, level with the top of the leaf, in an hour's time the leaf will be near an inch above it. When the plant is grown to its full height, the spike of flowers will appear from the center of the leaves, which is often near four feet in length, and nods on one side. The flowers come out in bunches, those on the lower part of the spike being the largest; the others diminish in their size upward; each of these bunches is covered with a spathæ or sheath, of a fine purple colour within, which drops off when the flowers open. The upper part of the spike is made up of male or barren flowers, which are not succeeded by fruit, but those of the second sort fall off with their covers. The fruit of this is eight or nine inches long, and above an inch diameter, a little incurved, and has three angles; it is at first green, but, when ripe, of a pale yellow colour. The skin is tough, and within is a soft pulp of a luscious sweet flavour. The spikes of fruit are often so large as to weigh upwards of forty pounds.

The fruit of the first sort is generally cut before it is ripe, and roasted in the embers, then it is eaten instead of bread. The leaves are used for napkins and table cloths, and are food for hogs.

The second sort, which is commonly called Bonana, differs from the first, in having its stalks marked with dark purple stripes and spots. The fruit is shorter, straiter, and rounder, and the male flowers drop off; the pulp is softer, and of a more luscious taste, so is generally eaten by way of desert, and seldom used in the same way as the Plantain, therefore is not cultivated in such plenty.

Both these plants were carried to the West-Indies from the Canary Islands, to which place it is believed they

they were carried from Guinea, where they grow naturally: these plants are also cultivated in Egypt, and in most other hot countries, where they grow to perfection in about ten months, from their first planting, to the ripening of their fruit; when their stalks are cut down, several suckers come up from the root; they will also produce fruit in ten months after, so that by cutting down the stalks at different times, there is a constant succession of fruit all the year.

In Europe there are some of these plants preserved in the gardens of curious persons, who have hot-houses capacious enough for their reception, in many of which they have ripened their fruit very well; but as they grow very tall and their leaves are large, they require more room in the stove than most people care to allow them: they are propagated by suckers, which come from the roots of those plants which have fruited; and many times the younger plants, when they are stinted in growth, will put out suckers; these should be carefully taken off, preserving some fibres to their roots, and planted in pots filled with light rich earth, and plunged into the tan-bed in the stove: these may be taken off any time in summer, and it is best to take them off when young, because if their roots are grown large, they do not put out new fibres so soon, and when the thick part of the root is cut in taking off, the plants often rot.

During the summer season these plants must be plentifully watered, for the surface of their leaves being large, there is a great consumption of moisture, by perspiration in hot weather, but in the winter they must be watered more sparingly; though at that season they must be often refreshed, but it must not be given them in such quantities.

The pots in which these plants are placed, should be large in proportion to the size of the plants, for their roots generally extend pretty far, and the earth should be rich and light. The degree of heat with which these plants thrive best, is much the same with the Anana, or Pine Apple, in which I have had many of these plants produce their fruit in perfection, and they were near twenty feet high.

The most sure method to have these plants fruit in England is, after they have grown for some time in pots, so as to have made good roots, to shake them out of the pots with the ball of earth to their roots, and plant them into the tan-bed in the stove, observing to lay a little old tan near their roots for their fibres to strike into, and in a few months the roots of these plants will extend themselves many feet each way in the bark; and these plants will thrive a great deal faster than those which are confined in pots, or tubs. When the bark-bed wants to be renewed with fresh tan, there should be great care taken of the roots of these plants, not to cut or break them, as also to leave a large quantity of the old tan about them, because if the new tan is laid too near them, it will scorch their roots, and injure them: these plants must be plentifully supplied with water, otherwise they will not thrive; in winter they should be watered twice a week, giving at least two quarts to each plant, but in summer they must be watered every other day, and double the quantity given to them each time. If the plants push out their flower-stems in the spring, there will be hopes of their perfecting their fruit; but when they come out late in the year, the plants will sometimes decay before the fruit is ripe. The stoves in which these plants are placed should be at least twenty feet in height, otherwise there will not be room for their leaves to expand; for when the plants are in vigour, the leaves are often eight feet in length, and two feet broad: so that if the stems grow to be fourteen feet to the division of the leaves, and the house is not twenty feet high, the leaves will be cramped, which will retard the growth of the plants; besides, when the leaves are bent against the glass, there will be danger of their breaking them, when they are growing vigorously; for I have had in one night the stems of such bent leaves force through the glass, and by the next morning advanced two or three inches above the glass.

I have seen some bunches of fruit of the first sort, which were upwards of forty pounds weight, and perfectly ripe in England; but this is not so good a fruit, as to tempt any person to be at the expence of raising them in England. The second sort is preferred to the first, for the flavour of its fruit, in all those hot countries where these plants abound: the bunches of these are not near so large as those of the first sort, nor are the single fruit near so long; these change to a deeper yellow colour as they ripen, but their taste is somewhat like that of meally Figs. Some persons who have resided in the West-Indies, having eaten some of these fruit which were produced in England, and thought them little inferior to those which grew in America; and I imagine, that the inhabitants of those countries would not esteem these fruits so much, had they variety of other sorts; but, for want of better, they eat many kinds of fruit, which would not be valued in Europe, could they be obtained in perfection.

MUSCARI. Tourn. Inst. R. H. 347. tab. 180. Musk, or Grape Hyacinth, vulgò.

The CHARACTERS are,

*The flower has no empalement. It hath one oval pitcher-shaped petal, which is reflexed at the brim. It hath three nectariums on the top of the germen, and six awl-shaped stamina which are shorter than the petal, whose summits join together, and in the center is situated a roundish three-cornered germen, supporting a single style, crowned by an obtuse stigma. The germen afterward turns to a roundish three-cornered capsule, having three cells, filled with roundish seeds.*

Dr. Linnæus has joined this genus to the Hyacinth, which is placed in the first section of his sixth class, which contains the plants whose flowers have six stamina and one style.

The SPECIES are,

1. MUSCARI (*Botryoide*) corollis globosis uniformibus, foliis canaliculato-cylindricis strictis. *Muscari with uniform globular petals, and cylindrical gutter-shaped leaves.* Muscari arvense, juncifolium, cæruleum, minus. Tourn. Inst. 348. *Smaller blue Field Muscary, with Rush leaves, commonly called Grape Hyacinth.*
2. MUSCARI (*Comosus*) corollis angulato-cylindricis, summis sterilibus longiùs pedicellatis. *Muscari with angular cylindrical petals, which on the top of the spike are barren, and have longer foot-stalks.* Muscari arvense, latifolium, purpurascens. Tourn. Inst. 347. *Broad-leaved, purple, Field Muscari, commonly called Fair-haired Hyacinth.*
3. MUSCARI (*Racemosus*) corollis ovatis, summis sessilibus foliis laxis. *Muscari with oval petals.* Muscari obsoletiore flore. Clus. Hist. 1. p. 178. *Muscari with an obsolete flower, commonly called Musk Hyacinth.*
4. MUSCARI (*Monstrosus*) corollis subovatis. *Muscari with almost oval corolla.* Hyacinthus paniculâ cæruleâ. C. B. P. 42. *Blue paniculated Hyacinth, called Feathered Hyacinth.*
5. MUSCARI (*Orchioide*) corollis sexpartitis, petalis tribus exterioribus brevioribus. *Muscari with petals which are cut into six parts.* Hyacinthus orchioides Africanus major bifolius maculatus, flore sulphureo, obsoleto majore. Breyn. Prod. 3. 24. *Greater African Hyacinth, resembling Orchis, with two spotted leaves, and a larger, obsolete, sulphur-coloured flower.*

The first sort grows naturally in the vineyards and arable fields in France, Italy, and Germany, and where it is once planted in a garden, it is not easily rooted out, for the roots multiply greatly, and if they are permitted to scatter their seeds, the ground will be filled with the roots. There are three varieties of this, one with blue, another with white, and a third with Ash-coloured flowers: the first sort hath a small, round, bulbous root, from which come out many leaves about six inches long, which are narrow, and their edges are incurved, so as to be shaped like a gutter: between these arise the flower-stalk, which is

is naked, and toward the top garnished with a close spike of blue flowers, shaped like pitchers, sitting very close to the stalk; these smell like fresh starch, or the stones of Plumbs which are fresh. They flower in April, and the seeds ripen the latter end of June.

The second sort grows naturally in Spain and Portugal, from whence I have received both roots and seeds; this hath a bulbous root as large as a middling Onion, from which come out five or six leaves a foot long, and three quarters of an inch broad at their base, diminishing gradually to a point. The flower-stalk rises about a foot high, the lower half naked, but the upper is garnished with cylindrical, angular, purple flowers, standing upon foot-stalks half an inch long; these grow horizontally, but the stalk is terminated by a tuft of flowers whose petals are oval, and have neither germen or style, so are barren. This sort flowers the latter end of April, or the beginning of May; there is a variety of this with white, and another with blue flowers, but the purple is the most common.

The third sort hath pretty large, oval, bulbous roots, from which arise several leaves, which are about eight or nine inches long, and half an inch broad; they are incurved a little on their sides, and end in obtuse points; these embrace each other at their base; out of the middle of these, the stalk which sustains the flowers arises; they are naked below, but their upper parts are garnished with small flowers growing in a spike; these have oval pitcher-shaped petals, which are reflexed at their brim, and are of an Ash-coloured purple, or obsolete colour, seeming as if faded, but have an agreeable musky scent: these stalks do not rise more than six inches high, so the flowers make no great appearance; but where they are in some quantity, they will perfume the air to a considerable distance. This sort flowers in April, and the seeds ripen in July.

Of this there are two varieties, one of which has the same coloured flowers with this here enumerated, on the lower part of the spike, but they are larger, and have more of the purple cast, but the flowers on the upper part of the spike are yellow, and have a very grateful odour. The Dutch gardeners title it Tibcadi Muscari. As this is supposed to be only a seminal variety of the third, I have not enumerated it as distinct. There is another variety of this with very large yellow flowers, that has been lately raised from seeds in Holland, which the florists there sell for a guinea a root.

The fourth sort hath a large bulbous root, from which come out several plain leaves a foot long, and about half an inch broad at their base; they are smooth, and end in obtuse points. The flower-stalks rise near a foot and a half high; they are naked at the bottom for about seven or eight inches, above which the panicles of flowers begin, and terminate the stalks. The flowers stand upon foot-stalks which are more than an inch long, each sustaining three, four, or five flowers, whose petals are cut into slender filaments like hairs; they are of a purplish blue colour, and have neither stamina or germen, so do never produce seeds. It flowers in May, and, after the flowers are past, the stalks and leaves decay to the root, and new ones arise the following spring.

The fifth sort grows naturally at the Cape of Good Hope, from whence I received the seeds, which succeeded in the Chelsea garden, where the plants have flowered for several years past; this hath a small, white, bulbous root, about the size of a Hazel nut, from which comes out generally but two, (though sometimes when the roots are strong) three leaves, which are five or six inches long, and one inch and a half broad in the middle, ending in obtuse points; these are of a lucid green, and have many spots, or protuberances on their upper surface. The flower-stalk rises between them to the height of six or seven inches; it is round, smooth, and naked for three inches high or more, and is terminated by a spike of flowers, which are of a pale sulphur colour; these have no foot-stalks; they have one petal, which is of an irregular figure, and cut at the top into six parts. The stamina are almost equal with the petal, and stand round the style, which is of the same length. The flowers appear in March, but are seldom succeeded by good seeds here.

The four first sorts are very hardy, so will thrive in the open air, and require no other culture than any other hardy bulbous-rooted flower; which is, to take up their roots every second or third year to separate their bulbs, for as some of the sorts multiply pretty fast, so when they are become large bunches, they do not flower so strong as when they are single: the best time to take them out of the ground, is soon after their stalks and leaves are decayed; then they should be spread on a mat, in a dry shady room for a fortnight to dry, after which they may be kept in boxes like other bulbous roots, till Michaelmas, when they may be planted again in the borders of the flower-garden, and treated in the same way as the common hardy kinds of Hyacinths.

The first sort should not be admitted into the flower-garden, because the roots will propagate so fast, as to become a troublesome weed there.

The second sort has but little beauty, so a few of these only should be allowed a place merely for the sake of variety; this is so hardy, as to thrive in any soil or situation.

The third sort merits a place for the extreme sweetness of its flowers, but especially that variety of it with yellow flowers, called Tibcady.

The fourth sort may also be allowed to have place in the common borders of the pleasure-garden, where they will add to the variety, and are by no means to be despised.

They are all easily propagated by offsets, which most of their roots send out in pretty great plenty, so that there is little occasion for sowing of their seeds, unless it be to gain some new varieties.

The fifth sort is too tender to thrive in the open air in England, so the roots must be planted in small pots, filled with light rich earth; and in the autumn they should be placed under a hot bed-frame, where they may be protected from frost, but should have as much free air as possible in mild weather; for when these are placed in a green-house, their leaves are drawn long and narrow, and the flower-stalks are generally weak, so never flower so well as when they have plenty of free air. These flowers will continue a month where they are not drawn, but will decay in half that time in a green-house.

These roots should be transplanted in July, when their stalks and leaves are decayed, and should be placed in the open air during the summer season, but should have very little water when their leaves are decayed.

MUSCIPULA. See Silene.

MUSCOSE, MUSCOSUS, Mossy, or abounding with Moss.

MUSCOSITY, Mossiness.

MUSCUS, Moss.

These, though formerly supposed to be only excrescences produced from the earth, trees, &c. yet are no less perfect plants than those of greater magnitude, having roots, branches, flowers, and seeds, but yet cannot be propagated from the latter by any art.

The botanists distinguish these into several genera, under each of which are several species; but as they are plants of no use or beauty, it would be to little purpose to enumerate them in this place.

These plants chiefly flourish in cold countries, and in the winter season, and are many times very injurious to fruit-trees, which grow upon cold barren soils, or where they are so close planted as to exclude the free access of air. The only remedy in such cases is to cut down part of the trees, and plough up the ground between those left remaining: and in the spring

ſpring of the year, in moiſt weather, you ſhould, with an iron inſtrument made a little hollow, the better to ſurround the branches of the trees, ſcrape off the Moſs, carrying it off the place; and by two or three times thus cleanſing them, together with carefully ſtirring the ground, it may be entirely deſtroyed from the trees; but if you do not cut down part of the trees, and ſtir the ground well, the rubbing off the Moſs will ſignify little; for the cauſe not being removed, the effect will not ceaſe, but the Moſs will in a ſhort time be as troubleſome as ever.

MUSHROOMS are, by many perſons, ſuppoſed to be produced from the putrefaction of the dung, earth, &c. in which they are found; but notwithſtanding this notion is pretty generally received amongſt the unthinking part of mankind, yet by the curious naturaliſts, they are eſteemed perfect plants, though their flowers and ſeeds have not as yet been perfectly diſcovered. But ſince they may, and are annually propagated by the gardeners near London, and are (the eſculent ſort of them) greatly eſteemed by moſt curious palates, I ſhall briefly ſet down the method practiſed by the gardeners who cultivate them for ſale.

But firſt, it will not be improper to give a ſhort deſcription of the true eatable kind, ſince there are ſeveral unwholſome ſorts, which have been by unſkilful perſons gathered for the table.

The true Champignon, or Muſhroom, appears at firſt of a roundiſh form, like a button; the upper part of which, as alſo the ſtalk, is very white; but being opened, the under part is of a livid fleſh colour, but the fleſhy part when broken is very white; when theſe are ſuffered to remain undiſturbed, they will grow to a large ſize, and explicate themſelves almoſt to a flatneſs, and the red part underneath will change to a dark colour.

In order to cultivate them, if you have no beds in your own, or in neighbouring gardens, which produce them, you ſhould look abroad in rich paſtures, during the months of Auguſt and September, until you find them (that being the ſeaſon when they are naturally produced;) then you ſhould open the ground about the roots of the Muſhrooms, where you will find the earth, very often, full of ſmall white knobs, which are the offſets, or young Muſhrooms; theſe ſhould be carefully gathered, preſerving them in lumps with the earth about them: but as this ſpawn cannot be found in the paſture, except at the ſeaſon when the Muſhrooms are naturally produced, you may probably find ſome in old dunghills, eſpecially where there has been much litter amongſt it, and the wet hath not penetrated it to rot it; as likewiſe, by ſearching old hot-beds, it may be often found; for this ſpawn has the appearance of a white mould, ſhooting out in long ſtrings, by which it may be eaſily known wherever it is met with: or this may be procured by mixing ſome long dung from the ſtable, which has not been thrown on a heap to ferment; which being mixed with ſtrong earth, and put under cover to prevent wet getting to it, the more the air is excluded from it, the ſooner the ſpawn will appear; but this muſt not be laid ſo cloſe together as to heat, for that will deſtroy the ſpawn: in about two months after the ſpawn will appear, eſpecially if the heap is cloſely covered with old thatch, or ſuch litter as hath lain long abroad, ſo as not to ferment, then the beds may be prepared to receive the ſpawn: theſe beds ſhould be made of dung, in which there is good ſtore of litter, but this ſhould not be thrown on a heap to ferment; that dung which hath lain ſpread abroad for a month or longer, is beſt. Theſe beds ſhould be made on dry ground, and the dung laid upon the ſurface; the width of theſe beds at bottom ſhould be about two feet and a half or three feet, the length in proportion to the quantity of Muſhrooms deſired; then lay the dung about a foot thick, covering it about four inches with ſtrong earth. Upon this lay more dung, about ten inches thick; then another layer of earth, ſtill drawing in the ſides of the bed, ſo as to form it like the ridge of a houſe, which may be done by three layers of dung and as many of earth. When the bed is finiſhed it ſhould be covered with litter or old thatch, to keep out wet, as alſo to prevent its drying; in this ſituation it may remain eight or ten days, by which time the bed will be in a proper temperature of warmth to receive the ſpawn; for there ſhould be only a moderate warmth in it, great heat deſtroying the ſpawn, as will alſo wet; therefore when the ſpawn is found, it ſhould always be kept dry until it is uſed, for the drier it is, the better it will take in the bed; for I had a parcel of this ſpawn, which had lain near the oven of a ſtove upward of four months, and was become ſo dry, that I deſpaired of its ſucceſs; but I never have yet ſeen any which produced ſo ſoon, nor in ſo great quantity as this.

The bed being in a proper temperature for the ſpawn, the covering of litter ſhould be taken off, and the ſides of the bed ſmoothed; then a covering of light rich earth about an inch thick ſhould be laid all over the bed, but this ſhould not be wet; upon this the ſpawn ſhould be thruſt, laying the lumps four or five inches aſunder; then gently cover this with the ſame light earth above half an inch thick, and put the covering of litter over the bed, laying it ſo thick as to keep out wet, and prevent the bed from drying: when theſe beds are made in the ſpring or autumn, as the weather is in thoſe ſeaſons temperate, ſo the ſpawn will then take much ſooner, and the Muſhrooms will appear perhaps in a month after making; but thoſe beds which are made in ſummer, when the ſeaſon is hot, or in winter, when the weather is cold, are much longer before they produce.

The great ſkill in managing of theſe beds is, that of keeping them in a proper temperature of moiſture, never ſuffering them to receive too much wet: during the ſummer ſeaſon the beds may be uncovered, to receive gentle ſhowers of rain at proper times; and in long dry ſeaſons the beds ſhould be now and then gently watered, but by no means ſuffer much wet to come to them; during the winter ſeaſon they muſt be kept as dry as poſſible, and ſo cloſely covered as to keep out cold. In froſty or very cold weather, if ſome warm litter ſhaken out of a dung heap is laid on, it will promote the growth of the Muſhrooms; but this muſt not be laid next the bed, but a covering of dry litter between the bed and this warm litter; and as often as the litter is found to decay, it ſhould be renewed with freſh; and as the cold increaſes, the covering ſhould be laid ſo much thicker. If theſe things are obſerved, there may be plenty of Muſhrooms produced all the year; and theſe produced in beds, are much better for the table than any of thoſe which are gathered in the fields.

A bed thus managed, if the ſpawn takes kindly, will continue good for ſeveral months, and produce great quantities of Muſhrooms; from theſe beds when they are deſtroyed, you ſhould take the ſpawn for a freſh ſupply, which may be laid up in a dry place until the proper ſeaſon of uſing it, which ſhould not be ſooner than five or ſix weeks, that the ſpawn may have time to dry before it is put into the bed, otherwiſe it will not ſucceed well.

Sometimes it happens, that beds thus made do not produce any Muſhrooms till they have lain five or ſix months, ſo that theſe beds ſhould not be deſtroyed, though they ſhould not at firſt anſwer expectation; for I have frequently known theſe to have produced great quantities of Muſhrooms afterward, and have continued a long time in perfection.

MUSTARD. See Sinapi.

MYAGRUM. Tourn. Inſt. R. H. 211. tab. 99. Lin. Gen. Plant. 713. Gold of Pleaſure.

The Characters are,

*The empalement of the flower is compoſed of four oblong, oval, coloured leaves, which fall off. The flower hath four roundiſh obtuſe petals, placed in form of a croſs. It hath ſix ſtamina the length of the petals, four of which are a little longer than the other, terminated by ſingle ſummits.*

*mits. In the center is situated an oval germen, supporting slender style, crowned by an obtuse stigma. The germen afterward becomes a turbinated, heart-shaped, short pod, having two valves with a rigid style on the top, inclosing roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's fifteenth class, which contains the plants whose flowers have four long and two shorter stamina, and the seeds are inclosed in short small pods.

The Species are,

1. Myagrum (*Sativum*) siliculis ovatis, pedunculatis polyspermis. Hort. Cliff. 328. *Myagrum with oval pods having foot-stalks, inclosing several seeds.* Alysson segetum foliis auriculatis acutis. Tourn. Inst. R. H. *Corn Madwort with eared acute-pointed leaves, commonly called Gold of Pleasure.*
2. Myagrum (*Alyssum*) siliculis cordatis pedunculatis polyspermis, foliis denticulatis obtusis. *Myagrum with heart-shaped pods standing upon foot-stalks, having many seeds and indented leaves.* Alysson segetum foliis auriculatis acutis fructu majori. Tourn. Inst. 217. *Corn Madwort, with acute-eared leaves and a larger fruit.*
3. Myagrum (*Rugosum*) siliculis globosis compressis punctato-rugosis. Hort. Cliff. 328. *Myagrum with globular, compressed, small pods, having rough punctures.* Rapistrum arvense, folio auriculato acuto. Tourn. Inst. 211. *Field Charlock with an acute-eared leaf.*
4. Myagrum (*Perenne*) siliculis biarticulatis dispermis, foliis extrorsum sinuatis denticulatis. Hort. Upsal. 182. *Myagrum with short pods, having two joints and two seeds, and outer leaves which are sinuated and indented.* Rapistrum monospermum. C. B. P. 95. *One-seeded Charlock.*
5. Myagrum (*Perfoliatum*) siliculis obcordatis subsessilibus, foliis amplexicaulibus. Hort. Upsal. 182. *Myagrum with small heart-shaped pods sitting close to the stalk, and the leaves embracing it.* Myagrum monospermum latifolium. C. B. P. 109. *Broad-leaved Myagrum having one seed in a pod.*

The first sort grows naturally in Corn fields in the south of France and Italy; I have also found it growing in the Corn in Easthamsted-park, the seat of William Trumbull, Esq; but it is not common in this country. It is an annual plant, with an upright stalk about a foot and a half high, sending out two or four side branches toward the top, which grow erect; they are smooth, and have a fungous pith; the lower leaves are from three to four inches long, of a pale or yellowish green, and are eared at their base; those upon the stalks diminish in their size all the way up, and are entire, and almost embrace the stalks with their base. The flowers grow in loose spikes at the end of the branches, standing upon foot-stalks an inch long; they are composed of four small yellowish petals, placed in form of a cross; these are succeeded by oval capsules, which are bordered, and crowned at the top with the style of the flower, having two cells, which are filled with red seeds.

The second sort is also an annual plant, and differs from the first in having a taller stalk; the leaves are much longer, narrower, and are regularly indented on their edges, ending in obtuse points. The flowers are larger, but of the same form and colour; the capsules are much larger, and are shaped like a heart. Both these plants flower in June and July, and their seeds ripen in September.

The third sort grows naturally on the borders of arable fields, in the south of France and Italy. This is an annual plant, whose lower leaves are five or six inches long; they are hairy and succulent; their base is eared, and they end in acute points. The stalks rise a foot and a half high, they are brittle and hairy, branching out toward the top like the two former, and are terminated by short loose spikes of small pale flowers, which are succeeded by small, rough, roundish capsules, compressed at the top. It flowers in July, and the seeds ripen in autumn.

The fourth sort grows naturally amongst the Corn, in France and Germany. This is also an annual plant; the lower leaves are large, jagged, and hairy; the stalks branch out from the bottom, and are garnished with leaves about four inches long and two broad; they are hairy, and unequally jagged. The stalks are terminated by very long loose spikes of yellow flowers, which are succeeded by short pods with two joints, each including one roundish seed. It flowers about the same time with the former.

The fifth sort grows naturally in the south of France and Italy; this hath a smooth branching stalk upward of two feet high; the lower leaves are five or six inches long, smooth, succulent, and a little indented; the upper leaves almost embrace the stalks with their base. The flowers are produced in long loose spikes, which are yellow, and sit close to the stalk; these are succeeded by heart-shaped compressed pods, divided into two cells by a longitudinal partition, each containing one roundish seed. It flowers at the same time with the former.

If the seeds of all these plants are permitted to scatter in the autumn, the plants will rise without any care, and only require to be thinned and kept clean from weeds. These autumnal plants will always ripen their seeds, whereas those which are sown in the spring sometimes fail.

MYOSOTIS. Dill. Gen. 3. Lin. Gen. 180. Mouse-ear.

The Characters are,

*The flower hath an oblong, erect, permanent empalement, cut into five points; the flower is salver-shaped, having a short cylindrical tube, cut into five obtuse segments at the brim; the chaps are closed by five small scales which join, and are prominent. It hath five short stamina in the neck of the tube, terminated by small summits; and four germen supporting a slender style the length of the tube, crowned by an obtuse stigma; the germina afterward become four oval seeds inclosed in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flower having five stamina and one style.

The Species are,

1. Myosotis (*Virginica*) seminibus aculeatis glochidibus, foliis ovato-oblongis, ramis divaricatis. Lin. Sp. 189. *Mouse-ear with prickly seeds, oblong oval leaves, and divaricated branches.* Cynoglossum Virginianum, flore & fructu minimo. Mor. Hist. 3. tab. 30. fol. 9. *Virginian Hound's-tongue, with small flowers and seeds.*
2. Myosotis (*Lappula*) seminibus aculeis glochidibus, foliis lanceolatis pilosis. Flor. Suec. 150. *Mouse-ear with prickly seeds, and hairy spear-shaped leaves.* Cynoglossum minus. C. B. P. 257. *Smaller Hound's-tongue.*
3. Myosotis (*Apula*) seminibus nudis, foliis hispidis, racemis foliolis. Lin. Sp. 189. *Mouse-ear with naked seeds, stinging leaves, and leafy branches.* Echium luteum minimum. C. B. P. 254. *The least yellow Viper's Buglose.*

There are one or two other species of this genus which grow naturally in England, so are rarely admitted into gardens, therefore are omitted here: and those here enumerated are seldom cultivated except in botanic gardens, being plants of little beauty or use. Those persons who are desirous of keeping them, should sow their seeds in the autumn, upon an open bed or border of light earth, and in the spring thin the plants where they are too close, and keep them clean from weeds, which is all the culture they require; and if their seeds are permitted to scatter, the plants will rise withour farther trouble.

MYOSURUS, Mouse-tail.

This plant is very near a-kin to the Ranunculus, in which genus it is ranged by some botanists; the flowers are extremely small, and are succeeded by long slender spikes of seeds, resembling the tail of a mouse, from whence it had the name. It grows wild upon moist grounds in divers parts of England, where it flowers the latter end of April; and the seeds ripen in a month after, when the plants decay, being annual. It is rarely cultivated in gardens, so I shall not trouble the reader with any further account of it.

MYRICA. Lin. Gen. Plant. 981. Gale. Tourn. Act. Reg. Scien. 1706. The Candleberry Myrtle, Gale, or Sweet Willow; by some Myrtus Brabantica, or Dutch Myrtle; in French, *Piment Royal.*

The Characters are,

*The male flowers are upon different plants from the female; the male flowers are produced in a loose, oblong, oval katkin, imbricated on every side; under each scale is situated one moon-shaped flower, having no petal, but hath four or six short slender stamina, terminated by large twin summits, whose lobes are bifid. The female flowers have neither petal or stamina, but an oval germen supporting two slender styles, crowned by single stigmas. The germen afterward becomes a berry with one cell, inclosing a single seed.*

This genus of plants is ranged in the fourth section of Linnæus's twenty-second class, which includes the plants whose male flowers have four stamina, and are upon different plants from the fruit.

The Species are,

1. Myrica (*Gale*) foliis lanceolatis subserratis, caule fruticoso. Lin. Sp. Plant. 1024. *Myrica with spear-shaped sawed leaves and a shrubby stalk.* Gale frutex odoratus septentrionalium. J. B. 1. p. 2. 225. *Northern, shrubby, sweet Gale, sweet Willow, Dutch Myrtle, or Gale.*
2. Myrica (*Cerifera*) foliis lanceolatis subserratis, caule arborescente. Kalm. *Myrica with spear-shaped leaves, and a shrubby stalk.* Myrtus Brabanticæ similis Caroliniensis baccifera, fructu racemoso sessili monopyreno. Pluk Phyt. tab. 48. fol. 9. *Carolina Myrtle like that of the Dutch, with berries growing in bunches, and sitting close to the stalks, commonly called Candleberry Myrtle.*
3. Myrica (*Caroliniensis*) foliis lanceolatis serratis, caule suffruticosa. *Myrica with spear-shaped sawed leaves, and a shrubby stalk.* Myrtus Brabanticæ similis Caroliniensis humilior, foliis latioribus & magis serratis. Catesb. Car. vol. i. p. 13. *Lower Carolina Myrtle, or Candleberry-tree resembling that of Brabant, having broader leaves which are more sawed.*
4. Myrica (*Asplenifolia*) foliis oblongis alternatim sinuatis. Hort. Cliff. 456. *Myrica with oblong oval leaves, which are alternately sinuated.* Gale Mariana Asplenii folio. Pet. Mus. 773. *Maryland Gale with a Spleenwort leaf.*
5. Myrica (*Quercifolia*) foliis oblongis opposite sinuatis glabris. *Myrica with oblong smooth leaves, which are oppositely sinuated.* Laurus Africana minor, folio quercûs. Hort. Amst. 2. p. 161. *Smaller African Bay with an Oak leaf.*
6. Myrica (*Hirsuta*) foliis oblongis opposite sinuatis hirsutis. *Myrica with oblong hairy leaves, which are oppositely sinuated.*
7. Myrica (*Cordifolia*) foliis subcordatis serratis sessilibus. Hort. Cliff. 456. *Myrica with sawed leaves which are almost heart-shaped, and sit close to the stalk.* Gale Capensis, ilicis cocciferæ folio. Pet. Mus. 774. *Gale from the Cape, with a leaf like the Kermes Oak.*

The first sort grows naturally upon bogs in many parts of England, particularly in the northern and western counties, as also in Windsor-park, and near Tunbridge-wells. This rises with many shrubby stalks near four feet high, which divide into several slender branches, garnished with stiff spear-shaped leaves, about an inch and a half long, and half an inch broad in the middle; they are of a light or yellowish green, smooth, and a little sawed at their points, and emit a fragrant odour when bruised; they are placed alternately on their branches. The male flowers or katkins are produced from the side of the branches, growing upon separate plants from the female, which are succeeded by clusters of small berries, each having a single seed. It flowers in July, and the seeds ripen in autumn.

The leaves of this shrub has been by some persons gathered and used for Tea, but it is generally supposed to be hurtful to the brain; but from this use of it, a learned physician a few years since, wrote a treatise to prove this to be the true Tea, in which he has only shewn his want of knowledge in these things.

It grows naturally in bogs, so cannot be made to thrive on dry land, for which reason it is seldom preserved in gardens.

The second sort grows naturally in North America, where the inhabitants get a sort of green wax from the berries, which they make into candles. The method of collecting and preparing this, is described by Mr. Catesby, in his History of Carolina.

This grows naturally in bogs and swampy lands, where it rises with many strong shrubby stalks eight or ten feet high, sending out several branches, garnished with stiff spear-shaped leaves near three inches long, and one broad in the middle; they are smooth and entire, having scarce any foot-stalks, of a yellowish lucid green on their upper side, but paler on their under, standing alternately, and pretty close to the branches; these have a very grateful odour when bruised. The katkins come out upon different plants from the berries; these are about an inch long, standing erect. The female flowers come out on the side of the branches in longish bunches, which are succeeded by small roundish berries, covered with a sort of meal. This shrub delights in a moist soft soil, in which it thrives extremely well, and lives in the open air without any protection.

The third sort grows naturally in Carolina; this doth not rise so high as the former, the branches are not so strong, and they have a grayish bark; the leaves are shorter, broader, and are sawed on their edges, but in other respects is like the second sort; the berries of this are also collected for the same purpose.

These sorts are propagated by seeds, which should be sown in the autumn, and then the plants will come up the following spring; but if the seeds are kept out of the ground till the spring, they seldom grow till the year after. These plants will require water in dry weather, and should be screened from frosts while young, but when they have obtained strength, they will resist the cold of this country very well.

The fourth sort grows naturally in Philadelphia, from whence many of the plants have been brought to England, and those which have been planted on a moist soil have thriven very well; some of these creep at their roots, and send up suckers plentifully, in the same manner as in their native soil.

This rises with slender shrubby stalks near three feet high, which are hairy, and divide into several slender branches, which are garnished with leaves from three to four inches long, and half an inch broad; they are alternately indented almost to the midrib, and have a great resemblance to those of Spleenwort; they are of a dark green, hairy on their under side, and sit close to the stalks. The male flowers or katkins come out on the side of the branches between the leaves; these are oval, and stand erect. I have not seen any of these plants in fruit, so I can give no description of it.

This sort may be propagated by suckers, which are sent out from the roots when it is planted in a loose moist soil, and will endure the cold full as well as the two former sorts.

The fifth and sixth sorts grow naturally at the Cape of Good Hope; these only differ from each other, in one having very smooth shining leaves, and those of the other hairy. I do not know if they are really different species, but as I received them from Holland as such, and the plants still retaining their difference, so I have enumerated them both.

These rise with shrubby slender stalks about four feet high, which divide into smaller branches, which in one sort are smooth, and in the other they are hairy; these are closely garnished with leaves about an inch and a half long, and almost an inch broad; some having two, others three, deep indentures on their sides, which are opposite; in one sort they are smooth and shining, and in the other they are hairy, and of a darker green; they sit close to the branches, and

end in obtufe points which are indented: between the leaves come out fome oval katkins, which drop off, fo that all the plants which I have feen have been male, therefore I can give no account of the fruit. Thefe retain their leaves all the year, but are too tender to live through the winter in the open air in England, fo muft be placed in the green-houfe in winter. As thefe do not produce feeds here, fo they are propagated by layers, but they do not take root very freely, fo that the plants are not very common in Europe at prefent; for I do not find that the cuttings of thefe plants will eafily take root, having made feveral trials of them in all the different methods; nor have the Dutch gardeners had better fuccefs, fo that the plants are as fcarce there as in England.

When the layers are laid down, that part of the fhoot which is laid fhould be tongued at a joint, as is practifed in laying of Carnations; and the young fhoots only fhould be chofen for this purpofe, for the old branches will not put out roots. Thefe layers are often two years before they will have taken root enough to tranfplant, for they fhould not be feparated from the old plants till they have made good roots, becaufe they are very fubject to mifcarry if they are not well rooted.

When they are taken off from the old plants, they fhould be each put into a feparate fmall pot, filled with foft, rich, loamy earth; and if they are placed under a common frame, fhading them from the fun in the middle of the day, it will forward their taking new root; then they may be placed in a fheltered fituation during the fummer, and in the autumn removed into the green-houfe, and treated in the fame way as other plants from the fame country. The beft feafon for laying down the branches, I have obferved to be in July, and by the fame time the following year they have been fit to remove.

The feventh fort is a native of the Cape of Good Hope; this hath a weak fhrubby ftalk which rifes five or fix feet high, fending out many long flender branches, which are clofely garnifhed their whole length with fmall heart-fhaped leaves, which fit clofe to the branches, and are flightly indented and waved on their edges. The flowers come out between the leaves in roundifh bunches; thefe are male in all the the plants I have yet feen; they have an uncertain number of ftamina, and are all included in one common fcaly involucrum or cover. Thefe flowers appear in July, but make no great appearance; the leaves of this fort continue all the year green.

This is propagated in the fame way as the two former forts, and is difficult to increafe, fo is not common in the European gardens. It requires the fame treatment as the two former forts.

MYRRHIS. See Chærophyllum, Scandix, Sison.

MYRTUS. Tourn. Inft. R. H. 640. tab. 409. Lin. Gen. Plant. 543. Myrtle; in French, *Mirte.*

The Characters are,

*The empalement of the flower is of one leaf, cut into five acute points at the top, is permanent, and fits on the germen. The flower has five large oval petals which are inferted in the empalement, and a great number of fmall ftamina which are alfo inferted in the empalement, terminated by fmall fummits. The germen is fituated under the flower, fupporting a flender ftyle, crowned by an obtufe ftigma. The germen afterward turns to an oval berry with three cells, crowned by the empalement, each cell containing one or two kidney-fhaped feeds.*

This genus of plants is ranged in the firft fection of Linnæus's twelfth clafs, in which is contained thofe plants whofe flowers have about twenty ftamina and one ftyle.

The Species are,

1. Myrtus (*Communis*) foliis ovatis, pedunculis longioribus. *Myrtle with oval leaves, and longer foot-ftalks to the flowers.* Myrtus latifolia Romana. C. B. P. 468. *Broad-leaved Roman Myrtle, or common broad-leaved Myrtle.*
2. Myrtus (*Belgica*) foliis lanceolatis acuminatis. *Myrtle with fpear-fhaped acute-pointed leaves.* Myrtus latifolia Belgica. C. B. P. 469. *Broad-leaved Dutch Myrtle.*
3. Myrtus (*Acuta*) lanceolato-ovatis acutis. *Myrtle with fpear-fhaped, oval, acute-pointed leaves.* Myrtus fylveftris, foliis acutiffimis. C. B. P. 469. *Wild Myrtle with very acute-pointed leaves.*
4. Myrtus (*Bœtica*) foliis ovato-lanceolatis confertis. *Myrtle with oval fpear-fhaped leaves growing in clufters.* Myrtus latifolia Bœtica 2 vel foliis laurinus, confertim nafcentibus. C. B. P. 469. *Second broad-leaved Spanifh Myrtle, with Bay leaves growing in clufters, commonly called Orange-leaved Myrtle.*
5. Myrtus (*Italica*) foliis ovato-lanceolatis acutis, ramis erectioribus. *Myrtle with oval, acute-pointed, fpear-fhaped leaves, and erect branches.* Myrtus communis Italica. C. B. P. 468. *Common Italian Myrtle, called upright Myrtle.*
6. Myrtus (*Tarentina*) foliis ovatis, baccis rotundioribus. *Myrtle with oval leaves and rounder berries.* Myrtus minor vulgaris. C. B. P. 469. *Common fmaller Myrtle, called the Box-leaved Myrtle.*
7. Myrtus (*Minima*) foliis lineari-lanceolatis acuminatis. *Myrtle with linear, fpear-fhaped, acute-pointed leaves.* Myrtus foliis minimis & mucronatis. C. B. P. 469. *Myrtle with the fmalleft fharp-pointed leaves, commonly called Rofemary-leaved Myrtle.*
8. Myrtus (*Zeylanica*) pedunculis multifloris, foliis ovatis fubpetiolatis. Lin. Sp. Plant. 472. *Myrtle with many flowers on each foot-ftalk, and oval leaves having fhort foot-ftalks.* Myrtus Zeylanica odoratiffima, baccis niveis monococcis. H. L. 434. *Sweet fmelling Myrtle of Ceylon, with fnow white berries containing one feed.*

The firft fort is the common broad-leaved Myrtle, which is one of the hardieft kinds we have. The leaves of this are an inch and a half long, and one inch broad, of a lucid green, ftanding upon fhort foot-ftalks. The flowers are larger than thofe of the other forts, and come out from the fide of the branches, on pretty long foot-ftalks; thefe are fucceeded by oval berries of a dark purple colour, inclofing three or four hard kidney-fhaped feeds. It flowers in July and Auguft, and the berries ripen in winter. This fort is by fome called the flowering Myrtle, becaufe it generally has a greater quantity of flowers, and thofe are larger than of any other fort.

The fecond fort has leaves much lefs than thofe of the former, and are more pointed, ftanding clofer together on the branches; the midrib on the under fide of the leaves is of a purple colour, they are of a darker green, and fit clofer to the branches. The flowers are fmaller, and have fhorter foot-ftalks than thofe of the firft fort; this flowers a little later in the fummer, and feldom ripens its berries here.

The double flowering Myrtle I take to be a variety of this, for the leaves and growth of the plant, the fize of the flowers, and the time of flowering, agree better with this than any of the other forts.

The third fort grows naturally in the fouth of France and in Italy; the leaves of this are much fmaller than thofe of the fecond, being lefs than an inch long, and not more than half an inch broad, of an oval fpear-fhape, ending in acute points, of a dull green, and fet pretty clofe on the branches. The flowers are fmaller than either of the former, and come out from the wings of the leaves toward the end of the branches; the berries are fmall and oval.

The fourth fort hath a ftronger ftalk and branches than either of the former forts, and rifes to a greater height; the leaves are oval, fpear-fhaped, and are placed in clufters round the branches; thefe are of a dark green. The flowers are of a middling fize, and come out fparingly from between the leaves; the berrries are oval, and fmaller than thofe of the firft fort, but feldom ripens in England. The gardeners call this the Orange-leaved Myrtle, and by fome it is ftiled the Bay-leaved Myrtle. This fort is not fo hardy as the former.

The fifth fort is the common Italian Myrtle; this hath oval fpear-fhaped leaves, ending in acute points; the branches of this grow more erect than thofe of either

ther of the former sorts, as do also the leaves, from whence it is called by the gardeners upright Myrtle. The flowers of this sort are not large, and the petals are marked with purple at their points, while they remain closed; the berries are small, oval, and of a purple colour. There is a variety of this with white berries, in which it only differs from this; and I believe the Nutmeg Myrtle is only a variety of this, for I have raised several of the plants from seed, many of which were so like the Italian Myrtle, as not to be distinguished from it.

The sixth sort is commonly called the Box-leaved Myrtle; the leaves of this are oval, small, and sit close on the branches; they are of a lucid green, ending in obtuse points; the branches are weak, and frequently hang downward, when they are permitted to grow without shortening, and have a grayish bark. The flowers are small, and come late in the summer, the berries are small and round.

The seventh sort is called the Rosemary-leaved Mytle, and by some it is called the Thyme-leaved Myrtle. The branches of this grow pretty erect; the leaves are placed close on the branches; they are small, narrow, and end in acute points; they are of a lucid green, and have a fragrant odour when bruised. The flowers of this are small, and come late in the season, and are but seldom succeeded by berries here.

There are some other varieties of these Myrtles, which are propagated in the gardens for sale; but as their difference has been occasioned by culture, so it would be multiplying their titles to little purpose. Those which are here enumerated I believe to be really distinct, for I have raised most of them from seeds, and have not found them change from one to another, though there has been other small variations among the plants.

The eighth sort is a native of the Island of Ceylon: this is much tenderer than either of the former sorts, so cannot be kept through the winter in England, without some artificial heat. This hath a strong upright stalk, covered with a smooth gray bark, dividing upward into many slender stiff branches, garnished with oval leaves placed opposite, which are near two inches long, and an inch and a quarter broad, ending in points; they are of a lucid green, and have very short foot-stalks. The flowers come out at the ends of the branches, several of them being sustained upon one common foot-stalk, which branches out, and each flower stands on a very slender distinct foot-stalk; they are very like the flowers of Italian Myrtle, but always appear in December and January, and are never succeeded by berries here.

I shall first treat of the method of cultivating and propagating the common sorts of Myrtle, as they all require nearly the same management, and shall afterward take notice of that of the last mentioned, which require a different treatment; but as the varieties of the common sorts of Myrtle are cultivated in the gardens for sale, I shall just mention the titles by which they are known, that the curious may be informed how many there are.

Two sorts of Nutmeg Myrtles, one with a broader leaf than the other.

The Bird's Nest Myrtle, the striped Nutmeg Myrtle, the striped upright Myrtle, the striped Rosemary-leaved Myrtle, the striped Box-leaved Myrtle, and the striped broad-leaved Myrtle.

These plants may be all propagated from cuttings, the best season for which is in the beginning of July, when you should make choice of some of the straitest and most vigorous young shoots, which should be about six or eight inches long, and the leaves on the lower part must be stripped off about two or three inches high, and the part twisted which is to be placed in the ground; then having filled a parcel of pots (in proportion to the quantity of cuttings designed) with light rich earth, you should plant the cuttings therein, at about two inches distance from each other, observing to close the earth fast about them, and give them some water to settle it to the cuttings; then place the pots under a common hot-bed frame, plunging them either into some old dung, or tanners bark, which will prevent the earth from drying too fast; but you must carefully shade them with mats in the heat of the day, and give them air in proportion to the warmth of the season, not forgetting to water them every two or three days, as you shall find the earth in the pots require it. With this management, in about six weeks, the cuttings will be rooted, and begin to shoot, when you must inure them to the open air by degrees, into which they should be removed towards the latter end of August, or the beginning of September, placing them in a situation where they may be sheltered from cold winds, in which place they may remain till the middle or latter end of October, when the pots should be removed into the green-house, but should be placed in the coolest part thereof, that they may have air given to them whenever the weather is mild, for they require only to be protected from severe cold, except the Orange-leaved, and the striped Nutmeg Myrtles, which are somewhat tenderer than the rest, and should have a warmer situation.

During the winter season, they must be frequently, but gently watered; and, if any decayed leaves appear, they should be constantly picked off, as also the pots kept clear from weeds, which, if permitted to grow, will soon overspread the young plants, and destroy them.

If these pots are placed under a common hot-bed frame in winter, where they may be screened from frost, and have the free air in mild weather, the young plants will succeed better than in a green-house, provided they do not receive too much wet, and are not kept closely covered, which will occasion their growing mouldy, and dropping their leaves.

The spring following these plants should be taken out of the pots very carefully, preserving a ball of earth to the roots of each of them, and every one should be placed into a separate small pot filled with rich light earth, observing to water them well to settle the earth to their roots, and place them under a frame until they have taken root; after which they should be inured to the open air, and in May they must be placed abroad for the summer, in a sheltered situation, where they may be defended from strong winds.

During the summer season they will require to be plentifully watered, especially being in such small pots, which in that season soon dry; therefore you should observe to place them where they should receive the morning sun, for when they are too much exposed to the sun in the heat of the day, the moisture contained in the earth of these small pots will soon be exhaled, and the plants greatly retarded in their growth thereby.

In August following you should examine your pots, to see if the roots of the plants have not made way out through the hole in the bottom of the pots, which if you observe, you must then shift them into pots a size larger, filling them up with the like rich earth, and observe to trim the roots which were matted to the side of the pots, as also to loosen the earth from the outside of the ball with your hands, some of which should be taken off, that the roots may the easier find passage into the fresh earth; then you must water them well, and place the pots in a situation where they may be defended from strong winds; and at this time you may trim the plants, in order to reduce them to a regular figure; and if they are inclinable to make crooked stems, you should thrust down a slender strait stick close by them, to which their stems should be fastened, so as to bring them upright.

If care be taken to train them thus while they are young, the stems afterward, when they have acquired strength, will continue strait without any support, and their branches may be pruned, so as to form either balls or pyramids, which for such plants as are preserved in the green-house, and require to be kept in

ſmall compaſs, is the beſt method to have them handſome; but then theſe ſheered plants will not produce any flowers, for which reaſon that ſort with double flowers ſhould not be clipped, becauſe the chief beauty of that conſiſts in its flowers; but it will be neceſſary to ſuffer a plant or two of each kind to grow rude, for the uſe of their branches in noſegays, &c. for it will greatly deface thoſe which have been conſtantly ſheered to cut off their branches.

As theſe plants advance in ſtature, they ſhould annually be removed into larger pots, according to the ſize of their roots; but you muſt be careful not to put them into pots too large, which will cauſe them to ſhoot weak, and many times prove the deſtruction of them; therefore when they are taken out of the former pots, the earth about their roots ſhould be pared off, and that within ſide the ball muſt be gently looſened, that the roots may not be too cloſely confined; and then place them into the ſame pots again, provided they are not too ſmall, filling up the ſides and bottom of them with freſh rich earth, and giving them plenty of water to ſettle the earth to their roots; which ſhould be frequently repeated, for they require to be often watered both in winter and ſummer, but in hot weather they muſt have it in plenty.

The beſt ſeaſon for ſhifting theſe plants is either in April or Auguſt, for if it be done much ſooner in the ſpring, the plants are then in a ſlow growing ſtate, and ſo not capable to ſtrike out freſh roots again very ſoon; and if it be done later in autumn, the cold weather coming on will prevent their taking root; nor is it adviſeable to do it in the great heat of ſummer, becauſe they will require to be very often watered, and alſo to be placed in the ſhade, otherwiſe they will be liable to droop for a conſiderable time; and that being the ſeaſon when theſe plants ſhould be placed amongſt other exotics, to adorn the ſeveral parts of the garden, theſe plants, being then removed, ſhould not be expoſed until they have taken root again, which, at that time (if the ſeaſon be hot and dry) will be three weeks or a month.

In October, when the nights begin to be froſty, you ſhould remove the plants into the green-houſe; but if the weather proves favourable in autumn (as it often happens) they may remain abroad until the beginning of November; for if they are carried into the green-houſe too ſoon, and the autumn ſhould prove warm, they will make freſh ſhoots at that ſeaſon, which will be weak, and often grow mouldy in winter, if the weather ſhould be ſo ſevere as to require the windows to be kept cloſely ſhut, whereby they will be greatly defaced; for which reaſon they ſhould always be kept as long abroad as the ſeaſon will permit, and removed out again in the ſpring before they ſhoot out; and during the winter ſeaſon that they are in the green-houſe, they ſhould have as much free air as poſſible when the weather is mild.

The three firſt-mentioned ſorts I have ſeen planted abroad in warm ſituations, and upon a dry ſoil, where they have endured the cold of our winters for ſeveral years very well, with only being covered in very hard froſts with two or three mats, and the ſurface of the ground about their roots covered with a little mulch to prevent the froſt from entering the ground; but in Cornwall and Devonſhire, where the winters are more favourable than in moſt other parts of England, there are large hedges of Myrtle which have been planted ſeveral years, and are very thriving and vigorous, ſome of which are upward of ſix feet high; and I believe, if the double flowering kind were planted abroad, it would endure the cold as well as any of the other ſorts, it being a native of the ſouthern parts of France. This, and the Orange-leaved kind, are the moſt difficult to take root from cuttings; but if they are planted toward the latter end of June, making choice of only ſuch ſhoots as are tender, and the pots are plunged into an old bed of tanners bark which has loſt moſt of its heat, and the glaſſes ſhaded every day, they will take root extremely well, as I have more than once experienced. The Orange-leaved ſort, and thoſe with variegated leaves, are ſomewhat tenderer than the ordinary ſorts, and ſhould be houſed a little ſooner in autumn, and placed farther from the windows of the green-houſe.

The eighth ſort is at preſent rare in Europe, ſo is in very few gardens. This ſort was by Dr. Linnæus ſeparated from the Myrtles in the former editions of his works, and had the title of Myrſine applied to it; but in his Species of Plants, he has joined it to that genus again, to which, according to his ſyſtem, it properly belongs; for the number of petals, ſtamina, and ſtyle, do agree with thoſe of the Myrtle, but it differs in fructification, this having but one ſeed in each fruit, and the Myrtle has four or five.

This plant is with difficulty propagated, which occaſions its preſent ſcarcity, for as it does not produce ripe ſeeds in Europe, it can only be increaſed by layers or cuttings. By the former method the layers are commonly two years before they take root, and the cuttings frequently fail, though the latter is preferred, when performed at a proper ſeaſon and in a right method; the beſt time to plant the cuttings is in May: in the choice of them, it ſhould be the ſhoots of the former year, with a ſmall piece of the two years wood at bottom; theſe ſhould be planted in ſmall pots, filled with ſoft loamy earth, for ſmall pots are to be preferred to large ones for this purpoſe, and they ſhould be plunged into a very moderate hot-bed of tanners bark; and if the pots are each covered with ſmall bell or hand-glaſſes, ſuch as have been uſed for blowing of Carnations to exclude the air, it will be of great ſervice to promote the cuttings putting out roots, though they are covered with the glaſſes of the hot-bed above them; the cuttings ſhould be ſhaded from the ſun in the heat of the day, and gently refreſhed with water, as the earth in the pots is found to dry, but they ſhould by no means have too much wet; thoſe cuttings which ſucceed, will have taken root by July, when they ſhould be gradually inured to bear the open air, into which it will be proper to remove them about the middle of that month, that they may be ſtrengthened before winter, but it will not be proper to tranſplant the cuttings till ſpring; the pots muſt be removed into a temperate ſtove in autumn, and during the winter the cuttings muſt be gently refreſhed with water. In the ſpring they ſhould be carefully taken up, and each planted in a ſmall pot filled with light earth from a kitchen-garden, and plunged into a moderate hot-bed to forward their taking freſh root; then they ſhould be gradually hardened, and in July placed in the open air in a ſheltered ſituation, where they may remain till the end of September, and then be removed into the ſtove.

This plant will not live through the winter in England in a green-houſe, but if it is placed in a moderate degree of warmth, it will flower well in winter; and in July, Auguſt, and September, the plants ſhould be placed abroad in a ſheltered ſituation.

MYRTUS BRABANTICA. See MYRICA.

NAP-

# N.



NAPELLUS. See Aconitum.

NAPUS. See Brassica and Rapa.

NAPÆA. Lin. Gen. Plant. 748. Malva. H. L.

The Characters are,

*It hath male and hermaphrodite flowers in distinct plants. The male flowers have pitcher-shaped empalements of one leaf, which are permanent, and cut at the top into five segments. The flowers have five oblong petals, which are connected at their base, but spread open, and are divided at the top; they have many hairy stamina, which are joined at the bottom into a sort of a cylindrical column, terminated by roundish compressed summits. The hermaphrodite flowers have the like empalement, petals, and stamina, as the male, and have a conical germen, supporting a cylindrical style, divided at the top into ten parts, crowned by single stigmas. The germen afterward turns to an oval fruit, inclosed in the empalement, divided into ten cells, each containing one kidney-shaped seed.*

This genus of plants is ranged in the third section of Linnæus's sixteenth class, which includes the plants whose flowers have many stamina, which are joined at their base to the style, and together form a column. As the plants of this genus have male and hermaphrodite flowers on distinct plants, so they differ from all the tribe of malvaceous plants, to which they properly belong, the flowers being monopetalous, the stamina and styles being joined at their base, forming a column, which are the essential characters of that class.

The Species are,

1. Napæa (*Dioica*) pedunculis involucratis angulatis foliis scabris, floribus dioicis. Flor. Virg. 102. *Napæa with angular foot-stalks, rough leaves, and male and hermaphrodite flowers on different plants.* Abutilon folio profundè dissecto, pedunculis multifloris mas & fœmina. Ehret. Pict. 7 & 8. *Abutilon with a deeply divided leaf, and foot-stalks having many flowers, which are both male and female.*
2. Napæa (*Hermaphrodita*) pedunculis nudis lævibus, foliis glabris, floribus hermaphroditis. *Napæa with naked foot-stalks, smooth leaves and hermaphrodite flowers.* Althæa Ricini folio Virginiana. H. L. *Virginia Marshmallow with a Ricinus leaf.*

The first sort has perennial roots, which are composed of many thick fleshy fibres, which strike deep into the ground, and are connected at the top into a large head, from which come out a great number of rough hairy leaves, near a foot diameter each way, which are deeply cut into six or seven lobes, which are irregularly indented on their edges, each lobe having a strong midrib, which all meet in a center at the foot-stalk. The foot-stalks are large and long, arising immediately from the root, and spread out on every side. The flower-stalks rise seven or eight feet high, and divide into smaller branches, garnished at each joint with one leaf, of the same form as those below, but diminish in their size toward the top, where they seldom have more than three lobes, which are divided to the foot-stalk; toward the upper part of the stalk come out from the side at each joint a long foot-stalk, which branches out toward the top, sustaining several white flowers, which are tubulous at bottom, where the segments of the petal are connected, but they spread open above, and are divided into five obtuse segments; in the center arises the column, to which the stamina are joined at their base, but spread open above, and in the hermaphrodite flowers the style is connected to the same column. The hermaphrodite flowers are succeeded by compressed orbicular fruit, inclosed in the empalement, and divided into five cells, each containing a kidney-shaped seed, but the male plants are barren. It flowers in July and the seeds ripen in autumn, soon after which the stalk decays, but the roots will live many years.

The second sort hath also a perennial root, which frequently creeps in the ground; this sends up smooth stalks, which rise about four feet high, garnished with smooth leaves, placed alternately, standing upon pretty long slender foot-stalks; they are deeply cut into three lobes, which end in acute points, and are irregularly sawed on their edges; those on the lower part of the stalk are near four inches long, and almost as much in breadth, but they diminish gradually toward the top of the stalk. At the base of the leaf comes out the foot-stalk of the flower, which is about three inches long, dividing at the top into three smaller, each sustaining one white flower of the same form with those of the first sort, but are smaller, and the column of stamina is longer, their summits standing out beyond the petal.

Both these plants grow naturally in Virginia, and other parts of North America; from the bark of these plants might be procured a sort of hemp, which many of the malvaceous tribe afford; and in some of the sorts which grow naturally in India, the fibres of the bark are so fine, as to spin into very fine threads, of which there might be woven very fine cloth.

These plants are easily propagated by seeds, which if sown on a bed of common earth in the spring, the plants will rise very freely, and will require no other care but to keep them clear from weeds till autumn, when they may be transplanted into the places where they are to remain; they delight in a rich moist soil, in which they will grow very luxuriantly, so they must be allowed room. The second sort may be propagated by its creeping roots, which may be parted in autumn; but as these plants have no great beauty, so one or two of each sort in a garden, for the sake of variety, will be enough.

NARCISSO LEUCOIUM. See Galanthus.

NARCISSUS. Lin. Gen. Plant. 364. [takes its name of ναρκὸς, or νάρκη, a torpidness, or deep sleep, because the smell of this flower is said to cause a heaviness of the head, and a stupidity. Plutarch tells us, this plant was sacred to the infernal gods. The poets tell us, that Narcissus was the son of Cephisus, and the nymph Lyriope; a youth of such excellent beauty, that once upon a time coming to a fountain to drink, and seeing his beauteous image in the water, he grew so enamoured with it that he pined away with desire, and was transformed into a flower of his name.] The Daffodil.

The Characters are,

*The flowers are included in an oblong compressed spatha (or sheath) which tears open on the side, and withers. The flowers have a cylindrical funnel-shaped empalement of one leaf, which is spread open at the brim; they have six oval petals on the outside of the nectarium, which are inserted above their base, and six awl-shaped stamina fixed to*

*to the tube of the nectarium, terminated by oblong summits; they have a three-cornered, roundish, obtuse germen, situated below the flower, supporting a long slender style, crowned by a trifid stigma. The germen afterward turns to an obtuse, roundish, three-cornered capsule, with three cells, filled with globular seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, which contains those plants whose flowers have six stamina and one style.

The Species are,

1. Narcissus (*Pseudonarcissus*) spathâ uniflorâ, nectario campanulato erecto, crispo æquante petala ovata. Lin. Sp. Plant. 414. *Daffodil with one flower in each sheath, whose nectarium is erect, bell-shaped, and equal with the petals, which are oval.* Narcissus sylvestris pallidus, calyce luteo. C. B. P. 52. *Pale wild Daffodil with a yellow cup, or common English Daffodil.*
2. Narcissus (*Poëticus*) spathâ uniflorâ, nectario rotato brevissimo, scarioso crenulato. Hort. Upsal. 74. *Daffodil with one flower in a sheath, having a very short wheel-shaped nectarium indented on the edge.* Narcissus albus, circulo purpureo. C. B. P. 48. *White Daffodil with a purple circle in the middle.*
3. Narcissus (*Incomparibilis*) spathâ uniflorâ, nectario campanulato erecto, petalo dimidio breviore. *Daffodil with one flower in a sheath, having an erect bell-shaped empalement half the length of the petal.* Narcissus incomparibilis, flore pleno, partim flavo, partim croceo. H. R. Par. *The Incomparable Daffodil with a double flower, partly yellow, and partly Saffron-coloured.*
4. Narcissus (*Medio-luteus*) spathâ biflorâ, nectarii campanulato, brevissimo, floribus nutantibus. *Daffodil with two flowers in a sheath, a short bell-shaped nectarium, and nodding flowers.* Narcissus medio luteus vulgaris. Park. *Common Daffodil with a yellow middle, called Primrose Peerless.*
5. Narcissus (*Albus*) spathâ uniflorâ, nectario campanulato brevissimo, petalis reflexis. *Daffodil with one flower in a sheath, having a very short bell-shaped nectarium, and reflexed petals.* Narcissus albus, foliis reflexis, calyce brevi aureo. H. R. Par. *Daffodil with white flowers, having reflexed petals, and a short golden cup.*
6. Narcissus (*Bulbocodium*) spathâ uniflorâ, nectario turbinato petalis majore, genitalibus declinatis. Lin. Sp. Plant. 417. *Rush-leaved Daffodil with one flower in each sheath, a turbinated nectarium larger than the petal, and declining stamina.* Pseudonarcissus juncifolius flavo flore. Clus. Hist. 166. *Commonly called Hoop-petticoat Narcissus.*
7. Narcissus (*Serotinus*) spathâ uniflorâ, nectario brevissimo sex-partito. Lœfl. Lin. Sp. Plant. 290. *Daffodil with one flower in a sheath, having a very short nectarium, which is cut into six parts.* Narcissus autumnalis minor. Clus. Hisp. 251. *Smaller autumnal Daffodil.*
8. Narcissus (*Tazetta*) spathâ multiflorâ, nectario campanulato, foliis planis. Hort. Upsal. 74. *Daffodil with many flowers in a sheath, having a bell-shaped nectarium, and plain leaves.* Narcissus luteus polyanthos Lusitanicus. C. B. P. 50. *Yellow Portugal Daffodil with many flowers, commonly called Polyanthus Narcissus.*
9. Narcissus (*Jonquilla*) spathâ multiflorâ, nectario campanulato brevi, foliis subulatis. Hort. Upsal. 75. *Daffodil with many flowers in a sheath, a short bell-shaped nectarium, and awl-shaped leaves.* Narcissus juncifolius luteus minor. C. B. P. 51. *Smaller yellow Rush-leaved Daffodil, called Jonquil.*

The sorts here enumerated, are all the real species which I have met with in the English gardens, though there is a great variety of each species, which differ so much from one another, as to render it very difficult to ascertain the species to which they belong; in order to find out, as well as I could, from what species many of those varieties have been raised, I endeavoured to degenerate as many of the double flowering, and others of the best kinds, so far as I could, by which I have observed their several changes, and shall here mention under each species, the varieties I have observed.

The first sort is the common English Daffodil, which grows naturally by the borders of woods and fields in many parts of England; this hath a large bulbous root, from which comes out five or six flat leaves, about a foot long, and an inch broad, of a grayish colour, and a little hollowed in the middle like the keel of a boat. The stalk rises a foot and a half high, having two sharp longitudinal angles; at the top comes out a single flower, inclosed in a thin spatha (or sheath), which is torn open on one side, to make way for the flower to come out, and then withers and remains on the top of the stalk. The flower is of one petal or leaf, being connected at the base, but is cut into six parts almost to the bottom, which expand; in the middle of this is situated a bell-shaped nectarium, called by the gardeners a cup, which is equal in length to the petal, and stands erect. The flower nods on the side of the stalk. The petal is of a pale brimstone colour, and the nectarium yellow. It flowers the beginning of April, and after the flowers are past, the germen turns to a roundish capsule, with three cells filled with roundish black seeds, which ripen in July. This sort propagates very fast by offsets from the root.

The varieties of this are,

One with white petals, and a pale yellow cup.

One with yellow petals, and a golden cup.

The common double yellow Daffodil.

Another double Daffodil, with three or four cups within each other.

And, I believe, John Tradescant's Daffodil may be referred to this species.

The second sort grows naturally in the south of France and in Italy; this hath a smaller and rounder bulbous root than the former. The leaves are longer, narrower, and flatter than those of that sort. The stalks do not rise higher than the leaves, which are of a gray colour: at the top of the stalk comes out one flower from the sheath, which nods on one side. The petal of this is cut into six segments, which are rounded at their points; they are of a snow white, and spread open flat. In the center is situated a very short nectarium or cup, which is fringed on the border with a bright purple circle. The flowers have an agreeable odour. This flowers in May, but seldom produces seeds, however it increases fast enough by offsets.

The double white Narcissus is the only variety of this which I have observed, though there is mentioned in some books several other.

The third sort grows naturally in Spain and Portugal, from whence I have received the roots. The bulbs of this sort are very like those of the first. The leaves are longer, of a darker green, and the flower-stalks rise higher. The segments of the petal are rounder, and spread open, flatter than those of the first sort. The nectarium, or cup, in the middle, is about half the length of the petal, and is edged with a gold-coloured fringe. It flowers in April, but seldom produces seeds here. This sort sports and varies more than any of the other: the following variations I have traced in the same roots.

The roots of these, the first year, produced very double flowers, of the sort which is commonly called the Incomparable Daffodil. The six outer segments of the petal were longer than either of the others, and white; the middle was very full of shorter petals, some of which were white, others yellow, and collected into a globular figure: some of these roots, the following year, produced flowers less double than before, with no white petals in them, but the larger petals were of a sulphur colour, and the others yellow; from this they afterward degenerated to half double flowers, and at last to single flowers, with a cup half the length of the petal, in which manner they have continued to flower many years; so that we may conclude, that those varieties were first obtained from the seeds of this single flower.

The fourth ſort grows naturally in the ſouth of France and in Italy, and has been found growing in the fields in ſome parts of England, but it is likely to have been from ſome roots which have been thrown out of gardens with rubbiſh. The roots of this ſort are not ſo large as thoſe of the firſt, and are rounder; the leaves are long, of a gray colour, and ſmoother than thoſe of the firſt; the flower-ſtalks are of the ſame length with the leaves, and have commonly but one flower in a ſheath, but ſometimes when the roots are ſtrong, they have two. The flower nods downward, the ſegments of the petal are a little waved on their edges, the nectarium or cup is ſhort, and bordered with yellow; it flowers in May. The ſcent of theſe flowers is not very agreeable, and as they are not very beautiful, ſo they are ſeldom cultivated in gardens, ſince the finer ſorts have been plenty. There is no variety of this ſo far as I have been able to trace, for I could never obſerve any variation in the flowers.

The fifth ſort has ſome reſemblance of the fourth, but the flowers are whiter, the ſegments of the petal are reflexed, and the border of the nectarium or cup is of a gold yellow colour; this has ſome affinity to the ſecond ſort.

The ſixth ſort grows naturally in Portugal, from whence I have received the roots. The bulbs of this kind are ſmall, the leaves are very narrow, having ſome reſemblance to thoſe of the Ruſh, but are a little compreſſed, and have a longitudinal furrow on one ſide; theſe are ſeldom more than eight or nine inches long. The flower-ſtalk is ſlender, taper, and about ſix inches long, ſuſtaining at the top one flower, which is at firſt incloſed in a ſheath; the petal is ſcarce half an inch long, and is cut into ſix acute ſegments; the nectarium or cup is more than two inches long, very broad at the brim, leſſening gradually to the baſe, being ſomewhat formed like the ladies hoop petticoats, from whence the flower is ſo called. It flowers in April, but does not produce ſeeds here. There are no varieties of this ſort.

The ſeventh ſort grows naturally in Spain; this hath a ſmall bulbous root; the leaves are but few in number, and are narrow; the ſtalk is jointed, and riſes about nine inches high, ſuſtaining at the top one flower, which at firſt is incloſed in the ſpatha, or ſheath; the flower is cut into ſix narrow ſegments, which are white; the nectarium, or cup, is yellow. It flowers late in the autumn, and the roots are tender, ſo are often killed by hard froſts in England, which renders it ſcarce here.

The eighth ſort grows naturally in Portugal, and in the iſlands of the Archipelago: of this there are a greater variety than of all the other ſpecies; for as the flowers are very ornamental, and come early in the ſpring, ſo the floriſts in Holland, Flanders, and France, have taken great pains in cultivating and improving them; ſo that at preſent the catalogues printed by the Dutch floriſts, contain more than thirty varieties, the principal of which are theſe hereafter mentioned.

Theſe have yellow petals, with Orange, yellow, or ſulphur-coloured cups, or nectariums.

| | |
|---|---|
| The Great Algiers. | The Moſt Beautiful. |
| The Ladies Noſegay. | The Golden Star. |
| The Greater Bell. | The Mignon. |
| The Golden Royal. | The Zeylander. |
| The Golden Scepter. | The Madouſe. |
| The Triumphant. | The Golden Sun. |

The following have white petals, with yellow or ſulphur-coloured cups or nectariums.

| | |
|---|---|
| The Archdutcheſs. | The Greater Bozelman. |
| The Triumphant Noſegay. | The Czarina. |
| The New Dorothy. | The Grand Monarque. |
| The Paſſe Bozelman. | The Czar of Muſcovy. |
| The Superb. | The Surpaſſante. |

There are ſome with white petals and white cups, but theſe are not ſo much eſteemed as the others, though there are two or three varieties with large bunches of ſmall white flowers, which have a very agreeable odour, ſo are as valuable as any of the other, and are later in flower than moſt of the other ſorts. There is alſo one with very double flowers, whoſe outer petals are white, and thoſe in the middle are ſome white, and others of an Orange-colour, which have a very agreeable ſcent, and is the earlieſt in flowering; it is generally called the Cyprus Narciſſus, and ſeems to be a diſtinct ſpecies from the others. This, like moſt other double flowers, never produces any ſeeds, ſo is only propagated by offſets, and is the moſt beautiful of all the Narciſſus, when blown upon glaſſes of water in a room; but when it is planted in the ground, if the bed in which they are planted is not covered with mats in froſty weather, to prevent their flower-buds from being deſtroyed, they ſeldom flower; for the leaves begin to ſhoot early in the autumn, and the flower-buds appear about Chriſtmas, which are tender, ſo that if hard froſt happen when they are coming out of the ground, it generally kills them; but if they are properly ſcreened from froſt, they will flower in February, and in mild ſeaſons often in January.

The ninth ſort is the Jonquil, a flower ſo well known as to need no deſcription; of this there is the great and ſmall Jonquil with ſingle flowers, and the common ſort with double flowers, which is moſt eſteemed.

I ſhall firſt treat of the method for raiſing the fine ſorts of Polyanthus Narciſſus from ſeeds, which is the way to obtain new varieties.

The not practiſing this has occaſioned our ſending abroad annually for great quantities of flower-roots, which have been kept up to a high price, on account of the great demand for them in England; whereas if we were as induſtrious to propagate them as our neighbours, we might ſoon vie with them, if not outdo them, in moſt ſorts of flowers; as may be ſeen, by the vaſt variety of Carnations, Auriculas, Ranunculas, &c. which have been produced from ſeeds in England, and exceed moſt of thoſe kinds in any part of Europe.

You muſt be very careful in ſaving your ſeeds, to gather none but from ſuch flowers as have good properties, and particularly from ſuch only as have many flowers upon a ſtalk, that flower tall, and have beautiful cups to their flowers; from ſuch you may expect to have good flowers produced; but if you ſow ordinary ſeed, it is only putting yourſelf to trouble and expence to no purpoſe, ſince from ſuch ſeeds there can be no hopes of procuring any valuable flowers.

Having provided yourſelf with good ſeeds, you muſt procure either ſome ſhallow caſes or flat pans, made on purpoſe for the raiſing of ſeedlings, which ſhould have holes in their bottoms, to let the moiſture paſs off; theſe muſt be filled with freſh, light, ſandy earth about the beginning of Auguſt (that being the ſeaſon for ſowing the ſeeds of moſt bulbous-rooted flowers;) the earth in theſe muſt be levelled very even; then ſow the ſeeds thereon pretty thick, covering them over with fine ſifted light earth about half an inch thick, and place the caſes or pans in a ſituation where they may have only the morning ſun till about ten o'clock, where they ſhould remain until the beginning of October, when they muſt be removed into a warmer ſituation, placing them upon bricks, that the air may freely paſs under the caſes, which will preſerve them from being too moiſt.

They ſhould alſo be expoſed to the full ſun, but ſcreened from the north and eaſt winds; and if the froſt ſhould be ſevere, they muſt be covered, otherwiſe there will be danger of their being deſtroyed; in this ſituation they may remain until the beginning of April, by which time the plants will be up, when you muſt carefully clear them from weeds; and if the ſeaſon ſhould prove dry, they muſt be frequently watered: the caſes ſhould alſo now be removed into their former ſhady poſition, or ſhaded in the middle

of the day, for the heat of the noon-day ſun will be too great for the young plants.

The latter end of June, when the leaves of the plants are decayed, you ſhould take off the upper ſurface of the earth in the caſes (which by that time will have contracted a moſſineſs, and, if ſuffered to remain, will greatly injure the young roots) obſerving not to take it ſo deep as to touch the roots; then ſift ſome freſh light earth over the ſurface, about half an inch thick, which will greatly ſtrengthen the roots; the ſame ſhould alſo be repeated in October, when the caſes are moved again into the ſun.

During the ſummer ſeaſon, if the weather ſhould prove very wet, and the earth in the caſe appear very moiſt, you muſt remove them into the ſun till the earth be dry again; for if the roots receive much wet during the time they are inactive, it very often rots them; therefore you muſt never give them any water after their leaves are decayed, but only place them in the ſhade, as was before directed.

Thus you ſhould manage them the two firſt ſeaſons, till their leaves are decayed; but the ſecond ſummer after ſowing, you ſhould carefully take up the roots; which may be done, by ſifting the earth in the caſes through a fine ſieve, whereby the roots will be eaſily ſeparated from the earth; then having prepared a bed or two of good freſh light earth, in proportion to the quantity of your roots, you ſhould plant them therein, at about three inches diſtance every way, and about three inches deep in the ground.

Theſe beds ſhould be raiſed above the level of the ground, in proportion to the moiſture of the ſoil, which if dry, three inches will be enough; but if it be wet, they muſt be raiſed ſix or eight inches high, and laid a little rounding, to ſhoot off the wet.

If theſe beds are made in July, which is the beſt time to tranſplant the roots, the weeds will ſoon appear very thick; therefore you ſhould gently hoe the ſurface of the ground to deſtroy them, being very careful not to cut ſo deep as to touch any of the roots; and this ſhould be repeated as often as may be found neceſſary, by the growth of the weeds, obſerving always to do it in dry weather, that they may be effectually deſtroyed; and toward the latter end of October, after having entirely cleared the beds from weeds, you ſhould ſift a little rich light earth over them, about an inch thick; the goodneſs of which will be waſhed down to the roots by the winter's rain, which will greatly encourage their ſhooting in the ſpring.

If the cold ſhould be very ſevere in winter, you ſhould cover the beds either with old tan or ſea coal aſhes, or in want of theſe with Peaſe-haulm, or ſome ſuch light covering, to prevent the froſt from penetrating the ground to the roots, which might greatly injure them while they are ſo young.

In the ſpring, when the plants begin to appear above ground, you muſt gently ſtir the ſurface of the ground, clearing it from weeds, &c. in doing of which, you ſhould be very careful not to injure the plants; and if the ſeaſon ſhould prove dry, you ſhould now and then gently refreſh them with water, which will ſtrengthen the roots.

When their leaves are decayed, you ſhould clear the beds from weeds, and ſift a little earth over them (as was before directed) which muſt alſo be repeated in October, in like manner; but the roots ſhould not remain longer in theſe beds than two years, by which time they will have grown ſo large as to require more room; therefore they ſhould be taken up as ſoon as their leaves are decayed, and planted into freſh beds, which ſhould be dug deep, and a little very rotten dung buried in the bottom, for the fibres of the roots to ſtrike into. Then the roots ſhould be planted at ſix inches diſtance, and the ſame depth in the ground. In the autumn, before the froſt comes on, if ſome rotten tan is laid over the beds, it will keep out the froſt, and greatly encourage the roots; and if the winter ſhould prove ſevere, it will be proper to lay a greater thickneſs of tan over the beds, and alſo in the alleys, to keep out froſt, or to cover them over with Straw, or Peaſe-haulm, otherwiſe they may be all deſtroyed by the cold. In the ſpring theſe coverings ſhould be removed, as ſoon as the danger of hard froſts is over, and the beds muſt be kept clean from weeds the following ſummer: at Michaelmas they ſhould have ſome freſh earth laid over the beds, and covered again with tan, and ſo every year continued till the roots flower, which is generally in five years from ſeed, when you ſhould mark all ſuch as promiſe well, which ſhould be taken up as ſoon as their leaves decay, and planted at a greater diſtance in new prepared beds; but thoſe which do not flower, or thoſe you do not greatly eſteem, ſhould be permitted to remain in the ſame bed; therefore, in taking up thoſe roots which you marked, you muſt be careful not to diſturb the roots of thoſe left, and alſo to level the earth again, and ſift ſome freſh earth over the beds (as before) to encourage the roots; for it often happens in the ſeedlings of theſe flowers, that at their firſt time of blowing, their flowers ſeldom appear half ſo beautiful as they do the ſecond year; for which reaſon none of them ſhould be rejected until they have flowered two or three times, that ſo you may be aſſured of their worth.

Thus having laid down directions for the ſowing and managing theſe roots, until they are ſtrong enough to flower, I ſhall proceed to give ſome inſtructions for planting and managing the roots afterwards, ſo as to cauſe them to produce large fair flowers.

All the ſorts of Narciſſus which produce many flowers upon a ſtalk, ſhould have a ſituation defended from cold and ſtrong winds, otherwiſe they will be ſubject to be injured by the cold in winter, and their ſtems broken down when in flower; for notwithſtanding their ſtalks are generally pretty ſtrong, yet the number of flowers upon each renders their heads weighty, eſpecially after rain, which lodges in the flowers, and, if ſucceeded by ſtrong winds, very often deſtroys their beauty, if they are expoſed thereto; ſo that a border under a hedge, which is open to the ſouth-eaſt, is preferable to any other poſition for theſe flowers.

The morning ſun riſing upon them will dry off the moiſture which had lodged upon them the preceding night, and cauſe them to expand fairer than when they are planted in a ſhady ſituation; and if they are too much expoſed to the afternoon ſun, they will be hurried out of their beauty very ſoon; and the ſtrong winds uſually coming from the weſt and ſouth-weſt points, they will be expoſed to the fury of them, which frequently is very injurious to them.

Having made choice of a proper ſituation, you muſt then proceed to prepare the earth neceſſary to plant them in; for if the natural ſoil of the place be very ſtrong or poor, it will be proper to make the border of new earth, removing the former ſoil away about three feet deep. The beſt earth for theſe flowers is a freſh, light, hazel loam, mixed with a little very rotten neats dung; this ſhould be well mixed together, and often turned over, in order to ſweeten it; then having removed away the old earth to the fore-mentioned depth, you ſhould put a layer of rotten dung or tan in the bottom, about four or five inches thick, upon which you muſt lay ſome of the prepared earth about eighteen or twenty inches thick, making it exactly level; then having marked out by line the exact diſtances at which the roots are to be planted (which ſhould not be leſs than ſix or eight inches ſquare) you muſt place the roots accordingly, obſerving to ſet them upright; then you muſt cover them over with the before-mentioned earth about eight inches deep, being very careful in doing it, not to diſplace the roots; when this is done, you muſt make the ſurface of the border even, and make up the ſide ſtrait, which will appear handſome.

The beſt time for planting theſe roots is in the end of Auguſt, or beginning of September; for if they are kept too long out of the ground, it will cauſe their flowers to be weak. You ſhould alſo obſerve the nature of the ſoil where they are planted, and whe-

ther

ther the situation be wet or dry, according to which you should adapt the fresh earth, and order the beds; for if the soil be very strong and the situation moist, you should then make choice of a light earth, and raise the beds six or eight inches, or a foot, above the level of the ground, otherwise the roots will be in danger of perishing by too much wet; but if the situation be dry and the soil naturally light, you should then allow the earth to be a little stronger, and the beds should not be raised above three or four inches high; for if they are made too high, the roots will suffer very much, if the spring should prove dry, nor would the flowers be near so fair. As also in very severe winters, those beds which are raised much above the level of the ground, will be more exposed to the cold than those which are lower, unless the alleys are filled up with rotten tan or litter.

During the summer, the only culture these flowers require is, to keep them free from weeds; and when their leaves are entirely decayed, they should be raked off, and the beds made clean: but by no means cut off their leaves till they are quite decayed, as is by some practised, for that greatly weakens the roots.

Towards the middle of October, if the weeds have grown upon the beds, you should in a dry day gently hoe the surface of the ground to destroy them, observing to rake it over smooth again; and before the frosts come on, the beds should be covered over two inches thick with rotten tan, to keep out the frost; after which they will require no farther care till the spring, when their leaves will appear above ground; at which time you should gently stir the surface of the earth with a small trowel, being very careful not to injure the leaves of the plants, and rake it smooth with your hands, clearing off all weeds, &c. which, if suffered to remain at that season, will soon grow so fast as to appear unsightly, and will exhaust the nourishment from the earth. With this management these roots will flower very strong, some of which will appear in March, and the others in April; which, if suffered to remain, will continue in beauty a full month, and are, at that season, very great ornaments to a flower-garden.

After the flowers are past, and the leaves decayed, you should stir the surface of the ground, to prevent the weeds from growing; and if at the same time you lay a little very rotten dung over the surface of the beds, the rain will wash down the salts thereof, which will greatly encourage the roots the succeeding year.

During the summer season they will require no farther care, but to keep them clear from weeds till October, when the surface of the beds should be again stirred, raking off all weeds, &c. and laying some good fresh earth over the beds about an inch deep, which will make good the loss sustained by weeding, &c. and in the spring you must manage as was directed for the preceding year.

These roots should not be transplanted oftener than every third year, if they are expected to flower strong and make a great increase; because the first year after removing, they never flower so strong as they do the second and third; nor will the roots increase so fast, when they are often transplanted; but if you let them remain longer than three years unremoved, the number of offsets which by that time will be produced, will weaken the large bulbs, and cause them to produce very weak flowers; therefore at the time of transplanting them, all the small offsets should be taken off, and planted in a nursery-bed by themselves, but the large bulbs may be planted again for flowering. If you plant them in the same bed where they grew before, you must take out all the earth two feet deep, and fill it up again with fresh, in the manner before directed, which will be equal to removing them into another place: this is the constant practice of the gardeners in Holland, who have but little room to change their roots; therefore they every year remove the earth of their beds, and put in fresh, so that the same place is constantly occupied by the like flowers. But those people take up their roots every year, for as they cultivate them for sale, the rounder their roots are, the more valuable they will be: the way to have them so is, to take their offsets from them annually; for when their roots are left two or three years unremoved, the offsets will have grown large, and these pressing against each other, will cause their sides to be flatted; so that where the roots are propagated for sale, they should be annually taken up as soon as their leaves decay; and the large bulbs may be kept out of the ground till the middle or end of October, but the offsets should be planted the beginning of September or sooner, that they may get strength, so as to become blowing roots the following year: but where they are designed for ornament, they should not be removed oftener than every third year, for then the roots will be in large bunches, and a number of stalks with flowers coming from each bunch, they will make a much better appearance than where a single stalk rises from each root, which will be the case when the roots are annually removed.

The common sorts of Daffodil are generally planted in large borders of the pleasure-garden, where, being intermixed with other bulbous-rooted flowers, they afford an agreeable variety in their seasons of flowering. These roots are very hardy, and will thrive in almost any soil or situation, which renders them very proper for rural gardens, where, being planted under the shade of trees, they will thrive for several years without transplanting, and produce annually in the spring great quantities of flowers, which will make a good appearance before the trees come out in leaf.

The Jonquils should be planted in beds or borders, separate from other roots, because these require to be transplanted at least every year, otherwise their roots are apt to grow long and slender, and seldom flower well after; which is also the case, if they are continued many years in the same soil; wherefore the roots should be often removed from one part of the garden to another, or at least, the earth should be often renewed, which is the most probable method to preserve their flowers in perfection.

The soil in which these flowers succeed best, is an hazel loam, neither too light nor over stiff; it must be fresh, and free from roots of trees or noxious weeds, but should not be dunged; for it is very remarkable, that where the ground is made rich, they seldom continue good very long, but are subject to shoot downwards, and form long slender roots.

These flowers are greatly esteemed by many people for their strong sweet scent, though there be very few ladies that can bear the smell of them; so powerful is it, that many times it overcomes their spirits, especially if confined in a room; for which reason, they should never be planted too close to a habitation, lest they become offensive; nor should the flowers be placed in such rooms where company is entertained.

NASTURTIUM. See Lepidium.

NASTURTIUM INDICUM. See Tropæolum.

NATURAL is belonging to, or proceeding from nature.

NATURE is a term variously used; and Mr. Boyle, in a treatise of the vulgarly received notion of Nature, gives us eight principal ones.

1. Nature is used for the system of the world, the machine of the universe, or the assemblage of all created beings.

In this sense we say, the author of Nature, meaning God; and speaking of the sun, call him the father of Nature, because he warms the earth, and makes it fruitful; and the eye of Nature, because he illuminates the universe; and of a phœnix, a unicorn, a griffin, a satyr, that there are no such things in Nature.

2. Nature, in a more confined sense, comprehends the several kinds of beings, created and uncreated, corporeal and spiritual: thus we say, human Nature, i. e. all men who possess the same rational souls; angelical Nature, divine Nature.

3. Nature, in a still more restrained sense, is used for the essence of a thing, or that attribute that makes a thing what it is; as, it is the Nature of the soul to think.

4. Nature is particularly used for the established order and course of material things, the series of the second causes, or the laws that God has imposed on the motions impressed by him. In this sense we say, the day and night, by Nature, succeed one another; physic is the study of Nature; respiration is by Nature necessary to life.

5. Nature is also used to signify an aggregate of powers, which belong to any body, especially a living one. Thus we say, Nature is strong, Nature is weak, Nature is spent, &c.

6. Nature is also more strictly used for the action of providence, the principle of all things, or that spiritual being which is diffused throughout the creation, and moves and acts in all bodies, and gives them certain properties, and procures certain effects. In this sense, Nature signifies the qualities or virtues that God has given to his creatures, animal, vegetable, &c. In speaking of the action of Nature, no more is to be understood, but that bodies act on one another in a manner agreeable to the general laws of motion which the Creator has established.

NEBULOSE, or NEBULOUS, signifies cloudy, misty, foggy, hazy.

NECTARINE [properly so called of nectar, the poetical drink of the Gods] Nectarine.

This fruit should have been placed under the article of Peaches, to which it properly belongs, differing from them in nothing more than in having a smooth rind, and the flesh being firmer. These the French distinguish by the name of Brugnon, as they do those Peaches which adhere to the stone, by the name of Pavies, retaining the name of Pêsche to only such as part from the stone; but since the writers in gardening have distinguished this fruit by the name of Nectarine from the Peaches, so I shall follow their example, lest by endeavouring to rectify their mistakes, I should render myself less intelligible to the reader. I shall therefore mention the several varieties of this fruit, which have come to my knowledge:

1. Fairchild's early Nectarine. This is one of the earliest ripe Nectarines we have; it is a small round fruit, about the size of the Nutmeg Peach, of a beautiful red colour, and well flavoured; it ripens the end of July.

2. Elruge Nectarine: the tree has sawed leaves; the flowers are small; it is a middle-sized fruit, of a dark red or purple colour next the sun, but of a pale yellow or greenish colour towards the wall; it parts from the stone, and has a soft melting juice: this ripens in the beginning of August.

3. Newington Nectarine: the tree has sawed leaves; the flowers are large and open; it is a fair large fruit, (when planted on a good soil) of a beautiful red colour next the sun, but of a bright yellow towards the wall; it has an excellent rich juice; the pulp adheres closely to the stone, where it is of a deep red colour: this ripens the latter end of August, and is the best flavoured of all the sorts, or perhaps of any known fruit in the world.

4. Scarlet Nectarine is somewhat less than the last, of a fine red or scarlet colour next the sun, but loses itself in paler red towards the wall: this ripens in the end of August.

5. Brugnon or Italian Nectarine, has smooth leaves; the flowers are small; it is a fair large fruit, of a deep red colour next the sun, but of a soft yellow towards the wall; the pulp is firm, of a rich flavour, and closely adheres to the stone, where it is very red: this ripens in the end of August.

6. Roman Red Nectarine has smooth leaves, and large flowers; it is a large fair fruit, of a deep red or purple colour towards the sun, but has a yellowish cast next the wall; the flesh is firm, of an excellent flavour, closely adhering to the stone, where it is very red: this ripens in September.

7. Murry Nectarine is a middle sized fruit, of a dirty red colour on the side next the sun, but of a yellowish green towards the wall, the pulp is tolerably well flavoured: this ripens the beginning of September.

8. Golden Nectarine is a fair handsome fruit, of a soft red colour next the sun, but of a bright yellow next the wall; the pulp is very yellow, of a rich flavour, and closely adheres to the stone, where it is of a faint red colour: this ripens the middle of September.

9. Temple's Nectarine is a middle-sized fruit, of a soft red colour next the sun, of a yellowish green toward the wall: the pulp is melting, of a white colour towards the stone, from which it parts, and has a fine poignant flavour; this ripens the end of September.

10. Peterborough, or late green Nectarine, is a middle sized fruit, of a pale green colour on the outside next the sun, but of a whitish green towards the wall; the flesh is firm, and, in a good season, tolerably well flavoured; this ripens the middle of October.

There are some persons who pretend to have more varieties than I have here enumerated, but I much doubt whether they are different, there being so near a resemblance between the fruits of this kind, that it requires a very close attention to distinguish them well, especially if the trees grow in different soils and aspects, which many times alters the same fruit so much, as hardly to be distinguished by persons who are very conversant with them; therefore, in order to be thoroughly acquainted with their differences, it is necessary to consider the shape and size of their leaves, the size of their flowers, their manner of shooting, &c. which is many times very helpful in knowing of these fruits.

The culture of this fruit differing in nothing from that of the Peach, I shall forbear mentioning any thing on that head in this place, to avoid repetition, but only wish those persons who propagate this fruit, will take their buds from bearing trees, and not from young nursery trees, as is too often practised; however, I shall refer the reader to the article PERSICA, where there is an ample account of their planting, pruning, &c.

NEMORAL signifies belonging to a wood or grove.

NEPETA. Lin. Gen. Plant. 629. Cataria. Tourn. Inst. R. H. 202. tab. 95. Catmint, or Nep; in French, *Herbes aux Chats*.

The CHARACTERS are,

*The empalement of the flower is tubulous and cylindrical, indented into five acute parts at the top. The flower is of the lip kind, with one petal, having an incurved cylindrical tube, gaping at the top. The upper lip is erect, roundish, and indented at the point. The under lip is large, concave, entire, and sawed on the edge. It hath four awl-shaped stamina situated under the upper lip, two of which are shorter than the other, terminated by incumbent summits. In the bottom of the tube is situated the quadrifid germen, supporting a slender style, crowned by a bifid acute stigma. The germen afterward turns to four oval seeds, sitting in the empalement.*

This genus of plants is ranged in the first section of Linnaeus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and are succeeded by naked seeds sitting in the empalement.

The SPECIES are,

1. NEPETA (*Cataria*) floribus spicatis, verticillis subpedicellatis, foliis petiolatis cordatis dentato-serratis. Lin. Sp. Plant. 796. *Catmint with spiked flowers, whose whorls have very short foot-stalks, and heart-shaped leaves growing on foot-stalks, which are indented like the teeth of a saw.* Cataria major vulgaris. Tourn. Inst. R. H. 202. *Common greater Catmint.*

2. NEPETA (*Minor*) floribus spicatis, spicis interruptis, verticillis pedicellatis, foliis subcordatis serratis petiolatis. *Catmint with spikes of flowers, with interrupted whorls standing on foot-stalks, and sawed leaves, with foot-stalks almost heart-shaped.* Cataria minor vulgaris.

garis. Tourn. Inst. R. H. 202. *Smaller common Catmint.*

3. Nepeta (*Angustifolia*) floribus spicatis, verticillis subsessilibus, foliis cordato-oblongis serratis sessilibus. *Catmint with spiked flowers, whose whorls grow almost close to the stalks, and oblong, sawed, heart-shaped leaves, sitting close.* Cataria angustifolia major. Tourn. Inst. R. H. 202. *Greater narrow-leaved Catmint.*

4. Nepeta (*Paniculata*) floribus paniculatis, foliis oblongo cordatis acutis serratis sessilibus. *Catmint with panicled flowers, and oblong, heart-shaped, acute, sawed leaves, sitting close to the stalks.* Cataria quæ nepeta minor, folio melissæ Turcicæ. Boerh. Ind. alt. 1. 174. *Smaller Catmint with a Turkey Balm leaf.*

5. Nepeta (*Italica*) floribus sessilibus verticillato-spicatis, bracteis lanceolatis longitudine calycis, foliis petiolatis. Lin. Sp. Plant. 798. *Catmint whose flowers grow in whorled spikes, sitting close to the stalk, having spear-shaped bracteæ the length of the empalement, with leaves growing upon the foot-stalks.* Cataria minor Alpina. Tourn. Inst. R. H. 202. *Smaller Alpine Catmint.*

6. Nepeta (*Violacea*) verticillis pedunculatis corymbosis, foliis petiolatis cordato-oblongis dentatis. Lin. Sp. Plant. 797. *Catmint with roundish whorls standing upon foot-stalks, and oblong, heart-shaped, indented leaves.* Cataria Hispanica, betonicæ folio angustiore flore cæruleo. Tourn. Inst. R. H. 202. *Spanish Catmint with a narrow Betony leaf, and a blue flower.*

7. Nepeta (*Tuberosa*) spicis sessilibus, bracteis ovatis coloratis, foliis summis sessilibus. Hort. Cliff. 311. *Catmint with spiked flowers sitting close to the stalks, oval coloured bractea, and the upper leaves sitting close to the stalks.* Cataria Hispanica, supina, betonicæ folio, tuberosâ radice. Tourn. Inst. R. H. 202. *Spanish Catmint with a declining stalk, a Betony leaf, and a tuberous root.*

8. Nepeta (*Hirsuta*) floribus sessilibus verticillato-spicatis, verticillis tomento obvolutis. Hort. Cliff. 311. *Catmint with flowers growing in whorled spikes sitting close to the stalk, and the whorls covered with down.* Horminum spicatum lavendulæ flore & odore. Bocc. Plant. Sic. 48. tab. 25. *Spiked Clary with a Lavender smell and flower.*

9. Nepeta (*Virginica*) foliis lanceolatis, capitulis terminalibus, staminibus flore longioribus. Lin. Sp. Plant. 571. *Catmint with spear-shaped leaves, stalks terminated by flowers growing in heads, and stamina longer than the flower.* Clinopodium amaraci folio, floribus albis. Pluk. Alm. 110. *Field Basil with a Marjoram leaf, and a white flower.*

10. Nepeta (*Orientalis*) floribus spicatis, verticillis crassioribus, foliis cordatis obtusè dentatis petiolatis. *Catmint with spiked flowers, whose whorls are very thick, and heart-shaped leaves which are obtusely indented, and stand upon foot-stalks.* Cataria Orientalis, teucrii folio, lavendulæ odore, verticillis florum crassissimis. Tourn. Cor. Inst. 13. *Eastern Catmint with a Tree Germander leaf smelling like Lavender, and very thick whorls to the flowers.*

11. Nepeta (*Procumbens*) floribus verticillatis, bracteis ovatis hirsutis, foliis cordato-ovatis crenatis, caule procumbente. *Catmint with whorled flowers, having oval hairy bracteæ, oval heart-shaped leaves, which are crenated, and a trailing stalk.*

The first sort is the common Nep, or Catmint, which grows naturally on the side of banks and hedges in many parts of England; this has a perennial root, from which arise many branching stalks, which are four-cornered, about two feet high, garnished at each joint by two heart-shaped leaves standing opposite, upon pretty long foot-stalks; they are sawed on their edges, and are hoary on their under side. The flowers grow in spikes at the top of the stalks, and below the spikes are two or three whorls of flowers, which have very short foot-stalks. The flowers are white, and have two lips; the upper lip stands erect, and the lower is a little reflexed, and indented at the point; these are each succeeded by four oval black seeds, which ripen in the empalement. The whole plant has a strong scent between Mint and Penny Royal; it is called Catmint, because the cats are very fond of it, especially when it is withered, for then they will roll themselves on it, and tear it to pieces, chewing it in their mouths with great pleasure. Mr. Ray mentions his having transplanted some of the plants of this sort from the fields, into his garden, which were soon destroyed by the cats, but the plants which came up from seeds in his garden escaped, which verifies the old proverb, viz. "If "you set it the cats will eat it, if you sow it the cats "will not know it." I have frequently made trial of this, and have always found it true; for I have transplanted one of the plants from another part of the garden, within two feet of some plants which came up from seeds, the latter has remained unhurt, when the former has been torn to pieces and destroyed by the cats; but I have always observed, where there is a large quantity of the herb growing together, they will not meddle with it. This flowers in June and July, and the seeds ripen in autumn. It is used in medicine.

The second sort grows naturally in Italy, and the south of France; the stalks of this are slendere, their joints farther asunder, the leaves are narrower, and the whole plant whiter than the first. The spikes of flowers are divided into whorls; the lower of these are two inches apart, others are an inch, and the upper half an inch, and these differences are permanent, for I have always found the seeds produce the same kind.

The stalks of the third sort do not branch so much as either of the former; they are slenderer, and their joints farther asunder; the leaves are small, narrow, and almost heart-shaped, sawed on their edges, hoary, and stand upon short foot-stalks. The spikes of flowers are more broken, or interrupted than those of the second, and the whorls stand upon foot-stalks. It grows naturally in Italy.

The fourth sort grows naturally in Sicily; this rises with a strong four-cornered stalk near three feet high; the lower joints are four or five inches asunder. The leaves are long, narrow, and heart-shaped, deeply sawed on their edges, and set pretty close to the stalk. The flowers grow in panicles along the stalks, and are of a pale purplish colour. It flowers about the same time with the other sorts.

The fifth sort grows naturally upon the Alps; the stalks of this seldom rise more than a foot and a half high, sending out very few branches. The whorls of flowers which form the spike, are distant from each other, and set close to the stalk. The leaves are short, oval, heart-shaped, and stand upon foot-stalks; the plant is hoary, and strong scented.

The sixth sort grows naturally in Spain; the stalks of this rise about two feet high, and have a few slender branches coming out from the sides. The leaves are heart-shaped, and indented on their edges. The flowers grow in roundish whorls, upon foot-stalks, and are blue; there is also a variety of this with white flowers.

The seventh sort grows naturally in Portugal; this has a thick knobbed root, from which comes out one or two stalks, which often decline to the ground; they are about two feet and a half long, and send out two side branches opposite. The leaves are oblong, crenated on their edges, and sit close to the stalks, and are of a deep green. The upper part of the stalk, for more than a foot in length, is garnished with whorls of flowers, the lower being two inches asunder, but are nearer all the way upward; these sit very close to the stalks, and are guarded by oval, small, coloured leaves, or bracteæ. The flowers are blue, and shaped like those of the other species; there is one of this sort with an erect stalk, which is the only difference between them.

The eighth sort grows naturally in Sicily. The stalks of this grow about two feet high; the branches come out toward the bottom; they are heart-shaped, obtuse, and but little indented, standing upon pretty

 long

dom destitute of flowers. This has been by some persons, who have only a superficial knowledge of plants, thought only a variety of the common sort, but those who have cultivated both, know better; for the first will live through the winter in the open air, in a warm situation, but this is too tender to thrive in England, unless preserved in a warm green-house; nor will the plants flower without the assistance of a glass-case in summer. The third sort was not known here till the beginning of last century, being a stranger in Europe, but the former has been in the English gardens near two centuries: nor has the seeds of the first ever produced plants of the third sort, though this has been positively asserted by persons of no skill.

The leaves of this sort are six inches long, and one inch broad in the middle, of a much thinner texture than those of the first, and their ends are generally reflexed; they are of a light green, and irregularly placed on the branches; sometimes they are by pairs, at others alternate, and sometimes by threes round the branches. The flowers are produced in very large bunches at the end of the branches, standing upon long foot-stalks; they have three or four series of petals within each other, so are more or less double. The flowers are much larger than those of the common sort, and smell like the flowers of Hawthorn. The plain flowers are of a soft red, or Peach colour; but in most they are beautifully variegated with a deeper red, and make a fine appearance. Their usual time of flowering is in July and August, but if they are placed in a warm stove, they will continue in flower till Michaelmas. As the flowers of this are double, they are not succeeded by seeds; and at present we are unacquainted with the single flowering of this kind, for the second is undoubtedly a distinct species.

All the species of the Rose Bay are supposed to have a poisonous quality; the young branches, when cut or broken, have a milky sap or juice, and the larger branches, when burnt, emit a very disagreeable odour, so there is great reason to believe the plants have some noxious quality; but this genus of plants has been confounded by many of the writers on botany with the Chamærhododendros of Tournefort, and many of the noxious qualities with which the latter abounds, have been applied to the Nerium, but particularly that of the honey, about Trebisond, which is reckoned very unwholsome, which has been supposed to be occasioned by the bees sucking it from the flowers of the Nerium; whereas it is from the flowers of the Chamærhododendros, as Tournefort has fully informed us; but the affinity of their names in the Greek language has occasioned these two plants to be often confounded.

These plants are generally propagated by layers in this country, for although they will sometimes take root from cuttings, yet that being an uncertain method, the other is generally pursued; and as the plants are very apt to produce suckers, or shoots from their roots, those are best adapted for laying, for the old branches will not put out roots; when these are laid down, they should be slit at a joint, in the same manner as is practised in laying of Carnations, which will greatly facilitate their taking root: if these branches are laid down in autumn, and are properly supplied with water, they will have taken root by that time twelvemonth, when they should be carefully raised up with a trowel; and if they have taken good root, they should be cut off from the old plant, and each planted in a separate small pot, filled with soft loamy earth; those of the common sort will require no other care, but to be placed in a shady situation, and gently watered as the season may require, till they have taken new root; but the two other species should be plunged into a very moderate hot-bed, to forward their taking root, observing to shade them from the sun in the heat of the day; after the common sort has taken new root, the plants may be placed in a sheltered situation with other hardy exotics, where they may remain till the end of October, when they should either be removed into the green-house, or placed under a hot-bed frame, where they may be protected from frost in winter, but enjoy the free air at all times when the weather is mild.

This sort is so hardy as to live abroad in mild winters, if planted in a warm situation; but as they are liable to be destroyed in severe frost, the best way is to keep the plants in pots, or if they are very large in tubs, that they be sheltered in winter, and in the summer removed abroad, placing them in a warm sheltered situation. In the winter they may be placed with Myrtles, and other of the hardier kinds of exotic plants, in a place where they may have as much free air as possible in mild weather, but screened from severe frost; for if these are kept too warm in winter, they will not flower strong, and when the air is excluded from them, the ends of their shoots will become mouldy; so that the hardier they are treated, provided they are not exposed to hard frosts, the better they will thrive.

The other two sorts require a different treatment, otherwise they will not make any appearance; therefore the young plants when they have taken new root, should be gradually inured to bear the open air, into which they should be removed in July, where they may remain till October, provided the weather continues mild; but during this time, they should be placed in a sheltered situation; and upon the first approach of frost, they should be removed into shelter, for if their leaves are injured by frost, they will change to a pale yellow, and will not recover their usual colour till the following autumn. These sorts may be preserved in a good green-house through the winter, and the plants will be stronger than those which are more tenderly treated; but in May, when the flower-buds begin to appear, the plants should be placed in an open glass-case, where they may be defended from the inclemency of the weather; but when it is warm weather, the air should at all times be admitted to them in plenty. With this management the flowers will expand, and continue long in beauty; and during that time, there are few plants which are equal to them, either to the eye or nose, for their scent is very like that of the flowers of the White Thorn; and the bunches of flowers will be very large, if the plants are strong.

NERVES are long tough strings, which run either across, or lengthways, in the leaves of plants.

NICOTIANA. Tourn. Inst. R. H. 117. tab. 41. Lin. Gen. Plant. 220. [This plant takes its name from James Nicotius, counsellor to Francis II. King of France, who in the year 1560, being ambassador to the court of Portugal, bought the seeds of this plant of a Dutchman, who brought them from America, and sent them to Queen Catharine de Medicis in France; where, being sown, they produced seeds: the Indian inhabitants call it Tabac, because it grew in an island called Tabaco, or Tobago. The lesser sort is by some called Hyoscyamus, because it agrees in some of its characters with this plant; it is also called Priapeia.] Tobacco; in French, *Nicotiane ou Tabac.*

The CHARACTERS are,

*The empalement of the flower is permanent, of one leaf, cut into five acute segments. The flower has one funnel-shaped petal, with a long tub spread open at the brim, and ending in five acute points. It hath five awl-shaped stamina which are the length of the tube, a little inclined, and terminated by oblong summits; and an oval germen supporting a slender style, crowned by an indented stigma. The germen afterward turns to an oval capsule, with a furrow on each side, having two cells which open at the top, and are filled with rough seeds fastened to the partition.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and one style.

The Species are,

1. Nicotiana (*Latissima*) foliis ovato-lanceolatis rugosis, semiamplexicaulibus. *Tobacco with oval, spear-shaped, rough leaves, which half embrace the stalks.* Hyoscyamus Peruvianus. Ger. 357. *Tobacco, or Henbane of Peru.*
2. Nicotiana (*Tabacum*) foliis lanceolato-ovatis decurrentibus, floribus acutis. Lin. Sp. Plant. 258. *Tobacco with oval, spear-shaped, running leaves, sitting close to the stalks.* Nicotiana major latifolia. C. B. P. 169. *Greater broad-leaved Tobacco.*
3. Nicotiana (*Angustifolia*) foliis lanceolatis acutis, sessilibus, calycibus acutis, tubo floris longissimo. Plat. 185. *Tobacco with acute spear-shaped leaves sitting close to the stalks, sharp-pointed empalements, and a very long tube to the flower.* Nicotiana major angustifolia. C. B. P. 170. *Greater narrow-leaved Tobacco.*
4. Nicotiana (*Fruticosa*) foliis lineari-lanceolatis acuminatis semiamplexicaulibus, caule fruticoso. *Tobacco with linear, spear-shaped, acute-pointed leaves, half embracing the stalks, and a shrubby stalk.* Nicotiana major angustissimo folio perennis. Juss. *Narrowest-leaved, greater, perennial Tobacco.*
5. Nicotiana (*Alba*) foliis ovatis acuminatis semiamplexicaulibus, capsulis ovatis obtusis. *Tobacco with oval acute-pointed leaves half embracing the stalk, and oval obtuse seed-vessels.* Nicotiana major latifolia, floribus albis, vasculo brevi. Martyn. Dec. 5. *Greater broad-leaved Tobacco with white flowers, and a short seed-vessel.*
6. Nicotiana (*Rustica*) foliis petiolatis ovatis integerrimis, floribus obtusis. Lin. Sp. 258. *Tobacco with oval entire leaves, and obtuse flowers.* Nicotiana minor. C. B. P. 170. *Smaller Tobacco, commonly called English Tobacco.*
7. Nicotiana (*Rugosa*) foliis ovatis rugosis petiolatis. *Tobacco with oval rough leaves, having foot-stalks.* Nicotiana minor, foliis rugosioribus amplioribus. Vaill. *Smaller Tobacco with larger and rougher leaves.*
8. Nicotiana (*Paniculata*) foliis petiolatis cordatis integerrimis, floribus paniculatis obtusis clavatis. Lin. Sp. Plant. 259. *Tobacco with heart-shaped leaves, paniculated flowers, and club-shaped tubes.* Nicotiana minor, folio cordiformi tubo floris prælongis. Feuill. Obs. 1. p. 717. tab. 10. *Smaller Tobacco with a heart-shaped leaf, and a very long tube to the flower.*
9. Nicotiana (*Glutinosa*) foliis petiolatis cordatis integerrimis, racemosis floribus secundis ringentibus, calycibus inæqualibus. Lin. Sp. Plant. 259. *Tobacco with heart-shaped leaves, having foot-stalks, branching ringent petals, and unequal empalements.*
10. Nicotiana (*Humilis*) foliis ovato-lanceolatis obtusis rugosis, calycibus brevissimis. Plat. 185. *Tobacco with oval, spear-shaped, obtuse, rough leaves, and a very short empalement.* Nicotiana humilis, primulæ veris folio. Houst. MSS. *Dwarf Tobacco with a Primrose leaf.*

The first sort was formerly the most common Tobacco which was sown in England, and which has been generally taken for the common broad-leaved Tobacco of Caspar Bauhin, and others, but is greatly different from it. The leaves of this sort are more than a foot and a half long, and a foot broad, their surfaces very rough and glutinous: when these plants are in a rich moist soil, they will grow more than ten feet high; the base of the leaves half embrace the stalks; the upper part of the stalk divides into smaller branches, which are terminated by loose bunches of flowers standing erect; they have pretty long tubes, and are of a pale purplish colour. It flowers in July and August, and the seeds ripen in the autumn. This is the sort of Tabacco which is commonly brought to the markets in pots to adorn the shops and balconies of London, and by some is called Oroonoko Tobacco.

The second sort is the broad-leaved Tobacco of Casper Bauhin; the stalks of this seldom rise more than five or six feet high, and divide into more branches than the first. The leaves are about ten inches long, and three and a half broad, smooth, and end in acute points, sitting close to the stalks; the flowers of this are rather larger, and of a brighter purple colour than those of the first. It flowers and perfects seeds at the same time; this is by some called sweet-scented Tobacco.

The third sort rises with an upright branching stalk four or five feet high; the lower leaves are a foot long, and three or four inches broad; those on the stalks are much narrower, lessening to the top, and end in very acute points, sitting close to the stalks; they are very glutinous. The flowers grow in loose bunches at the top of the stalks, they have long tubes, and are of a bright purple or red colour. These appear at the same time with the former sorts, and their seeds ripen in the autumn.

The fourth sort rises with very branching stalks about five feet high; the leaves on the lower part of the stalks are a foot and a half long, broad at the base, where they half embrace the stalks, and are about three inches broad in the middle, terminating in long acute points; the stalks divide into many smaller branches, which are terminated by loose bunches of flowers, of a bright putple colour, and are succeeded by acute-pointed seed-vessels. This flowers about the same time with the former, but if the plants are placed in a warm green-house, they will live through the winter. The seeds of this sort were sent me for Brazil Tobacco.

The fifth sort grows naturally in the woods in the island of Tobago, from whence the seeds were sent me by the late Mr. Robert Millar. This rises about five feet high; the stalk does not branch so much as those of the former; the leaves are large and oval, about fifteen inches long and two broad in the middle, but diminish gradually in their size to the top of the stalk, and with their base half embrace it. The flowers grow in closer bunches than those of the former, and are white; these are succeeded by short, oval, obtuse seed-vessels. It flowers and perfects seeds about the same time with the former.

The sixth sort is commonly called English Tobacco, from its having been the first which was introduced here, and being much more hardy than the other sorts. The seeds ripen very freely, and scattering in the autumn, the plants have come up without care, wherever any of the plants have been suffered to run to seed, so that it has been a weed in many places; but it came originally from America, by the title of Petum. Dodonæus, Tabernemontanus, and others, have titled it Hyoscyamus luteus, from the affinity there is between this plant and the Henbane; but the flowers of this are tubulous, and not ringent, as are those of the Henbane; nor do the seed-vessels of this open with a lid on the top, as that of Henbane. The stalks of this seldom rise more than three feet high; the leaves are placed alternately on the stalks, standing upon short foot-stalks; they are oval and smooth. The flowers grow in small loose bunches on the top of the stalks; they have short tubes, which spread open at the top, and are cut into five obtuse segments, of an herbaceous yellow colour, appearing in July, and are succeeded by roundish capsules, filled with small seeds, which ripen in the autumn.

The seventh sort rises with a strong stalk near four feet high; the leaves of this are shaped like those of the former, but are greatly furrowed on their surface and near twice the size, of a darker green, and have longer foot-stalks. The flowers are larger than those of the former, and of the same shape. This is undoubtedly a distinct plant from the former, for I have sown the seeds more than thirty years, and have never found any of the plants vary.

The eighth sort was found growing naturally in the valley of Lima, by Pere Feuille, in the year 1710; and of late years the seeds of it were sent from Peru, by the younger de Jussieu, to Paris. The stalk of this sort rises more than three feet high, dividing upward into many smaller panicled branches, which are round and a little hairy; the leaves are heart-shaped, about four inches long, and three broad, standing upon

upon pretty long foot-ſtalks. The flowers are produced in looſe panicles at the end of the branches; theſe have tubes about an inch long, ſhaped like a club; the brim is ſlightly cut into nine obtuſe ſegments, which are reflexed; they are of a yellowiſh green colour, and are ſucceeded by roundiſh capſules, filled with very ſmall ſeeds. It flowers about the ſame time with the other ſorts.

The ſeeds of the ninth ſort were ſent from Peru with thoſe of the former, by the younger de Juſſieu; the ſtalk of this is round, and riſes near four feet high, ſending out two or three branches from the lower part; the leaves are large, heart-ſhaped, and a little waved; they are very clammy, ſtanding upon long foot-ſtalks. The flowers grow in looſe ſpikes at the top of the ſtalk, having ſhort open tubes, which are curved almoſt like the lip flowers; they are of a dull purple colour; the empalement is unequally cut, one of the ſegments being twice the ſize of the other.

The tenth ſort was diſcovered by the late Dr. Houſtoun at La Vera Cruz, who ſent the ſeeds to England. This hath a pretty thick taper root, which ſtrikes deep in the ground; at the top comes out ſix or ſeven oval ſpear-ſhaped leaves, which ſpread on the ſurface of the ground; they are about the ſize of thoſe of the common Primroſe, but are of a deeper green; the ſtalk riſes about a foot high, branching into three or four diviſions, at each of theſe is placed one ſmall leaf; the branches are terminated by a looſe ſpike of flowers, which are ſmall, tubulous, and of a yellowiſh green colour, having very ſhort empalements, which are cut at the brim into five acute ſegments. The ſeed-veſſel is ſmall, oval, and divided into two cells, which are full of ſmall ſeeds.

All the ſorts except the ſixth, ſeventh, and eighth, require the ſame culture, and are too tender to grow from ſeeds ſown in the full ground, to any degree of perfection in this country, ſo require to be raiſed in a hot-bed, after the following manner:

The ſeeds muſt be ſown upon a moderate hot-bed in March, and when the plants are come up fit to remove, they ſhould be tranſplanted into a new hot-bed of a moderate warmth, about four inches aſunder each way, obſerving to water and ſhade them until they have taken root; after which you muſt let them have air in proportion to the warmth of the ſeaſon, otherwiſe they will draw up very weak, and be thereby leſs capable of enduring the open air: you muſt alſo obſerve to water them frequently, but while they are very young, it ſhould not be given to them in too great quantities; though when they are pretty ſtrong, they will require to have it often, and in plenty.

In this bed the plants ſhould remain until the middle of May, by which time (if they have ſucceeded well) they will touch each other, therefore they ſhould be inured to bear the open air gradually; after which they muſt be taken up carefully, preſerving a large ball of earth to each root, and planted into a rich light ſoil, in rows four feet aſunder, and the plants three feet diſtance in the rows, obſerving to water them until they have taken root; after which they will require no farther care (but only to keep them clean from weeds) until the plants begin to ſhew their flower-ſtems; at which time you ſhould cut off the tops of them, that their leaves may be the better nouriſhed, whereby they will be rendered larger, and of a thicker ſubſtance. In Auguſt they will be full grown, when they ſhould be cut for uſe; for if they are permitted to ſtand longer, their under leaves will begin to decay. This is to be underſtood for ſuch plants as are propagated for uſe, but thoſe plants which are deſigned for ornament, ſhould be planted in the borders of the pleaſure-garden, and permitted to grow their full height, where they will continue flowering from July, till the froſt puts a ſtop to them.

The three ſmaller ſorts of Tobacco are preſerved in botanic gardens for variety, but are ſeldom propagated for uſe. The firſt ſort is found growing upon dunghills in divers parts of England. The ſixth and ſeventh are very hardy, and may be propagated by ſowing their ſeeds in March, upon a bed of light earth, where they will come up, and may be tranſplanted into any part of the garden, where they will thrive without farther care.

The laſt ſort being ſomewhat tenderer than the other, ſhould be ſown early in the ſpring on a hot-bed; and when the plants come up, they ſhould be tranſplanted on another moderate hot-bed, where they muſt be duly watered, and ſhould have a large ſhare of free air in warm weather; and when the plants have obtained a good ſhare of ſtrength, they ſhould be tranſplanted into ſeparate pots, and plunged into a moderate hot-bed to bring them forward. About the middle of June ſome of the plants may be ſhaken out of the pots, and planted into beds of rich earth; but it will be proper to keep one or two plants in pots, which may be placed in the ſtove (in caſe the ſeaſon ſhould prove bad,) that they may ripen their ſeeds, ſo that the ſpecies may be preſerved.

NIGELLA. Tourn. Inſt. R. H. 258. tab. 134. Lin. Gen. Plant. 606. [ſo called, as though Nigrella, from the colour of its ſeed, becauſe the ſeeds of this plant are, for the moſt part, black. It is alſo called Melianthum, of μέλας, black, and ἄνθος, a flower, q. d. black flower, although the flower is not black: it is alſo called Melaſpermum, of μέλας, black, and σπέρμα, ſeed.] Fennel-flower, or Devil in a buſh.

The Characters are,

*The flower has no empalement, but a leafy perianthium. It hath five oval, obtuſe, plain petals, which ſpread open, and are contracted at their baſe, and eight very ſhort nectariums ſituated in a circle, each having two lips; the exterior being larger, the inferior bifid, plain, and convex; the interior is ſhorter, narrower, from an oval terminating in a line. It hath a great number of awl-ſhaped ſtamina, which are ſhorter than the petals, terminated by obtuſe, compreſſed, erect ſummits; and in ſome five, in others ten, oblong, convex, erect germen, ending in awl-ſhaped ſtyles, which are long, revolved, and permanent, having ſtigmas faſtened longitudinally to them. The germen afterward become ſo many oblong compreſſed capſules, divided by a furrow, but connected within, filled with rough angular ſeeds.*

This genus of plants is ranged in the fifth ſection of Linnæus's thirteenth claſs, which includes thoſe plants whoſe flowers have many ſtamina and five ſtyles.

The Species are,

1. Nigella (*Arvenſis*) piſtillis quinis, petalis integris, capſulis turbinatis. Lin. Sp. Plant. 534. *Fennel-flower having five pointals, entire petals, and turbinated ſeed-veſſels.* Nigella arvenſis cornuta. C. B. P. *Field horned Fennel-flower.*
2. Nigella (*Damaſcena*) floribus involucro folioſo cinctis. Hort. Cliff. 215. *Fennel-flower whoſe flowers are encompaſſed with a leafy involucrum.* Nigella anguſtifolia, flore majore ſimplici cæruleo. C. B. P. 145. *Narrow-leaved Fennel-flower, having a larger, ſingle, blue flower.*
3. Nigella (*Sativa*) piſtillis quinis, capſulis muricatis ſubrotundis, foliis ſubpiloſis. Hort. Upſal. 154. *Fennel-flower with five pointals which are prickly, and leaves ſomewhat hairy.* Nigella flore minore ſimplici candido. C. B. P. 145. *Fennel-flower with a ſmaller, ſingle, white flower.*
4. Nigella (*Cretica*) piſtillis quinis, corolla longioribus, petalis integris. *Fennel-flower with five pointals longer than the petals, which are entire.* Nigella Cretica latifolia odorata. Park. Theat. 1376. *Broad-leaved ſweet-ſmelling Fennel-flower of Crete.*
5. Nigella (*Latifolia*) piſtillis denis corollâ brevioribus. *Fennel-flower with ten pointals which are ſhorter than the petals.* Nigella alba ſimplici flore. Alp. Exot. 261. *Fennel-flower with a ſingle white flower.*
6. Nigella (*Hiſpanica*) piſtillis denis corollam æquantibus. Hort. Upſal. 154. *Fennel-flower with ten pointals equalling the petal.* Nigella latifolia flore majore ſimplici cæruleo. C. B. P. 145. *Broad-leaved Fennel-flower with a large, ſingle, blue flower.*

7. NIGELLA (*Orientalis*) pistillis denis corollâ longioribus. Hort. Cliff. 215. *Fennel-flower with ten pointals which are longer than the petals.* Nigella Orientalis, flore flavescente, semine alato plano. Tourn. Cor. 19. *Fennel-flower of the East, with a yellowish flower, and a plain winged seed.*

The first sort grows naturally among the Corn, in France, Italy, and Germany, so is seldom propagated in gardens; this rises with slender stalks near a foot high, which sometimes branch out at the bottom, and at others they are single, garnished with a few very fine cut leaves, somewhat like those of Dill; each stalk is terminated by one star-pointed flower of five petals, which are of a pale blue colour, and have no leafy involucrum under them; these are succeeded by capsules, having five short horns, which incline different ways at the top, and are filled with rough black seeds; there is a variety of this with white flowers, and another with double flowers.

The second sort grows naturally in Spain and Italy, among the Corn; this rises with an upright branching stalk a foot and a half high, garnished with leaves much longer and finer than those of the first. The flowers are large, of a pale blue, and have a long leafy involucrum under each: these are succeeded by larger swelling seed-vessels, with horns at the top; of this there is one with single white flowers, and another with double flowers, which is sown in gardens for ornament.

The third sort grows naturally in Crete; this rises about the same height as the former. The leaves are not so finely cut as those of the second, and are a little hairy. At the top of each stalk is one flower, composed of five white petals, which are slightly cut at their end into three points; these are succeeded by oblong swelling seed-vessels, with five horns at the top, filled with small pale-coloured seeds.

The fourth sort grows naturally in Crete; this rises with branching stalks about a foot high, garnished with shorter and broader leaves than either of the other species. At the top of each branch is one flower, having no involucrum; they are composed of five oval petals, and have five pointals longer than the petals; the seed-vessel is not much swollen, and has five slender horns at the top; the seeds are of a light yellowish brown colour.

The fifth sort is also a native of Crete; this rises with a branching stalk a foot high, garnished with leaves like those of Larkspur. The flowers have five large oval petals, which are entire, and ten pointals which are shorter than the petals, and a great number of green stamina with blue chives; the seed-vessels are like those of the last sort.

The sixth sort rises a foot and a half high; the lower leaves are finely cut, but those on the stalks are cut into broader segments. The flowers are larger than those of the other species, and are of a fine blue colour: the pointals of this are of equal length with the petals; the seed-vessel has five horns, and is of a firmer texture than any of the other. This grows naturally in the south of France and Spain; there is a variety of this with double flowers.

The seventh sort grows naturally in the Corn-fields about Aleppo; this rises with a branching stalk a foot and a half high, garnished with pretty long leaves, which are finely divided. The flowers are produced at the end of the branches; they are composed of five yellowish leaves or petals; at the base of these are placed eight nectariums, between which arise a great number of stamina, with an unequal number of germen, some having but five, others have eight or nine; they are oblong and compressed; these afterward become so many oblong compressed seed-vessels, joined together on their inner side, terminating with horns, and open longitudinally, containing many thin compressed seeds, having borders round them.

The varieties of these with double flowers, are chiefly propagated in gardens for ornament; but those with single flowers are rarely admitted into any but botanic gardens, where they are preserved for the sake of variety.

All these plants may be propagated by sowing their seeds upon a bed of light earth, where they are to remain (for they seldom succeed well if transplanted;) therefore, in order to have them intermixed amongst other annual flowers in the borders of the flower-garden, the seeds should be sown in patches at proper distances; and when the plants come up, you must pull up those which grow too close, leaving but three or four of them in each patch, observing also to keep them clear from weeds, which is all the culture they require. In July they will produce their flowers, and their seeds will ripen in August, when they should be gathered and dried; then rub out each sort separately, and preserve them in a dry place.

The season for sowing these seeds is in March; but if you sow some of them in August, soon after they are ripe, upon a dry soil and in a warm situation, they will abide through the winter, and flower strong the succeeding year; so by sowing the seeds at different times, they may be continued in beauty most part of the summer.

They are all annual plants, which perish soon after they have perfected their seeds; which, if permitted to scatter upon the borders, will come up without any farther care.

NIGELLASTRUM. See AGROSTEMMA.

NIGHTSHADE. See SOLANUM.

NIGHTSHADE, the Deadly. See BELLADONNA.

NIL. See ANIL.

NISSOLIA. See LATHYRUS.

NITRE is a kind of salt, impregnated with abundance of spirits out of the air, which renders it volatile.

Monsieur Le Clerc gives us the following account of it: In Egypt they make a great quantity of it, but it is not so good, for it is dusky, and full of knots and stones.

It is made almost in the manner that salt is made, but only that they use sea-water in their salt-works, and the water of Nile about their Nitre.

When the Nile retires, their Nitre-pits stand soaking for forty days together; but as the Nitre is grown firm, they are in haste to carry it off, lest it should melt again in the pits. They pile it up in heaps, and it keeps very well.

The Memphian Nitre grows strong, and there are several pits of stone thereabouts; out of these they make vessels, and some they melt down with sulphur among their coals.

This same Nitre they use also about such things as they would have to last a long time.

The proof of the goodness of Nitre is, that it be very light, very friable, and very near of a purple colour.

There is but very little difference between the natural and artificial Nitre; but that the one refines itself, and the other is refined by art, as salt; and, indeed, all Nitre is a kind of salt, and hardly differs from salt, properly so called, farther than in these respects, That well refined Nitre is more acid and light than salt, and easily takes fire.

The reason of which difference, he says, seems to be;

1. That the angles at both ends of the oblong particles of Nitre are shorter than the angles of the saline particles.

2. That the particles of Nitre are finer and fuller of pores; which, when the particles of fire get in, they soon put the nitrous particles into a hurry, till they break to pieces, and turn to flame.

3. Nitre exceeds salt in lightness, because the saline particles contain more homogeneous matter in the same compass, than the nitrous do.

Dr. Lister tells us, he viewed the particles of Nitre through a microscope, and found them to have six angles, parallelogram sides, and pointed like a pyramid at one end.

Some authors are of opinion, that the nitrous salts seem to be assigned by nature chiefly for the growth of plants.

Others differ from them in opinion, and say, that when Nitre is contiguous to plants, it rather destroys than nourishes them; but yet they allow, that Nitre and other salts do certainly loosen the earth, and separate the concreted parts of it, and by that means, fit and dispose them to be assumed by water, and carried up into the seed or plant, for its formation and augment.

It is observable, how all salts are wrought upon by moisture, how easily they liquidate and run with it; and when these are drawn off, and have deserted the lumps wherewith they were incorporated, those must moulder immediately, and fall asunder of course.

The hardest stone, if it has any salt mixed with the sand of which it consists, upon being exposed to a humid air, in a short time dissolves and crumbles all to pieces; and much more will clodded earth and clay, which is not of near so compact and solid a constitution as stone is.

If the earth be never so good and fit for the production of vegetables, little will come of it, unless the parts of it be separated and loose; and for this reason, is the ground digged, ploughed, and harrowed, and the clods broken; and it is this way that Nitre, sea-salt, and other salts, promote vegetation.

A certain gentleman has given a relation, That he dwelling in the country near a petre-house, where such saltpetre as is brought from abroad, is boiled and refined, to make gunpowder, this being so near as to communicate the steam of the Nitre to the greatest part of the orchard and garden; and, though some were of opinion that it injured his trees and plants, yet he found, that it had a contrary influence upon his orchard, &c. in that it never failed to bring him a plentiful crop of fruit every year, although those about him had but very little, or scarce any; notwithstanding his orchard, &c. was not less exposed to blighting winds by its natural situation, than the other orchards in the same town. From whence he judged, that the nitrous vapour which mixes with the air that surrounds his orchard, prevents blights, and is noxious to the caterpillars.

The Lord Bacon, in his Natural History, commends the use of Nitre, for the preservation of health in human bodies; and many skilful husbandmen have given it no less a character for the preservation of vegetables, if its quantity be rightly proportioned.

That the atmosphere does abound with saline particles, is most certain; for being filled continually with effluvia from earth and sea, it must needs have from both a great quantity of saline corpuscles; and the salt will be of different kinds, according to the variety of those salts from whence they are derived.

**NOLANA.** Royen. Lin. Gen. Plant. 193.

The Characters are,

*The empalement of the flower is of one leaf, turbinated at the base, divided into five acute heart-shaped segments, and is permanent. The flower is bell-shaped, plaited, spread open, and is twice as large as the empalement; it hath five awl-shaped erect stamina, which are terminated by arrow-pointed summits, and five roundish germen surrounding a cylindrical erect style, crowned by a headed stigma. The succulent interior base of the receptacle becomes four cells, in which the seeds are inclosed.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes the plants having five stamina and one style.

We know but one Species of this genus at present viz.

Nolana (*Prostrata.*) Lin. Sp. 202. Dec. 1. tab. 2. *Trailing Nolana.* Atropa foliis geminatis, calycibus polycarpis, caule humifusa. Gouan. Monsp. 82. *Deadly Nightshade with two leaves at each joint, flower-cups with several seeds, and a trailing stalk.*

This plant grows naturally in Egypt, from whence I received the seeds, which were sent by Mr. Forschal, one of the persons who were sent by the late king of Denmark, to make discoveries in the East.

It is an annual plant, with trailing stalks which lie prostrate on the ground, and divide into several branches, which are garnished with oval, spear-shaped, smooth leaves, having short foot-stalks; these come out single at some joints, by pairs at others, and frequently three or four at the upper joints: the flowers are produced singly from the forks of the branches, upon pretty long foot-stalks; they are shaped like those of the Winter Cherry, having short tubes, which spread open above, and are of a fine blue colour; these are succeeded by four naked seeds, sitting in the empalement of the flower. This plant flowers in July, and the seeds ripen in the beginning of September.

The seeds of this plant must be sown on a hot-bed in March, and when the plants come up and are fit to remove, they should be each transplanted into a small pot filled with light earth, and plunged into a fresh hot-bed to bring the plants forward, otherwise they will not ripen their seeds in this country; but when their flowers open in July, they should have a large share of air admitted to them when the weather is warm, to prevent their flowers falling away without producing seeds: with this management the plants will continue flowering till the early frost destroys them, and their flowers will produce ripe seeds the beginning of September.

**NOLI ME TANGERE.** See Impatiens.

**NONSUCH, or FLOWER of BRISTOL.** See Lychnis.

**NORTHERN ASPECT** is the least favourable of any in England, as having very little benefit from the sun, even in the height of summer, therefore can be of little use, whatever may have been advanced to the contrary; for although many sorts of fruit-trees will thrive and produce fruit in such positions, yet such fruit can be of little worth, since they are deprived of the kindly warmth of the sun to correct their crude juices, and render them well tasted and wholsome; therefore it is to little purpose to plant fruit-trees against such walls, except it be those which are intended for baking, &c. where the fire will ripen, and render those juices wholsome, which, for want of sun, could not be performed while growing. You may also plant Morello Cherries for preserving; and white and red Currants, to come late, after those which are exposed to the sun are gone; and if the soil be warm and dry, some sorts of summer Pears will do tolerably well on such an exposure, and will continue longer in eating, than if they were more exposed to the sun. But you should by no means plant Winter Pears in such an aspect, as hath been practised by many ignorant persons, since we find, that the best south walls, in some bad years, are barely warm enough to ripen those fruits.

Duke Cherries planted against walls exposed to the North, will ripen much later in the season, and, if the soil is warm, they will be well flavoured, so that hereby this fruit may be continued a month later than is usual.

**NUCIFEROUS TREES**, are such which produce nuts.

**NUMMULARIA**, See Lysimachia.

**NURSERY**, or Nursery-garden, is a piece of land set apart for the raising and propagating all sorts of trees and plants to supply the garden, and other plantations. Of this sort there are a great number in the different parts of this kingdom, but particularly in the neighbourhood of London, which are occupied by the gardeners, whose business it is to raise trees, plants, and flowers for sale; and in many of these there is at present a much greater variety of trees and plants cultivated, than can be found in any other part of Europe. In France, their Nurseries, (which are but few, when compared with those in England) are chiefly confined to the propagation of fruit-trees, from whence they have the appellation of Pepinier. For there is scarce any of those gardens, where a person can be supplied either

either with evergreens, flowering-ſhrubs, or foreſt-trees: and in Holland their Nurſeries are principally for flowers; ſome few of them, indeed, propagate tender exotic plants. But thoſe Nurſeries in the neighbourhood of London do, ſeveral of them, include all theſe, and from hence moſt of the curious perſons abroad are ſupplied with furniture for their gardens. But I do not propoſe in this place, to treat of theſe extenſive Nurſeries, or to give a deſcription of them, therefore ſhall confine myſelf to treat of ſuch Nurſeries only as are abſolutely neceſſary for all lovers of planting, to have upon the ſpot where they deſign to make their plantation. For if theſe are large, the expence of carrying a great number of trees, if the diſtance is great, will be no ſmall article, beſide the hazard of their growing; which, when the plants have been trained up in good land, and removed to an indifferent one, is very great. Therefore it is of the utmoſt conſequence to every planter, to begin by making a Nurſery. But in this article I muſt beg leave to obſerve, that a Nurſery ſhould not be fixed to any particular ſpot: I mean by this, that it would be wrong to continue the raiſing of trees any number of years upon the ſame ſpot of ground, becauſe hereby the ground will be ſo much exhauſted by the trees, as to render it unfit for the ſame purpoſe. Therefore all good Nurſery gardeners ſhift and change their land from time to time, for when they have drawn off the trees from a a ſpot of ground, they either plant kitchen herbs, or other things, upon the ground for a year or two, by which time, as alſo by dunging and trenching the land, it is recovered, and made fit to receive other trees. But this they are obliged to from neceſſity, being confined to the ſame land; which is not the caſe with thoſe gentlemen, who have large extent of ground in the country. Therefore all ſuch perſons I would adviſe to make Nurſeries upon the ground which is intended for planting, where a ſufficient number of the trees may be left ſtanding, after the others have been drawn out to plant in other places; which, for all large growing trees, but particularly ſuch as are cultivated for timber, will be found by much the moſt advantageous method; for all thoſe trees which come up from the ſeed, or which are tranſplanted very young into the places where they are deſigned to remain, will make a much greater progreſs, and become larger trees, than any of thoſe which are tranſplanted at a greater age. Therefore the Nurſeries ſhould be thinned early, by removing all thoſe trees which are intended for other plantations while they are young, becauſe hereby the expence and trouble of ſtaking, watering, &c. will be ſaved, and the trees will ſucceed much better. But in expoſed ſituations, where there are Nurſeries made, it will be neceſſary to permit the trees to ſtand much longer; that, by growing cloſe together, they may ſhelter each other, and draw themſelves up; and theſe ſhould be thinned gradually, as the trees advance; for, by taking away too many at firſt, the cold will check the growth of the remaining trees. But then thoſe trees which are taken out from theſe Nurſeries, after a certain age, ſhould not be depended on for planting; and it will be prudence rather to conſign them for fuel, than by attempting to remove them large, whereby, in endeavouring to get them up with good roots, the roots of the ſtanding trees will be often much injured.

What has been here propoſed, muſt be underſtood for all large plantations in parks, woods, &c. but thoſe Nurſeries which are only intended for the raiſing of evergreens, flowering ſhrubs, or plants which are deſigned to embelliſh gardens, may be confined to one ſpot, becauſe a ſmall compaſs of ground will be ſufficient for this purpoſe. Two or three acres of land employed this way, will be ſufficient for the moſt extenſive deſigns, and one acre will be full enough for thoſe of moderate extent. And ſuch a ſpot of ground may be always employed for ſowing the ſeeds of foreign trees and plants, as alſo for raiſing many ſorts of biennial and perennial flowers, to tranſplant into the borders of the pleaſure-garden, and for raiſing many kinds of bulbous-rooted flowers from ſeeds, whereby a variety of new ſorts may be obtained annually, which will recompenſe for the trouble and expence, and will moreover be an agreeable diverſion to all thoſe perſons who delight in the amuſements of gardening.

Such a Nurſery as this ſhould be conveniently ſituated for water; for where that is wanting, there muſt be an expence attending the carriage of water in dry weather. It ſhould alſo be as near the houſe as it can with conveniency be admitted, in order to render it eaſy to viſit at all times of the year, becauſe it is abſolutely neceſſary that it ſhould be under the inſpection of the maſter, for unleſs he delights in it, there will be little hopes of ſucceſs. The ſoil of this Nurſery ſhould alſo be good, and not too heavy and ſtiff, for ſuch land will be very improper for ſowing moſt ſorts of ſeeds; becauſe as this will detain the moiſture in the ſpring and winter, the ſeeds of moſt tender things, eſpecially of flowers, will rot in the ground, if ſown early; therefore where perſons are confined to ſuch land, there ſhould be a good quantity of ſand, aſhes, and other light manures buried, in order to ſeparate the parts, and pulverize the ground; and if it is thrown up in ridges, to receive the froſt in winter, it will be of great uſe to it, as will alſo the frequent forking, or ſtirring of the ground, both before and after it is planted.

The many advantages which attend the having ſuch a Nurſery, are ſo obvious to every perſon who has turned his thoughts in the leaſt to this ſubject, that it is needleſs for me to mention them here; and therefore I ſhall only beg leave to repeat here what I have ſo frequently recommended, which is, the carefully keeping the ground always clean from weeds; for if theſe are permitted to grow, they will rob the young trees of their nouriſhment. Another principal buſineſs is, to dig the ground between the young plants at leaſt once every year, to looſen it for the roots to ſtrike out; but if the ground is ſtiff, it will be better if it is repeated twice a year, viz. in October and March, which will greatly promote the growth of the plants, and prepare their roots for tranſplanting.

But as there may be ſome perſons who may have the curioſity to raiſe their own fruit-trees, which is what I would recommend to every one who is a lover of good fruit, becauſe the uncertainty in procuring the intended kinds of each fruit is very great, when taken from common Nurſery-gardens, ſo that moſt gentlemen who have planted many, have conſtantly complained of this diſappointment; but beſide this, there is another inconvenience, which, for want of ſkill, is ſcarce taken notice of, which is, the taking the buds or grafts from young trees in the Nurſeries which have not borne fruit; this having been frequently repeated, renders the trees ſo raiſed as luxuriant as Willows, making ſhoots to the top of the walls in two or three years, and are rarely after fruitful with the moſt ſkilful management: I ſhall therefore treat of the proper method to make a Nurſery of theſe trees.

In the doing of which you muſt obſerve the following rules:

1. That the ſoil in which you make the Nurſery be not better than that where the trees are to be planted out for good; the not obſerving this is the reaſon that trees are often at a ſtand, or make but little progreſs for three or four years after they come from the Nurſery, as it commonly happens to ſuch trees as are raiſed near London, and carried into the northern parts of England, where, being planted in a poor ſoil and a much colder ſituation, the trees ſeldom ſucceed well; therefore it is by far the better method (when you have obtained the ſorts you would propagate) to raiſe a Nurſery of the ſeveral ſorts of ſtocks proper for the various kinds of fruit, upon which you may bud or graft them; and thoſe trees which are thus raiſed upon the ſoil, and in the ſame degree of warmth, where they are to be planted, will ſucceed much better than thoſe

thoſe brought from a greater diſtance and from a richer ſoil.

2. This ground ought to be freſh, and not ſuch as has been already worn out by trees, or other large growing plants, for in ſuch ſoil your ſtocks will not make any progreſs.

3. It ought not to be too wet, nor over dry, but rather of a middling nature; though of the two extremes, dry is to be preferred, becauſe in ſuch ſoils (though the trees do not make ſo great a progreſs as in moiſt, yet) they are generally ſounder, and more diſpoſed to fruitfulneſs.

4. You muſt alſo obſerve to incloſe it, that cattle and vermin may not come in, for theſe will make ſad havock with young trees, eſpecially in winter, when the ground is covered with ſnow, that they have little other food which they can come at. Some of the moſt miſchievous of theſe animals are hares and rabbets, which are great deſtroyers of young trees at that ſeaſon, by eating off all their bark; therefore you muſt carefully guard your Nurſery againſt theſe enemies.

The ground being incloſed, ſhould be carefully trenched about eighteen inches, or two feet deep, provided it will allow it; this ſhould be done in Auguſt or September, that it may be ready to receive young ſtocks at the ſeaſon for planting, which is commonly in the middle or end of October. In trenching the ground, you muſt be very careful to cleanſe it from the roots of all noxious weeds, ſuch as Couch-graſs, Docks, &c. which, if left in the ground, will get in among the roots of the trees, ſo as not to be gotten out afterwards, and will ſpread and over-run the ground, to the great prejudice of your young ſtocks.

After having dug the ground, and the ſeaſon being come for planting, you muſt level down the trenches as equal as poſſible, and then lay out the ground into quarters, proportionable to the ſize thereof, and thoſe quarters may be laid out in beds, for the ſowing of ſeeds or the ſtones of fruit.

The beſt ſort of ſtocks for Peaches, Nectarines, &c. are ſuch as are raiſed from the ſtones of the Muſcle and white Pear Plumb, but you ſhould never plant ſuckers of theſe (which is what ſome people practiſe) for theſe ſeldom make ſo good ſtocks, nor are ever well-rooted plants; beſides, they are very ſubject to produce great quantities of ſuckers from their roots, which are very troubleſome in the borders, or walks of a garden, and greatly injure the tree; ſo that you ſhould annually, or at leaſt every other year, ſow a few ſtones of each, that you may never be at a loſs for ſtocks.

For Pears, you ſhould have ſuch ſtocks as have been raiſed from the kernels of the fruit where perry hath been made, or elſe preſerve the ſeeds of ſome ſorts of ſummer Pears, which generally ſhoot ſtrong and vigorous, as the Cuiſſe Madame, Windſor, &c. but when this is intended, the fruit ſhould be ſuffered to hang upon the trees till they drop, and afterward permitted to rot; then take out the kernels and put them in ſand, being careful to keep them from vermin, as alſo to place them where they may not be too damp, which will cauſe them to grow mouldy. Theſe you ſhould ſow for ſtocks early in the ſpring, upon a bed of good light freſh earth, where they will come up in about ſix weeks, and, if kept clear from weeds, will be ſtrong enough to tranſplant the October following. But for many ſorts of ſummer and autumn Pears, Quince ſtocks are preferable to free (i. e. Pear) ſtocks; theſe are generally uſed for all the ſorts of ſoft-melting Pears, but they are not ſo good for the breaking Pears, being apt to render thoſe fruits which are grafted upon them ſtony; theſe are very often propagated from ſuckers, which are generally produced in plenty from the roots of old trees; but thoſe are not near ſo good as ſuch as are propagated from cuttings or layers, which have always much better roots, and are not ſo ſubject to produce ſuckers as the other, which is a very deſirable quality, ſince theſe ſuckers do not only rob the trees of part of their nouriſhment, but are very troubleſome in a garden.

Apples are grafted or budded upon ſtocks raiſed from ſeeds which come from the cyder-preſs, or upon Crab ſtocks, the latter of which are eſteemed for their durableneſs, eſpecially for large ſtandard trees; theſe ſhould be raiſed from ſeeds, as the Pear ſtock, and muſt be treated in the ſame manner, for thoſe procured from ſuckers, &c. are not near ſo good; but for ſmall gardens, the Paradiſe ſtock hath been for ſome years paſt greatly eſteemed, it being of very humble growth, cauſeth the fruit-trees grafted or budded thereon to bear very ſoon, and they may be kept in ſmall compaſs; but theſe are only proper for very ſmall gardens, or by way of curioſity, ſince the trees thus raiſed are but of ſhort duration, and ſeldom ariſe to any ſize to produce fruit in quantities, unleſs the graft or bud be buried in planting, ſo that they put forth roots, and then they will be equal to trees grafted upon free ſtocks, ſince they receive but ſmall advantage from the ſtock.

For Cherries, you ſhould make uſe of ſtocks raiſed from the ſtones of the common Black, or the wild Honey Cherry, both of which are ſtrong free growers, and produce the cleaneſt ſtocks.

For Plumbs, you may uſe the ſtones of moſt free-growing ſorts, which will alſo do very well for Apricots, theſe being not ſo difficult to take as Peaches or Nectarines; but (as I ſaid before) theſe ſhould not be raiſed from ſuckers for the reaſon there aſſigned, but rather from ſtones.

There are ſome perſons who recommend the Almond ſtock for ſeveral ſorts of tender Peaches, upon which they will take much better than upon Plumb ſtocks; but theſe being tender in their roots, and apt to ſhoot early in the ſpring, and being of ſhort duration, are by many people rejected; but ſuch tender ſorts of Peaches which will not take upon Plumb ſtocks, ſhould be budded upon Apricots, upon which they will take very well; and all ſorts of Peaches which are planted upon dry ſoils, will continue much longer, and not be ſo ſubject to blight, if they are upon Apricots; for it is obſerved, that upon ſuch ſoils where Peaches ſeldom do well, Apricots will thrive exceedingly, which may be owing to the ſtrength and compactneſs of the veſſels in the Apricots, which render it more capable of aſſimilating, or drawing its nouriſhment from the Plumb ſtock, which in dry ſoils ſeldom afford it in great plenty to the bud; and the Peach-tree being of a looſe ſpongy nature, is not ſo capable to draw its nouriſhment therefrom, which occaſions that weakneſs which is commonly obſerved in thoſe trees, when planted on a dry ſoil; therefore it is the common practice of the Nurſery-gardeners, to bud the Plumb ſtocks either with Apricots, or ſome free growing Peach; and after theſe have grown a year, they bud the tender ſorts of Peaches upon theſe ſhoots, by which method many ſorts ſucceed well, which in the common way will not thrive, or ſcarce keep alive; and theſe the gardeners term double worked Peaches.

There are ſome people who of late have budded and grafted Cherries upon ſtocks of the Corniſh, and others on the Morello Cherry, which, they ſay, will render the trees more fruitful, and leſs luxuriant in growth, ſo that they may be kept in leſs compaſs; theſe ſtocks having the ſame effect upon Cherries, as the Paradiſe ſtock hath on Apples.

Having provided yourſelf with young ſtocks of all theſe different ſorts, which ſhould be raiſed in the ſeminary the preceding year, you ſhould proceed to tranſplanting them in October (as was before directed) into the Nurſery. The diſtance which they ſhould be planted, if deſigned for ſtandards, ſhould be three feet and a half or four feet, row from row, and a foot and a half diſtant in the rows; but if for dwarfs, three feet row from row, and one foot in the rows, will be a ſufficient diſtance.

In taking theſe ſtocks out of the ſeed-beds, you muſt raiſe the ground with a ſpade, in order to preſerve the

the roots as entire as possible; then with your knife you should prune off all the very small fibres; and if there are any which have a tendency to root downright, such roots should be shortened; then having thus prepared the plants, you should draw a line across the ground intended to be planted, and with your spade open a trench thereby exactly strait, into which you should place them at the distance beforementioned, setting them exactly upright; and then put the earth in close to them, filling up the trench, and with your foot press the earth gently to the roots of them, observing not to displace them so as to make the rows crooked, which will render them unsightly; these plants should by no means be headed, or pruned at top, which will weaken them, and cause them to produce lateral branches, and thereby spoil them.

If the winter should prove very cold, it will be of great service to your young stocks, to lay some mulch upon the surface of the ground near their roots, which will prevent the frost from penetrating the ground, so as to hurt the tender fibres which were produced after planting; but you should be careful not to let it lie too thick near the stems of the plants, nor remain too long, lest the moisture should be prevented from penetrating to the roots of the plants, which it often does, where there is not due care taken to remove it away as soon as the frost is over.

In the summer season you must always observe to hoe and destroy the weeds, which, if permitted to remain in the Nursery, will greatly weaken and retard the growth of your stocks; and, the succeeding years, you should observe to dig up the ground every spring between the rows, which will loosen it so, as that the fibres may easily strike out on each side, and the weeds will thereby be destroyed; you should also observe, where any of the stocks have shot out lateral branches, to prune them off, that they may be encouraged to grow upright and smooth.

The second year after planting, such of the stocks as are designed for dwarf trees will be fit to bud, but those which are designed for standards, should be suffered to grow six or seven feet high before they are budded or grafted. The manner of budding and grafting being fully described under their respective heads, I shall not repeat them in this place, nor need I say any thing more of treating these trees after budding, that being also treated of under the several articles of fruits; I shall only add, that those stocks which were budded in the summer, and have failed, may be grafted the following spring, but Peaches and Nectarines never take well from grafts, these should therefore be always budded.

The ground you intend for the Flower-nursery should be well situated to the sun, but defended from strong winds, by plantations of trees or buildings, and the soil should be light and dry; which must always be observed, especially for bulbous-rooted flowers, which are designed to be planted therein, the particulars of which are exhibited under the several articles of flowers.

In this Nursery should be planted the offsets of all your bulbous-rooted flowers, where they are to remain until they become blowing roots, when they should be removed into the pleasure-garden, and planted either in beds or borders, according to the goodness of the flowers, or the management which they require.

You may also in this ground raise the several sorts of bulbous-rooted flowers from seed, by which means new varieties may be obtained; but most people are discouraged from setting about this work, from the length of time before the seedlings will come to flower: however, after a person hath once begun, and constantly continued sowing every year, after the parcel first sown has flowered, the regular succession of them coming annually to flower, will not render this method so tedious as it at first appeared.

The seedling Auriculas, Polyanthuses, Ranunculuses, Anemonies, Carnations, &c. should be raised in this Nursery, where they should be preserved until they have flowered, when you should mark all such as are worthy of being transplanted into the flower-garden, which should be done in their proper seasons; for it is not so well to have all these seedling flowers exposed to public view in the flower-garden, because it always happens, that there are great numbers of ordinary flowers produced amongst them, which will make but an indifferent appearance in the pleasure-garden.

NUX AVELLANA. See Corylus.

NUX JUGLANS. See Juglans.

NUX VESICARIA. See Staphylodendron.

NYCTANTHES. Lin. Gen. Plant. 16. Jasminum. Raii Meth. Plant. *Arabian Jasmine.*

The Characters are,

*The empalement of the flower is cylindrical, permanent, and of one leaf, cut into eight or ten acute segments. The flower is of the salver-shape, of one leaf, with a cylindrical tube longer than the empalement, cut into eight or ten segments at the top, which spread open. It hath two small awl-shaped stamina, situated at the bottom of the tube, terminated by erect summits, and one roundish depressed germen, supporting a single style the length of the tube, crowned by a bifid erect stigma. The germen afterward becomes a roundish berry with two cells, each containing a large roundish seed.*

This genus of plants is ranged in the first section of Linnæus's second class, which includes those plants whose flowers have two stamina and one style.

The Species are,

1. Nyctanthes (*Sambac*) caule volubili, foliis subovatis acutis. Hort. Upsal. 4. *Nyctanthes with a winding stalk and acute leaves.* Jasminum Arabicum. Clus. Cur. 3. *The Arabian Jasmine.*
2. Nyctanthes (*Hirsuta*) petiolis pedunculisque villosis. Lin. Sp. Plant. 6. *Nyctanthes with the foot-stalks of the leaves and flowers hairy.* Jasminum Indicum bacciferum, flore albo majore, noctu olente. Com. Hort. Mal. *Indian berry-bearing Jasmine, with a larger white flower, smelling by night.*

The first sort grows naturally in India, from whence it has been formerly brought to the islands in America, where the plants are cultivated for ornament; this rises with a winding stalk to the height of fifteen or twenty feet, sending out many small branches, garnished with oval smooth leaves near three inches long, and almost two broad, of a light green, standing opposite on short foot-stalks, ending in acute points. The flowers are produced at the end of the branches, and also upon the side shoots, upon short foot-stalks; each generally sustain three flowers, the two lower being opposite, and the middle ones longer: these have cylindrical empalements, which are short, and are cut almost to the bottom into eight narrow segments. The tube of the flower is narrow, about half an inch long, and is cut at the top into eight obtuse segments, which expand quite flat; they are of a pure white, and have a most agreeable odour, somewhat like the Orange-flower, but sweeter; these flowers, when fully blown, drop out of their cups upon being shaken, and frequently fall in the night, so that when the plants are in full flower, the place under them is often covered with flowers in the morning, which soon change to a purplish colour. The plants continue flowering great part of the year, when they are kept in a proper temperature of warmth.

There is a variety of this sort with very large double flowers, having a most agreeable odour, which grows naturally at Malabar, where the women string the flowers to hang round their necks, and by way of ornament. This sort was, some years past, growing in the gardens at Hampton-Court, but was afterward lost, with many other rare plants, by the ignorance of the gardener; and, for several years past, was only known to grow in the gardens of the Duke of Tuscany in Europe, who kept a constant guard over the plants, so that neither cuttings or layers might be taken from them, so as to be propagated; but I have lately received a plant of this sort, which was brought from the Malabar coast, with several other rare

rare plants, by Captain Quick; and this is at present in so flourishing a state of health, that I hope soon to increase the number of plants, which will be a great acquisition to the English gardens.

Linnæus has supposed that sort of Jasmine, to which the title of Gardenia has been given, to be the same with this; but as my plant has flowered here, so it appears plainly to be an accidental variety of this Nyctanthes, the flowers changing to a purple colour before they drop off, whereas the plant titled Gardenia changes to a buff colour; beside, this Nyctanthes is a twining plant, whereas the other is of upright growth: he is likewise as much mistaken in supposing it to be the same with Rumpfius's plant, for it differs in many respects from that, as also from Burman's figure; therefore if he had looked upon the figure, and attended to the description given of this plant in the Pisa Garden, he could not have supposed these two to be the same plant.

The second sort grows naturally in India, where it rises to the height of a tree, dividing into many branches, garnished with large, oval, smooth leaves, of a lucid green, with hairy foot-stalks; these come out on every side the branches without order. The flowers are produced on the side of the branches from the wings of the leaves, upon long hairy foot-stalks, each sustaining seven or eight flowers, which are of a pure white, and very fragrant, but have longer tubes than those of the former sort. The flowers of this plant open in the evening, and drop off in the morning, which has occasioned some to give it the title of Arbor Tristis, or the Sorrowful-tree, from its casting the flowers in the morning; this is very rare in Europe at present.

The plants of the first sort are frequently brought from Italy by the Italian gardeners, who bring Orange-trees here for sale; but those plants are always grafted upon stocks of the common Jasmine, which do not keep pace in their growth with the graft, so become very unsightly, when the plants are grown to any size; besides, the stocks are very subject to shoot from the bottom, and if these shoots are not constantly rubbed off, they will draw the nourishment from the graft and starve it: therefore the best method to obtain the plants, is to propagate them by layers or cuttings; the former is the surest method, for unless the cuttings are very carefully managed, they will not take root; and as the stalks of this sort are pliable, they may be easily brought down, and laid in pots filled with a soft loamy soil, which should be plunged into a hot-bed of tan: if the branches are laid down in the spring and carefully watered, they will put out roots by autumn, when they may be cut from the old plants, and each transplanted into a separate small pot, and then plunged into the tan-bed, where they should be shaded from the sun till they have taken new root.

If these plants are propagated by cuttings, they should be planted from May to August, into pots filled with the before-mentioned earth, and plunged into a moderate hot-bed of tanners bark. The pots should be pretty large, and there may be ten or twelve cuttings planted in each; if these pots are closely covered with bell or hand-glasses to exclude the air, it will greatly promote their taking root; they must also be shaded from the sun in the heat of the day, and gently refreshed with water when the earth is dry; with this management the cuttings will have taken root by August, when they may be transplanted into separate pots, and treated in the same way as the layers.

These plants may be preserved in a moderate degree of warmth, but if they are plunged into the tan-bed of the bark-stove, they will thrive much better, and produce a greater quantity of flowers; and as the leaves continue all the year, the plants will make a fine appearance in the stove at all seasons, and produce flowers great part of the year.

The second sort requires the same treatment, but is much more difficult to propagate, so is very rarely found in the European gardens; there were two or three of these plants brought from Florence a few years since, but they were put into the hands of unskilful persons, so were lost.

NYMPHÆA. Tourn. Inst. R. H. 260. tab. 137, 138. Lin. Gen. Plant. 579. [is so called, because it grows in water, which the poets feign to be the residence of the nymphs.] The Water Lily; in French, *Nenufar*.

The Characters are,

*The empalement of the flower is composed of four or five coloured leaves, and is permanent. The flower hath many petals which are smaller than the empalement, sitting on the side of the germen, for the most part in a single series. It hath a great number of short, plain, incurved stamina, with oblong summits, like threads, growing to their borders It hath a large oval germen, but no style, with an orbicular, plain, target-shaped stigma, sitting close, whose border is crenated and is permanent. The germen afterward becomes a hard, oval, fleshy fruit, with a rude narrow neck, crowned at the top, and divided into ten or fifteen cells full of pulp, with many roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, which contains those plants whose flowers have many male parts and but one female.

The Species are,

1. Nymphæa (*Lutea*) foliis cordatis integerrimis, calyce petalis majore pentaphyllo. Flor. Lap. 218. *Water Lily with entire heart-shaped leaves, whose empalement consists of five leaves larger than the petals.* Nymphæa lutea major. C. B. P. 193. *Greater yellow Water Lily.*
2. Nymphæa (*Alba*) foliis cordatis integerrimis, calyce quadrifido. Lin. Sp. Plant. 510. *Water Lily with heart-shaped entire leaves, and a four-pointed empalement.* Nymphæa alba major. C. B. P. 193. *Greater white Water Lily.*

There are some other species of this genus which are natives of warm countries, but as they cannot without great difficulty be cultivated here, so I shall not enumerate them; for unless there is a contrivance for standing water in the stove, in which the plants may be planted, they will not grow; and such a place would be injurious to most other plants in the stove, by occasioning damps; so that unless a stove was contrived on purpose for some of these aquatic plants, it would be imprudent to attempt their cultivation.

The two sorts here mentioned, grow naturally in standing waters in many parts of England; they have large roots, which are fastened in the ground, from which arise the stalks to the surface of the water, where the leaves expand and float; they are large, roundish, and heart-shaped. The flowers arise between the leaves, and swim upon the surface of the water. The white sort has a faint sweet scent; these appear in July, and are succeeded by large roundish seed-vessels, filled with shining black seeds, which ripen toward the end of August, when they sink to the bottom of the water.

The best method to propagate these plants is, to procure some of their seed-vessels just as they are ripe and ready to open; these should be thrown into canals, or large ditches of standing water, where the seeds will sink to the bottom, and the following spring the plants will appear floating upon the surface of the water, and in June and July will produce their beautiful large flowers. When they are once fixed to the place, they will multiply exceedingly, so as to cover the whole surface of the water in a few years.

In some small gardens I have seen the plants cultivated in large troughs of water, where they have flourished very well, and have annually produced great quantities of flowers; but as the expence of these troughs is pretty great (their insides requiring to be lined with lead, to preserve them) there are but few people who care to be at that charge.

# O.



OAK. See QUERCUS.

OBELISCOTHECA. See RUDBECKIA.

OCHRUS. See PISUM.

OCULUS CHRISTI. See HORMINUM SYLVESTRE.

OCYMUM. Tourn. Inst. R. H. 203. tab. 96. Lin. Gen. Plant. 651. Basil; in French, *Basilic.*

The CHARACTERS are,

*The empalement of the flower is short, permanent, of one leaf, divided into two lips; the upper lip is plain, bifid, and heart-shaped; the under is cut into four acute segments. The flower is of the lip kind, of one petal inverted. It has a short spreading tube; the rising lip is broad, and cut into four obtuse equal parts; the reflexed lip is long, narrow, and sawed. It hath four stamina in the lower lip, which are deflexed, two of which are a little longer than the other, terminated by half-moon-shaped summits. The germen is divided into four parts, supporting a slender style, situated with the stamina, crowned by a bifid stigma. The germen afterward become four naked seeds inclosed in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which contains those plants whose flowers have two long and two shorter stamina, and their seeds have no covering.

The SPECIES are,

1. OCYMUM (*Basilicum*) foliis ovatis glabris, calycibus ciliatis. Hort. Cliff. 315. *Basil with oval smooth leaves, and hairy empalements.* Ocymum caryophyllatum majus. C. B. P. 226. *Greater Clove-scented, or common Basil.*
2. OCYMUM (*Minimum*) foliis ovatis integerrimis. Hort. Upsal. 169. *Basil with oval entire leaves.* Ocymum minimum. C. B. P. 226. *The least Basil, commonly called Bush Basil.*
3. OCYMUM (*Medium*) hirsutum, foliis ovato-lanceolatis acuminatis dentatis. *Hairy Basil with oval spear-shaped leaves which are indented, and end in acute points.* Ocymum medium vulgatius & nigrum. J. B. 3. p. 2. 247. *Common middle black Basil.*
4. OCYMUM (*Americanum*) foliis ovato-oblongis serratis, bracteis cordatis reflexis concavis spicis filiformibus. Lin. Sp. Plant. 833. *Basil with oval, oblong, sawed leaves, and heart-shaped, concave, reflexed bractea.*
5. OCYMUM (*Campechianum*) foliis lanceolatis subtus incanis, petiolis longissimis villosis floribus pedunculatis. *Basil with spear-shaped leaves, which are hoary on their under side, and very long hairy foot-stalks to the flowers.* Ocymum Campechianum odoratissimum. Houst. MSS. *The sweetest-scented Basil of Campeachy.*
6. OCYMUM (*Frutescens*) racemis secundis lateralibus, caule erecto. Lin. Sp. Plant. 832. *Basil with fruitful spikes of flowers on the side of the stalk, which are erect.* Ocymum Zeylanicum, perenne, odoratissimum latifolium. Burm. Zeyl. 174. tab. 80. fol 1. *Sweet-scented perennial Basil of Ceylon, with broad leaves.*

The three first sorts grow naturally in India and Persia; of these there are a great variety, which differ in the size, shape, and colour of their leaves, as also in their odour; but as these differences are accidental, so I have not enumerated them, being convinced from repeated experiments, that the seeds of one plant will produce many varieties.

The first sort rises with a branching stalk a foot and a half high; the leaves are large, oval, and smooth; the stalk is hairy, and four-cornered; the leaves are placed by pairs opposite, and the branches also come out in the same manner; the stalk is terminated by a whorled spike of flowers, which is five or six inches long, and the branches are also terminated by short spikes of flowers of the same sort; the whole plant has a strong scent of Cloves.

Of this there are the following varieties:

1. The fringed-leaved Basil with purple leaves.
2. The green fringed-leaved Basil.
3. The green Basil with studded leaves.
4. The large-leaved Basil.

The second sort is a low bushy plant, which seldom rises more than six inches high, spreading out into branches from the bottom, forming an orbicular head; the leaves are small, oval, and smooth, standing opposite on short foot-stalks. The flowers are produced in whorls toward the top of the branches; they are smaller than those of the former sort, and are seldom succeeded by ripe seeds in England.

Of this there are some varieties, as

1. The smallest Basil with black purple leaves.
2. The smallest Basil with variable leaves.

The third sort is the common Basil which is used in medicine, and also in the kitchen, particularly by the French cooks, who make great use of it in their soups and sauces. This rises about ten inches high, sending out branches by pairs opposite, from the bottom; the stalks and branches are four-cornered; the leaves are oval, spear-shaped, ending in acute points, and are indented on their edges; the whole plant is hairy, and has a strong scent of Cloves, too powerful for most persons, but to some it is very agreeable: the whole plant is an ingredient in the compound Briony-water.

There are some varieties of this species, viz.

1. Common Basil with very dark green leaves, and a Violet-coloured flower.
2. Curled-leaved Basil with short spikes of flowers.
3. Narrow-leaved Basil smelling like Fennel.
4. Middle Basil with a scent of Citron.
5. Basil with studded leaves.
6. Basil with leaves of three colours.

The fourth sort grows naturally in India; this rises with a branching stalk a foot and a half high, which is taper, and of a purplish colour; the leaves are short and hairy; they are of an oval oblong figure, ending in obtuse points, and are sawed on their edges, standing upon pretty long foot-stalks. The stalks are terminated by three spikes of flowers, that in the middle being longer than the other two; the spikes are narrow, and the flower have short foot-stalks; under each whorl of flowers are two small leaves (or bractea) placed opposite, which are heart-shaped, concave, and reflexed. The flowers are small, and in some plants are of a purplish colour, but in general they are white; their empalements are smooth, and cut into five parts at the top; the style of the flower is longer than the petal, and the whole plant has a strong, sweet, aromatic odour.

The fifth sort rises with an upright stalk near two feet high, sending out sometimes two, and at others four branches towards the top, opposite, garnished with spear-shaped leaves about three inches long, and one broad in the middle, lessening at both ends to a point; their foot-stalks are two inches long, and are hairy.

The flowers grow in whorled ſpikes at the top of the ſtalks, the flowers ſtanding upon foot-ſtalks, each ſuſtaining three flowers; theſe are about the ſize of thoſe of the common Baſil, and are white; the whole plant has a ſtrong aromatic odour. It grows naturally at Campeachy.

The ſixth ſort grows naturally in the iſland of Ceylon; this riſes with a ſquare ſtalk two feet high, which is hairy, and divides into three branches at the top; the lower leaves are roundiſh, ending in points; they are hairy, and crenated on their edges, ſtanding upon ſlender foot-ſtalks; the leaves on the ſtalks are narrower and ſhorter, and have foot-ſtalks an inch long; the ſtalks are terminated by three ſpikes of flowers in whorls, that in the middle being the longeſt. The flowers are reflexed and hang downward, they are white, and larger than thoſe of the common ſort. This plant has leſs odour than the other ſorts.

Theſe plants being moſt of them annual, are propagated from ſeeds, which ſhould be ſown in March, upon a moderate hot-bed; and when the plants are come up, they ſhould be tranſplanted into another moderate hot-bed, obſerving to water and ſhade them until they have taken root; after which they ſhould have plenty of air in mild weather, otherwiſe they will draw up very weak; you muſt alſo water them frequently, for they love moiſture. In May they ſhould be taken up with a ball of earth to their roots, and tranſplanted either into pots or borders, obſerving to ſhade them until they have taken root; after which they will require no farther care but to clear them from weeds, and refreſh them with water in dry weather. Though theſe plants are only propagated from ſeeds, yet if you have any particular ſort which may ariſe from ſeeds, which you are deſirous to increaſe, you may take off cuttings any time in May, and plant them on a moderate hot-bed, obſerving to water and ſhade them for about ten days; in which time they will take root, and in three weeks time be fit to remove, either into pots or borders, with the ſeedling plants. In September theſe plants will perfect their ſeeds, when thoſe ſorts which appear the moſt diſtinct, ſhould have their ſeeds preſerved ſeparate, for ſowing the following ſpring.

The ſeeds of theſe plants are uſually brought from the ſouth of France or Italy every ſpring, becauſe ſome of them ſeldom ripen their ſeeds in this country in the open air. But whoever is curious to preſerve the ſeeds of any of the varieties, ſhould place them in an airy glaſs-caſe or ſtove in the autumn, when the weather begins to be cold or wet; and by ſupplying them with water, and letting them have free air every day in mild weather, they will perfect their ſeeds very well in this country.

The fifth ſort is more tender than any of the other; this was diſcovered growing wild at Campeachy, by the late Dr. William Houſtoun, who ſent the ſeeds to England. This ſhould be ſown on a hot-bed early in the ſpring, and when the plants are come up, they ſhould be tranſplanted on another very temperate hot-bed to bring them forward; and when they have obtained ſtrength, they ſhould be each tranſplanted into a ſeparate pot, and placed either in the ſtove, or on a moderate hot-bed, where they may have a large ſhare of air in warm weather; but by being ſheltered from the cold and wet, the plants will perfect their ſeeds very well in England.

The ſixth ſort grows to be ſhrubby, and if placed in a moderate warmth in winter, may be preſerved two years; but this will ripen its ſeeds the firſt year, if the plants are brought forward in the ſpring; but if this ſhould fail, the plants may be placed in the ſtove, where they may be kept through the winter, and the following ſeaſon they will perfect their ſeeds. In the ſummer the plants ſhould be placed in the open air in a ſheltered ſituation, and in warm weather they ſhould have plenty of water.

There have been many fictitious ſtories handed down through ſeveral generations, of ſcorpions being bred in the brain of perſons who frequently ſmelled this plant; and others have aſſerted, that ſcorpions commonly breed under the plants, but theſe ſtories are without foundation: but it is certain, that the odour of theſe plants is too ſtrong for moſt perſons, eſpecially in a room, or if near them; for which reaſon they ſhould not be placed too near the habitation, becauſe if they are in any quantity, the odour will extend at times to moſt of the apartments when the windows are open.

ŒNANTHE. Tourn. Inſt. R. H. 312. tab. 166. Lin. Gen. Plant. 314. [Οἰνανθη, of Οἴνη, a Vine, and Ἄνθος, a flower. The ancients called any plant Œnanthe that flowered at the ſame time with the Vine, or whoſe flowers had the ſame odour.] Water Dropwort.

The Characters are,

*It is a plant with an umbelliferous flower; the principal umbel has but few rays, but the particular umbels have many ſhort ones. The principal involucrum is compoſed of many ſingle leaves, which are ſhorter than the umbel; the ſmaller umbels have many ſmall leaves; the rays of the principal umbel are difform. Thoſe flowers in the diſk are hermaphrodite, and are compoſed of five heart-ſhaped inflexed petals, which are almoſt equal; thoſe of the rays are male, and have five large unequal petals which are bifid; they have five ſingle ſtamina terminated by roundiſh ſummits. The germen is ſituated under the flower, ſupporting two awl-ſhaped permanent ſtyles, crowned by obtuſe ſtigmas. The germen afterward becomes an oval fruit, divided into two parts, containing two almoſt oval ſeeds, convex on one ſide and plain on the other.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifth claſs, which contains thoſe plants whoſe flowers have five ſtamina and two ſtyles.

The Species are,

1. Œnanthe (*Crocata*) foliis omnibus multifidis obtuſis ſubæqualibus. Hort. Cliff. 99. *Water Dropwort, whoſe leaves all end in many obtuſe points, and are almoſt equal.* Œnanthe ſucco viroſo, cicutæ facie lobelii. J. B. 3. p. 2. 193. *Hemlock Dropwort.*
2. Œnanthe (*Fiſtuloſa*) ſtolonifera, foliis caulinis pinnatis filiformibus fiſtuloſis. Lin. Sp. Plant. 254. *Water Dropwort, with ſlender, fiſtular, winged leaves growing on the ſtalks.* Œnanthe aquatica. C. B. P. 162. *Water Dropwort.*
3. Œnanthe (*Pimpinelloides*) foliolis radicalibus cuneatis fiſſis, caulinis integris linearibus longiſſimis canaliculatis. Hort. Cliff. 99. *Water Dropwort whoſe lower leaves are oval and cut, but thoſe on the ſtalks entire, narrow, and channelled.* Œnanthe apii folio. C. B. P. 162. *Water Dropwort with a Smallage leaf.*
4. Œnanthe (*Prolifera*) umbellularum pedunculis marginalibus longioribus ramoſis maſculis. Hort. Upſal. 63. *Water Dropwort whoſe foot-ſtalks on the borders of the umbels are longer, branching, and bear male flowers.* Œnanthe prolifera Apula. C. B. P. 163. *Childing Water Dropwort of Apulia.*
5. Œnanthe (*Globuloſa*) fructibus globoſis. Hort. Cliff. 99. *Water Dropwort with globular fruit.* Œnanthe Luſitanica, ſemine craſſiore globoſo. Tourn. Inſt. 313. *Portugal Water Dropwort, with a thicker globular ſeed.*

The firſt of thoſe here mentioned, is very common by the ſides of the Thames on each ſide London, as alſo by the ſides of large ditches and rivers in divers parts of England: this plant commonly grows four or five feet high with ſtrong jointed ſtalks, which, being broken, emit a yellowiſh fœtid juice; the leaves are ſomewhat like thoſe of the common Hemlock, but are of a lighter green colour: the roots divide into four or five large taper ones, which, when ſeparated, have ſome reſemblance to Parſneps; for which ſome ignorant perſons have boiled them, whereby themſelves and family have been poiſoned.

This plant is one of the moſt poiſonous we know; the juice which is at firſt like milk, turns afterward to a Saffron colour: if a perſon ſhould ſwallow ever ſo little of this juice, it will ſo contract every part it touches,

touches, that there will immediately follow a terrible inflammation and gangrene: and what is worse, there has not yet been found an antidote against it; for which reason, we ought to be very careful to know this plant, in order to avoid it, for fear we should take it for any other like it, which would certainly prove fatal.

The poisonous quality of this plant, had led some persons to believe it to be the Cicuta of the ancients; but according to Wepfer, the Sium alterum olusatri facie of Lobel, is what the ancients called Cicuta, as may be seen at large in Wepfer's book De Cicuta.

The second sort is very common in moist soils, and by the sides of rivers in divers parts of England: this is not supposed to be near so strong as the first, but is of a poisonous quality.

All the sorts of these plants naturally grow in moist places, so that whoever hath a mind to cultivate them, should sow their seeds soon after they are ripe in autumn, upon a moist soil, where they will come up, and thrive exceedingly the following summer, and require no farther care but to clear them from weeds.

ŒNOTHERA. Lin. Gen. Plant. 424. Onagra. Tourn. Inst. R. H. 302. tab. 156. Tree Primrose.

The CHARACTERS are,

*The empalement of the flower is of one leaf, having a long cylindrical tube, cut into four acute segments at the brim, which turn backward. The flower has four heart-shaped petals, which are lengthways inserted in the divisions of the empalement. It hath eight awl-shaped incurved stamina, which are inserted in the tube of the empalement, and are terminated by oblong prostrate summits. The cylindrical germen is situated under the tube of the empalement, supporting a slender style, crowned by a thick quadrifid, obtuse, reflexed stigma. The germen afterward becomes a four-cornered cylindrical capsule having four cells, which are filled with small angular seeds.*

This genus of plants is ranged in the first section of Linnæus's eighth class, which includes those plants whose flowers have eight stamina and one style.

The SPECIES are,

1. ŒNOTHERA (*Biennis*) foliis ovato-lanceolatis planis, caule muricato subvilloso Vir. Cliff. 33. *Tree Primrose, with plain, oval, spear-shaped leaves, and a rough hairy stalk.* Onagra latifolia. Tourn. Inst. 302. *Broad-leaved Tree Primrose.*
2. ŒNOTHERA (*Angustifolia*) foliis lanceolatis dentatis, caule hispido. *Tree Primrose with spear-shaped indented leaves, and a prickly stalk.* Onagra angustifolia, caule rubro, flore minore. Tourn. Inst. R. H. 302. *Narrow-leaved Tree Primrose, with a red stalk and a smaller flower.*
3. ŒNOTHERA (*Glabra*) foliis lanceolatis planis, caule glabro. *Tree Primrose with plain spear-shaped leaves, and a smooth stalk.*
4. ŒNOTHERA (*Mollissima*) foliis lanceolatis undulatis. Vir. Cliff. 33. *Tree Primrose with waved spear-shaped leaves.* Onagra Bonariensis villosa, flore mutabili. Hort. Elth. 297. *Hairy Tree Primrose of Buenos Ayres, with a changeable flower.*
5. ŒNOTHERA (*Pumila*) foliis radicalibus ovatis, caulinis lanceolatis obtusis, capsulis ovatis sulcatis. Tab. 188. *Tree Primrose with oval leaves at the root, those on the stalks spear-shaped, blunt-pointed, and oval furrowed seed-vessels.*

The other species which have been formerly placed in this genus, are now under JUSSIÆA and LUDWIGIA, to which the reader is desired to turn.

The three first sorts grow naturally in Virginia, and in other parts of North America, from whence their seeds were brought to Europe in the beginning of the fixteenth century; but they are now become so common in many parts of Europe, as to be taken for natives. The first hath a long, thick, taper root, which runs deep into the ground, from which arise many obtuse leaves which spread flat on the ground; between these the stalks come out, which rise between three and four feet high, and is of a pale green colour, a little hairy, and about the thickness of a finger, full of pith; this is garnished with long narrow leaves set close to the stalk, without order. The flowers are produced all along the stalk from the wings of the leaves, the germen sitting close to the stalk, from the top of which arises the tube of the flower, which is narrow, more than two inches long; at the top is the empalement, which is cut into four acute segments, which are reflexed downward. The petal of the flower is cut into four large obtuse segments, which in the evening are expanded quite flat, but are shut in the day; these are of a bright yellow colour. From the flower opening in the evening, many persons call it the Night Primrose. The plants begin to flower about Midsummer, and as the stalks advance in height, so other flowers are produced, whereby there is a succession of flowers on the same plant till autumn.

The second sort hath red stalks, which are set with rough protuberances: it does not rise so high as the first, the leaves are narrower, and the flowers are smaller.

The third sort differs from the first, in having shorter stalks, narrower leaves, and smaller flowers; and from the second, in having smooth stalks, which are of a pale green colour. These differences are permanent, so they are undoubtedly different species.

The fourth sort grows naturally at Buenos Ayres; this hath a shrubby stalk more than two feet high, hairy, garnished with narrow spear-shaped leaves ending in acute points; these sit close to the stalks, being a little waved on their edges. The flowers come out from the wings of the leaves along the stalks, like the other sorts; they are first of a pale yellow, but as they decay change to an Orange colour; they are smaller than those of either of the former sorts, and expand only in the evening; the seed-vessels are slender, taper, and hairy. This flowers at the same time with the former.

The fifth sort grows naturally in Canada, from whence the seeds were brought to Paris a few years past. This is a perennial plant; the root is fibrous; the lower leaves are oval and small, sitting close to the ground; the stalk is slender, near a foot high, and is garnished with small spear-shaped leaves, of a light green, ending in blunt points, sitting close to the stalks. The flowers come out from the wings of the leaves like the other species; these are small, of a bright yellow colour, and appear at the same time as the former, and are succeeded by short, oval, furrowed seed-vessels, filled with small seeds.

The three first sorts are very hardy plants, and if once brought into a garden, and the seeds permitted to scatter, there will be a supply of plants without any care. They are biennial, and perish after they have perfected their seeds. The seeds of these plants should be sown in the autumn, for those which are sown in the spring seldom rise the same year: when the plants come up, they should be thinned and kept clean from weeds, which is all the care they require till the autumn, when they should be transplanted to the places where they are designed to flower; but as the roots of these plants strike deep in the ground, so there should be care taken not to cut or break them in removing. The plants will thrive in almost any soil or situation, and will flower in London in small gardens, better than most other plants.

The fourth sort is now become pretty common in the English gardens, for if the seeds of this are permitted to scatter, the plants will come up the following spring, and require no other care but to keep them clean from weeds, and thin them where they grow too close. If these plants are kept in pots, and placed in a green-house in the autumn, they will live through the winter; but as they produce flowers and seeds in the open air, the plants are seldom preserved longer.

The fifth sort is perennial, and may be propagated either by parting of the roots, or by seeds: if it is by the former, the best time for doing it is in the spring; but

but if they are propagated by seeds, these should be sown in the autumn; and the surest way is to sow the seeds in pots, and place them under a hot-bed frame in winter: in the spring the plants will appear, and when they are fit to remove, a few of them may be planted in small pots, to be sheltered under a common frame in the winter; and the others may be planted in a sheltered border, where they will endure the cold of our ordinary winters very well, and the following summer they will produce flowers and seeds in plenty; so there will be little occasion for parting of their roots, because the seedling plants will be much stronger and flower better, than those propagated by offsets.

OLDENLANDIA. Plum. Nov. Gen. 42. tab. 36. Lin. Gen. Plant. 143.

The Characters are,

*The empalement of the flower is permanent, sitting upon the germen, and is cut into five parts. The flower has four oval petals which spread open, and are double the length of the empalement, and four stamina terminated by small summits. It hath a roundish germen situated under the flower, supporting a single style, crowned by an indented stigma. The germen afterward turns to a globular capsule with two cells, filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's fourth class, which includes those plants whose flowers have four stamina and one style.

We have but one Species of this genus in the English gardens, which is,

Oldenlandia (*Corymbosa*) pedunculis multifloris, foliis lineari-lanceolatis. Lin. Sp. Plant. 119. *Oldenlandia with many flowers on a foot-stalk, and linear spear-shaped leaves.* Oldenlandia humilis hyssopifolia. Plum. Nov. Gen. *Dwarf Oldenlandia having a Hyssop leaf.*

This plant was discovered in America by Father Plumier, who gave this name to it in honour of Henry Bernard Oldenland, a German, who was disciple of Dr. Herman at Leyden, and was a very curious botanist.

The seeds of this plant were sent into England by Mr. Robert Millar, who gathered them in Jamaica. It is a low annual plant, which seldom rises above three or four inches high, and divides into many branches which spread near the ground. These branches are furnished with long narrow leaves, which are placed opposite. From the wings of the leaves arises the flower-stalk, which grows about an inch, or a little more in length, and divides into three or four smaller foot-stalks; on the top of each of these, stands one small white flower.

The seeds of this plant should be sown early in the spring on a hot-bed, and when the plants are come up, they should be transplanted on another hot-bed, or into small pots, and plunged into a moderate hot-bed of tanners bark, observing to water and shade them until they have taken root; after which time they must have a large share of free air in warm weather, and should be frequently refreshed with water. With this management the plants will flower in June, and their seeds will ripen in July, so that the seeds must be gathered from time to time as they ripen; for as the branches grow larger, so there will be fresh flowers produced until autumn, when the plants will perish; but if the seeds are permitted to scatter in the pots, the plants will soon after appear, which will live through the winter, provided they are placed in the stove, and will flower early the following spring.

OLEA. Tourn. Inst. R. H. 598. tab. 370. Lin. Gen. Plant. 20. [of Ἐλαία,] the Olive; in French, *Olivier.*

The Characters are,

*It has a small tubulous empalement of one leaf, cut into four segments at the top. The flower consists of one petal which is tubulous, cut at the brim into four segments which spread open. It has two short stamina terminated by erect summits, and a roundish germen supporting a short style, crowned by a thick bifid stigma. The germen afterward turns to an oval smooth fruit (or berry) with one cell, inclosing an oblong oval nut.*

This genus of plants is ranged in the first section of Linnæus's second class, which contains those plants whose flowers have two stamina and one style.

The Species are,

1. Olea (*Gallica*) foliis lineari-lanceolatis subtus incanis. *Olive with linear spear-shaped leaves, which are hoary on their under side.* Olea fructu oblongo minori. Tourn. Inst. R. H. 599. *Olive with a smaller oblong fruit, commonly called Provence Olive.*
2. Olea (*Hispanica*) foliis lanceolatis, fructu ovato. *Olive with spear-shaped leaves, and an egg-shaped fruit.* Olea fructu maximo. Tourn. Inst. R. H. 599. *Olive with the largest fruit, called the Spanish Olive.*
3. Olea (*Sylvestris*) foliis lanceolatis obtusis rigidis, subtus incanis. *Olive with spear-shaped, obtuse, rigid leaves, which are hoary on their under side.* Olea sylvestris, folio duro, subtus incano. C. B. P. 472. *The wild Olive with a hard leaf, and hoary on its under side.*
4. Olea (*Africana*) foliis lanceolatis lucidis, ramis teretibus. *Olive with spear-shaped shining leaves, and taper branches.* Olea Afra, folio longo, lato, supra atroviridi splendente, infra pallidè viridi. Boer. Ind. alt. 2. 218. *African Olive, with a long, broad, shining leaf, of a greenish black above, and pale on its under side.*
5. Olea (*Buxifolia*) foliis ovatis rigidis sessilibus. *Olive with oval stiff leaves, sitting close to the branches.* Olea Afra, folio buxi crasso atroviridi, lucido, cortice albo scabro. Boerh. Ind. alt. 2. 218. *African Olive, with a thick, dark, shining Box leaf, and a rough white bark, commonly called Box-leaved Olive.*

The first sort is what the inhabitants of the south of France chiefly cultivate, because from this species the best oil is made, which is a great branch of trade in Provence and Languedoc; and it is the fruit of this sort which is most esteemed when pickled: of this there are some varieties; the first is called Olive Picholine; there is another with dark green fruit, one with white fruit, and another with smaller and rounder fruit; but as these are supposed to be only accidental varieties which have risen from the same seeds, I have not enumerated them.

The Olive seldom rises to be a large tree, and is rarely seen with a single stem, but frequently two or three stems rise from the same root; these grow from twenty to thirty feet high, putting out branches from the sides almost their whole length, which are covered with a gray bark, and garnished with stiff leaves about two inches and a half long, and half an inch broad in the middle, gradually diminishing to both ends; they are of a lively green on their upper side, and hoary on their under, standing opposite. The flowers are produced in small bunches from the wings of the leaves; they are small, white, and have short tubes, spreading open at the top; these are succeeded by oval fruit, which, in warm countries, ripen in the autumn.

The second sort is chiefly cultivated in Spain, where the trees grow to a much larger size than the former sort; the leaves are much larger, and not so white on their under side; and the fruit is near twice the size of those of the Provence Olive, but are of a strong rank flavour, and the oil made from these, is too strong for most English palates.

The third sort is the wild Olive, which grows naturally in woods, in the south of France, Spain, and Italy, so is never cultivated; the leaves of this sort are much shorter and stiffer than those of the other; the branches are frequently armed with thorns, and the fruit is small and of no value.

The fourth and fifth sorts grow naturally at the Cape of Good Hope; the fourth rises to the height of the first, to which it bears some resemblance, but the bark is rougher; the leaves are not so long, and are of a lucid green on their upper side; but as this does not produce fruit in Europe, I can give no account of it.

The fifth sort is of humbler growth, seldom rising more than four or five feet high, sending out branches from the root upward, forming a bushy shrub; the branches are taper, and covered with a gray bark; the leaves are oval, very stiff, and smaller than those of the other species. This has not produced any fruit in England.

All these sorts are preserved in the gardens of the curious, but they are rather too tender to thrive in the open air, in the neighbourhood of London, where they are sometimes planted against walls, and with a little protection in very severe frost, they are maintained pretty well; but in Devonshire there are some of these trees, which have grown in the open air many years, and are seldom injured by the frost, but the summers are not warm enough to bring the fruit to maturity. There were several of these trees planted against a warm wall at Cambden-house near Kensington, which succeeded very well, till their tops were advanced above the wall; after which they were generally killed in winter, so far down as to the top of the wall. These in 1719 produced a good number of fruit, which grew so large as to be fit for pickling; but since that time, their fruit has seldom grown to any size.

The Olive was, by the ancients, considered as a maritime tree, and they supposed it would not thrive at any distance from the sea; but by experience, we find they will succeed very well in any country, where the air is of a proper temperature of heat, though the trees are found to bear the spray of the sea better than most other sorts.

In Languedoc and Provence, where the Olive-tree is greatly cultivated, they propagate it by truncheons split from the roots of the trees; for as these trees are frequently hurt by hard frosts in winter, so when their tops are killed, they send up several stalks from the root; and when these are grown pretty strong, they separate them with an ax from the root, in the doing of which they are careful to preserve a few roots to the truncheons; these are cut off in the spring, after the danger of frost is over, and planted about two feet deep in the ground, covering the surface with litter or mulch, to prevent the sun and wind from penetrating and drying of the ground; when the plants have taken new root, they are careful to stir the ground and destroy the weeds.

This tree will grow in almost any soil, but when it is planted in rich moist ground, they grow larger and make a finer appearance, than in poor land; but the fruit is of less esteem, because the oil made from it is not so good as that which is produced in a leaner soil. The chalky ground is esteemed the best for these trees, and the oil which is made from the trees growing in that sort of land is much finer, and will keep longer than the other.

In the countries where the inhabitants are curious in the making of their oil, they are frequently obliged to get truncheons of the ordinary sorts of Olives to plant; but after they have taken good root, they graft them with the sort of Olive which they prefer to the others. In Languedoc they chiefly propagate the Cormeau, the Ampoulan, and Moureau, which are three varieties of the first species: but in Spain the second sort is generally cultivated, where they have more regard to the size of the fruit, and the quantity of oil they will produce, than to their quality.

If the culture of these trees was well understood by the inhabitants of Carolina, and properly pursued, it might become a valuable branch of trade to them; for there is no reason to doubt of their succeeding, the summers there being hot enough to ripen the fruit to its utmost perfection.

In this country the plants are only preserved by way of curiosity, and are placed in winter in the greenhouse for variety, so I shall next give an account of the method by which they are here propagated, with their manner of treatment.

These plants may be propagated by laying down their tender branches (in the manner practised for other trees,) which should remain undisturbed two years; in which time they will have put out roots, and may then be taken off from the old plants, and transplanted either into pots filled with fresh light earth, or into the open ground in a warm situation. The best season for transplanting is the beginning of April, when you should, if possible, take the opportunity of a moist season; and those which are planted in pots, should be placed in a shady part of the green-house until they have taken root; but those planted in the ground should have mulch laid about their roots, to prevent the earth from drying too fast, and now and then refreshed with water; but you must by no means let them have too much moisture, which will rot the tender fibres of their roots, and destroy the trees. When the plants have taken fresh root, those in the pots may be exposed to the open air, with other hardy exotics, with which they should be housed in winter, and treated as Myrtles, and other less tender trees and shrubs; but those in the open air will require no farther care until the winter following, when you should mulch the ground about their roots, to prevent the frost from penetrating deep into it; and if the frost should prove very severe, you should cover them with mats, which will defend them from being injured thereby; but you must be cautious not to let the mats continue over them after the frost is past, lest by keeping them too close, their leaves and tender branches should turn mouldy for want of free air; which will be of as bad consequence to the trees, as if they had been exposed to the frost, and many times worse; for it seldom happens, if they have taken much of this mould, or have been long covered, so that it has entered the bark, that they are ever recoverable again; whereas it often happens, that the frost only destroys the tender shoots; but the body and larger branches remaining unhurt, put out again the succeeding spring.

These trees are generally brought over from Italy every spring, by the persons who import Orange-trees, Jasmines, &c. from whom they may be procured pretty reasonable; which is a better method than to raise them from layers in this country, that being too tedious; and those which are thus brought over, have many times very large stems, to which size young plants in this country would not arrive in ten or twelve years. When you first procure these stems, you should (after having soaked their roots twenty-four hours in water, and cleaned them from the filth they have contracted in their passage) plant them in pots filled with fresh light sandy earth, and plunge them into a moderate hot-bed, observing to screen them from the violence of the sun in the heat of the day, and also to refresh them with water, as you shall find the earth in the pots dry. In this situation they will begin to shoot in six weeks or two months after, when you should let them have air in proportion to the warmth of the season; and after they have made pretty good shoots, you should inure them to the open air by degrees, into which they should be removed, placing them in a situation where they may be defended from strong winds; in this place they should remain till October following, when they must be removed into the green-house, as was before directed. Having thus managed these plants until they have acquired strong roots, and made tolerable good heads, you may draw them out of the pots, preserving the earth to their roots, and plant them in the open air in a warm situation, where you must manage them as was before directed for the young ones; and these will in two or three years produce flowers, and in very warm seasons some fruit, provided they do well. The Lucca and Box-leaved Olives are the hardiest, for which reason they should be preferred to plant in the open air, but the first sort will grow to be the largest trees.

OMPHALODES. See CYNOGLOSSUM.

ONAGRA. See ŒNOTHERA.

ONIONS. See CEPA.

ONOBRYCHIS. See HEDYSARUM.

ONONIS. Lin. Gen. Plant. 772. Anonis. Tourn. Inst. R. H. 408. tab. 229. Rest-harrow, Cammock, Pettywin; in French, *Arrête-beuf.*

The CHARACTERS are,

*The empalement of the flower is cut into five narrow segments, which end in acute points, the upper being a little raised and arched, the lower bending under the keel. The flower is of the butterfly kind. The standard is heart-shaped, depressed on the sides, and larger than the wings. The wings are oval and short; the keel is pointed, and longer than the wings. It hath ten stamina joined together, terminated by single summits, and an oblong hairy germen, supporting a single style, crowned by an obtuse stigma. The germen afterward becomes a turgid pod with one cell, inclosing kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes those plants whose flowers have ten stamina joined in two bodies.

The SPECIES are,

1. ONONIS (*Spinosa*) floribus subsessilibus, solitariis lateralibus, caule spinoso. Hort. Cliff. 389. *Rest-harrow with single flowers sitting close to the sides of the branches, and a prickly stalk.* Anonis spinosa flore purpureo. C. B. P. 389. *Prickly Rest-harrow with a purple flower, sometimes called Cammock, or Petty-win, and in some countries, French Furze.*

2. ONONIS (*Mitis*) floribus subsessilibus solitariis lateralibus, ramis inermibus. Hort. Cliff. 359. *Rest-harrow with single flowers sitting close to the stalks, and branches without spines.* Anonis spinis carens purpurea. C. B. P. 389. *Purple Rest-harrow having no spines.*

3. ONONIS (*Repens*) caulibus diffusis, ramis erectis, foliis superioribus solitariis stipulis ovatis. Lin. Sp. 1006. *Rest-harrow with diffused stalks, which are erect, the upper leaves single, and oval stipulæ.* Anonis maritima procumbens, foliis hirsutis pubescentibus. Pluk. Alm. 33. *Trailing maritime Rest-harrow with hairy leaves.*

4. ONONIS (*Tridentata*) foliis ternatis carnosis sublinearibus tridentatis, fruticosa pedunculis bifloris. Lin. Sp Plant. 718. *Shrubby Rest-harrow, with trifoliate fleshy leaves which are narrow, and have three indentures.* Anonis Hispanica, frutescens, folio tridentato carnoso. Tourn. Inst. 408. *Shrubby Spanish Rest-harrow with a fleshy leaf, having three indentures.*

5. ONONIS (*Fruticosa*) fruticosa floribus paniculatis, pedunculis subtrifloris, stipulis vaginalibus, foliis ternatis lanceolatis serratis. Hort. Cliff. 358. *Rest-harrow with paniculated flowers growing three upon a foot-stalk, sheath-like stipulæ, and trifoliate leaves.* Anonis purpurea verna præcox frutescens, flore rubro amplo. Mor. Hist. 2. p. 170. *Early spring, purple, shrubby Rest-harrow, with a large red flower.*

6. ONONIS (*Natrix*) pedunculis unifloris aristatis foliis terminatis ovatis, stipulis integerrimis. Hort. Cliff. 358. *Rest-harrow with one flower on a foot-stalk terminated by a thread, and oval trifoliate leaves.* Anonis viscosa spinis carens lutea major. C. B. P. 389. *Glutinous Rest-harrow without spines, having a large yellow flower.*

7. ONONIS (*Viscosa*) pedunculis unifloris aristatis, foliis simplicibus infimis ternatis. Lin. Sp. 1009. *Rest-harrow with one flower on each foot-stalk terminated by a thread, whose lower leaves are trifoliate.* Anonis annua erectior, latifolia glutinosa Lusitanica. Tourn. Inst. 409. *Annual broad-leaved, glutinous, erect Rest-harrow of Portugal.*

8. ONONIS (*Minutissima*) floribus subsessilibus lateralibus, foliis ternatis glabris, stipulis setaceis, calycibus aristis corolla longioribus. Lin. Sp. Plant. 1007. *Rest-harrow with flowers sitting close to the sides of the stalks, trifoliate leaves, bristly stipulæ, and the beard of the calyx longer than the corolla.* Anonis flore luteo parvo. H. R. Par. *Rest-harrow with a small yellow flower.*

9. ONONIS (*Cristata*) pedunculis unifloris prælongis, ramis inermibus, foliis ternatis glabris, vaginis acutè dentatis. *Rest-harrow with one flower growing on a long foot-stalk, branches without spines, smooth trifoliate leaves, and sheaths which are sharply indented.* Anonis glabra inermis, pedunculis unifloris prælongis vaginis cristatis. Allion. *Smooth Rest-harrow without spines, having one flower on a long foot-stalk, with a crested sheath.*

10. ONONIS (*Ornithopodoides*) pedunculis bifloris aristatis, leguminibus linearibus cernuis. Prod. Leyd. 376. *Rest-harrow with two flowers on a foot-stalk terminated by a thread, and narrow nodding pods.* Anonis siliquis ornithopodii. Boerh. Ind. alt. 2. 34. *Rest-harrow with pods like those of the Bird's-foot.*

11. ONONIS (*Rotundifolia*) fruticosa pedunculis trifloris, calycibus triphyllo-bractatis foliis ternatis subrotundis. Hort. Cliff. 358. *Rest-harrow with foot-stalks proceeding from the side of the branches, sustaining three flowers, and trifoliate roundish leaves.* Cicer sylvestre latifolium triphyllum. C. B. P. 347. *Broad three-leaved wild Chich.*

12. ONONIS (*Mitissima*) floribus sessilibus spicatis, bracteis stipularibus, ovatis ventricosis scariosis imbricatis. Lin. Sp. 1007. *Rest-harrow with spiked flowers sitting close, and oval stipulæ to the flowers.* Anonis alopecuroïdes, mitis annua purpurascens. Hort. Elth. 28. tab. 24. *Smooth, annual, purplish, Fox-tail Rest-harrow.*

13. ONONIS (*Alopecuroïdes*) spicis foliosis simplicibus ovatis obtusis stipulis dilatis. Lin. Sp. Plant. 1008. *Rest-harrow with leafy spikes, and single obtuse leaves.* Anonis sicula alopecuroïdes. Tourn. Inst. 408. *Fox-tail Rest-harrow of Sicily.*

14. ONONIS (*Anil*) foliis ternatis ovatis, petiolis longissimis, leguminibus hirsutis. *Rest-harrow with oval trifoliate leaves growing on very long foot-stalks, and hairy pods.* Anonis Americana, folio latiori subrotundo. Tourn. Inst. R. H. 409. *American Rest-harrow with a broader roundish leaf.*

15. ONONIS (*Decumbens*) foliis ternatis lineari-lanceolatis, caule decumbente, floribus spicalis alaribus, leguminibus glabris. *Rest-harrow with trifoliate, narrow, spear-shaped leaves, a trailing stalk, flowers growing in spikes from the wings of the stalk, and smooth pods.* Anonis Americana, angustifolia, humilior & minus hirsuta. Houst. MSS. *Lower narrow-leaved American Rest-harrow, which is less hairy.*

The first sort is a common weed in most parts of England, so is rarely admitted into gardens. It has a strong creeping root, which spreads far in the ground, and is with great difficulty eradicated; the stalks rise a foot and a half high, they are slender, purple, and hairy, sending out small branches on their side, which are armed with sharp prickles. The flowers come out singly from the side of the branches; they are of the butterfly kind, and of a purple colour, which are succeeded by small pods, containing one or two kidney-shaped seeds. It flowers great part of summer, and the seeds ripen in the autumn. The root of this is one of the five opening roots; the cortical part of it is esteemed a good medicine for stoppage of urine, and to open the obstructions of the liver and spleen; there is a variety of this with white flowers.

The second sort grows naturally in many parts of England, and has been by some supposed to be only a variety of the first; but I have cultivated both by seeds, and have always found the plants retain their difference; the stalks of this sort are hairy, and more diffused than those of the first; the leaves are broader, and sit closer on the branches; the stalks do not grow so upright, and have no spines; the flowers and pods are like those of the first. There is also a variety of this with white flowers.

The third sort grows naturally on the borders of the sea in several parts of England; this hath a creeping root, from which arise many hairy stalks which are near two feet long, spreading on every side upon the ground, garnished with trifoliate hairy leaves, those on the lower part of the stalks being pretty large and oval,

oval, but the upper are ſmaller and narrower. The flowers are like thoſe of the firſt in ſhape, coming out ſingly from the ſide of the ſtalks, but are of a brighter purple colour; the pods are ſhort, containing two or three ſeeds in each. It flowers in July, and the ſeeds ripen in autumn.

The fourth ſort grows naturally in Spain and Portugal; this riſes with ſhrubby ſtalks a foot and a half high, dividing into ſlender branches very full of joints, garniſhed with narrow, trifoliate, thick, fleſhy leaves, ſtanding upon ſhort foot-ſtalks. The flowers are produced at the end of the branches in looſe panicles, ſome of the foot-ſtalks ſuſtaining two, and others but one flower; they are of a fine purple colour, and appear in June; the ſeeds ripen in September.

The fifth ſort grows naturally on the Alps: this is a very beautiful low ſhrub; it riſes with ſlender ſhrubby ſtalks about two feet high, dividing into many branches, which are garniſhed with narrow trifoliate leaves ſawed on their edges, ſitting cloſe to the branches. The flowers come out in panicles at the end of the branches upon long foot-ſtalks, which for the moſt part ſuſtain three large purple flowers; the ſtipula is a kind of ſheath, embracing the foot-ſtalk of the flower. It flowers the end of May and the beginning of June, and the flowers are ſucceeded by turgid pods about an inch long, which are hairy, incloſing three or four kidney-ſhaped ſeeds, which ripen in Auguſt.

The ſixth ſort grows naturally in the ſouth of France and in Spain; this hath a perennial root and an annual ſtalk, which riſes near two feet high, ſending out ſhort branches from the ſide on the lower part of the plants, garniſhed with trifoliate oblong leaves, which are hairy and clammy. The flowers grow in looſe ſpikes at the end of the ſtalks; they are large, and of a bright yellow colour, ſtanding upon pretty long foot-ſtalks, which are extended beyond the leaves, the flowers hanging downward from the middle of the foot-ſtalk. The flowers appear the latter end of June, which are ſucceeded by turgid pods an inch long, containing three or four brown kidney-ſhaped ſeeds, which ripen in September.

The ſeventh ſort grows naturally in Portugal, from whence the ſeeds were ſent to me. This is an annual plant, with a ſtrong, herbaceous, hairy ſtalk, riſing a foot and a half high, ſending out branches the whole length, cloſely garniſhed with trifoliate leaves; the middle lobe being large and oval, the two ſide lobes long and narrow, rounded at their points and indented on their edges; they are very clammy. The foot-ſtalks of the flowers come out from the wings of the ſtalks ſingly, each ſuſtaining one pale yellow flower, ſtanding erect in the middle of the foot-ſtalk, which is extended beyond the flower. This plant flowers in July, and the ſeeds ripen in autumn.

The eighth ſort grows naturally in the ſouth of France and Italy; this is an annual plant; the ſtalks riſe about nine inches high, ſending out one or two ſide branches toward the bottom; the leaves are ſmall, trifoliate, and oval, ſtanding upon pretty long foot-ſtalks, and are indented on their edges. The flowers come out ſingly at the wings of the ſtalk; they are ſmall, yellow, and ſit very cloſe to the ſtalk, having a ſharp briſtly ſtipula under the empalement; the pods are very ſhort and turgid, containing two or three kidney-ſhaped ſeeds. It flowers in July, and the ſeeds ripen in the autumn.

The ninth ſort grows naturally on the Alps; this hath a perennial root, from which come out ſeveral ſlender trailing ſtalks about ſix inches long, garniſhed with ſmall, trifoliate, oval leaves, indented on their edges, ſtanding upon pretty ſhort foot-ſtalks. The flowers come out ſingly toward the top of the ſtalk, upon pretty long ſlender foot-ſtalks, ariſing from the wings of the leaves, each ſuſtaining one yellow flower; the ſheath embracing the baſe of the foot-ſtalk, is ſharply indented. This flowers in June, and the ſeeds ripen in the autumn.

The tenth ſort grows naturally in Sicily, and is an annual plant; the ſtalks riſe about nine inches high, ſending out one or two branches toward the bottom, garniſhed with ſmall trifoliate leaves, which ſtand on ſhort foot-ſtalks. The flowers come out from the ſide of the branches upon ſhort foot-ſtalks, each ſuſtaining two ſmall yellow flowers, which are ſucceeded by jointed compreſſed pods like thoſe of Bird's-foot, having four or five kidney-ſhaped ſeeds in each. This ſort flowers in July, and the ſeeds ripen in the autumn.

The eleventh ſort grows naturally on the Alps and Helvetian mountains; this riſes with a ſingle jointed ſtalk a foot and a half high, garniſhed with oval, indented, trifoliate leaves, ſtanding on pretty long foot-ſtalks. The foot-ſtalks of the flowers come out from the wings of the leaves; they are long, ſlender, each ſuſtains three pale yellow flowers, which are ſucceeded by ſhort turgid pods, containing two or three ſeeds in each. It flowers in June, and the ſeeds ripen in September.

The twelfth ſort came up in earth which was brought from Barbadoes, but it does not ſeem to be a native of that country, for it riſes eaſily from ſeeds in the open air here, and perfects its ſeeds in the autumn, nor will it thrive in greater warmth. This hath an upright ſtalk a foot and a half high, ſending out ſmall ſide branches, which are garniſhed with roundiſh trifoliate leaves ſawed on their edges, ſtanding upon ſhort foot-ſtalks. The flowers grow in ſhort leafy ſpikes at the end of the branches; they are ſmall, and of a pale purple colour, appearing in July, and are ſucceeded by ſhort turgid pods, containing two or three kidney-ſhaped ſeeds, which ripen in the autumn.

The thirteenth ſort grows naturally in Portugal, Spain, and Italy. This is an annual plant, riſing with upright branching ſtalks a foot high, garniſhed with ſingle leaves ſitting cloſe to the ſtalks; the larger leaves are oval, about one inch long and three quarters of an inch broad; the upper leaves are narrow, ending in obtuſe points, and are ſlightly indented at their ends. The flowers grow in leafy ſpikes at the end of the ſtalks ſet cloſe together, having hairy empalements; they are pretty large, of a purple colour, and appear in July: theſe are ſucceeded by taper pods about an inch long, incloſing four or five kidney-ſhaped ſeeds. This plant has ſeveral titles, in the different books of botany.

The fourteenth ſort grows naturally in the American iſlands; this is an annual plant, riſing with a branching ſtalk two feet high, garniſhed with trifoliate leaves, whoſe lobes are oval, ſtanding upon very long foot-ſtalks, which are hairy. The flowers grow in looſe ſpikes at the end of the branches; they are large, and of a purpliſh yellow colour, and are ſucceeded by very turgid hairy pods, each containing five or ſix large kidney-ſhaped ſeeds. This ſort flowers in July and Auguſt, and the ſeeds ripen in the autumn. From this plant Indigo was formerly made, which, I ſuppoſe, was of leſs value than that which is made of Anil, ſo has not been for many years paſt cultivated in any of the iſlands.

The fifteenth ſort was diſcovered by the late Dr. Houſtoun, growing naturally at La Vera Cruz in New Spain, from whence he ſent the ſeeds to England. This is a perennial plant, from whoſe roots come out ſeveral pretty ſtrong branches, which ſpread and incline toward the ground; theſe are garniſhed with narrow trifoliate leaves, very little hairy. The flowers come out in looſe panicles at the end of the branches; they are yellow, and are ſucceeded by ſmooth turgid pods about half an inch long, each containing two or three kidney-ſhaped ſeeds. This flowers in July, and the ſeeds ſometimes ripen here in the autumn.

The three firſt ſorts are never cultivated in gardens; being very troubleſome weeds whenever they get into the fields; for the roots ſpread and multiply greatly in the ground, and are ſo tough and ſtrong, that the plough will ſcarcely cut through them, ſo are with great difficulty eradicated when they have once gotten poſſeſſion.

The fourth and fifth sorts are low shrubby plants, which are propagated by seeds. The fourth is too tender to thrive in the open air in England, unless it is planted in a warm situation, and in very severe frost covered to protect it. If the seeds of both these sorts are sown upon a bed of light earth in April, the plants will come up in May, when they must be kept clean from weeds; and if they are too close, some of them should be carefully drawn up in moist weather, and transplanted at four or five inches distance: those of the fourth sort upon a warm sheltered border, but the fifth may be planted in a shady border, where they will thrive very well; after these have taken root, the plants will thrive very well, but must be kept clean from weeds till the following autumn, when they may be transplanted to the places where they are to remain; those plants which were left growing in the bed where they were sown, must also be treated in the same way. These plants will not thrive in pots, therefore should always be planted in the full ground, where the fifth sort will flourish greatly, and frequently send up many plants from their roots, but the other is more impatient of cold. These plants will flower the second year, and make a fine appearance during the continuance of their flowers, and the fifth sort will produce seeds in plenty.

The sixth sort is propagated by seeds, which should be sown thin in drills upon a bed of light earth; and when the plants come up, they must be kept clean from weeds till the autumn, when they should be carefully taken up, and transplanted into the borders of the pleasure-garden, where they are to remain; the second year they will flower and produce ripe seeds, but the roots will continue several years, and are very hardy.

The seventh, eighth, and eleventh sorts are hardy annual plants; these are propagated by seeds, which should be sown in the places where the plants are to remain, and will require no other care but to thin them where they are too close, and keep them clean from weeds.

The ninth sort is a hardy perennial plant, but as it makes but little appearance, so it is rarely preserved, unless in botanic gardens for the sake of variety; it rises yearly from seed, and will thrive in any soil or situation.

The fourteenth sort is an annual plant; the seeds of this must be sown upon a moderate hot-bed in the spring, and, when the plants are fit to remove, they should be transplanted to another moderate hot-bed to bring the plants forward, treating them in the same way as the African and French Marygold. In June they should be taken up with balls of earth to their roots, and transplanted into the open borders, where, if they are shaded till they have taken root, they will thrive and flower the following month, and perfect their seeds in autumn.

The eighteenth sort is a tender plant. The seeds of this should be sown upon a good hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a small pot filled with light loamy earth, and plunged into a hot-bed of tanners bark, observing to shade them from the sun till they have taken new root, after which they must be treated in the same way as other tender plants from the same countries. In autumn they should be removed into the bark-stove; the summer following they will produce flowers, but they do not often perfect seeds in England.

ONOPORDUM. Lin. Gen. Plant. 834. Vaill. Act. Par. 1718. Carduus. Tourn. Inst. R. H. 440. tab. 253. Woolly Thistle; in French, *Chardon.*

The CHARACTERS are,

*The common empalement is roundish, bellied, and imbricated, composed of numerous scales terminated by spines. The flower is composed of many hermaphrodite florets, which are funnel-shaped, equal, and uniform, having narrow tubes swelling at the brim, cut into five points; they have five short hairy stamina, terminated by cylindrical summits, and an oval germen crowned with down, supporting a slender style terminated by a crowned stigma. The germen becomes a single seed crowned with down, sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which includes those plants with compound flowers, whose florets are all hermaphrodite and fruitful.

The SPECIES are,

1. ONOPORDUM (*Acanthium*) calycibus squarrosis, foliis ovato-oblongis sinuatis. Lin. Sp. Plant. 827. *Woolly Thistle with rough empalements, and oblong, oval, sinuated leaves.* Carduus tomentosus, acanthi folio, vulgaris. Tourn. Inst. R. H. 441. *Common Woolly Thistle with a Bearsbreech leaf.*
2. ONOPORDUM (*Illyricum*) calycibus squarrosis, spinis foliis lanceolatis pinnatifidis. Lin. Sp. Plant. 1158. *Woolly Thistle with rough empalements, and narrow leaves ending in many points.* Carduus tomentosus, acanthi folio angustiori. Tourn. Inst. R. H. 441. *Woolly Thistle with a narrower Bearsbreech leaf.*
3. ONOPORDUM (*Arabicum*) calycibus imbricatis. Hort. Upsal. 249. *Woolly Thistle with imbricated empalements.* Carduus tomentosus, acanthi folio altissimus, Lusitanicus. Tourn. Inst. 441. *Tallest woolly Thistle of Portugal, with a Bearsbreech leaf.*
4. ONOPORDUM (*Orientale*) calycibus squarrosis, foliis oblongis pinnato-sinuatis decurrentibus, capite magno. *Woolly Thistle with rough empalements, oblong, sinuated, wing-pointed leaves running along the stalk, and a large head.* Carduus tomentosus, acanthi folio Aleppicus, magno flore. Tourn. Inst. R. H. 441. *Woolly Thistle of Aleppo with a Bearsbreech leaf, and a large flower.*
5. ONOPORDUM (*Acaulon*) subacaule. Lin. Sp. 1159. *Woolly Thistle with a head sitting close to the ground.* Onopordon acaulon ferme flore albicante. D. Jussieu. Vaill. Mem. 1718. *Woolly Thistle without a stalk, and having a whitish flower.*

There are some other species of this genus, which are preserved in botanic gardens, and also several varieties differing in the colours of their flowers; but as these plants are rarely admitted into other gardens, so it would be to little purpose to enumerate them here.

The first sort grows naturally on uncultivated places in most parts of England. It is a biennial plant; the first year it puts out many large downy leaves, which are sinuated on their edges, and are prickly; these spread on the ground, and continue the following winter, and in the spring arises the stalk in the middle of the leaves, which, upon dunghills, or good ground, grows five or six feet high, dividing upward into many branches, which have leafy borders running along them, indented, and each indenture is terminated by a spine. The stalks are terminated by scaly heads of purple flowers, which appear in June, and to these succeed oblong angular seeds crowned with a hairy down, which assist their spreading about to a great distance by the wind, so that where the plants are permitted to ripen their seeds, they often become troublesome weeds.

The second sort grows natually in Spain, Portugal, and the Levant; this rises with a taller stalk than the former, the leaves are much longer and narrower, and the indentures on their sides are regular, ending in sharp spines. The heads of flowers are larger, and the spines of the empalement are longer than those of the first sort.

The third sort grows to the height of nine or ten feet; the stalks divide into many branches; the leaves are longer than any of the other species; the heads of flowers are large and of a purple colour; the empalement hath the scales lying over each other like the scales of fish. This grows naturally in Spain and Portugal.

The fourth sort grows naturally about Aleppo; this rises with an upright branching stalk seven or eight feet high; the leaves are long and are regularly sinuated on their borders, like wing-pointed leaves; the heads of the flowers are very large, and the empalement is very rough and prickly.

The

The fifth sort hath several oblong, oval, woolly leaves, which spread on the ground; between these comes out the head of flowers sitting close to the ground; these heads are smaller than any of the other, and the flowers are white. Some of these plants have been formerly cultivated for the table, but it was before the English gardens were well supplied with other esculent plants, for at present they are rarely eaten here. They require no culture, for if the seeds are permitted to fall, the plants will come up fast enough.

ONOSMA. Lin. Gen. 187.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, which is erect, and cut into five segments; the corolla is bell-shaped, of one petal, having a short tube, with a swelling top, the brim cut into five parts, and naked pervious chaps; it hath five short awl-shaped stamina, terminated by arrow-shaped summits, which are the length of the corolla, and a germen of four parts, supporting a slender style, crowned by an obtuse stigma; the germen afterward becomes four seeds sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, intitled Pentandria Monogynia, the flowers having five stamina and one style.

The SPECIES are,

1. ONOSMA (*Simplicissima*) foliis confertissimis lanceolato-linearibus pilosis. Lin. Sp. 196. *Onosma with hairy, linear, spear-shaped leaves growing in clusters.* Echium Creticum. Alp. Exot. 130. *Cretan Viper's Buglose.*
2. ONOSMA (*Orientalis*) foliis lanceolatis hispidis, fructibus pendulis. Lin. Sp. 196. *Onosma with hispid spear-shaped leaves, and hanging fruit.* Cerinthe Orientalis. Amœn. Acad. 4. p. 267. *Eastern Honeywort.*
3. ONOSMA (*Echioides*) foliis lanceolatis hispidis, fructibus erectis. Lin. Sp. 196. *Onosma with hispid spear-shaped leaves and erect fruit.* Anchusa lutea minor. C. B. P. 255. *Smaller yellow Buglose.*

The first and second sorts are generally biennial plants, which perish soon after they have perfected seeds; though sometimes when they happen to grow out of the joints of walls, or the fissures of rocks, they will abide three or four years; for in such situations the plants are stinted in their growth, so are less replete with moisture, and more compact, whereby they are in less danger of suffering from frost in winter. Therefore, if all the three sorts can be cultivated on a wall or in rubbish, where their seeds may scatter, they may be maintained much better than in good ground. In order to have the plants grow in such situations, it will be proper to sow their seeds soon after they are ripe, either on the joints of old walls, or in rubbish, laying the stalks of the plants over the places where their seeds are sown, which will shade them from the sun, and thereby greatly forward the vegetation of the seeds; and when the plants are well established in their situation, if they are permitted to scatter their seeds, they will maintain themselves very well afterwards.

As these plants are seldom cultivated unless in botanic gardens, so it will be unnecessary to enlarge farther about them; they flower early in the spring, and their seeds ripen in June.

OPHIOGLOSSUM, Adder's-tongue.

This plant grows naturally in moist meadows, and is not easily brought to thrive long in gardens, so is rarely attempted.

OPHRYS. Tourn. Inst. R. H. 437. tab. 250. Lin. Gen. Plant. 902. Twyblade.

The CHARACTERS are,

*It has a single stalk with a vague spatha (or sheath.) The flower hath no empalement; it consists of five oblong petals which ascend, and join so as to form a helmet, and the under one is bifid. The nectarium is dependent, and keel-shaped behind; it hath two short stamina sitting on the pointal, with erect summits fastened to the interior border of the nectarium, and an oblong contorted germen situated under the flower, with a style adhering to the inner border of the nectarium, crowned by an obsolete stigma. The germen afterward turns to an oval, three-cornered, obtuse capsule, with one cell opening with three valves, and filled with small seeds like dust.*

This genus of plants is ranged in the first section of Linnæus's twentieth class, which contains the plants whose flowers have two stamina, which are joined to the style; he has joined to this genus several species of Orchis.

The SPECIES are,

1. OPHRYS (*Nidas avis*) bulbis fibroso-fasciculatis caule vaginato, nectarii labio bifido. Lin. Sp. Plant. 1339. *Twyblade with a fibrous root bundled, and a bifid lip to the nectarium.* Ophrys bifolia. C. B. P. 87. *Common Twyblade, or Twayblade.*
2. OPHRYS (*Cordato*) bulbo fibroso, caule bifolio, foliis cordatis. Lin. Sp. Plant. 946. *Twyblade with a fibrous root, and two heart-shaped leaves on the stalk.* Ophrys minima. C. B. P. 87. *Smallest Twyblade.*
3. OPHRRYS (*Spiralis*) bulbis aggregatis oblongis, caule subfolioso, floribus secundis, nectarii labio indiviso. Act. Upsal. 1740. *Twyblade with oblong clustered bulbs, a leafy stalk, fruitful flowers, and an undivided lip to the nectarium.* Orchis spiralis alba odorata. J. B. 2. 769. *White, sweet-scented, spiral Orchis, called Triple Ladies Traces.*
4. OPHRYS (*Monorchis*) bulbo globoso, caule nudo, nectarii labio trifido. Act. Upsal. 1740. *Twyblade with a globular bulb, a naked stalk, and a trifid lip to the nectarium.* Orchis odorata moschata, sive monorchis. C. B. P. 84. *Yellow, sweet, or Musk Orchis.*
5. OPHRYS (*Anthropophora*) bulbis subrotundis, scapo folioso, nectarii labio lineari tripartito, medio elongato bifido. Lin. Sp. Plant. 948. *Twyblade with roundish bulbs, a leafy stalk, and a narrow three-pointed lip to the nectarium, the middle segment of which is stretched out and bifid.* Orchis flore nudi hominis effigiem repræsentans fœmina. C. B. P. 82. *Man Orchis.*
6. OPHRYS (*Insectifera*) bulbis subrotundis, scapo folioso, nectarii labio subquinquelobo. Lin. Sp. Plant. 948. *Twyblade with roundish bulbs, a leafy stalk, and the lip of the nectarium divided almost into five lobes.* Orchis muscam referens major. C. B. P. 83. *Greater Fly Orchis.*
7. OPHRYS (*Adrachnites*) bulbis subrotundis, caule folioso, nectarii labio trifido. *Twyblade with roundish bulbs, a leafy stalk, and a trifid lip to the nectarium.* Orchis fucum referens major, foliolis superioribus candidis, aut purpurascentibus. C. B. P. 83. *The common Humble Bee Orchis.*
8. OPHRYS (*Sphegodes*) bulbis subrotundis, caule subfolioso, nectarii labio trifido hirsuto. *Twyblade with roundish bulbs, a leafy stalk, and a hairy trifid lip to the nectarium.* Orchis sive testiculus sphegodes hirsuto flore. J. B. 2. 727. *Humble Bee Satyrion with green wings.*

The first sort grows naturally in woods, and sometimes in moist pastures in several parts of England. The root is composed of many strong fibres, from which arise two oval veined leaves three inches long, and two broad, joined at their base; between these arises a naked stalk about eight inches high, terminated by a loose spike of herbaceous flowers, resembling gnats, composed of five petals, with a long bifid lip to the nectarium, with a crest or standard above, and two wings on the side. The flowers sit upon an angular germen, which afterward swells to a capsule, opening when ripe in six parts, and filled with small dusty seeds. This plant refuses culture, but may be transplanted from the places where it grows naturally, into a shady part of the garden, where, if the roots are not disturbed, they will continue several years, and flower in May, but they do not increase in gardens. The best time to remove the roots is in July or August, when the leaves are decaying, for it will be difficult to find the roots after the leaves are gone.

The second sort is found in some of the northern counties in England, but is seldom seen growing in the south. This hath a small bulb with many strong fibres to the root, and sends out two small, ribbed, heart-shaped leaves at bottom. The stalk rises about four inches high, and is terminated by a spike of small herbaceous flowers shaped like those of the first sort.

The third sort grows upon chalky hills in several parts of England; this hath an oblong, clustered, bulbous root, from which arises a single stalk six inches high, having two oblong leaves at bottom, and rarely any above; the flowers are small, of a white colour, growing in a loose spike on the top of the stalk; they have a musky scent. This flowers in August.

This sort grows naturally in moist pastures in the northern parts of England; I have also found it in great plenty on Enfield Chace, not far from the town.

The fourth and fifth sorts grow upon the chalk-hills near Northfleet in Kent, and also upon Causham-hills near Reading; they have roundish bulbous roots, from which come out a few oblong leaves; the stalks rise a foot and a half high, garnished with a few narrower leaves; the flowers grow in a loose spike on the top of the stalk; they are in one of a rusty iron colour, and the other hath herbaceous flowers. The lip of the nectarium is divided into three parts, the middle segment being stretched out much longer than the other, and is divided into two; the upper part of the flower being hooded, the whole bears some resemblance to a naked man. They flower in June.

The eighth sort grows naturally in dry pastures in several parts of England, and is commonly called the Humble Bee Orchis; of this there are two or three varieties found wild in England, and several more in Spain and Portugal. This hath a roundish bulbous root; the leaves are like those of the narrow-leaved Plantain. The stalk rises six or seven inches high, having two or three sheath-shaped leaves embracing it, which are erect; at the top of the stalk come out two or three flowers without spurs, having purplish crests and wings. The nectarium is large, shaped like the body of a humble bee, of a dark footy colour, with two or three lines running across it of a darker or lighter colour, which appear brighter or duller according to the position of the flower to the sun. It flowers early in June. There are some varieties of this sort, which differ in the colour and size of their flowers.

All these sorts may be preserved in gardens, though not propagated there. The best time to remove the roots from the places where they naturally grow, is just before the stalks fall, for at that time the roots may be easily discovered, and then they are beginning to rest, so that the bulb will be fully formed for flowering the following year, and will not shrink; but when they are removed at a time of the year when they are in action, the bulb designed for flowering the following year, not being fully ripened, will shrink, and frequently perish; or if they survive their removal, do not recover their former strength in less time than two years.

When these are removed into a garden, the soil should be adapted to the sorts. Such of them as grow naturally in moist pastures, should be planted in shady moist borders; those which are inhabitants of woods may be planted under trees in wildernesses, but such as grow upon chalk-hills should have a bed of chalk prepared for them in an open situation, and when the plants are fixed in their several places, they should not be disturbed after; for if they are kept clean from weeds, the less the ground is disturbed, the better the plants will thrive, and the longer they will continue.

**OPUNTIA.** Tourn. Inst. R. H. 239. tab. 122. Tuna. Hort. Elth. 295. Cactus. Lin. Gen. Plant. 539. [This plant is called Opuntia, because Theophrastus writes, that it grows about Opuntium.] The Indian Fig, or prickly Pear; in French, *Raquette.*

The Characters are,

*The flower is composed of several petals, which are obtuse, concave, and placed in a circular order, sitting upon the germen. It has a great number of awl-shaped stamina, which are inserted in the germen, are shorter than the petals, and terminated by oblong erect summits. The germen, which is situated under the flower, supports a cylindrical style the length of the stamina, crowned by a multifid stigma. The germen afterward turns to a fleshy umbilicated fruit with one cell, inclosing many roundish seeds.*

This genus of plants is ranged in the second section of Tournefort's sixth class, which includes the herbs with a Rose flower, whose pointal or empalement becomes a fruit with one capsule. Dr. Linnæus places it in the first section of his twelfth class, in which he ranges those plants whose flowers have more than nineteen stamina, which are inserted either into the empalement, or petals of the flower.

The Species are,

1. Opuntia (*Vulgaris*) articulis ovatis compressis, spinis setaceis. *Indian Fig with oval compressed joints, and bristly spines.* Opuntia vulgò herbariorum. J. B. 1. 154. *The common Opuntia, or Indian Fig.*
2. Opuntia (*Ficus Indica*) articulis ovato-oblongis, spinis setaceis. *Indian Fig with oblong oval joints, and bristly spines.* Opuntia folio oblongo media. Tourn. Inst. R. H. 239. *Middle Indian Fig with oblong leaves.*
3. Opuntia (*Tuna*) articulis ovato-oblongis, spinis subulatis. *Indian Fig with oblong oval joints, and awl-shaped spines.* Opuntia major, validissimis spinis munita. Tourn. Inst. R. H. 239. *Greater Indian Fig with very strong spines.*
4. Opuntia (*Elatior*) articulis ovato-oblongis, spinis longissimis nigricantibus. *Indian Fig with oblong oval joints, and very long black spines.* Tuna elatior spinis validis nigricantibus. Hort. Elth. tab. 194. *Taller Indian Fig with strong black spines.*
5. Opuntia (*Maxima*) articulis ovato-oblongis crassissimis, spinis inæqualibus. *Indian Fig with oblong, oval, thick joints, and unequal spines.* Opuntia maxima, folio spinoso, latissimo & longissimo. Tourn. Inst. 240. *Greatest Indian Fig, with the longest and broadest prickly branches.*
6. Opuntia (*Cochinelifera*) articulis ovato-oblongis subinermibus. *Indian Fig with oblong oval joints, almost without spines.* Opuntia maxima, folio oblongo-rotundo majore, spinulis mollibus & innocentibus obsito, flore striis rubris variegato. Sloan. Cat. Jam. 194. *Greatest Indian Fig, with a larger, oblong, round leaf, armed with soft, innocent, small spines, and a flower variegated with red stripes, commonly called the Cochineal Fig.*
7. Opuntia (*Curassavica*) articulis cylindrico-ventricosis, compressis, spinis setaceis. *Indian Fig with compressed, cylindrical, bellied joints, and bristly spines.* Ficus Indica, seu Opuntia Curassavica minima. Hort. Amst. 1. 107. *Indian Fig, or the least Opuntia of Curassoa, frequently titled Pinpillow.*
8. Opuntia (*Spinosissima*) articulis longissimis tenuibus compressis, spinis longissimis confertissimis, gracilibus albicantibus armatis. Houst. MSS. *Stalky Indian Fig, with large, narrow, compressed leaves, armed with the longest, narrowest, white spines, growing in clusters; this is by the gardeners called, Robinson Crusoe's Coat.*
9. Opuntia (*Phyllanthus*) prolifer ensiformi-compressus serrato-repandus. *Indian Fig with compressed sword-shaped joints, whose indentures turn backward.* Cereus scolopendri folio brachiato. Hort. Elth. 73. tab. 64. *Torch Thistle with a branching Spleenwort leaf.*

These plants are all of them natives of America, though the first sort is found growing wild on the sides of the roads about Naples, in Sicily, and Spain, but it is probable that the plants may have been brought from America thither at first. This sort has been long in the English gardens; the joints or branches of this are oval, or roundish, compressed on their two sides flat, and have small leaves coming out in knots on their surface, as also on their upper edges, which fall off in a short time; and at the same knots there are three or four short bristly spines, which do not appear unless they are closely viewed; but on being handled, they enter the flesh, and separate from the plant, so are troublesome, and often very difficult to get out of the flesh. The branches of this sort spread near the ground, and frequently trail upon it, putting out new roots, so are extended to a considerable distance, and never rise in height; these are fleshy and herbaceous while they are young, but

but as they grow old become drier, of a tough contexture, and have ligneous fibres. The flowers come out on the upper edges of the branches, generally, though sometimes they are produced on their sides; these sit upon the embryo of their fruit, and are composed of several roundish concave petals, which spread open; they are of a pale yellow colour, and within arise a great number of stamina, fastened to the embryo of the fruit, which are terminated by oblong summits; and in the center is situated the style, crowned by a many-pointed stigma; after the flowers are past, the embryo swells to an oblong fruit, whose skin, or cover, is set with small spines in clusters, and the inside is fleshy, of a purple, or red colour, in which are lodged many black seeds. This plant flowers here in July and August, but unless the season is very warm, the fruit will not ripen in England.

I received some branches of this sort from Mr. Peter Collinson, F. R. S. who assured me they were sent him from Newfoundland, where the plants grow naturally, which is much farther to the north than it was before known to grow; and how it endures the cold of that country is inconceivable, for though the plants will live abroad in England, in a warm situation and a dry soil, yet, in severe winters, they are generally destroyed, if they are not protected from the frost.

The second sort hath oblong, oval, compressed branches, which grow more erect than those of the first, armed with long bristly spines, which come out in clusters from a point on each of the compressed sides, spreading open like the rays of a star. The flowers grow upon the embryo of the fruit, which come out from the upper edges of the leaves like the first, but are larger, and of a brighter yellow colour. The fruit is also larger, and of a deeper purple colour, the outer skin is also armed with longer spines; this is the most common sort in Jamaica, and upon the fruit of this the wild sort of cochineal feeds, which is called Sylvester. I had some of the plants sent me with the live insects upon them from Jamaica, by the late Dr. Houstoun, who was writing a history of these insects, at the time when he was taken ill and died; these insects kept alive upon the plants here for three or four months, but afterward perished. If the fruit of this plant is eaten, it will dye the urine of a bloody colour.

The third sort hath stronger branches than the second, which are armed with larger thorns, of an awl-shape; they are whitish, and come out in clusters like those of the other sort. The flowers are large, of a bright yellow colour, and the fruit is shaped like that of the second sort.

The fourth sort grows taller than either of the former; the branches are larger, thicker, and of a deeper green, and are armed with strong black spines, which come out in clusters like those of the other sorts, but the clusters are farther asunder. The flowers are produced from the upper edges of the branches; they are smaller than those of the other sorts, and are of a purplish colour, as are also the stamina; the fruit is of the same form as those of the first, but do do not ripen here.

The fifth sort is the largest of all the sorts yet known. The joints of these are more than a foot long, and eight inches broad; they are very thick, of a deep green colour, and armed with a few short bristly spines; the older branches of this often become almost taper, and are very strong. The flowers of this sort I have never yet seen; for although I have had many of the plants more than ten feet high, none of them has produced any flowers.

The sixth sort has been always supposed to be the plant, upon which the cochineal insects feed; this hath oblong, smooth, green branches, which grow erect, and rise to the height of eight or ten feet, having scarce any spines on them and those few which are, can scarce be discerned at a distance, and are so soft as not to be troublesome when handled. The flowers of this sort are small, and of a purple colour, standing upon the embryo of the fruit, in the same manner as those of the other sort, but do not expand open like them. The flowers of this appear late in the autumn, and the fruit drop off in winter, without coming to any perfection here; this sort is cultivated in the fields of New Spain, for the increase of the insects, but it grows naturally in Jamaica, where it is probable the true cochineal might be discovered, if persons of skill were to search after the insects.

The seventh sort is said to grow naturally at Curassao; this hath cylindrical swelling joints, which are closely armed with slender white spines. The branches spread out on every side, and where they have no support, fall to the ground, very often separating at the joints from the plants, and as they lie upon the ground, put out roots, so form new plants; this sort very rarely produces flowers in England. In the West-Indies it is called Pinpillow, from the appearance which the branches have to a pin-cushion stuck full of pins.

The eighth sort was sent me from Jamaica by the late Dr. Houstoun, who found it growing naturally there in great plenty, but could never observe either fruit or flower upon any of the plants, nor have any of them produced either in England. The branches of this sort have much longer joints than any of the other; they are narrower, and more compressed. The spines of this are very long, slender, and of a yellowish brown colour, coming out in clusters all over the surface of the branches, crossing each other, so as to render it dangerous to handle; for upon being touched, the spines adhere to the hand and quit the branches, and penetrate into the flesh, so become very troublesome.

The ninth sort grows naturally in the Brasils; this hath very thin branches, which are indented regularly on their edges, like Spleenwort; they are of a light green, and shaped like a broad sword; these are smooth, having no spines. The flowers come out from the side, and at the end of the branches, sitting on the embryos in the same way as the other sorts; they are of a pale yellow colour. The fruit is shaped like those of the first sort, but rarely ripen in England.

All these sorts (except the first) are too tender to thrive in the open air in England; nor can many of them be preserved through the winter here, unless they have artificial heat; for when they are placed in a green-house, they turn to a pale yellow colour, their branches shrink, and frequently rot on the first approach of warm weather in the spring.

These plants may be all propagated by cutting off their branches at the joints, during any of the summer months, which should be laid in a warm dry place for a fortnight, that the wounded part may be healed over, otherwise they will rot with the moisture which they imbibe at that part, as is the case with most other succulent plants. The soil in which these plants must be planted, should be composed after the following manner, viz. one third of light fresh earth from a pasture, a third part sea sand, and the other part should be one half rotten tan, and the other half lime rubbish; these should be well mixed, and laid in a heap three or four months before it is used, observing to turn it over at least once a month, that the several parts may be well united; then you should pass it through a rough screen, in order to separate the largest stones and clods, but by no means sift it too fine, which is a very common fault; then you should reserve some of the smaller stones and rubbish to lay at the bottom of the pots, in order to keep an open passage for the moisture to drain off; which is what must be observed for all succulent plants, for if the moisture be detained in the pots, it will rot their roots and destroy the plants.

When you plant any of the branches of these plants (except the first sort) you should plunge the pots into a moderate hot-bed, which will greatly facilitate their taking root; you should also refresh them now and then with a little water, but be very careful not to let them

them have too much, or be too often watered, especially before they are rooted. When the plants begin to ſhoot, you muſt give them a large ſhare of air, by raiſing the glaſſes, otherwiſe their ſhoots will draw up ſo weak, as not to be able to ſupport themſelves; and after they have taken ſtrong root, you ſhould inure them to the air by degrees, and then remove them into the ſtove where they ſhould remain, placing them near the glaſſes, which ſhould always be opened in warm weather; ſo that they may have the advantage of a free air, and yet be protected from wet and cold.

During the ſummer ſeaſon theſe plants will require to be often refreſhed with water, but it muſt not be given to them in large quantities leſt it rot them, and in winter this ſhould be proportioned to the warmth of the ſtove; for if the air be kept very warm they will require to be often refreſhed, otherwiſe their branches will ſhrink; but if the houſe be kept in a moderate degree of warmth, they ſhould have but little, for moiſture at that ſeaſon will rot them very ſoon. The heat in which theſe plants thrive beſt, is the temperate point, as marked on botanical thermometers, for if they are kept too warm in winter, it cauſes their ſhoots to be very tender, weak, and unſightly. Thoſe ſorts which are inclinable to grow upright, ſhould have their branches ſupported with ſtakes, otherwiſe their weight is ſo great, that it will break them down.

Theſe plants are by moſt people expoſed to the open air in the ſummer ſeaſon, but they thrive much better if they are continued in the ſtoves, provided the glaſſes be kept open, ſo that they may have free air; for when they are ſet abroad, the great rains which generally fall in ſummer, together with the unſettled temperature of the air in our climate, greatly diminiſh their beauty, by retarding their growth; and ſometimes in wet ſummers they are ſo replete with moiſture, as to rot in the ſucceeding winter; nor will thoſe plants which are ſet abroad (I mean the tender ſorts) produce their flowers and fruit in ſuch plenty, as thoſe which are conſtantly preſerved in the houſe.

ORANGE. See Aurantium.

ORCHARD. In planting of an Orchard, great care ſhould be had to the nature of the ſoil; and ſuch ſorts of fruits only ſhould be choſen, as are beſt adapted to the ground deſigned for planting, otherwiſe there can be little hopes of their ſucceeding; and it is for want of rightly obſerving this method, that we ſee in many countries Orchards planted, which never arrive to any tolerable degree of perfection, the trees ſtarving; and their bodies are either covered with Moſs, or the bark cracks and divides, both which are evident ſigns of the weakneſs of the trees; whereas, if inſtead of Apples the Orchard had been planted with Pears, Cherries, or any other ſort of fruit better adapted to the ſoil, the trees might have grown very well, and produced great quantities of fruit.

As to the poſition of the Orchard, (if you are at full liberty to chuſe) a riſing ground, open to the ſouth-eaſt, is to be preferred; but I would by no means adviſe planting upon the ſide of a hill, where the declivity is very great; for in ſuch places the great rains commonly waſh down the better part of the ground, whereby the trees would be deprived of proper nouriſhment; but where the riſe is gentle, it is of great advantage to the trees, by admitting the ſun and air between them, better than it can upon an entire level; which is an exceeding benefit to the fruit, by diſſipating fogs and drying up the damps, which, when detained amongſt the trees, mix with the air and render it rancid: if it be defended from the weſt, north, and eaſt winds, it will alſo render the ſituation ſtill more advantageous, for it is chiefly from thoſe quarters that fruit-trees receive the greateſt injury; therefore, if the place be not naturally defended from theſe by riſing hills (which is always to be preferred,) then you ſhould plant large growing timber-trees at ſome diſtance from the Orchard, to anſwer this purpoſe.

You ſhould alſo have a great regard to the diſtance of planting the trees, which is what few people have rightly conſidered; for if you plant them too cloſe, they will be liable to blights; the air being hereby pent in amongſt them, will alſo cauſe the fruit to be ill taſted, having a great quantity of damp vapours from the perſpiration of the trees, and the exhalations from the earth mixed with it, which will be imbibed by the fruit, and render their juices crude and unwholſome.

Wherefore I cannot but recommend the method which has been lately practiſed by ſome particular gentlemen with very good ſucceſs, and that is, to plant the trees fourſcore feet aſunder, but not in regular rows. The ground between the trees they plough and ſow with Wheat and other crops, in the ſame manner as if it were clear from trees; and they obſerve their crops to be full as good as thoſe quite expoſed, except juſt under each tree, until they are grown large, and afford a great ſhade; and by thus ploughing and tilling the ground, the trees are rendered more vigorous and healthy, ſcarcely ever having any Moſs, or other marks of poverty, and will abide much longer and produce better fruit.

If the ground in which you intend to plant an Orchard has been paſture for ſome years, then you ſhould plough in the green ſward the ſpring before you plant the trees; and if you will permit it to lie a ſummer fallow, it will greatly mend it, provided you ſtir it two or three times, to rot the ſward of Graſs, and prevent weeds growing thereon.

At Michaelmas you ſhould plough it pretty deep, in order to make it looſe for the roots of the trees, which ſhould be planted thereon in October, provided the ſoil is dry; but if it be moiſt, the beginning of March will be a better ſeaſon. The diſtance, if deſigned for a cloſe Orchard, muſt not be leſs than forty feet, but the trees planted twice that diſtance will ſucceed better.

When you have finiſhed planting the trees, you ſhould provide ſome ſtakes to ſupport them, otherwiſe the wind will blow them out of the ground; which will do them much injury, eſpecially after they have been planted ſome time; for the ground in the autumn being warm, and for the moſt part moiſt, the trees will very ſoon puſh out a great number of young fibres; which, if broken off by their being diſplaced, will greatly retard the growth of the trees.

In the ſpring following, if the ſeaſon ſhould prove dry, you ſhould cut a quantity of green ſward, which muſt be laid upon the ſurface of the ground about their roots, turning the Graſs downward, which will prevent the ſun and wind from drying the ground, whereby a great expence of watering will be ſaved; and after the firſt year they will be out of danger, provided they have taken well.

Whenever you plough the ground betwixt theſe trees, you muſt be careful not to go too deep amongſt their roots, leſt you ſhould cut them off, which would greatly damage the trees; but if you do it cautiouſly, the ſtirring the ſurface of the ground will be of great benefit to them; though you ſhould obſerve, never to ſow too near the trees, nor ſuffer any great rooting weeds to grow about them, which would exhauſt the goodneſs of the ſoil, and ſtarve them.

If after the turf which was laid round the trees be rotted, you dig it in gently about the roots, it will greatly encourage them.

There are ſome perſons who plant many ſorts of fruit together in the ſame Orchard, mixing the trees alternately; but this is a method which ſhould always be avoided, for hereby there will be a great difference in the growth of the trees, which will not only render them unſightly, but alſo the fruit upon the lower trees ill taſted, by the tall ones overſhadowing them; ſo that if you are determined to plant ſeveral ſorts of fruit on the ſame ſpot, you ſhould obſerve to

place

place the largest growing trees backward, and so proceed to those of less growth, continuing the same method quite through the whole plantation; whereby it will appear at a distance in a regular slope, and the sun and air will more equally pass throughout the whole Orchard, that every tree may have an equal benefit therefrom; but this can only be practised upon good ground, in which most sorts of fruit-trees will thrive.

The soil of your Orchard should also be mended once in two or three years with dung, or other manure, which will also be absolutely necessary for the crops sown between; so that where persons are not inclinable to help their Orchards, where the expence of manure is pretty great, yet, as there is a crop expected from the ground besides the fruit, they will the more readily be at the charge upon that account.

In making choice of trees for an Orchard, you should always observe to procure them from a soil nearly a-kin to that where they are to be planted, or rather poorer; for if you have them from a very rich soil, and that wherein you plant them is but indifferent, they will not thrive well, especially for four or five years after planting; so that it is a very wrong practice to make the nursery where young trees are raised very rich, when the trees are designed for a middling or poor soil. The trees should be also young and thriving, for whatever some persons may advise to the contrary, yet it has always been observed, that though large trees may grow and produce fruit after being removed, they never make so good trees, nor are so long lived, as those which are planted while young.

These trees, after they are planted out, will require no other pruning, but only to cut out dead branches, or such as cross each other, which render their heads confused and unsightly: the pruning them too often, or shortening their branches, is very injurious; especially to Cherries and stone-fruit, which will gum prodigiously, and decay in such places where they are cut; and the Apples and Pears which are not of so nice a nature, will produce a greater quantity of lateral branches, which will fill the heads of the trees with weak shoots, whenever their branches are thus shortened; and many times the fruit is hereby cut off, which, on many sorts of fruit-trees, is first produced at the extremity of their shoots.

It may, perhaps, seem strange to some persons, that I should recommend the allowing so much distance to the trees in an Orchard, because a small piece of ground will admit of very few trees when planted in this method; but if they will please to observe, that when the trees are grown up, they will produce a great deal more fruit, than twice the number when planted close, and will be vastly better tasted; the trees when placed at a large distance, being never so much in danger of blighting as in close plantations, as hath been observed in Herefordshire, the great county for Orchards, where they find, that when Orchards are so planted or situated, that the air is pent up amongst the trees, the vapours which arise from the damp of the ground, and the perspiration of the trees, collect the heat of the sun, and reflect it in streams so as to cause what they call a fire-blast, which is the most hurtful to their fruits; and this is most frequent where the Orchards are open to the south sun.

But as Orchards should never be planted, unless where large quantities of fruit are desired, so it will be the same thing to allow twice or three times the quantity of ground; since there may be a crop of grain of any sort upon the same place (as was before said,) so that there is no loss of ground; and for a family only it is hardly worth while to plant an Orchard, since a kitchen-garden well planted with espaliers, will afford more fruit than can be eaten while good, especially if the kitchen-garden be proportioned to the largeness of the family; and if cyder be required, there may be a large avenue of Apple-trees extended cross a neighbouring field, which will render it pleasant, and produce a great quantity of fruit; or there may be some single rows of trees planted to surround fields, &c. which will fully answer the same purpose, and be less liable to the fire-blasts before-mentioned.

ORCHIS. Tourn. Inst. R. H. 431. tab. 248, 249. Lin. Gen. Plant. 900. [of ὄρχις, a testicle, because the root of this plant resembles the testicles of a man; or of ὀρέγω, to have an appetite after, on account of its being a provocative to venery: it is also called κυνοσόρχις, of κυνὸς, a dog, and ὄρχις, a testicle.] Satyrion, or Fool-stones.

The Characters are,

*It hath a single stalk with a vague sheath; it has no empalement. The flower hath five petals, three without and two within, which rise and join in a standard. The nectarium is of one leaf, fixed to the side of the receptacle, between the division of the petals. The upper lip is short and erect, the under large, broad, and spreading; the tube is pendulous, horn-shaped, and prominent behind. It hath two short slender stamina sitting upon the pointal, with oval erect summits fixed to the upper lip of the nectarium. It hath an oblong contorted germen under the flower, with a short style fastened to the upper lip of the nectarium, crowned by an obtuse compressed stigma. The germen afterward turns to an oblong capsule with one cell, having three keel-shaped valves, opening on the three sides, but joined at top and bottom, filled with small seeds like dust.*

This genus of plants is ranged in the first section of Linnæus's twentieth class, which contains those plants whose flowers have two stamina, which are connected with, or fixed to the style.

The Species are,

1. Orchis (*Morio*) bulbis indivisis, nectarii labio quadrifido crenulato, cornu obtuso. Act. Upsal. 1740. *Orchis with undivided bulbs, the lip of the nectarium cut into four points which are slightly indented, and an obtuse horn.* Orchis morio fœmina. C. B. P. 82. *Common female Orchis.*
2. Orchis (*Mascula*) bulbis indivisis, nectarii labio quadrilobo crenulato, cornu obtuso, petalis dorsalibus reflexis. Flor. Suec. 795. *Orchis with undivided bulbs, the lip of the nectarium having four lobes and an obtuse horn, and the backs of the petals reflexed.* Orchis morio mas, foliis maculatis. C. B. P. 81. *The male Orchis with spotted leaves.*
3. Orchis (*Bifolia*) bulbis indivisis, nectarii labio lanceolato integerrimo, cornu longissimo, petalis patentibus. Act. Upsal. 1740. *Orchis with undivided bulbs, the lip of the nectarium entire and spear-shaped, a very long horn, and petals spreading very wide.* Orchis alba bifolia minor, calcari oblongo. C. B. P. 83. *Smaller, white two-leaved Orchis, with an oblong spur, or Butterfly Orchis.*
4. Orchis (*Militaris*) bulbis indivisis, nectarii labio quinquefido punctis scabro, cornu obtuso, petalis confluentibus. Act. Upsal. 1740. *Orchis with undivided bulbs, a five-pointed lip to the nectarium, having rough spots, an obtuse horn, and petals running together.* Orchis latifolia, hiante cucullo major. Tourn. Inst. R. H. 432. *The Man Orchis.*
5. Orchis (*Pyramidalis*) bulbis indivisis, nectarii labio trifido æquali integerrimo, cornu longo, petalis sublanceolatis. Act. Upsal. 1740. *Orchis with undivided bulbs, an equal trifid lip to the nectarium, with a long horn, and spear-shaped petals.* Orchis militaris, montana, spicâ rubente, conglomeratâ. Tourn. Inst. R. H. 432. *Mountain military Orchis, with a reddish conglomerated spike.*
6. Orchis (*Latifolia*) bulbis subpalmatis rectis, nectarii cornu conico, labio trilobo, lateralibus reflexo, bracteis flore longioribus. Act. Upsal. 1740. *Orchis with strait, palmated, bulbous roots, a conical horn to the nectarium, the lip cut into three lobes, which are reflexed on the sides, and bracteæ longer than the flowers.* Orchis palmata pratensis, latifolia, longis calcaribus. C. B. P. 85. *Broad-leaved, Meadow, handed Orchis, having a long spur.*
7. Orchis (*Maculata*) bulbis palmatis patentibus, nectarii cornu germinibus breviore, labio plano petalis dorsalibus patulis. Act. Upsal. 1740. *Orchis with*

*handed*

*handed spreading bulbs, the horn of the nectarium shorter than the germen, a plain lip, and the hinder part of the petals spreading.* Orchis palmata pratensis, maculata. C. B. P. 85. *Meadow handed Orchis, with spotted leaves.*

8. Orchis (*Cornopica*) bulbis palmatis, nectarii cornu, setaceo germinibus longiore, labio trifido, petalis duobus patentissimis. Act. Upsal. 1740. *Orchis with palmated bulbs, a bristly horn to the nectarium, which is longer than the germen, and a trifid lip.* Orchis palmata minor, calcaribus oblongis. C. B. P. 85. *Smaller palmated Orchis, with an oblong spur to the flower.*

9. Orchis (*Abortiva*) bulbis fasciculatis filiformibus, nectarii labio ovato integerrimo. Act. Upsal. 1740. *Orchis with thread-like bulbs growing in bunches, and the lip of the nectarium oval and entire.* Limidorum Austriacum. Clus. Pan. 241. *Purple Bird's-nest.*

The first sort grows naturally in pastures in most parts of England. This hath a double bulbous root, with some fibres coming out from the top; it has four or six oblong leaves lying on the ground, which are reflexed. The stalk rises nine or ten inches high, having four or six leaves which embrace it; this is terminated by a short loose spike of flowers, having a four-pointed indented lip to the nectarium, and an obtuse horn. The flowers are of a pale purple colour, marked with deeper purple spots; it flowers in May.

The second sort grows naturally in woods and shady places in many parts of England; this hath a double bulbous root, which is about the size and shape of middling Olives; it hath six or seven long broad leaves, shaped like those of Lilies, which have several black spots on their upper side; the stalk is round, and a foot high, having one or two smaller leaves embracing it. The flowers are disposed in a long spike on the top of the stalk; they are of a purple colour, marked with deep purple spots, and have an agreeable scent. It flowers the latter end of April.

The third sort grows naturally under the bushes by the side of pastures, in many parts of England. This hath a root composed of two oblong Pear-shaped bulbs, from which come out three or four Lily-shaped leaves, of a pale green, with a few faint spots; the stalk rises near a foot high, it is slender, furrowed, and has a very few small leaves which embrace it; this is terminated by a loose spike of white flowers, smelling sweet, which resemble a butterfly with expanded wings. This flowers in June.

The fourth sort is found growing naturally on Cawsham-hills, and in other places where the soil is chalk. The roots of this sort are composed of two bulbs, from which come out four or five oblong leaves; the stalk is about nine inches high, sustaining a loose spike of sweet-smelling flowers, each hanging on a pretty long foot-stalk; they have a short obtuse horn, a crest and wings, of an Ash-colour without, reddish within, and striped with deeper lines; the lip is oblong, divided into five parts, having rough spots. This flowers in June.

The fifth sort grows naturally on chalk-hills in several parts of England; the root of this is composed of two oblong bulbs, from which arise three or four narrow oblong leaves; the stalk rises a foot high, having three or four narrow erect leaves which embrace it. The flowers are produced in a thick roundish spike at the top; they are of a reddish colour, having long spurs, and the wings are acute-pointed. It flowers in June.

The sixth sort grows naturally in moist meadows in many parts of England; the root of this is composed of two fleshy bulbs, which are divided into four or five fingers, so as to resemble an open hand; the stalk rises from nine inches to a foot high, garnished with leaves the whole length, which are three or four inches long and one broad, embracing the stalk with their base; these are not spotted, and end in acute points. The flowers are disposed in a spike on the top of the stalk, with small narrow leaves (called bractea) between them, which are longer than the flowers. The spur is half an inch long, extended backward; the lip of the nectarium is broad, divided into three lobes, two side ones being reflexed; the flowers and bractea are of a purplish colour, having deep purple spots. It flowers in May. There are two varieties of this, differing in the colour of their flowers, and one with a narrower leaf.

The seventh sort grows naturally in moist meadows in several parts of England; the root of this is composed of two broad fleshy bulbs, both of which are divided into four fingers, which spread asunder. The stalk rises a foot and a half high, and is very strong, inclining to a purple colour; it is garnished with leaves the whole length; those on the lower part of the stalk are six inches long, and an inch and a half broad, embracing it with their base. The flowers are collected in a close spike at the top of the stalk, they are of a pale purple colour; the spur is about a third part of an inch long; the beard of the nectarium is plain, and divided into three parts, which is marked with deep purple spots; under each foot-stalk is placed a narrow leaf (or bractea) of a purplish colour. The leaves and stalks of the plant have many dark spots. It flowers in June. There are two or three varieties of this, which differ in the colour of their flowers.

The eighth sort grows naturally in moist meadows in several parts of England; this hath a double-handed root, that which sustains the stalk being wasting and decaying, but the other is full, succulent, and plump; the finger-like bulbs which compose the root are long, and spread asunder; the lower leaves are six or seven inches long, they are narrow, of a pale green, and have no spots. The stalk rises a foot high, it is garnished with a few narrow short leaves, which embrace it like sheaths; it is terminated by a beautiful spike of red flowers six inches long; the flowers are not marked with any spots; they have long, slender, bristly spurs like birds claws, being crooked; the lip of the nectarium is indented on the edge. It flowers in June.

The ninth sort grows naturally in shady woods in several parts of England, but particularly in Sussex and Hampshire, in both which counties I have several times found it. The root of this plant is composed of many thick, oblique, long fibres, which are fleshy; the stalk rises near two feet high, wrapped round with leaves like sheaths; they are of a purple colour. The flowers are disposed in a loose thyrse at the top of the stalk, and are of a purple colour, having an oval entire lip to the nectarium, the crest terminating in a horn. It flowers in June.

All these sorts of Orchis grow wild in several parts of England, but, for the extreme oddness and beauty of their flowers, deserve a place in every good garden; and the reason for their not being cultivated in gardens, proceeds from their difficulty to be transplanted; though this, I believe, may be easily overcome, where a person has an opportunity of marking their roots in their time of flowering, and letting them remain until their leaves are decayed, when they may be transplanted with safety; for it is the same with most sorts of bulbous or fleshy-rooted plants, which, if transplanted before their leaves decay, seldom live, notwithstanding you preserve a large ball of earth about them; for the extreme parts of their fibres extend to a great depth in the ground, from whence they receive their nourishment; which, if broken or damaged by taking up their roots, seldom thrive after; for though they may sometimes remain alive a year or two, yet they grow weaker until they quite decay; which is also the case with Tulips, Fritillarias, and other bulbous roots, when removed, after they have made shoots; so that whoever would cultivate them, should search them out in their season of flowering, and mark them; and when their leaves are decayed, or just as they are going off, the roots should be taken up, and planted in a soil or situation as nearly resembling that wherein they naturally grow, as possible, otherwise they will not thrive, so that

they cannot be placed all in the same bed; for some are only found upon chalky hills, others in moist meadows, and some in shady woods, or under trees; but if their soil and situation be adapted to their various sorts, they will thrive and continue several years, and, during their season of flowering, will afford as great varieties as any flowers which are at present cultivated.

The other sorts not here enumerated, may be found under the following articles, OPHRYS, SATYRIUM, SERAPIAS.

OREOSELINUM. See ATHAMANTA.

ORIGANUM. Lin. Gen. Plant. 645. Tourn. Inst. R. H. 198. tab. 94. [of Ὀρίγανον, of ὄρος, a mountain, and γάνυμαι, to rejoice, q. d. a plant that delights to grow upon mountains.] Origany or Pot Marjoram; in French, *Origan.*

The CHARACTERS are,

*The flower is of the lip kind, having a cylindrical compressed tube; the upper lip is plain, erect, obtuse, and indented; the under lip is trifid, the segments being nearly equal. These are disposed in spikes composed of oval coloured leaves, placed over each other like the scales of fish. The flowers have four slender stamina, two being as long as the petal, the other two are longer, terminated by simple summits; they have a four-cornered germen, supporting a slender style inclining to the upper lip, crowned by a bifid stigma. The germen afterward turns to four seeds shut up in the empalement of the flower.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes the plants whose flowers have two long and two shorter stamina, and are succeeded by naked seeds. To this genus he has added the Majorana of Tournefort, and the Dictamnus of Boerhaave. The first has its flowers disposed in four-cornered scaly heads, the other has the flowers disposed in loose scaly heads, coming out from between the leaves.

The SPECIES are,

1. ORIGANUM (*Vulgare*) spicis subrotundis paniculatis conglomeratis, bracteis calyce longioribus ovatis. Lin. Sp. Plant. 590. *Pot Marjoram with roundish paniculated spikes gathered in clusters, and oval bracteæ which are longer than the empalement.* Origanum vulgare spontaneum. I. B. 2. 236. *Common Wild Origany.*

2. ORIGANUM (*Heracleoticum*) spicis longis pedunculis aggregatis, bracteis longitudine calycum. Lin. Gen. Plant. 589. *Origany with long spikes growing in bunches, and bracteæ as long as the empalement.* Origanum heracleoticum, culina Gallinacea Plinii. C. B. P. 223. *Winter Sweet Marjoram.*

3. ORIGANUM (*Latifolium*) spicis oblongis paniculatis conglomeratis, foliis ovatis glabris. *Origany with oblong spikes of flowers growing in clustered panicles, and oval smooth leaves.* Origanum humilius latifolium glabrum. Tourn. Inst. R. H. 199. *Low, broad-leaved, smooth Origany.*

4. ORIGANUM (*Humile*) caule repente, spicis oblongis conglomeratis, bracteis florum longioribus. *Origany with a creeping stalk, and oblong spikes of flowers growing in clusters, with bracteæ longer than the flower.* Origanum sylvestre, humile. C. B. P. 223. Prod. 109. *Low wild Origany.*

5. ORIGANUM (*Orientale*) caule erecto ramoso, foliis ovatis rugosis, spicis subrotundis conglomeratis, bracteis calycum brevioribus. *Origany with an erect branching stalk, oval rough leaves, roundish spikes of flowers growing in clusters, with bracteæ shorter than the empalement.* Origanum Orientale prunellæ folio glauco, flore purpureo. Boerh. Ind. alt. 1. 179. *Eastern Origany with a gray Self-heal leaf, and a purple flower.*

6. ORIGANUM (*Creticum*) spicis aggregatis longis prismaticis rectis, bracteis membranaceis, calyce duplo longioribus. Lin. Sp. Plant. 589. *Origany with long, upright, prismatical spikes growing in clusters, and membraneous bracteæ twice the length of the empalement.* Origanum Creticum. C. B. P. 223. *Origany of Crete.*

7. ORIGANUM (*Majorana*) foliis ovalibus obtusis, spicis subrotundis compactis pubescentibus. Hort. Cliff. 304. *Origany with oval obtuse leaves, and roundish, compact, hairy spikes.* Majorana vulgaris. C. B. P. 224. *Common, or Sweet Marjoram.*

8. ORIGANUM (*Ægyptiacum*) foliis carnosis tomentosis, spicis nudis. Lin. Sp. Plant. 822. *Origany with fleshy woolly leaves.* Majorana rotundifolia, scutellata, exotica. H. R. Par. *Round-leaved foreign Marjoram with a spoon-shaped leaf.*

9. ORIGANUM (*Smyrnæum*) foliis ovatis acute serratis, spicis congestis umbellatim fastigiatis. Hort. Cliff. 304. *Origany with oval leaves acutely sawed, and spikes of flowers disposed in umbellated bunches.* Origanum Smyrnæum. Wheel. Raii Hist. 450. *Origany of Smyrna.*

10. ORIGANUM (*Dictamnus*) foliis omnibus tomentosis, spicis nutantibus. *Origany with all the leaves woolly, and nodding spikes of flowers.* Dictamnus Creticus. C. B. P. 222. *The Dittany of Crete.*

11. ORIGANUM (*Sipyleum*) foliis omnibus glabris, spicis nutantibus. Hort. Cliff. 304. *Origany with all the leaves smooth, and nodding spikes of flowers.* Dictamnus montis Sipyli origani foliis. Flor. Bat. 2. 72. *Dittany of Mount Sipylus with an Origany leaf.*

12. ORIGANUM (*Hybridinum*) foliis inferioribus tomentosis, spicis nutantibus. Hort. Cliff. 304. *Origany with the under leaves hoary, and nodding spikes of flowers.* Origanum Dictamni Cretici facie, folio crasso, nunc villoso, nunc glabro. Tourn. Cor. 13. *Origany with the appearance of Dittany of Crete, and thick leaves sometimes hairy, at others smooth.*

13. ORIGANUM (*Onites*) spicis oblongis aggregatis hirsutis, foliis cordatis tomentosis. Lin. Sp. Plant. 590. *Origany with oblong hairy spikes growing in bunches, and heart-shaped woolly leaves.* Origanum lignosum Syracusanum perenne, umbellâ amplissimâ brevi, lato & nervoso folio. Bocc. Mus. 2. p. 43. tab. 38. *Ligneous perennial Origany of Syracuse, with a short ample umbel, and a broad-veined leaf.*

The first sort grows naturally in thickets, and among bushes in several parts of England; the root is perennial, composed of many small ligneous fibres. The stalks are square, and rise near two feet high; they are ligneous, and garnished with oval leaves placed by pairs, and from the wings of these come out three or four smaller leaves on each side, which resemble those of Marjoram, sitting close to the stalk; they have an aromatic scent: the flowers are produced in roundish spikes growing in panicles at the top of the stalks, many of the spikes being gathered together; the flowers are of a flesh colour, and peep out of their scaly covering. Their upper lip is cut into two, standing erect, and the lower lip or beard is divided into three parts, and hangs downward the stamina stand out a little beyond the petals, and are of a purplish colour. It flowers in June and July, and the seeds ripen in the autumn. This sort is sometimes cultivated in gardens, and is by some called Pot Marjoram; it is generally used in soups.

It will rise plentifully from scattered seeds, or it may be propagated by parting the roots; the best time for doing this is in autumn, and the roots may be planted in any soil not over moist, and will thrive in any situation, so requires no other care but to keep them clear from weeds. There is a variety of this with white flowers and light green stalks, and another with variegated leaves.

The second sort is now commonly known by the title of Winter Sweet Marjoram, though it was formerly stiled Pot Marjoram. This hath a perennial root, from which arise many branching four-cornered stalks a foot and a half high, which are hairy, and inclining to a purplish colour, garnished with oval, obtuse, hairy leaves, resembling greatly those of Sweet Marjoram, standing by pairs on short foot-stalks; the flowers are disposed in spikes about two inches long, several arising together from the divisions of the stalk. The flowers are small, white, and peep out of their scaly covers; these appear in July, and the seeds ripen in autumn. It grows naturally in Greece and the warm parts of Europe, but is hardy enough to thrive in the

the open air in England, and is chiefly cultivated for nosegays, as it comes sooner to flower than Sweet Marjoram, so it is used for the same purposes, till the other comes to maturity. There is a variety of this with variegated leaves. This is generally propagated by parting the roots in autumn, and should have a dry soil, where it will thrive, requiring no other culture than the first sort.

The third sort grows naturally in France and Italy; this hath a perennial root, from which arise several slender bending stalks near a foot high, garnished with oval smooth leaves standing on pretty long footstalks. The flowers are produced in oblong spikes, which grow in clustered panicles; they are small, of a purplish colour, peeping out of their scaly coverings. It flowers in June, and may be propagated by parting the roots in the same way as the former.

The fourth sort grows plentifully about Orleans; this hath a perennial root, from which arise several four-cornered stalks about six inches high, which frequently bend to the ground, and put out roots; they are garnished with oblong hairy leaves sitting close to the stalk. The flowers grow in oblong clustered spikes at the top of the stalks, having long coloured bracteæ between each; the flowers are some whitish, others purple in the same spikes; they are small, and peep out of their scaly covers. This flowers in June, and may be propagated in the same way as the former.

The fifth sort grows naturally in the Levant; it is a perennial plant. The stalks rise two feet high, and branch out their whole length; they are purple, and garnished with oval rough leaves, somewhat like those of Self-heal, but smaller. The flowers grow in roundish clustered spikes, having short bracteæ; they are purple, and appear in June, but are not succeeded by seeds here. It is propagated by parting of the heads in the same way as the former, and must have a dry soil.

The sixth sort is the Origany of Crete, which is directed to be used in medicine, but there has been great confusion among botanists in distinguishing the species. This rises with four-cornered stalks a foot and half high, garnished with oval hoary leaves of a strong aromatic scent. The flowers grow in long, erect, bunched spikes at the top of the stalks, having membraneous bracteæ between, which are twice the length of the empalement; the flowers are small and white, like those of the common Origany. It flowers in July, but seldom perfects seeds in England. It is propagated by parting the roots as the former, but must have a dry soil and a warm situation, otherwise it will not live through the winter here.

The seventh sort is the common Sweet Marjoram, which is so well known as to need no description. With us in England it is esteemed an annual plant, though the roots often live through the winter in mild seasons, or if they are sheltered in a green-house; but in warm countries, I believe, it is only biennial.

This is propagated by seeds, which are generally imported from the south of France or Italy, for they seldom ripen in England. These are sown on a warm border toward the end of March, and when the plants are come about an inch high, they should be transplanted into beds of rich earth, at six inches distance every way, observing to water them duly till they have taken new root; after which, they will require no other care but to keep them clean from weeds. The plants will spread and cover the ground; in July they will begin to flower, at which time it is cut for use, and is then called Knotted Marjoram, from the flowers being collected into roundish close heads like knots.

The eighth sort grows naturally in Africa; this is a perennial plant with a low shrubby stalk, seldom rising more than a foot and half high, dividing into branches, which are garnished with roundish, thick, woolly leaves, and hollowed like a ladle; they are like those of the common Marjoram, but are of a thicker substance and woolly, and have much the same scent. The flowers are produced in roundish spikes, closely joined together at the top of the stalks, and, at the end of the small side branches they are of a pale flesh colour, peeping out of their scaly coverings. This sort flowers in July and August, but does not ripen seeds in England.

It is propagated by slips or cuttings, which if planted in a border of good earth during any of the summer months, and shaded from the sun and duly watered, will take root freely; and afterward the plants may be taken up, and planted in small pots filled with light kitchen-garden earth, and placed in the shade till they have taken new root, when they may be removed into an open situation, where they may remain till the end of October, when they must be placed under shelter, for they will not thrive through the winter in the open air here; but if they are put under a hot-bed frame, where they may be protected from hard frost, and have as much free air as possible in mild weather, they will thrive better than if they are more tenderly treated.

The tenth sort is the Dittany of Crete, which is used in medicine; this grows naturally upon Mount Ida, in Candia; it is a perennial plant. The stalks are hairy, and rise about nine inches high, of a purplish colour, and send out small branches from their sides by pairs; they are garnished with round, thick, woolly leaves, which are very white; the whole plant has a piercing aromatic scent, and biting taste: the flowers are collected in loose leafy heads of a purple colour, which nod downward; they are small, and of a purple colour; the stamina stands out beyond the petal, two of them being much longer than the other. It flowers in June and July, and in warm seasons the seeds sometimes ripen in autumn.

This is propagated easily by planting cuttings or slips during any of the summer months. These should be planted either in pots or a shady border, covering them close with a bell or hand-glass to exclude the air, and now and then refreshing them with water, but they must not have too much wet. When these have taken root, they should be carefully taken up, and each planted into a separate small pot filled with light earth, and placed in the shade till they have taken new root, when they should be removed into an open situation, where they may continue till autumn, and then placed under a hot-bed frame to screen them from the frost, but they should enjoy the free air at all times in mild weather. The following spring some of the plants may be shaken out of the pots, and planted in a warm border near a good aspected wall, and in a dry soil, where the plants will live through the common winters without any other shelter; but as they are liable to be killed by severe frost, it will be proper to keep a few plants in pots, to be sheltered in winter to preserve the kind.

The eleventh sort grows naturally on Mount Sipylus near Magnesia, where it was discovered by Sir George Wheeler, who sent the seeds to the Oxford Garden, where the plants were raised; this hath a perennial root, but an annual stalk. The root is composed of many slender ligneous fibres; the leaves are oval, smooth, and of a grayish colour; the stalks are slender, of a purplish colour, four-cornered, and smooth; they rise near two feet high, sending out slender branches opposite, which are terminated by slender oblong spikes of purplish flowers, which peep out of their scaly covers; the flowers are small, but shaded like those of the tenth sort; their stamina are extended out of the petal to a considerable length. The leaves, on the lower part of the stalk, are almost as large as the common Origany, but those on the upper part of the stalk and branches are very small, and sit close to the stalk. It flowers in June and July, and in warm seasons the seeds ripen here in autumn. It is propagated by cuttings or slips, in the same way as the Cretan Dittany, and the plants require the same treatment.

The twelfth sort is undoubtedly a variety, which has been produced from the intermixing of the farina

of the Cretan Dittany with that of Mount Sipylus; for the plants now in the Chelsea Garden were accidentally produced from the seeds of one species, where both sorts stood near each other in the garden of John Browning, Esq; of Lincoln's-Inn; the seeds were dropped from the plant into the border between the two sorts, so that it is uncertain from which species; but as the stalks and heads of such flowers bear a greater resemblance to the Dittany of Mount Sipylus, we may suppose it arose from the seeds of that, which had been impregnated by the farina of the Cretan Dittany, which grew near it; for the under leaves of this are round, of a thick texture and woolly, so nearly resembling those of the Cretan Dittany, as not to be distinguished from it; but the stalks rise full as high as those of the Dittany of Sipylus, but branch out more their whole length; they are of a purple colour and hairy. The lower leaves on the stalks are much larger than those of Mount Sipylus, and are hairy, approaching to those of the Cretan Dittany, but are not so thick or woolly; the upper leaves are smooth, and approach to those of the other sort, but are larger, as are also the spikes of flowers, and the scaly leaves which cover the flowers are larger and of a deeper purple colour.

I have also dried samples of another variety, which arose from seeds in the Leyden Garden; the seeds were sent from Paris, by the title which Tournefort gave to that which he found in the Levant, which I have joined to the variety before-mentioned. The leaves of this are as large as those of the Dittany of Crete, but are not so thick or woolly; the stalks rise more like those of the Dittany of Mount Sipylus, but branch out wider at the top; the flowers grow in closer clusters, and do not nod downward; they are small, and shaped like those of the former sort, flowering at the same time.

By the title which Dr. Linnæus has given to the Cretan Dittany, it may be supposed he has not seen the true sort, for his title better suits the variety to which I have applied it; for all the leaves of the true Dittany are very thick and woolly, even those which are situated immediately below the flowers, whereas the lower leaves only are so in this title.

The thirteenth sort grows at Syracuse; this hath perennial ligneous stalks which rise a foot and a half high, dividing into many small branches, which are garnished with small heart-shaped leaves a little larger than those of Marjoram, which are woolly. The flowers grow in oblong tufted spikes which are hairy; they are small, white, and peep out of their scaly covers; they appear in July, but seldom perfect seeds in England. This is propagated by cuttings or slips, in the same way as the tenth sort, and the plants require the same treatment.

The first and sixth sorts are used in medicine, but the first being a native of this country, is frequently substituted for the other, which is pretty rare in England, and is now seldom imported here. When the first sort is used, those plants which grow upon dry barren ground are to be preferred, as they are much stronger and have greater virtue than those which grow on good land, or are cultivated in gardens.

The Dittany of Crete is also used in medicine, but the dried herb is generally imported into England, which, by being closely packed, and the voyage being long, it loses much of its virtue; so that if the plants of English growth were used, they would be found much better.

ORNITHOGALUM. Tourn. Inst. R. H. 378. tab. 203. Lin. Gen. Plant. 377. [Ὀρνιθόγαλον, of ὄρνις, a bird, and γάλα, milk, i. e. a plant whose flowers are as white as the white plumes of feathered animals.] Star of Bethlehem.

The Characters are,

*The flower has no empalement. It is composed of six petals, whose under parts are erect, but spread open above, and are permanent. It hath six erect stamina about half the length of the petals, crowned by single summits, with an angular germen, supporting an awl-shaped style which is permanent, terminated by an obtuse stigma. The germen afterward turns to a roundish angular capsule with three cells, filled with roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, in which are contained those plants whose flowers have six stamina and one style.

The Species are,

1. Ornithogalum (*Pyrenaicum*) racemo longissimo, filamentis lanceolatis, pedunculis floriferis patentibus æqualibus, fructiferis scapo approximatis. Lin. Sp. Plant. 440. *Star-flower with a very long spike of flowers, spear-shaped filaments, and foot-stalks to the flowers equal, spreading, and those of the fruit approaching to the stalk.* Ornithogalum angustifolium majus, floribus ex albo virescentibus. C. B. P. 70. *Greater narrow-leaved Star-flower, with whitish green flowers.*
2. Ornithogalum (*Pyramidale*) racemo conico, floribus numerosis adscendentibus. Prod. Leyd. 32. *Star-flower with a conical spike, having numerous flowers rising above each other.* Ornithogalum angustifolium, spicatum, maximum. C. B. P. 70. *Largest spiked Star-flower with a narrow leaf.*
3. Ornithogalum (*Latifolium*) racemo longissimo, foliis lanceolato-ensiformibus. Lin. Sp. Plant. 307. *Star-flower with the longest spike, and spear-shaped leaves.* Ornithogalum latifolium & maximum. C. B. P. 70. *Greatest broad-leaved Star-flower, called the Star-flower of Alexandria.*
4. Ornithogalum (*Nutans*) floribus secundis pendulis, nectario stamineo campaniformi. Lin. Sp. Plant. 308. *Star-flower with fruitful hanging flowers, and a bell-shaped nectarium.* Ornithogalum Neapolitanum. Clus. App. 2. p. 9. *Star-flower of Naples.*
5. Ornithogalum (*Luteum*) scapo angulato diphyllo, pedunculis umbellatis simplicibus. Flor. Suec. 270. *Star-flower with an angular stalk having two leaves, and single umbellated foot-stalks.* Ornithogalum luteum. C. B. P. 71. *Yellow Star-flower.*
6. Ornithogalum (*Minimum*) scapo angulato diphyllo, pedunculis umbellatis ramosis. Flor. Suec. 271. *Star-flower with an angular stalk bearing two leaves, and branching foot-stalks having umbels.* Ornithogalum luteum minus. C. B. P. 71. *Smaller yellow Star-flower.*
7. Ornithogalum (*Umbellatum*) floribus corymbosis, pedunculis scapo altioribus, filamentis emarginatis. Hort. Cliff. 124. *Star-flower with flowers growing in a corymbus, whose foot-stalks are taller than the stalk, and indented filaments.* Ornithogalum umbellatum medium angustifolium. C. B. P. 70. *Middle umbellated Star-flower having narrow leaves.*
8. Ornithogalum (*Arabicum*) floribus corymbosis, pedunculis scapo humilioribus, filamentis emarginatis. Prod. Leyd. 32. *Star-flower with flowers growing in a corymbus, foot-stalks lower than the stalk, and indented filaments.* Ornithogalum Arabicum. Clus. Hist. 1. p. 186. *Star-flower of Arabia.*
9. Ornithogalum (*Capense*) foliis cordatis ovatis. Prod. Leyd. 31. *Star-flower with oval heart-shaped leaves.* Ornithogalum Africanum plantaginis roseæ folio, radice tuberosâ. Hort. Amst. 2. p. 175. *African Star-flower, with a Rose Plantain leaf and a tuberous root.*
10. Ornithogalum (*Tuberosum*) racemo brevissimo, foliis teretibus fistulosis. *Star-flower with a very short spike, and taper fistular leaves.* Ornithogalum Africanum, luteum odoratum, foliis cepaceis, radice tuberosâ. H. L. *African Star-flower having yellow sweet flowers, leaves resembling those of the Onion, and a tuberous root.*

The first sort grows naturally near Bristol, and also near Chichester in Sussex, and some other parts of England. This hath a pretty large bulbous root, from which come out several long keel-shaped leaves, which spread on the ground; between these come out a single naked stalk about two feet long, sustaining a long loose spike of flowers of a yellowish green colour, standing upon pretty long foot-stalks, which spread wide from the principal stalk; the petals of the flowers are narrow, making but little appearance. The flowers have an agreeable scent; they appear in May, and when the seed-vessels are formed, the foot-

ſtalks which ſuſtain them become erect, and approach near the ſtalk. The ſeeds ripen in Auguſt.

The ſecond ſort grows naturally upon the hills in Portugal and Spain, but has been long cultivated in the Engliſh gardens by the title of the Star of Bethlehem. This hath a very large, oval, bulbous root, from which ariſe ſeveral long keel-ſhaped leaves of a dark green colour, in the middle of which come out a naked ſtalk which riſes near three feet high, terminated by a long conical ſpike of white flowers, ſtanding upon pretty long foot-ſtalks, riſing one above another in an upright ſpike. Theſe appear in June, and are ſucceeded by roundiſh ſeed-veſſels, having three cells filled with roundiſh ſeeds, which ripen in Auguſt.

The third ſort grows naturally in Arabia; this hath a very large bulbous root, from which come out ſeveral broad ſword-ſhaped leaves, which ſpread on the ground; the ſtalk is thick and ſtrong, riſing between two and three feet high, bearing a long ſpike of large white flowers, ſtanding upon long foot-ſtalks. They are compoſed of ſix petals which ſpread open in form of a ſtar, and appear in June, but do not ripen their ſeeds in England.

The fourth ſort grows in great abundance naturally in the kingdom of Naples, and is now become almoſt as common in England, for the roots propagate ſo faſt by offsets and ſeeds, as to become troubleſome weeds in gardens; and in many places where the roots have been thrown out of gardens, they have grown upon dunghills and in waſte places as plentifully as weeds. This hath a pretty large, compreſſed, bulbous root, from which come out many long, narrow, keel-ſhaped leaves, of a dark green colour. The ſtalks are very thick and ſucculent, riſing about a foot high, ſuſtaining ten or twelve flowers in a looſe ſpike, each hanging on a foot-ſtalk an inch long; they are compoſed of ſix petals, which are white within, but of a grayiſh green on their outſide, having no ſcent; within the petals is ſituated the bell-ſhaped nectarium, compoſed of ſix leaves, out of which ariſe the ſix ſtamina, terminated by yellow ſummits. The flowers appear in April, and are ſucceeded by large, roundiſh, three-cornered capſules, which are filled with roundiſh ſeeds; as the capſules grow large, they are ſo heavy as to weigh the ſtalk to the ground.

The ſixth ſort hath ſmall bulbous roots not larger than Peas, from which ariſe one or two narrow keel-ſhaped leaves about five inches long, of a grayiſh colour; the ſtalk is angular, and riſes about four inches high, having two narrow keel-ſhaped leaves juſt below the flowers, which are diſpoſed in an umbel upon branching foot-ſtalks; theſe are yellow within, but of a purpliſh green on their outſide. They appear in May, and are ſucceeded by ſmall triangular capſules, filled with reddiſh uneven ſeeds. It grows on the borders of cultivated fields in France and Germany.

The ſeventh ſort grows naturally in moſt parts of Europe, and is ſuppoſed to do ſo in England, though it is ſeldom found here, unleſs in orchards or grounds where the roots may have been planted, or thrown out of gardens with rubbiſh. This hath a bulb as large as a ſmall Onion, to which adhere many ſmall offſets: the leaves are long, narrow, and keel-ſhaped, ſpreading on the ground, and have a longitudinal white line through the hollow. The ſtalk riſes about ſix inches high, ſuſtaining an umbel of flowers which are white within, but have broad green ſtripes on the outſide of the petals; theſe ſtand upon long foot-ſtalks, which riſe above the principal ſtalk. It flowers in April and May, and is ſucceeded by roundiſh three-cornered capſules filled with angular ſeeds, which ripen in July.

The eighth ſort grows naturally in Arabia; this hath a large bulbous root, from which ariſe many long keel-ſhaped leaves, which embrace each other with their baſe; they are of a deep green, and ſtand erect. The flowers of this kind I have never yet ſeen, though I have tried many ways to procure them: the roots multiply exceedingly, and are never injured by froſt, although the leaves are put out before winter. Theſe roots are frequently brought over from Italy for ſale, but I have not heard of any having flowered; and Cluſius ſays, he never ſaw but one root flower, and that came from Conſtantinople.

The ninth ſort grows naturally at the Cape of Good Hope; this hath an irregular tuberous root, varying greatly in form and ſize, covered with a dark brown ſkin, from which ariſe ſeveral oval heart-ſhaped leaves, upon pretty long foot-ſtalks; they have ſeveral longitudinal veins like Ribwort Plantain. The flower-ſtalks are ſlender, naked, and riſe about a foot high, ſuſtaining ſeveral ſmall, greeniſh, white flowers, formed in a looſe ſpike, ſtanding upon long ſlender foot-ſtalks. They come out in November, making but little appearance, and are not ſucceeded by ſeeds in England.

The tenth ſort grows naturally on the dry rocks at the Cape of Good Hope; this hath a large, depreſſed, bulbous root, as big as a man's fiſt, covered with an uneven brown ſkin, putting out ſeveral taper hollow leaves nine or ten inches long, between which comes forth a naked ſtalk near a foot high, terminated by a looſe ſpike of yellow flowers, of an agreeable ſweet ſcent. It flowers in May, but does produce ſeeds in England.

The three ſorts firſt mentioned, are cultivated for ornament in the Engliſh gardens. Theſe are propagated by offsets, which their roots commonly produce in great plenty. The beſt time to tranſplant their roots is in July or Auguſt, when their leaves are decayed; for if they are removed late in autumn, their fibres will be ſhot out, when they will be very apt to ſuffer if diſturbed. They ſhould have a light ſandy ſoil, but it muſt not be over dunged. They may be intermixed with other bulbous-rooted flowers in the borders of the pleaſure-garden, where they will afford an agreeable variety. Their roots need not be tranſplanted oftener than every other year, for if they are taken up every year, they will not increaſe ſo faſt; but when they are ſuffered to remain too long unremoved, they will have ſo many offsets about them as to weaken their blowing roots. Theſe may alſo be propagated from ſeeds, which ſhould be ſown and managed as moſt other bulbous-rooted flowers, and will produce their flowers three or four years after ſowing.

The fourth ſort is ſcarce worthy of a place in gardens, but as it will thrive in any ſituation or under trees, ſo a few plants may be admitted in obſcure places for the ſake of variety.

The fifth ſort has not much beauty, therefore a few roots of it will be enough for variety, as alſo of the ſixth and ſeventh ſorts; the two laſt will thrive in ſhade, but the fifth ſhould have an open ſituation.

The eighth ſort multiplies ſo faſt by offsets from the roots as to become troubleſome weeds in a garden, for every ſmall root will grow, and in two years produce twenty or thirty more; ſo that unleſs the large roots are taken up every year and diveſted of their offsets, the borders will be over-run with them.

The ninth ſort is too tender to thrive in the open air in England, ſo the roots of this ſhould be planted in pots filled with light earth, and in the autumn placed under a hot-bed frame, where they may be ſcreened from froſt, and in mild weather enjoy the free air. The leaves of this appear in the autumn, and continue growing all the winter, ſo muſt not be expoſed to froſt; nor ſhould they be drawn up weak, for then the flowers will be few on a ſtalk, and not large. If the pots do now and then receive a gentle ſhower of rain in winter it will be ſufficient, for they ſhould not have much wet during that ſeaſon. Toward the beginning of July the leaves and ſtalks decay, and then the roots may be taken up, laying them in a dry cool place till the end of Auguſt, when they muſt be planted again.

The other ſpecies which were included in this genus, are now removed to Scilla.

**ORNITHOPUS.** Lin. Gen. Plant. 790. Ornithopodium. Tourn. Inſt. R. H. 400. tab. 224. Bird's-foot; in French, *Pié-d'oiſeau.*

The Characters are,

*The empalement of the flower is permanent, of one leaf, tubulous, and indented in five equal ſegments at the brim. The flower is of the butterfly kind, the ſtandard is heart-ſhaped and entire; the wings are oval, erect, and almoſt as large as the ſtandard; the keel is ſmall and compreſſed. It hath ten ſtamina, nine of which are joined, and one ſtands ſeparate, terminated by ſingle ſummits. The germen is narrow, ſupporting a briſtly aſcending ſtyle, terminated by a punctured ſtigma. The germen afterward becomes a taper incurved pod, having many joints connected together, but when ripe ſeparate, each containing one oblong ſeed.*

This genus of plants is ranged in the third ſection of Linnæus's ſeventeenth claſs, which includes the plants whoſe flowers have ten ſtamina joined in two bodies.

The Species are,

1. Ornithopus (*Perpuſillus*) foliis pinnatis, leguminibus compreſſis ſubarcuatis. Hort. Upſal. 234. *Bird's-foot with winged leaves, and compreſſed pods a little arched.* Ornithopodium majus. C.B.P. 350. *Greater Bird's-foot.*
2. Ornithopus (*Nodoſa*) foliis pinnatis, leguminibus confertis pedunculatis. *Bird's-foot with winged leaves, and pods growing in cluſters upon foot-ſtalks.* Ornithopodium radice tuberculis nodoſâ. C. B. P. 350. *Bird's-foot with knobbed tubercular roots.*
3. Ornithopus (*Compreſſus*) foliis pinnatis, pinnis leguminibus compreſſis rugoſus. Hort. Cliff. 364. *Bird's-foot with linear winged leaves, and compreſſed pods growing in pairs.* Ornithopodium Scorpoides, ſiliquâ compreſſâ. Tourn. Inſt. 400. *Bird's-foot with the appearance of Caterpillar, and flat pods.*
4. Ornithopus (*Scorpioides*) foliis ternatis ſubſeſſilibus impari maximo. Hort. Cliff. 364. *Bird's-foot with trifoliate leaves ſitting cloſe to the ſtalk, and the middle lobe very large.* Ornithopodium Portulacæ folio. Tourn. Inſt. 400. *Bird's-foot with a Purſlane leaf.*

The firſt ſort grows naturally in the ſouth of France, in Spain and Italy. It is an annual plant, having many trailing ſtalks a foot and a half long, from which come out a few ſide branches, garniſhed with long winged leaves, compoſed of about eighteen pair of ſmall oval lobes, terminated by an odd one; theſe lobes ſtand ſometimes oppoſite, and at others they are alternate and hairy. The flowers are produced in ſmall cluſters at the top of foot-ſtalks, which ariſe from the wings of the ſtalks, and are near three inches long, having a ſmall winged leaf, part of which is below, and the other part above the flowers, ſo that they ſeem to come from the midrib of the leaf; the flowers are of a deep gold colour, and ſhaped like a butterfly. Theſe appear in July, and are ſucceeded by flat narrow pods about three inches long, which turn inward at the top like a bird's claw. They are jointed, and a little hairy, containing a ſingle ſeed in each joint, which ripens in autumn, when the joints ſeparate and fall aſunder.

The ſecond ſort grows naturally on dry commons and heaths in moſt parts of England. The root of this ſort is compoſed of two or three ſtrong fibres, to which hang ſeveral ſmall tubercles or knobs like grains. There are many ſlender ſtalks come out from the root, and ſpread on the ground, from four to eight inches long, garniſhed with ſmall, winged, hairy leaves, compoſed of ſix or ſeven pair of narrow lobes, terminated by an odd one. The flowers ſtand upon long ſlender foot-ſtalks, which come out at every joint of the ſtalk; they are ſmall, of a yellow colour, and are ſucceeded by cluſters of ſhort pods, which are a little incurved at the top. It flowers and ſeeds about the ſame time as the former.

The third ſort grows plentifully about Meſſina and Naples. The root of this ſort runs deep into the ground, ſending out a few ſmall fibres on the ſide; the ſtalks are about ſix inches long, and do not lie flat on the ground like the other; the leaves are hairy, compoſed of ten or twelve pair of narrow lobes placed along the midrib, terminated by an odd one. The flowers grow in ſmall bunches on the top of the branches; they are yellow, and are generally ſucceeded by two flat pods not much more than an inch long, turned inward like a bird's claw. This flowers and ſeeds about the ſame time with the former.

The fourth ſort grows naturally among the Corn in Spain and Italy; this hath many ſmooth branching ſtalks, which riſe near two feet high, garniſhed toward their top with trifoliate oval leaves ſitting cloſe, having two ſmall appendages. The lower leaves are often ſingle, and of a grayiſh colour, the middle lobe being twice the ſize of the two ſide ones. The flowers ſtand upon ſlender foot-ſtalks, are yellow, and ſucceeded by taper pods, which are two inches long, ſhaped like a bird's claw. This flowers and ſeeds about the ſame time with the former.

Theſe plants are propagated by ſowing their ſeeds in the ſpring upon a bed of light freſh earth, where they are to remain (for they ſeldom do well when they are tranſplanted;) when the plants come up, they muſt be carefully cleared from weeds; and where they are too cloſe, ſome of the plants ſhould be pulled out, ſo as to leave the remaining ones about ten inches aſunder. In June theſe plants will flower, and the ſeeds will ripen in Auguſt. There is no great beauty in them, but for the variety of their jointed pods, they are preſerved by ſome curious perſons in their pleaſure-gardens; where, if their ſeeds are ſown in patches in the borders, each ſort diſtinctly by itſelf, and the plants thinned, leaving only two at each patch, they will require no farther care, and will add to the variety, eſpecially where the Snail and Caterpillar plants are preſerved, which are very proper to intermix with them. They are all annual plants, which periſh ſoon after the ſeeds are ripe.

**OROBANCHE,** or Broom Rape.

There are ſix or ſeven ſpecies of this genus at preſent known, two of which grow naturally on dry grounds in ſeveral parts of England; but as all the ſorts do not agree with culture, ſo they are not admitted into gardens. They are ranged in the ſecond ſection of Linnæus's fourteenth claſs, intitled Didynamia Angioſpermia, the flowers having two long and two ſhorter ſtamina, and their ſeeds being included in a capſule.

**OROBUS.** Tourn. Inſt. R. H. 393. tab. 214. Lin. Gen. Plant. 780. [ὄροβος, of ἐρέπτω, to eat, βοῦς, an ox, q. d. an herb with which oxen are fed, becauſe the ancients uſed to fatten their oxen with a like herb.] Bitter Vetch; in French, *Orobe.*

The Characters are,

*The empalement of the flower is tubulous, of one leaf, with an obtuſe baſe; the brim is oblique and indented in five parts, the three lower acute, the two upper ſhorter and obtuſe. The flower is of the butterfly kind; the ſtandard is heart-ſhaped; the two wings are almoſt as long as the ſtandard, and join together; the keel is bifid, acute-pointed, and riſing upwards; the borders are compreſſed, and the body ſwollen. It hath ten ſtamina, nine are joined, and one ſeparate; theſe are riſing, and terminated by roundiſh ſummits. It hath a cylindrical compreſſed germen, ſupporting a crooked riſing ſtyle, crowned by a narrow downy ſtigma, faſtened by the inner edge in the middle to the point of the ſtyle. The germen afterward becomes a long taper pod ending in an acute point, having one cell, containing ſeveral roundiſh ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's ſeventeenth claſs, which contains thoſe plants whoſe flowers have ten ſtamina joined in two bodies.

The Species are,

1. Orobus (*Vernus*) foliis pinnatis ovatis, ſtipulis ſemiſagittatis integerrimis, caule ſimplici. Lin. Sp. Plant. 728. *Bitter Vetch with oval winged leaves, entire ſtipulæ half arrow-pointed, and a ſingle ſtalk.* Orobus ſylvaticus purpureus vernus. C. B. P. 351. *Purple, vernal, wood Bitter Vetch.*
2. Orobus (*Tuberoſus*) foliis pinnatis lanceolatis, ſtipulis ſemiſagittatis, caule ſimplici. Lin. Sp. Plant. 728.

*Bitter Vetch with spear-shaped winged leaves, entire half arrow-pointed stipulæ, and a single stalk.* Orobus sylvaticus foliis oblongis glabris. Tourn. Inst. R. H. 393. *Wood Bitter Vetch with oblong smooth leaves.*

3. Orobus (*Sylvaticus*) caulibus decumbentibus hirsutis ramosis. Cent. pl. 67. Flor. Angl. 275. *Bitter Vetch with hairy, branching, decumbent stalks.* Orobus sylvaticus nostras. Raii Syn. 324. *Wood Bitter Vetch.*

4. Orobus (*Niger*) caule ramoso, foliis sexjugis ovato-oblongis. Hort. Cliff. 366. *Bitter Vetch with a branching stalk, and leaves composed of six pair of oblong oval lobes.* Orobus sylvaticus foliis viciæ. C. B. P. 352. *Wood Bitter Vetch with a Vetch leaf.*

5. Orobus (*Pyrenaicus*) caule ramoso, foliis bijugis lanceolatis nervosis, stipulis subspinosis. Lin. Sp. 1029. *Bitter Vetch with a branching stalk, and leaves composed of two pair of nervous spear-shaped lobes.* Orobus Pyrenaicus, foliis nervosis. Tourn. Inst. 393. *Bitter Vetch of the Pyrenees with nervous leaves.*

6. Orobus (*Lathyroides*) foliis conjugatis subsessilibus, stipulis dentatis. Hort. Upsal. 220. *Bitter Vetch with leaves placed by couples close to the stalks, and indented stipulæ.* Lathyroides erecta, folio ovato acuminato, cæruleis viciæ floribus & siliquis, Sibirica. Amman. Ruth. 151. *Siberian, upright, Bastard Lathyrus, with an oval acute-pointed leaf, blue flowers, and pods like those of the Vetch.*

7. Orobus (*Luteus*) foliis pinnatis ovato-oblongis, stipulis rotundato-lunatis dentatis, caule simplici. Lin. Sp. Plant. 728. *Bitter Vetch with oval, oblong, winged leaves, roundish, moon-shaped, indented stipulæ, and a single stalk.* Orobus Sibericus perenne. Gmel. *Perennial Siberian Bitter Vetch.*

8. Orobus (*Venetis*) foliis pinnatis ovatis acutis, quatuor-jugatis, caule simplici. Tab. 193. fol. 2. *Bitter Vetch with oval, acute-pointed, winged leaves, having four pair of lobes and a single stalk.* Orobus Venetus. Clus. Hist. 232. *Venetian Bitter Vetch.*

9. Orobus (*Americanus*) foliis pinnatis lineari-lanceolatis infernè tomentosis, caule ramosissimo frutescente. *Bitter Vetch with linear, spear-shaped, winged leaves, which are woolly on their under side, and a very branching shrubby stalk.* Orobus Americanus erectus, foliorum pinnis angustoribus & subtus incanis, siliquis glabris. Houst. MSS. *Upright American Bitter Vetch, with very narrow lobes to the leaves, hoary on their under side, and having smooth pods.*

10. Orobus (*Argenteus*) foliis pinnatis oblongo-ovatis infernè sericeis, caule erecto tomentoso, floribus spicatis terminalibus. *Bitter Vetch with oblong, oval, winged leaves, which are silky on their under side, and have an upright woolly stalk, terminated by a spike of flowers.* Orobus Americanus, latifolius, argenteus, flore purpureo. Houst. MSS. *Broad-leaved, silvery, American Bitter Vetch, with a purple flower.*

11. Orobus (*Procumbens*) foliis pinnatis, foliolis exterioribus majoribus tomentosis, caule procumbente. *Bitter Vetch with winged leaves, whose outer lobes are woolly, and a trailing stalk.* Orobus Americanus procumbens & hirsutus, flore purpureo. Houst. MSS. *Trailing, hairy, American Bitter Vetch, with a purple flower.*

12. Orobus (*Coccineus*) foliis pinnatis, foliis linearibus villosis, caule procumbente floribus alaribus & terminalibus. *Bitter Vetch with winged leaves, having hairy linear lobes, a trailing stalk, and flowers growing on the sides and at the ends of the branches.* Orobus Americanus procumbens minimus, flore coccineo. Houst. MSS. *The least trailing American Bitter Vetch, having a scarlet flower.*

The first sort grows naturally in the forests of Germany and Switzerland. The root of this is perennial, composed of many strong fibres; the stalks rise a foot high, and are garnished with winged leaves, composed of two pair of oval acute-pointed lobes, and at the base of the foot-stalk is situated a stipula, (or small leaf,) shaped like the point of an arrow cut through the middle. This embraces the stalk. The lobes of the leaves are about an inch and an half long, and near an inch broad, ending in acute points. The flowers stand upon foot-stalks, which arise from the wings of the stalk; they are about three inches long, sustaining six or seven flowers ranged in a spike, which are of the butterfly kind. These are at first of a purple colour, but afterward change blue; they appear early in the spring, and are succeeded by slender taper pods an inch and a half long, having one cell, in which are lodged four or five oblong bitter seeds, which ripen in June. There is a variety of this with pale flowers, which is preserved in some gardens.

The second sort grows naturally in woods and shady places in most parts of England. This hath a perennial creeping root, from which arise angular stalks nine or ten inches long, garnished at each joint by one winged leaf, composed of four pair of smooth spear-shaped lobes, and, at the base of each, is situated a stipula like that of the first sort; and from the wings of the stalks arise the foot-stalks of the flowers, which are about four inches long, each sustaining two or three purplish red flowers, which turn to a deep purple before they fade. They appear in April, and are succeeded by long taper pods, containing six or seven roundish seeds, which ripen the beginning of June. These are called Wood or Heath Peas.

The third sort grows naturally in Cumberland and Wales. The root is perennial and ligneous, from which arise several hairy stalks a foot and a half high, garnished at each joint with one winged leaf, composed of ten or eleven pair of narrow lobes ranged close together along the midrib; at the base of which is situated an acute stipula embracing the stalk. The flowers are disposed in a close spike, standing upon foot-stalks three inches long, which arise from the wings of the leaves; they are of a purple colour, and are succeeded by short flat pods, containing two or three seeds. It flowers the beginning of June, and the seeds ripen in July.

The fourth sort grows naturally on the mountains in Germany and Switzerland. This hath a strong, ligneous, perennial root, from which arise many branching stalks two feet high, garnished at each joint by one winged leaf, composed of five or six small, oblong, oval lobes ranged along the midrib. The flowers stand upon very long foot-stalks, which arise from the wings of the stalk; these sustain at their top four, five, or six purple flowers, which appear in May, and are succeeded by compressed pods an inch and a half long, containing four or five oblong seeds, which ripen the beginning of July. The stalks decay in autumn, and new ones arise in the spring.

The fifth sort grows naturally on the Pyrenean mountains; this hath a perennial root, from which arise several smooth branching stalks a foot and a half high, garnished with winged leaves composed of four pair of spear-shaped lobes, which have three longitudinal veins; at the base of the leaves is situated a stipula embracing the stalk, in the same manner as the first. The flowers stand upon long foot-stalks, arising from the wings of the leaves; toward the upper part of the stalk they are ranged in a loose spike, are of a purple colour, appearing in May, and are succeeded by compressed pods about two inches long, containing three or four seeds, which ripen in July.

The sixth sort grows naturally in Siberia; this hath a perennial root, from which arise three or four branching stalks about a foot high. The leaves stand by pairs opposite along the stalks, to which they sit close, having an indented stipula at their base; the leaves are smooth, stiff, and of a lucid green. The flowers grow in close spikes upon short foot-stalks, which rise from the wings of the leaves at the top of the stalks, where are generally three or four of these spikes standing together. The flowers are of a fine blue colour, so make a pretty appearance. These appear in June, and are succeeded by short flattish pods, containing two or three seeds in each, which ripen in August.

The seventh sort grows naturally in Siberia; this hath a perennial root, from which arise several herbaceous stalks a foot and a half high, garnished with winged leaves, composed of four or five pair of oval oblong lobes, having at their base a roundish moon-shaped stipula embracing the stalk. The flowers come out from the wings of the leaves upon short foot-stalks; they are large and of a purple colour, appearing in April, and are succeeded by swelling pods near two inches long, containing four or five seeds, which ripen in June.

The eighth sort grows naturally in Italy; this hath a perennial root, from which arise several stalks about a foot high, garnished with winged leaves, composed of four pair of oval lobes, ending in acute points; they are smooth and of a pale green colour, placed pretty far distant on the midrib. The flowers come out upon slender foot-stalks, which arise from the wings of the leaves, four or five standing at the top; they are of a purple colour, and appear in March. These are succeeded by swelling pods an inch and a half long, each containing three or four roundish seeds, which ripen in May.

The ninth sort grows naturally in Jamaica, from whence the late Dr. Houstoun sent the seeds in 1731. This rises with a very branching stalk about three feet high, which is ligneous; the branches are garnished with winged leaves, composed of five or six pair of narrow spear-shaped lobes, which are woolly on their under side. The flowers grow in loose spikes at the end of the branches, are of a pale purple colour, and are succeeded by smooth compressed pods an inch and a half long, each containing five or six roundish seeds.

The tenth sort was discovered by the late Dr. Houstoun at La Vera Cruz, from whence he sent the seeds to England. This rises with a shrubby stalk five or six feet high, dividing into many slender branches, which are covered with a brown woolly bark, and garnished with soft, fatteny, winged leaves; those on the young branches are composed of four pair of oval obtuse lobes, of a brownish green colour, hairy on their upper side, but of a silvery silky hue on their under. The leaves on the upper branches are composed of seven or eight pair of oblong oval lobes, of the same colour and consistence as the lower. The flowers are produced in long erect spikes at the end of the branches; they are of a deep purple colour, and are succeeded by long, woolly, compressed pods, each conraining four or five seeds.

The eleventh sort was discovered by Dr. Houstoun at La Vera Cruz, who sent it to England in 1730. This is a low plant, whose stalks bend to the ground, and are seldom more than six or eight inches long, from which come out a few short side branches; they are garnished with winged leaves, composed of four or five pair of small, oblong, oval, woolly lobes, terminated by an odd one, the upper lobes being much larger than the lower. The flowers come out in small bunches, standing upon short foot-stalks, which arise from the wings of the stalk; they are small, and of a bright purple colour; these are succeeded by compressed pods near two inches long, each having six or seven roundish compressed seeds.

The twelfth sort was discovered at the same time, growing naturally in the same country as the former, by the same gentleman. This hath a pretty thick ligneous root, which sends out many slender stalks a foot and a half long, trailing upon the ground, garnished with winged leaves, composed of three or four pair of narrow hoary lobes, about half an inch long. The flowers come out from the side and at the end of the stalks, three or four standing upon a short foot-stalk; they are small and of a scarlet colour, and are succeeded by short taper pods, each containing three or four small roundish seeds.

The eight sorts which are first mentioned, have perennial roots but annual stalks, which decay every autumn; several of these may be propagated by parting their roots; the best time for doing this is in the autumn, that the plants may be well established before the spring; for as several of them begin to put out their stalks very early in the spring, so if they are then disturbed, it will either prevent their flowering, or cause their flowers to be very weak. Most of these plants delight in a shady situation, and love a loamy soil.

They are also propagated by seeds, but these should be sown in the autumn, for if they are kept out of the ground till spring, many of the sorts will never grow, and those which do, seldom vegetate the same year; and the fourth sort I could never raise from seeds sown in the spring, though I have made the trial in different situations many times; but the seeds which have scattered in the summer, have come up well the following spring, as have also those which were sown in September. When the plants come up they must be kept clean from weeds, and where they are too close together they should be thinned, so as they may have room to grow till the autumn, when they should be transplanted into the places where they are designed to remain. If the roots are strong, they will flower very well the following spring, but those which are weak will not flower till the second year; therefore such may be planted in a shady border at four or five inches distance, where they may grow one year to get strength, and then may be removed to the places where they are to remain. The farther care of them is only to dig the ground between them in winter, and in summer to keep them clean from weeds.

The four last mentioned sorts being natives of warm countries are tender, so must be preserved in stoves, otherwise they will not live in England. These are propagated by seeds, which should be sown early in the spring, in small pots filled with light rich earth, and plunged into a hot-bed of tanners bark, observing frequently to moisten the earth, otherwise the seeds will not grow. When the plants come up, they should be carefully taken out of the pots, and each transplanted into separate small pots filled with rich earth, and then plunged again into the tan-bed, observing to shade them until they have taken root; after which time they should have fresh air admitted to them every day in warm weather, and must be frequently watered. With this management the plants will make a great progress. When any of the plants are grown too tall to remain in the hot-bed, they should be taken out, and plunged into the bark-bed in the stove, where they may have room to grow, especially the ninth and tenth sorts; but the other two being of humbler growth, may be kept in the hot-bed until Michaelmas, when the nights begin to be cold; at which time they should be removed into the stove, and plunged into the bark-bed, where they must be treated as other tender exotic plants; by which method they may be preserved through the winter, and the following summer they will produce flowers. These plants are perennial, so that if they should not perfect their seeds, the plants may be maintained for several years.

ORTEGIA HISPANICA.

This is called by Clusius, Juncaria Salmantica; it is a low trailing plant, with Rush-like stalks, producing at the joints a few small almost invisible flowers, therefore the plant is seldom cultivated except in botanic gardens for variety.

ORYZA. Tourn. Inst. R. H. 513. tab. 296. Rice; in French, *Ris.*

The Characters are,

*The chaff is small, acute-pointed, having two valves nearly equal, inclosing a single flower. The petal has two valves, which are hollow, compressed, and boat-shaped, ending in a beard or awn. It has a two-leaved nectarium, and six hairy stamina the length of the petal, terminated by summits whose base are bifid, and a turbinated germen, supporting two reflexed hairy styles, crowned by feathered stigmas. The germen afterward becomes one large, oblong, compressed seed, having two channels on each side, sitting on the petal of the flower.*

This

This genus of plants is ranged in the second section of Linnæus's sixth class, which contains those plants whose flowers have six stamina and two styles.

We have but one SPECIES of this plant, viz.

ORYZA (*Sativa.*) Matth. 403. Rice.

This grain is greatly cultivated in most of the eastern countries, where it is the chief support of the inhabitants; and great quantities of it are brought into England and other European countries every year, where it is in great esteem for puddings, &c. it being too tender to be produced in these northern countries, without the assistance of artificial heat; but from some seeds which were formerly sent to South Carolina, there have been great quantities produced; and it is found to succeed as well there as in its native country, which is a very great improvement to our American settlements.

This plant grows upon moist soils, where the ground can be flowed over with water after it is come up; so that whoever would cultivate it in England for curiosity, should sow the seeds upon a hot-bed; and when the plants are come up, they should be transplanted into pots filled with rich light earth, and placed into pans of water, which should be plunged into a hot-bed; and as the water wastes, so it must, from time to time, be renewed again, still preserving the water in the pans, otherwise they will not thrive, and keeping them in a stove all the summer; and toward the latter end of August, they will produce their grain, which will ripen tolerably well, provided the autumn proves favourable.

OSIER. See SALIX.

OSMUNDA, the Osmund Royal, or flowering Fern.

This is one of the kinds of Fern which is distinguished from the other sorts, by its producing flowers on the top of the leaves; whereas the others, for the most part, produce them on the back of their leaves.

There is but one kind of this plant, which grows wild in England, but there are several sorts of them which grow in America; but as they are seldom kept in gardens, I shall not enumerate their species.

The common sort grows on bogs in several parts of England, therefore whoever hath an inclination to transplant it into gardens, should place it in a moist shady situation, otherwise it will not thrive.

OSTEOSPERMUM. Lin. Gen. Plant. 887. Monilifera. Vaill. Act. Par. 1720. Chrysanthemoides. Tourn. Act. Par. 1705. Hard-seeded Chrysanthemum.

The CHARACTERS are,

*The flower hath an hemispherical empalement, which is single, and cut into many segments. The flower is composed of several hermaphrodite florets in the disk, which are tubulous, and cut at the brim into five parts. These are surrounded by several female florets, which are radiated, each having a long narrow tongue, which is cut into three parts at the top. The hermaphrodite florets have each five slender short stamina, terminated by cylindrical summits, with a small germen supporting a slender style, crowned by an obsolete stigma; these are barren. The female florets have each a globular germen supporting a slender style, crowned by an indented stigma; the germen afterward becomes one single hard seed.*

This genus of plants is ranged in the fourth section of Linnæus's nineteenth class, intitled Syngenesia Polygamia Necessaria, the flowers being composed of hermaphrodite florets in the disk, which are barren, and female florets which are fruitful.

The SPECIES are,

1. OSTEOSPERMUM (*Moniliferum*) foliis ovalibus serratis petiolatis subdecurrentibus. Lin. Hort. Cliff. 424. *Hard-seeded Chrysanthemum, with oval sawed leaves on running foot-stalks.* Chrysanthemoides Afrum populi albæ foliis. Hort. Elth. 80. tab. 68. *Hard-seeded African Chrysanthemum, with leaves like those of the white Poplar.*

2. OSTEOSPERMUM (*Pisiferum*) foliis lanceolatis acutè dentatis, caule fruticoso. Tab. 194. fig. 1. *Hard-seeded Chrysanthemum, with spear-shaped leaves which are acutely indented, and a shrubby stalk.*

3. OSTEOSPERMUM (*Spinosum*) spinis ramosis. Lin. Hort. Cliff. 424. *Hard-seeded Chrysanthemum, with branching spines.* Chrysanthemoides Osteospermum Africanum odoratum, spinosum & viscosum. Hort. Amst. 2. p. 85. *Hard-seeded Chrysanthemum of Africa, which is prickly, viscous, and sweet.*

4. OSTEOSPERMUM (*Polygaloides*) foliis lanceolatis imbricatis sessilibus. Flor. Leyd. Prod. 179. *Hard-seeded Chrysanthemum, with spear-shaped leaves sitting close to the stalks, and lying over each other like the scales of a fish.* Monilifera poligoni foliis. Vaill. Act. Par. 1720. *Monilifera with Knot Grass leaves.*

The first sort grows naturally at the Cape of Good Hope, but has been several years an inhabitant in the English gardens. This rises with a shrubby stalk seven or eight feet high, covered with a smooth gray bark, and divides into several branches, garnished with oval leaves, which are unequally indented on their edges; they are placed alternately, and are of a thick consistence, covered with a hoary down, which goes off from the older leaves. The flowers are produced in clusters at the end of the branches, six or eight coming out together, upon foot-stalks an inch and a half long; these are yellow, and shaped like those of Ragwort. The border or rays are composed of about ten half florets, which spread open; the disk or middle is composed of tubulous florets, which are cut into five parts at the brim; these are barren, but the half florets round the border, have one hard seed succeeding each of them. This plant flowers but seldom here; the time of its flowering is in July or August.

The second sort grows like the first, but the leaves are more pointed, of a green colour, and acutely sawed on the edges; the foot-stalks of the leaves are bordered, and the leaves are deeply veined. This produces tufts of yellow flowers at the extremity of the shoots from spring to autumn, and frequently ripens seeds.

The third sort is a low shrubby plant, which seldom rises above three feet high, and divides into many branches; the ends of the shoots are beset with green branching spines; the leaves are very clammy, especially in warm weather; these are long and narrow, and set on without any order. The flowers are produced singly at the ends of the shoots, which are yellow, and appear in July and August.

These three sorts are too tender to live in the open air in England, so are placed in the green-house in October, and may be treated in the same manner as Myrtles, and other hardy green-house plants, which require a large share of air in mild weather; and in the beginning of May the plants may be removed into the open air, and placed in a sheltered situation during the summer season. The second and third sorts must have plenty of water, being very thirsty plants.

These plants are propagated by cuttings, which may be planted in any of the summer months, upon a bed of light earth, and should be watered and shaded until they have taken root, which they will be in five or six weeks, when they must be taken up and planted in pots; for if they are suffered to stand long, they will make strong vigorous shoots, and will be difficult to transplant afterward, especially the first and second sorts; but there is not so much danger of the third, which is not so vigorous, nor so easy in taking root as the other. During the summer season the pots should be frequently removed, to prevent the plants from rooting through the holes in the bottom of the pots into the ground, which they are very apt to do when they continue long undisturbed, and then they shoot very luxuriantly; and, on their being removed, these shoots, and sometimes the whole plants, will decay.

The fourth sort grows naturally at the Cape of Good Hope; this hath a shrubby stalk about four feet high, which divides into many small branches, garnished with small oblong leaves which sit close to them, and in some of the upper branches they lie over each other like the scales of fish. The flowers come out

at the end of the branches, ſtanding ſingly upon foot-ſtalks, which are about an inch long; the half florets which compoſe the border or rays, are acute-pointed and ſpread open; the diſk is compoſed of florets which are barren. This ſort is propagated by cuttings, in the ſame manner as the other ſorts, and muſt be treated in the ſame way.

OSYRIS. Lin. Gen. Plant. 978. Caſia. Tourn. Inſt. R. H. 664. tab. 488. Poets Caſia.

The CHARACTERS are,

*It is male and female in different plants; the empalement of the flower is of one leaf, which is divided into three acute ſegments. The flower hath no petals, but thoſe on the male plants have three ſhort ſtamina; the female have a germen, which afterward changes to a globular berry, having a ſingle ſeed.*

We know but one SPECIES of this plant, viz.

OSYRIS (*Alba*) fruteſcens baccifera. C. B. P. *Shrubby berry-bearing Poets Caſia; and by ſome, red-berried ſhrubby Caſia.*

This is a very low ſhrub, ſeldom riſing above two feet high, having ligneous branches, which are garniſhed with long narrow leaves, of a bright colour. The flowers appear in June, which are of a yellowiſh colour, and are ſucceeded by berries, which at firſt are green, and afterward turn to a bright red colour, ſomewhat like thoſe of Aſparagus.

This plant grows wild in the ſouth of France, in Spain, and ſome parts of Italy, by the ſide of roads, as alſo between the rocks, but is with great difficulty tranſplanted into gardens; nor does it thrive after being removed, ſo that the only method to obtain this plant is, to ſow the berries where they are to remain. Theſe berries commonly remain a year in the ground before the plants appear, and ſometimes they will lie two or three years, ſo that the ground ſhould not be diſturbed under three years, if the plants do not come up ſooner. Theſe ſeeds muſt be procured from the places where the plants naturally grow, for thoſe which have been brought into gardens never produce any, and it is with great difficulty they are preſerved alive.

OTHONNA. Lin. Gen. Plant. 888. Doria. Raii Meth Plant. 33. Jacobæa. Tourn. Inſt. R. H. 485. tab. 276. Ragwort.

The CHARACTERS are,

*It hath a radiated flower, compoſed of hermaphrodite florets which form the diſk, and female half florets which form the rays or border; theſe are included in one common ſingle empalement of one leaf, cut into eight or ten ſegments. The hermaphrodite flowers are tubulous, indented at the top in five parts; the female half florets are ſtretched out like a tongue, and the point has three indentures which are reflexed. The hermaphrodite florets have ſhort hairy ſtamina, terminated by cylindrical ſummits, and an oblong germen ſupporting a ſlender ſtyle, crowned by a ſingle ſtigma. The female half florets have oblong germen with a ſlender ſtyle, crowned by a large bifid reflexed ſtigma. The hermaphrodite florets are ſeldom fruitful, but the female half florets have an oblong ſeed, which is ſometimes naked, and at others crowned with down; theſe ſit in the permanent empalement.*

This genus of plants is ranged in the fourth ſection of Linnæus's nineteenth claſs, which includes the plants with compound flowers, whoſe female flowers are fruitful and the hermaphrodite barren.

The SPECIES are,

1. OTHONNA (*Coronopifolia*) foliis infimis lanceolatis integerrimis, ſuperioribus ſinuato-dentatis. Hort. Cliff. 419. *Othonna with ſpear-ſhaped lower leaves which are entire, and the upper ones indented in ſinuſes.* Jacobæa Africana fruteſcens coronopi folio. Hort. Amſt. 2. p. 139. *Shrubby African Ragwort, with a Hartſhorn leaf.*
2. OTHONNA (*Calthoides*) foliis cuneiformibus integerrimis ſeſſilibus, caule fruticoſo procumbente, pedunculis longiſſimis. *Othonna with entire wedge-ſhaped leaves ſitting cloſe, a ſhrubby trailing ſtalk, and very long foot-ſtalks to the flowers.* Calthoides Africana, glaſti folio. Juſſ. *African Baſtard Marygold, with a Woad leaf.*
3. OTHONNA (*Pectinata*) foliis pinnatifidis, laciniis linearibus parallelis. Hort. Cliff. 419. *Othonna with wing-pointed leaves, whoſe ſegments are narrow and parallel.* Jacobæa Africana fruteſcens, foliis abſinthii umbelliferi incanis. Hort. Amſt. 2. p. 137. tab. 69. *Shrubby African Ragwort, with hoary leaves like thoſe of the umbelliferous Wormwood.*
4. OTHONNA (*Abrotanifolia*) foliis multifido-pinnatis linearibus. Flor. Leyd. Prod. 380. *Othonna with very narrow leaves, ending in many winged points.* Jacobæa Africana fruteſcens, foliis abrotani, ſc. crithmi major & minor. Volk. Norim. 225. *Shrubby African Ragwort, with a Southernwood or Samphire leaf.*
5. OTHONNA (*Bulboſa*) foliis ovato-cuneiformibus dentatis. Lin. Sp. Plant. 926. *Othonna with oval, wedge-ſhaped, indented leaves.* Solidago foliis oblongis dentatis glabris, floribus magnis umbellatis. Burm Afr. 164. tab. 59. *Woundwort with oblong, indented, ſmooth leaves, and large flowers growing in umbels.*

The firſt ſort grows naturally in Æthiopia. This riſes with a ſhrubby ſtalk four or five feet high, dividing into ſeveral branches, garniſhed with grayiſh leaves placed without order, thoſe on their lower part being narrow and entire, but the others are indented on the edges after the manner of Hartſhorn. The flowers are produced in looſe umbels at the end of the branches; they are yellow, and are ſucceeded by downy ſeeds.

The ſecond ſort was diſcovered by the late Dr. Shaw, growing naturally near Tunis in Africa, from whence he brought the ſeeds. This ſends out many ligneous ſtalks from the root, which ſpreads out on every ſide, declining toward the ground, garniſhed with grayiſh leaves, which are narrow at their baſe, enlarging upward, and are broad at their points, where they are rounded; theſe ſit cloſe to the ſtalks. The flowers are produced upon long, thick, ſucculent foot-ſtalks at the end of the branches; they are yellow; the rays are ſharp-pointed, and not much longer than the empalement; the diſk is large, and the florets are as long as the empalement; the ſeeds are crowned with a long down.

The third ſort grows naturally at the Cape of Good Hope, from whence the ſeeds were brought to Holland, and the plants were raiſed in the Amſterdam Garden in 1699. This riſes with a ſhrubby ſtalk about the thickneſs of a man's thumb, two or three feet high, which divide into many branches, covered with a hoary down, and garniſhed with hoary leaves about three inches long and one broad, cut into many narrow ſegments almoſt to the midrib; theſe ſegments are equal and parallel, and are indented at their ends into two or three points. The flowers are produced on long foot-ſtalks which ariſe from the wings of the ſtalks; toward the end of the branches they have large yellow rays, or borders, with a diſk of florets, and are ſucceeded by oblong purple ſeeds crowned with down.

The fourth ſort grows naturally on the hills near the Cape of Good Hope, and was raiſed from ſeed in the Amſterdam Garden. This hath a low, ſhrubby, branching ſtalk; the leaves are thick like thoſe of Samphire, and are cut into many narrow ſegments. The flowers are produced on ſhort foot-ſtalks at the end of the branches; they are yellow, and ſhaped like the other ſpecies of this genus, and are ſucceeded by brown ſeeds crowned with ſoft down.

The fifth ſort grows naturally at the Cape of Good Hope. This hath a thick ſhrubby ſtalk, dividing into ſeveral branches which riſe five or ſix feet high; the leaves come out in cluſters from one point, ſpread on every ſide; they are ſmooth, narrow at their baſe, enlarging gradually to their points, which are rounded; their edges are acutely indented like thoſe of the Holly. From the center of the leaves ariſe the foot-ſtalks of the flowers, which are five or ſix inches long, branching out into ſeveral ſmaller, each ſuſtaining one yellow radiated flower, ſhaped like the former; theſe are ſucceeded by ſlender ſeeds crowned with down.

The firſt, ſecond, third, fourth and fifth ſorts, are preſerved in green-houſes through the winter, but require

quire no artificial warmth; if these are protected from the frost it is sufficient, and in mild weather they must have a large share of free air. In the summer they must be placed abroad in a sheltered situation, among other hardy exotic plants, where they will add to the variety, and flower great part of the season. These may be all propagated by cuttings during the summer months, which should be planted upon an old hot-bed, and covered with glasses, shading them from the sun in the heat of the day. When these have taken root, they should be planted each into a separate pot filled with soft loamy earth, placing them in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain till autumn, treating them in the same way as the old plants.

The second sort will live in the open air if it is planted in a warm situation and a dry soil. Some of these plants have endured the open air for more than twenty years in the Chelsea Garden, without protection. This is easily propagated by cuttings, in the same way as the former.

OXALIS. Lin. Gen. Plant. 515. Oxys. Tourn. Inst. R. H. 88. tab. 19. Wood-sorrel.

The Characters are,

*The empalement of the flower is short, permanent, and cut into five acute segments. The flower is of one petal, cut into five obtuse indented segments almost to the bottom; it hath ten erect hairy stamina, terminated by roundish furrowed summits, and a germen with five angles, supporting five slender styles, crowned by obtuse stigmas. The germen afterward becomes a five-cornered capsule with five cells, which open longitudinally at the angles, containing roundish seeds, which are thrown out with an elasticity on the touch when ripe.*

This genus of plants is ranged in the fifth section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and five styles.

The Species are,

1. Oxalis (*Acetosella*) scapo unifloro, foliis ternatis, radice squamoso-articulata. Hort. Cliff. 175. *Wood-sorrel with one flower on a foot-stalk, trifoliate leaves, and a scaly jointed root.* Oxys flore albo. Tourn. Inst. 88. *Wood-sorrel with a white flower.*
2. Oxalis (*Corniculata*) caule ramoso diffuso, pedunculis umbelliferis. Hort. Cliff. 175. *Wood-sorrel with a branching diffused stalk, and umbellated foot-stalks.* Oxys lutea. J. B. *Yellow Wood-sorrel.*
3. Oxalis (*Stricta*) caule ramoso erecto, pedunculis umbelliferis. Flor. Virg. 161. *Wood-sorrel with a branching upright stalk, and umbellated foot-stalks.* Oxys lutea, Americana, erectior. Tourn. Inst. R. H. 88. *Upright, yellow, American Wood-sorrel.*
4. Oxalis (*Incarnata*) caule subramoso bulbifero, pedunculis unifloris, foliis passim verticillatis foliolis obcordatis. Lin. Sp. 622. *Wood-sorrel with branching stalks bearing bulbs, the leaves generally in whorls, and the small leaves heart-shaped.* Oxys bulbosa Æthiopica minor, folio cordato, flore ex albido purpurascente. Tourn. Inst. 89. *Smaller bulbous Ethiopian Wood-sorrel, with a heart-shaped leaf, and a purplish white flower.*
5. Oxalis (*Purpurea*) scapo unifloro, foliis ternatis, radice bulbosâ. Hort. Cliff. 175. *Wood-sorrel with a foot-stalk supporting one flower, trifoliate leaves, and a bulbous root.* Oxys bulbosa Africana, rotundifolia, caulibus & floribus purpureis amplis. Hort. Amst. 1. p. 41. tab. 21. *African bulbous Wood-sorrel, having a round leaf, and large purple stalks and flowers.*
6. Oxalis (*Pes-capræ*) scapo umbellifero, foliis ternatis bipartitis. Lin. Sp. Plant. 434. *Wood-sorrel with an umbelliferous stalk, and trifoliate leaves divided in two parts.* Oxalis bulbosa pentaphylla & hexaphylla, floribus magnis luteis & copiosis. Burm. Afr. 80. tab. 29. *Bulbous Wood-sorrel with five or six leaves, and large yellow flowers in abundance.*
7. Oxalis (*Frutescens*) caule erecto fruticoso, foliis ternatis, impari maximo. *Wood-sorrel with an upright shrubby stalk, and trifoliate leaves, the middle one being very large.* Oxys lutea frutescens, trifolii bituminosi facie. Plum. Cat. 2. *Yellow shrubby Wood-sorrel, with the appearance of bituminous Trefoil.*
8. Oxalis (*Barreleri*) caule ramoso erecto, pedunculis bifidis racemiferis. Lin. Sp. 624. *Wood-sorrel with an erect branching stalk, and branching bifid foot-stalks.* Trifolium acetosum Americanum, rubro flore. Barrel. Rar. 64. *Three-leaved American Wood-sorrel, with a red flower.*

The first sort grows naturally in moist shady woods, and close to hedges in most parts of England, so is but seldom admitted into gardens; though whoever is fond of acid herbs in sallads, can scarce find a more grateful acid in any other plant. The roots of this sort are composed of many scaly joints, which propagate in great plenty. The leaves arise immediately from the roots upon single long foot-stalks, are composed of three heart-shaped lobes, which meet in a center, where they join the foot-stalk; they are of a pale green and hairy; between these come out the flowers upon pretty long foot-stalks, each sustaining one large white flower of the open bell shape. These appear in April and May, and are succeeded by five-cornered oblong seed-vessels having five cells, inclosing small brownish seeds; when these are ripe, the seed-vessels burst open at the least touch, and cast out the seeds to a considerable distance. This is the sort which is directed for medicinal use in the dispensaries; but those people who supply the market with herbs, generally bring the third sort, which is now become common in the gardens; but this hath very little acid, so is unfit for the purposes of the other; but as it rises with an upright branching stalk, so it is soon gathered and tied up in bunches; whereas the leaves of the first grow singly from the root, and require more time in gathering. There is a variety of the first sort with a purplish flower, which grows naturally in the North of England, but, as it does not differ from it in any other respect, I have not enumerated it.

The second sort is an annual plant, which grows naturally in woods and shady places in Italy and Sicily. The root of this is long, slender, and fibrous; the stalks trail upon the ground, spreading out eight or nine inches wide on every side, dividing into small branches; the leaves stand upon pretty long foot-stalks, and are composed of three heart-shaped lobes, which have deeper indentures at their points than those of the first sort. The flowers are yellow, growing in form of an umbel, upon pretty long slender foot-stalks, arising from the side of the branches. These appear in June and July, and are succeeded by seed-vessels near an inch long, which open with an elasticity, and cast out the seeds.

The third sort grows naturally in Virginia and other parts of North America, from whence the seeds were formerly brought to Europe; but wherever this plant has been once introduced and suffered to ripen seeds, it has become a common weed. This is an annual plant, rising with a branching herbaceous stalk eight or nine inches high; the leaves stand upon very long foot-stalks, and are shaped like those of the second sort. The flowers are yellow, standing in a sort of umbel, upon long, slender, erect foot-stalks; the seed-vessels and seeds are like those of the second sort.

These three sorts require no particular culture; if the roots of the first sort are taken up and transplanted in a shady moist border, they will thrive and multiply exceedingly; and if they are kept clean from weeds, will require no other care. If the seeds of the other two sorts are sown in an open border, the plants will rise freely, and require no care; for if they are permitted to scatter their seeds, there will be a plentiful supply of the plants.

The fourth sort hath a roundish bulbous root, from which come out slender stalks about six inches high, which divide into branches by pairs, and from the divisions come out the foot-stalks of the leaves; these are long, slender, and sustain a trifoliate leaf composed of three small, roundish, heart-shaped lobes. The foot-stalks of the flowers are long, slender, and arise from the division of the stalks, each sustaining one purplish flower about the same size and shape as those of the first sort. This flowers in May, June, and July, and sometimes produces ripe seeds in England. It grows naturally at the Cape of Good Hope, so is too tender

to

to live through the winter in the open air in England; but if it is sheltered from hard frost under a common hot-bed frame in winter, it will require no other protection. It propagates in plenty by offsets from the root, as also by bulbs, which come out from the side of the stalks.

The fifth sort grows naturally at the Cape of Good Hope in such plenty, that the earth which came from thence, in which some plants were brought to England, was full of it. This hath a roundish bulbous root, covered with a brown skin, sending out strong fibres which strike deep into the ground; the leaves are trifoliate, composed of three roundish, large, hairy lobes, which are but little indented at the top; these stand upon long slender foot-stalks, which arise from a thick short stalk, which adheres to the root. The foot-stalks of the flowers arise between the leaves from the stalk, each supporting one large purple flower; these appear in January and February, but are rarely succeeded by seeds here, but the roots put out offsets in great plenty, whereby it is propagated. This sort will not thrive in winter in the open air here, so the roots should be planted in pots, which may be sheltered under a common frame in winter, where it may have as much free air as possible in mild weather, otherwise the leaves will draw up weak; for the leaves of this plant come out in October, and continue growing till May, when they begin to wither and decay. The roots may be transplanted any time after the leaves decay, till they begin to push out again.

The sixth sort is a native of the same country as the fifth; the roots of this are bulbous; the leaves stand upon long slender foot-stalks, which arise from a short stalk or head; they are composed of three lobes, which are for the most part divided into two parts almost to their base. The foot-stalks of the flowers are five or six inches long, sustaining several large yellow flowers ranged in form of an umbel. These appear in March, and are sometimes succeeded by seeds here. This sort requires the same treatment as the fifth.

The seventh sort was discovered by Plumier in some of the French colonies in America, and was since found growing plentifully at La Vera Cruz by the late Dr. Houstoun, who sent it to England. This rises with a shrubby stalk a foot and a half high, sending out several slender branches, which are garnished with trifoliate small leaves, composed of three oval lobes, the middle one being twice as large as the side ones. These are placed by pairs opposite, and sometimes by threes round the stalk, standing upon short foot-stalks. The foot-stalks of the flowers arise from the wings of the stalks, are near two inches long, each sustaining four or five yellow flowers, whose petals are not much longer than the empalement; each of these have a smaller foot-stalk which is crooked, so that the flowers hang downward.

This sort is much tenderer than either of the former, so requires to be placed in a stove kept to a moderate degree of warmth in winter. It is propagated by seeds, which must be sown in pots, and plunged into a moderate hot-bed; and when the plants come up, they should be each planted into a separate pot filled with light sandy earth, and plunged into a fresh hot-bed, shading them from the sun till they have taken new root; after which they must be treated in the same manner as other tender plants from the same country.

The eighth sort grows naturally in the Brazils; for in a tub of earth which came from thence, the plants came up in plenty. This seldom rises more than three or four inches high, having upright stalks; the leaves arec omposed of three pretty large hairy lobes, standing on long foot-stalks. The flowers rise immediately from the root, having foot-stalks the same length with those of the leaves; they are bifid, supporting two pretty large red flowers, which are succeeded by oblong capsules filled with brown seeds.

This sort may be propagated by offsets from the root, or by seeds, and requires the same protection as the sixth sort.

OX-EYE. See Buphthalmum.

OXYACANTHA. See Berberis.

OXYS. See Oxalis.

# P.



PADUS. Lin. Gen. Edit. prior. 476. Edit. 5. Prunus. 546. Cerasus & Laurocerasus. Tourn. Inst. R. H. 625, 627. tab. 401, 403. The Bird-cherry, or Cherry Laurel.

The Characters are,

*The empalement of the flower is bell-shaped, of one leaf, indented in five parts at the brim, which spread open. The flower hath five large roundish petals, which spread open, and are inserted in the empalement. It hath from twenty to thirty awl-shaped stamina, which are inserted in the empalement, terminated by roundish summits, and a roundish germen supporting a slender style, crowned by an entire obtuse stigma. The germen afterward becomes a roundish fruit, inclosing an oval-pointed nut having rough furrows.*

This genus of plants was by Dr. Linnæus, in the former editions of his Method, separated from the Cherries, to which they had been before joined, because the furrows of the nuts in this genus were obtuse, whereas those of the Cherries are acute; but there is a more obvious distinction between them, which is, the flowers of the Padus are ranged in a long bunch (or racemus) and those of the Cherry have their foot-stalks arising from one joint; but in the last edition of his Method, he has joined this genus, the Cherry and Apricot, to the Plumb, making them only species of the same genus; in which, I think, he has exceeded the boundaries of nature; for although the Padus and Cerasus may with propriety be joined in the same genus, yet these ought by no means to be joined to the Prunus; for it is well known, that the Cherry will not grow by grafting or budding upon the Plumb stock, nor the Plumb upon Cherry stocks, though there are no instances of two trees of the same genus, which will not grow upon each other, however different their exterior appearance may be.

It is ranged in the first section of Linnæus's twelfth class, which includes those plants whose flowers have from twenty to thirty stamina, which are either inserted in the empalement or petals of the flower, and but one style.

The Species are,

1. Padus (*Avium*) glandulis duobus, basi foliorum subjectis. Hort. Cliff. 185. *Bird-cherry with two glands at the base of the leaves.* Cerasus racemosa, sylvestris, fructu non eduli. C. B. P. 451. *Branching wild Cherry with a fruit not eatable.*
2. Padus (*Rubra*) foliis lanceolato-ovatis deciduus, petiolis biglandulosis. tab. 196. fol. 2. *Bird-cherry with spear-shaped, oval, deciduous leaves, whose foot-stalks have two glands.* Cerasus racemosa sylvestris, fructu non eduli

eduli rubro. H. R. Par. *Branching wild Bird-cherry with a red fruit, which is not eatable, and commonly called by the gardeners, Cornish Cherry.*

3. Padus (*Virginiana*) foliis oblongo-ovatis serratis acuminatis deciduis, basi antice glandulosis. *Bird-cherry with oblong, oval, sawed, acute-pointed, deciduous leaves, and glands on the fore part of the foot-stalk.* Cerasi similis arbuscula Mariana, padi folio, flore albo parvo racemoso. Pluk. Mant. 43. Catesb. Car. 1. p. 28. *American Bird-cherry.*

4. Padus (*Laurocerasus*) foliis sempervirentibus lanceolato-ovatis. Hort. Cliff. 42. *Bird-cherry with evergreen, spear-shaped, oval leaves.* Laurocerasus. Clus. Hist. 1. p. 4. *The common Laurel.*

5. Padus (*Lusitanica*) foliis oblongo-ovatis sempervirentibus eglandulosis. *Bird-cherry with oblong, oval, evergreen leaves, having glands.* Laurocerasus Lusitanica minor. Tourn. Inst. 628. *Smaller Portugal Laurel, called Asarero by the Portuguese.*

6. Padus (*Caroliniana*) foliis lanceolatis acutè denticulatis sempervirentibus. *Evergreen Bird-cherry with spear-shaped leaves, having small acute indentures, called in America Bastard Mahogany.*

The first sort grows naturally in the hedges in Yorkshire, and many of the northern counties in England, as also in some few places near London, but it is propagated as a flowering-shrub in the nursery-gardens for sale. This rises with several woody stalks to the height of ten or twelve feet, which will grow to have stems nine or ten inches diameter, if they are permitted to stand; but as the fashions of gardens have been frequently altering for fifty or sixty years past, so there are few places where any of the ornamental flowering trees have been suffered to remain. The branches of this tree grow wide and scattering; they are covered with a purplish bark, and garnished with oval spear-shaped leaves placed alternate, which are slightly sawed on their edges, and have two small protuberances or glands at their base. The flowers are produced in long loose bunches from the side of the branches; they have five roundish white petals, which are much smaller than those of the Cherry, and are inserted in the border of the empalement; and within these are a great number of stamina, which also are inserted in the empalement. The flowers stand each upon a short foot-stalk, and are ranged alternately along the principal foot-stalk; they have a strong scent, which is very disagreeable to most persons. These flowers appear in May, and are succeeded by small roundish fruit, which are first green, afterward turn red, and when ripe, are black, inclosing a roundish furrowed stone or nut, which ripens in August.

The second sort grows naturally in Armenia, from whence I have received the seeds; but it has been many years ago propagated in the nursery-gardens about London, where it is generally called Cornish-cherry. This sort has been often confounded with the first; many of the late writers in botany have supposed it was the same species, but I have raised both sorts from seeds, and have always found the young plants to retain their difference. This rises with a strait upright stem more than twenty feet high; the branches are shorter, and grow closer together than those of the first, so naturally form regular heads; the leaves of this are shorter and broader than those of the other, and are not so rough; the flowers grow in closer shorter spikes, which stand more erect; the fruit is larger, and red when ripe. This flowers a little after the first sort.

The third sort grows naturally in Virginia, and other parts of North America. This rises with a thick stem from ten to thirty feet high, dividing into many branches, which have a dark purple bark, and are garnished with oval leaves placed alternately on short foot-stalks; they are of a lucid green, and slightly sawed on their edges, continuing in verdure as late in the autumn as any of the deciduous trees. The flowers come out in bunches like those of the second sort, and are succeeded by larger fruit, which is black when ripe, and is soon devoured by the birds. The wood of this tree is beautifully veined with black and white, and will polish very smooth, so is frequently used for cabinet work; as is also the wood of the first sort, which is much used in France, where it is called, *Bois de Sainte-Lucie.*

The fourth sort is the common Laurel, which is now so well known as to need no description. This grows naturally about Trebisond, near the Black Sea, and was brought to Europe about the year 1576, but is now become very common, especially in the warmer parts of Europe.

The fifth sort was brought to England from Portugal, but whether it is a native of that country, or was introduced there from some other country, is hard to determine. The Portugueze call it Aseraro, or Azerero. This was supposed to have been but a low evergreen shrub, but by experience we find, that when it is in a proper soil, it will grow to a large size. There are at present some of the trees whose trunks are more than a foot diameter, and twelve or sixteen feet high, which are not of many years standing, and are well furnished with branches, which when young have a reddish bark; the leaves are shorter than those of the common Laurel, approaching nearer to an oval form; they are of the same consistence, and of a lucid green, which mixing with the red branches, make a beautiful appearance. The flowers are produced in long loose spikes from the side of the branches; they are white, and shaped like those of the common Laurel, appearing in June, and are succeeded by oval berries smaller than those of the common Laurel; they are first green, afterward red, and when ripe are black, inclosing a stone like the Cherry.

The seeds of the sixth sort were sent from Carolina, by the title of Bastard Mahogany, from the colour of the wood, which is somewhat like Mahogony. This seems to be little more than a shrub, if we may judge from its growth here; the stalk does not rise more than three feet high, but sends out lateral branches, which spreaon every side, covered with a brown bark, and garnished with spear-shaped leaves near two inches long, and three quarters of an inch broad, with small acute indentures on the edges; they stand alternately upon very short foot-stalks, and are of a lucid green, continuing their verdure all the year. This has not as yet flowered in England, so I can give no account of it; but by the seeds and description which I received of its flowers, it belongs to this genus.

This plant will live in the open air here, if it is planted in a warm situation, and sheltered in severe frost, to which, if they are exposed, often destroys them, especially while the plants are young; but when they have acquired strength, there is no doubt of their thriving very well in the open ground in sheltered situations. It may be propagated in the same manner as the Portugal Laurel from the berries; and if the branches are laid down they will take root, but the cuttings will not grow, so far as I have experienced.

The three first sorts are easily propagated, either by the seeds or layers; when they are propagated by the seeds they should be sown in the autumn, for if they are kept out of the ground till spring, they seldom grow till the second year. These may be sown upon a bed or border of good ground, in the same way as the Cherry-stones which are designed for stocks; and the young plants may be treated in the same manner, planting them out in a nursery, where they may stand two years to get strength, and then they may be transplanted to the places where they are to remain. They are usually intermixed with other flowering shrubs, in wilderness work, where they add to the variety.

If they are propagated by layers, the young shoots should be laid down in the autumn, which will have good roots by that time twelvemonth, when they may be separated from the old plants, and transplanted into a nursery for a year or two to get strength, and may then be removed to the places where they are to grow.

The third sort will grow to be a very large tree when it is planted in a moist soil, but in dry ground it rarely rises to be more than twenty feet high. There have been some plants of late years raised from seeds which came from Carolina, which have all the appearance of the third sort, but are of much humbler growth; whether this may proceed from their being brought from a warmer climate, so do not agree with the cold of our winters so well as that, or whether they are a different species from that, I cannot yet determine, as they have not produced fruit here.

The Laurel may be easily propagated by planting of the cuttings; the best time for doing this is in September, as soon as the autumnal rains fall to moisten the ground; the cuttings must be the same year's shoots, and if they have a small part of the former year's wood to their bottom, they will more certainly succeed, and form better roots. These should be planted in a soft loamy soil about six inches deep, pressing the earth close to them. If these are properly planted, and the ground is good, there will few of the cuttings fail; and if they are kept clean from weeds the following summer, they will have made good shoots by the following autumn, when they may be transplanted into a nursery, where they may grow two years to get strength, and then should be removed to the places where they are to remain. These plants were formerly kept in pots and tubs, and preserved in green-houses in winter; but afterward they were planted against warm walls, to preserve them, being frequently injured by severe frost. After this the plants were trained into pyramids and globes, and constantly kept sheered; by which the broad leaves were generally cut in the middle, which rendered the plants very unsightly. Of late years they have been more properly disposed in gardens, by planting them to border woods, and the sides of wilderness quarters; for which purpose we have but few plants so well adapted, for it will grow under the drip of trees, in shade or sun; and the branches will spread to the ground, so as to form a thicket; and the leaves being large, and having a fine glossy green colour, they set off the woods and other plantations in winter, when the other trees have cast their leaves; and in summer they make a good contrast with the green of the other trees. These trees are sometimes injured in very severe winters, especially where they stand single and are much exposed; but where they grow in thickets, and are screened by other trees, they are seldom much hurt; for in those places it is only the young tender shoots which are injured, and there will be new shoots produced immediately below these to supply their place, so that in one year the damage will be repaired. But whenever such severe winters happen, these trees should not be cut or pruned till after the following Midsummer; by which time it will appear what branches are dead, which may then be cut away, to the places where the new shoots are produced; for by hastily cutting these trees in the spring, the drying winds have free ingress to the branches, whereby the shoots suffer as much, if not more, than they had done by the frost.

These trees are also very ornamental, when they are mixed with other evergreen trees, in forming of thickets, or to shut out the appearance of disagreeable objects; for the leaves being very large, make a very good blind, and are equally useful for screening from winds; so that when they are planted between flowering-shrubs, they may be trained so as to fill up the vacancies in the middle of such plantations; and will answer the purpose of screening in the winter, and shutting out the view through the shrubs in all seasons: there are also many other purposes to which this tree may be applied, so as to render it very ornamental.

In warmer countries this tree will grow to a large size, so that in some parts of Italy there are large woods of them; but we cannot hope to have them grow to so large stems in England; for should these trees be pruned up, in order to form them into stems, the frost would then become much more hurtful to them than in the manner they usually grow, with their branches to the ground: however, if the trees are planted pretty close together in large thickets, and permitted to grow rude, they will defend each other from the frost, and they will grow to a considerable height: an instance of which is now in that noble plantation of evergreen trees, made by his Grace the Duke of Bedford at Wooburn-abbey, where there is a considerable hill covered entirely with Laurels; and in the other parts of the same plantation, there are great numbers of these intermixed with the other evergreen trees, where they are already grown to a considerable size, and make a noble appearance.

There are some persons who propagate these trees from their berries, which is certainly the best way to obtain good plants; for those which come from seeds have a disposition to an upright growth, whereas almost all those which are raised from cuttings or layers, incline more to an horizontal growth, and produce a greater number of lateral branches. When any person is desirous to propagate this tree by seeds, the berries must be guarded from the birds, otherwise they will devour them before they are perfectly ripe, which is seldom earlier than the latter end of September, or the beginning of October, for they should hang until the outer pulp is quite black. When these berries are gathered, they should be sown soon after; for when they are kept out of the ground till spring, they frequently miscarry; and there will be no hazard in sowing them in the autumn, provided they are put in a dry soil; and if the winter should prove severe, the bed in which they are sown should be covered with rotten tan, straw, Peas-haulm, or any light covering, to prevent the frost from penetrating of the ground. The best way will be to sow the berries in rows at about six inches distance, and one inch asunder in the rows; if drills are made about three inches deep, and the berries scattered in them, and the earth drawn over them, it will be a very good method. The following spring the plants will appear, when they should be kept clean from weeds; and if the season should prove dry, if they are duly watered, the plants will make so good progress as to be fit for transplanting the following autumn, when they should be carefully taken up, and planted in a nursery, placing them in rows at three feet asunder, and the plants one foot distance in the rows. In this nursery they may remain two years, by which time they will be fit to transplant where they are designed to remain.

The best season for transplanting these plants is in the autumn, as soon as the rain has prepared the ground for planting; for although they often grow when removed in the spring, yet those do not take so well, nor make so good progress as those which are removed in the autumn, especially if the plants are taken from a light soil, which generally falls away from their roots; but if they are taken up with balls of earth to their roots, and removed but a small distance, there will be no danger of transplanting them in the spring, provided it is done before they begin to shoot; for as the plants will shoot very early in the spring, so if they are removed after thay have shot, the shoots will decay, and many times the plants entirely fail.

There are some persons who, of late, have banished these plants from their gardens, as supposing them possessed of a poisonous quality, because the distilled water has proved so in many instances; but however the distilled water may have been found destructive to animals, yet from numberless experiments which have been made both of the leaves and fruit, it hath not appeared that there is the least hurtful quality in either; so that the whole must be owing to the oil, which may be carried over in distillation.

The berries have been long used to put into brandy, to make a sort of ratafia, and the leaves have also been put into custards, to give them an agreeable flavour; and although these have been for many years much used, yet there hath been no one instance of their

their having done the least injury; and as to the berries, I have known them eaten in great quantities without prejudice.

There are some persons who have grafted the Laurel upon Cherry stocks, with design to enlarge the trees, but although they will take very well upon each other, yet they seldom make much progress when either the Laurel is grafted on the Cherry, or the Cherry upon the Laurel; so that it is only a thing of curiosity, attended with no real use: and I would recommend to persons who have this curiosity, to graft the Laurel upon the Cornish Cherry, rather than any other sort of stock, because the graft will unite better with this; and as it is a regular tree and grows large, so it will better answer the purpose of producing large trees.

The Portugal Laurel may be propagated in the same way as the common Laurel, either by cuttings, layers, or seeds. If the cuttings are planted at the same season, and in the same way as hath been directed for the common Laurel, they will take root very freely; or if the young branches are laid in the autumn, they will take root in one year, and may then be removed into a nursery, where they may grow a year or two get strength, and then transplanted where they are to remain.

But although both these methods are very expeditious for the propagating these plants, yet I would recommend the raising them from the berries, especially where they are designed for tall standards; for the plants which are propagated by cuttings and layers, put out more lateral branches and become bushy, but are not so well inclined to grow upright, as those which come from seeds: and as there are now many trees in the English gardens which produce plenty of berries every year, so if they are guarded from birds till they are ripe, there may be a supply of them sufficient to raise plants enough without propagating them any other way. These berries must be sown in the autumn, and treated in the same way as the common Laurel.

This tree delights in a gentle loamy soil, which is not too wet nor over dry, though it will grow upon almost any soil: but the plants do not make so great progress, nor appear so beautiful, when planted in a very dry soil, or in ground that is too wet. The time of transplanting this, is the same as for the common Laurel.

This tree is much hardier than the common Laurel, for in the severe frost of the year 1740, when great numbers of Laurels were entirely killed, and most of them lost their verdure, this remained unhurt in perfect verdure, which renders it more valuable; and as by the appearance of some trees now growing in the gardens, they seem as if they will grow to a large size, so it is likely to be one of the most ornamental evergreens we have.

PÆONIA. Tourn. Inst. R. H. 273. tab. 146. Lin. Gen. Plant. 600. [so called from Paeon the physician, because he is said to have cured Pluto, when wounded by Hercules, with this herb.] The Peony; in French, *Pivoine.*

The Characters are,

*The flower has a permanent empalement, composed of five concave reflexed leaves, unequal in size and position. The flower hath five large, roundish, concave petals which spread open, and a great number of short hairy stamina, terminated by large, oblong, four-cornered summits, with two, three, or four oval, erect, hairy germen in the center, having no styles, but have oblong, compressed, obtuse, coloured stigmas. The germen afterward become so many oval, oblong, reflexed, hairy capsules, having one cell, open longitudinally, containing several oval, shining, coloured seeds, fixed to the furrow.*

This genus of plants is ranged in the second section of Linnæus's thirteenth class, which contains those plants whose flowers have many stamina and two germen or styles.

The Species are,

1. Pæonia (*Mascula*) foliis lobatis ex ovato-lanceolatis. Haller. Helv. 311. *Peony with lobated leaves which are oval and spear-shaped.* Pæonia folio nigricante splendido, quæ mas. C. B. P. 323. *Peony with dark shining leaves, otherwise male Peony.*
2. Pæonia (*Fœminea*) foliis difformiter lobatis. Haller. Helvet. 311. *Peony with difformed lobated leaves.* Pæonia communis, vel fœmina. C. B. P. 323. *Common or female Peony.*
3. Pæonia (*Peregrina*) foliis difformiter lobatis, lobis incisis, petalis florum rotundioribus. *Peony with difformed lobated leaves which are cut, and rounder petals to the flower.* Pæonia peregrina, flore saturatè rubente. C. B. P. 324. *Foreign Peony with a deep red flower.*
4. Pæonia (*Hirsuta*) foliis lobatis, lobis lanceolatis integerrimis. *Peony with lobated leaves, whose lobes are spear-shaped and entire.* Pæonia fœmina flore pleno rubro majore. C. B. P. 324. *Female Peony with a larger double red flower.*
5. Pæonia (*Tartarica*) foliis difformiter lobatis pubescentibus. Tab. 199. *Peony with difformed lobated leaves, which are downy.*
6. Pæonia (*Lusitanica*) foliis lobatis, lobis ovatis infernè incanis. *Peony with lobated leaves, whose lobes are oval and hoary on their under side.* Pæonia Lusitanica, flore simplici odoro. Juss. *Peony of Portugal with a single sweet flower.*

The first sort here enumerated, is the common male Peony, which grows naturally in the woods on the Helvetian mountains. The root of this is composed of several oblong knobs, shaped like the dugs of a cow, which hang by strings, fastened to the main head; the stalks rise about two feet and a half high, which are garnished with leaves composed of several oval lobes, some of which are cut into two or three segments; they are of a lucid green on their upper side, but are hoary on their under. The stalks are terminated by large single flowers, composed of five or six large roundish red petals, inclosing a great number of stamina, terminated by oblong yellow summits. In the center is situated two, three, or sometimes five germen, which join together at their base; they are covered with a whitish hairy down; these afterward spread asunder, and open longitudinally, exposing the roundish seeds, which are first red, then purple, and when perfectly ripe turn black. The flowers appear in May, and the seeds ripen in the autumn.

There is one variety of this with pale, and another with white flowers, as also one whose leaves have larger lobes; but as these are generally supposed to be only seminal variations, so I have not enumerated them here.

The second sort is called the female Peony; the roots of this are composed of several roundish thick knobs or tubers, which hang below each other, fastened with strings; the stalks are green, and rise about the same height as the former; these are garnished with leaves, composed of several unequal lobes, which are variously cut into many segments; they are of a paler green than those of the first, and are hairy on their under side; the flowers are smaller, and of a deeper purple colour. It flowers at the same time as the first.

There are several varieties of this sort with double flowers, which are cultivated in the English gardens; these differ in the size and colour of their flowers, but are supposed to have been accidentally obtained from seeds.

The third sort grows naturally in the Levant; the roots of this are composed of roundish knobs like those of the second sort, as are also the leaves, but are of a thicker substance; the stalks do not rise so high, and the flowers have a greater number of petals. This flowers a little after the other. The large double purple Peony, I suspect is a variety of this sort.

The fourth sort hath roots like the second; the stalks are taller, and of a purplish colour; the leaves are much longer, the lobes are spear-shaped and entire; the flowers are large, and of a deep red colour. This flowers at the same time as the two first sorts.

The feeds of the fifth fort were brought from the Levant, and from them there were plants raifed, which produced fingle, and others with double flowers, of the fame fhape, fize, and colour. The roots of thefe are compofed of oblong flefhy tubers or knobs; they are of a pale colour, and hang by ftrings like the other fpecies. The ftalks rife about two feet high, which are of a pale green, and are garnifhed with leaves compofed of feveral lobes, which are irregular in fhape and fize, fome of them having but fix, and others have eight or ten fpear-fhaped lobes; thefe are fome cut into two, fome three fegments, and others are entire; they are of a pale green, and are downy on their under fide. The ftalks are terminated by one flower of a bright red colour, a little lefs than that of the female Peony, and have fewer petals; they have a great number of ftamina, and fometimes two, at others three germen, like thofe of the female Peony, but fhorter and whiter. This flowers a little later than the common Peony.

The feeds of the fixth fort were fent to the Chelfea Garden by Dr. de Juffieu, who brought them from Portugal, where the plants grow naturally. The root of this fort is not compofed of roundifh tubers or knobs, but hath two or three long, taper, forked fangs like fingers. The ftalk rifes little more than a foot high, and is garnifhed with leaves compofed of three or four oval lobes, of a pale colour on their upper fide, and hoary on their under; the ftalk is terminated by a fingle flower, which is of a bright red colour, fmaller than either of the former, and an agreeable fweet fcent. This flowers about the fame time with the common fort.

The firft of thefe forts is chiefly propagated for the roots, which are ufed in medicine; for the flowers being fingle, do not afford near fo much pleafure as thofe with double flowers, nor will they abide near fo long in beauty.

All the forts with double flowers are preferved in curious gardens for the beauty of their flowers, which, when intermixed with other large growing plants in the borders of large gardens, will add to the variety; and the flowers are very ornamental in bafons or flower-pots, when placed in rooms.

They are all extremely hardy, and will grow in almoft any foil or fituation, which renders them more valuable; for they will thrive under the fhade of trees, and in fuch places they will continue much longer in beauty.

They are propagated by parting their roots, which multiply very faft. The beft feafon for tranfplanting them is toward the latter end of Auguft, or the beginning of September; for if they are removed after their roots have fhot out new fibres, they feldom flower ftrong the fucceeding fummer.

In parting thefe roots, you fhould always obferve to preferve a bud upon the crown of each offfet, otherwife they will come to nothing; nor fhould you divide the roots too fmall (efpecially if you have regard to their blowing the following year) for when their offsets are weak, they many times do not flower the fucceeding fummer, or at leaft produce but one flower upon each root: but where you would multiply them in quantities, you may divide them as fmall as you pleafe, provided there be a bud to each offset; but then they fhould be planted in a nurfery-bed for a feafon or two to get ftrength, before they are placed in the flower-garden.

The fingle forts may be propagated from feeds (which they generally produce in large quantities, where the flowers are permitted to remain) which fhould be fown in the autumn foon after they are ripe, upon a bed of light frefh earth, covering them over about half an inch thick with the fame light earth. The fpring following the plants will come up, when they fhould be carefully cleared from weeds, and in very dry weather refrefhed with water, which will greatly forward their growth. In this bed they fhould remain two years before they are tranfplanted, obferving in autumn, when the leaves are decayed, to fpread fome frefh rich earth over the beds about an inch thick, and conftantly to keep them clear from weeds. When you tranfplant them, (which fhould be done in September) you muft prepare fome beds of frefh light earth, which fhould be dug, and well cleaned from the roots of all noxious weeds; then plant the roots therein fix inches afunder, and about three inches deep. In thefe beds they may remain until they flower, after which they may be tranfplanted where you defign they fhould grow. It is very probable there may be fome varieties obtained from the feeds of thefe plants, as is common in moft other flowers; fo that thofe which produce beautiful flowers, may be placed in the flower-garden, but fuch as continue fingle or ill coloured, may be planted in beds to propagate for medicinal ufe.

The Portugal Peony may alfo be propagated either by feeds, or parting the roots, in the fame manner as the other forts, but fhould have a lighter foil and a warmer fituation. The flowers of this kind are fingle, but fmell very fweet, which renders it worthy of a place in every good garden.

PALIURUS. Tourn. Inft. R. H. 616. tab. 387. Rhamnus. Lin. Gen. Plant. 235. Chrift's Thorn.

The Characters are,

*The flower has no empalement. It hath five petals which are ranged circularly, and end in acute points. It hath five ftamina, which are inferted in the fcales under the petals, terminated by fmall fummits, and a roundifh trifid germen, fupporting three fhort ftyles, crowned by obtufe ftigmas. The germen afterward becomes a buckler-fhaped nut divided into three cells, each containing one feed.*

This genus of plants is by Dr. Linnæus joined to the Rhamnus, which is ranged in the firft fection of his fifth clafs, in which are placed thofe plants whofe flowers have five ftamina and one ftyle; but as the flowers of this have three ftyles, fo it fhould be ranged in his third fection.

We know but one Species of this genus, viz.

Paliurus (*Spina Chrifti.*) Dod. Pempt. 848. *Chrift's Thorn.* Rhamnus aculeis geminatis, inferiore reflexo, floribus trigynis. Hort. Cliff. 69. *Prickly Buckthorn with double thorns, the under ones of which are reflexed, and flowers containing three germina.*

This plant grows naturally in the hedges in Paleftine; it rifes with a pliant fhrubby ftalk to the height of eight or ten feet, fending out many weak flender branches, garnifhed with oval leaves placed alternately, ftanding upon foot-ftalks near one inch long; thefe have three longitudinal veins, and are of a pale green. The flowers come out at the wings of the ftalk in clufters, almoft the length of the young branches; they are of a greenifh yellow colour, and appear in June, and are fucceeded by broad, roundifh, buckler-fhaped feed-veffels, which have borders like the brims of a hat, the foot-ftalks being faftened to the middle; thefe have three cells, each containing one feed.

This is by many perfons fuppofed to be the plant, from which the crown of thorns which was put upon the head of our Saviour, was compofed; the truth of which is fupported by many travellers of credit, who affirm that this is one of the moft common fhrubs in the country of Judæa; and from the pliablenefs of its branches, which may eafily be wrought into any figure, it may afford a probability.

This fhrub grows wild in moft parts of the Levant, as alfo in Italy, Spain, Portugal, and the fouth of France, efpecially near Montpelier, from whence their feeds may be procured, for they do not ripen in England. Thefe feeds fhould be fown as foon as poffible after they arrive, on a bed of light earth, and the plants will come up the following fpring; but when the feeds are kept out of the ground till fpring, they will not come up till the next year, and very often fail; therefore it is much the beft way to fow them in the autumn. Thefe feedling plants may be tranfplanted the following feafon into a nurfery to get ftrength, before they are planted out for good.

It may also be propagated by laying down its tender branches in the spring of the year, which if carefully supplied with water in dry weather, will take root in a year's time, and may then be taken off from the old plant, and transplanted where they are to remain.

The best time for transplanting this plant is in autumn, soon after the leaves decay, or the beginning of April, just before it begins to shoot, observing to lay some mulch upon the ground about their roots to prevent them from drying, as also to refresh them now and then with a little water until they have taken fresh root, after which they will require but very little care. They are very hardy, and will grow to be ten or twelve feet high, if planted in a dry soil and a warm situation. There is little beauty in this plant, but it is kept in gardens as a curiosity.

PALMA. Plum. Gen. 1. Raii Meth. Plant. 135. The Palm-tree.

The CHARACTERS are,

*It hath male and female flowers in some species on the same plant, and in others on different plants; the empalement of the male flowers are divided into three parts. The flowers of some species have three petals, and six stamina terminated by oblong summits, with an obsolete germen, supporting three short styles, crowned by acute stigmas; these are barren. The female flowers have a common sheath, but no empalement; they have six short petals, and an oval germen sitting upon an awl-shaped style, crowned by a trifid stigma. The germen afterward becomes a fruit of various forms and sizes in different species.*

Mr. Ray ranges this genus in the front of his trees and shrubs, which have male flowers at remote distances from the fruit, sometimes on the same, and at others on different trees. Dr. Linnæus has separated the species under the following genera, Chamærops, Borassus, Corypha, Cocos, Phœnix, Areca, and Elate, ranging them in his Appendix.

The SPECIES are,

1. PALMA (*Dactylifera*) frondibus pinnatis, foliolis angustioribus aculeis terminalibus. *Palm-tree with winged leaves, whose lobes are narrow, terminated by spines.* Palma major. C. B. P. 506. *The greater Palm or Date-tree.*
2. PALMA (*Cocos*) frondibus pinnatis, foliolis replicatis, spadicibus alaribus, fructu maximo anguloso. *Palm-tree with winged leaves, whose lobes are folded back, foot-stalks proceeding from the sides of the branches, and a large angular fruit.* Palma Indica, coccifera, angulosa. C. B. P. 502. *Indian Palm-tree having an angular fruit, commonly called Cocoa-nut.*
3. PALMA (*Spinosa*) frondibus pinnatis, ubique aculeatis, aculeis nigricantibus fructu majore. *Palm-tree with winged leaves, which are every where armed with black spines, and bearing a larger fruit.* Palma tota spinosa major, fructu pruniformi. Sloan. Cat. Jam. 177. *Greater Palm-tree which is all over prickly, and a Plum-shaped fruit, commonly called great Macaw-tree.*
4. PALMA (*Altissima*) frondibus pinnatis, caudice æquali, fructu minore. *Palm-tree with winged leaves, an equal trunk, and a smaller fruit.* Palma altissima non spinosa, fructu pruniformi minore racemoso sparso. Sloan. Cat. Jam. 176. *The tallest Palm-tree having no spines, and a smaller Plum-shaped fruit, growing in long bunches scatteringly, commonly called the Cabbage-tree.*
5. PALMA (*Gracili*) frondibus pinnatis, caudice tereti aculeato, fructu minore. *Palm-tree with winged leaves, a taper prickly stalk, and a smaller fruit.* Palma spinosa minor, caudice gracili, fructu pruniformi, minimo rubro. Sloan. Cat. Jam. 178. *Smaller prickly Palm-tree with a slender stalk, and the least, red, Plum-shaped fruit, called Prickly Pole.*
6. PALMA (*Oleosa*) frondibus pinnatis, foliolis linearibus planis, stipitibus spinosis. *Palm-tree with winged leaves, having narrow plain lobes, and prickly midribs.* Palma foliorum pediculis spinosis, fructu pruniformi luteo oleoso. Sloan. Cat. Jam. 175. *Palm-tree with prickly foot-stalks to the leaves, and a yellow, Plum-shaped, oily fruit, commonly called oily Palm-tree.*
7. PALMA (*Prunifera*) frondibus pinnato-palmatis plicatis, caudice squamato. *Palm-tree with hand-shaped winged leaves which are plaited, and a scaly stalk.* Palma Brasiliensis prunifera, folio plicatili seu flabelliformi, caudici squamato. Raii Hist. 1368. *Plum-bearing Palm-tree of the Brasils, with a plaited or fan-shaped leaf, and a scaly stalk, called Palmetto or Thatch.*
8. PALMA (*Polypodifolia*) frondibus pinnatis, foliolis lineari-lanceolatis, petiolis spinosis. Hort. Cliff. 482. *Palm-tree with winged leaves, whose lobes are linearly spear-shaped, and prickly foot-stalks.* Palma Japonica, spinosis pediculis, polypodii folio. Boerh. Ind. alt. 2. 170. *Palm-tree of Japan with prickly foot-stalks, and a Polypody leaf, or the Sago-tree.*
9. PALMA (*Pumila*) fructu clavato polypyreno. Trew. Dec. tab. 26. *Palm-tree with a club-shaped fruit containing many seeds.* Palma Americana foliis polygonati brevioribus, læviter serratis, & nonnihil spinosis, trunco crasso. Pluk. Phyt. tab. 103. fig. 2. & tab. 309. fig. 5. *American Palm-tree, with shorter Solomon's Seal leaves which are lightly sawed and somewhat prickly, with a thick trunk.*
10. PALMA (*Americana*) frondibus pinnatis, foliolis lanceolatis plicatis geminatis sparsis. *Palm-tree with winged leaves, whose lobes are spear-shaped, plaited, and come out by pairs from one point, standing thinly along the midrib.* Palma altissima, non spinosa, fructu oblongo. Houst. MSS. *Tallest Palm-tree having no prickles, and bearing an oblong fruit.*
11. PALMA (*Draco*) foliis simplicibus ensiformibus integerrimis flaccidis. *Palm-tree with single, sword-shaped, entire flaccid leaves.* Palma prunifera foliis yuccæ, fructu in racemis congestis cerasi formi, duro, cinereo, pisi magnitudine, cujus lacryma sanguis draconis est dicta. Com. Cat. Amst. *Plum-bearing Palm-tree, with leaves like those of the Yucca, and fruit gathered in long bunches, which are Cherry-shaped, Ash-coloured, hard, and the size of Peas, whose tears are called Dragons Blood, commonly called Dragon-tree.*

The first sort here mentioned is the common Date-tree, which grows plentifully in Africa, and some of the eastern countries, from whence the fruit is brought to England. This rises to a great height in the warm countries; the stalks are generally full of rugged knots, which are the vestiges of the decayed leaves, for the trunks of these trees are not solid like other trees, but the center is filled with pith, round which is a tough bark full of strong fibres while young, but as the trees grow old, so this bark hardens and becomes ligneous; to this bark the leaves are closely joined, which in the center rise erect, being closely folded or plaited together, but after they are advanced above the vagina which surrounds them, they expand very wide on every side the stem, and, as the older leaves decay, the stalk advances in height. The leaves of these trees, when grown to a size for bearing fruit, are six or eight feet long, and may be termed branches; (for the trees have no other) these have narrow long leaves (or pinnæ) set on alternately their whole length. The small leaves or lobes are toward the base three feet long, and little more than one inch broad; they are closely folded together when they first appear, and are wrapped round by brown fibres or threads, which fall off as the leaves advance, making way for them to expand; these never open flat, but are hollow like the keel of a boat, with a sharp ridge on their backside; they are very stiff, and, when young, of a bright green, ending with a sharp black spine. These trees have male flowers on different plants from those which produce the fruit, and there is a necessity for some of the male trees to grow near the female trees to render them fruitful; or, at least, to impregnate the ovary of the seed, without which the stones, which are taken out of the fruit, will not grow. Most of the old authors, who have mentioned these trees, affirm, that unless the female or fruit-bearing Palm-trees have the assistance of

of the male, they are barren; therefore in ſuch places where there are no male trees near the female, the inhabitants cut off the bunches of male flowers when they are juſt opened, and carry them to the female trees, placing them on the branches near the female flowers to impregnate them; which, they all agree, has the deſired effect, rendering the trees fruitful, which would otherwiſe have been barren. Pere Labat in his account of America, mentions a ſingle tree of this kind, growing near a convent in the iſland of Martinico, which produced a great quantity of fruit, which came to maturity enough for eating; but, as there was no other tree of this kind in the iſland they were deſirous to propagate it, and accordingly planted great numbers of the ſtones for ſeveral years, but not one of them grew; therefore after having made ſeveral trials without ſucceſs, they were obliged to ſend to Africa, where theſe plants grew in plenty, for ſome of the fruit; the ſtones of which they planted, and raiſed many of the plants. He then conjectures, that the ſingle tree before-mentioned, might be probably ſo far impregnated by ſome neighbouring Palm-trees of other ſpecies, as to render it capable of ripening the fruit, but not ſufficient to make the ſeeds prolific, as is the caſe when animals of different kinds copulate.

The flowers of both ſexes come out in very long bunches from the trunk between the leaves, and are covered with a ſpatha, (or ſheath) which opens and withers; thoſe of the male have ſix ſhort ſtamina, with narrow four-cornered ſummits filled with farina. The female flowers have no ſtamina, but have a roundiſh germen, which afterward becomes an oval berry, with a thick pulp incloſing a hard oblong ſtone, with a deep furrow running longitudinally. The bunches of fruit are ſometimes very large.

This ſpecies of Palm is by Dr. Linnæus titled Phœnix, which is the Greek name of it, and he makes it a diſtinct genus. There are ſome varieties, if not different ſpecies of this tree, in the warm countries; but as we cannot expect to ſee the trees in perfection in our country, it is not likely we ſhall come to any certainty how they differ from each other.

Theſe plants may be eaſily produced from the ſeeds taken out of the fruit, (provided they are freſh) which ſhould be ſown in pots filled with light rich earth, and plunged into a moderate hot-bed of tanners bark, which ſhould be kept in a moderate temperature of heat, and the earth frequently refreſhed with water.

When the plants are come up, they ſhould be each planted into a ſeparate ſmall pot filled with the ſame light rich earth, and plunged into a hot-bed again, obſerving to refreſh them with water, as alſo to let them have air in proportion to the warmth of the ſeaſon, and the bed in which they are placed. During the ſummer time they ſhould remain in the ſame hot-bed, but in the beginning of Auguſt you ſhould let them have a great ſhare of air to harden them againſt the approach of winter; for if they are too much forced, they will be ſo tender as not to be preſerved through the winter without much difficulty, eſpecially if you have not the conveniency of a bark-ſtove to keep them in.

The beginning of October you muſt remove the plants into the ſtove, placing them where they may have a moderate ſhare of heat (theſe being ſomewhat tenderer, while young, than after they have acquired ſome ſtrength;) though indeed they may be ſometimes preſerved alive in a cooler ſituation, yet their progreſs would be ſo much retarded, as not to recover their vigour the ſucceeding ſummer. Nor is it worth the trouble of raiſing theſe plants from ſeeds, where a perſon has not the conveniency of a ſtove to forward their growth; for where this is wanting, they will not grow to any tolerable ſize in twenty years.

Whenever theſe plants are removed, (which ſhould be done once a year) you muſt be very careful not to cut or injure their large roots, which is very hurtful to them; but you ſhould clear off all the ſmall fibres which are inclinable to mouldineſs, for if theſe are left on, they will in time decay, and hinder the freſh fibres from coming out, which will greatly retard the growth of the plants.

The ſoil in which theſe plants ſhould be placed, muſt be compoſed in the following manner, viz. half of light freſh earth taken from a paſture ground, the other half ſea-ſand, and rotten dung or tanners bark, in equal proportion; theſe ſhould be carefully mixed, and laid in a heap three or four months at leaſt before it is uſed, but ſhould be often turned over to prevent the growth of weeds and to ſweeten the earth.

You ſhould alſo obſerve to allow them pots proportionable to the ſizes of the plants; but you muſt never let them be too large, which is of worſe conſequence than if they are too ſmall. During the ſummer ſeaſon they ſhould be frequently refreſhed with water, but you muſt be careful not to give it in too great quantities; and in winter they muſt be now and then refreſhed, eſpecially if they are placed in a warm ſtove, otherwiſe they will require very little water at that ſeaſon.

Theſe plants are very ſlow growers, even in their native countries, notwithſtanding they arrive to a great magnitude; for it has been often obſerved by ſeveral of the old inhabitants of thoſe countries, that the plants of ſome of theſe kinds have not advanced two feet in height in ten years; ſo that when they are brought into theſe countries, it cannot be expected they ſhould advance very faſt, eſpecially where there is not due care taken to preſerve them warm in winter. But however ſlow of growth theſe plants are in their native countries, yet they may be with us greatly forwarded, by placing the pots into a hot-bed of tanners bark, which ſhould be renewed as often as is neceſſary, and the plants always preſerved therein both winter and ſummer, obſerving to ſhift them into larger pots as they advance in growth, as alſo to ſupply them with water properly, with which management I have had ſeveral of them come on very faſt; for I obſerve the roots of theſe plants are very apt to root into the bark, if their pots remain a conſiderable time without ſhifting, where they meet with a gentle warmth, and the moiſture ariſing from the fermentation of the bark doth preſerve their fibres plump and vigorous; but although the leaves grow tall in a few years with this management, yet it is long before the plants come to have any ſtems. There are plants now in the Chelſea Garden, whoſe leaves are ſeven feet long, which were raiſed from ſeeds more than twenty years ago, and their ſtems are not two feet high, ſome of which have produced ſmall bunches of male flowers.

The ſecond ſort here mentioned, is the Cocoa-nut, whoſe fruit are frequently brought to England, ſome of which are of a large ſize. The branches of this tree are winged like thoſe of the former, but the ſmall leaves or lobes are three times as broad; they open flat, their borders fold backward, and are of a lighter green than thoſe of the firſt ſort. The whole leaf (or branch) is often twelve or fourteen feet long; the male flowers grow in different parts of the ſame tree with the fruit, proceeding from the trunk between the leaves; they are diſpoſed in long bunches, as are alſo the female, the nuts growing in very large cluſters, which are covered with a thick fibrous coat adhering cloſely to them. The nuts are large, oval, and have three holes in the ſhell at the top; the kernel is firm, white within, and the ſhell contains a quantity of pale juice, which is called the milk.

The Cocoa-nut is cultivated in moſt of the inhabited parts of the Eaſt and Weſt-Indies, but is ſuppoſed a native of the Maldives, and the deſert iſlands of the Eaſt-Indies, from whence it is ſuppoſed it hath been tranſported to all the warm parts of America; for it is not found in any of the inland parts, nor any where far diſtant from ſettlements. It is one of the moſt uſeful trees to the inhabitants of America, who have many of the common neceſſaries of life from it. The bark of the tree is made into cordage, the ſhell of the nut

nut into drinking bowls, the kernel of the nut affords them a wholsome food, and the milk contained in the shell a cooling liquor. The leaves of the trees are used for thatching their houses, and are also wrought into baskets, and most other things which are made of Osiers in Europe.

This tree is propagated by planting of the nuts, which in six weeks or two months after planting will come up, provided they are fresh and thoroughly ripe, which is what few of them are which are brought to England; for they always gather them before they are ripe, that they may keep during their passage; so that the best way to bring nuts into England for planting, would be to take such of them as are fully ripe, and put them in dry sand in a tub, where the vermin may not come to them; and these will often sprout in their passage, which will be an advantage, because then they may be immediately planted into pots of earth, and plunged into the bark-bed.

These plants, in the hot islands of America, make considerable progress in their growth, in which places there are some trees of very great magnitude; but in Europe it is of much slower growth, being many years before it advances to any considerable height; but as the young leaves of this plant are pretty large, they make a good appearance amongst other tender exotic plants in two or three years time. This plant is preserved in some curious gardens in England for variety, where it must be placed in the bark-stove, and managed as hath been directed for the other kind of Palm; observing, as often as they are transplanted, not to cut their strong roots, which is generally death to most of the Palm kind. These plants must not be too much confined in their roots, for if they are, they will make but little progress; therefore, when the young plants have filled the pots with their roots, they should be shifted into tubs of a moderate size, that their roots may have room to extend; but these tubs must be kept constantly plunged into the bark-bed, otherwise the plants will not thrive. The method of raising these plants from the nuts, when they are planted before they have sprouted, is fully described under the article of raising exotic seeds; to which the reader is desired to turn, to avoid repetition.

The third sort is commonly called Macaw-tree by the inhabitants of the British Islands in America; this rises to the height of thirty or forty feet. The stem is generally larger toward the top than at bottom; the branches (or rather the leaves) are winged; the small leaves or lobes are long and very broad; the stalk and leaves are strongly armed with black spines of various sizes in every part; the male and female flowers are on the same tree, coming out in the same manner as the Cocoa-nut. The fruit is about the size of a middling Apple, and is inclosed in a very hard shell.

The Macaw-tree is very common in the Caribbee Islands, where the negroes pierce the tender fruit, from whence flows out a pleasant liquor, of which they are very fond; and the body of the tree affords a solid timber, with which they make javelins, arrows, &c. and is by some supposed to be a sort of Ebony. This tree grows very slow, and requires to be kept warm in winter.

The fourth sort is commonly called Cabbage-tree in the West-Indies; this rises to a very great height in the countries where it grows naturally. Ligon in his History of Barbadoes says, there were then some of these growing there, which were more than two hundred feet high, and that he was informed they were a hundred years growing to maturity, so as to produce seeds. The stalks of these trees are seldom larger than a man's thigh; they are smoother than those of most other sorts, for the leaves naturally fall off entire from them, and only leave the vestigia or marks where they have grown. These leaves (or branches) are twelve or fourteen feet long; the small leaves or lobes are about a foot long, and half an inch broad, with several longitudinal plaits or furrows ending in soft acute points; these are not so stiff as those of the first sort, and are placed alternately. The flowers come out in long loose bunches below the leaves; these branch out into many loose strings, and are near four feet long, upon which the flowers are thinly placed. The female flowers are succeeded by fruit about the size of a Hazel nut, having a yellowish skin, sitting close to the strings of the principal foot-stalk.

As the inner leaves of this encompass the future buds more remarkably than most of the other species, so it is distinguished by this appellation of Cabbage-tree; for the center shoots, before they are exposed to the air, are white and very tender, like most other plants which are blanched; and this is the part which is cut out and eaten by the inhabitants, and is frequently pickled and sent to England by the title of Cabbage; but whenever these shoots are cut out, the plants decay, and never after thrive; so that it destroys the plants, which is the reason that few of the trees are now to be found in any of the islands near settlements, and those are left for ornament.

The fifth sort is commonly called Prickly Pole in Jamaica, where it naturally grows. These trees are commonly found in thickets, where a great number of them are close together. Their stalks are slender, seldom more than five or six inches diameter, but rise to the height of forty feet, and are closely armed with long thorns. The leaves are placed circularly on the top, (as in most of the species.) These are winged, but the lobes are shorter and greener than those of the other sorts, and are closely armed with thorns. The flowers come out in the same manner as those of the Cocoa-nut, upon long branching foot-stalks; they are larger than the largest gray Peas, flatted at the top, and are covered with a red skin. The inhabitants of Jamaica make rammers and rods for scowering of guns, of the stems of these trees, which are very tough and pliable; but there is no use made of any other part, so far as I can learn.

The sixth sort is called in the West-Indies the Oily Palm, and by some Negroes Oil, for the fruit of this tree was first carried from Africa to America by the negroes. It grows in great plenty on the coast of Guinea, and also in the Cape de Verd Islands, but was not in any of our American colonies till it was carried there; but now the trees are in plenty in most of the islands, where the negroes are careful to propagate them.

The branches, (or rather the leaves) of this tree, are winged; the small leaves or lobes, are long, narrow, and not so stiff as most of the other sorts; the foot-stalks of the leaves are broad at their base, where they embrace the stem, diminishing gradually upward, and are armed with strong, blunt, yellowish thorns, which are largest at their base. The flowers come out at the top of the stem between the leaves; some bunches have only male flowers, others have female; the latter are succeeded by oval berries, bigger than those of the largest Spanish Olives, but of the same shape; these grow in very large bunches, and when ripe are of a yellowish colour.

From the fruit the inhabitants draw an oil, in the same way as the oil is drawn from Olives; from the body of the tree they extract a liquor, which, when fermented, has a vinous quality, and will inebriate. The leaves of the tree are wrought into mats by the negroes, on which they lie.

The seventh sort is called Palmetto-tree, or Thatch, by the inhabitants of Jamaica, where this tree grows upon all the honey-comb rocks in great plenty. It rises with a slender stalk ten or twelve feet high, which is naked and smooth, and at the top garnished with many fan-shaped leaves placed circularly; these have foot-stalks two or three feet long, which are armed with a few strong, green, crooked spines; the pinnæ, or lobes, do all meet in one center, where they join the foot-stalk, and are joined together a third part of their length from their base; they are at first closely folded into plaits, but afterward spread out like a fan; their ends being pliant often hang downward,

downward, and between these pinnæ hang down long threads. The flowers and fruit come out from between the leaves; the fruit is of the shape and size of the small Lúcca Olives. The leaves of this tree are used for thatch all over the West-Indies.

The eighth sort grows naturally in Japan, and also upon rocky dry mountains at Malabar. This in time rises with a strait trunk about forty feet high, which has many circles round it the whole length, which are occasioned by the vestigia of the leaves, which are placed circularly round the stem; so as these separate entirely and fall off, the circles remain where their base embraced the stalk. The stalks are terminated by an obtuse cone, just below which the leaves are placed; these on the large trees are eight or nine feet long, but those of the small plants are much less; the largest I have seen were not more than two feet long. The base of the foot-stalk, which partly embraces the trunk, is broad and three-cornered, and is armed on each side with short spines to the place where the lobes, or small leaves, begin. These pinnæ or lobes, are long, narrow, and entire, of a lucid green on their upper side, standing by pairs opposite along the midrib, very close together. The flowers and fruit are produced in large bunches at the foot-stalks of the leaves; the fruit is oval, about the size of a large Plum, and nearly of the same shape; the skin, or covering, changes first yellow, and afterward red when ripe, of a sweet taste, under which is a hard brown shell, inclosing a white nut, which is in taste like the Chestnut.

From the pith of the trunk of this tree is made the sago; this is first pulverized, then it is made into a paste, and afterward granulated.

The ninth sort was discovered by the late Dr. Houstoun, growing naturally in the sands near Old Vera Cruz in America. This hath a thick stem, which seldom rises more than two feet high. The leaves come out round the upper part of the stem, standing upon foot-stalks which are a foot and a half long; they are winged; the lobes or small leaves are about five inches long, and one and a half broad in the middle, drawing to a point at both ends; they are stiff, smooth, and entire, having a few small indentures at their points, and are placed alternate, of a pale green colour; there are fourteen or fifteen of these lobes ranged along the midrib, or stalk. The fruit rises up from the side of the stem, upon a short thick foot-stalk, standing upright, and shaped like a club, having many red seeds about the size of large Peas, standing in separate cells round the central foot-stalk, to which they adhere. These plants have their male flowers on separate plants from the fruit, for all those plants which have flowered in England are of the male kind. These plants lose their leaves before the fruit is ripe annually. The first time when Dr. Houstoun saw these plants growing at La Vera Crùz, they were in full leaf, but on his return to the same place three months after, the fruit was then ripe, and all the leaves were fallen off; and this he afterwards observed the following season.

The tenth sort was discovered by the late Dr. Houstoun in the Spanish West-Indies. This rises with a very tall naked trunk, garnished at the top with long winged branches or leaves, whose lobes are spear-shaped and plaited; they are of a softer texture than any of the other sorts, and for the most part come out two from the same point, so stand by pairs on the same side of the midrib; they have two lobes on a side a little above each other, but there is a great space between every four lobes. The flowers come out in long bunches from between the leaves, the male flowers hanging on long tender strings; but the fruit, which is about the size of a middling Plum, is collected into large bunches.

The eleventh sort grows naturally in the Cape Verd Islands, from whence I had one of the plants brought me, as also in the Madeira, from whence I have received the seeds. This is called Dragon-tree, because the inspissated juice of the plants becomes a red powder, very like the eastern Dragons Blood, and is frequently used instead of it in the shops; but the tree, from whence the true Dragons Blood is taken, is of a very different genus from this. Dr. Van Royen, in the Prodromus of the Leyden Garden, has ranged this among the Yuccas, I suppose, from the similitude of the plant to those of that genus; for, as the fruit of this is a berry not unlike those of the Bay-tree, and the seeds of the Yucca grow in capsules with three cells, they cannot be of the same genus; nor have we any good account of the real characters of this plant, so as absolutely to determine the genus. Dr. Linnæus has, upon the information of his pupil Lœfling, ranged it in his genus of Asparagus, to which it seems to have little affinity; therefore, as it has by several modern authors been ranged under this title, I have continued it there. This rises with a thick trunk nearly equal in size the whole length, the inner part of which is pithy; next to this is a circle of strong fibres, and the outside is soft. The stalk or trunk rises twelve or fourteen feet high, and is nearly of the same diameter the whole length, which is rarely more than eight or ten inches; there are the circular marks or rings left the whole length, where the leaves are fallen off; for as these half embrace the stalk with their base, so when they fall away, the vestigia where they grew remain. The top of the stalk sustains a large head of leaves, which come out singly all round it; they are shaped like those of the common Iris, but are much longer, being often four or five feet long, and an inch and a half broad at their base, where they embrace the stalk, and lessen gradually to the end, where they terminate in a point. These leaves are pliable, and hang down all round the stem; they are entire, and of a deep green, smooth on both surfaces, and greatly resemble those of the common yellow Iris. As this plant has not flowered in England, I can give no account of its flowers; but so far as I can judge from the berries which I have received, it may properly enough be ranged in this genus.

All these sorts of Palms are propagated by seeds, which should be sown in the same way as hath been directed for the first sort, and the plants should afterward be treated in the same manner; with this difference, that such of them as are natives of very warm countries, will require to be kept in a warmer air. The second, third, fourth, fifth, sixth, seventh, eighth, and ninth sorts should be constantly kept in the bark-bed in the stove, otherwise they will not make great progress in England; and when they do thrive, they grow in about twenty years too tall for most of the stoves which are at present built here, nor can we hope to see many of them produce their fruit in England; so the plants are preserved by the curious for their foliage, which being so singular and different from that of the European trees, renders them worthy of care.

The other sorts may be kept in a dry stove in winter in a moderate temperature of air, and in the heat of summer they may be exposed to the open air in a warm sheltered situation for about three months, but they should be removed into the stove before the morning frosts come on in the autumn. When these plants are kept in a moderate degree of warmth, they should have but little water during the winter season; and in the summer, when they are exposed in the open air, they must not be often watered, unless the season is remarkably dry and warm, for too much moisture will soon destroy them. The other management of them is nearly the same as for the Date Palms, which is not to cut their principal roots when they are shifted from one pot to another, nor to confine their roots too much; but as the plants grow in size, they should annually be removed into pots a size larger than those they were in the former year. The earth in which they are planted, should be light, so as to let the moisture easily pass off; for if it is strong, and detains the moisture, the tender fibres of the roots will rot.

PANAX. Lin. Gen. Plant. 1031. Panacea. Mitch. Gen. 26. Araliastrum. Vaill. 6. Ginseng or Ninseng.

The CHARACTERS are,

*It hath male and hermaphrodite flowers on distinct plants; the male have simple globular umbels, composed of several coloured rays which are equal. The involucrum on the outside, consists of the same number of small spear-shaped leaves. The flower has five narrow, oblong, blunt petals, which are reflexed, sitting on the empalement, and five oblong slender stamina inserted in the empalement, terminated by single summits. The hermaphrodite umbels are simple, equal, and clustered; the involucrum is small, permanent, and composed of several awl-shaped leaves; the empalement is small and permanent. The flowers have five oblong equal petals, which are recurved, and five short stamina terminated by single summits which fall off, with a roundish germen under the empalement, supporting two small erect styles, crowned by single stigmas. The germen afterward becomes an umbillicated berry with two cells, each containing a single, heart-shaped, convex, plain seed.*

This genus of plants is ranged in the second section of Linnæus's twenty-third class, which includes the plants whose male flowers are upon distinct plants from the female or hermaphrodite flowers.

The SPECIES are,

1. PANAX (*Quinquefolium*) foliis ternis quinatis. Flor. Virg. 147. *Panax with trifoliate Cinquefoil leaves.* Araliastrum quinquefolii folio, majus, Ninzin vocatum. D. Sarrasin. Vaill. Gen. 43. *Greater five-leaved Bastard Aralia, called Ninzin.*
2. PANAX (*Trifolium*) foliis ternis ternatis. Flor. Virg. 35. *Panax with three trifoliate leaves.* Araliastrum fragariæ folio minus. Vaill. Gen. 43. *Smaller Bastard Aralia with a Strawberry leaf.*

Both these plants grow naturally in North America; the first is generally believed to be the same as the Tartarian Ginseng, the figures and descriptions of that plant, which have been sent to Europe by the missionaries, agreeing perfectly with the American plant.

This hath a fleshy taper root as large as a man's finger, which is jointed, and frequently divided into two smaller fibres downward. The stalk rises near a foot and a half high, naked at the top, where it generally divides into three smaller foot-stalks, each sustaining a leaf composed of five spear-shaped lobes, which are sawed on their edges; they are of a pale green, and a little hairy. The flowers grow on a slender foot-stalk, just at the division of the foot-stalks, which sustain the leaves, and are formed into a small umbel at the top; they are of an herbaceous yellow colour, composed of five small petals which are recurved. These appear the beginning of June, and are succeeded by compressed heart-shaped berries, which are first green, but afterward turn red, inclosing two hard, compressed, heart-shaped seeds, which ripen the beginning of August.

The Chinese hold this plant in great esteem, according to the accounts which have been transmitted to Europe by the missionaries. Father Jartoux in his Letters says, that the most eminent physicians in China have written whole volumes upon the virtues of this plant, and make it an ingredient in almost all remedies which they give to their nobility, for it is of too high price for the common people. They affirm, that it is a sovereign remedy for all weakness occasioned by excessive fatigues either of body or mind; that it cures weakness of the lungs, and the pleurisy; that it stops vomitings; that it strengthens the stomach, and helps the appetite; that it strengthens the vital spirits, and increases lymph in the blood; in short, that it is good against dizziness of the head and dimness of sight, and that it prolongs life in old age.

This father also says, he has made trials of the root of this plant himself, and has, in an hour after taking half one of the roots, found himself greatly recovered from weariness and fatigue, and much more vigorous, and could bear labour with greater ease than before.

He likewise mentions the emperor's having employed ten thousand Tartars in the year 1709, to gather this plant in the desarts, where it naturally grows; these were attended by a guard of mandarines, who encamp with their tents in such places as are proper for the subsistence of their horses, and from time to time send their orders to the respective troops under their care; and when they have completed their collection of roots, they return with their cargo to the city. The roots of this plant which have been gathered in America and brought to England, have been sent to China, where, at the beginning, there was a good market for them; but the quantities which were afterward sent, did not answer so well, the market being overstocked with that commodity.

This plant has been introduced to the English gardens from America, and where it has been planted in a shady situation and a light soil, the plants have thriven and produced flowers, and ripened their seeds annually, but not one of these seeds have grown; for I have several years sown them soon after they were ripe, without any success; I have also sown of the seeds which were sent me from America several times in various situations, and have not raised a single plant from either; and by the accounts which the missionaries have sent from China, it appears, they have had no better success with the seeds of this plant, which they say they have frequently sown in the gardens in China, but could not raise one plant; so that I believe there is a necessity for the hermaphrodite plants to have some male plants stand near them, to render the seeds prolific; for all those plants which I have seen, or saved the seeds from, were such as had hermaphrodite flowers; and though the seeds seemed to ripen perfectly, yet their not growing, though I have waited three years without disturbing of the ground, confirms me in this opinion.

The second sort grows naturally in the same countries, but whether it is possessed of the same qualities as the first I cannot say; I have seen but one plant of this sort in England, which was sent me a few years ago from Maryland, and did not live over the first summer, which was remarkably dry, and being planted in a dry soil, was the occasion of its death; the stalk of this was single, and did not rise more than five inches high, dividing into three foot-stalks, each sustaining a trifoliate leaf, whose lobes were longer, narrower, and deeper indented on their edges, than those of the former. The flower-stalk rose from the divisions of the foot-stalk of the leaves, but before the flowers opened, the plant decayed, so I can give no farther account of it.

PANCRATIUM. Dill. Hort. Elth. 221. fol. 289. Lin. Gen. Plant. 365. Narcissus. Tourn. Inst. R. H. 353. tab. 185. Sea Daffodil.

The CHARACTERS are,

*The flowers are inclosed in an oblong spatha or sheath, which tears open on the side and withers. The flowers have a funnel-shaped cylindrical nectarium of one leaf, spreading open at the top, and six spear-shaped petals, which are inserted on the outside of the nectarium above its base, with six long stamina inserted in the brim of the nectarium, terminated by oblong prostrate summits. They have a three-cornered obtuse germen situated under the flower, supporting a long slender style, crowned by an obtuse stigma. The germen afterward becomes a roundish three-cornered capsule with three cells, filled with globular seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes those plants whose flowers have six stamina and one style.

The SPECIES are,

1. PANCRATIUM (*Maritimum*) spathâ multiflorâ, petalis planis, foliis lingulatis. Lin. Sp. Plant. 291. *Pancratium with a sheath containing many flowers, having plain petals, and tongue-shaped leaves.* Narcissus maritimus. C. B. P. 540. *The Sea Daffodil.*
2. PANCRATIUM (*Illyricum*) spathâ multiflorâ, foliis ensiformibus, staminibus nectario longioribus. Flor. Leyd. Prod. 34. *Pancratium with many flowers in a sheath,*

*sheath, sword-shaped leaves, and stamina longer than the nectarium.* Narcissus Illyricus liliaceus. C. B. P. 55. *Lily Daffodil of Sclavonia.*

3. Pancratium (*Zeylanicum*) spathâ uniflorâ, petalis reflexis. Flor. Zeyl. 126. *Pancratium with one flower in a sheath, whose petals are reflexed.* Narcissus Zeylanicus, flore albo hexagono odorato. H. L. 691. *Daffodil of Ceylon, with a white hexagonal sweet flower.*

4. Pancratium (*Carribæum*) spathâ biflorâ. Hort. Cliff. 133. *Pancratium with two flowers in a sheath.* Pancratium Mexicanum, flore gemello candido. Hort. Elth. 299. tab. 222. *Mexican Pancratium, with two white flowers.*

5. Pancratium (*Amboinense*) spathâ multiflorâ, foliis ovatis nervosis. Lin. Sp. Plant. 291. *Pancratium with many flowers in a sheath, and oval veined leaves.* Narcissus Amboinensis, folio latissimo subrotundo. Hort. Amst. 1. p. 77. tab. 39. *Narcissus of Amboyna, with the broadest roundish leaf.*

6. Pancratium (*Carolinianum*) spathâ multiflorâ, foliis linearibus, staminibus nectarii longitudine. Lin. Sp. Plant. 291. *Pancratium with many flowers in a sheath, narrow leaves, and stamina the length of the nectarium.* Lilio-Narcissus polyanthos, flore albo. Catesb. Car. 3. p. 5. *The Lily Narcissus bearing many white flowers.*

7. Pancratium (*Americanum*) spathâ multiflorâ, foliis carinatis angustioribus. *Pancratium with many flowers in a sheath, and narrow keel-shaped leaves.* Narcissus Americanus, flore multiplici, albo, odore balsami Peruviani. Tourn. Inst. R. H. 358. *American Narcissus with many white flowers, smelling like Balsam of Peru.*

8. Pancratium (*Latifolium*) spathâ multiflorâ, foliis carinatis latioribus. *Pancratium with many flowers in a sheath, and broader keel-shaped leaves.* Narcissus totus albus, latifolius, polianthos, major odoratus, staminibus sex è tubi ampli margine extantibus. Sloan. Cat. Jam. 115. *Broad-leaved Daffodil, with many larger sweet flowers which are very white, and a large tube, out of whose border proceed six stamina.*

The first sort grows naturally on the sea-coast in Spain, and the south of France. This hath a large, coated, bulbous root, of an oblong form, covered with a dark skin; the leaves are shaped like a tongue; they are more than a foot long, and one inch broad, of a deep green, six or seven of them rising together from the same root, encompassed at bottom with a vagina or sheath; between these arise the stalk, which is a foot and a half long, naked, sustaining at the top six or eight white flowers, inclosed in a sheath, which withers and opens on the side, to make way for the flowers to come out. The germen are situated close to the top of the stalk, from these arise the tube of the flowers, which are three inches long; they are very narrow, swelling at the top, where the cup or nectarium is situated, on the outside of which is fastened the six segments or petals of the flower; these are narrow, and extend a great length beyond the nectarium; from the border of the nectarium arise six long slender stamina, terminated by oblong summits which are prostrate, and in the center arises a style the length of the stamina, terminated by an obtuse stigma. The flowers of this sort do not appear in England till the latter end of August, so are not succeeded by seeds here. The leaves of this sort are green all the winter, and decay in the spring, so the roots should be transplanted in June, after the leaves are decayed. This must be planted in a very warm border, and screened from severe frost, otherwise it will not live through the winter in England.

The second sort grows naturally in Sclavonia, and also in Sicily; this hath a large, coated, bulbous root, covered with a dark skin, sending out many thick strong fibres, which strike deep in the ground; the leaves are sword-shaped, a foot and a half long and two inches broad, of a grayish colour. The stalks are thick, succulent, and rise near two feet high, sustaining at the top six or seven white flowers shaped like those of the first sort, but the tube is shorter and the stamina are much longer. This flowers in June, and frequently produces seeds which ripen in September.

This sort is hardy, and will live through the winter in the full ground, being never injured but in very severe winters; and if, in such seasons, the surface of the ground is covered with tanners bark, sea-coal ashes, straw, or Peas-haulm, to keep out the frost, there will be no danger of the roots suffering. It is propagated either by offsets from the roots, or from seeds; the former is the more expeditious method, for the offsets will flower very strong the second year; whereas those which are raised from seeds, seldom flower in less than five years.

The roots of this plant should not be removed oftener than every third year, if they are expected to flower strong; the best time to transpant them is in the beginning of October, soon after their leaves decay: they should not be kept long out of the ground, for as they do not lose their fibres every year, so if these are dried by long keeping out of the ground, it greatly weakens the roots. It loves a light sandy soil, and a sheltered situation; the roots should be planted nine inches or a foot asunder every way, and five inches deep in the ground.

If the plants are propagated by seeds, they should be sown in pots filled with light earth soon after they are ripe; these pots should be placed under a hot-bed frame in winter to screen them from frost, but the glasses must be taken off every day in mild weather. The other management being the same as for the Narcissus, I need not repeat it here; so shall only mention, that the young roots will require a little protection in winter, till they have obtained strength.

The third sort grows naturally at Ceylon; this hath a pretty large bulbous root, the leaves are long and narrow, of a grayish colour, and pretty thick, standing upright; the stalk rises between them a foot and a half high, naked, sustaining one flower at the top, whose petals are reflexed backward; the nectarium is large, and cut at the brim into many acute segments; the stamina are long, and turn toward each other at their points, in which it differs from the other species. The flower has a very agreeable scent, but is of short duration; this is very rare in the gardens at present.

The fourth sort grows naturally at La Vera Cruz, from whence the late Dr. Houstoun brought some of the roots. The leaves of this sort are about a foot long and two inches broad, having three longitudinal furrows. The stalk rises about a foot high, then divides like a fork into two small foot-stalks, or rather tubes, which are narrow, green, and at first are encompassed by a thin spatha (or sheath) which withers, and opens to give way to the flowers, which are white, and shaped like those of the other species, but have no scent.

The fifth sort grows naturally at Amboyna, and also in the American islands. The root of this sort is oblong, white, and sends out several thick fleshy fibres, which strike downward; the leaves stand upon very long foot-stalks, some of them are oval, and others heart-shaped, about seven inches long, and five broad, ending in points, having many deep longitudinal furrows; they are of a light green, and their borders turn inward. The stalk is thick, round, and succulent, rising near two feet high, sustaining at the top several white flowers, shaped like the other species, but the petals are broader, the tube is shorter, and the stamina are not so long as the petals. These flowers have a thin sheath or covering, which splits open longitudinally, to make way for the flowers.

The sixth sort grows naturally in moist boggy soils in Georgia, where Mr. Catesby discovered it. This hath a roundish bulbous root, covered with a light brown skin, from which arise several narrow dark green leaves, about a foot long; between these come out a thick stalk about nine inches high, sustaining six or seven white flowers, with very narrow petals, having large bell-shaped nectariums or cups, which are deeply indented on their brims; the stamina do not rise far

above

above the nectarium, and are terminated by yellow summits.

The seventh sort grows naturally in the islands of the West-Indies, where it is called white Lily. This hath a pretty large bulbous root, a little flatted at the top, covered with a brown skin; the leaves are near a foot and a half long, and little more than one inch broad, of a dark green, and hollowed in the middle like the keel of a boat. The stalks rise near two feet high, which are thick, succulent, and naked, sustaining at the top eight or ten white flowers, shaped like those of the first sort, but are of a purer white, and have a strong sweet odour, like that of Balsam of Peru. The stamina of this are very long, spreading out wide each way; the pointal is of the same length, standing in the middle of the nectarium. These flowers are of short duration, seldom continuing longer in beauty than three or four days, and in very hot weather not so long; when these fade, the germen, which are situated at the bottom of the tubes, turn to so many oblong bulbs, which are irregular in form, and when ripe, drop off in the ground, where they put out fibres and become plants.

These foreign species are most, if not all of them, of this kind, bearing bulbs; whereas the two first have seed-vessels with three cells, inclosing many roundish black seeds, so that though they agree in the characters of their flowers, yet in this particular they differ greatly.

The eighth sort grows naturally in the West-Indies, where it is not distinguished from the former; but as I have frequently propagated both by their bulbs which succeed the flowers, and have always found the plants so raised continue their difference, I make no doubt of their being distinct species. This differs from the former, in the leaves being much longer and broader than that; for these are near two feet long, and more than three inches broad, and are hollowed like the keel of a boat. The flowers are larger, the petals longer, and the scent is not so strong as that of the former, and the roots flower in every season of the year. This seems to be the sort figured by Dr. Trew, in the twenty-seventh table of his Decades of Rare Plants, but if it is, the leaves in his figure are too flat.

These six sorts last mentioned are tender, so will not thrive in England, unless they are placed in a warm stove. The best way to have these plants in perfection, is to plunge the pots into the bark-bed in the stove, where they will thrive and flower exceeding well; for though they may be preserved in a dry stove, yet those will not thrive so well, nor will their flowers be so strong, as when they are plunged in the tan-bed, nor will they flower oftener than once a year; whereas when they are in the tan-bed, the same roots will often flower two or three times in a year. I have had several of the species in flower at all seasons of the year, so there has not been a month when some of them were not in flower.

They are propagated by offsets from the roots, as also by the bulbs which succeed the flowers; if the latter are planted in small pots filled with light earth from a kitchen-garden, and plunged into a moderate hot-bed, they will soon put out roots and leaves, and with proper management, will become blowing roots in one year, so that they may be easily propagated; and if they are constantly kept in the tan-bed in the stove, they will put out offsets from their roots, and thrive as well as in their native countries.

PANICLE. A Panicle is a stalk diffused into several pedicles or foot-stalks, sustaining the flowers or fruits, as in Oats, &c.

PANICUM. Tourn. Inst. R. H. 515. tab. 298. Lin. Gen. Plant. 70. Panic; in French, *Panis*.

The Characters are,

*There is one flower in each chaff; the chaff opens with three valves which are oval, ending in acute points. The petals open with two oval acute-pointed valves. The flowers have three short hair-like stamina, terminated by oblong summits, and a roundish germen supporting two hair-like styles, crowned by feathered stigmas. The germen afterward becomes a roundish seed, fastened to the withered petals.*

This genus of plants is ranged in the second section of Linnæus's third class, which includes the plants whose flowers have three stamina and two styles.

The Species are,

1. Panicum (*Germanicum*) spicâ simplici cernuâ, setis brevioribus pedunculo hirsuto. *Panic with a single nodding spike, short awns, and a hairy foot-stalk.* Panicum Germanicum, sive panicula minore. C. B. P. 27. *German Panic with a smaller panicle.*
2. Panicum (*Italicum*) spicâ compositâ, spiculis glomeratis, setis immixtis, pedunculo hirsuto. Lin. Sp. Plant. 56. *Panic with a compounded spike, whose smaller spikes grow in clusters intermixed with awns, and a hairy foot-stalk.* Panicum Italicum sive paniculâ majore. C. B. P. 27. *Italian Panic with a larger spike.*
3. Panicum (*Indicum*) spicâ simplici longissimâ, setis hispidis, pedunculo hirsuto. *Panic with the longest single spike, prickly awns, and a hairy foot-stalk.* Panicum Indicum, spicâ longissimâ. C. B. P. 27. *Indian Panic with the longest spike.*
4. Panicum (*Alopecurodem*) spicâ tereti, involucellis bifloris fasciculato-pilosis. Flor. Zeyl. 44. *Panic with a taper spike having two flowers in each cover, and hairs growing in clusters.* Panicum Indicum altissimum, spicâ simplicibus mollibus, in foliorum alis longissimis pediculis insidentibus. Tourn. Inst. 515. *Tallest Indian Panic, with the soft single spikes proceeding from the wings of the leaves, and sitting upon very long foot-stalks.*
5. Panicum (*Cæruleum*) spicâ simplici æquali, pedunculis bifloris. Prod. Leyd. 54. *Panic with an equal single spike, and two flowers growing on each foot-stalk.* Panicum Indicum, spicâ obtusâ cæruleâ. C. B. P. 7. *Indian Panic, with an obtuse blue spike.*

There are several other species of this genus than are here enumerated, some of which grow naturally in England; but as they are not cultivated, so it would be swelling this work too much if they were inserted here.

The first sort grows naturally in Germany and Hungary; of this there are three varieties, one with yellow grain, another with white, and the third has purple grains. This hath been formerly cultivated for bread, in some of the northern countries. It rises with a jointed Reed-like stalk about three feet high, and about the size of the common Reed, garnished at each joint with one Grass-like leaf a foot and a half long, and about an inch broad at the base where broadest, ending in acute points; they are rough to the touch, embracing the stalk at their base, and turn downward about half their length. The stalks are terminated by compact spikes, which are about the thickness of a man's finger at their base, growing taper toward their points, and are eight or nine inches long, closely set with small roundish grain like that of Millet. This is an annual plant, which perishes soon after the seeds are ripe.

The second sort is frequently cultivated in Italy, and other warm countries. This rises with a Reed-like stalk near four feet high, which is much thicker than that of the former; the leaves are also broader, but of the same shape. The spikes are a foot long, and twice the thickness of those of the former, but not so compact, being composed of several roundish clustered spikes; the grain is also larger, but of the same form. There are two or three varieties of this, which differ only in the colour of their grain; this is also annual.

The third sort grows naturally in both Indies; this hath a Reed-like stalk as large as a man's thumb, rising upward of five feet high; the leaves are two inches broad, and more than two feet long, of the same form with those of the former sort; the spikes at the top are a foot and a half long, very compact, and thicker than a man's thumb at the base, growing taper toward the top. The seeds are much larger than those of the other sorts, and are in some white and in others yellow.

The fourth sort grows naturally in both Indies; this hath a strong Reed-like stalk, which rises six or seven feet high, garnished with leaves more than three feet long; they are near three inches broad at their base, lessening to a point at the end, having a smooth surface; the spikes arise at the wings of the stalk; they are single, but not so compact as those of the former, having soft awns or beards; they are about six inches long, and stand upon very long foot-stalks; the grain of this is pretty large.

The fifth sort grows naturally in Peru; this rises with a Reed-like stalk six feet high, which sends out two or three branches from the sides, and is garnished with long leaves two inches broad at their base; the stalks are of a purple colour, the leaves are also inclining to the same. The spikes come out from the wings of the stalks, and at the end of the branches; they are about four or five inches long, thicker than a man's thumb, and almost equal at the point with the base. They are of a pale blue colour, having pretty long awns or beards of the same colour, as are also the seeds, which are larger and rounder than those of the other sorts.

The two first sorts are sown in several parts of Europe in the fields, as Corn, for the sustenance of the inhabitants, but it is reckoned not to afford so good nourishment as Millet; however, it is frequently used in some parts of Germany and Italy, to make cakes and bread, but the German is not so much esteemed as the Italian sort; but as it will ripen better in cold countries than that, it is generally cultivated where a better sort of grain will not succeed.

The seeds of this sort may be sown in the spring, at the same time as Barley is sown, and may be managed exactly in the same way; but this should not be sown too thick, for these seeds are very small, and the plants grow stronger, therefore require more room. The German sort doth not grow above three feet high, unless it is sown on very rich land, in which case it will rise to be four feet high; but the leaves and stems of this Corn are very large, so require to stand four or five inches apart, otherwise they will grow up weak and come to little. These large growing Corns should be sown in drills at about eighteen inches apart, so that the ground may be hoed between the rows of Corn, to keep them clear from weeds, and the stirring of the ground will greatly improve the Corn. In August the Corn will ripen, when it may be cut down and dried, and then should be housed.

The Italian Panic grows much larger than the German, and produces much larger spikes; so this should be allowed more room to grow, otherwise it will come to little. This is also later before it ripens, so it is not very proper for cold countries.

The other sorts are natives of very warm countries, where they are used by the inhabitants to make bread. These grow very large, and require a good summer, otherwise they will not ripen in this country. The seeds of this kind should be sown the latter end of March or the beginning of April, on a moderate hot-bed, and the plants should be planted out when grown to a proper size, upon a bed of light rich earth, in a warm situation. They should be planted in rows about three feet asunder, and the plants must be kept clear from weeds. When the plants are grown pretty tall, they should be supported by stakes, otherwise the winds will break them down; and when the Corn begins to ripen, the birds must be kept from it, otherwise they will soon destroy it. These sorts are preserved in some curious gardens for the sake of variety, but they are not worth cultivating for use in England. The two last sorts seldom ripen here.

**PANSIES.** See Viola Tricolor.

**PAPAVER.** Tourn. Inst. R. H. 2. tab. 119. Lin. Gen. Plant. 573. Poppy; in French, *Pavot.*

The Characters are,

*The empalement of the flower is oval, indented, and composed of two almost oval, concave, obtuse leaves, which fall off. The flower has four large roundish petals which spread open, with a great number of hair-like stamina, terminated by oblong, compressed, erect summits. In the center is placed a large roundish germen having no style, but is crowned by a plain, radiated, target-shaped stigma. The germen afterward becomes a large capsule, crowned by the plain stigma, having one cell, opening in many places at the top under the crown, and is filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, which includes those plants whose flowers have many stamina and one germen.

The Species are,

1. Papaver (*Rhœas*) capsulis glabris globosis, caule piloso multifloro, foliis pinnatifidis incisis. Lin. Sp. Plant. 507. *Poppy with smooth globular heads, a hairy stalk with many flowers, and wing-pointed cut leaves.* Papaver erraticum, rubrum, campestre. J. B. 3. 395. *Common red field Poppy.*
2. Papaver (*Hybridum*) capsulis subglobosis torosis hispidis, caule folioso multifloro. Lin. Sp. Plant. 506. *Poppy with globular capsules which are furrowed and prickly, and a leafy stalk bearing many flowers.* Argemone capitulo breviore hispido. J. B. 3. 396. *Argemone with a shorter prickly head.*
3. Papaver (*Argemone*) capsulis clavatis hispidis, caule folioso multifloro. Lin. Sp. Plant. 506. *Poppy with nail-shaped prickly heads, and a leafy stalk bearing many flowers.* Papaver erraticum, capite longiore hispido. Tourn. Inst. 238. *Field Poppy with a longer prickly head.*
4. Papaver (*Alpinum*) capsulâ hispidâ, scapo unifloro nudo hispido, foliis bipinnatis. Lin. Sp. Plant. 507. *Poppy with prickly heads, and a naked prickly stalk bearing one flower, and double winged leaves.* Argemone Alpina coriandri folio. C. B. P. 172. *Alpine Argemone with a Coriander leaf.*
5. Papaver (*Cambricum*) capsulis glabris oblongis, caule multifloro lævi, foliis pinnatis incisis. Lin. Sp. Plant. 508. *Poppy with oblong smooth heads, a smooth stalk bearing many flowers, and cut winged leaves.* Papaver luteum perenne, laciniato folio, Cambrobritannicum. Raii Syn. Ed. 3. p. 309. *Yellow, Welch, perennial Poppy, with a cut leaf.*
6. Papaver (*Nudicaule*) capsulis hispidis, scapo unifloro nudo hispido, foliis simplicibus pinnato-sinuatis. Hort. Upsal. 136. *Poppy with prickly heads, a naked rough stalk having one flower, and single leaves which are wingedly sinuated.* Papaver erraticum, luteo flore, capite oblongo hispido. Amman. Ruth. 61. *Field Poppy with a yellow flower, and an oblong prickly head.*
7. Papaver (*Orientale*) capsulis glabris, caulibus unifloris, scabris, foliis pinnatis serratis. Hort. Upsal. 136. *Poppy with smooth heads, rough leafy stalks having one flower, and sawed winged leaves.* Papaver Orientale hirsutissimum flore magno. Tourn. Cor. 17. *Most hairy eastern Poppy with a large flower.*
8. Papaver (*Somniferum*) calycibus capsulisque glabris, foliis amplexicaulibus incisis. Lin. Sp. Plant. 508. *Poppy with smooth capsules and empalements, and cut leaves embracing the stalks.* Papaver hortense nigro semine, sylvestre Dioscoridis, nigrum Plinii. C. B. P. 170. *Garden Poppy with black seeds.*
9. Papaver (*Album*) capsulis ovatis glabris, foliis latioribus amplexicaulibus marginibus inciso-serratis. *Poppy with oval smooth heads, and broader leaves embracing the stalks, which are cut on their edges like the teeth of a saw.* Papaver hortense, semine albo, sativum Dioscoridis, album Plinii. C. B. P. 170. *Garden Poppy with white seeds, commonly called white Poppy.*

The first sort is the common red Poppy, which grows naturally on arable land in most parts of England; from the flowers of this sort is drawn a simple water, a tincture, a syrup and conserve for medicinal use. It is an annual plant; from the roots rise several rough branching stalks a foot and a half high, garnished with hairy leaves five or six inches long, deeply jagged almost to the midrib, those on the lower part of the leaves being the deepest; these jags are opposite and regular, like those of the winged leaves. At the top of each stalk stand the flowers, which have oval hairy empalements, opening with

two valves, and foon fall away. The flowers are compofed of four large roundifh petals, which are narrow at their bafe, but fpread out into a circular order; they are of a beautiful fcarlet colour, and foon fall off. Thefe appear in June, and are fucceeded by oblong fmooth heads, crowned by the flat target-fhaped ftigma, and perforated in feveral places at the top, filled with fmall purplifh-coloured feeds. There are feveral varieties of this with double flowers, cultivated in gardens; fome of them have white flowers, others have red flowers bordered with white, and fome have variegated flowers; but as thefe varieties have been produced by culture from the feeds of the common fort, they fhould be included in that fpecies.

The fecond fort grows naturally among the Corn in many parts of England; the leaves of this fort are much fmaller than thofe of the firft, and are cut into much finer fegments; the ftalks are flender, a little more than a foot high, not fo branching as the former. The flowers are not fo large, and of a deep purple colour, very foon falling away, feldom lafting more than a whole day; thefe are fucceeded by oblong prickly heads, filled with fmall black feeds. It flowers in June.

The third fort grows naturally among Corn in fome parts of England, but not in fo great plenty as either of the former. The leaves of this are finer cut and fmaller than thofe of the firft fort, but are not fo fine as thofe of the fecond; the ftalks do not rife fo high as either of the former, and feldom have many branches. The flowers are not half fo large as either of the former, and are of a copper colour, falling away in a few hours. Thefe appear in May, and are fucceeded by long, flender, prickly heads, which are channelled, filled with fmall, black, fhrivelled feeds.

The fourth fort grows naturally on the Alps, among the rocks. The leaves of this are fmooth and doubly winged, the fegments are finely cut; the ftalks rife about a foot high, fuftaining one fmall yellow, or copper-coloured flower, which is fucceeded by roundifh prickly heads, filled with fmall feeds. This flowers abour the fame time as the former fort.

The fifth fort has a perennial root; it grows naturally in Wales, and alfo in fome of the northern counties in England. I found it growing plentifully near Kirby-Lonfdale in Weftmoreland. Tournefort alfo found this plant upon the Pyrenean mountains. The leaves of this fort are winged; the lobes are deeply cut on their edges. The ftalks rife a foot high; they are fmooth, and are garnifhed with a few fmall leaves of the fame fhape as the lower. The upper part of the ftalk is naked, fuftaining one large yellow flower. Thefe appear in June, and are fucceeded by oblong fmooth capfules, filled with fmall purplifh feeds.

The fixth fort grows naturally on the confines of Ruffia, near Tartary. The leaves of this fort are fingle, and finuated almoft to the midrib in form of a winged leaf; they are rough and hairy. The ftalk rifes near two feet high; it is flender, naked, fuftaining one flower at the top, which is compofed of four roundifh petals of a pale yellow colour, each having a dark bottom or tail. The flowers have an agreeable fcent, but are of fhort duration. They come out in June, and are fucceeded by long rough capfules, filled with fmall feeds.

The feventh fort grows naturally in Armenia, from whence Dr. Tournefort fent the feeds to the royal gardens at Paris, where they fucceeded, and were afterward communicated to the curious gardens in England and Holland. The root of this plant is compofed of two or three ftrong fibres as thick as a man's little finger, which are a foot and a half long, of a dark brown on their outfide, and full of a milky juice, which is very bitter and acrid. The leaves are winged, and fawed on their edges; they are a foot long, clofely covered with briftly white hairs. The ftalks rife two feet and a half high; they are very rough and hairy, garnifhed below with leaves like thofe at bottom, but fmaller; the upper part is naked, fuftaining at the top one very large flower, of the fame colour with the common red Poppy. Thefe appear in May, and are fucceeded by oval fmooth capfules, filled with purplifh feeds.

There are two or three varieties of this which differ only in the colour of their flowers; and I have been informed, there is a double flower of this kind, but I have not feen it. Tournefort fays, the Turks eat the green heads of this Poppy, although they are very bitter and acrid.

The eighth fort is the common black Poppy, the feeds of which are fold in the fhops by the title of Maw-feed. The fort with fingle flowers grows in the warm parts of Europe naturally; this is annual; the ftalks rife three feet high; they are fmooth, and divide into feveral branches, and are garnifhed with large leaves, which are fmooth, and deeply cut or jagged on their edges, embracing the ftalks with their bafe. The flowers grow on the top of the ftalks; they are compofed of four large roundifh petals of a purplifh colour, with dark bottoms, and are fucceeded by oval fmooth capfules filled with black feeds. It flowers in June, and the feeds ripen the latter end of Auguft.

There are great varieties in the flowers of this fort, fome having very large double flowers, which are variegated of feveral colours; fome are red and white, others purple and white, and fome are finely fpotted like Carnations; fo that during their fhort continuance in flower, there are few plants whofe flowers appear fo beautiful; but having an offenfive fcent, and being of fhort duration, they are not much regarded. The leaves of this fort are ufed as an ingredient in cooling ointments; and the heads of this were an ingredient in the fyrupus e Melonio, but in the late Difpenfaries they have been left out.

The ninth fort is the common white Poppy; this is cultivated in gardens for the heads, which are ufed in medicine. The ftalks of this are large, fmooth, and rife to the height of five or fix feet; they branch out into feveral fmaller, garnifhed with large grayifh leaves, whofe bafe embraces the ftalks; they are jagged irregularly on their fides. The flowers terminate the ftalks; thefe, when inclofed in the empalement, nod downward, but before the flowers open they are erect. The empalement of the flower is compofed of two large oval leaves, of the fame grayifh colour as the other; thefe feparate and foon drop off. The flower is compofed of four large, roundifh, white petals, which are of fhort duration, and are fucceeded by large roundifh heads as big as Oranges, flatted at both ends, having indented crowns, and are filled with fmall white feeds. This flowers in June, and the feeds ripen in Auguft.

There are feveral varieties of this fort, which differ in the colour of their flowers and multiplicity of petals; thofe with beautiful flowers are preferved in gardens for ornament, but that with the fingle flowers only is cultivated for ufe. The feeds of this fort are ufed in emulfions, being cooling, and good in fevers and inflammatory diftempers, as alfo for the ftrangury and heat of the urine. Of the dry heads infufed and boiled in water, is made the diacodium of the fhops.

It has been generally fuppofed, that from the heads of this fort of Poppy the opium is extracted; but one of the heads which I have by me, from which opium had been extracted in Turkey, is of a different fhape from thofe of this fort.

All the forts of Poppy are propagated by feeds, but the fifth and feventh forts, which have perennial roots, may be alfo propagated by offsets. The beft time for fowing the feeds is in September, when they will more certainly grow than thofe which are fown in the fpring; and thofe forts which are annual will make larger plants, and flower better than when they are fown in the fpring. The beft way is to fow the feeds of the annual kinds in the places where they are to remain, and to thin the plants where they are too clofe; thofe of the large kinds fhould not be left nearer to each other than a foot and a half, and the fmaller

sorts may be allowed about half that space. The culture they will require after this, is only to keep them clean from weeds.

Those who are curious to have fine Poppies in their gardens, carefully look over their plants when they begin to flower, and cut up all those plants whose flowers are not very double and well marked, before they open their flowers, to prevent their farina mixing with their finer flowers, which would degenerate them; and it is the not being careful of this, that causes the flowers to degenerate so frequently in many places, which is often supposed to be occasioned by the ground.

The yellow Welsh Poppy requires a cool shady situation, where the plants will thrive, and produce plenty of seeds annually. If these seeds are permitted to scatter, the plants will come up better than when sown by hand; but if they are sown, it should be always in the autumn; for the seeds of this, which are sown in the spring, rarely succeed.

The best time to transplant and part the roots of this sort is in the autumn, that the plants may be well established in their new quarters, before the dry weather comes on in the spring.

The eastern Poppy will thrive either in sun or shade, for I have several of these plants growing under trees, where they have thriven many years, and flower full as well as those in an open situation, but came later in the season. This will propagate very fast by its roots, so there is no necessity for sowing the seeds, unless to procure new varieties. This sort should be transplanted at the same season as the former; and if the seeds are sown, it should be at the same time, for the reasons before given.

PAPAVER CORNICULATUM. See Glaucium.

PAPAVER SPINOSUM. See Agremone.

PAPAYA. See Carica.

PAPILIONACEOUS. A papilionaceous (or Pea-bloom) flower is so called, because in some measure it resembles a butterfly with its wings expanded. It always consists of these parts; the vexillum or standard, which is a large erect segment or petal; the alæ, or two wings, which compose the sides, and the carina, or keel, which is a concave petal or segment, resembling the lower part of a boat: this keel is sometimes entire, and sometimes it consists of two petals or segments adhering pretty close together. Of this tribe are Peas, Beans, Kidney-beans, Vetches, and other leguminous plants.

PAPPOSE PLANTS are such as have their seeds covered with a down, which adheres to the upper part of the seed, and are of use to spread them when ripe, by sustaining them in the air, so that they may be conveyed to a great distance. Of this kind are the Sow-thistles, Hawkweeds, Dandelion, Starworts, &c.

PARASITICAL PLANTS are such as are produced out of the trunk or branches of other plants, from whence they receive their nourishment, and will not grow upon the ground, as the Misleto, &c.

PARIETARIA. Tourn. Inst. R. H. 509. tab. 289. Lin. Gen. Plant. 1020. so called from Paries, *Lat.* a wall, because it grows on old walls.] Pellitory; in French, *Parietaire.*

The Characters are,

*It hath hermaphrodite and female flowers upon the same plant. There are two hermaphrodite flowers contained in a six-leaved involucrum; these have a quadrifid plain empalement of one leaf, half the size of the involucrum. They have no petals, but four permanent awl-shaped stamina longer than the empalement, terminated by twin summits, with an oval germen supporting a slender coloured style, crowned by a pencil-shaped stigma. The germen afterward turns to an oval seed wrapped up in the empalement. The female flowers have no stamina, but in other respects are the same as the hermaphrodite.*

This genus of plants is ranged in the first section of Linnæus's twenty-third class, which contains those plants which have hermaphrodite and female flowers on the same plant.

The Species are,

1. Parietaria (*Officinalis*) foliis lanceolato-ovatis alternis. Hort. Upsal. 38. *Pellitory with oval spear-shaped leaves, placed alternately.* Parietaria officinarum & Dioscoridis. C. B. P. 121. *The official Pellitory of Dioscorides.*
2. Parietaria (*Judaica*) foliis ovatis caulibus erectiusculis, calycibus trifloris, corollis hermaphroditis, defloratis elongato-cylindricis. Lin. Sp. 1492. *Pellitory with oval leaves, an erect stalk, and three flowers in each cup, which are hermaphrodite.* Parietaria minor Ocimi folio. C. B. P. 121. *Smaller Pellitory with a Basil leaf.*

The first sort grows naturally in Germany and Holland, but was not in England till the year 1727, when I brought it here. This is supposed to be the true sort which is recommended by the ancients to be used in medicine; it hath a thick perennial root, composed of fleshy reddish fibres, from which arise many stalks a foot and a half high, garnished with hairy, oval, spear-shaped leaves, about two inches long, and one broad in the middle, having several veins. The flowers come out in small clusters on the side of the stalks; they are small, of an herbaceous colour, so make no figure. These appear in succession all the summer months, and the seeds ripen accordingly, which are cast out to a distance with an elasticity when ripe.

The second sort grows plentifully on old walls, and the sides of dry banks in most parts of England; this differs from the former in having shorter stalks, and smaller oval leaves. The flowers are also less, and are in smaller clusters; in other respects they are the same.

They may be propagated in plenty from a single plant, which, if permitted to scatter its seeds, will fill the ground about it with young plants, for the seeds are very difficult to collect, as they are thrown out of their covers as soon as they are ripe.

There are three or four other species of this genus, but as they have little beauty and are of no use, so are not cultivated in gardens.

PARIS. Lin. Gen. Plant. 449. Herba Paris. Tourn. Inst. R. H. 233. tab. 117. True-love, or One-berry.

The Characters are,

*The empalement of the flower is permanent, and composed of four leaves, which expand in form of a cross. The flower also hath four leaves, which spread open in the same manner, and are permanent. In the center of the flower is situated a roundish four-cornered germen, supporting four spreading styles, crowned by single summits. This is attended by eight stamina, each having an oblong summit, fastened by threads on each side to the stamina. The germen afterward changes to a roundish berry, having four cells which are filled with seeds.*

This genus of plants is ranged in the fourth section of Linnæus's eighth class, which includes the plants whose flowers have eight stamina and four styles.

We know but one Species of this genus, viz.

Paris (*Quadrifolia*) foliis quaternis. Flor. Lapp. 155. *Herb Paris, True-love, or One-berry.*

This plant grows wild in moist shady woods in divers parts of England, but especially in the northern counties, and it is with great difficulty preserved in gardens. The only method to procure it, is to take up the plants from the places where they grow wild, preserving good balls of earth to their roots, and plant them in a shady moist border, where they may remain undisturbed, in which situation they will live some years; but as it is a plant of little beauty, it is rarely preserved in gardens.

PARKINSONIA. Plum. Nov. Gen. 25. tab. 3. Lin. Gen. Plant. 460.

The Characters are,

*The empalement of the flower spreads open; it is of one leaf, indented in five parts at the top. The flower has five almost equal petals placed circularly; the four upper are oval, the under is kidney-shaped. It has ten declining stamina terminated by oblong summits, and a long taper germen with scarce any style, crowned by an obtuse stigma.*

*The germen afterward becomes a long taper pod with swelling joints, in each of which is lodged one oblong seed.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and one style.

We know but one SPECIES of this genus, viz.

PARKINSONIA (*Aculeata.*) Parkinsonia. Hort. Cliff. 57. Parkinsonia aculeata, foliis minutis, uni costæ adnexis. Plum. Nov. Gen. 25. *Prickly Parkinsonia with very small leaves, which are fastened to one middle rib.*

This plant was discovered by Father Plumier in America, who gave it this name in honour of Mr. John Parkinson, who published an Universal History of Plants in English, in the year 1640.

It is very common in the Spanish West-Indies, but of late years it has been introduced into the English settlements in America, for the beauty and sweetness of its flowers. This, in the countries where it grows naturally, rises to be a tree of twenty feet high or more, and bears long slender bunches of yellow flowers, which hang down after the same manner as the Laburnum. These flowers have a most agreeable sweet scent, so as to perfume the air to a considerable distance round about the trees; for which reason, the inhabitants of the West-Indies plant them near their habitations. And though this plant has not been introduced many years into the English settlements, yet it is now become so common in all the islands, that but few houses are without some of the trees near it; for it produces flowers and seeds in plenty in about two years from seed, so that it may soon be made common in all hot countries; but in Europe it requires a stove, otherwise it will not live through the winter.

This plant is propagated by seeds, which should be sown in small pots filled with light fresh earth early in the spring, and the pots must be plunged into a hot-bed of tanners bark, where, in about three weeks or a month's time, the plants will come up, when they should be kept clear from weeds, and frequently refreshed with a little water. In a little time these plants will be fit to transplant, which should be done very carefully, so as not to injure their roots. They must be each planted into a separate halfpenny pot filled with light fresh earth, and then plunged into the hot-bed again, observing to stir up the tan; and if it hath lost its heat, there should be some fresh tan added to renew it again. Then shade the plants from the heat of the sun, until they have taken new root; after which time they should have fresh air admitted to them every day, in proportion to the warmth of the season. With this management the plants will grow so fast, as to fill the pots with their roots by the beginning of July, at which time they should be shifted into pots a little larger than the former, and plunged again into the bark-bed to forward their taking new root; after which it will be the best way to inure the plants by degrees to bear the open air, that they may be hardened before winter; for if they are kept too warm in winter, the plants will decay before the next spring. The only method by which I have succeeded in keeping this plant through the winter, was by hardening them in July and August to bear the open air; and in September I placed them on shelves in the dry stove, at the greatest distance from the fire, so that they were in a very temperate warmth; and there they retained their leaves all the winter, and continued in health, when those which were placed in a warmer situation, as also those in the green-house, were entirely destroyed, but these seldom survived the second winter.

PARNASSIA. Tourn. Inst. R. H. 246. tab. 127. Lin. Gen. Plant. 345. Grass of Parnassus.

The CHARACTERS are,

*The flower hath a permanent spreading empalement, cut into five parts. The flower has five roundish, concave, spreading petals, which have five heart-shaped concave nectariums, and five stamina terminated by depressed summits, with a large oval germen having no style, but four obtuse permanent stigmas in their place. The germen afterward turns to an oval four-cornered capsule with one cell, containing several oblong seeds.*

This genus of plants is ranged in the fourth section of Linnæus's fifth class, which includes the plants whose flowers have five stamina and four styles.

The SPECIES are,

1. PARNASSIA (*Palustris.*) *Parnassus Grass.* Parnassia palustris & vulgaris. Inst. R. H. *Common Marsh Grass of Parnassus.*
2. PARNASSIA (*Pleno flore*) vulgaris flore pleno. *Common Grass of Parnassus, with a double flower.*

The former of these sorts grows wild in moist meadows in several parts of England, but particularly in the north; but it doth not grow in the neighbourhood of London, any nearer than on the other side of Watford, in the low meadows by Cassioberry, where it is in pretty great plenty.

The other sort is an accidental variety of the former, which has been discovered wild, and transplanted into gardens. This is but rarely to be found, being in very few gardens at present.

These plants may be taken up from the natural places of their growth, with balls of earth to their roots, and planted into pots filled with pretty strong, fresh, undunged earth, and placed in a shady situation; where, if they are constantly watered in dry weather, they will thrive very well, and flower every summer; but if the plants are planted in the full ground, it should be in a very moist shady border, otherwise they will not live; and these should be as duly watered as those in the pots in dry weather, to make them produce strong flowers.

They may be propagated by parting their roots, which should be done in March, before they put out new leaves; but the roots should not be divided too small, for that will prevent their flowering the following summer. These roots should always be planted in pretty strong fresh earth, for they will not thrive in a light rich soil. In the spring they must be constantly watered, if the season should prove dry, otherwise they will not flower; nor should they be parted oftener than every third year, to have them strong. These plants flower in July, and their seeds are ripe the latter end of August.

It is called Parnassus, from Mount Parnassus, on which it was supposed to grow; and from the cattle feeding on it, it was called a Grass, though the plant has no resemblance to any of the Grass kind, but is more like the Ranunculus in flower, and the leaves are pretty broad, oblong, and smooth.

PARONYCHIA. See ILLECEBRUM.

PARSLEY. See APIUM.

PARSNEP. See PASTINACA.

PARTERRE is a level division of ground, which, for the most part, faces the south and best front of a house, and is generally furnished with greens, flowers, &c.

There are several sorts of Parterres, as plain Grass with borders, and Parterres of embroidery, &c.

Plain Parterres are more beautiful in England than in any other countries, by reason of the excellency of our turf, and that decency and unaffected simplicity that it affords to the eye of the spectator.

Others are cut into shell and scroll-work, with sand-alleys between them, which are the finest Parterre works esteemed in France.

As to the general proportion of Parterres, an oblong or long square is accounted the most proper figure for a Parterre; because by the rules of perspective, or the natural declension of the visual rays in optics, a long square sinks almost to a square, and an exact square appears much less than it really is, therefore a Parterre should not be less than twice as long as it is broad; twice and a half is accounted a very good proportion, and it is very rare that three times is exceeded.

As to the breadth of a Parterre, it is to take its dimensions from the breadth of the front of the house. If the front of the house is one hundred feet long, the breadth of the Parterre should be one hundred and fifty

fifty feet; and if the front of the house be two hundred feet, the Parterre should be fifty feet broader; but where the front of the house exceeds the breadth of the Parterre, it will be a good proportion to make the Parterre of the same dimensions with the front.

Some do not approve of making Parterres very broad, because it makes them appear too short; when nothing is more pleasing to the eye, than a contracted regular conduct and view, as soon as the person goes out of a house or building; and a forward direct view is the best, whether it be either Parterre or lawn, or any other open space, either two, three, or fourfold in the width; and for that reason, those designs may justly be disapproved, by which the nobleness of the view is marred at the immediate entrance into the garden, the angle of light being broken and confused.

The making of Parterres too large causes a great expence, and at the same time occasions a diminution of wood, which is the most valuable part of a garden.

As to the adorning and furnishing these Parterres, whether it be plain or with embroidery, that depends much upon the form of them, and therefore must be left to the judgment and fancy of the designer.

PARTHENIUM. Lin. Gen. Plant. 939. Partheniastrum. Nissol. Act. Par. 1711. Dill. Gen. 13. Bastard Feverfew.

The Characters are,

*It hath a flower composed of hermaphrodite florets and female half florets, which are inclosed in a common five-leaved spreading empalement. The hermaphrodite flowers which form the disk, have one tubulous petal cut into five parts at the brim; they have five hair-like stamina the length of the tube, terminated by thick summits. The germen is situated below the floret, and is scarce visible, supporting a slender style having no stigma; these florets are barren. The female florets which compose the rays or border, are stretched out on one side like a tongue; these have a large, heart-shaped, compressed germen, with a slender style crowned by two long spreading stigmas. These are succeeded by one heart-shaped compressed seed.*

This genus of plants is ranged in the fifth section of Linnæus's twenty-first class, which includes those plants which have male and female, or hermaphrodite flowers in the same plants, whose male or hermaphrodite flowers have five stamina.

The Species are,

1. Parthenium (*Hysterophorus*) foliis composito-multifidis. Lin. Hort. Cliff. 442. *Parthenium with many-pointed compound leaves.* Partheniastrum artemisiæ folio, flore albo. Hort. Chelf. 152. *Bastard Feverfew, with a Mugwort leaf.*
2. Parthenium (*Integrifolium*) foliis ovatis crenatis. Lin. Hort. Cliff. 442. *Parthenium with oval crenated leaves.* Partheniastrum helenii folio. Hort. Elth. 302. tab. 225. *Bastard Feverfew with an Elecampane leaf.*

The first sort grows wild in great plenty in the island of Jamaica, and in some other of the English settlements in the West-Indies, where it is called wild Wormwood, and is used by the inhabitants as a vulnerary herb.

The second sort grows plentifully in several parts of the Spanish West-Indies, from whence the seeds have been brought to Europe.

The first is an annual plant, which may be propagated by sowing the seeds on a hot-bed early in the spring; and when the plants come up, they should be transplanted on another hot-bed, at about five or six inches distance, observing to water and shade them until they have taken new root; after which time they must have a pretty large share of fresh air in warm weather, by raising the glasses of the hot-bed every day, and they must be duly watered every other day at least. When the plants have grown so as to meet each other, they should be carefully taken up, preserving a ball of earth to their roots, and each planted into a separate pot filled with light rich earth; and if they are plunged into a moderate hot-bed, it will greatly facilitate their taking fresh root; but where this conveniency is wanting, the plants should be removed to a warm sheltered situation, where they must be shaded from the sun until they have taken new root; after which time they may be exposed, with other hardy annual plants in a warm situation, where they will flower in July, and their seeds will ripen in September. But if the season should prove cold and wet, it will be proper to have a plant or two in shelter, either in the stove, or under tall frames, in order to have good seeds, if those plants which are exposed should fail, whereby the species may be preserved.

The second sort is a perennial plant, which dies to the ground every autumn, and shoots up again the following spring. The seeds of this sort were sent me by my good friend Dr. Thomas Dale, from South Carolina, where the plants grow wild. This may be propagated by parting the roots in autumn, and may be planted in the full ground, where it will abide the cold of our ordinary winters very well. This sort flowers in July, but seldom produces good seeds in England.

These plants make no great appearance, so are seldom cultivated but for the sake of variety.

PASQUE-FLOWER. See Pulsatilla.

PASSERINA. Lin. Gen. Plant. 440. Thymelæa. Tourn. Inst. R. H. 594. Pluk. Sanamunda. Clus. Sparrow-wort.

The Characters are,

*The flower has no empalement; it has one withered petal, having a slender cylindrical tube swelling below the middle, and divided into four parts at the top, which spread open. It hath eight bristly stamina sitting on the top of the tube, terminated by erect summits almost oval. It has an oval germen under the tube, having a slender style rising on one side of the top of the germen, crowned by a headed stigma, set with prickly hairs on every side. The germen afterward turns to an oval seed pointed at both ends, inclosed in a thick oval capsule of one cell.*

This genus of plants is ranged in the first section of Linnæus's eighth class, which includes those plants whose flowers have eight stamina and one style.

The Species are,

1. Passernia (*Filiformis*) foliis linearibus convexis quadrifariàm imbricatis, ramis tomentosis. Lin. Sp. Plant. 559. *Sparrow-wort with linear convex leaves imbricated four ways, and downy branches.* Thymelæa Ethiopica, passerinæ foliis. Breyn. Cent. 10. fig. 6. *Ethiopian Spurge Laurel, with Sparrow-wort leaves.*
2. Passerina (*Hirsuta*) foliis carnosis extus glabris, caulibus tomentosis. Lin. Sp. Plant. 559. *Sparrow-wort with fleshy leaves, which are smooth on their outside, and downy stalks.* Sanamunda 3. Clus. Hist. 1. p. 89. *The third Sanamunda of Clusius.*
3. Passernia (*Ciliata*) foliis lanceolatis subciliatis erectis, ramis nudis. Lin. Sp. Plant. 559. *Sparrow-wort with spear-shaped erect leaves having small hairs and naked branches.* Sanamunda 1. Clus. Hist. 88. *The first Sanamunda of Clusius.*
4. Passernia (*Uniflora*) foliis linearibus oppositis, floribus terminalibus solitariis, ramis glabris. Lin. Sp. Plant. 560. *Sparrow-wort with linear leaves placed opposite, single flowers terminating the branches, and smooth stalks.* Thymelæa ramosa, linearibus foliis angustis, flore solitario. Burm. Afr. 131. tab. 48. fig. 1. *Branching Spurge Laurel, with narrow linear leaves and a single flower.*

The first sort grows naturally at the Cape of Good Hope, from whence it was first brought to the gardens in Holland. This rises with a shrubby stalk five or six feet high, sending out branches the whole length, which, when young, grow erect, but as they advance in length, they incline toward an horizontal position; but more so, when the small shoots toward the end are full of flowers and seed-vessels, which weigh down the weak branches from their upright position. The branches are covered with a white down like meal, and are closely garnished with very narrow leaves which are convex, and lie over each other in four rows like the scales of fish, so as that the young branches seem as if they were four-cornered.

The flowers come out at the extremity of the young branches, from between the leaves on every side; they are small and white, so make but little appearance, and are succeeded by small seed-vessels, which seem withered and dry. The flowers come out in June and July, and the seeds ripen in the autumn.

This plant may be propagated by cuttings during the summer months, which should be planted in a bed of loamy earth, and closely covered with a bell or hand-glass to exclude the air, shading them every day from the sun, and refreshing them now and then with water. With this treatment the cuttings will have taken root in about two months, when they may be taken up, and each planted in a small pot filled with soft loamy earth, placing them in the shade till they have taken new root; then they may be removed into a sheltered situation, where they may remain till October, when they must be placed in the green-house, for they will not live in the open air through the winter in England; but they require no other treatment, than Myrtles and other hardy green-house plants, which is to screen them from frost. As this plant retains its verdure all the year, so it makes a pretty variety in the green-house in winter.

It may also be propagated by seeds, which if sown in the autumn soon after they are ripe, will more certainly succeed, than at any other season of the year. The seeds should be sown in small pots filled with light earth, and if they are plunged into an old bed of tanners bark, under a common frame in winter, the plants will come up in the spring, and should then be treated in the same manner as those raised from cuttings; but the seedling plants will grow more erect, and appear handsomer than those propagated by cuttings.

The second sort grows naturally in Spain and Portugal; this hath shrubby stalks, which rise to a greater height than the former; the branches grow more diffused, and are covered with a meally down, garnished with short, thick, succulent leaves, lying over each other like the scales of fish; they are smooth and green on their outside, but downy on their inner. The flowers are small and white, like those of the former, and appear about the same time. This plant will live abroad in ordinary winters, if it is planted in a dry soil and a warm situation; but in hard frosts the plants are frequently destroyed, therefore one or two plants should be kept in pots, and sheltered in winter to preserve the species. This may be propagated by cuttings, in the same way as the former sort.

The third sort grows naturally in Spain and Portugal, as also at the Cape of Good Hope. This hath a shrubby stalk rising five or six feet high, sending out many branches which are naked to their ends, where they are garnished with oblong leaves standing erect, which have hairy points. The flowers are small, white, and come out between the leaves at the end of the branches; they appear in June, but are not succeeded by seeds in England. This may be propagated by cuttings as the two former, and requires the same treatment.

The fourth sort grows naturally at the Cape of Good Hope; it hath a low shrubby stalk, which seldom rises more than a foot high, dividing into many slender branches, which are smooth, and spread out on every side, garnished with very narrow leaves placed opposite; they are of a dark green, and have the appearance of those of the Fir-tree, but are narrower. The flowers come out singly at the end of the branches, which are larger than those of the former, and the upper part of the petals is spread open almost flat; they are of a purple colour, and appear about the same time as the former. This may be propagated by cuttings as the other sorts, and the plants must be treated as the first sort.

PASSIFLORA. Lin. Gen. Plant. 910. Granadilla. Tourn. Inst. R. H. 240. tab. 124. Passion-flower; in French, *Fleur de la Passion.*

The Characters are,

*The flower has a plain coloured empalement of five leaves, and five half spear-shaped petals, which are large, plain and obtuse. The nectarium hath a triple crown; the outer, which is longer, is fastened to the inside of the petal, but is larger and compressed above. It has five awl-shaped stamina, fastened at their base to the column of the style annexed to the germen, spreading out horizontally, and terminated by oblong, obtuse, incumbent summits. The style is an erect cylindrical column, upon whose top sits an oval germen, with three smaller styles which spread out, crowned by headed stigmas. The germen afterward becomes an oval fleshy fruit with one cell, sitting at the end of the style, filled with oval seeds, fastened longitudinally to the skin or shell.*

This genus of plants is ranged in the fourth section of Linnæus's twentieth class, which includes those plants whose male and female parts are joined together, and their flowers have five stamina.

The Species are,

1. Passiflora (*Incarnata*) foliis trilobis serratis. Amœn. Acad. vol. i. p. 230. *Passion-flower with leaves having three sawed lobes.* Granadilla Hispanis, flos passionis Italis. Hern. Mex. 888. *The Granadilla of the Spaniards, and the Passion-flower of the Italians, commonly called three-leaved Passion-flower.*
2. Passiflora (*Cærulea*) foliis palmatis integerrimis. Amœn. Acad. vol. i. p. 231. *Passion-flower with hand-shaped entire leaves.* Granadilla pentaphyllos, flore cæruleo magno. Boerh. Ind. alt. 2. p. 81. *Five-leaved Passion-flower, with a large blue flower, or the most common Passion-flower.*
3. Passiflora (*Lutea*) foliis trilobis cordatis æqualibus obtusis glabris integerrimis. Amœn. Acad. vol. i. p. 224. *Passion-flower with heart-shaped leaves having three equal lobes, which are smooth, obtuse, and entire.* Granadilla folio tricuspidi, flore parvo flavescente. Tourn. Inst. R. H. 240. *Passion-flower with a three-pointed leaf, and a small yellowish flower.*
4. Passiflora (*Glabra*) foliis trilobis integerrimis, lobis sublanceolatis, intermedio productiore. Amœn. Acad. vol. i. p. 229. *Passion-flower with leaves having three entire lobes, which are somewhat spear-shaped, and have the middle one longer than the others.* Flos passionis minor, folio in tres lacinias non serratis profundius diviso, flore luteo. Sloan. Cat. Jam. 104. *Smaller Passion-flower, with a leaf deeply divided into three segments which are not sawed, and a yellow flower.*
5. Passiflora (*Suberosa*) foliis trilobis integerrimis glabris, cortice suberoso. Amœn. Acad. 1. 226. *Passion-flower with leaves having three entire smooth lobes, and a Cork-like bark.* Flos passionis Curassavicus, folio glabro, trilobato, & angusto, flore flavescente omnium minimo. Par. Bat. Pluk. Alm. 282. *Passion-flower of Curassao, with a smooth leaf having three lobes, and the least yellow flower.*
6. Passiflora (*Olivæforma*) foliis hastatis glabris, petalis florum angustioribus. *Passion-flower with halbert-pointed smooth leaves, and narrow petals to the flowers.* Granadilla folio amplo tricuspidi, fructu olivæforma. Tourn. Inst. R. H. 240. *Passion-flower with a large three-pointed leaf, and an Olive-shaped fruit.*
7. Passiflora (*Fœtida*) foliis trilobis cordatis pilosis, involucris multifido-capillaribus. Amœn. Acad. 1. p. 228. *Passion-flower with leaves having three hairy lobes, and the involucrum of the flower composed of many pointed hairs.* Granadilla fœtida, folio tricuspidi villoso, flore albo. Tourn. Inst. R. H. 240. *Stinking Passion-flower with a hairy three-pointed leaf, and a white flower.*
8. Passiflora (*Variegata*) foliis hastatis pilosis amplioribus, involucris multifido capillaribus. *Passion-flower with the largest halbert-pointed hairy leaves, and empalements composed of many-pointed hairs.* Granadilla fœtida, folio tricuspidi villoso, flore purpureo variegato. Tourn. Inst. R. H. 241. *Stinking Passion-flower with a hairy three-pointed leaf, and a flower variegated with purple.*
9. Passiflora (*Holosericea*) foliis trilobis, basi utrinque denticulo reflexo. Amœn. Acad. 1. p. 229. *Passion-flower with leaves having three lobes, a little indented on each side the base, which is reflexed.* Granadilla folio hastato holoserico, petalis candicantibus, fimbriis ex purpureo & luteo variis. Martyn. Dec. 51. *Passion-flower with a silky halbert-pointed leaf, and flowers having white*

*white petals, which are variegated with a purple and yellow colour.*

10. Passiflora (*Capsularis*) foliis bilobis cordatis oblongis petiolatis. Lin. Sp. Plant. 957. *Passion-flower with oblong heart-shaped leaves, having two lobes standing upon foot-stalks.* Granadilla flore suaverubente folio bicorni. Tourn. Inst. R. H. 241. *Passion-flower with a soft red flower, and a leaf ending with two horns.*

11. Passiflora (*Vespertillio*) foliis bilobis, basi rotundatis biglandulosis, lobis acutis divaricatis, subtus punctatis. Amœn. Acad. 1. 223. *Passion-flower having two lobes, and two glands at the base of their leaves, whose lobes are acute, spread from each other, and spotted on their under side.* Granadilla bicornis, flore candido, filamentis intortis. Hort. Elth. 164. tab. 137. *Passion-flower with a two-horned leaf, a white flower, and intorted filaments.*

12. Passiflora (*Normalia*) foliis bilobis, basi emarginatis, lobis linearibus obtusis divaricatis, intermedio obsoleto mucronato. Amœn. Acad. 5. 248. *Passion-flower with leaves having two linear obtuse lobes, which are indented at the base, and have foot-stalks.* Granadilla quæ Coanenepilli seu Contrayerva. Hernand. *Passion-flower, called Coanenepilli or Contrayerva, by Hernandes.*

13. Passiflora (*Bicorna*) foliis bilobis glabris rigidis, basi indivisis. *Passion-flower with stiff smooth leaves having two lobes, which are undivided at their base.* Granadilla folio bicorni, glabro rigido, flore albo. Houst. MSS. *Passion-flower with a smooth two-horned leaf, and a white flower.*

14. Passiflora (*Murucuia*) foliis bilobis transversis amplexicaulibus. Amœn. Acad. 1. p. 222. *Passion-flower with transverse leaves, having two lobes embracing the stalk.* Murucuia folio lunato. Tourn. Inst. R. H. 251. *Murucuia with a moon-shaped leaf.*

15. Passiflora (*Maliformis*) foliis indivisis cordato-oblongis integerrimis, petiolis biglandulosis involucris integerrimis. Amœn. Acad. 1. p. 220. *Passion-flower with undivided, heart-shaped, oblong, entire leaves, foot-stalks with two glands, and entire covers to the flowers.* Granadilla latifolia, fructu maliformi. Tourn. Inst. R. H. 241. *Broad-leaved Passion-flower with an Apple-shaped fruit, commonly called Granadilla in the West-Indies.*

16. Passiflora (*Laurifolia*) foliis indivisis ovatis, integerrimis, petiolis biglandulosis involucris dentatis. Amœn. Acad. 1. p. 220. *Passion-flower with oval entire leaves, foot-stalks with two glands, and the covers of the flowers indented.* Granadilla fructu citriformi, foliis oblongis. Tourn. Inst. R. H. 241. *Passion-flower with a Citron-shaped fruit, and oblong leaves, commonly called Water Lemon in the West-Indies.*

17. Passiflora (*Cupræa*) foliis indivisis ovatis integerrimis, petiolis æqualibus. Amœn. Acad. vol. i. p. 219. *Passion-flower with undivided, oval, entire leaves, and equal foot-stalks.* Granadilla Americana, fructu subrotundo, corollâ floris erectâ, petalis amœne fulvis, foliis integris. Martyn. Cent. 1. 37. *American Passion-flower with a roundish fruit, an erect corolla to the flower, the petals of a fine copper colour, and entire leaves.*

18. Passiflora (*Serratifolia*) foliis indivisis serratis. Amœn. Acad. 1. p. 217. *Passion-flower with undivided sawed leaves.* Granadilla Americana, folio oblongo læviter serrato, petalis ex viridi rubescentibus. Mart. Cent. 1. p. 36. *American Passion-flower, with oblong leaves which are slightly sawed, and petals to the flower of a greenish red colour.*

19. Passiflora (*Multiflora*) foliis indivisis oblongis integerrimis, floribus confertis. Amœn. Acad. 1. p. 221. *Passion-flower with undivided, oblong, entire leaves, and flowers growing in clusters.* Clematis Indica, polyanthos odoratissima. Plum. Pl. Amer. 75. tab. 90. *Indian Climber having many sweet flowers.*

20. Passiflora (*Quadrangularis*) foliis indivisis subcordatis integerrimis, petiolis sexglandulosis, caule membranaceo tetragono. Lin. Sp. Plant. 1356. *Passion-flower with heart-shaped entire leaves, whose foot-stalks have six glands, and a four-cornered membranaceous stalk.* Passiflora foliis amplioribus cordatis, petiolis glandulis sex, caule quadrangulo alato. Brown. Jam. 327. *Passion-flower with ample heart-shaped leaves, whose foot-stalks have six glands, and a square winged stalk.*

The first sort grows naturally in Virginia and other parts of North America; this was the first known in Europe of all the species, but was not very common in the English gardens till of late years. The root of this plant is perennial, but the stalk is annual in North America, dying to the ground every winter, as it also does in England, unless it is placed in a stove. The stalks of this are slender, rising about four or five feet high, having tendrils or claspers at each joint, which fasten themselves about whatever plant stand near them, whereby the stalk is supported. At each joint comes out one leaf upon a short foot-stalk; these have for the most part three oblong lobes, which join at their base, but the two side lobes are sometimes divided part of their length into two narrow segments, so as to resemble a five-lobed leaf; they are thin, of a light green, and slightly sawed on their edges. The flowers are produced from the joints of the stalk at the foot-stalks of the leaves; these have long slender foot-stalks succeeding each other, as the stalks advance in height, during the summer months. The involucrum of the flower is composed of five oblong blunt-pointed leaves, of a pale green; these open and disclose five more leaves or petals, which are white, having a fringe or circle of rays of a double order round the style, of a purple colour, the lower row being the longest. In the center of this arises the pillar-like style, with the roundish germen at the top, surrounded at the bottom, where it adheres to the style, with five flattish stamina which spread out every way, and sustain each of them an oblong summit which hang downward, and on their under side are covered with a yellow farina. The flowers have an agreeable scent, but are of short duration, opening in the morning, and fade away in the evening, never opening again, but are succeeded by fresh flowers, which come out at the joints of the stalk above them. When the flowers fade, the roundish germen swells to a fruit as large as a middling Apple, which changes to a pale Orange colour when ripe, inclosing many oblong rough seeds inclosed in a sweetish pulp.

This sort is usually propagated by seeds which are brought from America, for the seeds do not often ripen in England; though I have sometimes had several fruit perfectly ripe on plants, which were plunged in a tan-bed under a deep frame; but those plants which are exposed to the open air, do not produce fruit here. The seeds should be sown upon a moderate hot-bed, which will bring up the plants much sooner than when they are sown in the open air, so they will have more time to get strength before winter. When the plants are come up two or three inches high, they should be carefully taken up, and each planted in a separate small pot filled with good kitchen-garden earth, and plunged into a moderate hot-bed to forward their taking new root; after which they should be gradually inured to bear the open air, to which they should be exposed in summer, but in the autumn they must be placed under a garden-frame to screen them from the frost; but they should have the free air at all times in mild weather. The spring following some of these plants may be turned out of the pots, and planted in a warm border, where, if they are covered with tanners bark every winter to keep out the frost, they will live several years, their stalks decaying in the autumn, and new ones arise in the spring, which in warm seasons will flower very well. If those plants which are continued in pots, are plunged into a tan-bed, some of them may produce fruit; and, if the stalks of these are laid down in the beginning of June, into pots of earth plunged near them, they will take root by the end of August, so that the plants may be easily propagated this way.

The second sort has not been many years in England, but is now the most common. This grows naturally in the Brasils, yet is hardy enough to thrive in the open air here, and is seldom injured except in very severe winters, which commonly kills the branches to the ground, and sometimes destroys the roots; this rises

rises in a few years to a great height, if they have proper support. I have seen some of these plants, whose branches were trained up more than forty feet high. The stalks will grow almost as large as a man's arm, and are covered with a purplish bark, but do not become very woody. The shoots from these stalks are often twelve or fifteen feet long in one summer; they are very slender, so must be supported, otherwise they will hang to the ground, intermix with each other, and appear very unsightly. These are garnished at each joint with one hand-shaped leaf, composed of five smooth entire lobes, the middle one, which is the longest, being almost four inches long, and one broad in the middle, the other are gradually shorter, and the two outer lobes are frequently divided on their outer side into two smaller lobes or segments. Their foot-stalks are near two inches long, and have two small leaves or ears embracing the stalks at their base, and from the same point comes out a long clasper, which twists round the neighbouring plants, whereby the stalks are supported. The flowers come out at the same joint as the leaves; these have foot-stalks almost three inches long. The flowers have an outer cover, composed of three concave oval leaves, of a paler green than the leaves of the plant, which are little more than half the length of the empalement, which is composed of five oblong blunt leaves, of a very pale green; within these are five petals, nearly of the same shape and size with the empalement, standing alternately between them. In the center of the flower arises a thick club-like column about an inch long, on the top of which sits an oval germen, from whose base spreads out five awl-shaped horizontal stamina, which are terminated by oblong broad summits fastened in the middle of the stamina, hanging downward; these may be moved round without separating from the stamina, and their under surface is charged with yellow farina; on the side of the germen arise three slender purplish styles near an inch long, spreading from each other, terminated by obtuse stigmas. Round the bottom of the column are two orders of rays; the inner, which is the shortest, inclines toward the column the outer, which is near half the length of the petals, spread open flat upon them; these rays are composed of a great number of thread-like filaments, of a purple colour at bottom, but are blue on the outside. The flowers have a faint scent, and continue but one day; after they fade, the germen on the top of the column swells to a large oval fruit about the size and shape of the Mogul Plum, and when ripe is of the same pale yellow colour, inclosing a sweetish disagreeable pulp, in which are lodged oblong seeds. This plant begins to flower early in July, and there is a succession of flowers daily, till the frost in autumn puts a stop to them.

It may be propagated by seeds, which should be sown in the same manner as those of the first sort, and the plants treated in the same way till the following spring, when they should be turned out of the pots, and planted against a good aspected wall, where they may have height for their shoots to extend, otherwise they will hang about and entangle with each other, so make but an indifferent appearance; but where buildings are to be covered, this plant is very proper for the purpose. After they have taken good root in their new quarters, the only care they will require, is to train their shoots up against the wall, as they extend in length, to prevent their hanging about, and if the winter proves severe, the surface of the ground about their roots should be covered with mulch to keep the frost from penetrating of the ground; and if the stalks and branches are covered with mats, Peas-haulm, straw, or any such light covering, it will protect them in winter against severe frosts; but this covering must be taken off in mild weather, otherwise it will cause the branches to grow mouldy, which will be more injurious to them than the cold. In the spring the plants should be trimmed, when all the small weak shoots should be entirely cut off, and the strong ones shortened to about four or five feet long, which will cause them to put out strong shoots for flowering the following year.

This plant is also propagated by laying down the branches, which in one year will be well rooted, so may be taken off from the old plants, and transplanted, where they are designed to remain. The cuttings of this will also take root, if they are planted in a loamy soil not too stiff, in the spring, before they begin to shoot. If these are covered with bell or hand-glasses to exclude the air, they will succeed much better than when they are otherwise treated; but when the cuttings put out shoots, the air should be admitted to them, otherwise they will draw up weak and spoil, and they must be afterwards treated as the layers. Those plants which are propagated by layers or cuttings, do not produce fruit so plentifully as the seedling plants; and I have found the plants which have been propagated two or three times, either by layers or cuttings, seldom produce fruit, which is common to many other plants.

If in very severe winters the stalks of these plants are killed to the ground, the roots often put out new stalks the following summer, therefore they should not be disturbed; and where there is mulch laid on the ground about their roots, there will be little danger of their being killed, although all the stalks should be destroyed.

There is a variety of this; the lobes of the leaves are much narrower, and are divided almost to the bottom. The flowers come later in the summer; the petals of the flowers are narrower, and of a purer white, but I believe it is only a seminal variation of the other, so not worthy of being enumerated.

The third sort grows naturally in Virginia, and also in Jamaica; this hath a perennial creeping root, sending up many weak stalks about three or four feet high, which are garnished with leaves shaped very like those of Ivy, and are almost as large, but of a pale green and very thin consistence. The flowers come out from the wings of the stalk upon slender foot-stalks an inch and a half long, and at their base arise very slender tendrils, which clasp round any neighbouring support. The flowers are of a dirty yellow colour, and not larger than a six-pence when expanded, so make no great appearance. This may be propagated by its creeping roots, which may be parted in April, and planted where they are to remain. This sort will live in a warm border, if treated in the same way as is directed for the first sort. Some of these plants lived many years in the Chelsea Garden in a border to a south-west aspect, but in the year 1740 they were killed by the frost.

The fourth sort grows naturally in Jamaica; this hath a perennial root, from which arise several slender stalks four or five feet high, which have joints four or five inches asunder; at each of these come out one leaf, a tendril, and a flower. The leaves have three lobes; the middle one is three inches long, and almost an inch broad in the middle; the two side lobes are about two inches long, and three quarters of an inch broad, of a light green colour, and thin. The flowers are smaller than those of the last mentioned, and are of a greenish colour; these are succeeded by oval fruit, about the size of small Olives, which turn purple when they are ripe.

The fifth sort grows naturally in most of the West-India islands; this rises with a weak stalk to the height of twenty feet. As the stalks grow old, they have a thick fungous bark like that of the Cork-tree, which cracks and splits. The smaller branches are covered with a smooth bark, and garnished with smooth leaves at each joint, sitting upon very short foot-stalks; these have three lobes, the middle one being much longer than those on the sides, so that the whole leaf has the form of the point of those halberts used by the yeomen of the guards. The flowers are small, of a greenish yellow colour, and are succeeded by small oval fruit of a dark purple colour when ripe.

The sixth sort grows naturally in the West-Indies; this hath a perennial root, from which arise several

slender

ſlender ſtalks, which riſe eight or ten feet high, garniſhed with ſmooth green leaves ſtanding upon ſlender foot-ſtalks. Theſe are but ſlightly indented into three lobes, which end in acute points, and are ſhaped like the points of halberts, the middle one ſtanding obliquely to the foot-ſtalk. The flowers come out from the wings of the leaves on very ſhort foot-ſtalks; they are of a pale yellow. The petals of the flowers are very narrow, and longer than thoſe of the two former ſorts; the fruit is ſmaller and of an oval form, changing to a dark purple when ripe.

The ſeventh ſort grows naturally in moſt of the iſlands in the Weſt-Indies, where the inhabitants of the Britiſh iſlands call it Love in a Miſt. The root of this is annual; the ſtalks riſe five or ſix feet high when they are ſupported; they are channelled and hairy. The leaves are heart-ſhaped, divided into three lobes, the middle lobe being three inches long, and one and a half broad; the two ſide lobes are ſhort but broad; they are covered with ſhort brown hairs. The tendrils come out at the ſame place as the leaves, as do alſo the flowers, whoſe foot-ſtalks are two inches long, hairy, and pretty ſtrong. The empalement of the flower is compoſed of ſlender hairy filaments, which are wrought like a net; theſe are longer than the petals of the flower, and turn up round them, ſo that the flowers are not very conſpicuous at a diſtance. Theſe are white, and of ſhort duration; their ſtructure is the ſame with the other ſorts, and they are ſucceeded by roundiſh oval fruit about the ſize of an ordinary Golden Pippin, of a yellowiſh green colour, incloſed with a netted empalement. This plant is propagated by ſeeds, which ſhould be ſown upon a hot-bed early in the ſpring, and when the plants are fit to remove, they ſhould be each tranſplanted into a ſmall pot filled with light kitchen-garden earth, and plunged again into a hot-bed, obſerving to ſhade them from the ſun till they have taken new root; after which time they muſt be treated in the ſame way as other plants from the ſame country, ſhifting them into larger pots as their roots increaſe; and when the plants are too tall to remain under the glaſſes of the hot-bed, they ſhould be removed into an airy glaſs-caſe, where they ſhould have the free air admitted to them in warm weather, but ſcreened from the cold. In this ſituation the plants will flower in July, and their ſeeds will ripen in the autumn. The whole plant has a diſagreeable ſcent when touched.

There is a variety of this, if it is not a diſtinct ſpecies, with hairy leaves not ſo broad as thoſe of the former. The whole leaf is ſhaped more like the point of a halbert, and thoſe leaves which grow toward the upper part of the ſtalks, have very ſmall indentures, ſo approach near to ſimple leaves without lobes. The flowers are alſo ſmaller, but of the ſame form, and the roots are of a ſhorter duration, ſo that I am inclined to believe it is a diſtinct ſpecies.

The eighth ſort has ſome appearance of the ſeventh, ſo that many perſons have ſuppoſed it was only an accidental variety of it, but there can be no doubt of its being a different ſpecies. The ſtalks of this riſe upward of twenty feet high, and will continue two or three years; the leaves are larger, but of the ſame ſhape, and hairy; the tendrils of this ſort are very long, as are alſo the foot-ſtalks of the flowers, which are ſmooth, not hairy as the former; the empalement of the flowers is netted, but not ſo long as in the former ſort; the flowers are larger, and the rays are of a light blue colour; the fruit is much leſs and rounder than thoſe of the other, and when ripe changes to a deep yellow colour.

The ninth ſort was diſcovered by the late Dr. Houſtoun growing naturally at La Vera Cruz; this a perennial plant. The ſtalks riſe twenty feet high, dividing into many ſlender branches, which are covered with a ſoft hairy down. The leaves are ſhaped like the point of a halbert; they are three inches long, and one inch and a half at their baſe, of a light green, ſoft and ſilky to the touch, ſtanding obliquely to the foot-ſtalks. The flowers come out at the wings of the leaves like the other ſpecies; theſe are not half ſo large as thoſe of the ſecond ſort, but are of the ſame form. The petals are white, and the rays or filaments are purple, with a mixture of yellow. The fruit of this is ſmall, roundiſh, and yellow when ripe.

The tenth ſort grows naturally in Jamaica, from whence the late Dr. Houſtoun ſent the ſeeds to England; this is a perennial plant. The ſtalks are ſlender, and riſe to twenty feet high when they are ſupported, and divide into many weak branches; the leaves, flowers, and tendrils come out at each joint. The leaves are four inches long, and three broad, rounded at their baſe in form of a heart, but end at their points with two horns, which in ſome leaves are more acute than in others, ſeveral of them appearing as if they were cut a little hollow at the top, like the leaves of the Tulip-tree. They have three longitudinal veins, which join at the baſe of the leaf to the foot-ſtalk, but the two outer diverge toward the borders of the leaf in the middle, drawing inward again at the top. The leaves are of a deep green on their upper ſide, but are pale on their under, and ſtand upon ſhort foot-ſtalks; the foot-ſtalks of the flowers are very ſlender, of a purpliſh colour, about an inch and a half long. The flowers are ſhaped like thoſe of the other ſpecies, but when expanded are not more than an inch and a half diameter, of a ſoft red colour, and little ſcent. The fruit is ſmall, oval, and when ripe, changes to a purple colour.

The eleventh ſort was diſcovered by the late Mr. Robert Millar, growing naturally near Carthagena in New Spain. This hath ſlender ſtriated ſtalks of a browniſh red colour, dividing into many ſlender branches, which are garniſhed with leaves ſhaped like the wings of a bat when extended; they are about ſeven inches in length, meaſuring from the two extended points, which may rather be termed the breadth, for from the baſe to the top they are not more than two inches and a half. The foot-ſtalk is ſet half an inch from the baſe of the leaf, from which come out three ribs or veins; two of them extend each way to the two narrow points of the leaf, the other riſes upright to the top, where is the greateſt length of the leaf, if it may be ſo termed. The figure of this leaf is the moſt ſingular of any I have yet ſeen. The flowers come out at the joints of the ſtalk like the others, upon ſhort ſlender foot-ſtalks; they are about three inches diameter when expanded. The petals and rays are white; the rays are twiſted and ſlender, extending beyond the petals. The fruit of this I have not ſeen entire.

The twelfth ſort was diſcovered by the late Dr. Houſtoun, growing naturally at La Vera Cruz in New Spain. This hath ſlender angular ſtalks which riſe twenty feet high, ſending out many branches, which are garniſhed with moon-ſhaped leaves, and have two blunt lobes, ſpreading aſunder each way, ſo as to have the appearance of a half moon. The flowers and tendrils come out from the ſame joints of the ſtalks. The flowers are of a pale colour and ſmall, but ſhaped like thoſe of the other ſorts; theſe are ſucceeded by oval fruit of a purple colour, about the ſize of ſmall oval Grapes.

The thirteenth ſort has ſome reſemblance of the twelfth, but the ſtalks are rounder and become ligneous. The leaves are almoſt as ſtiff as thoſe of the Bay-tree, and are not ſo deeply divided as thoſe of the former. The flowers ſtand upon long foot-ſtalks, which are horizontal; they are ſmall, white, and ſhaped like thoſe of the other ſort. The fruit is oval, ſmall, and of a purple colour, ſitting cloſe to the petals of the flowers, which are permanent. This was diſcovered by the late Dr. Houſtoun growing naturally at Carthagena in New Spain.

The fourteenth ſort grows naturally in moſt of the iſlands in the Weſt-Indies; this is by Tournefort ſeparated from this genus, and titled by him Murucuia, which is the Braſilian name for this, and ſome of the other ſpecies. This hath ſlender climbing ſtalks, which are channelled, putting out tendrils at the joints, which faſten themſelves about the neighbouring plants for ſupport, and climb to the height of ten

or twelve feet; they are garniſhed with leaves which are cut into two lobes at their baſe, but at the top are only a little hollowed at a diſtance from each point, riſing again in the middle oppoſite the foot-ſtalk. The baſe of the two lobes ſpread and meet, ſo that they appear as if they embraced the ſtalk; but when they are viewed near, they are found divided to the ſhort crooked foot-ſtalk, which does ſcarcely appear. There are two purpliſh veins ariſing from the foot-ſtalk, which extend each way to the points of the lobes. The leaves are of a lucid green on their upper ſurface, but pale on their under; the tendrils, which come out with the leaves, are very long, tough, and of a purple colour. The flowers are produced toward the end of the branches, coming out by pairs on each ſide the branches; theſe have purple foot-ſtalks an inch and a half long, ſuſtaining one flower at the top, whoſe empalement is compoſed of five purple leaves, which form a kind of tube, and within are five very narrow purple petals. The column in the center of the flower is of the ſame length as the petals, but the ſtamina are extended an inch above. When the flowers fade, the germen ſwells to an oval purple fruit, the ſize of the ſmall red Gooſeberry, incloſing a ſoft pulp, in which are lodged the ſeeds.

The fifteenth ſort grows naturally in the Weſt-Indies, where the inhabitants call it Granadilla; the fruit of this ſort is commonly eaten there, being ſerved up to their table in deſerts. This hath a thick, climbing, herbaceous, triangular ſtalk, ſending out ſlender tendrils at each joint, which faſten to the buſhes and hedges for ſupport, riſing to the height of fifteen or twenty feet, garniſhed at each joint with one large, oval, heart-ſhaped leaf, ſix inches long, and four broad in the middle, indented at the baſe, where the ſhort foot-ſtalk is faſtened to the branches, round at the top, having an acute point. There are two large ſtipulæ or ears joined to the ſtalks, which encompaſs the foot-ſtalks of the flowers and leaves, as alſo the baſe of the tendril. The leaves are of a lively green and thin texture, having one ſtrong nerve or midrib running longitudinally, from which ariſe ſeveral ſmall veins, which diverge to the ſides, and incurve again toward the top. The flowers ſtand upon pretty long foot-ſtalks, which have two ſmall glandules in the middle; the cover of the flower is compoſed of three ſoft velvety leaves, of a pale red, with ſome ſtripes of a lively red colour; the petals of the flower are white, and the rays are blue. Theſe flowers are large, ſo make a fine appearance during their continuance; but they are like the other ſpecies, of ſhort duration, but there is a ſucceſſion of flowers for ſome time on the ſame plants. After the flowers are paſt, the germen ſwells to a roundiſh fruit, the ſize of a large Apple, of a yellow colour when ripe, having a thicker rind than any of the other ſorts, incloſing a ſweetiſh pulp, in which are lodged many oblong flat ſeeds, of a browniſh colour, a little rough to the touch.

The ſixteenth ſort grows naturally in the iſlands of the Weſt-Indies; this hath climbing rough ſtalks, which put out claſpers at every joint like the others, which faſten to the neighbouring trees and hedges for ſupport, and riſe upward of twenty feet high, ſending out many ſide branches. The leaves are four or five inches long, and two broad, of a pretty thick conſiſtence, and of a bright green on their upper ſide, but pale on their under. The flowers come out at the joints of the ſtalks, upon foot-ſtalks an inch and a half long; the buds of the flowers are as large as pigeons eggs before they begin to expand. The cover of the flower is compoſed of three large, oval, green leaves, which are indented on their edges, and hollowed like a ſpoon: within theſe is the empalement of the flower, which is compoſed of five oblong leaves, of a pale green on their outſide, but whitiſh within; theſe are about an inch and a half long, and half an inch broad. The petals of the flower are white, and ſtand alternately with thoſe of the empalement, but are not more than half their breadth, and are marked with ſeveral ſmall, browniſh, red ſpots. The rays of the flower are of a Violet colour; the column in the center is yellowiſh, as is alſo the round germen at the top, but the three ſtyles are of a purple colour. Theſe flowers have an agreeable odour, and when they fade, the germen ſwells to the ſize of a pullet's egg, and nearly of the ſame ſhape, which turns yellow when ripe. The rind is ſoft and thick; the pulp has an agreeable acid flavour, which quenches thirſt, abates the heat of the ſtomach, gives an appetite, and recruits the ſpirits, ſo is commonly given in fevers. The ſeeds are heart-ſhaped and browniſh.

The ſeventeenth ſort grows naturally in the Bahama Iſlands, from whence the late Mr. Cateſby ſent the ſeeds to England; this hath ſlender, climbing, three-cornered ſtalks, which ſend out tendrils at each joint, faſtening themſelves to any neighbouring ſupport. The ſtalks climb to the height of twelve or fourteen feet, and are garniſhed with oblong oval leaves about two inches long, and one broad, of a light green, and entire. Their foot-ſtalks are ſlender, and an inch long, from which ariſe three longitudinal veins, one running through the middle of the leaf, the other two diverge to the ſides, drawing toward each other again at the point. The flowers come out from the wings of the ſtalk, upon ſlender foot-ſtalks an inch long; the empalement of the flower is compoſed of five oblong, narrow, purpliſh leaves, and within are five narrower petals of the ſame colour, which turn backward after they have been ſome time expanded. The column in the middle of the flower is very long and ſlender, ſupporting a round germen, from whoſe baſe ſpread out five ſlender ſtamina, terminated by oblong hanging ſummits, and from the top of the germen ariſe three ſlender ſtyles, which ſpread aſunder, and are crowned by roundiſh ſummits. When the flowers fade, the germen ſwells to an oval fruit about the ſize of ſparrow's egg, which changes to a purple colour when ripe, filled with oblong ſeeds incloſed in a ſoft pulp.

The nineteenth ſort was diſcovered by the late Dr. Houſtoun at La Vera Cruz in New Spain, where it grows naturally, from whence he ſent the ſeeds in 1731 to England, which ſucceeded in ſeveral gardens. This hath ſlender climbing ſtalks, ſending out many ſmall branches, which climb to the height of twenty-five or thirty feet, when they meet with neighbouring ſupport, to which they faſten themſelves by tendrils. The ſtalks by age become ligneous toward the bottom; their joints are not far aſunder. The leaves ſtand upon ſhort ſlender foot-ſtalks; they are three inches and a half long, and two broad in the middle, rounded at their baſe, but terminate in a point at the top; they are ſmooth, entire, and of a lively green colour. The flowers come out from the wings of the leaves, ſtanding upon long foot-ſtalks; the empalement of the flower is compoſed of five oblong leaves, green on their outſide, but whitiſh within. The flower has five oblong white petals, ſituated alternately to the leaves of the empalement, which ſpread open; the rays are of a bluiſh purple colour, inclining at bottom to red; the column in the center is ſhort and thick; the germen on the top is oval, and, after the flowers fade, ſwells to the ſize of a pullet's egg, and changes to a pale yellow when ripe, having many oblong ſeeds incloſed in a ſoft pulp. The flowers of this kind have an agreeable odour, but are of ſhort duration, ſeldom continuing twenty hours open; but there is a ſucceſſion of flowers on the plants from June to September, and ſometimes the fruit will ripen here.

The twentieth ſort has much the appearance of the fifteenth, both in ſtalk and leaves; but the ſtalks of this have four angles, whereas thoſe of the fifteenth have but three: the leaves alſo of that are not hollowed at their baſe, but thoſe of twentieth ſort are almoſt heart-ſhaped; the flower of it is much larger, though very like it in colour, and the fruit is near twice as large, and of a very agreeable flavour.

This requires the ſame culture as the fifteenth, with which it will produce flowers, and often will ripen its fruit in England. By ſome perſons this is confounded with the fifteenth ſort, and paſſes for the Granadilla.

All theſe perennial ſorts which are natives of the hot parts of America, require a ſtove to preſerve them here, without which they will not thrive; for although ſome of the ſorts will live in the open air during the warm months in ſummer, yet they make but little progreſs; nor will the plants produce many flowers, unleſs the pots in which they are planted are plunged into the tan-bed of the ſtove, and their branches are trained againſt an eſpalier. The beſt way to have them in perfection, is to make a border of earth on the back ſide of the tan-bed, which may be ſeparated by planks to prevent the earth from mixing with the tan; and when the plants are ſtrong enough, they ſhould be turned out of the pots, and planted in this border; adjoining to which, ſhould be a trelliage erected to the top of the ſtove; againſt this the ſtalks of the plants muſt be trained, and as they advance they will form a hedge to hide the wall of the ſtove, and their leaves continuing green all the year, together with their flowers, which will be plentifully intermixed in ſummer, will have a very agreeable effect.

As there will be only a plank partition between the earth and the tan, ſo the earth will be kept warm by the tan-bed, which will be of great ſervice to the roots of the plants. This border ſhould not be leſs than two feet broad and three deep, which is the uſual depth of the pit for tan; ſo that where theſe borders are intended, the pits ſhould not be leſs than eight feet and a half, or nine feet and a half broad, that the bark-bed, excluſive of the border, may be ſix and a half or ſeven feet wide. If the border is fenced off with ſtrong ſhip planks, they will laſt ſome years, eſpecially if they are well painted over with a compoſition of melted pitch, brick-duſt and oil, which will preſerve them ſound a long time; and the earth ſhould be taken out carefully from between the roots of the plants, at leaſt once a year, putting in freſh: with this management, I have ſeen theſe plants in great perfection. But where there has not been this conveniency, I have turned the plants out of the pots, and planted them into the tan-bed when it was half rotten, into which they have rooted exceedingly, and have thriven for two or three years as well as could be deſired; but when their roots extended to a great diſtance in the tan-bed, they have been injured by renewing of the bark; and when it has fermented pretty violently, the roots have been ſcalded, and the plants have been killed, ſo that the other method is more eligible.

Theſe plants are propagated by ſeeds, which ſhould be ſown upon a good hot-bed in the ſpring, and when the plants are fit to remove, they ſhould be each planted in a ſmall pot filled with good kitchen-garden earth, and plunged into a bed of tanners bark, obſerving to ſhade them from the ſun till they have taken new root; then they muſt be treated like other tender plants from the ſame countries. When they are too high to remain under the glaſſes of the hot-bed, they ſhould be turned out of the pots and planted in the ſtove, in the manner before mentioned.

As theſe ſorts do not often perfect their ſeeds here, ſo they may be propagated by laying down their branches, which, if done in April, they will put out roots by the middle of Auguſt, when they may be ſeparated from the old plants, and either planted in pots to get ſtrength, or into the border of the ſtove, where they are to remain.

Some of theſe ſorts may alſo be propagated by cuttings; theſe ſhould be planted into pots about the middle or latter end of March, and plunged into a moderate hot-bed, obſerving to ſcreen them from the ſun, and refreſh them with water gently, as often as the earth may require it; and in about two months or ten weeks, they will put out roots, and may then be treated as the ſeedling plants.

PASSION-FLOWER. See PASSIFLORA.

PASTINACA. Tourn. Inſt. R. H. 319. tab. 170. Lin. Gen. Plant. 324. [of Paſtus, *Lat.* fed; becauſe it it a plant whoſe root is edible.] Parſnep; in French, *Panais.*

The CHARACTERS are,

*It hath an umbellated flower; the principal umbel is compoſed of many ſmaller, and theſe are likewiſe compoſed of ſeveral rays. They have no involucrum, and the empalement is ſcarce viſible; the umbel is uniform. The flowers have five ſpear-ſhaped incurved petals, and five hair-like ſtamina, terminated by roundiſh ſummits. The germen is ſituated under the flower, ſupporting two reflexed ſtyles, crowned by obtuſe ſtigmas. The germen afterward becomes an elliptical, plain, compreſſed fruit, dividing into two parts, having two bordered elliptical ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifth claſs, which contains thoſe plants whoſe flowers have five ſtamina and two ſtyles.

The SPECIES are,

1. PASTINACA (*Sylveſtris*) foliis ſimpliciter pinnatis hirſutis. *Parſnep with ſingle, winged, hairy leaves.* Paſtinaca ſylveſtris latifolia. C. B. P. 155. *Broad-leaved Wild Parſnep.*
2. PASTINACA (*Sativa*) foliis ſimpliciter pinnatis glabris. *Parſnep with ſingle winged ſmooth leaves.* Paſtinaca ſativa, latifolia. C. B. P. 155. *Broad-leaved Garden Parſnep.*
3. PASTINACA (*Opopanax*) foliis decompoſitis pinnatis. Hort. Cliff. 105. *Parſnep with decompounded winged leaves.* Paſtinaca ſylveſtris altiſſima. Tourn. Inſt. 319. *Talleſt wild Parſnep, by Caſpar Bauhin titled, Panax Coſtinum.* Pin. 156.

The firſt ſort grows naturally on the ſide of banks, and on dry land, in many parts of England. This is a biennial plant, the firſt year ſhooting out leaves which ſpread on the ſurface of the ground; theſe are ſingly winged, and the lobes are irregularly cut; the leaves are hairy. The following year the ſtalks riſe four or five feet high, which are channelled, hairy, and garniſhed with winged leaves like thoſe at the bottom, but ſmaller; the ſtalk branches out toward the top, each branch being terminated by a large umbel of yellow flowers; theſe are ſucceeded by compreſſed fruit, having two flat bordered ſeeds. The plant flowers in June, and the ſeeds ripen in Auguſt.

The root and ſeed of this ſort is ſometimes uſed in medicine, but it is ſeldom cultivated in gardens, the markets being ſupplied from the fields; yet the druggiſts commonly ſell the ſeeds of the garden kind for it, which they may purchaſe at an eaſy price when it is too old to grow, but then the ſeeds can have no virtue left.

The ſecond ſort hath ſmooth leaves, of a light or yellowiſh green colour, in which this differs from the former; the ſtalks alſo riſe higher, and are deeper channelled; the foot-ſtalks of the umbels are much longer, and the flowers are of a deeper yellow colour. Theſe two ſorts have been thought only varieties, the Garden Parſnep they have ſuppoſed to differ from the wild only by culture; but I have cultivated both many years, and have never found that either of the ſorts have varied; the ſeeds of each having conſtantly produced the ſame ſort as they were taken from, ſo that I am certain they are diſtinct ſpecies.

This ſort is cultivated in kitchen-gardens, the roots of which are large, ſweet, and accounted very nouriſhing. They are propagated by ſeeds, which ſhould be ſown in February or March, in a rich mellow ſoil, which muſt be well dug, that their roots may run downward, the greateſt excellency being the length and bigneſs of the roots. Theſe may be ſown alone, or with Carrots, as is practiſed by the kitchen-gardeners near London; ſome of whom alſo mix Leeks, Onions, and Lettuce, with their Parſneps; but this I think very wrong, for it is not poſſible, that ſo many different ſorts can thrive well together, except they are allowed a conſiderable diſtance; and if ſo, it will be equally the ſame to ſow the different ſorts ſeparate. However, Carrots and Parſneps may be ſown together very well, eſpecially where the Carrots are deſigned

to

to be drawn off very young; because the Parsneps generally spread most towards the latter end of the summer, which is after the Carrots are gone, so that there may be a double crop upon the same ground.

When the plants are come up, you should hoe them out, leaving them about ten inches or a foot asunder; observing at the same time to cut up all the weeds, which, if permitted to grow, would soon overbear the plants and choke them. This must be repeated three or four times in the spring, according as you find the weeds grow; but in the latter part of summer, when the plants are so strong as to cover the ground, they will prevent the growth of weeds, so that after that season they will require no farther care.

When the leaves begin to decay, the roots may be dug up for use, before which time they are seldom well tasted; nor are they good for much in the spring, after they are shot out again; so that those who would preserve these roots for spring use, should dig them up in the beginning of February, and bury them in sand, in a dry place, where they will remain good until the middle of April, or later.

If you intend to save the seeds of this plant, you should make choice of some of the longest, straitest, and largest roots, which should be planted about two feet asunder, in some place where they may be defended from the strong south and west winds; for the stems of these plants commonly grow to a great height, and are very subject to be broken by strong winds, if exposed thereto; they should be constantly kept clear from weeds, and if the season should prove very dry, if you give them some water twice a week, it will cause them to produce a greater quantity of seeds, which will be much stronger than if they were wholly neglected. Toward the latter end of August or the beginning of September, the seeds will be ripe; at which time you should carefully cut off the umbels, and spread them upon a coarse cloth for two or three days to dry; after which, the seeds should be beaten off, and put up for use; but you must never trust to these seeds after they are a year old, for they will seldom grow beyond that age.

The leaves of the Garden Parsnep are dangerous to handle, especially in a morning, while the dew remains upon them; at which time, if they are handled by persons who have a soft skin, it will raise it in blisters. I have known some gardeners, when they have been drawing up Carrots from among Parsneps in a morning, when their leaves were wet with dew, they have drawn the sleeves of their shirts up to their shoulders, to prevent their being wet; by doing of which they have had their arms, so far as they were bare, covered over with large blisters; and these were full of a scalding liquor, which has proved very troublesome for several days.

The third sort rises with a green rough stalk seven or eight feet high, garnished with large, decompounded, winged leaves, which are very rough to the touch, and of a dark green colour; the juice is very yellow, which flows out where either the leaf or stalk is broken; the stalks are divided upward into many horizontal branches, each being terminated by a large umbel of yellow flowers. These appear in July, and are succeeded by plain seeds which are bordered, and a little convex in the middle, which ripen in the autumn. The Opapanax of the shops is thought to be the concrete juice of this plant.

PASTURE.

Pasture ground is of two sorts: the one is low meadow land, which is often overflowed, and the other is upland, which lies high and dry. The first of these will produce a much greater quantity of hay than the latter, and will not require manuring or dressing so often; but then the hay produced on the upland is much preferable to the other, as is also the meat which is fed in the upland more valued than that which is fatted in rich meadows; though the latter will make the fatter and larger cattle, as is seen by those which are brought from the low rich lands in Lincolnshire. But where people are nice in their meat, they will give a much larger price for such as hath been fed on the downs, or in short upland Pasture, than for the other, which is much larger. Besides this, dry Pastures have an advantage over the meadows, that they may be fed all the winter, and are not so subject to poach in wet weather; nor will there be so many bad weeds produced, which are great advantages, and do, in a great measure, recompense for the smallness of the crop.

I have already mentioned the advantages of meadow land, or such as is capable of being overflowed with water, and given directions for draining and improving low Pasture land, under the article of LAND; therefore shall not repeat what is there said, but I shall just mention some method for improving of upland Pasture.

The first improvement of upland Pasture is, by fencing it, and dividing it into small fields of four, five, six, eight, or ten acres each, planting timber trees in the hedge rows, which will screen the Grass from the drying pinching winds of March, which prevents the Grass from growing in large open lands; so that if April proves a cold dry month, the land produces very little hay; whereas in the sheltered fields the Grass will begin to grow early in March, and will soon after cover the ground, and prevent the sun from parching the roots of the Grass, whereby it will keep growing, so as to afford a tolerable crop, if the spring should prove dry. But in fencing of land, it must be observed (as was before directed) not to make the inclosures too small, especially where the hedge rows are planted with trees; because when the trees are advanced to a considerable height, they will spread over the land; and, where they are close, will render the Grass sour; so that instead of being an advantage, it will greatly injure the Pasture.

The next improvement of upland Pastures is, to make the turf good, where, either from the badness of the soil, or want of proper care, the Grass hath been destroyed by Rushes, bushes, or mole-hills. Where the surface of the land is clayey and cold, it may be improved by paring it off, and burning it in the manner before directed under the article of LAND; but if it is a hot sandy land, then chalk, lime, marle, or clay, are very proper manures to lay upon it; but this should be laid in pretty good quantities, otherwise it will be of little service to the land.

If the ground is over-run with bushes or Rushes, it will be of great advantage to the land, to grub them up toward the latter part of the summer, and after they are dried to burn them, and spread the ashes over the ground just before the autumnal rains; at which time the surface of the land should be levelled, and sown with Grass-seed, which, if done early in the autumn, will come up in a short time, and make good Grass the following spring. So also, where the land is full of mole-hills, these should be pared off, and either burnt for the ashes, or spread immediately on the ground, when they are pared off, observing to sow the bare patches with Grass-seed, just as the autumnal rains begin.

There are some Pasture lands which are full of ant-hills, which are not only disagreeable to the sight, but where they are in any quantity, the Grass cannot be mowed; therefore the turf which grows over them should be divided with an instrument into three parts, and pared off each way; then the middle or core of the hills should be dug out and spread over the ground, leaving the holes open all the winter to destroy the ants, and in the spring the turf may be laid down again, and after the roots of the Grass are settled again in the ground, it should be rolled to settle the surface, and make it even. If this is properly managed, it will be a great improvement to such land.

Where the land has been thus managed, it will be of great service to roll the turf in the months of February and March, with a heavy wood roller, always observing to do it in moist weather, that the roll may make an impression: this will render the surface level, and make it much easier to mow the Grass, than

when the ground lies in hills; and will alſo cauſe the turf to thicken, ſo as to have what the people uſually term a good bottom. The Graſs likewiſe will be the ſweeter for this huſbandry, and it will be a great help to deſtroy bad weeds.

Another improvement of upland Paſtures is the feeding them every other year; for where this is not practiſed, the land muſt be manured at leaſt every third year; and where a farmer hath much arable land in his poſſeſſion, he will not care to part with his manure to the Paſture. Therefore every farmer ſhould endeavour to proportion his Paſture to his arable land, eſpecially where manure is ſcarce, otherways he will ſoon find his error; for the Paſture is the foundation of all the profit, which may ariſe from the arable land. Whenever the upland Paſtures are mended by manure, there ſhould be a regard had to the nature of the ſoil, and a proper ſort of manure applied: as for inſtance, all hot ſandy lands ſhould have a cool manure; neats dung and ſwines dung are very proper for ſuch lands, as alſo marle and clay; but for cold lands, horſe dung, aſhes, or ſand, and other warm manures, are proper. And when theſe are applied, it ſhould be done in autumn, before the rains have ſoaked the ground, and rendered it too ſoft to cart on; and it ſhould be carefully ſpread, breaking all the clods as ſmall as poſſible, and early in the ſpring harrowed with buſhes, to let it down to the roots of the Graſs. When the manure is laid on at this ſeaſon, the rains in winter will waſh down the ſalts, ſo that the following ſpring the Graſs will receive the advantage of it.

There ſhould alſo be great care had to the deſtroying of weeds in the Paſture, every ſpring and autumn; for where this is not practiſed, the weeds will ripen their ſeeds, which will ſpread over the ground, and thereby fill it with ſuch a crop of weeds as will ſoon over-bear the Graſs, and render it very weak, if not deſtroy it; and it will be very difficult to root them out, after they have gotten ſuch poſſeſſion; eſpecially Ragwort, Hawkweed, Dandelion, and ſuch other weeds as have down adhering to their ſeeds.

Theſe upland Paſtures ſeldom degenerate the Graſs which is ſown on them, if the land is tolerably good; whereas the low meadows, which are overflowed in winter, in a few years turn to a harſh ruſhy Graſs, but the upland will continue a fine ſweet Graſs for many years without renewing.

There is no part of huſbandry, of which the farmers are in general more ignorant, than that of the Paſture; moſt of them ſuppoſe, that when the old Paſture is ploughed up, it can never be brought to have a good ſward again; ſo their common method of managing their land after ploughing, and getting two or three crops of Corn is, to ſow with their crop of Barley, ſome Graſs-ſeeds, as they call them; that is, either the red Clover, which they intend to ſtand two years after the Corn is taken off the ground, or Rye-graſs mixed with Trefoil; but as all theſe are at moſt but biennial plants, whoſe roots decay ſoon after their ſeeds are perfected, ſo the ground having no crop upon it, is again ploughed for Corn; and this is the conſtant round which the lands are employed in, by the better ſort of farmers; for I never have met with one of them, who had the leaſt notion of laying down their land to Graſs for any longer continuance; therefore the ſeeds which they uſually ſow, are the beſt adapted for this purpoſe.

But whatever may have been the practice of theſe people, I hope to prove, that it is poſſible to lay down land, which has been in tillage, with Graſs, in ſuch manner as that the ſward ſhall be as good, if not better, than any natural Graſs, and of as long duration. But this is never to be expected, in the common method of ſowing a crop of Corn with the Graſs-ſeeds; for wherever this hath been practiſed, if the Corn has ſucceeded well, the Graſs has been very poor and weak; ſo that if the land has not been very good, the Graſs has ſcarcely been worth ſtanding; for the following year it has produced but little hay, and the year after the crop is worth little, either to mow or ſeed. Nor can it be expected it ſhould be otherwiſe, for the ground cannot nouriſh two crops; and if there were no deficiency in the land, yet the Corn being the firſt, and moſt vigorous of growth, will keep the Graſs from making any conſiderable progreſs; ſo that the plants will be extremely weak and but very thin, many of them which came up in the ſpring being deſtroyed by the Corn; for wherever there are roots of Corn, it cannot be expected there ſhould be any Graſs. Therefore the Graſs muſt be thin, and, if the land is not in good heart to ſupply the Graſs with nouriſhment, that the roots may branch out after the Corn is gone, there cannot be any conſiderable crop of Clover; and as theſe roots are biennial, many of the ſtrongeſt plants will periſh ſoon after they are cut; and the weak plants, which had made but little progreſs before, will be the principal part of the crop for the ſucceeding year, which is many times not worth ſtanding.

Therefore, when ground is laid down for Graſs, there ſhould be no crop of any kind ſown with the ſeeds; and the land ſhould be well ploughed, and cleaned from weeds; otherwiſe the weeds will come up the firſt, and grow ſo ſtrong, as to overbear the Graſs, and if they are not pulled up, will entirely ſpoil it. The beſt ſeaſon to ſow the Graſs ſeeds upon dry land is about the middle of Auguſt, if there is an appearance of rain; for the ground being then warm, if there happen ſome good ſhowers of rain after the ſeed is ſown, the Graſs will ſoon make its appearance, and get ſufficient rooting in the ground before winter, ſo will not be in danger of having the roots turned out of the ground by the froſt, eſpecially if the ground is well rolled before the froſt comes on, which will preſs it down, and fix the earth cloſe to the roots. Where this hath not been practiſed, the froſt has often looſened the ground ſo much, as to let in the air to the roots of the Graſs, and done it great damage; and this has been brought as an objection to the autumnal ſowing of Graſs; but it will be found to have no weight, if the above direction is practiſed; nor is there any hazard in ſowing the Graſs at this ſeaſon, but that of dry weather after the ſeeds are ſown; for if the Graſs comes up well, and the ground is well rolled in the middle or end of October, and repeated the beginning of March, the ſward will be cloſely joined at bottom, and a good crop of hay may be expected the ſame ſummer. In very open, expoſed, cold lands, it is proper to ſow the ſeeds earlier than is here mentioned, that the Graſs may have time to get good rooting, before the cold ſeaſon comes on to ſtop its growth; for in ſuch ſituations, vegetation is over early in the autumn, ſo the Graſs being weak, may be deſtroyed by froſt: but if the ſeeds are ſown in the beginning of Auguſt, and a few ſhowers follow ſoon after to bring up the Graſs, it will ſucceed much better than any which is ſown in the ſpring, as I have ſeveral years experienced, on ſome places as much expoſed as moſt in England. But where the ground cannot be prepared for ſowing at that ſeaſon, it may be performed the middle or latter end of March, according to the ſeaſon's being early or late; for in backward ſprings and in cold land, I have often ſowed the Graſs in the middle of April with ſucceſs; but there is danger in ſowing late of dry weather, and eſpecially if the land is light and dry; for I have ſeen many times the whole ſurface of the ground removed by ſtrong winds at that ſeaſon, ſo that the ſeeds have been driven in heaps to one ſide of the field. Therefore whenever the ſeeds are ſown late in the ſpring, it will be proper to roll the ground well ſoon after the ſeeds are ſown, to ſettle the ſurface, and prevent its being removed.

The ſorts of ſeeds which are the beſt for this purpoſe, are the beſt ſort of upland hay-ſeeds, taken from the cleaneſt Paſtures, where there are no bad weeds; if this ſeed is ſifted to clean it from rubbiſh, three, or at moſt four buſhels, will be ſufficient to ſow an acre of land. The other ſort is the Trifolium

pratenſe album, which is commonly known by the names of White Dutch Clover, or White Honeyſuckle Graſs. Eight pounds of this ſeed will be enough for one acre of land. The Graſs-ſeed ſhould be ſown firſt, and then the Dutch Clover-ſeed may be afterward ſown; but they ſhould not be mixed together, becauſe the Clover-ſeeds being the heavieſt, will fall to the bottom, and conſequently the ground will be unequally ſown with them.

After the ſeeds are ſown, the ground ſhould be lightly harrowed to bury the ſeeds; but this ſhould be performed with a ſhort-toothed harrow, otherwiſe the ſeeds will be buried too deep. Two or three days after ſowing, if the ſurface of the ground is dry, it ſhould be rolled with a Barley roller to break the clods and ſmooth the ground, which will ſettle it, and prevent the ſeeds from being removed by the wind.

When the ſeeds are come up, if the land ſhould produce many weeds, theſe ſhould be drawn out before they grow ſo tall as to overbear the Graſs; for where this has been neglected, the weeds have taken ſuch poſſeſſion of the ground, as to keep down the Graſs and ſtarve it; and when theſe weeds have been ſuffered to remain until they have ſhed their ſeeds, the land has been ſo plentifully ſtocked with them, as entirely to deſtroy the Graſs; therefore it is one of the principal parts of huſbandry, never to ſuffer weeds to grow on the land.

If the ground is rolled two or three times at proper diſtances after the Graſs is up, it will preſs down the Graſs, and cauſe it to make a thicker bottom; for as the Dutch Clover will put out roots from every joint of the branches which are near the ground, ſo by preſſing down the ſtalks, the roots will mat ſo cloſely together, as to form a ſward ſo thick as to cover the whole ſurface of the ground, and form a green carpet, which will better reſiſt the drought. For if we do but examine the common Paſtures in ſummer (in moſt of which there are patches of this White Honeyſuckle Graſs growing naturally) we ſhall find theſe patches to be the only verdure remaining in the fields. And this the farmers in general acknowledge, is the ſweeteſt feed for all ſorts of cattle, yet never had any notion of propagating it by ſeeds till of late years. Nor has this been long practiſed in England; for till within a few years, that ſome curious perſons imported the ſeed from Brabant, where it had been long cultivated, there was not any of the ſeeds ſaved in England; though now there are ſeveral perſons who ſave the ſeeds here, which ſucceed full as well as any of the foreign ſeeds which are imported.

As this White Clover is an abiding plant, ſo it is certainly the very beſt ſort to ſow where Paſtures are laid down to remain; for as the hay-ſeeds which are taken from the beſt Paſtures, will be compoſed of various ſorts of Graſs, ſome of which may be but annual and others biennial, ſo when thoſe go off, there will be many and large patches of ground left bare and naked, if there is not a ſufficient quantity of the White Clover to ſpread over and cover the land. Therefore a good ſward can never be expected where this is not ſown; for in moſt of the natural Paſtures, we find this plant makes no ſmall ſhare of the ſward; and it is equally good for wet and dry land, growing naturally upon gravel and clay in moſt parts of England; which is a plain indication how eaſily this plant may be cultivated to great advantage, in moſt ſorts of land throughout this kingdom.

Therefore the true cauſe why the land which is in tillage is not brought to a good turf again, in the uſual method of huſbandry is, from the farmers not diſtinguiſhing which Graſſes are annual, from thoſe which are perennial; for if annual or biennial Graſſes are ſown, theſe will of courſe ſoon decay; ſo that unleſs where ſome of their ſeeds may have ripened and fallen, nothing can be expected on the land but what will naturally come up. Therefore this, together with the covetous method of laying down the ground with a crop of Corn, has occaſioned the general failure of increaſing the Paſture in many parts of England, where it is now much more valuable than any arable land.

After the ground has been ſown in the manner before directed, and brought to a good ſward, the way to preſerve it good is, by conſtantly rolling the ground with a heavy roller, every ſpring and autumn, as hath been before directed. This piece of huſbandry is rarely practiſed by farmers, but thoſe who do, find their account in it, for it is of great benefit to the Graſs. Another thing ſhould alſo be carefully performed, which is, to cut up Docks, Dandelion, Knapweed, and all ſuch bad weeds, by their roots, every ſpring and autumn; this will increaſe the quantity of good Graſs, and preſerve the Paſtures in beauty. Dreſſing of theſe Paſtures every third year, is alſo a good piece of huſbandry, for otherwiſe it cannot be expected the ground ſhould continue to produce good crops. Beſides this, it will be neceſſary to change the ſeaſons of mowing, and not to mow the ſame ground every year, but to mow one ſeaſon, and feed the next; for where the ground is every year mown, it muſt be conſtantly dreſſed, as moſt of the Graſs grounds near London, otherwiſe the ground will be ſoon exhauſted.

Of late years there has been an emulation, eſpecially among gentlemen, to improve their Paſtures, by ſowing ſeveral ſorts of Graſs-ſeeds; and there have been ſome perſons of little ſkill in theſe matters, who have impoſed on many ignorant people, by ſelling them ſeeds of ſome foreign Graſs, recommending them for ſome particular quality, but when tried have proved of little worth, whereby they have loſt a ſeaſon or two, and have had their work to begin again. Therefore I would adviſe every perſon, not to truſt too much upon the faith of ſuch practitioners, who, upon ſlight experiments, have ventured to recommend without judgment; for of all the ſorts of Graſs-ſeeds which have been brought from America (of which I have, at various times, ſown more than a hundred different ſpecies) I have found none equal to the common Poa Graſs, which grows naturally in England, either for duration or verdure; therefore that, and about ſix or ſeven other ſorts, are the beſt worth cultivating; but the trouble of collecting theſe in quantity is ſo great, as to deter moſt people from attempting it; and in the purchaſing of hay-ſeeds, there is generally more ſeeds of weeds than Graſs, which will fill the ground; therefore for ſome years paſt, I have recommended and ſown only the White Dutch Clover-ſeeds, and have waited for the natural Graſs coming up amongſt it, and have generally ſucceeded better this way than by ſowing hay-ſeed with it; for if the Paſture is duly weeded, rolled, and dreſſed, all bad weeds may be deſtroyed, and a fine durable turf obtained: whereas the Burnet, and many other plants, which have been extolled as a good winter pabulum, are of ſhort duration, ſo very improper for improving land; nor are there two better plants yet known for the purpoſe of fodder, than the Lucern and Saintfoin; for where theſe are properly ſown upon right ſoils and duly cultivated, they will produce a much greater quantity of food, than can be procured from the ſame quantity of land, ſown with any other abiding plant: therefore I wiſh thoſe who are curious to have much fodder for their cattle, to apply themſelves to the culture of theſe, and not engage in uncertain experiments.

PAVIA. Boerh. Ind. alt. 2. p. 260. Eſculus. Lin. Gen. Plant. 420. The ſcarlet, flowering, Horſe Cheſtnut.

The Characters are,

*The flower has a ſmall bellied empalement of one leaf, indented in five parts at the top. The flower has five roundiſh petals, waved and plaited on their borders, and narrow at their baſe, where they are inſerted in the empalement. It hath eight ſtamina which are declined, and as long as the petals, terminated by riſing ſummits; and a roundiſh germen ſitting upon an awl-ſhaped ſtyle, crowned by an acuminated ſtigma. The germen afterward becomes an oval, Pear-ſhaped, leathery capſule with three cells,*

*in which is sometimes one, and at others two, almost globular seeds.*

This genus of plants should be ranged in the first section of Linnæsu's eighth clafs, which includes thofe plants whofe flowers have eight ftamina and one ftyle; but he has joined this to the Horfe Cheftnut, under the title Efculus, and places it in his feventh clafs; but as the flowers of this have eight ftamina, and thofe of the Horfe Cheftnut but feven; and the capfule of this is fmooth, and that of the Horfe Cheftnut prickly, fo they may be very well feparated.

There is but one Species of this genus, viz.

Pavia (*Octandria.*) Boerh. Ind. alt. 2. p. 260. *The fcarlet Horfe Cheftnut.* Dr. Linnæus titles it, Efculus floribus octandris. Sp. Plant. 344. *Efculus with flowers having eight ftamina.*

This plant grows naturally in Carolina and the Brazils; from the firft the feeds were brought to England, where the plants have been of late years much cultivated in the gardens. In Carolina it is but of humble growth, feldom rifing more than eight or ten feet high; the ftalk is pretty thick and woody, fending out feveral branches, which fpread out on every fide, which are garnifhed with hand-fhaped leaves, compofed of five or fix fpear-fhaped lobes, which unite at their bafe where they join the foot-ftalk; they are of a light green, having a rough furface, and are fawed on their edges; thefe have long foot-ftalks, and ftand oppofite on the branches. The flowers are produced in loofe fpikes at the end of the branches, ftanding upon long naked foot-ftalks, which fuftain five or fix tubulous flowers fpread open at the top, where the petals are irregular in fize and length, having an appearance of a lip flower; they are of a bright red colour, and have eight ftamina the length of the petals. When the flowers fade, the germen fwells to a Pear-fhaped fruit, with a thick ruffet cover having three cells, one of which, and fometimes two, are pregnant with globular feeds. It flowers in July, and the feeds fometimes ripen here in autumn. It may be propagated by fowing the feeds in the fpring, upon a moderate hot-bed covered with light fandy earth; and when the plants come up, they fhould be carefully cleared from weeds, but they muft not be tranfplanted until the year following. But as thefe feedling plants are tender while they are young, fo they fhould be covered with mats the following winter; and this fhould be carefully performed in autumn, when the early frofts begin; for as the tops of thefe young plants are very tender, fo a fmall froft will pinch them; and when the tops are killed, they generally decay to the ground; and when this happens, they feldom make good plants after. Therefore this fhould be conftantly obferved for two or three years at leaft, by which time the plants will have gotten ftrength enough to refift the froft, when they fhould be removed juft before they begin to fhoot, and placed either in a nurfery to be trained up, or otherwife where they are to remain; obferving, if the feafon proves dry, to water them until they have taken root, as alfo to lay fome mulch upon the furface of the ground, to prevent the fun and wind from drying it too faft; and as the plants advance, the lateral branches fhould be pruned off, in order to reduce them to regular ftems.

You muft alfo obferve to dig the ground about their roots every fpring, that it may be loofe, to admit the fibres of the roots, which, while young, are too tender to penetrate the ground if it be very hard.

With this management the plants will greatly advance, and in four or five years will produce flowers and often fruits, which in warm feafons ripen enough to grow, fo that the plants may be multiplied therefrom very faft.

This tree may alfo be propagated by budding or grafting it upon the common Horfe Cheftnut, which is the common method practifed by the nurferymen; but the trees thus raifed, feldom make a good appearance long, for the common Horfe Cheftnut will be more than twice the fize of the other, and frequently put out fhoots below the graft, and fometimes the grafts are blown out of the ftocks, after ten years growth; but thefe ftocks render the trees hardy, and of a larger growth.

PAULLINIA. Lin. Gen. Plant. 446. Serjana. Plum. Nov. Gen. 34. tab. 35. Cururu. Plum. Nov. Gen. 34. tab. 35.

The Characters are,

*The flower has a fpreading permanent empalement, compofed of four fmall oval leaves. It hath four oblong petals twice the fize of the empalement, and eight fhort ftamina, terminated by fmall fummits, with a turbinated germen, having three obtufe corners, fupporting three fhort flender ftyles, crowned by fpreading ftigmas. The germen afterward turns to a large three-cornered capfule with three cells, each containing one almoft oval feed. The capfule of Plumier's Serjana has the feeds faftened to the bafe, and that of Cururu has the feeds growing to the top.*

This genus of plants is ranged in the third fection of Linnæus's eighth clafs, which includes thofe plants whofe flowers have eight ftamina and three ftyles.

The Species are,

1. Paullinia (*Serjana*) foliis ternatis, petiolis teretiufculis, foliolis ovato-oblongis. Lin. Sp. Plant. 365. *Three-leaved Paullinia with taper foot-ftalks, and oblong oval lobes to the leaves.* Serjana fcandens, triphylla & racemofa. Plum. Nov. Gen. 34. *Climbing branching Serjana with three leaves.*
2. Paullinia (*Mexicana*) foliis biternatis, petiolis marginatis, foliis ovatis integris. Lin. Sp. Plant. 366. *Paullinia with nine lobes in each leaf, bordered foot-ftalks, having oval entire lobes.* Serjana fcandens enneaphylla & racemofa. Plum. Nov. Gen. 34. *Climbing branching Serjana with nine leaves.*
3. Paullinia (*Cururu*) foliis ternatis, foliolis cuneiformibus, obtufis fubdentatis. Lin. Sp. Plant. 365. *Three-leaved Paullinia with trifoliate leaves having wedge-fhaped lobes, which are obtufe and fomewhat indented.* Cururu fcandens triphylla. Plum. Nov. Gen. 34. *Climbing three-leaved Cururu.*
4. Paullinia (*Curaffavica*) foliis biternatis, foliolis ovatis. Lin. Sp. Plant. 366. *Paullina with double trifoliate leaves, having oval finuated lobes.* Cururu fcandens enneaphylla, fructu racemofo rubro. Plum. Nov. Gen. 34. *Climbing nine-leaved Cururu, with a red branching fruit.*
5. Paullinia (*Pinnata*) foliis pinnatis, foliolis incifis, petiolis marginatis. Hort. Cliff. 52. *Paullinia with winged leaves whofe lobes are cut, and bordered foot-ftalks.* Cururu fcandens pentaphylla. Plum. Nov. Gen. 37. *Climbing five-leaved Cururu.*
6. Paullinia (*Tomentofa*) foliis pinnatis tomentofis, foliolis ovatis incifis, petiolis marginatis. *Paullinia with winged woolly leaves whofe lobes are oval, cut on their edges, and bordered foot-ftalks.* Cururu fcandens, pentaphylla & villofa, fructu racemofo rubro. Houft. MSS. *Climbing Cururu with five leaves which are hairy, and a red fruit growing in long bunches.*

Thefe plants all grow naturally in the Weft-Indies, where there are feveral other fpecies which are not here enumerated. They have climbing ftalks with tendrils at each joint, by which they faften themfelves to the neighbouring trees, and rife to the height of thirty or forty feet, garnifhed at each joint with one leaf, which in fome fpecies is compofed of three lobes like Trefoil, in others of five lobes; fome have nine, and others have many lobes. Thefe are in fome fpecies entire, in others they are indented at the point, and fome are cut on their edges; in fome fpecies their furface is fmooth, in others they are woolly. The flowers come out in long bunches like thofe of Currants; they are fmall and white, fo make no figure; thefe are fucceeded by three-cornered capfules having three cells, which in the Cururu of Plumier, contain roundifh feeds; but thofe of the Serjana have winged feeds like thofe of the Maple reverfed, being faftened at the extremity of the wing to the capfule, the feed hanging downward.

As thefe plants are fo tender as not to live through the winter in England, unlefs they are placed in a warm ftove,

ſtove, and requiring a large ſhare of room, they are ſeldom propagated in Europe, unleſs in botanic gardens for the ſake of variety, for their flowers have very little beauty to recommend them.

They are propagated by ſeeds, which muſt be obtained from the countries where they naturally grow, for they do not produce ſeeds in England. Theſe ſhould be ſown in ſmall pots, filled with light earth, as ſoon as they arrive, and the pots ſhould be plunged into a moderate hot-bed of tanners bark. If theſe ſeeds arrive in the autumn, the pots ſhould be plunged into the bark-bed in the ſtove, and then there will be a probability of the plants coming up the following ſpring; but thoſe ſeeds which do not arrive here till ſpring, will not come up the ſame year, ſo the pots in which they are ſown, ſhould be plunged into a moderate hot-bed under a frame, where they may be continued all the ſummer, but in the autumn they ſhould be removed into the ſtove, where they ſhould remain during the winter, and as the earth in the pots will be dry, ſo they ſhould be now and then watered, but it ſhould be given ſparingly. The following ſpring the pots ſhould be removed out of the ſtove and plunged into a new hot-bed under a frame, which will bring up the plants in about ſix weeks if the ſeeds are good. When the plants are fit to remove, they ſhould be each planted in a ſmall pot filled with light earth, and plunged into a hot-bed of tanners bark, obſerving to ſhade them every day from the ſun till they have taken new root, after which they ſhould have free air admitted to them daily, in proportion to the warmth of the ſeaſon. In the autumn they muſt be removed into the bark-ſtove, where they ſhould conſtantly remain, and muſt be treated in the ſame way as other tender plants.

PEACH. See PERSICA.

PEAR. See PYRUS.

PEAS. See PISUM.

PEAS EVERLASTING. See LATHYRUS.

PEDICLE is that part of a ſtalk which immediately ſuſtains the leaf, a flower, or a fruit, and is commonly called a foot-ſtalk.

PEDICULARIS, Rattle, Cocks-comb, or Louſewort.

There are four different kinds of this plant, which grow wild in paſtures in ſeveral parts of England, and in ſome low meadows are very troubleſome to the paſtures, eſpecially one ſort with yellow flowers, which riſes to be a foot high, or more, and is often in ſuch plenty, as to be the moſt predominant plant; but this is very bad food for cattle, and when it is mowed with the Graſs for hay, renders it of little value. The ſeeds of this plant are generally ripe by the time the Graſs is mowed, ſo that whenever perſons take Graſs-ſeed for ſowing, they ſhould be very careful that none of this ſeed is mixed with it. As theſe plants are never cultivated, I ſhall not trouble the reader with their ſeveral varieties.

PEGANUM. Lin. Gen. Plant. 530. Harmala. Tourn. Inſt. R. H. 257. tab. 133. Wild Aſſyrian Rue.

The CHARACTERS are,

*The flower has a permanent empalement, compoſed of five narrow erect leaves the length of the petal. It has five oblong oval petals which ſpread open, and fifteen awl-ſhaped ſtamina about half the length of the petals, whoſe baſes ſpread into a nectarium under the germen, and are terminated by erect oblong ſummits. It has a three-cornered roundiſh germen, elevated at the baſe of the flower, with a three-cornered ſlender ſtyle the length of the ſummits, and three ſtigmas which are longer than the ſtyle. The germen afterward becomes a roundiſh three-cornered capſule, having three cells, filled with oval acute-pointed ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's eleventh claſs, which includes thoſe plants whoſe flowers have from eleven to nineteen ſtamina, and one ſtyle.

We have but one SPECIES in the Engliſh gardens at preſent, viz.

PEGANUM (*Harmala*) foliis multifidis. Hort. Upſal. 144. *Peganum with many-pointed leaves.* Harmala. Dod. Pempt. 121. Ruta ſylveſtris, flore magno albo. C. B. P. 336. *Wild Rue with a large white flower.*

This plant grows naturally in Spain and Syria; it has a root as large as a man's little finger, which by age becomes woody. The ſtalks decay every autumn, and new ones ariſe in the ſpring; theſe grow about a foot long, and divide into ſeveral ſmall branches, which are garniſhed with oblong thick leaves cut into ſeveral narrow ſegments; they are of a dark green, and of a gummy bitteriſh taſte. The flowers are produced at the end of the branches, ſitting cloſe between the leaves; they are compoſed of five roundiſh white petals, which open like a Roſe, having fifteen awl-ſhaped ſtamina, terminated by oblong, yellow, erect ſummits. In the center is ſituated a roundiſh three-cornered germen, having a three-cornered ſtyle the length of the ſtamina, with three ſtigmas which are longer than the ſtyle. The germen afterward becomes a roundiſh three-cornered capſule, having three cells, which contain ſeveral oval acute-pointed ſeeds. It flowers in July, and in warm ſummers the ſeeds will ripen here in the autumn.

It is propagated by ſeeds, which ſhould be ſown thinly on a bed of light earth the beginning of April, and when the plants come up, they muſt be conſtantly kept clean from weeds, which is all the culture they will require till the end of October, or the beginning of November, when their ſtalks decay. At which time, if the bed is covered with tanners bark, aſhes, ſaw-duſt, or ſuch like covering to keep out the froſt, it will be a ſecure way to preſerve the roots, which when young are ſomewhat tender. The following March the roots may be taken up, and tranſplanted into a warm ſituation and a dry ſoil, where they will continue ſeveral years. This is ſometimes uſed in medicine.

PELECINUS. See BISERRULA.

PELLITORY OF SPAIN. See ANTHEMIS.

PELLITORY OF THE WALL. See PARIETARIA.

PELTARIA. Jacq. Vind. 260. Lin. Gen. Plant. 806. Mountain Treacle Muſtard.

The CHARACTERS are,

*The empalement of the flower is compoſed of four ſmall, concave, coloured leaves which fall off; the flower has four petals placed in form of a croſs, whoſe necks are ſhorter than the empalement, and ſix awl-ſhaped ſtamina, two of which are ſhorter than the empalement, terminated by ſingle ſummits, with a roundiſh germen ſupporting a ſhort ſtyle, crowned by an obtuſe ſtigma. The germen afterward becomes a roundiſh compreſſed pod with one cell, containing one roundiſh ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifteenth claſs, intitled Tetradynamia Siliculoſa, the flower having four long and two ſhort ſtamina, and the ſeeds being included in ſhort pods.

We have but one SPECIES of this genus, viz.

PELTARIA (*Alliacea.*) Jacq. Vind. 260. Lin. Sp. Plant. 910. *Peltaria or Treacle Muſtard.* Thlaſpi montanum, glaſti folio majus. C. B. P. 106. *Mountain Treacle Muſtard with a Woad leaf.*

This plant grows naturally upon the mountains in Auſtria and Iſtria; it is a biennial, ſo generally dies ſoon after the ſeeds are perfected. It riſes with an upright branching ſtalk about a foot high, garniſhed with heart-ſhaped ſmooth leaves, which embrace the ſtalks with their baſe; the ſtalks are terminated by cluſters of white flowers growing in form of umbels, each flower having four petals placed in form of a croſs; theſe are ſucceeded by roundiſh compreſſed pods, each containing one ſeed of the ſame form. The plant flowers in May, and the ſeeds ripen in July. This is eaſily propagated by ſeeds, which may be ſown in ſmall patches in the borders of the flower-garden the beginning of April, and when the plants are up, there ſhould be four or five left in each patch; the others ſhould be pulled out, to give theſe room to grow; after this, they will require no other culture but to keep them clean from weeds.

PENDULOUS HEADS OF FLOWERS are such as hang downward.

PENNATED. A pennated leaf (called in Latin *Folium Pennatum*) is a compound leaf, divided into several parts (each of which is called a lobe,) placed along the middle rib, either alternately, or by pairs. When the middle rib is terminated by an odd lobe, it is said to be unequally pennated, and equally pennated, when it is not terminated by an odd lobe. When the lobes are all nearly of the same form and bigness, it is called an uniform pennated leaf; when they are not so, it is said to be difform. Examples of pennated leaves are the Ash, Walnut, &c.

PENNY-ROYAL. See PULEGIUM.

PENTAPETALOUS FLOWERS are such as have five leaves.

PENTAPETES. Lin. Gen. Plant 757. Alcea. Raii Supp. 523.

The CHARACTERS are,

*The flower has for the most part a double empalement, the outer being small and composed of three leaves, the inner is cut into five parts which are reflexed. It has five oblong petals which spread open, and fifteen narrow stamina joined in a tube at their base, with five long coloured summits, which are erect and barren; between each of these are three stamina, terminated by oblong erect summits. It has a roundish germen, with a cylindrical style the length of the stamina, crowned by a thick stigma. The germen afterward becomes an oval capsule with five cells, filled with oblong seeds.*

This genus of plants is ranged in the third section of Linnæus's sixteenth class, which includes those plants whose flowers have many stamina which are connected with the style, forming together a column.

We have but one SPECIES of this genus at present in the English gardens, viz.

PENTAPETES (*Phœnicia*) foliis hastato-lanceolatis serratis. Lin. Sp. Plant. 698. *Pentapetes with halbert-pointed, spear-shaped, sawed leaves.* Alcea Indica lucido hastato folio, flore blattarie Phœnicio. Raii Supp. 523. *Indian Vervain Mallow with a lucid spear-shaped leaf, and a scarlet flower like Moth Mullein.*

This plant grows naturally in India, from whence I have several times received the seeds; it is an annual plant which dies in the autumn, soon after it has ripened the seeds. It hath an upright stalk from two to near three feet high, sending out side branches the whole length; those from the lower part of the stalks are the longest, the others gradually diminish, so as to form a sort of pyramid. These are garnished with leaves of different forms; the lower leaves, which are largest, are cut on their sides towards the base into two side lobes which are short, and the middle is extended two or three inches farther in length, so that the leaves greatly resemble the points of halberts in their shape; they are slightly sawed on their edges, and are of a lucid green on their upper side, but are paler on their under, standing upon pretty long foot-stalks. The leaves which are on the upper part of the branches are much narrower, and some of them have very small indentures on their sides; these sit closer to the stalks, and are placed alternately. From the wings of the stalks the flowers come out; they are for the most part single, but sometimes there are two arising at the same place from the sides of the foot-stalk of the leaves. The foot-stalk of the flower is short and slender. The exterior empalement of the flower is composed of three short leaves, which fall off soon; the interior is of one leaf, cut at the top into five acute segments, which spread open, and are almost as long as the petal. The flower is of one petal, cut into five obtuse segments almost to the bottom, but as they are joined and fall off in one piece, so the flower is monopetalous, according to Mr. Ray and Tournefort. In the center of the flower arises a short thick column, to which adhere fifteen short stamina, terminated by oblong erect summits, and between every third stamina is situated a larger stamina, with an oblong erect summit of a deep red colour; these five large summits are barren, having no farina fœcundens upon them. Between the stamina is situated a roundish germen, supporting a style the length of the stamina, which is crowned by a thick stigma. These being all joined at their base into a sort of column, distinguish the tribe to which it belongs, which is the malvaceous; so that though the flower at first appearance greatly resembles the flowers of Moth Mullein, yet upon examination of its essential characters, it will be found to belong to the class here mentioned. The flowers are of a fine scarlet colour, appearing in July, and are succeeded by roundish capsules with five cells, which are a little woody, each cell inclosing three or four oblong seeds, which ripen in the autumn.

The seeds of this plant must be sown upon a good hot-bed early in March, and when the plants are fit to transplant, there should be a new hot-bed prepared to receive them, into which should be plunged some small pots filled with good kitchen-garden earth; in each of these should be one plant put, giving them a little water to settle the earth to their roots; they must also be shaded from the sun till they have taken new root, then they should be treated in the same way as other tender exotic plants, admitting the free air to them every day in proportion to the warmth of the season, and covering the glasses with mats every evening to keep them warm. When the plants are advanced in their growth so as to fill the pots with their roots, they should be shifted into larger pots, filled with the same sort of earth as before, and plunged into another hot-bed, where they may remain as long as they can stand under the glasses of the bed without being injured; and afterward they must be removed either into a stove or a glass-case, where they may be screened from the cold, and in warm weather have plenty of fresh air admitted to them. With this management the plants will begin to flower early in July, and there will be a succession of flowers continued till the end of September, during which time they will make a good appearance. The seeds ripen gradually after each other in the same succession as the flowers were produced, so they should be gathered as soon as their capsules begin to open at the top. These plants are sometimes turned out of the pots, when they are strong and planted in warm borders, where, if the seasons prove very warm, the plants will flower pretty well; but these very rarely perfect their seeds, so that in order to have them in perfection, they must be treated in the manner before directed.

PENTAPHYLLOIDES. See POTENTILLA.

PENTHORUM. Gronov. Virg. 51. Lin. Gen. Plant. 580.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, cut into five equal segments; the flower has sometimes five small narrow petals situated between the segments of the empalement, and ten equal bristly stamina twice the length of the empalement, which are permanent, terminated by roundish deciduous summits. It hath a coloured germen with five styles the length of the stamina, crowned by obtuse stigmas; and a single five-cornered conical capsule having five cells, filled with small compressed seeds.*

This genus of plants is ranged in the fourth section of Linnæus's tenth class, intitled Decandria Pentagynia, which contains those plants whose flowers have ten stamina and five styles.

We have but one SPECIES of this genus, viz.

PENTHORUM (*Sedoides.*) Gron. Virg. 51. Lin. Sp. 620. *Penthorum like Houseleek.*

This is a biennial plant, which grows naturally in Virginia. The stalks rise about a foot high, garnished with oblong leaves placed alternately, and are terminated by clusters of greenish yellow flowers, which make little appearance; these are succeeded by five-cornered conical capsules, filled with small compressed seeds. The flowers appear the latter end of July, and the seeds ripen in the autumn.

As this plant makes but a mean appearance, so it is rarely cultivated, except in botanic gardens for the sake of variety; but such as are desirous to have it, should sow the seeds on a moist shady spot of ground, and when the plants come up, if they are thinned and kept clean from weeds, they will require no other culture.

PEONY. See Pæonia.

PEPO. See Cucurbita.

PERENNIAL PLANTS are such whose roots will abide many years, whether they retain their leaves in winter or not; those which retain their leaves are called Evergreens, but such as cast their leaves are called Deciduous or Perdifols. Some of these have annual stalks, which die to the root every autumn, and shoot up again in the spring; to which Jungius gives the title of Radix restibilis.

PERESKIA. Plum. Nov. Gen. 37. tab. 26. Cactus. Lin. Gen. Plant. 539. Gooseberry, vulgò.

The Characters are,

*It hath a Rose-shaped flower consisting of several leaves, which are placed orbicularly, whose cup afterward becomes a soft, fleshy, globular fruit beset with leaves. In the middle of the fruit are many flat roundish seeds included in a mucilage.*

We have but one Species of this plant, viz.

Pereskia (*Aculeata*) aculeata, flore albo, fructu flavascente. Plum. Nov. Gen. 37. *Prickly Pereskia with a white flower, and a yellowish fruit.* Cactus caule tereti arboreo spinoso, foliis lanceolato-ovatis. Lin. Hort. Upsal. 122. *Cactus with a taper, tree-like, prickly stalk, and spear-shaped oval leaves.*

This plant grows in some parts of the Spanish West-Indies, from whence it was brought to the English settlements in America, where it is called a Gooseberry, and by the Dutch it is called Blad Apple. It hath many slender branches which will not support themselves, so must be supported by stakes, otherwise they will trail on whatever plants grow near them. These branches, as also the stem of the plant, are beset with long whitish spines, which are produced in tufts. The leaves are roundish, very thick, and succulent, and the fruit is about the size of a Walnut, having tufts of small leaves on it, and hath a whitish mucilaginous pulp.

It may be propagated by planting of the cuttings during any of the summer months: these cuttings should be planted in pots filled with fresh light earth, and plunged into a moderate hot-bed of tanners bark, observing to shade them from the sun in the heat of the day, as also to refresh them every third or fourth day with water. In about two months the cuttings will have made good roots, when they may be carefully taken out of the pots, and each planted into a separate pot filled with fresh earth, and then plunged into the hot-bed again, where they may remain during the summer season; but at Michaelmas, when the nights begin to be cold, they should be removed into the stove, and plunged into the bark-bed. During the winter season the plants must be kept warm, and should be watered twice a week; but in cold weather it should not be given in large quantities. In summer they must have a large share of air, and must be more plentifully watered, but they should constantly remain in the stove; for though they will bear the open air in summer in a warm situation, yet they will make no progress if they are placed abroad; nor do they thrive near so well in the dry stove, as when they are plunged in the tan; so that the best way is to set them next a trellis, at the back of the tan-bed, to which their branches may be fastened, to prevent their trailing on other plants. This plant has not as yet produced either flowers or fruit in England, but as there are several plants pretty well grown in the gardens of the curious, we may expect some of them will flower in a short time.

PERICLYMENUM. Tourn. Inst. R. H. 608. tab. 578. Caprifolium. Tourn. Inst. R. H. 608. tab. 379 Lonicera. Lin. Gen. Plant. 210. Honeysuckle; in French, *Chevre-feuille.*

The Characters are,

*The empalement of the flower is small, and cut into five parts sitting upon the germen. The flower is of one petal, having an oblong tube, which is cut at the top into five segments which turn backward. It has five awl-shaped stamina almost the length of the petal, terminated by oblong summits, and a roundish germen situated below the flower, supported by a slender style, crowned by an obtuse stigma. The germen afterward becomes an umbilicated berry with two cells, each containing one roundish seed.*

This genus of plants is by Dr. Linnæus placed in the first section of his fifth class, which includes those plants whose flowers have five stamina and one style, and joins it to the Lonicera of Plumier, and the Chamæcerasus of Tournefort; but as the flowers of this genus differ greatly in their form from either of those genera, so I have taken the liberty of separating it from them.

The Species are,

1. Periclymenum (*Sempervirens*) floribus capitatis terminalibus omnibus connatis sempervirentibus. *Honeysuckle with flowers growing in heads at the end of the branches, and evergreen leaves joined round the stalk.* Periclymenum perfoliatum Virginianum sempervirens & florens. H. L. *Perfoliate, evergreen, Virginia Honeysuckle which always flowers, commonly called Trumpet Honeysuckle.*
2. Periclymenum (*Racemosum*) racemis lateralibus oppositis, floribus pendulis, foliis lanceolatis integerrimis. *Honeysuckle with flowers in long bunches growing opposite, hanging down, and entire spear-shaped leaves.* Periclymenum racemosum flore flavascente, fructu niveo. Hort. Elth. 306. tab. 228. *Honeysuckle with yellowish flowers growing in bunches, and a snowy fruit.*
3. Periclymenum (*Verticillatum*) corymbis terminalibus, foliis ovatis verticillatis petiolatis. *Honeysuckle with round bunches of flowers at the end of the branches, and oval leaves growing in whorls, having foot-stalks.* Periclymenum aliud arborescens ramulis inflexis, flore corallino. Plum. Cat. 17. *Another tree-like Honey-suckle with inflexed branches, and a coral-coloured flower.*
4. Periclymenum (*Germanicum*) capitulis ovatis imbricatis terminalibus, foliis omnibus distinctis. *Honeysuckle with oval imbricated heads terminating the stalks, and the leaves distinct.* Caprifolium Germanicum. Dod. p. 411. *The German Honeysuckle.*
5. Periclymenum (*Italicum*) floribus verticillatis terminalibus sessilibus, foliis summis connato-perfoliatis. Hort. Cliff. 45. *Honeysuckle with whorls of flowers sitting close at the ends of the branches, and the upper leaves surrounding the stalk.* Caprifolium Italicum. Dod. p. 411. *Italian Honeysuckle.*
6. Periclymenum (*Vulgare*) floribus corymbosis terminalibus, foliis hirsutis distinctis, viminibus tenuioribus. *Honeysuckle with a corymbus of flowers terminating the stalks, hairy leaves growing distinct, and very slender branches, commonly called English Honeysuckle, or Woodbine.*
7. Periclymenum (*Americanum*) floribus verticillatis terminalibus sessilibus, foliis connato-perfoliatis sempervirentibus glabris. *Honeysuckle with whorled flowers sitting close, terminating the stalks, and smooth evergreen leaves surrounding the stalks.* Caprifolium perfoliatum sempervirens, floribus speciosis. Hort. Chelf. *The evergreen Honeysuckle, having beautiful flowers.*

The first sort grows naturally in Virginia, and many other parts of North America, but has been long cultivated in the English gardens by the title of Virginia Trumpet Honeysuckle. Of these there are two varieties, if not distinct species, one being much hardier than the other. The old sort, which came from Virginia, has stronger shoots; the leaves are of a brighter green; the bunches of flowers are larger, and deeper coloured than the other which came from Carolina. These plants have the appearance of the common Honeysuckle, but the shoots are weaker than any of those, except the wild sort called Woodbine; they are of a purplish red colour, and smooth. The leaves are of an oblong oval shape inverted, and

closely surround the stalk; of a lucid green on their upper side, but pale on their under. The flowers are produced in bunches at the end of the branches; these have long slender tubes, which are enlarged at the top, where they are cut into five almost equal segments. The outside of the flower is of a bright scarlet, and the inside yellow; they have great appearance of the Honeysuckle, but are not so deeply divided, nor are the segments reflexed. They have no odour, but for the beauty of their flowers, and their long continuance, together with their leaves being evergreen, they are preserved in most curious gardens.

These plants should be planted against walls or pales, to which their branches should be trained for support, otherwise they will fall to the ground; for they cannot be reduced to heads like many of the Honeysuckles, because their branches are too weak and rambling, and are liable to be killed in severe winters; therefore they should be planted to a warm aspect, where they will begin to flower the latter end of June, and there will be a succession of flowers till the autumn. These are propagated by laying down their young branches, which will easily take root, and may be afterward treated like the Honeysuckle.

The second sort grows naturally in Jamaica; this hath many slender branches which cannot support themselves, but trail upon any neighbouring bushes. They grow eight or ten feet long, are covered with a brown bark, and garnished with spear-shaped leaves about two inches and a half long, and one broad in the middle; of a lucid green on their upper side, but pale on their under, standing by pairs opposite. The flowers come out from the side of the branches at each joint; they are ranged on each side the foot-stalk in long bunches like Currants. The bunches come out opposite; they are three or four inches long. The flowers are small, of a yellowish green, and are succeeded by small berries of a snow white colour, from whence the plant is called Snowberry-bush in America.

The third sort grows naturally in some of the islands in the West-Indies; this rises with a shrubby stalk ten or twelve feet high, sending out many slender branches, covered with a light brown bark, garnished with oval leaves near two inches long, and an inch and a quarter broad, four of them coming out at each joint in whorls round the stalk; they stand upon short foot-stalks, and have one strong midrib, with several veins running from the midrib to the sides. The flowers come out in round bunches at the end of the branches; they are of a deep coral colour on their outside, but of a pale red within. This was found growing in Jamaica by the late Dr. Houstoun, who brought it to England.

These two sorts are too tender to thrive in this country without artificial heat; they are propagated by seeds, which must be procured from the countries where they naturally grow, for they do not ripen seeds here. These should be sown in pots, and plunged into a moderate hot-bed, where they may remain till the autumn, for the plants rarely come up the first year; so the pots should be removed into the stove for the winter season, and the following spring placed on a fresh hot-bed, which will bring up the plants; and when they are fit to remove, they should be each planted in a separate small pot filled with light earth, and plunged into a fresh hot-bed, shading them from the sun till they have taken new root, after which they must be treated in the manner as other tender plants from those countries. As the plants obtain strength, they should be more hardily treated, by placing them abroad in a sheltered situation for two months or ten weeks, in the warmest part of the summer, and in the winter they may be placed in a dry stove, kept to a moderate temperature of warmth, where they will thrive, and produce their flowers in the autumn.

The fourth sort is the common Dutch or German Honeysuckle, which has been generally supposed the same with the English wild sort called Woodbine, but is undoubtedly a very different species, for the shoots of this are much stronger. The plants may be trained with stems, and formed into heads, which the wild sort cannot, their branches being too weak and trailing for this purpose. The branches of this are smooth, of a purplish colour, garnished with oblong oval leaves three inches long, and an inch and three quarters broad, of a lucid green on their upper side, but pale on their under, having very short foot-stalks; they are placed by pairs, but are not joined at their base. The flowers are produced in bunches at the end of the branches, each flower arising out of a scaly cover, which cover, after the flowers fade, forms an oval head, whose scales lie over each other like those outside, and yellowish within, of a very agreeable of fish. The flowers are of a reddish colour on their odour. This sort flowers in June, July, and August. There are two other varieties of this species, one is called the long blowing, and the other the late red Honeysuckle.

The fifth sort is commonly called the Italian Honeysuckle; of this there are two or three varieties, the early white Honeysuckle is one; this is the first which flowers, always appearing in May. The branches of this are slender, covered with a light green bark, and garnished with oval leaves of a thin texture, placed by pairs, sitting close to the branches, but those which are situated toward the end of the branches, join at their base, so that the stalk seems as if it came through the leaves. The flowers are produced in whorled bunches at the end of the branches; they are white, and have a very fragrant odour, but are of short duration, so that in about a fortnight they are entirely over; and soon after the leaves appear as if blighted and sickly, making an indifferent appearance the whole summer, which has rendered them less valued than the others. The other variety is the yellow Italian Honeysuckle, which is the next in succession to the white. The shoots of this are much like those of the former, but have a darker bark; the leaves are also of a deeper green; the flowers are of a yellowish red, and appear soon after the white; they are not of much longer duration, and are succeeded by red berries, containing one hard seed inclosed in a soft pulp, which ripens in the autumn.

The sixth sort is the common wild English Honeysuckle or Woodbine; this grows naturally in the hedges in many parts of England. The branches are very slender and hairy, trailing over the neighbouring bushes, and twining round the boughs of trees; the leaves are oblong, hairy, and distinct, not joined at their base; they are placed opposite; the flowers are produced in long bunches at the end of the branches. There are two varieties, one with white, and the other yellowish red flowers. These appear in July, and there is a succession of flowers till the autumn.

There is also a variety of this with variegated leaves, and one with cut leaves somewhat like the leaves of Oak, and one of these with variegated leaves; but, as these are accidental varieties, I have not enumerated them.

The seventh sort is supposed to grow naturally in North America; this hath strong branches, covered with a purple bark, which are garnished with lucid green leaves embracing the stalks, which continue their verdure all the year. The flowers are produced in whorled bunches at the end of the branches; there are frequently two and sometimes three of these bunches rising one out of another; they are of a bright red on their outside, and yellow within, of a strong aromatic flavour. This sort begins to flower in June, and there is a succession of flowers till the frost puts a stop to them, so that it is the most valuable of all the sorts.

All the sorts of Honeysuckles are propagated either by layers or cuttings: when they are propagated by layers, the young shoots only should be chosen for that purpose; they should be layed in the autumn, and

and by the following autumn they will have taken root, when they should be cut off from the plants, and either planted where they are to remain, or into a nursery to be trained up, either for standards, which must be done by fixing down stakes to the stem of each plant, to which their principal stalk should be fastened, and all the other must be cut off; the principal stalk must be trained to the intended height of the stem, then it should be shortened to force out lateral branches, and these should be again stopped to prevent their growing too long; by the constant repeating this as the shoots are produced, they may be formed into a sort of standard; but if any regard is had to their flowering, they cannot be formed into regular heads, for by constantly shortening their branches, the flower-buds will be cut off, so that few flowers can be expected; and as it is an unnatural form for these trees, so there should be but few of them reduced to it, for when they are planted near other bushes, in whose branches the shoots of the Honeysuckles may run and mix, they will flower much better, and have a finer appearance than when they are more regularly trained; therefore, when the plants are in the nursery, if two or three of the principal shoots are trained up to the stakes, and the others are entirely cut off, they will be fit to transplant the following autumn, to the places where they are to remain; for though the roots may be transplanted of a greater age, yet they do not thrive so well as when they are removed while they are young.

When these plants are propagated by cuttings, they should be planted in September, as soon as the ground is moistened by rain. The cuttings should have four joints, three of which should be buried in the ground, and the fourth above the surface, from which the shoots should be produced. These may be planted in rows, at about a foot distance row from row, and four inches asunder in the rows, treading the earth close to them; and as the evergreen and late red Honeysuckles, are a little more tender than the other sorts, so if the ground between the rows where these are planted, is covered with tanners bark or other mulch to keep out the frost in winter, and the drying winds of the spring, it will be of great advantage to the cuttings; and if the cuttings of these sorts have a small piece of the two years wood at their bottom, there will be no hazard of their taking root. The plants which are raised from cuttings, are preferable to those which are propagated by layers, as they have generally better roots.

These plants will grow in almost any soil or situation (except the last mentioned, which will not thrive where they are too much exposed to the cold in winter) they thrive best in a soft sandy loam, and will retain their leaves in greater verdure in such ground than if planted in a dry gravelly soil, where in warm dry seasons their leaves often shrink, and hang in a very disagreeable manner; nor will those sorts which naturally flower late in the autumn, continue so long in beauty on a dry ground, unless the season should prove moist and cold, as those in a gentle loam, not too stiff or wet.

There are few sorts of shrubs which deserve cultivation better than most of these, for their flowers are very beautiful, and perfume the air to a great distance with their odour, especially in the mornings and evenings, and in cloudy weather, when the sun does not exhale their odour, and raise it too high to be perceptible; so that in all retired walks, there cannot be too many of these intermixed with the other shrubs. I have seen these plants intermixed in hedges planted either with Alder or Laurel, where the branches have been artfully trained between those of the hedge; from which the flowers have appeared dispersed from the bottom of the hedge to the top, and being intermixed with the strong green leaves of the plants which principally compose the hedge, they have made a fine appearance; but the best sorts for this purpose, are the evergreen and long-blowing Honeysuckles, because their flowers continue in succession much longer than the other sorts.

These plants may be propagated by seeds, but unless they are sown in the autumn soon after they are ripe, the plants will not come up the first year.

PERIPLOCA. Tourn. Inst. R. H. 93. tab. 22. Lin. Gen. Plant. 267. [Περιπλοκή, of περὶ, about, and πλοκὴ, a knitting or plaiting, because this plant entangles itself with itself, or any other neighbouring plants.] Virginian Silk.

The CHARACTERS are,

*The flower hath a small permanent empalement, cut into five points. The flower has one plain petal, cut into five narrow segments, which are indented at their points, with a small nectarium going round the center of the petal, and the five incurved filaments which are not so long as the petal, and five short stamina terminated by erect summits which join in a head. It has a small bifid germen with scarce any style, crowned by two simple stigmas. The germen afterward becomes two oblong bellied capsules with one cell, filled with seeds crowned with down, lying over each other like the scales of fish.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and two styles.

The SPECIES are,

1. PERIPLOCA (*Græca*) floribus internè hirsutis. Lin. Sp. Plant. 211. *Virginia Silk, with flowers hairy on their inside.* Periploca foliis oblongis. Tourn. Inst. R. H. 93. *Virginia Silk with oblong leaves.*
2. PERIPLOCA (*Africana*) caule hirsuto. Lin. Sp. Plant. 211. *Virginia Silk with a hairy stalk.* Apocynum scandens, Africanum, vincæ pervincæ folio subincanum. Com. Plant. Rar. 18. *Climbing African Dogsbane, with a hoary Periwinkle leaf.*
3. PERIPLOCA (*Fruticosa*) foliis oblongo-cordatis pubescentibus, floribus alaribus, caule fruticoso scandente. *Virginia Silk, with oblong heart-shaped leaves which are covered with soft hairs, and flowers proceeding from the sides of the stalks, which are shrubby.* Periploca foliis cordatis holosericeis, floribus parvis, albis, campaniformibus. Houst. MSS. *Periploca with heart-shaped silky leaves, and small, white, bell-shaped flowers.*

The first sort grows naturally in Syria, but is hardy enough to thrive in the open air in England. It hath twining shrubby stalks, covered with a dark bark, which twist round any neighbouring support, and will rise more than forty feet high, sending out slender branches from the side, which twine round each other, and are garnished with oval spear-shaped leaves near four inches long, and two broad in the middle, of a lucid green on their upper side, but pale on their under, standing by pairs, upon short foot-stalks. The flowers come out toward the end of the small branches in bunches; they are of a purple colour, and hairy on their inside, composed of one petal, cut into five segments almost to the bottom, which spread open in form of a star, and within is situated a nectarium, which goes round the five short stamina and germen, and is hairy. The germen afterward turns to a double long taper pod or capsule, filled with compressed seeds, lying over each other like the scales of fish, having a soft down fixed to their top. This plant flowers in July and August, but rarely ripens its seeds in England.

It is easily propagated by laying down of the branches, which will put out roots in one year, and may then be cut from the old plant, and planted where they are to remain. These may be transplanted either in autumn, when the leaves begin to fall, or in the spring before they begin to shoot, and must be planted where they may have support, otherwise they will trail on the ground, and fasten themselves about whatever plants are near them.

The second sort grows naturally in Africa; this hath many slender stalks, which twine about each other, or any neighbouring support, and will rise near three feet high, putting out several small side branches; these are hairy, as are also the leaves, which are oval,

about three quarters of an inch long, and half an inch broad, ſtanding by pairs upon very ſhort foot-ſtalks. The flowers come out in ſmall bunches from the ſide of the ſtalks; they are ſmall, and of a worn-out purpliſh colour, and a ſweet ſcent, being cut into five narrow ſegments almoſt to the bottom. It flowers in the ſummer months, but does not produce ſeeds here. There is a variety of this with ſmooth leaves and ſtalks, from the ſame country.

The third ſort was diſcovered by the late Dr. Houſtoun, growing naturally at La Vera Cruz in America. This riſes with a ſtrong woody ſtalk to the height of five or ſix feet, covered with a gray bark, putting out many weak branches, which twiſt themſelves about any neighbouring ſupport, and riſe to the height of twenty feet; they are garniſhed with heart-ſhaped leaves three inches long, and two broad near their baſe; they are of a yellowiſh green, covered with ſilky hairs, which are ſoft to the touch; they ſtand oppoſite upon pretty long foot-ſtalks. The flowers come out in ſmall bunches from the wings of the leaves; they are ſmall, white, and of the open bell ſhape; theſe are ſucceeded by ſwelling taper pods, filled with ſeeds crowned with long feathery down.

The ſecond ſort is hardy enough to thrive in this country, with a little protection from the froſt in winter. If the plants are ſheltered under a common frame or placed in a green-houſe during the winter ſeaſon, and placed abroad with other hardy exotic plants in ſummer, they will thrive and flower very well; but as all the plants of this genus have a milky juice, ſo they ſhould not have much wet, eſpecially in cold weather, leſt it rot them. They are eaſily propagated by laying down of their branches, which in one year will have roots enough to tranſplant; theſe ſhould be planted in a light ſandy loam not rich, and the pots muſt not be too large, for when they are over potted they will not thrive.

The third ſort is tender, ſo will not thrive in England, unleſs the plants are placed in a warm ſtove. They may be propagated by laying down of their branches in the ſame manner as the former; or from ſeeds, when they can be procured from the places where they naturally grow. Theſe ſhould be ſown upon a good hot-bed, and when the plants come up, they muſt be treated in the ſame manner as other tender exotic plants.

If theſe plants are conſtantly kept plunged in the tan-bed of the ſtove, they will thrive and flower much better than in any other ſituation, but the ſtove ſhould not be kept too warm in winter; and in the ſummer the plants ſhould have a large ſhare of free air admitted to them; for when they are kept too cloſe, their leaves will be covered with inſects, and the plants will become ſickly in a ſhort time.

All the ſpecies of this genus are ſuppoſed to be hurtful to animals, as the Dogſbanes in general are, and theſe are very near a-kin to them, both in their characters and qualities.

PERIWINCLE. See Vinca.

PERSEA. Plum. Nov. Gen. 44. tab. 20. Laurus. Lin. Gen. Plant. 452. The Avocado, or Avogato Pear.

The Characters are,

*The flower hath no empalement, but is compoſed of ſix petals ending in acute points, which ſpread open. It hath ſix ſtamina which are about half the length of the petals, terminated by roundiſh ſummits, and a ſhort ſtyle, crowned by a pyramidal germen, which afterward becomes a large fleſhy pyramidal fruit, incloſing an oval ſeed having two lobes.*

This genus of plants Dr. Linnæus has joined to his genus of Laurus, which he places in the firſt ſection of his ninth claſs, which includes thoſe plants whoſe flowers have nine ſtamina and one ſtyle.

We have but one Species of this plant, viz.

Persea (*Americana.*) Cluſ. Hiſt. *The Avocado, or Avogato Pear.*

This tree grows in great plenty in the Spaniſh Weſt-Indies, as alſo in the iſland of Jamaica, and hath been tranſplanted into moſt of the Engliſh ſettlements in the Weſt-Indies on account of its fruit; which is not only eſteemed by the inhabitants as a fruit to be eaten by way of deſert, but is very neceſſary for the ſupport of life. The fruit of itſelf is very inſipid, for which reaſon they generally eat it with the juice of Lemons and ſugar, to give it a piquancy. It is very nouriſhing, and is reckoned a great incentive to venery. Some people eat this fruit with vinegar and Pepper.

In the warm countries where this is planted, it grows to the height of thirty feet or more, and has a trunk as large as our common Apple-trees; the bark is ſmooth, and of an Aſh colour; the brances are beſet with pretty large, oblong, ſmooth leaves, like thoſe of Laurel, which are of a deep green colour, and continue on the tree throughout the year. The flowers and fruit are, for the moſt part, produced toward the extremity of the branches. The fruit is as large as one of the largeſt Pears, incloſing a large ſeed with two lobes, included in a thin ſhell.

In Europe this plant is preſerved as a curioſity, by thoſe perſons who delight in collecting exotic plants; and though there is little hope of its producing fruit, yet for the beauty of its ſhining green leaves, which continue through the winter, it deſerves a place in every curious collection of plants.

It is propagated by ſeeds, which ſhould be obtained as freſh as poſſible from the countries of its growth; and if they are brought over in ſand, will be more likely to grow, than ſuch as are brought over dry. Theſe nuts or ſeeds ſhould be planted in pots, filled with light rich earth, and plunged into a hot-bed of tanners bark, which ſhould be kept pretty warm. The pots ſhould be alſo frequently watered when the earth appears dry, which will greatly facilitate the vegetation of the ſeed, provided the water is not given in large quantities, which would rot them. In about five or ſix weeks the plants will come up, when they muſt be treated very tenderly, for the bed muſt be kept in a due temperature for heat; and when the weather proves warm, the freſh air ſhould be admitted to the plants, by raiſing the glaſſes a little. When they have grown about four inches high, they ſhould be carefully tranſplanted; and where there are ſeveral plants in one pot, they muſt be parted, being careful to preſerve a ball of earth to the root of each, and planted into ſeparate ſmall pots filled with light rich earth, and then plunged into a hot-bed of tanners bark, obſerving to ſhade them until they have taken new root; after which time they ſhould have freſh air admitted to them, in proportion to the warmth of the ſeaſon. Towards Michaelmas the plants muſt be removed into the ſtove, and plunged into the bark-bed, where, during the winter ſeaſon, they ſhould be kept in a moderate warmth, and muſt be gently watered twice a week. In the ſpring the plants ſhould be ſhifted into pots a ſize larger than the former, and the bark-bed ſhould be then renewed with freſh tan, which will ſet the plants in a growing ſtate early, whereby they will make a fine progreſs the following ſummer. Theſe plants muſt be conſtantly kept in the ſtove, for they are too tender to bear the open air in this country at any ſeaſon, but in warm weather ſhould have a large ſhare of air admitted to them.

PERSICA. Tourn. Inſt. R. H. 624. tab. 402. [ſo called of Perſia in Aſia, from whence this kind of plant was brought into our climate.] The Peach-tree. Amygdalus. Lin. Gen. 619.

The Characters are,

*The flower has a tubulous empalement of one leaf, cut into five obtuſe ſegments which ſpread open. It hath five oblong, oval, obtuſe petals, which are inſerted in the empalement, and about thirty erect ſlender ſtamina which are ſhorter than the petals, terminated by ſingle ſummits; theſe are alſo inſerted in the empalement. It hath a roundiſh hairy germen, ſupporting a ſtyle the length of the ſtamina, crowned by a headed ſtigma. The germen*

*afterward becomes a roundish, woolly, large, esculent fruit, with a longitudinal furrow, inclosing an oval nut with a netted shell, having many punctures.*

This genus of plants is ranged in the first section of Linnæus's twelfth class, which includes those plants whose flowers have from twenty to thirty stamina, which are inserted in the empalement of the flower, and one style.

There is a great variety of these trees, which are cultivated in the gardens of those who are curious in collecting the several sorts of fruit from the different parts of Europe: I shall therefore first beg leave to mention two or three sorts, which are cultivated for the beauty of their flowers; after which I shall enumerate the several varieties of good fruit which have come to my knowledge.

The Species are,

1. Persica (*Vulgaris*) vulgaris, flore pleno. Tourn. Inst. R. H. 625. *Common Peach-tree with double flowers.*
2. Persica (*Nana*) Africana nana, flore incarnato simplici. Tourn. Inst. R. H. 625. *Dwarf Almond with single flowers,* vulgò.
3. Persica (*Amygdalus*) Africana nana flore incarnato pleno. Tourn. Inst. R. H. 925. *Double flowering Dwarf Almond,* vulgò.

The first of these trees is a very great ornament in a garden early in the spring, the flowers being very large, double, and of a beautiful red or purple colour. This may be planted in standards, and if intermixed with other flowering trees of the same growth, makes a very agreeable variety; or it may be planted against the walls of the pleasure-garden, where the beautiful appearance of its flowers early in the spring, will be more acceptable in such places than the choicest fruits, which must be exposed to servants, and others, so that they seldom can be preserved in large families until they are ripe. This tree may be propagated by budding it on the Almond or Plum stocks, in the same manner as the other sort of Peaches, and should be planted in a good fresh soil that is not over moist.

The other two sorts are of humbler growth, seldom rising above three or four feet high; these may be budded upon Almond stocks, or propagated by layers; they will also take upon Plum stocks, but they are very apt to canker, after they have stood four or five years upon those stocks, especially that with double flowers, which is tenderer than the other, which sends out suckers from the root, whereby it may be propagated in great plenty.

These shrubs make a very agreeable variety amongst low flowering trees, in small wilderness quarters. The single sort flowers in the beginning of April, and the double is commonly three weeks later.

I shall now proceed to mention the sorts of good Peaches which have come to my knowledge; and though perhaps a greater number of sorts may be found in some catalogues of fruits, yet I doubt whether many of them are not the same kinds called by different names; for, in order to determine the various kinds, it is necessary to observe the shape and size of the flowers, as well as the different parts of the fruit; for this does sometimes determine the kind, when the fruit alone is not sufficient; besides, there is a vast difference in the size and flavour of the same Peach, when planted on different soils and aspects; so that it is almost impossible for a person who is very conversant with these fruits to distinguish them, when brought from various gardens.

The present confusion of the names of fruits, hath been many times owing to the bringing over trees from France; for the persons who are generally employed to bring over those trees for sale, are entirely ignorant of their various sorts, and do themselves take them upon trust, from the persons who make it their business to propagate great quantities, to supply the markets of France, whither they are brought in waggons, and sold out in parcels to those persons who bring them into England. It also happens many times, if they are received by right names, that these in length of time are lost, or the trees come into the possession of other persons, who not knowing the true name of the fruit, do often give them new names, whereby there is such a confusion in the names of fruit, as is impossible to rectify; and hence some persons have supposed a much greater variety of Peaches than there is in reality, though as the greatest part of these have been obtained from seeds, so their varieties may be multiplied annually, until there be no end of the sorts. However, I shall content myself with enumerating the principal sorts now known in England, which are sufficient for any gentleman to make a collection to continue through the whole season of fruit.

1. The white Nutmeg (called by the French, L'Avant Péche Blanche:) this tree has sawed leaves, but generally shoots very weak, unless it is budded upon an Apricot stock; the flowers are large and open, the fruit is small and white, as is also the pulp at the stone, from which it separates; it is a little musky and sugary, but is only esteemed for its being the first sort ripe. It is in eating pretty early in July, and soon becomes meally.

2. The red Nutmeg (called by the French, L'Avant Péche de Troyes:) this tree has sawed leaves, the flowers are large and open; the fruit is larger and rounder than the white Nutmeg, and is of a bright vermilion colour; the flesh is white, and very red at the stone; it has a rich musky flavour, and parts from the stone. This Peach is well esteemed, it ripens toward the end of July.

3. The early or small Mignon (called by the French, La Double de Troyes, or Mignonette:) this tree has small contracted flowers, the fruit is of a middling size, and round; it is very red on the side next the sun; the flesh is white, and separates from the stone, where it is red; the juice is vinous and rich. It is ripe the end of July, or beginning of August.

4. The yellow Alberge: this tree has smooth leaves; the flowers are small and contracted; the fruit is of a middling size, somewhat long; the flesh is yellow and dry; it is seldom well flavoured, but should be perfectly ripe before it is gathered, otherwise it is good for little. It is ripe early in August.

5. The white Magdalen: this tree has sawed leaves; the flowers are large and open; the wood is generally black at the pith; the fruit is round, of a middling size; the flesh is white to the stone, from which it separates; the juice is seldom high flavoured; the stone is very small. This ripens early in August.

6. The early purple (called by the French, La Pourprée hâtive:) this tree has smooth leaves; the flowers are large and open; the fruit is large, round, and of a fine red colour; the flesh is white, but very red at the stone; is very full of juice, which has a rich vinous flavour, and is by all good judges esteemed an excellent Peach. This is ripe before the middle of August.

7. The large or French Mignon: the leaves of this tree are smooth; the flowers are large and open; the fruit is a little oblong, and generally swelling on one side; it is of a fine colour; the juice is very sugary, and of a high flavour; the flesh is white, but very red at the stone, which is small. This is ripe in the middle of August, and is justly esteemed one of the best Peaches; this separates from the stone. This sort of Peach is tender, and will not thrive on a common stock, so is generally budded upon some vigorous shooting Peach, or an Apricot, by the nurserymen, which enhances the price of the trees. But the best method is to bud this Peach into some old healthy Apricot, which is planted to a south or south-east aspect, and to cut away the Apricot when the buds have taken, and made shoots: upon some trees which I have seen thus managed, there has been a much greater quantity of fairer, and better flavoured fruit than I have ever observed elsewhere, and the trees have been much more healthy.

8. The Chevreuse, or Belle Chevreuse: this tree has smooth leaves; the flowers are small and contracted;

the fruit is of a middling ſize, a little oblong, of a fine red colour; the fleſh is white, but very red at the ſtone, from which it ſeparates; it is very full of a rich ſugary juice, and ripens toward the end of Auguſt. This is a very good bearer, and may be ranged with the good Peaches.

9. The red Magdalen (called by the French about Paris, Madeleine de Courſon:) the leaves of this tree are deeply ſawed; the flowers are large and open; the fruit is large and round, of a fine red colour; the fleſh is white, but very red at the ſtone, from which it ſeparates; the juice is very ſugary, and of an exquiſite flavour. The fruit is ripe the end of Auguſt; it is one of the beſt ſort of Peaches.

10. The early Newington (or Smith's Newington:) this is very like, if not the ſame, with what the French call Le Pavie blanc. This tree has ſawed leaves; the flowers are large and open; the fruit is of a middling ſize, is of a fine red on the ſide next the ſun; the fleſh is firm and white, but very red at the ſtone, to which it cloſely adheres. It hath a ſugary juice, and is ripe the end of Auguſt.

11. The Montauban: this tree has ſawed leaves; the flowers are large and open; the fruit is of a middling ſize, of a deep red, inclining to purple next the ſun, but of a pale colour toward the wall; the fleſh is melting and white to the ſtone, from which it ſeparates; the juice is rich, and the tree is a good bearer. It ripens the middle of Auguſt, and is well eſteemed.

12. The Malta (which is very like, if not the ſame, with the Italian Peach:) this tree has ſawed leaves; the flowers are large and open; the fruit is of a middling ſize, of a fine red next the ſun: the fleſh is white and melting, but red at the ſtone, from which it ſeparates; the ſtone is flat and pointed; the tree is a good bearer. This ripens the end of Auguſt.

13. The Nobleſt: this tree has ſawed leaves; the flowers are large and open; the fruit is large, of a bright red next the ſun; the fleſh is white and melting, and ſeparates from the ſtone, where it is of a faint red colour; the juice is very rich in a good ſeaſon. It ripens the end of Auguſt.

14. The Chancellor: the leaves of this tree are ſmooth; the flowers are ſmall and contracted; the fruit is ſhaped ſomewhat like the Belle Chevreuſe, but is rounder; the fleſh is white and melting, and ſeparates from the ſtone, where it is of a fine red colour; the ſkin is very thin, and the juice is very rich. It ripens about the end of Auguſt, and is eſteemed one of the beſt ſort of Peaches. This tree is very tender, and will not ſucceed on common ſtocks, ſo is budded twice as the Mignon; and if budded on Apricots, as was directed for that ſort, will thrive much better than in any other method.

15. The Bellegarde (or as the French call it, the Gallande:) this tree has ſmooth leaves; the flowers are ſmall and contracted; the fruit is very large and round, of a deep purple colour on the ſide to the ſun; the fleſh is white, melting, and ſeparates from the ſtone, where it is of a deep red colour; the juice is very rich. This ripens the beginning of September, and is an excellent Peach, but at preſent not common.

16. The Liſle (or as the French call it, La petite Violette hâtive:) this tree has ſmooth leaves; the flowers are ſmall and contracted; the fruit is of a middling ſize, of a fine Violet colour toward the ſun; the fleſh is of a pale yellow and melting, but adheres to the ſtone, where it is very red; the juice is very vinous. This ripens the beginning of September.

17. The Bourdine: this tree has ſmooth leaves; the flowers are ſmall and contracted; the fruit is large, round, and of a fine red colour next the ſun; the fleſh is white, melting, and ſeparates from the ſtone, where it is of a fine red colour; the juice is vinous and rich; this ripens the beginning of September, and is greatly eſteemed by the curious. The tree bears plentifully, and will produce fruit in ſtandards very well.

18. The Roſſanna: this tree has ſmooth leaves; the flowers are ſmall and contracted; the fruit is large, a little longer than the Alberge; the fleſh is yellow and ſeparates from the ſtone, where it is red; the juice is rich and vinous. This ripens the beginning of September, and is eſteemed a good Peach. This is the ſame with what ſome call the purple, and others the red Alberge, it being of a fine purple colour on the ſide next the ſun.

19. The Admirable: this tree hath ſmooth leaves; the flowers are ſmall and contracted; the fruit is large, round, and red on the ſide next the ſun; the fleſh is white, melting, and ſeparates from the ſtone, where it is of a deep red colour; the juice is ſugary and rich. This ripens the beginning of September. This is by ſome called the early Admirable, but is certainly what the French call L'Admirable, and they have no other of this name which ripens later.

20. The old Newington: this tree has ſawed leaves; the flowers are large and open; the fruit is fair and large, of a beautiful red colour next the ſun; the fleſh is white, melting, and cloſely adheres to the ſtone, where it is of a deep red colour; the juice is very rich and vinous. This is eſtemed one of the beſt ſorts of Pavies. It ripens about the middle of September.

21. The Rambouillet (commonly called Rumbullion:) this tree has ſmooth leaves; the flowers are large and open; the fruit is of a middling ſize, rather round than long, deeply divided by a ſulcus or furrow in the middle; it is of a fine red colour next the ſun, but of a light yellow next the wall; the fleſh is melting, of a bright yellow colour, and ſeparates from the ſtone, where it is of a deep red colour; the juice is rich, and of a vinous flavour. This ripens the middle of September, and is a good bearer.

22. The Bellis (which I believe to be what the French call La Belle de Vitry:) the leaves of this tree are ſawed; the flowers are ſmall and contracted; the fruit is of a middle ſize, round, and of a pale red next the ſun; the fleſh is white and adheres to the ſtone, where it is red; the juice is vinous and rich. This ripens the middle of September.

23. The Portugal: this tree has ſmooth leaves; the flowers are large and open; the fruit is large, and of a beautiful red colour towards the ſun, the ſkin generally ſpotted; the fleſh is firm, white, and cloſely adheres to the ſtone, where it is of a faint red colour; the ſtone is ſmall, but full of deep furrows; the juice is rich and vinous. This ripens the middle of September.

24. La Teton de Venus (or Venus's breaſt,) ſo called from its having a riſing like a dug, or bubby: this tree has ſmooth leaves; the flowers are ſmall and contracted; the fruit is of a middling ſize reſembling the Admirable, of a pale red colour next the ſun; the fleſh is melting, white, and ſeparates from the ſtone, where it is red; the juice is ſugary and rich. This ripens late in September.

25. La Pourprée (or as the French call it Pourprée tardive, i. e. the late purple:) this tree has very large leaves which are ſawed; the ſhoots are very ſtrong; the flowers are ſmall and contracted; the fruit is large, round, and of a fine purple colour; the fleſh is white, melting, and ſeparates from the ſtone, where it is red; the juice is ſugary and rich. This ripens late in September.

26. The Nivette: this tree has ſawed leaves; the flowers are ſmall and contracted; the fruit is large, ſomewhat longer than round, of a bright red colour next the ſun, and of a pale yellow on their other ſide; the fleſh is melting, and full of rich juice, and is very red at the ſtone, from which it ſeparates. This is eſteemed one of the beſt Peaches; it ripens in the middle of September.

27. The Royal (La Royale:) this tree has ſmooth leaves; the flowers are ſmall and contracted; the fruit is large, round, and of a deep red on the ſide next the ſun, and of a paler colour on the other ſide; the fleſh is white, melting, and full of a rich juice; it parts from the ſtone, where it is of a deep red colour:

lour. This ripens the middle of September, and, when the autumn is good, is an excellent Peach.

28. The Persique: this tree has sawed leaves; the flowers are small and contracted; the fruit is large, oblong, and of a fine red colour next the sun; the flesh is melting, and full of a rich juice; it separates from the stone, where it is of a deep red colour. The stalk has a small knot upon it; this makes a fine tree, and is a good bearer; it ripens the end of September. Many gardeners call this the Nivette.

29. The monstrous Pavy of Pomponne (called by the French, La Pavie rouge de Pomponne:) the leaves of this tree are smooth; the flowers are large and open; the fruit is very large and round, many times fourteen inches in circumference; the flesh is white, melting, and closely adheres to the stone, where it is of a deep red colour; the outside is a beautiful red next the sun, and of a pale flesh colour on the other side. This ripens the end of October, and when the autumn is warm, is an excellent Peach.

30. The Catharine: this tree hath smooth leaves; the flowers are small and contracted; the fruit is large, round, and of a dark red colour next the sun; the flesh is white, melting, and full of a rich juice. It closely adheres to the stone, where it is of a deep red colour; it ripens the beginning of October, and in very good seasons is an excellent Peach, but being so very late ripe, there are not many situations where it ripens well.

31. The Bloody Peach (called by the French, La Sanguinolle;) this Peach is of a middling size, of a deep red next the sun; the flesh is of a deep red quite to the stone, and from thence is by some gardeners called the Mulberry Peach. This fruit rarely ripens in England, so is not often planted, but it bakes and preserves excellently; for which, as also the curiosity, one or two trees may be planted, where there is extent of walling.

There are some other sorts of Peaches which are kept in some of the nurseries, but those which are here enumerated, are the sorts most worth planting, and in the list, the choicest only should be planted; but I shall just mention the names of those sorts omitted, for the satisfaction of the curious.

The Sion; the Bourdeaux; the Swalch or Dutch; the Carlisle; the Eaton; the Pêche de Pau; yellow Admirable; the double Flower. This last sort is generally planted more for the beauty of the flowers, than for the goodness of the fruit, of which some years the standard trees produce great plenty; but they are late ripe, and have a cold, watery, insipid juice. The Dwarf Peach is also preserved in some places as a curiosity. This is a very tender tree, making very weak shoots, which are very full of flower-buds. The fruit is not so large as a Nutmeg, and not good, nor will the tree last any time, so it is not worth cultivating.

And indeed, from these thirty-one above-named, there are not above ten of them which I would advise to be planted; because, when a person can be furnished with those which are good, or has the best of the season, it is not worth while to plant any which are middling or indifferent, for the sake of variety; therefore the sorts which I should prefer, are these after-mentioned.

The early purple; the Grosse Mignon; Belle Chevreuse; red Magdalen; Chancellor; Bellegarde; Bourdine; Rossanna; Rambouillet, and Nivette. These are the sorts best worth planting; and as they succeed each other, they will furnish the table thro' the season of Peaches; and, where there is room, and the situation very warm, one or two trees of the Catharine Peach should have place, for in very warm seasons it is an excellent fruit.

As these eleven sorts do follow each other in their time of ripening, so unless there is extent of good aspected walls, these will be sufficient to furnish any family during the season of this fruit: but as in some seasons there will be some sorts of Peaches very good, which in other seasons often prove but indifferent; therefore when there is a sufficient extent of good walls, I would recommend the planting three or four other sorts, which some years are excellent, though in general are not so good as those before-mentioned. These are the Montauban, the Lisle, the old Newington, La Teton de Venus, the Catharine, and the Persique.

The French distinguish those we call Peaches into two sorts, viz. Pavies and Peaches; those are called Peaches which quit the stone, and those, whose flesh closely adheres to the stone, are called Pavies. These are much more esteemed in France than the Peaches, though in England the latter are preferred to the former by many persons.

The French also distinguish them into male and female; the Pavies they make to be the male, and the Peaches the female; but this division is without foundation, since the kernels of both sorts will produce trees equally; for the flowers of Peach-trees are generally hermaphrodite, and have all the parts of generation in them, so that there is no necessity for supposing any of them to be entirely male or female: but it is likely, that this distinction is of long standing, before persons had a perfect notion of male and female in plants, or at least they did not know how to distinguish them asunder.

The Nectarines (as I have in another place said) are by the French called Brugnons, which differ from the other two sorts, in having a firm hard flesh, and the skin quite smooth, without any down upon them. The sorts of these I have already mentioned under the article NECTARINES, to which the reader may readily turn, therefore I shall not repeat them in this place.

I shall now set down the good qualities of Peaches, by which any person may judge of their worth.

A good Peach ought to have a firm flesh; the skin should be thin, of a deep or bright red colour next the sun, and of a yellowish cast next the wall. The flesh should be of a yellowish colour, full of juice, which should be high-flavoured, the stone small, and the pulp or flesh very thick. When a Peach hath all these qualities, it may be esteemed a valuable fruit.

All the different sorts of Peaches have been originally obtained from the stones, which, being planted produce new varieties, as do the seeds of all other fruits; so that where persons have garden enough to allow room for propagating these fruits from seeds, there is no doubt but many good sorts may be obtained, which will be better adapted to our climate, than such as are brought from warmer countries; though it is true, that there will be many of them good for nothing, as is the case of most fruits and flowers which are produced from seeds, amongst which there may be some valuable kinds, superior to those from whence the seeds were taken, yet there is always a great number which are little worth; but if we can obtain only two or three valuable sorts, it is sufficient to make amends for the trouble of raising them; but where persons are so curious as to plant the stones of these fruits, great regard should be had to the sorts; and if the fruits were permitted to remain upon the trees until they dropped off, the kernels would be fitter for planting, and more likely to grow. The best sorts for sowing are those whose flesh is firm, and cleaves to the stone; and from amongst these you should chuse such as ripen pretty early, and have a rich vinous juice, from which sorts some good fruit may be expected.

These stones should be planted in autumn, on a bed of light dry earth, about three inches deep, and four inches asunder; and in the winter the beds should be covered to protect them from the frost, which, if permitted to enter deep into the ground, will destroy them. In the spring, when the plants come up, they should be carefully cleared from the weeds, which should also be observed throughout the summer; and if the spring should prove very dry, if you refresh them now and then with a little water, it will greatly promote their growth. In this bed they should re-

main until the following spring, when they should be carefully taken up, so as not to break their tender roots, and transplanted into a nursery in rows three feet asunder, and one foot distant plant from plant in the rows, observing to lay a little mulch upon the surface of the ground about their roots, to prevent its drying too fast; and if the spring should prove very dry, you should give them a little water once a week, until they have taken root; after which they should be constantly kept clear from weeds, and the ground between the rows carefully dug every spring to loosen it, so as that the tender fibres may strike out on every side.

In this nursery they may continue one or two years, according to the progress they make; after which they should be transplanted where they are to remain, to produce fruit.

In removing these trees, you should observe to prune their downright roots, if they have any, pretty short, and to cut off all bruised parts of the roots, as also all the small fibres, which generally dry, and when left upon the roots after planting again, grow mouldy and decay, so that they are injurious to the new fibres which are shot out from the roots, and very often prevent the growth of the trees; but you should by no means prune their heads, for the plants which are produced from stones, are generally of a more spongy texture, and so more liable to decay when cut, than those which are budded upon other stocks. Besides, as these trees are designed for standards (for it is not proper to plant them against walls, until you see the produce of the fruit, to shew which of them deserves to be cultivated,) they will never require any other pruning, but only to cut out decayed branches, or such as shoot out very irregular from the sides, for more than this is generally very injurious to them.

In planting these trees, it will be the better way to dispose them singly in the quarters of the kitchen-garden, where they will thrive, and produce fruit much better than if they are planted near each other in rows; and, as they are thus singly disposed, they will not do much injury to the crops which grow under them.

When they have produced fruit, you will soon be a judge of their goodness, therefore such of them as you dislike may be destroyed; but those which are good, may be propagated by inoculating them upon other stocks, which is the common method now practised to propagate these fruits, therefore I shall now proceed to treat of that more particularly; in the doing of which, I shall set down the method now commonly practised by the nursery-gardeners, and then propose some few things of my own as an improvement thereon, for such persons who are very curious to have good fruit. But first,

You should be provided with stocks of the Muscle and white Pear Plums, which are generally esteemed the two best sorts of Plums for stocks to inoculate Peaches and Nectarines upon; as also some Almond and Apricot stocks, for some tender sorts of Peaches which will not grow upon Plum stocks. These should be all produced from the stone (as hath been already directed in the article Nursery,) and not from suckers, for the reasons there laid down. These stocks should be transplanted, when they have had one year's growth in the seed-bed, for the younger they are transplanted, the better they will succeed, and hereby they will be prevented from sending tap-roots deep in the ground; for by shortening those roots which seem so disposed, it will cause them to put out horizontal roots. These stocks should be planted at the distance above-mentioned, viz. the rows three feet asunder, and one foot apart in the rows. This is wider than most nurserymen plant them, but I shall give my reasons hereafter for this.

When these stocks have grown in the nursery two years, they will be strong enough to bud; the season for which is commonly about Midsummer, or any time in July, when the rind will easily separate from the wood, when you should make choice of some good cuttings of the sorts of fruit you intend to propagate, always observing to take them from healthy trees, and such as generally produce a good quantity of well-tasted fruit; for it is very certain, that any sort of fruit may be so far degenerated where this care is wanting, as not to be like the same kind. Besides, whenever a tree is unhealthy, the buds taken from that tree will always retain the distemper, in a greater or less degree, according as it hath imbibed a greater or less quantity of the distempered juice. Thus, for instance, where a Peach or Nectarine-tree hath been greatly blighted, so as that the shoots have grown busled, and the leaves curled up to a great degree, that distemper is seldom recovered again by the greatest art, or at least not under several years management; for let the seasons prove ever so favourable, yet these trees will continually shew the same distemper, which many persons are so weak as to suppose a fresh blight, whereas in reality it is no other but the remains of the former sickness, which are spread and intermixed with all the juices of the tree; so that whatever buds are taken from such trees, will always retain a part of the distemper.

Upon the care which is taken in the choice of the buds, the whole success depends; therefore a person who is curious to have good fruit, cannot be too careful in this particular; for in general no more is regarded by those nurserymen who are the most careful in propagating the several sorts of fruit-trees, than the taking their buds or grafts from the true kinds of fruit-trees; but there is still more care required to have sound healthy trees, especially in this of Peaches and Nectarines; for if the buds are taken from young plants in the nursery which have not produced fruit, the shoots of which are generally very strong and vigorous, these buds will have so vicious a habit, as rarely to be corrected and brought into good order; for they will shoot more like the Willow than the Peach, the joints being extended to a great distance from each other, the shoots very gross, and the wood pithy; therefore where the practice of taking the buds from nursery-trees is long continued, there can be little hopes of the trees so raised. I would therefore recommend it to every curious person, to procure their buds from such trees as have been long growing, whose fruit are well flavoured, and the trees perfectly sound; as also never to make choice of the strongest or most luxuriant shoots of these trees, but such shoots as are well conditioned, and whose buds grow pretty close together. And although these do not make so strong shoots the following years, as those which are taken from luxuriant branches, yet they will be better disposed to bear fruit, and will make much better trees.

The cuttings with which you are thus to be provided, should always be taken from the trees either in a morning or evening, or else in a cloudy day; for if they are cut off when the sun is very hot, the shoots will perspire so freely, as to leave the buds destitute of moisture, which is often the cause of their miscarrying; and the sooner they are put into the stocks when cut from the trees, the better they will take. The manner of this operation being fully explained under the article of Inoculation, I shall not repeat it in this place. The management of these trees, during their remaining time in the nursery, is likewise fully set down under that article. I shall therefore proceed to give some directions for the choice of these trees, when they are to be procured from a nursery. The first care should be to find out a person of character to deal with, on whose integrity you may depend, not only for having the trees of those kinds which you propose, but also for their buds being taken from bearing trees; and either see them taken up, or let some person you can confide in do it for you; because, as most of the nurserymen have dealings with each other, if the person applied to has not the sort of fruit desired in his own nursery, he procures them from another; and if the gardener from

whom

whom he gets them, is not as honeſt and careful as himſelf, it is a great chance if the trees prove to be of the right kinds.

The trees ſhould alſo be choſen in the autumn, before others have drawn out the beſt; for thoſe who go firſt to the nurſeries, if they have ſkill, will always draw the fineſt plants. In the choice of the trees, you ſhould obſerve the ſtocks upon which they have been budded, that they are of the right ſort, whether Plum or Apricot; that they are ſound and young, not ſuch as had been budded the preceding year and failed, nor thoſe which have been cut down. If the ſize of the ſtock is near that of a man's finger, it will be better than if they are larger; theſe ſhould be clear of moſs or canker. The buds ſhould be of one year's growth only, and not ſuch as have been cut down in the ſpring, and made a ſecond ſhoot; nor ſhould thoſe trees be choſen whoſe ſhoots are very ſtrong and luxuriant, but ſuch as have clean ſhoots, of a moderate ſize, whoſe joints are not too far aſunder; and thoſe trees which ſtand on the outſide rows, or near the ends of the rows, where they have moſt air, are generally ſuch; for, where they ſtand cloſe in the nurſery, their ſhoots are drawn up in length, their joints are much farther aſunder, and their buds or eyes are flat; for which reaſon, I have before adviſed the planting of the ſtocks at a greater diſtance than the nurſerymen generally allow them; and, if a careful diſcreet nurſeryman would be at the trouble and expence in the raiſing of his Peach-trees according to this method, he would better deſerve three ſhillings per tree, than one in the manner they are uſually raiſed; for every perſon who is at the expence of building walls for fruit, ſhould not think of ſaving a few ſhillings in the purchaſe of their trees; becauſe, if they are bad, or not of the right kinds, there is a great loſs of time and expence to no purpoſe, and the diſappointment will be ſo great, after waiting three or four years, as to diſcourage many from making farther trials, thinking themſelves liable to the ſame ill ſucceſs.

When the trees are choſen in the nurſery, the next care muſt be to have them carefully taken up out of the ground, ſo as not to break or tear their roots, nor injure their bark; for as theſe trees are very apt to gum in thoſe places where they are wounded, there cannot be too much care taken of this. If the trees are to be tranſported to a diſtant place, their roots ſhould be cloſely wrapped either with haybands, ſtraw, or Peas-haulm, and mats ſewed over theſe, to prevent the air from drying their roots and branches. If the leaves of the trees are not fallen when they are taken up, they ſhould be carefully ſtripped off, before the trees are packed up; for when there are many of theſe left, they are very apt to heat, if they are long in their paſſage, and often occaſion a mouldineſs very hurtful to the branches.

We come next to the preparing of the ground to receive the trees. The beſt earth for Peach-trees is ſuch as is taken from a paſture-ground, that is neither too ſtiff and moiſt, nor over dry, but of a middling nature, ſuch as is termed hazel loam. This ſhould be dug from the ſurface of the ground about ten inches deep, taking the turf with it, and ſhould be laid in heaps eight or ten months at leaſt; but that which is prepared one year or more is ſtill better before it be uſed, that it may have the winter's froſt, and ſummer's heat to mellow it; during which time it ſhould be often turned, to rot the turf and break the clods, whereby it will be rendered very light and eaſy to work; and about the beginning of September you ſhould carry it into the garden, and make the borders, which muſt be raiſed in height proportionable to the moiſture of the garden; but if the ground be very wet, it will be adviſeable to lay ſome rubbiſh in the bottom of the border to drain off the moiſture, alſo to prevent the roots of the trees from running downward; and in this caſe it will be proper to make ſome under-ground drains at the bottom of the border, to convey off the ſuperfluous moiſture; which, if detained about the roots of the trees, will greatly prejudice them; then raiſe a border of earth at leaſt a foot, or in very wet land two feet above the level of the ground, ſo that the roots of the trees may always remain dry; but if the ground be pretty dry, the borders ſhould not be raiſed above ſix or eight inches higher than the ſurface, which will be ſufficient to allow for their ſinking.

As to the breadth of theſe borders, that cannot be too great; but they ſhould never be leſs than ſix or eight feet broad, where fruit-trees are planted, for when the borders are made very narrow, the roots of the trees will be ſo confined in four or five years time, that they will ſeldom thrive well after. The depth of theſe borders ſhould not be greater than two feet and a half; for when they are prepared to a great depth, it only entices the roots of the trees downward, which may be the cauſe of their future barrenneſs; for their roots being got down below the influences of the ſun and ſhowers, imbibe a great quantity of crude juices, which only add to the luxuriant growth of the trees, and deſtroy their fruitfulneſs; beſides, whatever fruit are produced from ſuch trees, are not near ſo well taſted as thoſe are which grow upon thoſe trees whoſe roots lie near the ſurface, and enjoy the kindly benefit of the ſun's heat, to correct and digeſt whatever crudities there may be in the earth.

Where the natural ſoil of the garden is ſhallow, and either chalk, clay, or gravel lies near the ſurface, theſe ſhould not be dug out to make pits to receive the earth for the border, as is by ſome practiſed, for this will be no better than planting the trees in tubs or caſes, for their roots will be confined to theſe pits; ſo that when they are extended to the ſides, and can get no farther, the trees will blight and decay; and if it is clay on the ſides, the wet will be detained as in a baſon, and the earth of the border will be like mud in very wet ſeaſons, ſo unfit for the roots of theſe trees. Therefore, whenever it ſo happens that the ground is of either of the ſorts before-mentioned, it will be the beſt way to raiſe the borders of a proper thickneſs of good earth over theſe, rather than to ſink down into them; for when the roots of the trees lie near the ſurface of the ground, they will extend to a great diſtance in ſearch of nouriſhment; but if they get below the ſtaple of the land, they can find nothing but ſour crude paſture very unfit for vegetation.

Your borders being thus prepared, ſhould lie about three weeks or a month to ſettle, by which time the ſeaſon for planting will be come, which ſhould be performed as ſoon as the leaves begin to decay, that the trees may put out new roots, before the froſt comes on to prevent them. Your ground being ready, and the trees brought carefully to the place, the next work is to prepare them for planting, which is to be performed in the following manner: you muſt ſhorten all the roots, and cut off ſmooth and broken or bruiſed roots, as alſo all the ſmall fibres ſhould be taken off, for the reaſons before given; and where any of the roots croſs each other, the worſt of them muſt be cut out, that they may not injure the other.

And having thus prepared your trees, you ſhould meaſure out their diſtance, which ought never to be leſs than twelve feet; but where the ground is very good, they ſhould be planted fourteen feet aſunder. This I doubt not, will be thought too great a diſtance by many perſons, eſpecially ſince it is contrary to the general practice at this time; but I am ſatisfied whoever ſhall try the experiment, will find it no more than is ſufficient for theſe trees where they are rightly managed; for if they take kindly to the ſoil, their branches may be ſo trained as to furniſh all the lower part of the wall in a few years, which is what ſhould be principally regarded, and not, as is too often the practice, run up the ſhoots in height, and leave all the lower part of the tree deſtitute of bearing wood; ſo that in a few years there will not be any fruit but upon the upper part of the trees; which alſo muſt be the caſe where they are planted too cloſe, becauſe there being no room to extend the branches on either ſide, they

they are obliged to lead them upright, which produces the before-mentioned ill effect.

There may be alſo ſome perſons, who may think this diſtance too ſmall for theſe trees, becauſe Plums, Cherries, and moſt other ſorts of fruit-trees require much more room; but when it is conſidered, that Peach and Nectarine-trees produce their fruit only upon the former year's wood, and not upon ſpurs, as Cherries, Plums, and Pears do, ſo that the ſhoots of theſe trees muſt be annually ſhortened in every part of them to obtain bearing wood; therefore the trees may be kept in much leſs compaſs than thoſe of any other ſort of fruit, and thereby every part of the wall may be conſtantly ſupplied with bearing branches; for when the trees are planted at a great diſtance, the branches are often extended to ſuch lengths as to leave the middle of the trees naked, for there are never any good ſhoots produced from the old branches of theſe trees.

And here I cannot help taking notice of another very great error in planting of wall-fruit, which is the placing ſtandard or half ſtandard trees between the others, to cover the upper part of the wall, and to produce fruit, until the trees underneath are grown up ſufficient to furniſh the walls, when the ſtandards are to be taken away. This is done, without conſidering that the greater number of trees which are planted in a ſmall compaſs, the leſs nouriſhment they can receive, and ſo conſequently muſt be the weaker, for the ſame ſpace of ground cannot nouriſh twenty trees equally as well as it could ten; ſo that whatever ſtrength the ſtandard-trees may have, the dwarfs will be proportionably weaker; and it is a common obſervation, that moſt trees extend their roots as far under ground, as their branches ſpread above ground; ſo that there ſhould always be the ſame allowance given to the wall-trees, if we would have them ſtrong and vigorous; therefore the building very high walls for fruit, unleſs for Pears, is to no purpoſe, for a ten or twelve feet wall will be ſufficient for moſt ſorts of fruit. I have ſeen gardens planted with fruit-trees by perſons of great eſteem for their ſkill in this art, where Peach and Nectarine-trees have been placed againſt walls expoſed to the eaſt and weſt, but could never ſee any of the fruit on thoſe trees come to perfection; for which reaſon I would caution every perſon never to follow ſuch examples, becauſe it is well known, that the beſt aſpected walls do barely ripen many of the latter Peaches ſome years; therefore the only aſpect to which theſe trees ſhould be expoſed, is ſouth, or with a point or two to the eaſt, and ſome ſorts may do well if they are a point or two to the weſt.

In the diſpoſition of the trees, it will not be amiſs to plant thoſe ſorts of Peaches near each other, which ripen about the ſame time; for by ſo doing, the fruit may be the better guarded from men and inſects, and this will ſave a great deal of trouble in gathering of the fruit; for if a perſon is obliged to go from one part of the garden to the other, or perhaps to look over all the walls of the garden every time the fruit is gathered, it is a great loſs of time, which may be avoided by this firſt care in planting the trees.

But to return to planting; after you have marked out the places where each tree is to ſtand, you muſt with your ſpade make a hole wide enough to receive the roots of the tree; then you ſhould place it down, obſerving to turn the bud outwards, that the wounded part of the ſtock may be hid from ſight; and let the ſtem of the tree be placed about four or five inches from the wall, with its head inclining thereto; then fill in the earth with your hands, obſerving to break the clods, that the earth may fall in between the roots, ſo as no void ſpaces may be left about them. You ſhould alſo gently ſhake the tree with your hands, to ſettle the earth down the better between the roots; then with your foot gently preſs down the earth about the ſtem, but do not tread it down too hard, which is many times a very great fault; for when the ground is inclinable to bind, the treading it cloſe doth often render the ground ſo hard, as that the tender fibres of the roots cannot ſtrike into it, whereby the tree remains at a ſtand for ſome time; and if the earth be not looſened in time, it frequently dies; ſo that whenever you obſerve the earth of your borders to be bound, either by great rains, or from any other cauſe, you ſhould dig or fork it, to looſen it again, obſerving always to do it in dry weather, if in winter or ſpring; but in ſummer it ſhould be done in a moiſt ſeaſon.

Although I have here given directions for the choice of trees from the nurſery, after the uſual method of planting theſe trees, which is that of taking ſuch as have made one year's ſhoot, yet I would prefer thoſe which were budded the preceding ſummer, and have made no ſhoot; for if the bud is ſound and plump, and the bark of the ſtock well cloſed where the bud is inſerted, there will be no danger of its growing; and when the bud has made a ſhoot the following ſpring the length of five or ſix inches, if it is ſtopped by pinching off the top, it will put out lateral branches, which may be trained to the wall, and this will prevent any cutting off the head, as muſt be done to thoſe trees which have had one year's growth in the nurſery; for theſe trees do not care for thoſe large amputations, eſpecially ſome of the more tender ſorts; ſo by this method of planting theſe trees in bud, no time will be loſt, when it is conſidered that the trees which have ſhot muſt be cut down, and there is a hazard of their ſhooting again; therefore I am convinced from experience, that it is the beſt method.

After you have thus planted your trees, which have made their ſhoots in the nurſery, you ſhould faſten their heads to the wall, to prevent their being ſhaken by the wind, which would diſturb their roots, and break off the tender fibres ſoon after they were produced, to the no ſmall prejudice of the trees; you ſhould alſo lay ſome mulch upon the ſurface of the ground about their roots, before the froſt ſets in, to prevent it from penetrating the ground, which would injure, if not deſtroy, the ſmall fibres; but this mulch ſhould not be laid upon the ground too early, leſt it prevent the autumnal rains from penetrating to the roots.

Theſe things being duly obſerved, they will require no farther care till the beginning or middle of March, according as the ſeaſon is earlier or later; when you muſt cut off the heads of the new planted trees, leaving only four or five eyes above the bud; in doing of which, you muſt be very careful not to diſturb their roots; to prevent which, you ſhould place your foot down cloſe to the ſtem of the tree, and take faſt hold of that part of the ſtock below the bud with one hand, to hold it ſteady, while with the other hand you gently ſlope off the head of the tree with a ſharp knife at the intended place, which ſhould always be juſt above a bud; this ſhould always be done in dry weather, for if there ſhould be much rain ſoon after it is done, there will be ſome danger that the wet will enter the wounded part, and damage the tree; nor ſhould it be done in froſty weather for the ſame reaſon, for that would enter the wounded part and prevent its healing over. After you have headed the trees, you ſhould gently looſen the earth of the borders, to admit the fibres of the roots; but you muſt be very careful in doing of this, not to cut or bruiſe their new roots, which would alſo damage them; and if the mulch which was laid about their roots in autumn be rotten, you may dig it into the border at ſome diſtance from the roots of the trees; and when the dry weather comes on, you ſhould pare off ſome turf from a paſture ground, which ſhould be laid upon the ſurface of the border about the roots of the trees, turning the Graſs downward, which will preſerve a gentle moiſture in the earth, better than any other ſort of mulch; and this will not harbour inſects, as moſt ſorts of dung and litter do, to the no ſmall detriment of the trees.

Thoſe trees which are planted in bud, and have not made any ſhoots, ſhould have their ſtocks cut down at

at this season just above the bud, for the buds will rarely shoot unless this is performed; and the nearer they are cut to the bud, the sooner will the head of the stock be covered by the buds; for although it may be necessary to leave a part of the stock above the bud, in those trees which are in the nursery, to which the shoots made by the buds may be fastened, to prevent their being broken by the wind; yet as these are placed against the wall, to which the shoots may be fastened, there will be no want of any part of the stock.

In watering these new planted trees, which should not be done unless the spring proves very dry, you should observe to do it with a nossel upon the watering-pot, so as to let it out in drops; for when it is hastily poured down, it causes the ground to bind; and if you water over the head of the tree, it will be of great service to it. Your waterings should not be repeated too often, nor should they be given in great quantity, both which are very injurious to new planted trees.

In the middle or latter end of May, when these trees will have several shoots six or eight inches in length, you should nail them to the wall, observing to train them horizontally, rubbing off all fore-right shoots, or such as are weak, whereby those which are preserved will be much stronger; but if there are not more than two shoots produced, and those very strong, you should at the same time nip off their tops, which will cause each of them to push out two or more shoots, whereby the wall will be better supplied with branches; you must also continue to refresh them with water in dry weather, during the whole season, otherwise they will be apt to suffer; for their roots having but little hold of the ground the first year after transplanting, if the season should prove very dry, it will greatly retard their growth, if due care be not taken to water them.

In the beginning of October, when you observe the trees have done shooting, you should prune them; in doing of which, you must shorten the branches in proportion to the strength of the tree; which, if strong, may be left eight inches long, but if weak, should be shortened to four or five; then you should train them horizontally to the wall (as was before directed,) so that the middle of the trees may be void of branches, for that part of the tree will be easily furnished with wood afterwards; whereas, if the shoots are trained perpendicularly to the wall, those which are the strongest, will draw the greatest share of the sap from the roots, and mount upwards; so that the side branches will be deprived of their nourishment and grow weaker, until they many times decay; and this is the reason that we see so many Peach-trees with one or two upright shoots in the middle, and the two sides wholly unfurnished with branches, whereby the middle of each tree cannot produce any fruit, that being filled with large wood, which never produces any bearing shoots. Nor can the two sides of the trees be regularly filled with fruitful branches, when this defect happens to them; therefore this method should be carefully observed in the training up young trees, for when they are permitted to run into disorder at first, it will be impossible to reduce them into a regular healthful state afterwards, the wood of these trees being too soft and pithy to admit of being cut down (as may be practised on many other hardy fruit-trees, which will shoot out vigorously again;) whereas these will gum at the places where they are wounded, and in a few years entirely decay.

The summer following, when the trees begin to shoot, you should carefully look over them, to rub off all fore-right buds, or such as are ill placed, and train those which are designed to remain horizontally to the wall, in their due order as they are produced, for this is the principal season when you can best order the trees as you would have them; whereas, if they are neglected until Midsummer, as is the common practice, a great part of the nourishment will be exhausted by fore-right shoots, and other useless branches, which must afterwards be cut off; and hereby the remaining shoots will be rendered very weak, and perhaps some part of the wall be entirely furnished with branches; which might have been easily supplied in May, by stopping some of the stronger shoots in such parts of the tree where there is a necessity for more branches, which would cause each of them to shoot out two or more side branches below the ends of the shoots, which may be guided into the vacant parts of the tree as they are produced, so as that every part may be regularly furnished with proper wood, which is the greatest beauty and excellency of wall-trees; but you should always forbear stopping the shoots in summer, where there is not a necessity for branches to fill the wall; for there cannot be a greater fault committed, than that of multiplying the number of shoots, so as to cause a confusion, whereby the branches will be too weak to produce good fruit; besides, when they are too close laid in against the wall, the air is excluded from the shoots by the great number of leaves, so that they are never duly ripened; and consequently, what fruit is produced thereon, cannot be so well tasted, as those which are produced upon such trees where the shoots receive all the advantages of the sun and air to bring them to maturity.

Thus having set down the method of training up young trees, I shall now proceed to their pruning and future management; which, being the same as with full grown trees, will serve for general directions how to manage these sorts of fruit.

In the pruning of Peach and Nectarine-trees (which require the same management) the two following rules should be strictly observed, viz. First, That every part of the tree be equally furnished with bearing wood; and secondly, That the branches are not laid in too close to each other for the reasons before laid down (with some others which will be hereafter inserted.) As to the first, it must be observed, That Peach and Nectarine-trees produce their fruit upon the young wood, either of the preceding year, or at most, the two years shoots, after which age they do not bear; therefore the branches should be shortened, so as to cause them to produce new shoots annually in every part of the tree; which cannot be done in the ordinary method of pruning, where persons neglect their trees at the proper season when they are most capable of management, which is in April, May, and June; at which time the luxuriant growth of branches may be checked by pinching, and new shoots produced where they are wanting, by stopping the neighbouring branches; which shoots, being produced at that season, will have time enough to ripen and gain strength before the autumn comes on; whereas all those shoots which are produced after the middle of June, will be crude and pithy; and though they may sometimes produce a few blossoms, yet those rarely bring fruit; nor are the future branches good which are produced from such wood, the vessels being too large to strain the juices, so that they easily admit of great quantities of crude nourishment to pass through them. Therefore those persons who only regard their wall-trees at two different seasons, viz. the winter and Midsummer pruning, cannot possibly have them in good order; for when all the branches which were produced in the spring, are permitted to remain until the middle or latter end of June (as is the common practice) some of the most vigorous will draw the greatest part of the nourishment from the weaker branches, which, when the strong ones are taken off, will be too weak to produce fair fruit; and hereby the strength of the tree is exhausted, to nourish the useless branches which are annually cut off again; and thus are too many trees managed, and at the same time complaints made of their luxuriancy; because two or three shoots, by drawing away the greatest share of the nourishment grow very strong and woody (whereas, if the nourishment had been equally distributed to a regular quantity of branches, there would be no sign of their too great strength) until by often cutting off these vigorous branches, the trees are either entirely destroyed, or at least rendered so weak as not to be able

able to produce fruit; for although by thus weakening the branches, it is often the means to produce a good number of blossoms (as may many times be observed also upon autumnal shoots;) yet the utmost of their strength is spent in expanding the flowers, so that they rarely produce fruit; and very often the greatest part of the branches die soon after, which is supposed to be occasioned by a blight (as I have elsewhere said) when in reality it is nothing less than the fault of those who have the management of the trees. It is therefore of the greatest consequence to wall-trees, especially of these sorts, to go over them two or three times in the months of April, May, and June, to rub off all irregular shoots, and to train in the branches that are left in due order to the wall, that each shoot may have an equal advantage of sun and air, both of which are absolutely necessary to ripen and prepare the wood for the next year's bearing; therefore the oftener the trees are looked over, to divest them of the useless branches, from the time they first begin to shoot in the spring till the autumn, the better will the wood be ripened for the succeeding year.

And by duly observing this in summer, there will not be occasion for so much cutting as is often practised on Peach-trees, to their great injury; for their wood branches are generally soft, tender, and pithy, which when greatly wounded, are not healed over again so soon as in many other sorts of trees; and the wet insinuating into the wounded parts, doth often cause the branches to canker and die; which may be entirely avoided by the gentle easy method of pinching and rubbing off the buds in the manner here directed, which makes no wounds on the tree; and hereby a vast deal of labour is saved, for one person who is ready at this business will go over a greater quantity of walling in one day, than three or four can when suffered to grow rude; so that if the trees are permitted to grow rude all the spring, they will require six times the labour to reduce them into order.

Besides, it is a great disadvantage to the fruit, in permitting the branches of the trees to extend from the wall and shade them; and when they have grown under the shelter of these branches and leaves all the spring, until Midsummer, then by pruning off and shortening most of these shoots, and nailing the others close to the wall, the fruit are suddenly exposed to the sun and air, whereby they receive a very great check, and are not only retarded in their growth, but often rendered ill-tasted, and have tough skins.

The distance which the branches of these trees should be allowed against the wall, must be proportioned to the size of the fruit or the length of the leaves; for if we observe how the branches of the trees are naturally disposed to grow, we shall always find them placed at a greater or less distance, as their leaves are larger or smaller, as I have already observed under the article LEAVES. And there is no surer guide to a curious artist than nature, from whence a gardener should always be directed in every part of his profession, since his business is to aid and assist nature, where she is not capable of bringing her productions to maturity; or where there is room, to make considerable improvements by art; which cannot be any otherwise effected, than by gently assisting her in her own way.

But to return to pruning these trees: the branches being carefully trained in, as before directed, in the spring and summer seasons, we come now to treat of the winter pruning, which is commonly performed in February or March. But the best season for this work is in October, when their leaves begin to fall, which will be early enough for their wounds to heal before the frost comes on, so that there will be no danger of their being hurt hereby; and the branches of the trees being proportioned to the strength of the roots at that season, all the ascending sap in the spring will be employed to nourish only those useful parts of the branches which are left; whereas, if they are left unpruned till February, the sap in the branches being then in motion, as may be observed by the swelling of the buds, the greatest part of it will be drawn up to the extreme parts of the branches, to nourish such blossoms as must be afterwards cut off; and this may be easily known by observing the strongest shoots at that season, when you will find the extreme buds to swell faster than most of the lower ones; for there being no leaves then upon the branches to detain the sap to nourish the lower buds, the upper ones will always draw from those below.

But it is a constant practice amongst gardeners, founded upon long experience, to prune weak trees early in the winter, and luxuriant trees late in the spring, in order to check their luxuriancy. Now it is evident, that this check does not proceed from any considerable loss of sap at the wounds of the pruned tree (excepting a few of the bleeding trees, when cut at that season) but must arise from some other cause; for by several experiments made by the Rev. Dr. Hales, in fixing mercurial gages to the stems of fresh cut trees, he found those wounds were constantly in an imbibing state, except the Vine in the bleeding season.

Therefore when a weak tree is pruned early in the beginning of winter, the orifices of the sap-vessels are closed up long before the spring; and consequently, when in the spring and summer, the warm weather advancing, the attracting force of the perspiring leaves is not then weakened by many inlets from fresh wounds, but is wholly exerted in drawing sap from the root; whereas, on the other hand, when a luxuriant tree is pruned late in the spring, the force of its leaves to attract sap from the root, will be much spent and lost at the several fresh cut inlets.

Besides, if it were no advantage to the trees to prune them at this season, (which I think no one will have reason to doubt after making the trial) but that it only succeeds as well as the spring pruning; yet there is a great advantage in doing it at Michaelmas, for that being a much more leisure season with gardeners than the spring, they will have more time to perform it carefully; and then they will not have too many things come together, which may require to be immediately executed; for the spring being the principal season for cropping their kitchen-gardens and attending their hot-beds, if they are disengaged from the business of pruning at that time, it will be of great advantage, especially where there is a great quantity of walling. And here is also another benefit in pruning at this season, which is, the having the borders at liberty to dig and make clean before the spring, so that the garden may not appear in a litter at that season.

Having said thus much concerning the time of pruning, I shall now proceed to give some general directions how it is to be performed on Peach and Nectarine-trees, which require a very different management from most other sorts of fruits.

In pruning these trees, you should always observe where branches are shortened, to cut them behind a wood-bud, which may be easily distinguished from the blossom-buds, which are shorter, rounder, and more turgid than the wood-buds; for if the shoot have not a leading bud where it is cut, it is very apt to die down to the next leading bud; so that what fruit may be produced above that, will come to nothing, there being always a necessity of a leading bud to attract the nourishment; for it is not sufficient to have a leaf-bud, as some have imagined, since that will attract but a small quantity of nourishment, the great use of the leaves being to perspire away such crude juices as are unfit to enter the fruit. The length you should leave these branches, should be proportioned to the strength of the tree, which, in a healthy strong tree, may be left ten or twelve inches, or more; but in a weak one, they should not be more than six inches; however, in this you must be guided by the position of a leading bud; for it is better to leave a shoot three or four inches longer, or to cut it two or three inches shorter than might be proper to do, provided there be one of these buds, it being absolutely necessary for the future welfare of the tree;

you

you ſhould alſo cut out entirely all weak ſhoots, tho' they may have many bloſſom-buds upon them; for theſe have not ſtrength enough to nouriſh the fruit, but they will weaken the other parts of the tree.

In nailing the ſhoots to the wall, you muſt be careful to place them at as equal diſtances as poſſible, that their leaves, when come out, may have room to grow without ſhading the branches too much; and you ſhould never nail them upright if it can be avoided; for when they are thus trained, they are very ſubject to ſhoot from the uppermoſt eyes, and the lower part of the ſhoots will thereby become naked.

There is not any thing in the buſineſs of gardening, which has more exerciſed the thoughts of the curious, than how to preſerve their tender ſorts of fruit from being blighted in the ſpring of the year, and yet there has been little written upon this ſubject which is worth notice: ſome have propoſed mattreſſes of ſtraw or Reeds to be placed before the fruit-trees againſt walls, to prevent their being blaſted; others have directed the fixing horizontal ſhelters in their walls, to prevent the perpendicular dew or rain from falling upon the bloſſoms of the fruit-trees, which they ſuppoſed to be the chief cauſe of their blighting; but both theſe contrivances have been far from anſwering the expectations of thoſe perſons who have put them in practice, as I have elſewhere ſhewn; therefore it may not be improper to repeat ſome things in this place, which I have before mentioned in relation to this matter. And

Firſt, I have already ſaid, that the blights which are ſo often complained of, do not ſo often proceed from any external cauſe, or inclemency in the ſeaſon, as from a diſtemper or weakneſs in the trees; for if we obſerve the trees at that ſeaſon, where they are the moſt ſubject to what is called a blight, we ſhall find the branches very ſmall, weak, and not half ripened, as alſo trained in very cloſe to each other; theſe branches are, for the moſt part, full of bloſſom-buds (which is chiefly occaſioned by their want of ſtrength.) Theſe buds do indeed open, and to perſons not ſkilled in fruit-trees, ſhew a great proſpect of a plentiful crop of fruit; whereas the whole ſtrength of the branches is ſpent in nouriſhing the flowers, and being unable to do any more, the bloſſoms fall off, and the ſmall efforts of the leaf-buds are checked, ſo that many times great part of the branches die away, and this is called a great blight; whereas, at the ſame time it may be often obſerved, that ſome trees of a different ſort, nay, even ſome of the ſame ſort, were ſtronger and in health, though placed in the ſame ſoil, expoſed to the ſame aſpect, and ſubject to the ſame inclemency of air, have eſcaped very well, when the weak trees have appeared to be almoſt dead; which is a plain indication, that it proceeds from ſome cauſe within the tree, and not from any external blight. All this will therefore be remedied, by obſerving the foregoing directions in the pruning and management of the trees, ſo as never to over-burden them with branches, nor to ſuffer any particular part of the trees to exhauſt the whole nouriſhment from the root, which will cauſe the other parts to be very weak; but to diſtribute the nouriſhment equally to every ſhoot, that there may be none too vigorous, at the ſame time that others are too weak; and by continually rubbing off uſeleſs or fore-right ſhoots as they are produced, the ſtrength of the trees will not be ſpent, to nouriſh ſuch branches as muſt be afterwards cut out, which is too often ſeen in the management of theſe trees. And

Secondly, It ſometimes happens, that the roots of theſe trees are buried too deep in the ground, which, in a cold or moiſt ſoil is one of the greateſt diſadvantages that can attend theſe tender fruits; for the ſap which is contained in the branches, being by the warmth of the ſun, put ſtrongly into motion early in the ſpring, is exhauſted in nouriſhing the bloſſoms; and a part of it is perſpired through the wood-branches, ſo that its ſtrength is loſt before the warmth can reach to their roots, to put them into an equal motion in ſearch of freſh nouriſhment, to ſupply the expence of the branches; for want of which, the bloſſoms fall off and decay, and the ſhoots ſeem to be at a ſtand, until the farther advance of the warmth penetrates to the roots, and ſets them in motion; when ſuddenly after, the trees, which before looked weak and decaying, make prodigious progreſs in their ſhoots; and before the ſummer is ſpent, are furniſhed with much ſtronger branches than thoſe trees which have the full advantage of ſun and ſhowers, and are more fruitful and healthy; which muſt certainly be owing to the cauſe here mentioned, as alſo to their drawing in a great quantity of crude moiſture, which, though productive of wood, is yet unkindly for fruit: if therefore this be the caſe, there is no way of helping it, but by raiſing up the trees, if they are young; or if they are too old to remove, it is the better way to root them out and make new borders of freſh earth, and plant down young trees; for it is a great vexation to be at the trouble and expence of pruning and managing theſe trees, without having the pleaſure of reaping any advantage from them, which will always be the caſe where the trees are thus injudiciouſly planted. Or,

Thirdly, This may proceed from the trees wanting nouriſhment, which is many times the caſe, where they are planted in a hard gravelly ſoil, in which it is the common practice to dig borders three or four feet wide, and three feet deep into the rock of gravel, which is filled with good freſh earth, into which the trees are planted, where they will thrive pretty well for two years, until their roots reach the gravel, where they are confined as if planted in a pot; and for want of proper nouriſhment, the branches continually decay every year. This cannot be helped where the trees have been growing ſome years, without taking them entirely up, or by digging away the gravel from their roots, and adding a large quantity of freſh earth, that may afford them a ſupply of nouriſhment a few years longer; but trees ſo planted, cannot by any art be continued long in health.

But if the unfruitfulneſs of the trees does not proceed from any of the before-mentioned cauſes, and is the effect of unkindly ſeaſons, then the beſt method yet known is, in dry weather, when little dew falls, to ſprinkle the branches of the trees gently with water ſoon after the bloſſoming ſeaſon, and while the young-ſet fruit is tender, which ſhould always be done before noon, that the moiſture may evaporate before the night comes on; and if in the night you carefully cover the trees with mats, canvas, or ſome ſuch light covering, it will be of great ſervice to them: however, where the trees are ſtrong and vigorous, they are not ſo liable to ſuffer by a ſmall inclemency, as are thoſe which are weak, ſo that there will be few ſeaſons in which there may not be hopes of a moderate quantity of fruit from them, though there ſhould be no covering uſed; for where theſe coverings are uſed, if it is not performed with great care and diligence, it is much better to have no covering, but to truſt to the clemency of the ſeaſon; for if the coverings are kept too cloſe, or continued too long, the trees will receive more injury hereby, than from being conſtantly expoſed; or, if after having been covered for ſome time, and then incautiouſly removed, ſo as to expoſe the trees too ſuddenly to the open air, they will ſuffer more thereby than if they had not been covered. However, I muſt repeat in this place what has been before mentioned under another article, of a management which has been generally attended with ſucceſs, which is, the putting up two feather-edge deal boards joined together over the top of the trees, ſo as to form a pent-houſe to caſt off perpendicular wet. Theſe ſhould be fixed up when the trees begin to bloſſom, and ſhould remain till the fruit is well ſet, when they ſhould be taken down to admit the dew and rain to the leaves and branches of the trees, which muſt not be longer kept off; and where the wall is long, and expoſed to currents of wind, if at the diſtance of forty feet from each other, are fixed ſome croſs Reed-

hedges, to project about ten feet from the wall, these will break the force of the wind, and prevent its destroying of the blossoms; and these may be removed away as soon as the danger is over. Where these things have been practised, they were generally attended with success; and as there will be no trouble of covering and uncovering in this method, after they are fixed up, there can be no danger of neglect, as very often is the case, when the trouble is great, or to be often repeated.

When your fruit is set, and grown to the bigness of a small nut, you should look over the trees and thin them, leaving them at least five or six inches asunder; for when they are permitted to remain in bunches, as they are often produced, the nourishment which should be employed wholly to the fruits designed to stand, will be equally spent amongst the whole number, a great part of which must be afterwards pulled off; so that the sooner this is done, the better it will be for the remaining fruit; and if it should sometimes happen, that a part of those left, by any accident, should be destroyed, yet the remaining ones will be much the larger and better tasted for it, and the trees will gain more strength, for a moderate quantity of fruit is always preferable to a great crop; the fruit when but few, will be much larger, better tasted, and the trees in a condition to bear well the succeeding year; whereas when they are overcharged with fruit, it is always small, ill tasted, and the trees are generally so much weakened thereby, as not to be in a condition for bearing well for two or three years after; so that upon the whole, it is much better to have a lesser number of fruit than is commonly esteemed a crop, than to have too many, since the fruit and also the trees are benefited thereby. The quantity of fruit to be left on large full-grown trees should never be greater than five dozen upon each; but on middling trees, three or four dozen will be enough.

If the season should prove hot and dry, it will be proper to draw up the earth round the stem of each tree, to form a hollow bason of about six feet diameter, and cover the surface of the ground in this bason with mulch; and once in a week or fortnight, according to the heat and drought of the season, pour down eight or ten gallons of water to the root of each tree; or where there is an engine which will disperse the water in gentle easy drops like rain, if the same, or a larger quantity of water is sprinkled all over the branches of the trees, and this, soaking down to the roots, will keep the fruit constantly growing, which will prevent their falling off the trees, as they generally do where this method is not practised; and the fruit being thus constantly nourished, will be much better tasted, and hereby the trees will be maintained in vigour; so that it is what I can from long experience recommend, as one of the most necessary things to be practised by all lovers of good fruit. But this should not be continued longer than while the fruit are growing, for afterward it will be hurtful to the trees and fruit, for a dry autumn ripens both wood and fruit better than a moist later season.

When the Peach-trees are carefully managed in the spring of the year, according to the rules before laid down, all the nourishment which the roots can supply will be usefully employed in nourishing such shoots only as are to be continued, as also the quantity of fruit which is proper for each tree, therefore both must of consequence be rendered better; for where there is not this care, the trees soon grow ragged, and are not furnished properly with branches; and those shoots which are produced, are some of them very weak, and others very luxuriant, whereby the trees are rendered very unsightly, as also unhealthy, and never continues many years fruitful; and by thus training the branches to the wall as they are produced, the fruit will be always exposed to the sun and air; which in the common method of managing these trees, by letting their branches grow rude all the spring, they are deprived from, and consequently do not receive the benefit from these equal to those which are properly managed; and by the timely rubbing off useless and luxuriant shoots, it will save much trouble, and prevent the use of the knife in summer, which is very hurtful to these trees, for there will be no need to shorten any of the shoots in summer.

When these rules are duly executed, there will be no occasion to pull off the leaves of the trees, to admit the sun to the fruit, which is often practised; for if we consider, that the leaves are absolutely necessary to cherish the blossom-buds, which are always formed at the foot-stalks of the leaves, the pulling them off before they have performed the office assigned them by nature, is doing great injury to the trees, therefore I caution every one against that practice.

It is a common opinion which has for some years prevailed, even amongst persons of good understanding, that Peach-trees are not long lived, therefore should be renewed every twenty years; but this is a great mistake, for I have eaten some of the finest Peaches of various kinds, which grew on trees which had been planted above fifty years: and I am convinced by experience, that when the trees are budded upon proper stocks, and carefully planted and managed, they may be continued fruitful and healthy sixty years and upward; and the fruit produced on these old trees will be much better flavoured, than any of those upon young trees; but I suppose the foundation of the above opinion was taken from the French, who generally bud their Peaches upon Almond stocks, which are of short duration, these seldom lasting good more than twenty years; but this seldom being practised in England, the case is widely different; nor indeed should we fetch our examples from that nation, where the professors of the art of gardening are at least a century behind the English; and from their present disposition, seem unlikely to overtake them; for they depart from nature in almost every part of gardening, and are more pleased with introducing their little inventions of pruning and managing their fruit-trees, according to their own fancy, than they are careful to draw their instructions from nature, from whence the the true art is to be obtained; so that in very few instances gardeners should deviate from nature, unless it be in those particulars, where art may be practised to the greatest advantage, which is in the procuring many sorts of esculent plants and fruits earlier and better flavoured than can be obtained without, in which the French are extremely deficient; and herein they trust too much to nature, and use too little art.

In one of the most celebrated of their authors, who treats very particularly of fruit-trees, there are directions for planting of Peach-trees twelve feet asunder, and at the same time he advises the planting of Pear-trees but nine or ten feet distance; and yet he says, that a Pear-tree in health will shoot three feet on each side every year; therefore he does not allow room for these trees to grow more than two years, before they meet. There is also another thing positively laid down by the same author, which is, never to lay any dung upon the borders where fruit-trees are growing, which, he says, will render the fruit ill tasted; and this opinion has too generally prevailed in England; but this hath been exploded by one of his own countrymen, who affirms, that from upward of twenty years experience, those trees where the borders had been constantly dunged, always produced the most delicious fruit, and the trees were in the greatest vigour; and the same gentleman mentions the practice of the gardeners at Montreuil near Paris, who have for some generations been famous for the culture of Peaches; and are as careful to dung the borders where their Peach-trees grow every other year, as the kitchen-gardeners are for their legumes.

And from a long experience it is, that I can subscribe to the truth of this; for in some particular gardens, where the best fruit grew that I have yet tasted, the ground was constantly dunged every other year; therefore it is what I must recommend to the practice of every curious person, with this caution, always to use such dung for their borders as is well rotted, and to dig

dig it into the borders in November, that the rain may wash down the salts before the spring comes on; and where the ground is very loose or sandy, it will be the best way to make use of neats dung, which is cooler than that of horses, but for cold strong land the latter is to be preferred.

If the ground is well trenched every year about the roots, it will be of great service to them; and where the soil is subject to bind very close, if it is forked two or three times in a year to loosen the surface, it will greatly help the trees. The borders should not be crouded with any large growing plants, which will draw away the nourishment from the trees; therefore when any sort of kitchen herbs are planted on these borders, they should be only such as are of small growth, and which may be taken off early in the spring; and if this is carefully observed, the cultivating small things on these borders can do no harm, because the ground will be stirred the oftener, on account of these small crops, than perhaps it would have been, when no use was to be made of the borders. These rules which are here laid down, if properly observed, will direct any curious person how to have plenty of good fruit, as also to preserve the trees in vigour a great number of years.

PERVINCA. See VINCA.

PETALS are the fine coloured leaves which compose the most conspicuous parts of a flower; these are called in Latin Petala, to distinguish them from the leaves of plants, which are called Folia.

PETASITES. See TUSSILAGO.

PETIVERIA. Plum. Nov. Gen. 50. tab. 39. Lin. Gen. Plant. 417. Guinea Henweed.

The CHARACTERS are,

*The flower hath a permanent empalement, composed of five narrow obtuse leaves which are equal. It hath four small white petals, placed in form of a cross, which soon fall off, and six awl-shaped erect stamina terminated by single summits. In the center is situated an oblong compressed germen, with four awl-shaped styles, crowned by obtuse permanent stigmas. The germen afterward becomes one oblong seed, narrow at the bottom and taper, but broad above, where it is compressed and indented at the top, resembling an inverted shield armed with the acute style, which is reflexed.*

This genus of plants is ranged in the fourth section of Linnæus's sixth class, which includes those plants whose flowers have six stamina and four styles.

The SPECIES are,

1. PETIVERIA (*Alliacea*) floribus hexandris. Hort. Cliff. 141. *Petiveria with six stamina in the flowers.* Verbena aut scorodoniæ affinis anomala, flore albido calyce aspero, alii odore. Sloan. Hist. 1. p. 171. *commonly called Guinea Henweed.*

2. PETIVERIA (*Octandra*) floribus octandris. Lin. Sp. Plant. 486. *Petiveria with eight stamina in the flowers.* Petiveria solani foliis, loculis spinosis. Plum. Nov. Gen. 50.

The title of this genus was given to it by Father Plumier, who discovered it in America, in honour of Mr. James Petiver, an apothecary of London, who was a curious botanist.

The first is a very common plant in Jamaica, Barbadoes, and most of the other islands in the West-Indies, where it grows in shady woods, and all the savannas, in such plenty, as to become a troublesome weed; and as this plant will endure a great deal of drought, it remains green when other plants are burned up, which occasions the cattle to browze on it; and having a most unsavoury strong scent, somewhat like wild Garlick, it gives the cows milk the same flavour, and the cattle which are killed soon after feeding on this plant, have a most intolerable scent, and their flesh is good for little. The roots are strong, and strike deep in the ground; the stalks rise from two to three feet high; they are jointed and become ligneous at bottom, and are garnished with oblong leaves three inches long, and an inch and a half broad, of a deep green, and veined; these are placed alternately upon short foot-stalks. The flowers are produced in slender spikes at the end of the branches; they are very small, so make no figure. They appear in June, and are succeeded by short seed-vessels shaped like an inverted shield, containing one oblong seed which ripens in the autumn.

The second sort is very like the first, from which it differs in having a shorter and narrower stalk, and the flowers having eight stamina; but unless these marks are distinguished by a nice observer, they may both pass for one plant.

In Europe, these plants are preserved in the gardens of those persons who are curious in botany; but they have little beauty, and having so strong rank scent upon being handled, renders them less valuable. They are propagated by seeds, which must be sown on a hot-bed early in the spring, and when the plants are come up, they should be each transplanted into a separate pot, and plunged into a moderate hot-bed to bring them forward. When the plants have obtained a good share of strength, they should be inured to bear the open air by degrees, into which they may be removed toward the latter end of June, placing them in a warm situation, where they may remain till autumn, when they should be removed into the stove, and in winter must have a moderate degree of warmth, otherwise they will not live in this country. They will produce flowers and seeds every summer, and will continue several years, remaining constantly green throughout the year, and may be propagated by slips or cuttings.

PETREA. Houst. Gen. Nov. Lin. Gen. Plant. 682.

The CHARACTERS are,

*The flower hath a bell-shaped empalement of one leaf, cut into five large obtuse segments almost to the bottom, which are coloured, expanded and permanent. The flower hath one petal, having a short tube, but is cut above into five almost equal segments, which are expanded. It hath four short stamina situated in the tube, two of which are a little longer than the other, terminated by single summits, and four germen supporting a slender style, crowned by an obtuse stigma. The germen afterward become four seeds wrapped up in a fringed cover.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and the seeds are inclosed in a cover.

The title of this genus was given to this plant by the late Dr. Houstoun, who discovered it growing naturally at La Vera Cruz in New Spain, in honour of Lord Petre, who was a great encourager of botany, and was possessed of a noble collection of exotic plants.

We have but one SPECIES of this genus, viz.

PETREA (*Volubilis*) frutescens foliis lanceolatis rigidis, flore racemoso pendulo. *Shrubby Petrea with stiff spear-shaped leaves, and flowers growing in long hanging bunches.*

This plant was first discovered by the late Dr. Houstoun, growing naturally at La Vera Cruz in New-Spain, in 1731, since which time it was sent me from the island Berbuda, where it also grows naturally. It rises with a woody stalk to the height of fifteen or sixteen feet, which is covered with a light gray bark, sending out several long branches; these have a whiter bark than the stem, and are garnished with leaves at each joint, which on the lower part of the branches are placed by threes round them, but higher up they stand by pairs; they are about five inches long, and two inches and a half broad in the middle, drawing to a point at each end; they are stiff, and their surface rough, of a light green, having a strong dark midrib, with several transverse veins running from the midrib to the borders, which are entire. The flowers are produced at the end of the branches growing in loose bunches, which are nine or ten inches long, each flower standing upon a slender foot-stalk about an inch long; the empalement of the flower is composed of five narrow obtuse leaves about an inch long, which are of a fine blue colour, so are much more conspicuous than the petals, which are white,

white, and not more than half the length of the empalement. After the flower is past, the four germen in the center become so many oblong seeds wrapped up in a fringed cover.

The Doctor found a variety of this with blue petals, of the same bright colour with the empalement, which made a fine appearance, every branch being terminated by a long string of these flowers, so that he has ranked this among the first class of beautiful American trees.

So far as I have been able to discover from the dried samples which the Doctor brought to England, it appears that there are male and female flowers either on different parts of the same tree, or upon different trees; for one spike of flowers seems to be entirely male, and the other spikes are female, but the Doctor has not noticed this in his manuscript.

This is propagated by seeds, which must be obtained from the places where the trees grow naturally, and these are very few good; for, from the seeds which the Doctor sent to England, there were but two plants raised, though the seeds were distributed to several persons; and this is a sort of confirmation of the spikes of flowers being of different sexes, and that the seeds gathered by the Doctor, were taken either from trees at some distance from the male, or such parts of the same tree which were remote from the male flowers. The seeds must be sown in a good hot-bed, and when the plants come up, they should be each planted in a separate small pot filled with light loamy earth, and plunged into a hot-bed of tanners bark, and afterwards placed in the bark-bed in the stove, where they should constantly remain, and be treated like other plants of the same country.

PETROSELINUM. See Apium.

PEUCEDANUM. Tourn. Inst. R. H. 318. tab. 169. Lin. Gen. Plant. 302. Hogs-fennel, or Sulphur-wort.

The Characters are,

*It hath an umbelliferous flower. The principal umbel is composed of several long narrow umbels which spread open. The cover of the large umbel is composed of many linear reflexed leaves. The empalement of the flower is small and indented in five parts. The petals of the great umbel are uniform. Each flower is composed of five oblong incurved petals, which are equal and entire; they have each five hair-like stamina, terminated by single summits, with an oblong germen situated under the flower, supporting two small styles, crowned by obtuse stigmas. The germen afterward turns to an oval fruit channelled on each side, splitting in two parts, containing two seeds convex on one side, compressed on the other, with three raised furrows, and a broad membranaceous border indented at the top.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes the plants whose flowers have five stamina and two styles.

The Species are,

1. Peucedanum (*Officinale*) foliis quinquies tripartitis linearibus. Lin. Sp. Plant. 358. *Hogs-fennel with leaves which are divided by fives, and these are again divided into three linear segments.* Peucedanum Germanicum. C. B. P. 149. *German Hogs-fennel.*
2. Peucedanum (*Italicum*) foliis tripartitis filiformibus longioribus, umbellis difformibus. *Hogs-fennel with leaves cut into three parts, which are longer, slender, and have irregular umbels.* Peucedanum majus Italicum. C. B. P. 149. *Greater Italian Hogs-fennel.*
3. Peucedanum (*Alpestre*) foliolis linearibus ramosis. Hort. Cliff. 94. *Hogs-fennel with leaves branching, which are very slender.* Ferula foliis libanotidis brevioribus, alpestris, umbellis amplissimis. Boerh. Ind. alt. 1. p. 65.
4. Peucedanum (*Minus*) foliis pinnatis, foliolis pinnatifidis, laciniis linearibus oppositis, caule ramosissimo patulo. Flor. Angl. 101. *Hogs-fennel with winged leaves whose cuts are linear and opposite, with a spreading branching stalk.*
5. Peucedanum (*Nodosum*) foliolis alternatim multifidis. Hort. Cliff. 94. *Hogs-fennel with many-pointed leaves placed alternately.* Silaum (quod ligusticum Creticum, foliis fœniculi caule nodoso. Tourn. Cor. 23.)

The first sort is said to grow naturally in England, but I have not been lucky enough to find it, though I have searched the places where it is mentioned, but it grows in several parts of Germany in marshy meadows. This hath a perennial root, which divides into many strong fibres running deep in the ground, from which arise the foot-stalks of the leaves which are channelled; these are naked at bottom, but about four or five inches from the root branches into five smaller foot-stalks, and these again divide into three, and each of these divisions sustain three narrow leaves, which when bruised emit a strong scent like sulphur. The stalks rise near two feet high; they are channelled, and divide into two or three branches, each being terminated by a large regular umbel of yellow flowers, composed of several small umbels which are circular. These flowers appear in June, and are succeeded by compressed seeds, which are deeply furrowed, and ripen in the autumn.

The second sort grows naturally on the mountains, and also in the low valleys by the sides of rivers in Italy. The root of this is perennial, striking deep into the ground; the foot-stalks of the leaves are large and furrowed, dividing into three small branches, which are again divided into three, and these end with three long narrow lobes or small leaves, which are much longer than those of the other sort. The stalks which sustain the umbels rise near three feet high, and divide toward the top into several small branches, each sustaining an umbel composed of several smaller rays or umbels, which stand upon very long foot-stalks, that spread out irregularly. The flowers of this are yellow, and shaped like those of the former, but are much larger, as are also the seeds, but have the same form as the other. It flowers and perfects seeds about the same time as the former.

The third sort grows naturally in the forest of Fontainbleau, and some other parts of France; it hath a perennial root, from which come out leaves which branch into several divisions, that divide again into smaller; each of these smaller divisions are garnished with five short narrow leaves. The stalks are round, and not so deeply channelled as either of the former, sustaining a large umbel of yellow flowers shaped like those of the former sorts; the seeds are shorter, but of the same shape as those. It flowers in June, and the seeds ripen the beginning of September.

The fourth sort grows naturally on St. Vincent's rock near Bristol; this is a biennial plant, which perishes soon after it has perfected its seeds. The leaves of this sort are short and very narrow, spreading near the surface of the ground; the stalks rise near a foot high, but are branched almost from the bottom; these branches are almost horizontal, and are garnished with a few narrow short leaves of a lucid green. Each stalk is terminated by a small umbel of flowers, which are of an herbaceous yellow colour and small. These are succeeded by small channelled seeds.

The fifth sort grows naturally in Crete; it is not a plant of long duration in England, nor do the seeds ripen well here. The stalks rise a foot and a half high, having pretty large knots at the joints, from which arises a leaf cut into many divisions; the flowers terminate the stalks in umbels, and appear the beginning of July, and in warm seasons the seeds will ripen in the autumn.

The first sort stands in the list of medicinal plants, but is at present rarely used; the roots are the only part prescribed. It is accounted good to clear the lungs of tough viscid phlegm, and thereby to help old coughs and shortness of breath; it likewise opens obstructions of the liver and spleen, and helps the jaundice.

The other sorts are preserved in botanic gardens for the sake of variety; they are all propagated by seeds, which should be sown in the autumn soon after they are ripe, for those which are sown in the spring seldom

dom succeed, or if the plants come up, it is rarely before the following spring. When the plants come up, they must be kept clean from weeds, and the autumn following they may be transplanted where they are to remain; they love a moist soil and a shady situation, but will not thrive under the drip of trees. The roots of the three first sorts will continue several years, and every year produce flowers and seeds. The fourth sort will rarely ripen seeds in a garden, so that I have been obliged to procure them from the place where it grows naturally.

PHACA. Lin. Gen. Plant. 798. Astragaloides. Tourn. Inst. R. H. 399. tab. 223. Bastard Milk-vetch, or Astragaloides.

The Characters are,

*The flower hath a tubulous empalement of one leaf, which is cut into five small indentures at the brim. It is of the butterfly kind, having a large, oval, erect standard, with two oblong wings shorter than the standard, which are obtuse, and a short compressed obtuse keel. It hath ten stamina, nine of which are joined in one body, and the other stands separate, terminated by roundish rising summits. In the center is situated an oblong germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes an oblong swelling pod, whose upper suture is depressed toward the under, having one cell, containing several kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes those plants whose flowers have ten stamina joined in two bodies.

The Species are,

1. Phaca (*Bœtica*) caulescens erecta pilosa, leguminibus tereti-cymbriformibus. Lin. Sp. Plant. 755. *Phaca with a hairy upright stalk, and taper boat-shaped pods.* Astragaloides Lusitanica. Tourn. Inst. R. H. 399. *Portugal Bastard Milk-vetch.*
2. Phaca (*Alpina*) caulescens erecta glabra, leguminibus oblongis inflatis subpilosis. Lin. Sp. Plant. 1064. *Phaca with an upright smooth stalk, and oblong, swelling, hairy pods.* Astragaloides elatior erecta, viciæ foliis, floribus luteis, siliquis pendulis. Amman. Ruth. 148. *Taller upright Milk-vetch, with a Vetch leaf, yellow flowers, and pendulous pods.*

The roots of the first sort which grows naturally in Spain and Portugal, will abide many years, and run very deep into the ground, but the branches decay every autumn; these commonly rise near four feet high, and become ligneous. The flowers are produced in short spikes from the wings of the leaves, but unless the season proves very warm, they rarely flower in England, for which reason the plants are not much esteemed; for it is not once in seven years that the flowers arrive to perfection, nor do the plants ever produce seeds in England; so that the seeds must be procured from abroad, by those who are desirous to have the plants.

The second sort hath smooth stalks, which do not rise so high as the former; the flowers are smaller, the pods are much shorter, and hang downward.

Both these sorts are propagated by seeds; those of the first should be sown in the place where the plants are to remain; for as the roots strike very deep into the earth, so it is very difficult to transplant them with any safety, especially after they have remained any considerable time in the seed-bed. The plants should be left about six feet asunder, that there may be room to dig the ground between them every spring, which is all the culture they require, except the keeping them clean from weeds.

The second sort produces flowers in two years from seeds, and the seeds ripen well in England, but the roots rarely live longer than three or four years.

PHALANGIUM. See Anthericum.

PHALARIS. Lin. Gen. Plant. 74. Canary Grass.

The Characters are,

*It is one of the Grass tribe, with one flower inclosed in a calyx, having two valves, which is boat-shaped and compressed; the flower is less than the cup, the outer valve is oblong and twisted, the inner is smaller. It has three hair-like stamina, terminated by oblong summits; and a roundish germen supporting two hair-like styles, crowned by hairy stigmas; the seeds are inclosed by the petals of the flower, each containing one smooth seed pointed at each end.*

This genus of plants is ranged in the second section of Linnæus's third class, intitled Triandria Digynia, the flowers having three stamina and two styles.

The Species are,

1. Phalaris (*Canariensis*) panicula subovata spiciformi, carinatis glumis. Lin. Sp. Plant. 79. *Canary Grass with oval spike-shaped panicles, and boat-shaped chaff.* Phalaris major semine albo. C. B. P. 28. *Canary Grass with a white seed.*
2. Phalaris (*Arundinacea*) panicula oblonga ventricosa. Lin. Sp. Plant. 80. *Reed-like Canary Grass, with an oblong bellied panicle.* Gramen arundinaceum, acerosa gluma, Jerseianum. D. Sher.

There are several species of this genus which are never cultivated for use, therefore it would be to little purpose to enumerate them here.

The first sort is cultivated in some parts of England, particularly in the isle of Thanet in Kent, where this is esteemed as a profitable crop, and may be so to those who are situated where they have water carriage for the seed to the London markets, where is the general demand for this commodity. About London there is very little of it sown, and what is there cultivated is chiefly by some few curious persons, in small quantities, for their amusement. I have several years sown some of this seed by way of trial, but have never seen more than a few rods of ground sown with it, therefore cannot give so good an account of its culture as I could wish; however, I shall briefly give an account of the success I have had in those trials which I have made on this plant.

The first experiment I made was by sowing of the seed in broad cast all over the ground, and as the land was very poor, I sowed the seeds too thick, which is the common fault of farmers in general; the seeds grew well, but the months of May and June proving wet, the plants grew tall, and having weak tender stalks, a heavy rain which fell the beginning of August laid it flat on the ground, and many succeeding showers which happened after kept it down, so that the whole crop was lost.

The following year I sowed a spot of ground with this seed in rows at a foot distance, but the seeds were sown too thick in the drills, so that the plants were drawn up so weak, that great part of these were lodged by wet in the month of August; but many of the outside plants in the drills, whose stalks were much stronger than those of the other, remained upright, so produced a good quantity of seeds which ripened well. This put me on making a farther trial of this plant; accordingly I sowed the seeds thin, in drills made a foot asunder, and when the plants came up, where they were too close I thinned them, so as to leave them near two inches distance in the rows; and the season proving favourable, the plants sent out many stalks from the roots, which were strong, so able to bear up till the seed was perfectly ripened; and by hoeing the ground three times in the intervals, the weeds were destroyed, and the ground kept clean; the crop also was so plentiful, as to assure me that the culture of this plant would answer well to the farmer, provided a sufficient quantity of seed was demanded; but as there is but a moderate sale for the seeds, and that being chiefly in London, so the culture of this plant would not answer to those who are situated at a distance from the metropolis, or who had not water carriage for the seeds thither.

From several trials since made, I find that three gallons of the seed is sufficient to sow an acre of land; and if the seed is sown by a hopper, whose spring is properly set, to let out the seed at equal distance, it will be the best method of cultivating it; and keeping the ground clean from weeds, will not only improve the crop, but also be of great advantage to the future crops.

When the seed is ripe it should be immediately cut, otherwise a good quantity will soon shed out; and if it is turned two or three times to dry, according to the favourableness of the season, it will be fit to thrash out the seed, and the sooner that is done, the less loss there will be of the seed.

PHASEOLOIDES. See GLYCINE.

PHASEOLUS. Tourn. Inst. R. H. 412. tab. 232. Lin. Gen. Plant. 777. [takes its name of φάσηλος, an oblong swift ship, because the husk of this plant resembles a ship.] Kidney-bean; in French, *Haricot.*

The CHARACTERS are,

*The empalement of the flower is of one leaf, having two lips; the upper lip is indented at the top, and the under one is divided in three parts. The flower is of the butterfly kind; it hath a heart-shaped, obtuse, inclined standard, reflexed on the sides; the wings are oval, the length of the standard, and a narrow spiral keel twisted contrary to the sun. It hath ten stamina, nine joined in one body, and the other standing separate, which are spiral within the empalement, terminated by single summits, and an oblong, compressed, hairy germen, supporting a slender, inflexed, spiral style, crowned by an obtuse hairy stigma. The germen afterward becomes a long pod with a thick shell, ending in an obtuse point, inclosing oblong, compressed, kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which contains those plants whose flowers have ten stamina joined in two bodies; he has divided the plants which were formerly included in this genus into two genera, one of which he calls Dolichos, and the other Phaseolus; the latter differs from the former, in having the parts of generation in the flowers spirally twisted.

It would be to little purpose to enumerate all the varieties of this plant which have come to our knowledge in this place, since America does annually furnish us with so many new sorts, as that there is no knowing what varieties there may be produced in different countries: besides, as they are not likely to be much cultivated here, since some of the old sorts are preferable to any of the new, for the use of the kitchen-garden, therefore I shall only first mention a few sorts which are cultivated for their flowers, or as curiosities, and then mention those which are most esteemed for the table.

The SPECIES are,

1. PHASEOLUS (*Alatus*) volubilis, floribus laxè spicatis, alis longitudine vexillo. Lin. Sp. Plant. 1017. *Kidney-bean with a twining stalk, and flowers growing in loose spikes, whose wings are as long as the standard.* Phaseolus flore purpureo, alis amplis longè protensis. Hort. Elth. 314. tab. 235. *Kidney-bean with a purple flower, having large wings which are stretched out to a great length.*

2. PHASEOLUS (*Caracalla*) volubilis, vexillis carinâque spiraliter convolutis. Lin. Sp. Plant. 1017. *Kidney-bean with a twining stalk, whose standard and keel are spirally twisted.* Phaseolus Indicus cochleato flore. Triumf. Obs. 93. *Indian Kidney-bean with a snail-shaped flower, commonly called Caracalla in Portugal.*

3. PHASEOLUS (*Vexillatus*) volubilis, vexillis revolutis patulis leguminibus linearibus strictis. Lin. Sp. Plant. 1017. *Kidney-bean with a twining stalk, a spreading standard which is twisted backward, and narrow close pods.* Phaseolus flore odorato, vexillo amplo patulo. Hort. Elth. 313. *Kidney-bean with a sweet flower, having a large spreading standard.*

4. PHALEOLUS (*Farinosus*) volubilis pedunculis subcapitatis, seminibus tetragono-cylindricis pulverilentis. Hort. Upsal. 214. *Kidney-bean with a twining stalk, foot-stalks ending in flowers growing in heads, and four-cornered cylindrical dust-coloured seeds.* Phaseolus peregrinus, flore roseo, semine tomentoso. Nissol. Act. Par. 1730. *Foreign Kidney-bean with a Rose-coloured flower and downy seeds.*

5. PHASEOLUS (*Vulgaris*) volubilis, floribus racemosis geminis, bracteis calyce minoribus, leguminibus pendulis. Lin. Sp. Plant. 724. *Kidney-bean with a twining stalk, branching flowers growing by pairs, bracteæ which are shorter than the empalement, and hanging pods.* Phaseolus Indicus, flore coccineo sive puniceo. Mor. Hist. 2. p. 69. *Indian Kidney-bean with a scarlet or purple flower, commonly called the Scarlet-bean.*

6. PHASEOLUS (*Coccineus*) volubilis, floribus racemosis, siliquis brevibus pubescentibus. *Kidney-bean with a twining stalk, flowers growing in long bunches, and short hairy pods.* Phaseolus florum spicâ pyramidatâ, semine coccineo nigrâ maculâ notatâ. Plum. Cat. 12. *Kidney-bean with flowers growing in a pyramidal spike, and scarlet seeds which are marked with black.*

The first sort is an annual plant; the seeds of this were brought from Carolina, where it grows naturally. The stalks of this twine about any support like the common Kidney-bean; they are hairy, and rise four or five feet high; the leaves are shaped like those of the common Kidney-bean, but are narrower. The flowers are produced in loose spikes, standing upon long foot-stalks; they are large and of a purple colour, turning to a blue before they fade. These appear in July, and if the autumn proves warm, they will be succeeded by narrow long pods, containing small oval seeds which ripen in October.

The seeds of this sort should be sown on a warm border about the latter end of April, and when the plants begin to run up, they must be supported either with sticks, or fastened to a hedge or wall, to prevent their trailing on the ground, and constantly kept clean from weeds. If they are close to a wall or hedge exposed to a good aspect, they will ripen their seeds in England, otherwise they frequently fail in bad seasons.

The second sort grows naturally in the Brazils, from whence the seeds were brought to Europe. This is a perennial plant with twining stalks, which rise to the height of twelve or fourteen feet; the leaves are shaped like those of the common Kidney-bean, but are smaller. The flowers are produced in slender spikes; they are of a purplish colour, and have an agreeable odour; these are succeeded by slender pods which are compressed, containing several oval compressed seeds. This is propagated by seeds, which should be sown in a moderate hot-bed in the spring; and when the plants come up, they must be carefully transplanted into pots filled with light fresh earth, and must be plunged into a hot-bed to facilitate their taking root; after which they should be inured to bear the open air by degrees, into which they should be removed the end of June or beginning of July, placing them in a sheltered situation; and as they advance in their growth, and fill the pots with their roots, they should be removed into larger pots, which must be filled with fresh light earth.

During the summer season they must be frequently refreshed with water; but in winter they must be removed into the green-house, and should have but little water during that season. These plants when young, are tender, but after the first winter they will require only to be screened from frost, but must have open free air whenever the weather will permit, otherwise the leaves will grow mouldy, and decay the tender shoots. This plant produces its flowers in July and August, but seldom perfects its seeds in England. It is very common in Portugal, where the inhabitants plant it to cover arbours and seats in gardens, for which it is greatly esteemed by the inhabitants of that country, for its beautiful sweet smelling flowers, and in that country it thrives very well in the open air.

The third sort grows natutally in America, and is preserved in some curious gardens for variety, but is a plant of no great beauty; this may be propagated by sowing the seeds in the spring upon a hot-bed, and when the plants come up, they must be planted in pots, and treated as the former sort. It produces its flowers in July, and the seeds ripen in September.

The fourth sort was brought from America, and is preserved in curious gardens for the sake of its long flowering. This is an abiding plant, and should be managed as was directed for the third sort; but this requires

requires a stove to preserve it through the winter in England.

The fifth sort has been long cultivated in the English gardens for the beauty of its scarlet flowers; this hath twining stalks, which, if properly supported, will rise to the height of twelve or fourteen feet; the leaves are smaller than those of the common Kidney-bean. The flowers grow in large spikes, and are much larger than those of the common Kidney-bean, and of a deep scarlet colour; the pods are large and rough, and the seeds are purple marked with black. This sort requires no other treatment than the common sort, but the stalks should have tall stakes put down by them to twine round, otherwise they will fall on the ground, which will soon cause them to rot.

Although this sort is chiefly cultivated for the beauty of its flowers at present, yet I would recommend it as the best sort for the table; and whoever will make trial of this, I dare say must prefer it to all the other kinds yet known.

The fifth sort grows naturally in the warmest part of America, so will not thrive in England out of a stove; and as the chief beauty of it is in the seeds, which are half scarlet and the other half black, so these may be procured from abroad better than raised here.

I shall now mention those sorts of Kidney-beans which are cultivated in the English gardens to supply the table, which are few in comparison of the number already known, though these are not many of them valuable, and are only cultivated because they require less care, or will come a little forwarder in the season, for they are inferior in taste to the others; however, as there are some persons who esteem them for their qualities before-mentioned, so I shall put them down in the order of their ripening for use.

The three sorts which are usually cultivated for early crops, are the small white Dwarf, the Dwarf black, which is called the Negro-bean, and the Liver Colour Bean. The stalks of these are never very long, so may be planted much nearer together than the larger growing kinds, and they require but little support; so these are planted on hot-beds under frames, or in pots which are placed in stoves, to come early in the spring, for which purpose they are better adapted than any of the other; but they are not to be compared with some of the others for goodness; but as they may be had at a time when the others cannot be so well obtained, so they are generally cultivated in the gardens; and where there are not the convenience of stoves or frames for raising them very early, they are planted in warm borders near hedges, walls, or pales, where they will be fit for use a fortnight earlier than the other sorts.

The next to these are the Battersea and Canterbury Kidney-beans; these do not ramble far, and produce their flowers near the root, so bear plentifully for some time: the Battersea Bean is the forwarder of the two, but the other will continue bearing much longer; they are both better flavoured than either of the three former sorts, but when they begin to be large are very stringy and tough.

There are two or three sorts of Kidney-beans cultivated with erect stalks, which want no support, as they do not put out any twining stalks; these are much cultivated by the gardeners for that reason, as also for their producing a great plenty of pods; but they are inferior in goodness to all the other, especially that sort with black and white seeds, whose pods have a rank flavour, and, when boiled, become soft and meally; so this should never be propagated by persons of taste.

The best sorts for the table are the scarlet Blossom-bean before-mentioned, and a white Bean of the same size and shape, which appears to be only a variety of the scarlet, as it differs in no other respect but the colour of the flowers and seeds, being equal in size and flavour. And next to these is the large Dutch Kidney-bean, which grows as tall as either of these, so must be supported by stakes, otherwise their stalks will trail upon the ground and spoil. The sort with scarlet flowers is preferable to this in goodness, and is also hardier; and although it will not come so early as some of the dwarf kinds, yet as it will continue bearing till the frost puts a stop to it in the autumn, so it is much preferable to either of them; for the pods of this sort when old, are seldom stringy, and have a better flavour than the young pods of those sorts, and will boil greener; and where this is sown in the same situation and soil as the Battersea-bean, it will not be a fortnight later.

All the sorts of Kidney-beans are propagated by seeds, which are too tender to be sown in the open air before the middle of April; for if the weather should be cold and wet after they are in the ground, they will soon rot; or if the morning frosts should happen after the plants come up, they will be destroyed; therefore the best way to have early Kidney-beans, where there is no conveniency of frames for raising them, is to sow the seeds in rows pretty close upon a moderate hot-bed, the latter end of March, or the beginning of April. If the heat of the bed is sufficient to bring up the plants, it will be enough; this bed should be arched over with hoops, that it may be covered with mats every night, or in bad weather. In this bed the plants may stand till they have put out their trifoliate leaves, then they should be carefully taken up, and transplanted in warm borders near hedges, pales or walls. If the season proves dry at the time of removing them, the plants should be gently watered to forward their taking new root, and afterward they must be managed in the same way as those which are sown in the full ground. These transplanted Beans will not grow so strong as those which are not removed, nor will they continue so long in bearing, but they will come at least a fortnight earlier than those which are sown in the full ground.

The first crop intended for the full ground, should be put in about the middle of April; but these should have a warm situation and a dry soil, otherwise the seeds will rot in the ground; or if the weather should prove so favourable as to bring up the plants, yet there will be danger of their being killed by morning frosts, which frequently happen the beginning of May.

The second crop, which should be one of the three large sorts last mentioned, should be sown about the middle of May. These will come into bearing before the early kinds are over, and if they are of the scarlet sort, will continue fruitful till the frost destroys the plants in the autumn, and these will be good as long as they last. The manner of planting them is to draw shallow furrows with a hoe, at about three feet and a half distance from each other, into which you should drop the seeds about two inches asunder; then with the head of a rake draw the earth over them, so as to cover them about an inch deep.

If the season is favourable, the plants will begin to appear in about a week's time after sowing, and soon after will raise their heads upright; therefore, when the stems are advanced above ground, you should gently draw a little earth up to them, observing to do it when the ground is dry, which will preserve them from being injured by sharp winds; but you should be careful not to draw any of the earth over their seed-leaves, which would rot them, or at least greatly retard their growth. After this, they will require no farther care but to stick them when the plants begin to run, and to keep them clear from weeds until they produce fruit, when they should be carefully gathered two or three times a week; for if they are permitted to remain upon the plants a little too long, the Beans will be too large for eating, and the plants would be greatly weakened thereby.

The large sorts of Kidney-bean must be planted at a greater distance, row from row; for as these grow very tall, so if the rows are not at a greater distance, the sun and air will be excluded from the middle rows, therefore these should not be less than four feet distance row from row; and when the plants are about four inces high, the stakes should be thrust into the ground

ground by the side of the plants, to which they will fasten themselves, and climb to the height of eight or ten feet, and bear plenty of fruit from the ground upward. The Dutch and French preserve great quantities of the large Dutch Beans for winter use, which they stew, and make good with gravy and other sauces.

There are some persons who raise these in hot-beds, in order to have them early. The only care to be taken in the management of these plants when thus raised, is to allow them room, and give them as much air as can be conveniently when the weather is mild, as also to let them have but a moderate heat; for if the bed is over hot, they will either burn or be drawn up so weak as seldom to come to good.

The manner of making the hot-bed being the same as for Cucumbers, &c. need not be repeated in this place; but only observe, when the dung is equally levelled, to lay the earth about four or five inches thick, and let the great steam of the bed pass off before you sow the seeds. The time for doing this must be proportioned to the season when you would have the Beans for the table, but the surest time for a crop is about a week in February.

The manner of saving the seeds of these plants, is to let a few rows of them remain ungathered in the height of the season; for if you gather from the plants for some time, and afterwards leave the remaining for seed, their pods will not be near so long and handsome, nor will the seed be so good. In autumn, when you find they are ripe, you should in a dry season pull up the plants, and spread them abroad to dry; after which you may thresh out the seed, and preserve it in a dry place for use.

PHELLANDRIUM, Water Hemlock.

There are two species of this genus at present known; one of which grows naturally in standing waters and deep ditches in several parts of England, the other is found on the Alps; but as neither are cultivated, so I shall not trouble the reader with any farther account of them.

PHILADELPHUS. Lin. Gen. Plant. 540. Syringa. Tourn. Inst. R. H. 617. tab. 389. Syringa, Pipe-tree, or Mock-orange.

The Characters are,

*It hath a permanent empalement of one leaf, cut into five acute parts sitting upon the germen. It hath four or five roundish plain petals which spread open, and twenty or more awl-shaped stamina inserted to the empalement, terminated by erect summits with four furrows. The germen is situated under the flower, supporting a slender style divided in four parts, each being crowned by a single stigma. The germen afterward becomes an oval acute-pointed capsule having four cells, which are filled with small oblong seeds.*

This genus of plants is ranged in the first section of Linnæus's twelfth class, which includes those plants whose flowers have about twenty stamina, which are fixed either to the petals or empalement of the flower.

The Species are,

1. Philadelphus (*Coronarius*) foliis subdentatis. Lin. Sp. 671. *Philadelphia with indented leaves.* Syringa alba, sive Philadelphus Athenæi. C. B. P. *White Syringa, or Mock-orange.*
2. Philadelphus (*Nanus*) foliis ovatis subdentatis, flore solitario pleno. *Syringa or Mock-orange, with oval leaves which are somewhat indented, and double flowers standing singly on the sides of the branches.* Syringa nana nunquam florens. Cat. Hort. Angl. *Dwarf Syringa which seldom flowers.*
3. Philadelphus (*Inodorus*) foliis integerrimis. Lin. Sp. Plant. 672. *Philadelphus with entire leaves.* Philadelphus flore albo majore inodoro. Catesb. Carol. 1. p. 84. tab. 84. *Syringa with a larger white flower having no scent.*

The first sort has been long cultivated in the English gardens as a flowering shrub, but the place where it naturally grows is uncertain. This sends up a great number of slender stalks from the root, having a gray bark, sending out several short branches from their side, garnished with oval spear-shaped leaves; those upon the young shoots are three inches and a half long, and two broad in the middle, lessening toward both ends, and terminating in acute points, having several indentures on their edges, their surface rough, and of a deep green on their upper side, but pale on their under, and have the taste of fresh Cucumbers; these stand opposite upon very short foot-stalks. The flowers come out from the side, and at the end of the branches, in loose bunches, each standing on a short distinct foot-stalk; they have four oval petals which spread open, with a great number of stamina within, surrounding the style. The flowers are white, and have a strong scent, which at some distance resembles that of Orange-flowers, but when near is too powerful for most persons. These appear the latter end of May, and continue great part of June, but are seldom succeeded by seeds which ripen in this country. This shrub rises seven or eight feet high.

There is a variety of this with variegated leaves, which some people preserve in their gardens; but as the stripes generally disappear when the plants are in health, so it makes little appearance.

The second sort is of humble growth, seldom rising above three feet high; the leaves are shorter than those of the former, and approach near to an oval form; they are but little indented on their edges. The flowers come out singly from the side of the branches, and have a double or treble row of petals, of the same size and form as the other, and the flowers have the same scent; but this sort flowers very rarely, so is not much esteemed.

Both these are extreme hardy, and will thrive in almost any soil or situation, but will grow taller in light good ground than in that which is stiff. They are usually propagated by suckers, which are sent out from their roots in great plenty; these should be taken from the old plants in autumn, and planted in a nursery to grow one or two years till they have obtained strength, and then they should be transplanted to the place where they are designed to remain. They are commonly disposed in wilderness work, among other shrubs of the same growth, where they add to the variety.

The third sort grows naturally in Carolina, and is as yet very rare in Europe. This rises with a shrubby stalk about sixteen feet high, sending out slender branches from the sides opposite, garnished with smooth leaves shaped like those of the Pear-tree, which are entire, standing also opposite on pretty long foot-stalks. The flowers are produced at the end of the branches; they are large, each having four oval petals which spread open, and have large empalements, composed of four acute-pointed leaves. The petals are white, and within these stand a great number of short stamina, terminated by yellow summits. The flowers are succeeded by oval capsules, filled with small seeds.

This shrub is very rare in England, for it rarely will rise from seeds; I have sown the seeds, which were sent me by the late Dr. Dale from Carolina, two or three times without any success, and others have done the same, which occasions its present scarcity in England; but when the plants are procured from abroad, they may be propagated by laying down their branches. I had one of the shrubs which was sent me by the gentleman before-mentioned, which had thriven in the Chelsea Garden near two years; and some of the branches which were laid down had put out roots, but they were all destroyed by cold in the winter, 1740.

PHILLYREA. Tourn. Inst. R. H. 596. tab. 367. Lin. Gen. Plant. 16. Phillyrea, or Mock Privet; in French, *Filaria*.

The Characters are,

*The flower has a small permanent empalement of one leaf, cut into five segments at the brim. It has one petal, with a very short tube cut into five parts, which turn backward, and two short stamina standing opposite, terminated by single erect summits. It has a roundish germen, supporting*

*supporting a slender style the length of the stamina, crowned by a thick stigma. The germen afterward turns to a globular berry with one cell, inclosing one large roundish seed.*

This genus of plants is ranged in the first section of Linnæus's second class, which contains those plants whose flowers have two stamina and one style.

The Species are,

1. Phillyrea (*Latifolia*) foliis ovato-lanceolatis integerrimis. *Phillyrea with oval, spear-shaped, entire leaves.* Phillyrea latifolia lævis. C. B. P. 476. *Broad-leaved smooth Phillyrea, commonly called the true Phillyrea.*
2. Phillyrea (*Media*) foliis ovatis subintegerrimis. Lin. Sp. 10. *Phillyrea with oval leaves, which are almost entire.* Phillyrea folio leviter serrato. C. B. P. *Phillyrea with a leaf lightly sawed, called broad-leaved Phillyrea.*
3. Phillyrea (*Spinosa*) foliis cordato-ovatis serratis. Hort. Cliff. 4. *Phillyrea with oval heart-shaped leaves, which are sawed.* Phillyrea latifolia spinosa. C. B. P. 476. *Broad-leaved prickly Phillyrea.*
4. Phillyrea (*Ligustrifolia*) foliis lanceolatis integerrimis. Hort. Cliff. 4. *Phillyrea with spear-shaped entire leaves.* Phillyrea folio ligustri. C. B. P. 476. *Privet-leaved Phillyrea.*
5. Phillyrea (*Oleæfolia*) foliis lanceolato-ovatis integerrimis, floribus confertis axillaribus. *Phillyrea with spear-shaped, oval, entire leaves, and flowers growing in clusters from the sides of the branches.* Phillyrea olæ Ephesiacæ folio. Pluk. Alm. 295. Phyt. tab. 310. fig. 3. *Olive-leaved Phillyrea.*
6. Phillyrea (*Angustifolia*) foliis lineari-lanceolatis integerrimis, floribus confertis axillaribus. *Phillyrea with narrow, spear-shaped, entire leaves, and flowers growing in clusters from the sides of the branches.* Phillyrea angustifolia prima. C. B. P. 476. *First narrow-leaved Phillyrea.*
7. Phillyrea (*Rosmarinifolia*) foliis linearibus integerrimis. *Phillyrea with very narrow entire leaves.* Phillyrea angustifolia secunda. C. B. P. 476. *Second narrow-leaved Phillyrea, commonly called Rosemary-leaved Phillyrea.*

The first sort here mentioned is the most common in the English gardens, where it is known by the title of true Phillyrea; so called, to distinguish it from the Alaternus, which is called simply Phillyrea by the gardeners. This rises with a strong upright stem to the height of eighteen or twenty feet, dividing into several branches, covered with a smooth grayish bark, and garnished with oval spear-shaped leaves placed opposite, which are entire, firm, and of a light green, about an inch and a half long, and an inch broad, standing upon short foot-stalks. The flowers come out from the wings of the stalk on each side; they are of an herbaceous white colour, and grow in small clusters. These appear in March, but as they are small make no great appearance; they are succeeded by globular berries with one cell, inclosing a single seed of the same form.

The second sort rises to an equal height with the first, but the branches are more diffused, and have a darker bark; the leaves are oval, and of a darker green; they are more than two inches long, and almost an inch and a half broad, a little sawed on their edges, placed opposite, and have short foot-stalks. The flowers come out from the wings of the branches, growing in long bunches; they are of an herbaceous white colour, appear about the same time as the former, and are succeeded by berries of the same form.

The third sort rises with an upright stem as high as the two former, sending out several strong branches which grow erect, covered with a gray bark, and garnished with oval heart-shaped leaves, about an inch and a half long, and one inch broad; they are firm, of a lucid green, and sawed on their edges, each serrature ending in a spine. The flowers and seeds of this are like those of the two former sorts.

The fourth sort is of humbler growth than either of the former, seldom rising more than eight or ten feet high; the branches are weaker, and spread wider, and are covered with a light brown bark, and garnished with stiff spear-shaped leaves almost two inches long, and half an inch broad in the middle, drawing to a point at both ends; they are of a light green, and sit close to the branches opposite. The flowers are produced in small clusters at the wings of the branches; they are small, and whiter than those of the former, appearing about the same time, and are succeeded by small berries which ripen in autumn.

The fifth sort rises about the same height as the fourth; the branches are stronger, and spread out wider; the bark is of a lighter colour; the leaves are stiff, smooth, and entire, standing opposite on very short foot-stalks; they are of a lucid green, and terminate in a point. The flowers come out in clusters upon pretty long foot-stalks, at the wings of the young branches; they are small, white, and appear at the same time with the other sorts, and have round berries succeeding them, which ripen in autumn.

The sixth sort rises with a woody stalk ten or twelve feet high, sending out branches opposite, which are covered with a brown bark spotted with white, garnished with smooth, stiff, narrow, spear-shaped leaves, which are entire, sitting close to the branches; they are about an inch and a half long, and half an inch broad in the middle, drawing to a point at both ends, of a light green, and point upward. The flowers come out in large clusters at each joint of the branches, to which they sit close like the whorled flowers, almost surrounding the stalk; these are small, white, and appear at the same time as the former, and are succeeded by small berries, which ripen in autumn.

The seventh sort is of humbler growth than either of the former, seldom rising more than four or five feet high, sending out slender branches opposite, which are sparsedly disposed; the leaves are of a dark green, stiff, and entire; they are about an inch long, and not more than one eighth of an inch broad, sitting close to the branches. The flowers are small, white, and grow in clusters from the side of the branches. The berries of this sort are very small, and rarely ripen in England.

These plants all grow naturally in the south of France, Spain, and Italy, but are hardy enough to thrive in the open air in England, and are never injured except the winters are very severe, which sometimes causes their leaves to fall, and kills a few of the weaker branches, but these are repaired by new shoots the following summer; so that there are but few of the evergreen-trees which are hardier than these, or that deserve more to be cultivated for pleasure.

Formerly these were either planted against walls, to which they were trained to cover them; or if they were placed as standards, their branches were sheared either into balls or pyramids, like most of the evergreen-trees; so that when the former old taste of laying out gardens was exploded, the evergreens were generally banished; and for some years there were but few sorts cultivated, whereby several valuable kinds of evergreen-trees were almost entirely lost in England, and have been with difficulty retrieved since; for in the manner which the evergreen-trees and shrubs are now disposed in gardens, they have a very fine effect, especially during the winter season, when the other trees are destitute of leaves.

There are some other sorts mentioned to grow naturally in Spain and Italy, but those here mentioned are all that I have seen growing in the English gardens; and several of these have been supposed only accidental varieties, which have been produced from seeds; but I am more inclined to believe they are specifically different, for I have raised most of these from seeds which were sent me from Italy, where the sorts were carefully gathered distinct, and have never yet found them vary from the kinds the seeds were taken; so that I imagine those seeds from which two or three kinds have been raised, were gathered from different plants without care.

The three first sorts are very proper to intermix with other evergreen-trees of the same growth, to form

clumps in parks, or to plant round the borders of woods, which are filled with deciduous trees, where in the summer time, the dark shade of these evergreens will make a fine contrast with the brighter green leaves of the deciduous trees; and in winter, when the latter are destitute of leaves, they will have a fine effect, and will be a fine harbour for birds. These may be trained up to stems, so as to be out of the reach of cattle, therefore may be planted in open places, where, if they are fenced against cattle till they are grown up, they may be afterwards exposed.

The other sorts, which are of humbler growth, must be confined to gardens or other inclosures, where they may be secured from cattle, hares, rabbets, &c. otherwise they will be soon destroyed.

These plants are propagated either from seeds or layers, but the latter being the most expeditious method in England, is chiefly preferred. The best time to lay them down is in autumn, when you should dig the ground round the stems of the plants intended to be layed, making it very loose; then making choice of a smooth part of the shoot, you should make a slit upward (in the manner as is practised in laying of Carnations) and then bend the branch gently down to the ground, making a hollow place with your hand to receive it; and having placed the part which was slit into the gronnd, so as that the slit may be open, you should fasten it down with a forked stick that it may remain steady, covering that part of the branch with earth about three inches thick, observing to keep the upper part erect. You must keep them clear from weeds the spring and summer following, which, if suffered to grow up amongst them, will prevent their taking root.

The autumn following most of these plants will be rooted, at which time they may be taken off, and carefully planted in a nursery, where they may be trained up three or four years in the manner you intend them to grow; during which time you should dig the ground between the rows, and cut about the roots of the plants every year, which will cause them to strike out strong fibres, so as to support a good ball of earth when they are removed; you should also support their stems with stakes, in order to make them strait, otherwise they are very apt to grow crooked and unsightly.

When the plants have been thus managed three or four years, you may transplant them into the places where they are designed to remain. The best time for this work is the latter end of September, or the beginning of October; but in removing them, you should dig round their roots, and cut off all downright or strong roots, which have shot out to a great distance, that you may the better preserve a ball of earth to each plant, otherwise they are subject to miscarry; and when you have placed them in their new quarters, you should lay some mulch upon the surface of the ground to prevent its drying. You should also support the plants with stakes, until they have taken fast hold of the earth, to prevent their being turned out of the ground, or displaced by the winds, which will destroy the fibres that were newly put out, and greatly injure the plants. These trees delight in a middling soil, which is neither too wet and stiff, nor too dry, though the latter is to be preferred to the former, provided it be fresh.

Those sorts with small leaves are commonly two years before they take root when laid, therefore they should not be disturbed, for the raising them out of the ground greatly retards their rooting.

If these plants are propagated by seeds, they should be sown in the autumn soon after they are ripe, for when they are kept out of the ground till spring, they do not grow the first year. The seeds will do best if they are sown in pots or boxes filled with light loamy earth, and placed under a garden frame where they may be screened from hard frost, but always exposed to the open air in mild weather. If the seeds are sown early in the autumn, the plants will appear in the spring; but if they should not come up, the pots should be plunged into the ground in an east border, where they may only have the morning sun, in which situation they should remain the following summer; during which time they may be constantly kept clean from weeds, and in the autumn removed again under a frame for shelter in winter, and the spring following the plants will certainly come up, if the seeds were good. Toward the middle of April, the pots should be again plunged into the ground on an east border, to prevent the air from drying the earth through the pots, which is generally the case when the pots stand upon the ground; so that they must then be frequently watered, which should not be practised to these plants where it can be avoided. The Michaelmas following the plants should be carefully taken out of the pots, and planted in a nursery-bed, covering the surface with old tan to keep out the frost; and if the winter prove severe, they should be covered with mats, afterward they may be treated as the layers.

PHILLYREA OF THE CAPE. See MAUROCENA.

PHLOMIS. Tourn. Inst. R. H. 177. tab. 82. Lin. Gen. Plant. 642. [φλομὶς, so called of φλέγω, to burn, because in old time the peasants used to burn these plants to enlighten their chambers.] The Sage-tree, or Jerusalem Sage.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, having an oblong tube with five angles. It hath one petal, and is of the lip kind; the tube is oblong; the upper lip is oval, forked, and inflexed; the under is cut into three segments, the middle one being large and obtuse. It hath four stamina hid under the upper lip, two being longer than the other, terminated by oblong summits, and a germen divided into four parts, supporting a style the length of the stamina, crowned by an acute bifid stigma. The germen afterward become four oblong cornered seeds sitting in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which contains the plants whose flowers have two short and two longer stamina, and the seeds sit naked in the empalement.

The SPECIES are,

1. PHLOMIS (*Fruticosa*) foliis subrotundis tomentosis crenatis, involucris lanceolatis caule fruticoso. Lin. Sp. 818. *Phlomis with roundish, woolly, crenated leaves, and a shrubby stalk.* Phlomis fruticosa, salviæ folio latiore & rotundiore. Tourn. Inst. 177. *Shrubby Jerusalem Sage, with a broader and rounder Sage leaf.*
2. PHLOMIS (*Angustifolia*) foliis ovato-lanceolatis tomentosis integerrimis, caule fruticoso. *Phlomis with oval, spear-shaped, woolly leaves which are entire, and a shrubby stalk.* Phlomis fruticosa, salviæ folio longiore & angustiore. Tourn. Inst. 177. *Shrubby Jerusalem Sage, with a longer and narrower Sage leaf.*
3. PHLOMIS (*Latifolia*) foliis oblongo-ovatis petiolatis tomentosis, floribus capitatis, caule fruticoso. *Phlomis with oblong, oval, woolly leaves having foot-stalks, flowers growing in large heads, and a shrubby stalk.* Phlomis latifolia, capitata, lutea, grandiflora. Hort. Elth. 316. *Broad-leaved Jerusalem Sage, with large yellow flowers growing in heads.*
4. PHLOMIS (*Herba Venti*) involucris setaceis hispidis, foliis ovato-oblongis scabris, caule herbacea. Hort. Upsal. 171. *Phlomis with bristly prickly involucrums, oblong, oval, rough leaves, and an herbaceous stalk.* Phlomis Narbonensis, hormini folio, flore purpurascente. Tourn. Inst. R. H. 178. *Jerusalem Sage of Narbonne, with a Clary leaf and a purplish flower.*
5. PHLOMIS (*Tuberosa*) involucris hispidis subulatis, foliis cordatis scabris, caule herbacea. Hort. Upsal. 171. *Phlomis with awl-shaped prickly involucrums, rough heart-shaped leaves, and an herbaceous stalk.* Phlomis urticæ folio glabro. Amman. Ruth. 40. *Jerusalem Sage with a smooth Nettle leaf.*
6. PHLOMIS (*Lychnitis*) foliis lanceolatis tomentosis, floralibus ovatis, involucris setaceis lanatis. Lin. Sp. Plant. 585. *Phlomis with spear-shaped woolly leaves, those under the flowers oval, and bristly woolly involucrums.*

*crums.* Phlomis lychnitis. Cluf. Hift. 27. *Narrow-leaved Jerufalem Sage.*

7. Phlomis (*Purpurea*) foliis ovato-lanceolatis crenatis, fubtus tomentofis, involucris fetaceis. *Phlomis with oval fpear-fhaped leaves, which are woolly on their under fide, and have a briftly involucrum.* Phlomis fruticofa Lufitanica, flore purpurafcente, foliis acutioribus. Tourn. Inft. 178. *Shrubby Portugal Phlomis with a purplifh flower, and acute-pointed leaves.*

8. Phlomis (*Samia*) foliis cordatis acutis fubtus tomentofis, involucris ftrictis tripartitis. *Phlomis with acute-pointed heart-fhaped leaves, which are woolly on their under fide, and the covers of the flowers divided into three parts.* Phlomis Samia herbacea, folio lunariæ. Tourn. Cor. 10. *Herbaceous Samian Jerufalem Sage, with a Moon-wort-leaf.*

9. Phlomis (*Orientalis*) foliis cordatis rugofis fubtus tomentofis, involucris lanatis, caule herbaceo. *Phlomis with rough heart-fhaped leaves, which are woolly on their under fide, woolly covers to the flowers, and an herbaceous ftalk.* Phlomis orientalis lutea herbacea latifolia, verticillata. Phil. Tranf. vol. 34. *Yellow, herbaceous, eaftern Jerufalem Sage, having a broad leaf, and flowers growing in whorls.*

10. Phlomis (*Flavefcenta*) foliis lanceolatis crenatis fubtus tomentofis, involucris lanatis, caule fruticofo. *Phlomis with fpear-fhaped crenated leaves, which are woolly on their under fide, woolly covers to the flowers, and a fhrubby ftalk.* Phlomis anguftifolia lutea, cymis flavefcentibus. Sherard. Phil. Tranf. N° 376. *Yellow narrow-leaved Jerufalem Sage, with yellowifh tops.*

11. Phlomis (*Nifolii*) foliis radicalibus cordatis utrinque tomentofis villofis. Lin. Sp. Plant. 585. *Phlomis whofe lower leaves are heart-fhaped, woolly, and hairy on every fide.* Phlomis orientalis, foliis auriculatis incanis, flore luteo. Niffol. *Eaftern Jerufalem Sage, with hoary eared leaves, and a yellow flower.*

12. Phlomis (*Ferruginea*) involucris lanceolatis, foliis cordatis fubtus tomentofis, caule fuffruticofo. *Phlomis with fpear-fhaped involucrums, heart-fhaped leaves which are woolly, and a fhrubby ftalk.* Phlomis Hifpanica, fruticofa, candidiffima, flore ferrugineo. Tourn. Inft. 178. *Whiteft, fhrubby, Spanifh Jerufalem Sage, with an iron-coloured flower.*

13. Phlomis (*Rotundifolia*) involucris fubulatis, foliis cordato-ovatis fubtus tomentofis, caule fruticofo. *Phlomis with awl-fhaped involucrums, oval heart-fhaped leaves which are woolly on their under fide, and a fhrubby ftalk.* Phlomis fruticofa, flore purpureo, foliis rotundioribus. Tourn. Inft. 178. *Shrubby Jerufalem Sage with a purple flower, and rounder leaves.*

14. Phlomis (*Laciniata*) foliis alternatim pinnatis, foliolis laciniatis, calycibus lanatis. Lin. Sp. Plant. 585. *Phlomis with leaves alternately winged, whofe lobes are cut, and having woolly empalements to the flowers.* Phlomis orientalis foliis laciniatis. Tourn. Cor. 10. *Eaftern Jerufalem Sage with jagged leaves.*

The firft fort grows naturally in Spain and Sicily; this hath a pretty thick fhrubby ftalk, covered with a loofe bark rifing five or fix feet high, dividing into many irregular branches, which are four-cornered and woolly when young, but afterward become ligneous. Their joints are pretty far afunder; at each of thefe are placed two roundifh leaves oppofite, on fhort foot-ftalks; they are woolly on their under fide. The flowers come out in thick whorls round the ftalks; they are yellow, and have two lips; the upper lip is forked, bending over the under, which is divided into three parts; the middle is broad, and ftretched out beyond the two fmall fide fegments. The flowers appear in June, July, and Auguft, but are very rarely fucceeded by feeds here.

The fecond fort hath a fhrubby ftalk like the firft, but does not rife fo high. The branches are weaker; the leaves are fpear-fhaped and oval, being longer, narrower, and rounder at both points than the former; the whorls of flowers are fmaller, but the flowers are of the fame fhape and colour. It flowers about the fame time as the former.

Thefe two forts have been long propagated in the Englifh gardens by the title of Sage-tree, or Jerufalem Sage. The plants were formerly kept in pots, and houfed in winter with other exotic plants; but of late years they have been planted in the open air, where they are feldom injured by cold, unlefs in very fevere winters; fo they are intermixed with other fhrubs of the fame growth in quarters of wildernefs-work, where they add to the variety; for as they retain their hoary woolly leaves all the year, they make a good appearance in winter; and their yellow flowers, which continue great part of the fummer, being intermixed with their hoary leaves, have a good effect.

Thefe plants fhould have a dry foil and a warm fheltered fituation, otherwife they wlll not live in the open air. They may be planted among Ciftufes of all the different kinds, the fhrubby Moon-trefoil, evergreen Cytifus, Wormwood-tree, and fome other exotic fhrubs of the fame countries, which require a warm fituation and a dry foil, being too tender for open plantations which are expofed to ftrong cold winds; and as they are not of long duration, they are better when feparated from trees and fhrubs which continue many years; for thefe rarely live above twelve or fourteen years in dry ground, and not more than half fo long in cold moift land, or where they are not well fheltered.

They are propagated by cuttings, which if planted in a bed of light earth in April, juft before the plants begin to fhoot, and covered with mats to fcreen them from the fun every day, as alfo to obferve when the ground is dry to give them water gently, they will get good roots in about two months or ten weeks, when they may be carefully taken up, and tranfplanted into a nurfery, where they may remain one year, and then be tranfplanted to the places where they are defigned to ftand, for thefe plants will not bear tranfplanting at a greater age.

The third fort hath a fhrubby ftalk like the former, but much lower, feldom rifing more than three feet and a half high, fending out branches on every fide, which are garnifhed with broader hoary leaves than either of the former; thefe are of an oblong oval form, and have pretty long foot-ftalks; they are whiter than thofe of the former. The flowers grow in large whorls or heads, which generally terminate the branches; they are larger than thofe of the other forts, and the upper lip is very hairy. Thefe appear about the fame time as thofe of the other forts. The plants are equally hardy, and may be propagated by cuttings in the fame way as is before directed for them.

The fourth fort grows naturally in the fouth of France and in Italy; this hath a perennial root, and an annual ftalk which rifes about two feet high, and decays in the autumn. When the roots are large, they fend up a great number of fquare ftalks, which are covered with a hairy down, and garnifhed with oblong, oval, rough leaves placed oppofite, fitting clofe to the ftalks. The flowers grow in whorls round the ftalks, having ftinging briftly covers; they are of a bright purple colour, fo make a pretty appearance. They appear at the fame time with the former, but are rarely fucceeded by feeds in England.

This may be propagated by parting the roots; the beft time for doing this is in the autumn, when the ftalks begin to decay, that they may get root before the froft comes on; but they fhould not be parted oftener than every third or fourth year, if they are expected to have many flowers. This fort is hardy, fo may be planted in expofed places, but it fhould not be planted in moift ground.

The fifth fort grows naturally in Tartary; this hath a perennial root. The ftalks are purple, have four corners, and rife five or fix feet high, garnifhed with heart-fhaped leaves placed oppofite; they are fix inches long, and three broad at their bafe, but terminate in acute points, and are deeply crenated on their edges. The flowers grow in whorls round the ftalks; their covers are awl-fhaped, and are fet with ftinging hairs; they are of a pale purple colour and hairy. Thefe appear

pear in June and July, and are succeeded by seeds which ripen in September; soon after which the stalks decay, but the roots will abide many years. It is propagated by seeds, which should be sown upon an east border in the spring, and when the plants come up, they must be kept clean from weeds the following summer, and in the autumn they should be transplanted where they are to remain; the following summer they will produce flowers and seeds. This sort is very hardy, so will thrive in almost any soil or situation.

The sixth sort grows naturally in the south of France, in Spain and Italy; the root is perennial, and the stalk annual. This sends out long, narrow, woolly leaves from the roots in tufts, which are inveloped at their base by a common covering; they are soft to the touch, and lie upon the ground. The stalks are slender, and near two feet long; their joints are far asunder; at each of these stand two oval leaves opposite, which embrace the stalk with their base. The whorls of flowers are also encompassed by these leaves, and within them is situated a radiated bristly involucrum, which covers the flowers, which are yellow, and shaped like those of the other sorts. These appear in July, but are rarely succeeded by seeds in England. The stalks decay in the autumn, but the lower leaves remain all the year. It may be propagated by slips in the spring, and the plants require a dry soil and a warm situation.

The seventh sort grows naturally in Portugal and Spain. This hath a shrubby stalk which rises four or five feet high, sending out slender branches, which have four angles covered with a white bark, garnished with oval spear-shaped leaves about four inches long, and an inch and a half broad at their base; they are crenated on their edges, and woolly on their under side, standing upon very short foot-stalks. The flowers come out in whorls at each joint; they have bristly involucrums, and are of a deep purple colour. This flowers in June and July, but does not ripen seeds in England. It may be propagated by cuttings in the same way as the three first sorts, and the plants require the same treatment.

The eighth sort was discovered by the late Dr. Tournefort in the Levant, where it grows naturally; this hath a perennial root and an annual stalk. The leaves of this are heart-shaped; those at the root are three inches long, and an inch and a half broad at their base, ending in acute points; they are downy on their under side, and have five strong veins. The stalks rise a foot and a half high, and are garnished at each joint with two leaves placed opposite, of the same form as the lower, but smaller. The flowers grow in whorls round the stalks; they are of a worn-out purple colour; their involucrums are cut into segments, and are closely shut. This never produces seeds here, and the roots increase very slowly, so that now it is very rare in Europe; for before the severe winter in 1740, these plants had lived abroad in warm borders upward of twenty years, so that there were none of the plants kept in pots, and that year they were almost all destroyed in England.

The seeds of the ninth sort were sent from Smyrna by the late Consul Sherard to the Chelsea Garden, where the plants were raised; this hath a perennial root and an annual stalk. The lower leaves are near three inches long, and an inch and a half broad, standing upon long woolly foot-stalks; they are rough on their upper side, but woolly on their under, and are heart-shaped and entire. The stalks, which rise a foot high, are very downy; the flowers grow in whorls round the stalks; they have very long tubulous empalements covered with down; they are very large, and of a bright yellow, so make a good appearance. It flowers the latter end of June, and in July, but never ripens seeds in England. This sort hath survived many winters in the open air in the Chelsea Garden, but in the year 1740 they were all destroyed.

The seeds of the tenth sort were also sent from Smyrna by the same gentleman, and several of the plants were raised in the Chelsea Garden. This hath shrubby stalks which rise about three feet high, and are covered with a yellowish down, sending out many slender irregular branches, garnished with narrow spear-shaped leaves, which are covered with a yellowish down on their under side. The flowers are produced in heads at the end of the branches; their involucrums are very downy; the flowers are smaller than those of either of the first sorts, and are of a dirty yellow colour. This approaches near to the second sort, but the leaves are much smaller, the branches are slenderer, and are covered with a yellow down, especially toward the end of the branches. The whorls of flowers are not near so large, and are generally produced at the end of the branches.

This sort may be propagated by cuttings in the same way as the three first sorts, and the plants may be treated in the like manner, with this difference only, of planting them in a warmer situation, for it will not bear so much cold, though in a warm border the plants have lived several years abroad in the Chelsea Garden.

The eleventh sort grows naturally in the Archipelago, and also in Spain, from both which countries I have received the seeds. This plant hath an annual stalk, but the root is perennial, as are also the lower leaves, which do not arise from the root immediately, but stand in clusters upon short, trailing, woolly branches; they have very long downy foot-stalks, and are placed without order; they are heart-shaped, and downy on both sides, about four inches long, and two broad toward their base. The stalks are slender, and rise a foot high, garnished with oval spear-shaped leaves, which gradually decrease in size to the top, where they are not half an inch long. These stalks generally send out two side branches opposite, near the bottom, and from this division to the top are garnished with thin whorls of yellow flowers, which are not closely joined together as in the other species, but each flower stands separate. Their empalements are oval, very downy, and closely shut up. The flowers appear in June and July, but there are seldom any seeds produced in England. This sort may be propagated by slips in the same manner as the sixth sort, and the plants should be treated in the like way.

The twelfth sort grows naturally in Spain and Portugal; this hath an almost shrubby stalk, which is a little ligneous, and rises about two feet and a half high, covered with a thick white down. There are many of the stalks which arise from the same root, garnished with heart-shaped leaves about two inches long, and one broad toward their base; and from the lower part of the stalks, at each joint, there are two short shoots come out opposite, which have four or six small leaves of the same shape with the others, and are covered with a very white down. The flowers are produced in small whorls toward the upper part of the stalk; they have downy spear-shaped involucrums; the flowers are short, and of an iron colour. They appear in June and July, but the plants produce no seeds in England.

This sort multiplies by its spreading roots, so that they may be divided every other year; the best time for doing this is about the middle of September, that the offsets may get root before the frost comes on; but there should be some mulch laid about their roots to prevent the frost from penetrating the ground. It may be also propagated by cuttings in the same way as the three first sorts, during the spring and summer months. The plants require the same treatment as the tenth sort, for they are not so hardy as the three first sorts; therefore, if there is some tanners bark, or other mulch laid upon the surface of the ground about their roots every winter, it will be a means of preserving the roots; so that if a severe winter should kill the stalks, the roots will put out new ones the spring following.

The thirteenth sort grows naturally in Spain and Portugal. This rises with several shrubby stalks from three to four feet high, which divide into several four-cornered

cornered branches covered with a woolly down, and garnished with leaves which on the lower part of the stalks are heart-shaped, but upward they are of an oval spear-shape, and woolly on their under side; they stand opposite upon short foot-stalks. The flowers come out in whorls round the stalks; they have awl-shaped involucrums ending in acute points, and covered with down; the flowers are of a bright purple colour, and appear in June, but are not succeeded by seeds in this country. This sort is propagated by cuttings in the same way as the three first sorts, and the plants should be treated in the like manner as hath been before directed for the tenth sort.

The fourteenth sort was discovered by Dr. Tournefort in the Levant, from whence he sent the seeds to the Royal Garden at Paris, where they succeeded. This sort hath a perennial root and an annual stalk which decays in the autumn, but the lower leaves continue all the year; these are alternately winged, and the small lobes are cut on their edges. The stalks rise a foot and a half high, garnished with leaves of the same shape with the lower, but are smaller. The flowers come out in whorls round the stalks, like those of the other sorts, whose empalements are downy; they are of a worn-out purple colour, and appear in June, but the seeds do not ripen here.

It is propagated by offsets from the root in the same way as the eighth sort, but these are sent out sparingly also, and the plants require the same treatment as those of the eighth sort. It is at present very rare in England, for the severe frost in the year 1740 destroyed all the plants in England, many of which had survived all the winters for twenty years before in the open air.

All the species of this genus are ornamental plants when properly disposed in gardens, so deserve a place there, for there is generally a succession of flowers on them for two or three months, and their hoary downy leaves, when intermixed with plants whose leaves are green, make a pretty contrast.

The leaves of the two first sorts have been greatly recommended by some persons to be used as tea for sore throats.

**PHLOX.** Lin. Gen. Plant. 197. Lychnidea. Dill. Hort. Elth. 166. Lychnidea, or Bastard Lychnis.

The Characters are,

*The flower has a cylindrical empalement of one leaf, which is permanent, and hath five acute indentures at the top. It has one funnel-shaped petal, with a cylindrical tube narrow at the base, where it is incurved, and plain at the top, and is cut into five equal roundish segments which spread open. It hath five short stamina situated within the tube, two of which are longer than the tube, terminated by summits in the chaps of the flower. It hath a conical germen, supporting a slender style the length of the stamina, crowned by an acute trifid stigma. The germen afterward turns to an oval capsule with three cells sitting in the empalement, each cell containing a single seed.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style; but were it not for the number of stamina, it would be better placed among the ringent plants in the second section of his fourteenth class, the structure of the flower being the same with those there ranged.

The Species are,

1. Phlox (*Glaberrima*) foliis lineari-lanceolatis glabris acuminatis, caule erecto ramoso, corymbo terminali. Lin. Sp. 217. *Phlox with smooth, narrow, spear-shaped leaves ending in acute points, and upright branching stalks terminated by flowers, which grow in a corymbus.* Lychnidea Virginiana, holostei ampliore folio, floribus umbellatis purpureis. Rand. Phil. Transf. vol. 34. *Virginia Bastard Lychnis with a larger Stitch-wort leaf, and purple flowers growing in umbels.*
2. Phlox (*Carolina*) foliis lanceolatis lævibus, caule scabro corymbus subfastigiatis. Lin. Sp. 216. *Phlox with smooth spear-shaped leaves, and upright stalks terminated by flowers growing in a corymbus.* Lychnidea Caroliniana, floribus quasi umbellatim dispositis, foliis lucidis crassis acutis. Martyn. Dec. 1. *Bastard Lychnis of Carolina, with flowers disposed as it were in an umbel, and thick, shining, acute leaves.*
3. Phlox (*Maculata*) foliis lanceolatis lævibus, racemoso opposite corymboso. Lin. Sp. Plant. 216. *Phlox with spear-shaped leaves which are smooth, and branching opposite flowers.* Lychnoides Marylandica, foliis binis oppositis basi & auriculis caulem utrinque amplexicaulibus. Raii Supp. 459. *Maryland Bastard Lychnis with leaves growing opposite, whose base embraces the stalks on both sides.*
4. Phlox (*Divaricata*) foliis lato-lanceolatis, superioribus alternis, caule bifido pedunculis geminis. Lin. Sp. Plant. 217. *Phlox with broad spear-shaped leaves placed alternately at the top, and a branching stalk.* Lychnidea Virginiana, alsines aquaticæ foliis, floribus in ramulis divaricatis. Pluk. Mant. 121. *Bastard Lychnis of Virginia with Water Chickweed leaves, and flower-branches diverging from each other.*
5. Phlox (*Paniculatis*) foliis lanceolatis margine scabris, corymbis paniculatis. Lin. Sp. Plant. 216. *Phlox with spear-shaped leaves having rough borders, and flowers disposed in a compound corymbus.* Lychnidea Virginiana, umbellata maxima, Lysimachiæ luteæ foliis amplioribus, binis ex adverso positis. Pluk. Mant. 121. *Bastard Lychnis of Virginia with the largest umbel, and large yellow Loosestrife leaves placed opposite by pairs.*
6. Phlox (*Pilosa*) foliis lanceolatis villosis, caule erecto, corymbo terminali. Lin. Sp. Plant. 216. *Phlox with hairy spear-shaped leaves, and an upright stalk terminated by a corymbus of flowers.* Lychnoides Marylandica, calycibus lanuginosis, foliis angustis acutis. Raii Supp. 490. *Bastard Lychnis of Maryland, with woolly empalements to the flowers, and narrow acute-pointed leaves.*
7. Phlox (*Ovata*) foliis ovatis, floribus solitariis. Lin. Sp. Plant. 152. *Phlox with oval leaves and solitary flowers.* Lychnidea fistulosa Marylandica, clinopodii vulgaris folio, flore amplo singulari. Pluk. Mant. 122. *Fistulous Bastard Lychnis of Maryland, with a Field Basil leaf, and large flowers growing singly.*

The first sort grows naturally in Virginia, and in some other parts of North America, but has been several years pretty common in the English gardens. This hath a perennial root, which sends up several stalks, in number proportionable to the size of the roots; these rise near a foot and a half high, and divide into three or four small branches toward the top, which are terminated by a corymbus of flowers. The leaves on the lower part of the stalks are placed opposite, and are about three inches long, and near half an inch broad at their base, ending in long acute points; they are smooth, and set close to the stalks; the leaves on the upper part of the stalks are placed alternate. The flowers grow on the top of the stalks in a sort of corymbus, or rather in form of an umbel, many of them arising from the same point, standing on short foot-stalks; their empalements are tubulous, and have ten angles or furrows, and are cut at the top into five acute segments; the tube of the flower is twice the length of the empalement, and is divided at the top into five roundish segments which spread open; these are of a light purple colour, and appear in June, but unless the season proves warm, they are not succeeded by seeds in England.

The second sort grows naturally in Carolina; this hath a perennial root, from which arise several rough stalks near two feet high, garnished with stiff shining leaves placed opposite, sitting close to the stalks; they are spear-shaped, entire, and their edges are reflexed; the upper part of the stalk has generally two slender side branches, and is terminated by a head of flowers, which grow in whorls round the stalks; but the whorls are so nearly placed, as to appear one corymbus at some distance. The empalement of the flower is short, and deeply cut into five acute segments; the tube of the flower is long, and at the top is cut into five roundish segments, which spread open. These flowers are of a deeper purple colour than those of the former, and are a fortnight later before they appear.

The third sort grows naturally in Maryland; this hath a perennial root, from which arise several upright stalks of a purplish colour, closely covered with white spots; these grow about three feet high, and are garnished with heart spear-shaped leaves which are smooth, about three inches long and one broad at their base, ending in acute points. Toward the upper part of the stalks are sent out small branches opposite, each being terminated by a small bunch of flowers; but the principal stalk is terminated by a long loose spike of flowers, composed of small bunches arising from the wings of the stalk at each joint, each cluster having one common foot-stalk near an inch long, but the simple foot-stalks of the flowers are short; the flowers are of a bright purple colour, and appear late in July; so that if the season is temperate, or the soil in which they grow moist, they will continue in beauty great part of August, but are rarely succeeded by seeds in England.

The fourth sort grows naturally in North America; this has a perennial root, from which arise several slender stalks, which are apt to incline to the ground if they are not supported; these divide into several small branches, which spread from each other; the lower part of the stalks are garnished with broad spear-shaped leaves placed alternate, sitting close to the stalks, and on the smaller branches they are narrower, and placed opposite. The flowers grow in loose bunches at the end of the branches; they have short empalements, which are cut into five, narrow, acute segments; the tube of the flower is long and slender, the segments at the top are broad and heart-shaped, inverted. They are of a light blue, and appear the latter end of May or the beginning of June, but are rarely succeeded by seeds in England.

The fifth sort grows naturally in North America; this hath a perennial root and an annual stalk, which is smooth, of a light green, and rises about two feet high, sending out a few side branches, garnished with spear-shaped leaves placed opposite, near three inches long and one broad at the middle, drawing to a point at each end, sitting close to the stalks; they are of a dark green, and their edges are a little rough. The flowers are disposed in a corymbus at the top of the stalks, composed of many smaller bunches of flowers, which have each a distinct foot-stalk, and support a great number of flowers, which stand upon short slender foot-stalks; the empalement of the flower is short, and cut almost to the bottom into five narrow acute segments; the tube of the flower is long and slender, and is cut at the top into five oval segments which spread open. The flowers are of a pale purple colour, and appear late in July, but these are often succeeded by seeds which ripen in autumn.

The sixth sort grows naturally in Virginia; this hath a perennial root, from which arise a few stalks about a foot high, garnished with narrow spear-shaped leaves, ending in acute points, sitting close to the stalks, and are a little hairy. The flowers are produced in a loose corymbus at the top of the stalk; their empalements are cut into acute segments almost to the bottom; the tube of the flower is slender and pretty long, and is cut at the top into into five oval segments, which spread open. The flowers are of a light purple colour, and appear the latter end of June, but are seldom succeeded by seeds in England.

The seventh sort grows naturally in Maryland, and other parts of North America. This hath a perennial root, from which comes out two or three slender stalks about nine inches high, garnished with oval, rough, hairy leaves, an inch and a half long, and about three quarters of an inch broad in the middle; they are placed opposite upon very short foot stalks. The flowers come out singly at the top of the stalk; they have very slender tubes, but are cut into five roundish segments, which spread open. They are of a light purple colour, and appear in July, but are not succeeded by seeds in England.

These plants are hardy, so will thrive in the open air in England; they delight in a moist rich soil, not too stiff, in which they will grow tall, and produce much larger bunches of flowers than in dry ground; for when the soil is poor and dry, they frequently die in summer, unless they are duly watered.

They are generally propagated by parting their roots, because they do not often produce seeds in England. The best time for this is in autumn, when their stalks begin to decay. These roots should not be divided into small heads, if they are expected to flower well the following summer; nor should they be parted oftener than every other year, because when they are often removed and parted, it will greatly weaken the roots, so that they will send out but few stalks, and those will be so weak as not to rise their usual height, and the bunches of flowers will be much smaller.

When the roots are transplanted and parted, it will be a good way to lay some old tan, or other mulch, upon the surface of the ground about their roots, to prevent the frost from penetrating the ground; for as they will have put out new fibres before winter, so the frost when it is severe often kills the fibres, whereby the plants suffer greatly, and are sometimes destroyed.

The first, second, and fifth sorts, propagate pretty fast by their spreading roots, but the others increase but slowly this way, therefore the best method to propagate them is by cuttings; and if the three first sorts are desired in plenty, they may be easily obtained by this method. The best time to plant the cuttings, is about the latter end of April or the beginning of May, when the shoots from the roots are about two inches high; these should be cut off close to the ground, and their tops should be shortened; then they must be planted on a border of light loamy earth, and shaded from the sun until they have taken root; or if they are planted pretty close together, and covered with bell or hand-glasses, shading them every day from the sun, they will put out roots in five or six weeks; but when they begin to shoot, the glasses should be gradually raised to admit the free air to them, otherwise they will draw up weak and soon spoil: as soon as they are well rooted, the glasses should be taken off, and the plants inured to the open air; then they should be soon after removed into a bed of good soil, planting them about six inches distance every way, observing to shade them from the sun, and water them duly till they have taken new root; after which, if they are kept clean from weeds, they will require no other care till autumn, when they should be transplanted into the borders of the flower-garden, where they are designed to remain.

If some of these plants are put into pots, and sheltered under a hot-bed frame in winter, they will flower strong the following summer; and these may be placed in court-yards, or other places near the habitation, when they are in beauty, and being mixed with other flowers will be very ornamental.

PHYLICA. Lin. Gen. Plant. 236. Alaternoides. Com. Hort. Amst. 1. p. 1. *Bastard Alaternus.*

The Characters are,

*The flowers are collected in a disk, sitting in a common receptacle, each having a permanent empalement, composed of three narrow oblong leaves. They have one perforated petal, with an erect conical tube, cut into five parts at the brim, and an acute scale at each division, which join together within, and five small stamina inserted under the scales, terminated by single summits. The germen is situated at the bottom of the petal, supporting a single style, crowned by an obtuse stigma. The germen afterward becomes a roundish capsule with three lobes, having three cells, each inclosing a single roundish seed, gibbous on one side, and angular on the other.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

The Species are,

1. Phylica (*Ericoides*) foliis linearibus verticillatis. Lin. Sp. Plant. 195. *Phylica with narrow leaves growing in whorls.* Alaternoides Africana, ericæ foliis, floribus albicantibus & muscosis. Hort. Amst. 2. p. 1. tab.

tab. 1. *African Bastard Alaternus, with Heath leaves and white mossy flowers.*

2. Phylica (*Plumosa*) foliis lineari-subulatis, summis hirsutis. Prod. Leyd. 199. *Phylica with narrow awl-shaped leaves, which are hairy at the top.* Chamælæa foliis angustis subtus incanis, floribus capitatis muscosis. Burm. Plant. Afr. 117. tab. 43. *Spurge Olive with narrow leaves, which are hoary on their under side, and mossy flowers collected in heads.*

3. Phylica (*Buxifolia*) foliis ovatis sparsis. Lin. Sp. Plant. 195. *Phylica with oval leaves growing scatteringly.* Chamælæa folio subrotundo subtus incano floribus in capitulum collectis. Burm. Plant. Afr. 119. tab. 44. *Spurge Olive with roundish leaves, which are hoary on their under side, and flowers collected in heads.*

The first sort grows naturally at the Cape of Good Hope, from whence it was first brought to the gardens in Holland; but it also grows naturally about Lisbon, where there are large extents of ground covered with it, in the same manner as are many lands in England covered with Heath. This is a low bushy plant, seldom rising more than three feet high; the stalks are shrubby and irregular, dividing into many spreading branches, which are again divided into smaller. The young branches are closely garnished with short, narrow, acute-pointed leaves placed in whorls round the stalks, to which they sit close; they are of a dark green, and continue all the year. At the end of every shoot, the flowers are produced in small clusters sitting close to the leaves; they are of a pure white, and begin to appear in the autumn, continuing in beauty all the winter, and decay in the spring, which renders the plant more valuable. These flowers are not succeeded by seeds in England.

The second sort grows naturally at the Cape of Good Hope, from whence it was brought to the gardens in Holland. This hath an erect shrubby stalk, which rises near three feet high, covered with a purplish bark, and here and there some white down upon it; the leaves are narrow, short, and acute-pointed, sitting close to the branches in alternate order on every side; they are thick, nervous, and of a dark green on their upper side, but hoary on their under. The flowers are collected in small heads at the end of the branches; they are white, woolly, and fringed on their borders, cut into six acute segments at the top. These appear the beginning of winter, and continue long in beauty, but are not succeeded by seeds in England.

The third sort is a native of the same country as the former; this rises with a shrubby erect stalk five or six feet high; the stalks when old, are covered with a rough purplish bark, but the younger branches have a woolly down; these are garnished with thick oval leaves about the size of those of the Box-tree; they are veined, smooth, and of a lucid green on their upper side, but are hoary on their under; they have short foot-stalks, and stand without order on the branches. The flowers are collected in small heads at the end of the branches; they are of an herbaceous colour, so make no great figure. These appear at the same time with the former.

As these plants do not produce seeds in England, so they are propagated by cuttings, which, if properly managed, will take root freely. There are two seasons for planting these cuttings; the first is the latter end of March, before the plants begin to shoot; if these are planted in pots and plunged into a very moderate hot-bed, covering them close with bell or hand-glasses, obeving to shade them from the sun in the middle of the day, and to refresh them gently with water, they will put out roots in two months; then they should be inured to the open air, and after they have obtained strength, they should be carefully taken out of these pots, and each planted in a separate small pot, filled with soft loamy earth, and placed in a shady situation until they have taken new root, when they may be removed to a sheltered situation, where they may remain till autumn.

The other season for planting these cuttings is about the beginning of August; at this time they may be planted in pots, which may be either plunged into an old hot-bed or in the ground, covering them close with bell or hand-glasses as before, and treating them in the same way; these will put out roots in about two months, but it will then be too late in the season to transplant them, so they must remain in the same pots till spring. If these are placed under a hot-bed frame in autumn, where they may be protected from the frost, and exposed to the open air in mild weather, they will succeed better than when they are more tenderly treated.

The plants are too tender to thrive in the open air in England, so they must be kept in pots and housed in winter; for although the first sort will live through the winter in a warm sheltered situation when the seasons prove favourable, yet when severe frosts happen they are always destroyed; but they require no artificial heat to preserve them, if they are sheltered under a hot-bed frame in winter when they are young, and after they are grown large kept in a green-house, where they may enjoy the free air in mild weather, and treated in the same way as other hardy exotic plants from the same country; in the summer they must be placed abroad in a sheltered situation, with which management the plants will thrive and continue several years; and as they flower in the winter, they make a good appearance in the green-house during that season.

PHYLLANTHUS. Lin. Gen. Plant. 932. Sea-side Laurel.

The Characters are,

*It hath male and female flowers in the same plant; the empalements of the flower in both sexes are permanent, bell-shaped, and of one leaf, cut into six parts which spread open, and are coloured. The flowers have no petals according to some, or no empalements according to others. The male flowers have three short stamina which join at their base, but spread asunder at their top, and are terminated by twin summits. The female flowers have an angular nectarium surrounding the germen, which is roundish and three-cornered, supporting three spreading styles, crowned by obtuse stigmas. The germen afterward becomes a roundish capsule with three furrows, having three cells, each containing a single roundish seed.*

This genus of plants is ranged in the third section of Linnæus's twenty-first class, which includes those plants which have male and female flowers on the same plant, and the male flowers have three stamina.

The Species are,

1. Phyllanthus (*Epiphilanthus*) foliis lanceolatis serratis, crenis floriferis. Hort. Cliff. 439. *Phyllanthus with spear-shaped sawed leaves, having flowers growing on their edges.* Phyllanthus Americana planta, flores è singulis foliorum crenis proferens. Hort. Amst. 1. p. 199. *American Phyllanthus, with flowers growing out of every indenture of the leaves.*

2. Phyllanthus (*Niruri*) foliis pinnatis floriferis, floribus pedunculatis, caule herbaceo erecto. Flor. Zeyl. 331. *Phyllanthus with winged leaves bearing flowers on foot-stalks, and an upright herbaceous stalk.* Niruri Barbadense, folio ovali subtus glauco petiolis florum brevissimis. Martyn. Cent. 9. tab. 9. *Barbadoes Phyllanthus with an herbaceous upright stalk, and the flower-stalks very short.*

3. Phyllanthus (*Emblica*) foliis pinnatis floriferis, caule arboreo, fructu baccato. Flor. Zeyl. 333. *Phyllanthus with winged leaves bearing flowers, a tree-like stalk, and berry-bearing fruit.* Nelli-Camarum. Hort. Mal. 1. p. 69.

The first sort grows naturally upon the rocks near the sea, in all the islands of the West-Indies, where the inhabitants title it Sea-side Laurel. This is seldom found growing on the land, which occasions its scarcity in Europe; for the roots strike so deep into the crevices of the rocks, as to render it almost impracticable to transplant the plants, and it is very difficult to propagate by seeds; for unless they are sown soon after they are ripe, they will not grow, and the greatest part of the seed proves abortive, so that this sort is very rare in Europe. There was formerly a plant of this sort in the gardens at Hampton-court; but this, with many other fine plants, have been destroyed by the

the ignorance of the gardeners. I also saw a fine plant of this sort in the Amsterdam Garden.

This tree grows about fifteen or sixteen feet high; the leaves come out without any order, which are five or six inches long, smooth, and thick; upon the edges of the leaves the flowers are produced, but especially toward the upper part, where they are placed very closely, so as almost to form a sort of border to the leaves; which, together with the shining green colour of the leaves, makes a very beautiful appearance: the leaves continue green all the year, which renders the plant more valuable.

It requires to be placed in a moderate stove in the winter, otherwise it will not live in England; but in summer it may be placed in the open air, in a warm sheltered situation. With this management the plant was in great vigour in the Physic Garden at Amsterdam.

The second sort grows naturally in Barbadoes, where it is a common plant; for I have many times had it come up in the tubs of earth brought from thence, with other plants: though this is an annual plant, yet the seeds being cast out of the capsules when ripe, with an elasticity, is thrown to a considerable distance, and this way the plant propagates itself in England; for the seeds being cast into the pots which are placed near it in the stove, the plants come up without farther trouble.

This rises with an herbaceous stalk a foot and a half high, garnished with many long winged leaves, composed of a great number of oval lobes, of a gray colour on their under side, but of a bright green on their upper; these lobes contract every evening, turning their under side outward; on the under side of the leaves the flowers are produced along the midrib, turning downward; these are some of them male, and others female, intermixed on the same plant, having each a bell-shaped empalement of one leaf, cut into six segments at the brim; and being coloured, the title of petals, or corolla, are by some applied to them, but others call them apetalous flowers. The male flowers have each three stamina, the female having a single style, supporting a trifid stigma, and are succeeded by roundish capsules with three cells, each containing one seed. The plant usually flowers from June to October, and the seed ripens after in succession.

The third sort grows naturally at Malabar, where it rises with a tree-like stalk to the height of twelve or fourteen feet; but in England they do not rise more than half that height, sending out from the side many patulus branches, which are garnished with very narrow winged lobes; but as it hath not produced either flowers or fruit in England, so I can give no farther account of it.

This plant is propagated by seeds, when they can be procured from the country where the plants grow naturally; these must be sown upon a hot-bed, and when the plants come up and are fit to transplant, they should be each planted into a separate small pot filled with light earth, and plunged into a hot-bed of tanners bark, being careful to shade and water them until they have taken good root; after this, the plants must constantly remain in the bark-stove, and be treated in the same manner as hath been directed for many other plants from the same country, with which the plant has been maintained several years, but has made little progress.

The other sorts, which in the former edition of this work were added to this genus, are now placed under Andrachne.

**PHYLLIS.** Lin. Gen. Plant. 286. Bupleuroides. Boerh. Ind. alt. 71. Valerianella. Dill. Hort. Elth. 405. Simpla Nobla.

The Characters are,

*The empalement of the flower is very small, composed of two leaves sitting on the germen. The flower has five obtuse spear-shaped petals, which turn backward. It hath five short hair-like stamina, which are flaccid, terminated by oblong summits. The germen, which is situated under the flower, has no style, but is crowned by two awl-shaped, reflexed, hairy stigmas. The germen afterward turns to an oblong angular fruit, containing two parallel seeds, convex on their outside, plain on the other, and broad at the top.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and two styles or stigmas.

We have but one Species in the English gardens at present, viz.

Phyllis (*Nobla*) stipulis dentatis. Prod. Leyd. 92. *Phyllis with indented stipulæ.* Bupleuroides quæ simpla nobla Canariensium. Pluk. Boerh. Ind. alt. 1. p. 72. *Bastard Hare's-ear, or Simpla Nobla of the Canaries.*

This plant grows naturally in the Canary Islands, from whence the seeds were formerly brought to England. It rises with a soft shrubby stalk about two or three feet high, which is seldom thicker than a man's finger, of an herbaceous colour, and full of joints. These send out several small side branches toward the top, garnished with spear-shaped leaves near four inches long, and almost two broad in the middle, drawing to a point at each end; they are of a lucid green on their upper side, but pale on their under, having a strong whitish midrib, with several deep veins running from it to the sides; the leaves are for the most part placed by threes round the branches, to which they sit close. The flowers are produced at the end of the branches, in loose panicles; they are small, of an herbaceous colour at their first appearance, but before they fade, change to a brown or worn-out purple, and are cut into five parts to their base, where they are connected, and fall off without separating, so should be termed a flower of one petal. These segments are reflexed backward so as to cover the germen, which is situated under the flower, and afterward becomes a short, turbinated, obtuse, angular fruit, which splits in two parts when ripe, each containing one seed, flat on the inside, convex on the outside and angular. This plant flowers in June, and the seeds ripen in autumn.

It is propagated by seeds, which must be sown on a bed of fresh light earth toward the end of March, and the plants will come up by the beginning of May; when they are fit to transplant, they should be put into separate pots, and placed in a shady situation until they have taken root; after which time they should be placed in a sheltered situation, where they may have the morning sun, and in the summer will require to be frequently watered. In winter they must be sheltered from the frost, but require to have as much free air as possible in mild weather; the second year the plants will flower, so if in the spring some of the plants are shaken out out of the pots and put into the full ground, they will perfect their seeds much better than those which remain in the pots.

As these plants seldom continue in health above four or five years, it will be proper to raise a supply of young plants to succeed them.

The plants retain their leaves all the year, which being large and of a shining green, make a handsome appearance in winter, in which the beauty of it consists, for the flowers have none.

**PHYSALIS.** Lin. Gen. Plant. 223. Alkekengi. Tourn. Inst. R. H. 150. tab. 64. Winter Cherry.

The Characters are,

*The flower hath a small swelling permanent empalement of one leaf, which is five-cornered, and cut at the top into five acute points. The flower hath one wheel-shaped petal, with a short tube and a large brim, which is five-cornered and plaited. It has five small awl-shaped stamina which join together, terminated by erect summits, and a roundish germen supporting a slender style, crowned by an obtuse stigma. The germen afterward turns to an almost globular berry with two cells, inclosed in the large inflated empalement, and is filled with compressed kidney-shaped seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

The Species are,

1. Physalis (*Alkekengi*) foliis geminis integris acutis, caule herbaceo inferne subramoso. Lin. Sp. Plant. 262. *Physalis with two leaves at a joint, which are sharp-pointed, and an herbaceous stalk which branches at bottom.* Alkekengi officinarum. Tourn. Inst. R. H. 151. *The common or officinal Winter Cherry.*

2. Physalis (*Viscosa*) foliis geminis repandis obtusis subtomentosis, caule herbaceo superne paniculato. Lin. Sp. 261. *Winter Cherry with leaves growing by pairs, which are obtuse, a little woolly, and an herbaceous stalk.* Alkekengi Bonariense repens, baccâ turbinatâ viscosâ. *Creeping Winter Cherry of Buenos Ayres, with a viscous turbinated berry.*

3. Physalis (*Pensylvanica*) radice perenni, caule procumbente, foliis ovatis acutè dentatis, petiolis longissimis. *Physalis with a perennial root, a trailing stalk, and oval leaves which are acutely indented, and have very long foot-stalks.* Alkekengi Virginianum perenne majus, flore luteo amplo, fructu minimo. Rand. Act. Phil. N° 399. *Greater perennial Virginia Winter Cherry, with a large yellow flower and a small fruit.*

4. Physalis (*Virginiana*) caule herbaceo, foliis ovato-lanceolatis acutè dentatis. tab. 206. fig. 1. *Winter Cherry with an herbaceous stalk, and oval spear-shaped leaves which are acutely indented.*

5. Physalis (*Curassavica*) caule suffruticoso, foliis ovatis tomentosis integerrimis. *Physalis with a shrubby stalk, and oval downy leaves which are entire.* Alkekengi Curassavicum, foliis origani incanis, flore vietè sulphureo, fundo purpureo. Boerh. Ind. alt. 2. p. 66. *Winter Cherry of Curassao with hoary Origany leaves, and a rusty sulphur-coloured flower with a purple bottom.*

6. Physalis (*Somnifera*) caule fruticoso, ramis rectis, floribus confertis. Lin. Sp. Plant. 180. *Physalis with a shrubby stalk, erect branches, and flowers growing in clusters.* Alkekengi fructu parvo verticillato. Tourn. Inst. 151. *Winter Cherry with a small fruit growing in whorls.*

7. Physalis (*Flexuosa*) caule fruticoso, ramis flexuosis, floribus confertis. Lin. Sp. Plant. 182. *Physalis with a shrubby stalk, flexible branches, and flowers growing in clusters.* Baccifera Indica, floribus ad foliorum exortus, fructu sulcato decapyreno. Raii Hist 1632. *Indian berry-bearing Plant, with flowers coming out from the foot-stalks of the leaves, and a furrowed fruit containing ten seeds.*

8. Physalis (*Arborescens*) foliis ovato-lanceolatis integerrimis oppositis, caule fruticoso. tab. 206. fig. 2. *Physalis with oval, spear-shaped, entire leaves which are placed opposite, and a shrubby stalk.* Alkekengi Americanum arborescens, fructu sphærico rubro, vesicâ atro-purpureâ. Houst. MSS. *Tree American Winter Cherry, with a red spherical fruit and a deep purple-coloured bladder.*

9. Physalis (*Ramosa*) ramosissima, foliis villoso-viscosis floribus pendulis. Lin. Sp. Plant. 262. *The most branching Physalis with hairy viscous leaves, and nodding flowers.* Alkekengi Virginianum fructu luteo. Tourn. Inst. 151. *Virginia Winter Cherry with a yellow fruit.*

10. Physalis (*Angulata*) ramosissima, ramis angulatis glabris, foliis ovatis dentatis. Lin. Sp. Plant. 262. *The most branching Physalis with angular smooth branches.* Alkekengi Indicum majus. Tourn. Inst. 151. *Greater Indian White Cherry.*

11. Physalis (*Minima*) ramosissima, foliis ovatis acuminatis subdentatis petiolis longioribus. *Very branching Physalis, with oval acute-pointed leaves which are somewhat indented, and have longer foot-stalks.* Alkekengi Indicum minimum, fructu virescente. Tourn. Inst. 151. *The least Indian Winter Cherry with a greenish fruit.*

12. Physalis (*Patula*) ramosissima patula, ramis angulatis glabris, foliis lanceolatis pinnato-dentatis. *The most branching spreading Physalis, with smooth angular branches, and spear-shaped leaves which are indented like wings.*

13. Physalis (*Villosa*) ramosissima, ramis villosis, foliis ovatis acuminatis serrato-dentatis. *The most branching Physalis with hairy branches, and oval acute-pointed leaves, which are indented like a saw.* Alkekengi Americanum, annuum, ramosissimum, villosum, fructu rotundo ex luteo virescente. Houst. MSS. *The most branching, annual, hairy, American Winter Cherry, with a round, yellowish, green fruit.*

14. Physalis (*Cordata*) caule erecto ramoso, foliis ovatis serrato-dentatis, petiolis pedunculisque longissimis. *Physalis with an erect branching stalk, oval, indented, sawed leaves, and the foot-stalks of the leaves and flowers very long.* Alkekengi Americanum annuum, lamii folio, fructu cordato. Houst. MSS. *Annual American Winter Cherry, with a dead Nettle leaf and a heart-shaped fruit.*

15. Physalis (*Maxima*) caule erecto ramoso, foliis ovato-lanceolatis viscosis, fructu maximo cordato. *Physalis with an erect branching stalk, oval, spear-shaped, viscous leaves, and a large heart-shaped fruit.* Alkekengi Americanum annuum, maximum viscosum. Houst. MSS. *The largest, annual, viscous, American Winter Cherry.*

18. Physalis (*Peruviana*) caule erecto ramoso, ramis angulatis, foliis sinuatis, calycibus acutangulis. *Physalis with an erect branching stalk, angular branches, sinuated leaves, and empalements having acute angles.* Alkekengi amplo flore violaceo. Feuill. Obs. 724. tab. 16. *Winter Cherry with a large Violet-coloured flower.*

The first sort is the common Winter Cherry which is used in medicine; this grows naturally in Spain and Italy, but has been long cultivated in the English gardens. The roots of this are perennial, and creep in the ground to a great distance, if they are not confined; these shoot up many stalks in the spring, which rise about a foot high or better, and are garnished with leaves of various shapes; some are angular and obtuse, others are oblong and acute-pointed, of a dark green, and generally there are two leaves coming out from the same point on the same side of the stalk; they have long foot-stalks. The flowers are produced from the wings of the stalks, standing upon slender foot-stalks, having one white petal which has a short tube, and is cut at the brim into five angles spreading open. In the center of the tube is situated a roundish germen, supporting a slender style crowned by an obtuse stigma; this is accompanied by five stamina of the same length, terminated by oblong, erect, yellow summits which join together. The flowers appear in July, and are succeeded by round berries about the size of small Cherries, inclosed in an inflated bladder, which turns red in the autumn, when the top opens, and discloses the red berry, which is soft, pulpy, and filled with flat kidney-shaped seeds. Soon after the fruit is ripe, the stalks decay to the roots.

This plant is easily propagated, either by seeds or parting the roots; the latter being the most expeditious method is generally practised. These roots may be transplanted and parted, any time after the stalks decay, till the roots begin to shoot in the spring; they love a shady situation, and should be confined, otherwise they will ramble to a great distance in one year, and when the stalks stand at a distance they make no appearance. Their only beauty is in autumn, when the fruit is ripe, at which time their red bladders opening and disclosing the Cherry-shaped fruit, make a pretty appearance.

The leaves of this plant are cooling, and of the nature of common Nightshade; the berries are a singular good diuretic, and useful against the gravel and stone. There has been several instances of their great virtue in bringing away great quantities of gravel, when other remedies have been tried without success. The berries boiled in milk, and sweetened with sugar, cure the heat of the urine, making bloody water, and ulcers in the kidneys and bladder.

The second sort grows naturally at Buenos Ayres; this hath a creeping root, by which it multiplies very fast, sending up a great number of smooth stalks about a

 foot

foot high, which divide toward their top into small spreading branches, garnished with heart-shaped or oval leaves, about three inches long, and two broad near their base; they are entire and rough to the touch, of a pale yellowish green, standing upon pretty long foot-stalks placed alternately. The flowers come out from the wings of the stalks toward the top, and have long slender foot-stalks; they are of a dirty yellow colour with purple bottoms. They appear in June and July, and are succeeded by viscous berries about the size of the common sort, of an herbaceous yellow colour, inclosed in a swelling bladder, of a light green colour.

This plant is easily propagated by parting the roots either in spring or autumn, but it is too tender to live abroad through the winter in England, so they should be planted in pots, and sheltered under a hot-bed frame in winter, where they may enjoy the free air at all times in mild weather.

The seeds of the third sort were sent me from Virginia, where the plant grows naturally; this hath a perennial root and an annual stalk, but these roots do not creep in the ground like the two former. The stalks of this grow two feet long, and spread on the ground if they are not supported; these are garnished with oval leaves three inches long, and two inches and a half broad, standing alternately upon very long foot-stalks; they are of a pale green, having several acute indentures on their edges. The flowers come out from the wings of the stalk upon very short foot-stalks; they are larger than those of the common sort, and of a pale yellow colour. These are succeeded by very small yellowish berries which ripen in the autumn, when the season proves warm, but in cool moist summers they seldom ripen here.

This sort is propagated by seeds, which should be sown upon a warm border about the latter end of March; and when the plants come up, they should be thinned where they are too close, and kept clean from weeds till autumn, when they should be transplanted to the places where they are to remain, which should be in a warm situation, where they will live through the winter in mild seasons, but are killed by severe frost if they are not screened.

The seeds of the fourth sort were sent me from Philadelphia by Dr. Bensil, who found the plants growing there naturally. This hath a perennial root composed of strong fibres, from which arise two or three hairy stalks about nine or ten inches high, dividing into several branches which are garnished with oval spear-shaped leaves, of a pale green and hairy, about two inches and a half long, and an inch and a half broad, having several acute indentures on their edges, and stand alternately upon short foot-stalks. The flowers come out from the side of the branches, at the base of the foot-stalks of the leaves; these have long slender foot-stalks; the flowers have very short tubes, which are larger than in most of the species of this genus; they are of a sulphur colour, with a dark purple bottom. These appear in July, and in warm seasons are succeeded by oval yellowish berries, which ripen in the autumn. This sort may be propagated by seeds in the same way as the third, and the plants require the same treatment.

The fifth sort grows naturally at Curassao in the West-Indies. This hath a perennial creeping root, from which arise several slender stalks about a foot high, which become somewhat ligneous, but seldom last above two years, the leaves standing alternately upon short foot-stalks; they are about two inches long, and an inch and a half broad. The flowers come out from the wings of the stalk toward the top, standing upon short slender foot-stalks; these are garnished with oval downy petals, which are small, of a sulphur colour, and have dark purple bottoms. They appear in July and August, but are rarely succeeded by berries in England.

This is easily propagated by parting the roots in the spring, but the plants are too tender to live through the winter in England without artificial warmth, so the pots should be placed in a moderate warmth in winter; but during the months of July, August, and September they may be placed in the open air in a warm situation.

The sixth sort grows naturally in Crete, Sicily, and Spain. This rises with a shrubby stalk near three feet high, dividing into several branches which grow erect, and are covered with a woolly down, garnished with oval spear-shaped leaves almost three inches long, and one and a half broad in the middle; they are downy, and stand upon short foot-stalks. The flowers come out in clusters on the side of the branches; they are small, of an herbaceous white colour, sitting very close to the branches, and are succeeded by small berries almost as large as those of the first sort, which when ripe are red. This flowers in June and July, and the berries ripen in autumn.

This plant is propagated by seeds, which may be sown on a bed of light earth the beginning of April, and when the plants are two or three inches high, they should be carefully taken up, and each planted in a separate small pot filled with earth out of a kitchen-garden, and placed in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain till the beginning of October; at which time they should be removed into the green-house, for the plants are too tender to live through the winter in the open air, so they must be treated like the other green-house plants, but should be sparingly watered in winter. These plants will continue several years if they are not too tenderly treated.

The seventh sort grows naturally at Malabar, and also at the Cape of Good Hope. This rises to the height of five or six feet, sending out long flexible branches covered with a gray bark, and garnished with oblong oval leaves which are often placed opposite, and sometimes by threes round the branches, to which they sit close. The flowers are produced in clusters at the base of the foot-stalks of the leaves; they are small, and of an herbaceous yellow colour; these are succeeded by round purplish berries having ten cells, each including one seed. This plant flowers in July and August, but unless the season is warm, the berries do not ripen in England.

This is propagated by seeds, which should be sown upon a moderate hot-bed, and when the plants have four leaves, they should be transplanted on a fresh hot-bed, observing to shade them from the sun till they have taken new root; then they should have fresh air admitted to them every day in warm weather to prevent their drawing up weak, and should be treated in the same way as other exotic plants. When these are grown three or four inches high, they should be carefully taken up, and each planted in a separate small pot, filled with light loomy earth, and placed in a frame upon an old hot-bed, shading them from the sun till they have taken new root; then they should be gradually inured to bear the open air, into which they should be removed in July, and placed in a warm situation, where they may remain till the end of September; then they should be removed into shelter, and the first winter they should be placed in a moderate stove; but when the plants have obtained strength, they will live through the winter in a good green-house.

The eighth sort was discovered by the late Dr. Houstoun growing naturally at Campeachy, from whence he sent the seeds to England. This hath a shrubby stalk which rises ten or twelve feet high, dividing toward the top into several small branches, covered with a gray hairy bark, and garnished with oval spear-shaped leaves; those on the lower part are placed alternately, but toward the end of the branches they are opposite. The lower leaves are from three to four inches long, and two broad in the middle, drawing to a point at both ends; they are of a pale green, and are downy. The flowers come out from the wings of the stalks toward the end of the branches, sometimes one, and at other times two are produced at the same joint

opposite; they stand upon short nodding foot-stalks. The flowers are small, of a pale dirty yellow colour, having purple bottoms; these are succeeded by small, spherical, red berries included in an oval, dark, purple bladder. It flowers in June and July, but unless the season proves warm, there are no berries succeeding them.

This may be propagated by seeds in the same way as the last-mentioned, and the plants require the same treatment, but are not so hardy, therefore they must be kept in a moderate stove in winter; but in the middle of summer, they should be placed in the open air in a sheltered situation for about three months; for if they are constantly kept in the stove, they will draw up weak, so will not flower. It may also be propagated by cuttings, which, if planted in pots during the spring and summer months, and plunged into a gentle warmth, will take root freely, and may be treated in the same way as is before directed for the sixth sort.

The ninth sort is an annual plant, which grows naturally in Virginia. This branches out very wide close to the ground, and the branches frequently lie upon it; they are angular and full of joints, dividing again into smaller branches, and are garnished with hairy viscous leaves, which are almost heart-shaped, standing upon pretty long foot-stalks; they are about three inches long and almost two broad, having several acute indentures on their edges. The flowers are produced on the side of the branches upon short, slender, nodding foot-stalks; they are of an herbaceous yellow colour with dark bottoms; these are succeeded by large swelling bladders of a light green, inclosing berries as large as common Cherries, which are yellowish when ripe. This sort flowers in June and July, and the berries ripen in the autumn.

If the seeds of this sort are permitted to scatter, the plants will come up in the spring, and require no other care but to thin them, and keep them clean from weeds; or if the seeds are sown in the spring on a common border, the plants will rise very well, and need no other care.

The tenth sort is also an annual plant, which grows naturally in the islands of the West-Indies; this rises with an upright branching stalk from two to three feet high. The branches are smooth, angular, and garnished with spear-shaped leaves ending in acute points, which are sharply indented on their edges. The flowers come out toward the end of the branches upon short slender foot-stalks; they are very small, of a dirty white colour, and are succeeded by berries the size of common Cherries, covered with an angular bladder; they are of a yellowish colour when ripe.

This sort is propagated by seeds, which should be sown on a moderate hot-bed, and when the plants come up and are a little advanced, they should be planted on a fresh hot-bed to bring them forward, and treated in the same way as the Capsicum. When they are grown strong, and are hardened to bear the open air, they may be transplanted with balls of earth to their roots into a warm border, observing to water and shade them till they have taken root; after which they will require no other care, but to keep them clean from weeds.

The eleventh sort grows naturally in the West-Indies; this is an annual plant with very branching stalks, which seldom rise above a foot high. The leaves are oval, of a deep green, and have long foot-stalks; the flowers are small, white, and stand upon short foot-stalks; the berries are small, and green when ripe.

The twelfth sort was discovered by the late Dr. Houstoun growing naturally at La Vera Cruz; this is a low annual plant, with a very branching spreading stalk. The leaves are spear-shaped, downy, and have deep indentures on their edges, which are opposite and regular like a winged leaf; the branches are smooth and angular; the flowers small and white; the fruit is small, and yellowish when ripe.

The thirteenth sort was discovered by the late Dr. Houstoun at La Vera Cruz; this is an annual plant with a very branching hairy stalk. The leaves are oval, acute-pointed, and indented like a saw on their edges; the flowers are small, and of a pale yellow colour; the fruit is round, as large as a Cherry, and of a yellowish green when ripe.

The fourteenth sort was discovered at La Vera Cruz by the same gentleman; this is an annual plant, with an upright branching stalk near two feet high, garnished with oval leaves, indented on their edges like a saw. They have long foot-stalks, and change to a purplish colour in the autumn. The flowers are small and white, standing upon very long foot-stalks, and are succeeded by large berries almost as large, and of the shape of Heart-Cherries, of a yellowish green, with some purple stripes.

The fifteenth sort was found by the same gentleman, growing naturally in the same country; this is an annual plant, with a smooth, erect, branching stalk near three feet high, garnished with oval, spear-shaped, viscous leaves, standing on long foot-stalks. The flowers are of a pale yellow, and small; these are succeeded by large heart-shaped fruit, of a pale yellow when ripe. The five last mentioned sorts are propagated by seeds in the same manner as the eleventh, and the plants require the same treatment.

The sixteenth sort grows naturally in Peru, from whence the younger de Jussieu sent the seeds. This is an annual plant, rising with a strong, herbaceous, angular stalk four or five feet high, of a purplish colour, dividing into several branches which are angular, and spread out wide on every side; these are garnished with oblong leaves which are deeply sinuated on their sides, and are of a deep green. The foot-stalks of the flowers are short; the empalement of the flower is large, bell-shaped, and deeply cut into five segments; the flower is large, of the open bell-shape, of a light blue colour, and is succeeded by berries about the size of common Cherries, inclosed in a large swelling bladder, having five sharp angles. It flowers in July, and the seeds ripen in the autumn, which if permitted to scatter, the plants will come up the following spring; or if the seeds are sown on a bed of rich earth in the spring, the plants will rise easily, and may be afterward transplanted to the borders of the pleasure-garden, where they must be allowed room, for if the ground is good, the plants will grow very large.

Father Feuille, who first discovered this plant in Peru, and has given a figure and description of it, recommends it greatly for its virtues, and says, the Indians make great use of its berries to bring away gravel, and to relieve persons who have a stoppage of urine, and gives the manner of using them; which is, to bruise four or five of the berries either in common water, or white wine, giving it to the patient to drink, and the success is astonishing.

PHYTOLACCA. Tourn. Inst. R. H. 299. tab. 154. Lin. Gen. Plant. 521. [This plant is so called of Φυτὸν, a plant, and Lacca, a colour, because a red coloured lacca is made thereof.] American Nightshade.

The Characters are,

*The flower hath no petals according to some, or no empalement according to others, for the cover of the parts of generation being coloured, is by the latter termed petals; there are five of these which are roundish, concave, spreading open, and permanent. It has for the most part ten stamina which spread open, and are the same length as the petals, terminated by roundish summits, and ten compressed orbicular germen joined together on their inside, but are divided on their outside, upon which sit ten very short styles which are reflexed, and crowned by single stigmas. The germen afterward turns to an orbicular depressed berry, with ten longitudinal deep furrows, having ten cells, each containing a single smooth seed.*

This genus of plants is ranged in the fifth section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and ten styles.

The

The Species are,

1. Phytolacca (*Vulgaris*) floribus decandris decagynis. Hort. Cliff. 117. *Phytolacca with flowers having ten stamina and ten styles.* Phytolacca Americana, majori fructu. Tourn. Inst. 229. *American Nightshade with large fruit, commonly called Virginian Poke, or Porke Physic.*
2. Phytolacca (*Mexicana*) foliis ovato-lanceolatis, floribus sessilibus. *Phytolacca with oval spear-shaped leaves, and flowers sitting close to the stalks.* Phytolacca Mexicana, baccis sessilibus. Hort. Elth. 318. *Mexican Phytolacca, whose berries grow close to the stalk.*
3. Phytolacca (*Icosandra*) floribus icosandris decagynis. Lin. Sp. 631. *Phytolacca with many stamina, which are fixed to the receptacle.* Phytolacca spicis florum longissimis, radice annuâ. tab. 207. *Phytolacca with the longest spikes of flowers, and an annual root.*
4. Phytolacca (*Dioica*) floribus dioicis, caule arboreo ramosa. *Phytolacca with a tree-like stem, which has male and female flowers on different plants.*

The first sort grows naturally in Virginia, and also in Spain and Portugal; this hath a very thick fleshy root, as large as a man's leg, divided into several thick fleshy fibres, which run deep in the ground. When the roots are become large, they send out three or four stalks, which are herbaceous, as large as a good walking-stick, of a purple colour, and rise the height of six or seven feet, dividing into many branches at the top, garnished with leaves about five inches long, and two inches and a half broad; they are rounded at their base, but terminate in a point, and are placed without order, having short foot-stalks; they are of a deep green, and in the autumn change to a purplish colour before they fall off. From the joints of the branches and at their divisions, come out the foot-stalks of the flowers, which are about five inches long; the lower part is naked, but the upper half sustains a number of flowers ranged on each side like common Currants. Each flower stands upon a foot-stalk half an inch long; the flowers have five purplish petals, within which stand the ten stamina and styles. After the flowers are faded, the germen turns to a depressed berry with ten furrows, having ten cells, filled with smooth seeds. It flowers in July and August, and in warm seasons the berries ripen in autumn.

It may be propagated by sowing the seeds in the spring upon a bed of light earth, and when the plants come up, they should be transplanted into the borders of large gardens, allowing them space to grow, for they must not be planted too near other plants, lest they overbear and destroy them, as they grow to be very large, especially if the soil is good. When they have taken root, they will require no farther care but only to clear them from weeds, and in the autumn they will produce their flowers and fruit; but when the frost comes on, it will cut down the stems of these plants which constantly decay in the winter, but their roots will abide in the ground, and come up again the succeeding spring.

The roots of this plant will continue many years, especially if they are planted in a dry soil, for wet in winter standing about the roots will cause them to rot; and sometimes the frost in very severe winters will kill them, if the surface of the ground is not covered with mulch, but in our ordinary winters they are never injured.

Parkinson says, that the inhabitants of North America make use of the juice of the root as a familiar purge; two spoonfuls of the juice will work strongly. Of late there have been some quacks, who pretend to cure cancers with this herb, but I have not met with one instance of its having been serviceable in that disorder. The inhabitants of North America boil the young shoots of this plant, and eat it like Spinach. The juice of the berries stain paper and linen of a beautiful purple colour, but it will not last long. If there could be a method of fixing the dye, it might be very useful.

The vignerons in Portugal, for many years made use of the juice of the berries of this plant to mix with their red port wines when they made it, which gave a deep colour to the wine; and when there was too much of this juice added, it gave a very disagreeable taste to the wine; and complaint of this practice having been communicated to his Portuguese Majesty, he gave orders that the stems of the Phytolacca should be cut down and destroyed before they produced berries, to prevent the use of this juice for the future, in order to gain a better reputation to the wine of that country. Some of this unmixed wine I have drank, and found it much more palatable and lighter than any port wine I had ever before tasted; but whether this is still continued in that country, I cannot say.

The second sort grows naturally in the Spanish West-Indies; the late Dr. Houstoun found it growing in great plenty at La Vera Cruz, where the inhabitants constantly used it for their table. This plant is biennial, seldom continuing longer than two years; and when it flowers and produces plenty of seeds the first year, the plants frequently die before the following spring. This hath an herbaceous stalk about two feet high, about the size of a man's finger, dividing at the top into two or three short branches, garnished with ovalspear-shaped leaves near six inches long, and almost three broad, drawing to a point at each end; they have a strong longitudinal midrib, and several transverse veins running from that to the sides, of a deep green, and have foot-stalks an inch and a half long, placed without order on the stalk. The foot-stalks of the flowers come out from the side of the branches opposite to the leaves; they are seven or eight inches long; the lower part, about two inches in length, is naked; the remaining part is garnished with white flowers sitting close to the stalks, which are white, having a blush of purple in the middle, each being cut into five segments almost to the bottom, and have from eight to fourteen stamina, and ten styles in each flower, which are succeeded by flat berries, having ten deep furrows divided into so many cells, each containing one or two smooth seeds. This flowers in July and August, and the seeds ripen late in the autumn.

The third sort grows naturally in Malabar, from whence I received the seeds; this plant is annual, always perishing soon after it has perfected seeds, so that in this particular it differs greatly from the first; this rises with an herbaceous stalk from two to three feet high, which has several longitudinal furrows, and changes the latter part of summer to a purplish colour. It divides at the top into three or four branches, garnished with spear-shaped leaves six or seven inches long, and almost three broad in the middle, drawing to a point at each end; they are of a deep green, and have short foot-stalks; sometimes they stand alternately, at others they are placed opposite, and are frequently oblique to the foot-stalk. The foot-stalks of the flowers come out from the side of the branches opposite to the leaves; they are nine or ten inches long, the lower part being naked as in the other sorts, but this is much shorter than the other species; the other part is garnished with larger flowers than those of the other sorts; they are white on their inside, of an herbaceous colour on their edges, and purplish on their outside, standing upon short foot-stalks; these have not always the same number of stamina, some of them have but eight, and others nine or eleven, which are terminated by roundish summits. These flowers are succeeded by orbicular, compressed, soft berries divided by deep furrows on their outside into ten cells, each containing one smooth shining black seed; the racemus of flowers is very narrow at the top, where it is commonly inclined. This flowers in July and August, and the seeds ripen in the autumn, soon after which the plant decays.

The berries of this sort are very succulent, and their juice stains paper and linen of a beautiful purple colour, but it is not permanent.

These two sorts are not so hardy as the first, so their seeds should be sown upon a moderate hot-bed in the spring, and when the plants are fit to remove, they should

should be transplanted to another hot-bed to bring them forward, observing to shade them from the sun till they have taken new root; after which they should be treated in the same way as other tender exotic plants, and the beginning of July they may be transplanted out upon a warm border, or into pots filled with light rich earth, and shaded from the sun till they have taken new root; after which they will require to be duly watered in dry weather, and kept clean from weeds. As these plants perfect their seeds every autumn, they may be easily preserved.

The fourth sort grows naturally in Mexico, from whence the seeds were sent to Paris some years past, and they have been sent to Spain many years since; for there are growing in some of the gardens, several trees which are now upward of twenty feet high; and I have been credibly informed, there are some of the trees which produce male, and others female flowers only; but as the plant in the Chelsea Garden has not as yet produced any flowers which have opened perfectly, so I cannot from my own observations determine this.

The plant hath a strong woody stem as large as a man's leg, which sends out many irregular branches, garnished with oval spear-shaped leaves six inches long, and almost three broad, having large midribs, which are of a purple colour when the leaves are fully grown; the flowers are produced at the base of the foot-stalks of the leaves, in a racemus like those of the other species; but as those on the plant in the Chelsea Garden were produced late in the season, so they dropped off before they opened.

This species may be propagated by cuttings during the summer months, which should be planted in pots filled with light earth and plunged into a moderate hot-bed, covering the pots with hand-glasses to exclude the air from the cuttings, and duly shading them from the sun; in about five or six weeks they will put out roots, when they may be each planted into a separate small pot, and plunged into the bed again, shading them daily till they have taken new root; then they should be gradually inured to the open air, where they may remain till the end of September, when they must be removed into a moderate stove for the winter season, for they will not live through the winter in a green-house, unless it is a very warm one.

PIERCEA. Solanoides. Tourn. Act. Par. 1706.

The Characters are,

*The flower has no petals; the empalement which incloses the parts of generation is composed of four oblong, oval, coloured leaves, which are by some called petals. It hath four stamina, which stand erect and close together, terminated by small summits. In the center is situated a large roundish germen, supporting a short style, crowned by an obtuse stigma. The germen afterward turns to a roundish berry sitting upon the reflexed empalement, having one cell, inclosing a rough seed of the same form.*

I have taken the freedom of inscribing this genus of plants to his Grace the Duke of Northumberland, who is not only a great encourager of botanical studies, but greatly skilled in the science himself.

Tournefort first placed this with the Phytolacca, making it a species of that genus; but as the flowers of Phytolacca have five petals or leaves to the empalement, and ten stamina, and the flowers of this have but four petals and eight stamina, and the berries of Phytolacca have ten cells, and these have but one, so they could not with propriety be joined together; therefore upon mature consideration Tournefort constituted a new genus of it, by the title of Solanoides, and published the characters in the Memoirs of the Academy of Sciences for the year 1706; but as all those titles of plants which end with oides, have been by later botanists changed, so I shall join this to the first section of Linnæus's eighth class, who has supposed this to be the same with Plumier's Rivinia, so he has applied that title to this plant, and believed Plumier was mistaken when he drew eight stamina to the flower; but Plumier's Rivinia is totally different from this plant, and the flowers of it have eight stamina as Plumier has represented it.

The Species are,

1. Piercea (*Glabra*) foliis ovato-lanceolatis glabris. *Piercea with oval, spear-shaped, smooth leaves.* Solanoides Americana, circææ foliis glabris. Tourn. Act. Par. 1706. *American Solanoides with smooth Enchanters Nightshade leaves.*
2. Piercea (*Tomentosa*) foliis cordatis pubescentibus. *Piercea with heart-shaped downy leaves.* Solanoides Americana circææ foliis canescentibus. Tourn. Act. Par. 1706. *American Solanoides with hoary leaves like Enchanters Nightshade.*

These plants grow naturally in most of the islands in the West-Indies, but the first is the most common there. This rises with a slender herbaceous stalk three or four feet high, and by age becomes a little ligneous at the bottom. It divides into many branches which are herbaceous, and have angles; these are garnished with oval spear-shaped leaves near four inches long, and two broad in the middle; they are of a bright green, and have slender foot-stalks an inch and a half broad. The foot-stalks of the flowers come out from the side of the branches, at the base of the foot-stalks of the leaves; they are from four to five inches long, sustaining a great number of small white flowers, ranged along the upper part on both sides. These are succeeded by small red berries full of a red juice, inclosing one hard seed of the same form.

There is a succession of flowers upon this plant most part of the year, which are succeeded by berries ripening after each other, so that the plants are seldom destitute of them; and although the flowers make but a small appearance, yet the long bunches of bright red berries, hanging on all the branches great part of the year, have a fine effect.

The second sort grows taller than the first, and the branches grow more erect; the leaves are smaller, heart-shaped, and covered with short hairy down; the spikes of flowers are not so long, and the flowers are not so closely placed together, and have longer foot-stalks. This continues flowering and producing ripe fruit in the same manner as the other, most part of the year.

These plants are propagated by seeds, which should be sown soon after they are ripe, for if they are kept long out of the ground they seldom grow the same year. They should be sown in pots filled with light earth, and plunged into a moderate hot-bed; and when the plants come up, they should be kept clean from weeds, and gently watered as the earth becomes dry. When the plants are two inches high, they should be each planted in a small halfpenny pot filled with light earth, and plunged into a moderate hot-bed, observing to shade them till they have taken new root; after which they must be treated in the same way as other exotic plants, by admitting fresh air to them daily, according to the warmth of the season, and giving them water as often as they require it. When the plants have obtained strength, they should be removed into the stove, and may be placed on shelves, and there they must constantly remain, for they are too tender to thrive in the open air in England in the warmest part of the year.

The juice of the berries of these plants will stain paper and linen of a bright red colour, and I have made many experiments with it to colour flowers, which have succeeded extremely well; these were made in the following manner. I pressed out the juice of the berries, and mixed it with common water, putting it into a phial, shaking it well together for some time, till the water was thoroughly tinged; then I cut off the flowers which were just fully blown, and placed their stalks into the phial, and in one night the flowers have been finely variegated with red. The flowers which I made the experiments on were the Tuberose and the double white Narcissus.

PILOSELLA. See Hieracium.

PIMPINELLA. Lin. Gen. Plant. 328. Tragoselinum. Tourn. Inst. R. H. 309. tab. 163. Burnet Saxifrage; in French, *Boucage*.

The CHARACTERS are,

*It hath an umbellated flower; the principal umbel is composed of many rays or smaller umbels; neither of these have any involucrums, and the empalements are scarce visible; the greater umbel is uniform. The flowers have five heart-shaped inflexed petals, which are nearly equal, and five stamina which are longer than the petals, terminated by roundish summits. The germen is situated under the flower, supporting two short styles, crowned by obtuse stigmas. The germen afterward becomes an oblong oval fruit, divided in two parts, containing two oblong seeds, plain on the inside and convex on the other, and furrowed.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and two styles.

The SPECIES are.

1. PIMPINELLA (*Major*) foliis pinnatis, foliolis cordatis serratis, summis simplicibus trifidis. *Burnet Saxifrage with winged leaves near the root, having heart-shaped sawed lobes, and single three-pointed leaves at the top of the stalk.* Tragoselinum majus, umbellâ candidâ. Tourn. Inst. R. H. 309. *Greater Burnet Saxifrage with a white umbel.*
2. PIMPINELLA (*Saxifraga*) foliis pinnatis, foliolis radicalibus subrotundis, summis linearibus. Lin. Sp. Plant. 263. *Burnet Saxifrage with winged leaves, those at the bottom having lobes which are roundish, but those at the top linear.* Tragoselinum alterum majus. Tourn. Inst. R. H. 309. *Another greater Burnet Saxifrage.*
3. PIMPINELLA (*Hircina*) foliis pinnatis, foliolis radicalibus pinnatifidis, summis linearibus trifidis. *Burnet Saxifrage with winged leaves, whose lobes of the bottom leaves are wing-pointed, and the upper ones linear and trifid.* Tragoselinum minus. Tourn. Inst. R. H. *Lesser Burnet Saxifrage.*
4. PIMPINELLA (*Nigra*) foliis pinnatis hirsutis, foliolis radicalibus cordatis inæqualiter serratis, summis linearibus quinquefidis. *Burnet Saxifrage with hairy winged leaves, whose lobes of the bottom leaves are heart-shaped, unequal and sawed, the upper ones linear and five-pointed.* Tragoselinum radice nigrâ Germanicum. Jussieu. Hort. Chelf. Cat. 100. *German Burnet Saxifrage with a black root.*
5. PIMPINELLA (*Austriaca*) foliis pinnatis lucidis foliolis radicalibus lanceolatis, pinnato serratis, summis linearibus pinnatifidis. *Burnet Saxifrage with shining winged leaves, the lobes of whose bottom leaves are spear-shaped and sawed, and the upper ones linear and wing-pointed.* Tragoselinum Austriacum maximum, foliis profundissimè incisis. Boerh. Hort. Chelf. Cat. 100. *Largest Burnet Saxifrage of Austria, whose leaves are deeply cut.*
6. PIMPINELLA (*Peregrina*) foliis radicalibus pinnatis crenatis, summis cuneiformibus incisis. Lin. Sp. Plant. 164. *Burnet Saxifrage, whose lower leaves are winged and indented on their edges, and the upper ones wedge-shaped and cut.* Apium peregrinum foliis subrotundis. C. B. P. 153. *Foreign Parsley with roundish leaves.*
7. PIMPINELLA (*Anisum*) foliis radicalibus trifidis incisis. Lin. Sp. Plant. 264. *Pimpinel with trifid cut lower leaves.* Anisum vulgare. Clus. Hist. 2. p. 202. *Common Anise.*

The first sort grows naturally in woods, and on the side of banks near hedges in several parts of England, especially upon chalky land. The lower leaves of this sort are wing-shaped, composed of three pair of heart-shaped lobes, and terminated by an odd one; they are sharply sawed on their edges, and sit close to the midrib. The lower lobes which are the largest, are near two inches long, and one and a half broad at their base, and are of a dark green. The stalks are more than a foot high, dividing into four or five branching foot-stalks; the lower part of the stalk is garnished with winged leaves, shaped like those at the bottom, but smaller; those upon the branches are short and trifid; the branches are terminated by small umbels of white flowers, which are composed of smaller umbels or rays. The flowers have five heart-shaped petals which turn inward, and are succeeded by two narrow, oblong, channelled seeds. It flowers in July, and the seeds ripen in autumn. There is a variety of this with red flowers, which is frequently found among the other, and rises from the same seed.

The second sort grows naturally in dry pastures in many parts of England; the lower leaves of this are composed of four pair of lobes, terminated by an odd one; these are roundish; those on the lower part of the leaf are about half an inch long, and the same breadth; they are indented on their edges; the stalks rise near a foot high, sending out three or four slender branches, which are garnished with very narrow leaves. The umbels of flowers are smaller than those of the first, as are also the flowers and seeds. It flowers about the same time.

The third sort grows naturally in dry gravelly pastures in several parts of England; the lower leaves of this sort have five or six pair of lobes terminated by an odd one, which are deeply cut almost to their midrib in form of wings. The stalks are slender, and rise about a foot high, sending out a few small branches, which have a narrow trifid leaf placed at each joint, and are terminated by small umbels of white flowers, composed of several rays standing upon pretty long foot-stalks. The flowers are small, and appear at the same time with the former.

The seeds of the fourth sort were sent me from Paris by Dr. Bernard de Jussieu. The lower leaves of this sort are composed of six or seven pair of lobes terminated by an odd one; these are heart-shaped, almost two inches long, and one and a half broad near their base; they are hairy, and of a pale green. The stalk rises near two feet high, dividing into several branches, which have one narrow five-pointed leaf at each joint, and are terminated with umbels of white flowers like those of the first sort.

The seeds of the fifth sort I gathered in Dr. Boerhaave's private garden near Leyden; the synonime applied to it was the title he gave me for it, and he told me he had received the seeds of it from Austria. The lower leaves have five pair of lobes terminated by an odd one; these are placed at a wider distance from each other than those of the other sorts; they are near two inches long, and three quarters of an inch broad in the middle, drawing to a point at each end, and are deeply cut in regular jags opposite, in form of a winged leaf; they are of a lucid green, and have long foot-stalks. The stalks rise two feet high, dividing at the top into two or three slender branches, garnished at each joint with one wing-pointed narrow leaf. The umbels of flowers are very like the first.

All these sorts have perennial roots; they are propagated by seeds, which, if sown in the autumn, will more certainly succeed than when they are sown in the spring. When the plants come up, they will require no other culture but to thin them when they are too close, and keep them clean from weeds; the second year they will flower and produce ripe seeds, and the roots will abide some years, and continue to produce flowers and seeds, if they grow in poor land.

The first sort is directed for medicinal use, but the herbwomen either bring the third sort to market for it, or what is worse, substitute Burnet and Meadow Saxifrage in its stead. It enters the pulvis ari compositis, and is esteemed good for the gravel.

The last sort is the common Anise: this is an annual plant, which grows naturally in Egypt, but is cultivated in Malta and Spain, from which countries the seeds are annually brought to England. From these seeds there is a distilled water, and an oil drawn for medicinal use. The pastry-cooks also make great use of these seeds in several of their compositions, to give them an aromatic taste and smell. The lower leaves are divided into three lobes, which are deeply cut on their edges; the stalk rises a foot and a half high, dividing into several slender branches, which are garnished with narrow leaves, cut into three or four nar-

row segments, and are terminated by pretty large loose umbels, composed of many smaller umbels or rays, which stand upon pretty long foot-stalks. The flowers are small, and of a yellowish white; the seeds are oblong and swelling. It flowers in July, and if the season proves warm, the seeds will ripen in autumn.

The seeds of this should be sown the beginning of April upon a warm border, where the plants are to remain; when they come up, they should be thinned, and kept clean from weeds, which is all the culture this plant requires, but is too tender to be cultivated in England for profit.

PINASTER. See Pinus.

PINGUICULA, Butterwort.

This plant is found growing upon bogs in many parts of England, but is never cultivated in gardens, so I shall pass it over with barely mentioning it.

PINUS. Tourn. Inst. R. H. 585. tab. 355. Raii Meth. Plant. 138. Lin. Gen. Plant. 956. The Pine-tree; in French, *Pin.*

The Characters are,

*The male flowers are collected in a scaly conical bunch; they have no petals, but many stamina, which are connected at their base, but divide at the top, terminated by erect summits; these are included in the scales, which supply the want of petals and empalement. The female flowers are collected in a common oval cone, and stand at a distance from the male on the same tree. Under each scale of the cone is produced two flowers, which have no petals, but a small germen supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes an oblong oval nut, crowned with a wing, included in the rigid scale of the cone.*

This genus of plants is ranged in the ninth section of Linnæus's twenty-fourth class, which includes the plants with male and female flowers on the same plant, whose stamina are joined in one body; to this genus he adds the Larix and Abies of Tournefort.

The Species are,

1. Pinus (*Sylvestris*) foliis geminis primordialibus solitariis glabris. Hort. Cliff. 450. *Pine-tree with two leaves in each sheath, but the first leaves are single.* Pinus sylvestris. C. B. P. 491. *The wild Pine, or Pineaster.*
2. Pinus (*Pinea*) foliis geminis primordialibus solitariis ciliatis. *Pine-tree with two gray leaves coming out of each sheath, and the first leaves single.* Pinus sativa. C. B. P. 490. *The cultivated Pine-tree, commonly called the Stone Pine.*
3. Pinus (*Rubra*) foliis geminis brevioribus glaucis, conis parvis mucronatis. *Pine-tree with two shorter gray leaves proceeding out of each sheath, and small acute-pointed cones.* Pinus sylvestris foliis brevibus glaucis, conis parvis albentibus. Raii Syn. 2. 288. *Wild Pine with shorter gray leaves, and small whitish cones, called Scotch Fir or Pine.*
4. Pinus (*Tartarica*) foliis geminis brevioribus latiusculis glaucis, conis minimis. *Pine-tree with two shorter broad leaves in each sheath which are gray, and the smallest cones, commonly called Tartarian Pine.*
5. Pinus (*Montana*) foliis sæpius ternis tenuioribus viridibus, conis pyramidatis, squamis obtusis. *Pine with three narrow green leaves often in each sheath, and pyramidal cones with blunt scales.* Pinus sylvestris montana altera. C. B. P. 421. *Another wild Mountain Pine, called Mugho.*
6. Pinus (*Cembro*) foliis quinis lævibus. H. Scan. 32. Lin. Sp. Plant. 1000. *Pine-tree with five smooth leaves in each sheath.* Pinus sylvestris montana tertia. C. B. P. 491. *The third wild Mountain Pine, called Cembro.*
7. Pinus (*Maritima*) foliis geminis longioribus glabris, conis longioribus tenuioribusque. *Pine-tree with two longer smooth leaves in each sheath, and longer narrower cones.* Pinus maritima secunda. Tabern. Icon. 937. *The second maritime Pine.*
8. Pinus (*Halepensis*) foliis geminis tenuissimis, conis obtusis, ramis patulis. Tab. 208. *Pine-tree with two narrow leaves in each sheath, obtuse cones, and spreading branches.* Pinus Halepensis, foliis tenuibus læte viridibus. Rand. Hort. Chelf. Cat. 158. *Aleppo Pine with very narrow dark green leaves.*
9. Pinus (*Virginiana*) foliis geminis brevioribus, conis ovis, squamis acutis. *Pine-tree with two shorter leaves in each sheath, and small cones with acute scales.* Pinus Virginiana foliis binis brevioribus & crassioribus setis, minori cono singulis squamarum capitibus aculeo donatis. Pluk. Alm. 297. *Virginian Pine with two shorter and thicker leaves in each sheath, and a smaller cone with each scale ending in a prickle, commonly called Jersey Pine.*
10. Pinus (*Rigida*) foliis ternis, conis longioribus squamis rigidioribus. *Pine-tree with three leaves, and longer cones having rigid scales, commonly called three-leaved Virginian Pine.*
11. Pinus (*Tæda*) foliis longioribus tenuioribus ternis, conis maximis laxis. *Pine-tree with three longer narrower leaves, and the largest loose cones.* Pinus Virginiana tenuifolia tripilis, sc. ternis plerumque ex uno foliculo setis strobilis majoribus Pluk. Alm. 297. *Virginian Pine-tree with three narrow leaves in each sheath, and larger cones, called the Frankincense-tree.*
12. Pinus (*Echinata*) Virginiana prælongis foliis tenuioribus; cono echinato gracili. Pluk. Alm. 297. *Virginian Pine with longer and narrower leaves, and a slender prickly cone, called three-leaved Bastard Pine.*
13. Pinus (*Strobus*) foliis quinis scabris. Lin. Sp. Plant. 1001. *Pine-tree with five rough leaves in each sheath, commonly called Lord Weymouth's Pine.*
14. Pinus (*Palustris*) foliis ternis longissimis. *Pine-tree with the longest leaves growing by threes out of each sheath.* Pinus Americana palustris trifolia, foliis longissimis. Du Hamel. *Three-leaved, Marsh, American Pine with the longest leaves.*

There are some other species of this genus in America, which have not been sufficiently examined to ascertain their differences; and it is probable some of the European kinds, which are now supposed to be only varieties of the sorts here enumerated, may be distinct species; but as I have had no opportunities of seeing them, so I have omitted them here.

The first sort here enumerated is the Pineaster, or wild Pine, which grows naturally in the mountains in Italy and the south of France, where there are forests of these trees, which, if suffered to stand, grow to a large size; but in Switzerland they are frequently cut into shingles for covering their houses, and also for making pitch; and in the south of France, the young trees are cut for stakes to support their Vines. This grows to a large size; the branches extend on every side to a considerable distance, and while the trees are young, they are fully garnished with leaves, especially where they are not so close as to exclude the air from those within; but as they advance in age, the branches appear naked, and all those which are situated below become unsightly after years, for which reason they have not been much in esteem of late; for as the wood of the Scotch Fir is much preferable to this, and the branches being generally better garnished with leaves, so the latter has been more generally propagated than the former. The branches of this sort grow at a wider distance than those of the Scotch Pine, and are more horizontal; the leaves are much larger, thicker, and longer, and grow strait, have a broad surface on their inside, which has a furrow or channel running longitudinally; they are of a darker green, and their points are obtuse. The cones of this are seven or eight inches long, pyramidal, and have pointed scales; the seeds are oblong, a little flatted on their sides, and have narrow wings on their tops.

The second sort, which is generally called the Stone Pine, is very common in Italy; but I much doubt of the country where it grows naturally, for so far as I have been able to learn, there are none of these trees growing in any part of Italy, but where they have been planted, or where the seeds have scattered from planted trees; and I have frequently received the seeds of a Pine from China, which were taken out of the cones so like those of this sort, as not to be distinguished from them; but these have never grown, either by their being too old, or from their having been taken out of the cones; for if the seeds of Pines are kept in the cones, they will grow at ten or twelve years

years old; but when they are out of the cones, they ſeldom grow well after two years, and ſome ſorts do not grow after one year. The leaves of this are not quite ſo long as thoſe of the former ſort, and are of a grayiſh or ſea-green colour; the cones are not more than five inches long, but are very thick, roundiſh, and end in an obtuſe point; the ſcales of the cones are flat, and the ſeeds are more than twice the ſize of thoſe of the former. The kernels of theſe are frequently ſerved up in deſerts to the table during the winter ſeaſon in Italy, and formerly they were uſed in medicine here, but of late years the Piſtachia nuts have been generally ſubſtituted in lieu of them. The wood of this tree is white, not ſo full of reſin as many of the other ſorts, ſo is never cultivated for its wood, but chiefly for the beauty of its leaves and for the nuts, which are much eſteemed in the ſouth of France and in Italy.

The third ſort is generally known here by the title of Scotch Pine, from its growing naturally in the mountains of Scotland, but it is common in moſt parts of Europe; and Monſ. du Hamel of the Royal Academy of Sciences at Paris, mentions his having received cones of this tree from St. Domingo in the Weſt-Indies, ſo concludes that it grows indifferently in torrid, frozen, and temperate zones. It is by John Bauhin titled, Pinus ſylveſtris Geneventis vulgaris; ſo that it grows commonly in the mountains near that city, and all through Denmark, Norway, and Sweden. The wood of this tree is the red or yellow deal, which is the moſt durable of any of the kinds yet known; the leaves of this tree are much ſhorter than thoſe of the former ſorts, and are broader, of a grayiſh colour, and twiſted, growing two out of each ſheath; the cones are ſmall, pyramidal, and end in narrow points; they are of a light colour, and the ſeeds are ſmall.

This ſort grows well upon almoſt every ſoil; I have planted numbers of the trees upon Peat-pits, where they have made great progreſs. I have alſo planted them in clay, where they have ſucceeded far beyond expectation; and upon ſand, gravel, and chalk, they likewiſe thrive as well; but as they do not grow near ſo faſt upon gravel and ſand as upon moiſt ground, ſo the wood is much preferable; for thoſe trees which have been cut down upon moiſt ſoils, where they have made the greateſt progreſs, when they have been ſawn out into boards, have not been valuable, the wood has been white and of a looſe texture; whereas thoſe which have grown upon dry gravelly ground, have proved nearly equal to the beſt foreign deals; and I doubt not but thoſe plantations which of late years have been made of theſe trees, will, in the next age, not only turn greatly to the advantage of their poſſeſſors, but alſo become a national benefit; therefore this is the ſort which I would recommend to be cultivated on barren lands.

The fourth ſort grows naturally in Tartary, from whence I received the ſeeds. This hath a great reſemblance to the Scotch Pine, but the leaves are broader, ſhorter, and their points are more obtuſe; they emit a ſtrong balſamic odour when bruiſed; the cones of this are very ſmall, as are alſo the ſeeds, ſome of which were black, and others white; but whether they are from different trees or the ſame, I could not learn; for the ſeeds were taken out of the cones, but in the parcel there was not one entire cone.

The fifth ſort grows naturally upon the mountains in Switzerland; this hath very narrow green leaves, which grow ſometimes by pairs, and at others there are three coming out of each ſheath; theſe generally ſtand erect; the cones are of a middle ſize and pyramidal; the ſcales are flat, having each a ſmall obtuſe riſing, but are very compact, till they are opened by the warmth of the ſun the ſecond ſpring. The ſeeds of this are much leſs than thoſe of the Pineaſter, but larger than thoſe of the Scotch Pine.

The ſixth ſort grows naturally in Switzerland, and is ſuppoſed to be the ſame as the Siberian, which I greatly doubt; for the cones of this are ſhort and roundiſh, and the ſcales are cloſe, whereas thoſe of the Siberian Pine are long and looſer; the leaves have a near reſemblance to each other, ſo far as I have obſerved in the ſpecimens; but the plants which have been raiſed from the Switzerland ſeeds, have made much greater progreſs than thoſe from the Siberian ſeeds, which can ſcarce be kept alive in England. The leaves are long and narrow, ſmooth to the touch, of a light green, and five of them come out from the ſame ſheath; the branches are cloſely garniſhed with them; the cones are about three inches long, and the ſcales are pretty cloſe; the ſeeds are pretty large, and their ſhells are eaſily broken.

The ſeventh ſort grows in the maritime parts of Italy and the ſouth of France; this hath long ſmooth leaves, growing by pairs in each ſheath; the cones are very long and ſlender; the ſeeds are about the ſize of thoſe of the Pineaſter.

The eighth ſort grows naturally near Aleppo, and in ſeveral other parts of Syria. This is a tree of middling growth in its native ſoil, and in England there are none of any large ſize, for moſt of the plants which were growing here before the year 1740, were killed by the froſt that ſevere winter; the two largeſt which I have ſeen are growing at Goodwood in Suſſex, the ſeat of his Grace the Duke of Richmond; theſe had been tranſplanted thither the year before, ſo had ſcarce recovered their removal, and had made no ſhoots that ſummer, therefore eſcaped much better than thoſe plants which were in great vigour, moſt of which were deſtroyed. This tree branches out on every ſide near the root; the branches at firſt grow horizontally, but turn their ends upward; their bark is ſmooth, and of a dark gray colour. The leaves are long and very narrow, of a dark green, and grow by pairs in each ſheath; if they are bruiſed, they emit a ſtrong reſinous odour. The cones come out from the ſide of the branches; they are not much more than half the length of thoſe of the Pineaſter, but are full as large at their baſe; the ſcales are flatted, and and the point of the cone obtuſe. The ſeeds are much leſs than thoſe of the Pineaſter, but of the ſame ſhape.

The ninth ſort grows naturally in moſt parts of North America; this never riſes to any great height, and is the leaſt eſteemed in the country of all the ſorts. While the plants are young, they make a pretty good appearance; but when they get to the height of ſeven or eight feet, they become ragged and unſightly, ſo are not worth cultivating.

The tenth ſort grows naturally in Virginia, and other parts of North America, where it riſes to a great height; and ſo far as we can judge by the growth of thoſe trees which are now here, it ſeems likely to become a large tree in England. There are many of them now growing in the noble plantation of evergreen trees in his Grace the Duke of Bedford's park at Wooburn, which are twenty feet high, though not of many years ſtanding, and keep pace with the other kinds of Pines and Firs in the ſame plantation. The leaves of this are long, three generally ſtanding in each ſheath; the cones of this ſort come out in cluſters round the branches; they are as long as the cones of the Pineaſter, and have rigid ſcales; the ſeeds are winged, and nearly as large as thoſe of the Pineaſter.

The eleventh ſort grows naturally in North America; this hath very long narrow leaves, growing by threes out of each ſheath; the cones are as large as thoſe of the Stone Pine, but the ſcales are looſer, and the cones more pointed. The ſcales of this open horizontally, and diſcharge the ſeeds. This ſort was ſent over from America to Mr. Ball of Exeter, and alſo to Dr. Compton Biſhop of London, by the title of Frankincenſe Pine.

The twelfth ſort grows naturally in Virginia; the cones of this have been brought to England of late years, by the title of Baſtard three-leaved Pine. The leaves of this ſort are long and narrow; ſometimes there are three growing in each ſheath, and at others but two; the cones are long, ſlender, and their ſcales terminate in ſharp points; they are rather longer than thoſe of the Pineaſter, and not ſo thick.

The

The thirteenth ſort grows naturally in moſt parts of North America, where it is called the white Pine. It is one of the talleſt trees of all the ſpecies, often growing a hundred feet high in thoſe countries, as I have been credibly informed; the bark of this tree is very ſmooth and delicate, eſpecially when young; the leaves are long and ſlender, five growing out of each ſheath; the branches are pretty cloſely garniſhed with them, ſo make a fine appearance; the cones are long, ſlender, and very looſe, opening with the firſt warmth of the ſpring, ſo that if they are not gathered in winter, the ſcales open and let out the ſeeds. The wood of this ſort is eſteemed for making maſts for ſhips; it is in England titled Lord Weymouth's, or New England Pine. As the wood of this tree was generally thought of great ſervice to the navy, there was a law made in the ninth year of Queen Anne for the preſervation of the trees, and to encourage their growth in America; and it is within forty years paſt theſe trees began to be propagated in England in any plenty, though there were ſome large trees of this ſort growing in two or three places long before, particularly at Lord Weymouth's, and Sir Wyndham Knatchbull's in Kent; and it has been chiefly from the ſeeds of the latter, that the much greater number of theſe trees now in England have been raiſed; for although there has annually been ſome of the ſeeds brought from America, yet theſe have been few in compariſon to the produce of the trees in Kent; and many of the trees which have been raiſed from the ſeeds of thoſe trees, now produce plenty of good ſeeds, particularly thoſe in the gardens of his late Grace the Duke of Argyle at Whitton, which annually produce large quantities of cones, which his Grace did moſt generouſly diſtribute to all the curious.

This ſort and the Scotch Pine, are the beſt worth cultivating of all the kinds for the ſake of their wood; the others may be planted for variety in parks, &c. where they make a good appearance in winter, when other trees are deſtitute of leaves.

All the ſorts of Pines are propagated by ſeeds, which are produced in hard woody cones; the way to get out their ſeeds is to lay the cones before a gentle fire, which will cauſe the cells to open, and then the ſeeds may be eaſily taken out. If the cones are kept entire, the ſeeds will remain good for ſome years; ſo that the ſureſt way to preſerve them, is to let them remain in the cones until the time for ſowing the ſeeds; if the cones are kept in a warm place in ſummer, they will open, and emit the ſeeds; but if they are not expoſed to much heat, they will remain entire ſome years, eſpecially thoſe which are cloſe and compact; and the ſeeds which have been taken out of Cones of ſeven years old, have grown very well, ſo that theſe may be tranſported to any diſtance, provided the cones are well ripened and properly put up.

The beſt time for ſowing the ſeeds of Pines is about the end of March, and when the ſeeds are ſown, the place ſhould be covered with nets to keep off birds, otherwiſe, when the plants begin to appear with the huſk of the ſeed on their tops, the birds will pick off the heads of the plants and deſtroy them.

Where the quantity of ſeeds to be ſown is not great, it will be a good way to ſow them either in boxes or pots, filled with light loamy earth, which may be removed from one ſituation to another, according to the ſeaſon of the year; but if there is a large quantity of the ſeeds, ſo as to require a good ſpace to receive them, they ſhould be ſown on an Eaſt or North-eaſt border, where they may be ſcreened from the ſun, whoſe heat is very injurious to theſe plants at their firſt appearance above ground. Thoſe ſeeds which are ſown in pots or boxes, ſhould alſo be placed in a ſhady ſituation, but not under trees; and if they are ſcreened from the ſun with mats at the time when the plants firſt come up, it will be a good method to preſerve them.

Moſt of the ſorts will come up in about ſix or ſeven weeks after they are ſown, but the ſeeds of the Stone or cultivated Pine, and two or three of the others, whoſe ſhells are very hard, frequently lie in the ground a whole year; ſo that when the plants do not come up the firſt year, the ground ſhould not be diſturbed, but kept clean from weeds, and the following ſpring the plants will riſe. This frequently happens in dry ſeaſons, and when they are ſown in places a little too much expoſed to the ſun. Therefore the ſureſt method is, to ſoak the ſeeds in water twenty-four hours before they are ſown.

When the plants appear, they muſt be conſtantly kept clean from weeds; and in very dry ſeaſons, if they are now and then gently refreſhed with water, it will forward their growth; but this muſt be done with great care and caution, for if they are haſtily watered, it will waſh the tender plants out of the ground, or lay them down flat, which often rots their ſhanks; and when this is too often repeated, it will have the ſame effect; ſo that unleſs it is judiciouſly performed, it will be the beſt way to give them none, but only ſcreen them from the ſun.

If the plants come up too cloſe, it will be a good method to thin them gently about the beginning of July. The plants which are drawn up may then be planted on other beds which ſhould be prepared ready to receive them, for they ſhould be immediately planted as they are drawn up, becauſe their tender roots are ſoon dried and ſpoiled at this ſeaſon of the year. This work ſhould be done (if poſſible) in cloudy or rainy weather, and then the plants will draw out with better roots, and will ſoon put out new fibres again; but if the weather ſhould prove clear and dry, the plants ſhould be ſhaded every day from the ſun with mats, and now and then gently refreſhed with water. In drawing up the plants, there ſhould be great care taken not to diſturb the roots of the plants left remaining in the ſeed-beds, &c. ſo that if the ground be hard, the beds ſhould be well watered ſome time before the plants are thinned, to ſoften and looſen the earth; and if after the plants are drawn out, the beds are again gently watered to ſettle the earth to the roots of the remaining plants, it will be of great ſervice to them, but it muſt be done with great care, ſo as not to waſh out their roots, or lay down the plants. The diſtance which ſhould be allowed theſe plants in the new beds, is four or five inches row from row, and three inches in the rows.

In theſe beds the plants may remain till the ſpring twelve months after, by which time they will be fit to tranſplant where they are to remain for good, for the younger the plants are when planted out, the better they will ſucceed; for although ſome ſorts will bear tranſplanting at a much greater age, yet young plants planted at the ſame time will in a few years overtake the large ones, and ſoon outſtrip them in their growth; and there is an advantage in planting young, by ſaving the expence of ſtaking, and much watering, which large plants require. I have ſeveral times ſeen plantations of ſeveral ſorts of Pines, which were made of plants ſix or ſeven feet high, and at the ſame time others of one foot high planted between them, which in ten years were better trees than the old ones, and much more vigorous in their growth; but if the ground where they are deſigned to remain cannot be prepared by the time before-mentioned, the plants ſhould be planted out of the beds into a nurſery, where they may remain two years, but not longer; for it will be very hazardous removing theſe trees at a greater age.

The beſt ſeaſon to tranſplant all the ſorts of Pines is about the latter end of March or the beginning of April, juſt before they begin to ſhoot; for although the Scotch Pine, and ſome of the moſt hardy ſorts, may be tranſplanted in winter, eſpecially when they are growing in ſtrong land, where they may be taken with balls of earth to their roots; yet this is what I would not adviſe for common practice, having frequently ſeen it attended with bad conſequences, but thoſe which are removed in the ſpring rarely fail.

Where theſe trees are planted in expoſed ſituations, they ſhould be put pretty cloſe together, that they may

shelter each other; and when they have grown a few years, part of the plants may be cut down to give room for the others to grow; but this must be gradually performed, lest by too much opening the plantation at once, the air should be let in among the remaining trees with too great violence, which will stop their growth.

Although these Evergreen-trees are by many persons despised on account of their dark green in summer, yet a proper mixture of these in large clumps make a fine appearance about a seat in winter, and in summer, by their contrast with other trees, have no bad effect in diversifying the scene.

Wherever large plantations are designed to be made, the best method will be to raise the plants either upon a part of the same land, or as near to the place as possible, and also upon the same sort of soil: a small piece of ground will be sufficient to raise plants enough for many acres, but, as the plants require some care in their first raising, if the neighbouring cottagers, who have many of them small inclosures adjoining to their cottages, or where this is wanting, a small inclosure should be made them for the purpose of raising the plants, and they are furnished with the seeds and directions for sowing them, and managing the young plants till they are fit for transplanting, the women and children may be usefully employed in this work; and the proprietors of land agreeing with them to take their plants when raised at a certain price, it would be a great benefit to the poor; and hereby they would be engaged to have a regard for the plantations when made, and prevent their being destroyed. The Scotch Pine, as was before observed, being the hardiest of all the kinds, and the wood of it the most useful, is the sort which best deserves care. This will thrive upon the most barren sands, where scarce any thing else except Heath and Furze will grow; so that there are many thousand acres of such land lying convenient for water carriage, which at present is of little benefit to any body, that might, by plantations of these trees, become good estates to their proprietors, and also a national benefit; and as the legislature have taken this into their consideration, and already passed some laws for the encouraging these plantations, as also for their preservation and security, so it may be hoped that this will be undertaken by the gentlemen who are possessed of such lands in all the different parts of the kingdom with proper spirit; for although they may not expect to receive much profit from these plantations in their own time, yet their successors may with large interest; and the pleasure which those growing trees will afford them, by beautifying the present dreary parts of the country, will in some measure recompense them for their trouble and expence; and by creating employment for the poor, lessen those rates which are now so high in many parts of England as scarce to be borne.

The expence of making these plantations is what most people are afraid of, so would not engage in it; but the greatest of the expence is that of fencing them from the cattle, &c. for the other is trifling, as there will be no necessity for preparing the ground to receive the plants; and the charge of planting an acre of land with these plants will not be more than twenty or thirty shillings where labour is dear, exclusive of the plants, which may be valued at forty shillings more. I have planted many acres of land with these trees, which was covered with Heath and Furze, and have only dug holes between to put in the plants, and afterward laid the Heath or Furze which was cut, upon the surface of the ground about their roots, to prevent the ground drying, and few of the plants have failed. These plants were most of them four years old from seed, nor was there any care taken to clean the ground afterward, but the whole left to shift, and in five or six years the Pines have grown so well as to overpower the Heath and Furze, and destroy it.

The distance which I have generally planted these plants in all large open situations was about four feet, but always irregular, avoiding planting in rows as much as possible; and in the planting, the great care is not to take up the plants faster than they can be planted, so that some men have been employed in digging up the plants while others were planting. Those who take up the plants must be looked after, to see they do not tear off their roots or wound their bark; and as fast as they are taken up, their roots should be covered to prevent their drying, and put into their new quarters as soon as possible. In planting them, care should be had to make the holes large enough for their roots, as also to loosen and break the clods of earth, and put the finest immediately about their roots, then to settle the earth gently with the foot to the roots of the plant. If these things are duly observed, and a proper season chosen for performing it, there will be very little hazard of their succeeding; but I have seen some plantations made with plants which were brought from a great distance, and had been so closely packed up as to cause a heat, whereby most of the plants within had their leaves changed yellow, and few of them have grown, which has discouraged others from planting, not knowing the true cause of their failure.

After the plantations are made, the only care they require for five or six years will be to secure the plants from cattle, hares, and rabbits; for if these are admitted to them, they will make great destruction in a short time; for if the branches are gnawed by hares or rabbits, it will greatly retard the growth of the plants, if not destroy them.

In about five or six years after planting, the branches of the young trees will have met, and begin to interfere with each other; therefore they will require a little pruning, but this must be done with great caution. The lower tier of branches only should be cut off; this should be performed in September, at which time there will be no danger of the wounds bleeding too much, and the turpentine will harden over the wounds as the season grows cold, so will prevent the wet from penetrating the wounds. These branches should be cut off close to the stem of the plants, and care should be taken in doing this not to break any of the remaining branches of the young trees. This work should be repeated every other year, at each time taking off only the lower tier of branches; for if the plants are much trimmed, it will greatly retard their growth, as it does in general that of all trees; but as these trees never put out any new shoots where they are pruned, so they suffer more from amputation than those which do.

In those parts of France where they have forests of these trees, the proprietors always give the faggots to those, who prune their young trees first, for their labour, so it costs them no money. At the second pruning the proprietor has one-third of the faggots, and the dressers have the other two for their work, and afterward the faggots are equally divided between the workmen and proprietors, but there must be great care taken that they do not cut off more than should be.

In about twelve or fourteen years these will require no more pruning, for their upper branches will kill those below where they have not air; but soon after this, if the plants have made good progress, it may be necessary to thin them; but this should be gradually performed, beginning in the middle of the plantation first, leaving the outside close to screen those within from the cold, so by degrees coming to them at last, whereby those which were first thinned will have had time to get strength, so will not be in danger of suffering from the admission of cold air. When these plantations are thinned, the trees should not be dug up, but their stems cut off close to the ground, for their roots never shoot again, but decay in the earth, so there can no harm arise by leaving them, and hereby the roots of the remaining plants are not injured. The trees which are now cut will be fit for many purposes; those which are strait will make good putlocks for the bricklayers, and serve for scaffolding poles, so that there may be as much made by the

sale

ſale of theſe, as will defray the whole expence of the planting, and probably intereſt for the money into the bargain.

As the upright growth of theſe trees renders their wood the more valuable, they ſhould be left pretty cloſe together, whereby they will draw each other up, and grow very tall. I have ſeen ſome of theſe trees growing, whoſe naked ſtems have been more than ſeventy feet high, and as ſtrait as a walking-cane, and from one of theſe trees there were as many boards ſawed, as laid the floor of a room near twenty feet ſquare. If theſe trees are left eight feet aſunder each way, it will be ſufficient room for their growth; therefore if at the firſt thinning a fourth part of the trees are taken away, the other may ſtand twelve or fourteen years longer, by which time they will be of a ſize for making ladders and ſtandards for ſcaffolding, and many other purpoſes; ſo that from this ſale as much may be made, as not only to pay the remaining part of the expence of planting, if any ſhould be wanting in the firſt, but rent for the land with intereſt, and the ſtanding trees for the fortunes of younger children. This may be demonſtrated by figures, and there has been ſeveral examples of late years, where the profits have greatly exceeded what is here mentioned.

The fifth ſort is called in Switzerland Torch Pine; the peaſants there make uſe of the wood of this tree inſtead of torches for burning. This tree grows to a great height in its native ſoil, and is well furniſhed with branches. The wood is pretty full of reſin, and when firſt cut is of a reddiſh colour; this is uſed by the inhabitants in their buildings.

The ſixth ſort of Pine makes but ſlow progreſs in England, unleſs upon the ſummits of the northern mountains, where upon the peaty moors, this and the Siberian Pine are likely to ſucceed much better than in any other part of Britain, for they naturally grow among ſnow.

The eighth ſort is never a large tree in its native country, and in England it grows more like a ſhrub than a tree, and is often greatly injured by cold in winter, and by ſevere froſts ſometimes killed, ſo that this is only kept for the ſake of variety in the Engliſh gardens.

The ninth and tenth ſorts are uſed indifferently by the inhabitants of North America for their buildings, and the ſame purpoſes as the other ſorts of Pine.

There are ſome varieties of theſe in America, if they are not diſtinct ſpecies. Some of them ripen their cones the firſt year, but others are two years, and ſome three before they are ripe; but as theſe have not been well diſtinguiſhed by thoſe who reſide in that country, and there are few of the ſorts ſo large in England as to produce cones, ſo their differences can not as yet be aſcertained.

The eleventh and twelfth ſorts I believe are indifferently called red Pine in North America, where their wood is greatly eſteemed; the French at Canada have built a ſixty-gun ſhip entirely of this wood, called the Saint Laurent. I have had had a little of this wood from America, which was very like that of the Scotch Pine, but had rather more reſin. It may not be amiſs to make trial of ſome of theſe ſorts in plantations, to ſee which of them may deſerve to be propagated; for in ſome places where they are growing they thrive very well, but theſe will not ſucceed ſo well on dry land as on moiſt.

The thirteenth ſort is called the white Pine in moſt parts of North America; of this I believe there are two varieties, if not diſtinct ſpecies; but as they have not been well examined by perſons of ſkill, we cannot take upon us to determine this, for Monſieur Gaultier's deſcription of one ſpecies is very different from that of the Weymouth Pine, and yet he has applied the title of white Pine to both.

This ſort deſerves to be propagated for its beauty, which is ſuperior to all the ſorts of Pines yet known in England. The bark of the young trees and the branches are perfectly ſmooth; the branches are well garniſhed with leaves, which are long, and of an agreeable green, ſo that in ſummer they have a beauty, and in winter they make a better appearance than any of the ſorts. The wood of this tree is very uſeful, eſpecially for maſts of ſhips, as the trees grow very tall and ſtrait, and are pliable, ſo do not break with the wind, therefore the legiſlature thought proper to paſs a law for the preſervation and increaſe of theſe trees in America; but as theſe trees will thrive in England, they may be propagated in many places where the ſoil is proper for them. This ſort grows beſt upon a moiſt light ſoil, but it ſhould not be too wet; it will alſo thrive on a loamy ſoil, if it is not too much approaching to clay. The ſeeds of this ſort ſhould be ſown with a little more care than thoſe of the Scotch Pine, becauſe their ſtems are not ſo ſtrong, therefore are more apt to go off while young; ſo if theſe are ſown in the full ground, the bed ſhould be ſcreened with mats from the ſun every day, but expoſed to the dews every night. When the plants come up, they ſhould be treated in the ſame way as is before directed for the Scotch Pine; and if all the plants of this kind are tranſplanted into beds in July, it will be a ſecure way to preſerve them; but as theſe plants will grow faſter than thoſe of the Scotch Pine, they ſhould be planted farther aſunder; their rows ſhould be ſix inches diſtant, and in the rows they ſhould be four inches apart. This will allow them room to grow till the ſpring twelvemonth following, when they may be either tranſplanted where they are to remain, or into a nurſery, where they may ſtand two years to get ſtrength; but the ſooner they are planted where they are to ſtand, the leſs danger there will be of their ſucceeding, and the larger they will grow; for although they will bear tranſplanting at a greater age, yet when they are planted young, they will make much greater progreſs, and grow to a greater ſize.

The ſoil in which this ſort of tree thrives beſt is a ſoft hazel loam, not too wet, in which I have frequently meaſured ſhoots of one year, which were two feet and a half long, and have for ſome years continued growing ſo much: they ſhould have a ſheltered ſituation, for I have obſerved where the trees have been much expoſed to the South-weſt winds, they have not made near ſo great a progreſs as thoſe which grew in ſhelter; and where there have been plantations of theſe trees, thoſe on the outſide have not kept pace with the middle, nor have their leaves retained their verdure ſo well.

The fourteenth ſort grows naturally on ſwamps in many parts of North America, where I have been informed they grow to the height of twenty-five or thirty feet. Their leaves are a foot or more in length, growing in tufts at the end of the branches, ſo have a ſingular appearance, but I have not heard the wood was of any uſe but for fuel; and there are few places here where theſe plants do well, for in very ſevere froſts their leading ſhoots are often killed, and in dry ground they will not thrive; ſo that unleſs the ſoil is adapted for them, it is to little purpoſe planting them.

From the wild Pine or Pineaſter is procured the common turpentine, which is chiefly uſed by the farriers, and from it is diſtilled the oil of turpentine. The finer and more valuable part, which comes firſt, is called the ſpirit, what is left at the bottom of the ſtill is the common reſin.

The kernels of the nuts of the manured or Stone Pine are of a balſamic nouriſhing nature, good for conſumptions, coughs, and hoarſeneſs, reſtorative, and of ſervice after long illneſs.

PIPER. Lin. Gen. Plant. 42. Saururus. Plum. Nov. Gen. 51. tab. 12. Pepper, or Lizard's-tail.

The CHARACTERS are,

*The flowers are cloſely faſtened to a ſingle ſtalk, and have no compleat ſheath; theſe have no petals nor ſtamina, but have two ſummits oppoſite to the root of the germen, which are roundiſh; they have a large oval germen, but no ſtyle, crowned by a prickly triple ſtigma. The germen afterward*

*afterward becomes a roundiſh berry with one cell, containing one globular ſeed.*

This genus of plants is ranged in the third ſection of Linnæus's ſecond claſs, which includes thoſe plants whoſe flowers have two male, and three female parts of generation.

The Species are,

1. Piper (*Obtuſifolium*) foliis obovatis enerviis. Lin. Sp. Plant. 30. *Pepper with obverſe oval leaves having no veins.* Saururus humilis, folio carnoſo, ſubrotundo. Plum. Cat. 51. *Low Lizard's-tail with a fleſhy roundiſh leaf.*
2. Piper (*Pelucidum*) foliis cordatis petiolatis, caule herbaceo. Lin. Sp. Plant. 30. *Pepper with heart-ſhaped leaves having foot-ſtalks, and an herbaceous ſtalk.* Piper foliis cordatis, caule procumbente. Hort. Cliff. 6. tab. 4. *Pepper with heart-ſhaped leaves and a trailing ſtalk.*
3. Piper (*Amalago*) folis lanceolato-ovatis quinquenerviis rugoſis. Lin. Sp. Plant. 29. *Pepper with rough, oval, ſpear-ſhaped leaves having five veins.* Saururus foliis lanceolato-ovatis quinquenervis rugoſis. Hort. Cliff. 140. *Lizard's-tail with rough, ſpear-ſhaped, oval leaves, having five veins.*
4. Piper (*Humilis*) foliis lanceolatis nervoſis rigidis ſeſſilibus. *Pepper with ſtiff, ſpear-ſhaped, veined leaves ſitting cloſe to the branches.* Piper longum humilius, fructu è ſummitate caulis prodeunte. Sloan. Cat. Jam. 45. *Dwarf long Pepper, with the fruit coming out at the end of the ſtalk.*
5. Piper (*Peltatum*) foliis peltatis orbiculato-cordatis obtuſis repandis, ſpicis umbellatis. Lin. Sp. Plant. 30. *Pepper with target-formed leaves which are orbicular, heart-ſhaped, obtuſe, recurved, and have ſpikes growing in umbels.* Saururus arboreſcens, foliis amplis, rotundis & umbilicatis. Plum. Cat. 51. *Tree Lizard's-tail with large, round, navel-ſhaped leaves.*
6. Piper (*Laurifolia*) foliis lanceolato-ovatis nervoſis, ſpicis brevibus. *Pepper with ſpear-ſhaped, oval, veined leaves, and ſhort ſpikes.* Saururus fruteſcens, laurocerasi folio, fructu breviore & craſſiore. Houſt. MSS. *Shrubby Lizard's-tail with a Laurel leaf, and a ſhorter thicker fruit.*
7. Piper (*Tomentoſum*) foliis ovato-lanceolatis tomentoſis, caule arboreſcente. *Pepper with oval, ſpear-ſhaped, woolly leaves, and a tree-like ſtalk.* Saururus arboreſcens latifolia, villoſa fructu gracili. Houſt. MSS. *Broad-leaved, tree-like, hairy Lizard's-tail, with a ſlender fruit.*
8. Piper (*Aduncum*) foliis ovato-lanceolatis, nervis alternis, ſpicis uncinatis. Lin. Sp. Plant. 29. *Pepper with oval ſpear-ſhaped leaves, having alternate veins and crooked ſpikes.* Saururus arboreſcens fructu adunco. Plum. Cat. 51. *Lizard's-tail with a crooked fruit.*
9. Piper (*Decumanum*) foliis cordato-ovatis nervoſis acuminatis, ſpicis reflexis. *Pepper with oval, heart-ſhaped, nerved, acute-pointed leaves, and reflexed ſpikes.* Saururus fruteſcens plantaginis folio ampliore, fructu breviore & graciliore adunco. Houſt. MSS. *Shrubby Lizard's-tail with a larger Plantain leaf, and a ſhorter and ſlenderer crooked ſpike.*
10. Piper (*Siriboa*) foliis cordatis ſubſeptinerviis venoſis. Flor. Zeyl. 29. *Pepper with heart-ſhaped leaves, which are veined, and have almoſt ſeven nerves.*
11. Piper (*Reticulatum*) foliis cordatis ſeptemnervis reticulatis. Lin. Sp. Plant. 29. *Pepper with heart-ſhaped netted leaves having ſeven veins.* Saururus botryoites major, foliis plantaginis. Plum. Cat. 51. *Greater Lizard's-tail with Plantain leaves.*
12. Piper (*Glabrum*) foliis ovato-lanceolatis acuminatis glabris trinerviis. *Pepper with oval, ſpear-ſhaped, acute-pointed, ſmooth leaves, having three veins.* Saururus racemoſus, ſeu botryides minor. Plum. Cat. 51. *Small branching, or cluſtered Lizard's-tail.*
13. Piper (*Racemoſum*) foliis lanceolato-ovatis rugoſis, nervis alternis. *Pepper with ſpear-ſhaped, oval, rough leaves, having alternate veins.* Saururus racemoſus, ſeu botryites major. Plum. Cat. 51. *Greater branching, or cluſtered Lizard's-tail.*

The firſt ſort grows naturally in many of the iſlands in the Weſt Indies. This ſends out from the root many ſucculent herbaceous ſtalks almoſt as large as a man's little finger; they are jointed, and divide into many branches, never riſing above a foot high, but generally ſpread near the ground, putting out roots at each joint, ſo propagate very faſt, and ſoon cover a large ſpace of ground. The leaves are very thick and ſucculent; they are about three inches long and two broad, very ſmooth and entire. The foot-ſtalk, which ſuſtains the ſpike or tail, comes out at the end of the branches; this is alſo very ſucculent, and the whole length, including the ſpike, is about ſeven inches. The ſpike is ſtrait, erect, and about the ſize of a gooſe-quill, cloſely covered with ſmall flowers which require a glaſs to be diſtinguiſhed, ſo have no beauty; but the whole ſpike much reſembles the tail of a lizard, for which Plumier gave it that title.

Theſe ſpikes appear great part of the year, but they rarely have any ſeeds in England; the plants increaſe very faſt by their ſtalks, which put out roots. It requires a warm ſtove to preſerve it in England, and ſhould have but little wet, eſpecially in winter. If the plants are plunged into the tan-bed in the ſtove, the ſtalks will put out roots into the tan, ſo may be cut off to make new plants.

The ſecond ſort grows naturally in the Weſt-Indies; this is annual. The ſtalks are herbaceous and ſucculent; they riſe about ſeven or eight inches high; the leaves are heart-ſhaped, an inch and a half long, and three quarters of an inch broad; the ſpikes of flowers come out at the end of the ſtalks; they are ſlender, about an inch long, and ſtrait; the flowers are very ſmall, and ſit cloſe to the foot-ſtalk. Theſe appear in July, and are ſucceeded by very ſmall berries, each containing a ſmall ſeed like duſt. If theſe ſeeds are permitted to ſcatter on the pots near it, the plants will come up without trouble; or if the ſeeds are ſaved, and ſown upon a hot-bed in the ſpring, the plants will riſe eaſily. Theſe ſhould be tranſplanted into ſeparate pots, and plunged into a hot-bed of tanners bark, treating them in the ſame way as other tender plants, but they ſhould not have much wet.

The third ſort grows naturally in Jamaica and Barbadoes. This hath ſeveral crooked ſtems, which riſe to the height of twelve or fourteen feet, which are jointed, hollow, and pithy; theſe divide into many ſmall branches, which are garniſhed with ſpear-ſhaped oval leaves about three inches and a half long, and one and a half broad; they are rough, and have five longitudinal veins. The ſpikes come out at the end of the branches; they are ſlender, and about three inches long; theſe have many ſmall flowers ſitting cloſe to the foot-ſtalk, which are ſucceeded by ſmall berries.

The fourth ſort grows naturally in Jamaica. The ſtalks of this are ſlender, and frequently trail upon the ground, putting roots out from their joints like the firſt; they are garniſhed with ſtiff ſpear-ſhaped leaves five inches long, and two broad in the middle, drawing to a point at each end; they have one ſtrong midrib, and on the backſide have ſeveral veins running from that to the ſides. The ſpike of flowers is very ſlender, and about five inches long, ſhaped like thoſe of the former ſorts.

The fifth ſort grows naturally in Jamaica; this hath a pretty thick ſpongy ſtalk, which riſes fifteen feet high, dividing into ſeveral branches which are jointed, and pithy; the leaves are almoſt round; the foot-ſtalk is faſtened to the under ſide, ſo that the upper ſurface has a mark like a navel where the ſtalk joins, and from that center run out the veins to the ſide. The leaves are about a foot diameter; their lower part is indented like a heart, but the other part is round, and the ſtalk being fixed toward the middle, the leaves have the appearance of a target. The ſpikes are ſmall, and grow in form of an umbel.

The ſixth ſort grows naturally at La Vera Cruz in America. This hath ſhrubby jointed ſtalks which riſe nine or ten feet high, dividing into ſmaller branches, which are garniſhed with ſpear-ſhaped oval leaves ſeven inches long, and three broad, ending

in acute points; they are veined and rough, of the same consistence with Laurel leaves. The spikes of flowers come out from the side of the branch at the joints, opposite to the leaves; they are not more than one inch and a half long, about the thickness of a small quill, and are closely set with flowers like the other sorts.

The seventh sort was discovered by the late Dr. Houstoun growing naturally at La Vera Cruz. This hath hollow pithy stalks, which rise twelve or fourteen feet high, dividing into many crooked branches having swelling joints, which are garnished with oval spear-shaped leaves, about five inches long and three broad, having many veins, and are covered with a woolly down. The spikes of flowers come out from the side of the branches opposite to the leaves; they are slender, and about three inches long, turning downward.

The eighth sort grows naturally in Jamaica; this hath many hollow stalks, which rise about five feet high; the joints are pretty close and protuberant; these divide into smaller branches, which are garnished with oval spear-shaped leaves, seven inches long and three broad in the middle; they are rough and veined, the veins coming out alternately from the midrib, diverging to the sides, and join the borders of the leaf at the top. The spikes of flowers come out from the side of the branches, opposite to the leaves; they are slender, five inches long, and are incurved; these are closely set with small flowers their whole length. This is called Spanish Elder in the West-Indies.

The ninth sort was sent me from Carthagena by the late Dr. William Houstoun; this rises with several shrubby stalks fifteen feet high, dividing into many slender branches with protuberant joints, which are garnished with heart-shaped oval leaves, five inches long and three broad, ending in acute points; they are smooth, and at their base have five veins, but the two outer join the borders of the leaves soon; the other three run to the top, the middle one in a right line; the two side veins diverge, and join together at the top; the leaves are of a dark green on their upper side, but pale on their under. The spikes of flowers come out from the side of the branches; they are extremely slender, an inch and a half long, and are reflexed at the end like a scorpion's tail.

The tenth sort was sent me by Mr. Robert Millar from Panama, near which place it grows naturally. This hath hollow shrubby stalks which rise about four feet high, and divide into many small branches, which are garnished with heart-shaped leaves about five inches long, and four broad near their base, ending in long acute points; these have seven veins at their base, but the two outer soon diverge to the borders of the leaves, and unite with them; the other five are extended almost to the length of the leaves, diverging from the midrib toward the sides, and unite toward the top. The spikes come out from the side of the branches; they are slender, and about four inches long, bending in the middle like a bow, and are closely set with small herbaceous flowers, which are succeeded by small berries, inclosing a small single seed.

The eleventh sort grows naturally in Jamaica; this rises with a shrubby pithy stalk about five feet high, sending out several side branches which have protuberant joints, and are garnished with heart-shaped leaves six inches long and five broad near their base. They have five veins which arise from the foot-stalk, the middle one going in a direct line to the point; the two side veins diverge toward the edges of the leaves in the middle, but approach again at the top; the surface of the leaves is full of small veins, which form a sort of net-work. The spikes come out from the side of the branches opposite to the leaves; they are slender, and about five inches long, a little bending in the middle, and are closely set with very small herbaceous flowers.

The twelfth sort grows naturally at Campeachy, from whence it was sent me by the late Dr. Houstoun. This hath many shrubby stalks which rise about ten feet high, and divide into several crooked branches toward the top, which have swelling joints, and are garnished with oval spear-shaped leaves near four inches long, and two and a half broad, terminating in acute points; they are smooth, of a lucid green, and have three large veins running longitudinally; the middle or midrib being strait, the two outer diverging toward the sides in the middle of the leaf, but are drawn together again at the point. The spikes come out from the side of the stalks opposite to the leaves; they are pretty long, slender, and a little incurved. The flowers and seeds are like the other species.

The thirteenth sort grows naturally at Campeachy; this hath a shrubby stalk, which rises ten or twelve feet high, dividing toward the top into a great number of small branches, which are hollow, and have protuberant joints; they are garnished with spear-shaped, oval, rough leaves, about five inches long, and two inches and a half broad; some of them have long, and others very short foot-stalks; they are of a deep green on their upper side, but pale on their under, ending in acute points. The spikes come out from the side of the stalks, opposite to the leaves; they are long and slender, and are closely set with very small flowers like the other species.

The eleven last-mentioned sorts are abiding plants, which require a warm stove to preserve them in England. They may be propagated by seeds, if they can be procured fresh from the countries where the plants grow naturally; these should be sown upon a good hot-bed in the spring, and when the plants come up and are fit to transplant, they should be each put into a separate small pot filled with light fresh earth, and plunged into a hot-bed of tanners bark, shading them every day from the sun till they have taken fresh root; then they must be treated in the same way as other tender exotic plants, admitting fresh air to them daily in proportion to the warmth of the season, to prevent their drawing up weak; and when the nights are cold, the glasses of the hot-bed should be covered with mats to keep them warm. As the stalks of most of these plants are tender when young, so they should not have much wet, which would rot them; and when water is given to them it must be with caution, not to beat down the plants; for when that is done, they seldom rise again.

In autumn the plants must be plunged into the tan-bed of the bark-stove, and during the winter they must be sparingly watered; they require the same warmth as the Coffee-tree. In the summer they require a large share of fresh air in hot weather, but they must be constantly kept in the stove, for they are too tender to bear the inclemency of our weather in summer.

PISCIDIA. Lin. Gen. 856. Piscipula. Loefl. It. 275.

The Characters are,

*The flower is of the butterfly kind; the empalement is of one leaf, indented in five parts; the standard is rising, and indented at the end; the wings are as long as the standard, the keel is moon-shaped and rising. It hath ten stamina covered with a sheath at bottom, which opens at the top; these are terminated by oblong summits: the germen is linear and compressed, supporting a narrow rising style crowned by a pointed stigma. This becomes a narrow pod, having four longitudinal borders with one cell, and between each isthmus have one cylindrical seed.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, intitled Diadelphia Decandria, the flowers having ten stamina in two bodies.

The Species are,

1. Piscidia (*Erythrina*) foliolis ovatis. Jacq. Amer. 27. *Piscidia with oval leaves.* Coral arbor polyphylla, non spinosa, fraxini folio, siliquis alis foliaceis extantibus rotæ molendinaria fluviatilis acuta. Sloan. Hist. 2. p. 39. *Dogwood-tree.*
2. Piscidia (*Carthaginiensis*) foliolis obovatis. Jacq. Amer. 27. *Piscidia with oblong oval leaves.* Phaseolis accedens Coral arbor polyphyllos, foliis durioribus

non spinosa. Pluk. Alm. 293. tab. 214. f. 4. *Dog-wood-tree with oblong oval leaves.*

The first sort grows plentifully in Jamaica, where it rises with a stem to the height of twenty-five feet or more, which is almost as large as a man's body, covered with a light coloured smooth bark, and sending out several branches at the top without order; these are garnished with winged leaves, whose pinnæ or lobes are oval; there are generally seven in each leaf; these are about two inches long, and one and a half broad, placed for the most part opposite, and terminated by an odd lobe; the flowers are of the butterfly kind, of a dirty white colour, and are succeeded by oblong pods, which have four longitudinal wings, and are jointed between the cells which contain the seeds.

The negroes in the West-Indies make use of the bark of this tree to catch fish, which, if thrown into the water will intoxicate the fish, and cause them to rise to the surface of the water, and turn upon their backs, so are easily caught; but this intoxication is not of long continuance, nor has it been known to give any bad quality to the fish.

The second sort is also a native of the West-Indies; it differs from the first in the shape and consistence of the leaves, which are more oblong, and of a firmer texture than those of the first, but in other respects they are very similar.

Both sorts are easily propagated by seeds, when they can be obtained fresh from the countries where they naturally grow, for in Europe these plants do rarely flower; there are plants now in the Chelsea Garden which are more than twenty years old, and if they had not been two or three times shortened, would have been more than twenty-five feet high, yet have not attempted to flower though they are in perfect health. The seeds must be sown upon a good hot-bed in the spring, and when the plants come up and are fit to transplant, they should be each planted in a small pot filled with light earth, and plunged into a hot-bed of tanners bark, and afterward treated in the same way as hath been directed for the Erythrina, to which article the reader is desired to turn, to avoid repetition.

**PISONIA.** Plum. Nov. Gen. 7. tab. 11. Lin. Gen. Plant. 984. Fingrigo, vulgò.

The Characters are,

*The male flowers grow upon different plants from the fruit. The male flowers have a small erect empalement, cut into five acute points. The flowers are funnel-shaped, the tube is short; the brim is expanded, and cut into five acute parts; they have five awl-shaped stamina which are longer than the petal, terminated by obtuse summits. The female flowers have empalements like the male, and the flowers are of the same form; they sit upon the germen, which is situated under the receptacle, supporting a cylindrical style longer than the petal, crowned by five oblong spreading stigmas. The germen afterward turns to an oval capsule having five angles and one cell, containing one smooth, oblong, oval seed.*

This genus of plants is ranged in the fifth section of Linnæus's twenty-second class, which includes those plants whose male and female flowers are upon different plants, and the female flowers have five stigmas or styles.

We have but one Species at present in England, viz.

Pisonia (*Aculeata*) spinis axillaribus patentissimis. Lin. Sp. Plant. 1511. *Prickly Pisonia, called Fingrigo in the West-Indies.* Pisonia aculeata, fructu glutinoso & racemoso. Plum. Nov. Gen. 7. *Prickly Pisonia with a glutinous branching fruit.*

The title of this genus was given by Father Plumier, in honour of Dr. William Piso, who published a Natural History of Brasil. The name of Fingrigo is what the inhabitants of Jamaica know it by.

The male plants differ so much in appearance from the female, that those who have not seen them rise from the same seeds, would suppose they were different species, I shall therefore give short descriptions of each.

The male plants have stalks as thick as a man's arm, which rise ten or twelve feet high; the bark is of a dark brown colour, and smooth; these send out many branches by pairs opposite, which are much stronger than those of the female, so do not hang about so loose. They are garnished with obverse, oval, stiff leaves, an inch and a half long, and an inch and a quarter broad, standing opposite on short foot-stalks. From the side of the branches come out short cursons or spurs, like those of the Pear-tree, having each two pair of small leaves at bottom, and from the top comes out the foot-stalk of the flowers which is slender, about half an inch long, dividing at the top into three; each of these sustain a small corymbus of herbaceous yellow flowers, each having five stamina standing out beyond the petal, terminated by obtuse summits.

The stalks of the female plants are not so strong as those of the male, so require support. These rise eighteen or twenty feet high, sending out slender weak branches opposite, which are armed with short, strong, hooked spines, and garnished with small oval leaves, about an inch and three quarters broad; these stand opposite on the larger branches, but on the smaller they are alternate, and have short foot-stalks. The flowers are produced in small bunches at the end of the branches, sitting upon the germen; they are shaped like those of the male, but have no stamina; in the center is situated a cylindrical style, crowned by five spreading stigmas. The germen afterward turns to a channelled, five-cornered, glutinous capsule, armed with small crooked spines, each containing one oblong, oval, smooth seed.

These plants are very common in the savannas, and other low places in the island of Jamaica, as also in several other islands in the West-Indies, where it is very troublesome to whoever passes through the places of their growth, fastening themselves by their strong crooked thorns to the clothes of the persons; and their seeds being glutinous and burry, also fasten themselves to whatever touches them; so that the wings of the ground-doves and other birds, are often so loaded with the seeds, as to prevent their flying, by which means they become an easy prey.

In Europe this plant is preserved in the gardens of some curious persons for variety; it is propagated by seeds, which should be sown in pots filled with light rich earth, and plunged into a hot-bed of tanners bark; and when the plants come up, they should be transplanted into separate pots, and plunged into the hot-bed again, where they may remain till Michaelmas, when they should be removed into the stove, and plunged into the bark-bed, and treated in the same manner as hath been directed for several tender plants of the same country; observing in hot weather to give them plenty of water, but in winter they should have it more sparingly. They are too tender to thrive in the open air of this country at any season of the year, wherefore they should be constantly kept in the stove. They retain their leaves most part of the year in England.

**PISTACIA.** Lin. Gen. Plant. 982. Terebinthus. Tourn. Inst. R. H. 579. tab. 345. Lentiscus. Tourn. Inst. R. H. 580. Turpentine-tree, Pistachia-nut, and Mastick-tree.

The Characters are,

*The male and female flowers grow upon separate trees; the male flowers are disposed in loose sparsed katkins, having small scales with one flower; these have small five-pointed empalements, but no petals; they have five small stamina, terminated by oval, four-cornered, erect summits. The female flowers have small trifid empalements, but no petals; they have each a large oval germen, supporting three reflexed styles, crowned by thick prickly stigmas. The germen afterward turns to a dry berry or nut, inclosing an oval smooth seed.*

This genus of plants is ranged in the third section of Linnæus's twenty-second class, which includes those plants

plants which have male and female flowers on separate plants, whose female flowers have three styles.

The Species are,

1. Pistacia (*Terebinthus*) foliis impari pinnatis, foliolis subovato recurvis. Lin. Mat. Med. 454. Sp. Plant. 145. *Pistachia with unequal winged leaves, whose lobes are somewhat oval and recurved.* Terebinthus Indica Theophrasti pistacia Dioscoridis. Adv. 413. *The Pistachia-tree.*
2. Pistacia (*Trifolia*) foliis subternatis. Hort. Cliff. 456. *Pistacia with trifoliate leaves.* Terebinthus, seu pistacia trifolia. Tourn. Inst. 580. *Three-leaved Turpentine, or Pistachia-tree.*
3. Pistacia (*Narbonensis*) foliis pinnatis ternatisque, suborbiculatis. Lin. Sp. Plant. 1025. *Pistachia with winged and trifoliate leaves, which are almost round.* Terebinthus peregrina, fructu majore, pistaciis simili, eduli. C. B. P. 400. Tourn. Inst. 579. *Foreign Turpentine-tree, with a large eatable fruit like Pistachia.*
4. Pistacia (*Vera*) foliis impari pinnatis, foliolis ovato-lanceolatis. Hort. Cliff. 456. *Pistachia with unequal winged leaves, whose lobes are oval and spear-shaped.* Terebinthus vulgaris. C. B. P. 400. *The common Turpentine-tree.*
5. Pistacia (*Lentiscus*) foliis abruptè pinnatis, foliolis lanceolatis. Hort. Cliff. 456. *Pistachia with abrupt winged leaves, and narrow spear-shaped lobes.* Lentiscus vulgaris. C. B. P. 399. *Common Mastick-tree.*
6. Pistacia (*Massiliensis*) foliis abruptè pinnatis, foliolis lineari lanceolatis. *Pistachia with abrupt winged leaves, and narrow spear-shaped lobes.* Lentiscus angustifolia Massiliensis. H. R. Par. *Narrow-leaved Mastick-tree of Marseilles.*
7. Pistacia (*Americana*) foliis impari pinnatis, foliolis lanceolato-ovatis acuminatis. *Pistachia with unequal winged leaves, whose lobes are spear-shaped, oval, and acute-pointed.* Terebinthus pistaciæ fuctu non eduli. Plum. Cat. 17. *Turpentine-tree with a fruit like the Pistachia, which is not eatable.*
8. Pistacia (*Simaruba*) foliis pinnatis deciduis, foliolis oblongo ovatis. *Pistachia with winged deciduous leaves, having oblong oval lobes.* Terebinthus major, betulæ cortice, fructu triangulari. Sloan. Hist. Jam. 2. p. 89. tab. 199. *Greater Turpentine-tree with a bark like the Birch-tree, and a triangular fruit, commonly called Birch-tree in Jamaica.*

The first sort is the Pistachia-nut-tree, whose fruit is much better known in England than the tree. This grows naturally in Arabia, Persia, and Syria, from whence the nuts are generally brought to Europe. In those countries it grows to the height of twenty-five or thirty feet; the bark of the stem and old branches are of a dark russet colour, but that of the young branches is of a light brown; these are garnished with winged leaves, composed sometimes of two, and at others of three pair of lobes, terminated by an odd one; these lobes approach toward an oval shape, and their edges turn backward; if these are bruised, they emit an odour like the shell of the nut. Some of these trees produce male flowers, others have female, and some, when old, have both on the same tree. The male flowers come out from the side of the branches, in loose bunches or katkins; they are of an herbaceous colour, having no petals, but have each five small stamina, crowned by large four-cornered summits filled with farina; when that is discharged, the flowers fall off. The female flowers come out upon different trees in clusters from the side of the branches; these have no petals, but have each a large oval germen, supporting three reflexed styles; these are succeeded by oval nuts. This tree flowers in April, but the fruit never ripens in England. It is propagated by the nuts, which should be planted in pots filled with light kitchen-garden earth, and plunged into a moderate hot-bed to bring up the plants; when these appear, they should have a large share of air admitted to them, to prevent their drawing up weak; and by degrees they must be hardened to bear the open air, to which they should be exposed the beginning of June, and may remain abroad till autumn, when they should be placed under a hot-bed frame to screen them from the frost in winter; for while they are young, they are too tender to live through the winter in England without protection, but they should always be exposed to the air in mild weather; these plants shed their leaves in autumn, so should not have much wet in winter; and in the spring, before the plants begin to shoot, they must be transplanted each into a separate small pot; and if they are plunged into a very moderate hot-bed, it will forward their putting out new roots; but as soon as they begin to shoot, they must be gradually hardened, and placed abroad again; these plants may be kept in pots three or four years till they have got strength, during which time they should be sheltered in winter; and afterward they may be turned out of the pots, and planted in the full ground, some against high walls to a warm aspect, and others in a sheltered situation, where they will bear the cold of our ordinary winters very well, but in severe frosts they are often destroyed. The trees flower and produce fruit in England, but the summers are not warm enough to ripen the nuts.

The second sort grows naturally in Sicily and the Levant, where it is a tree of a middling size, covered with a rough brown bark, and dividing into many branches, which are garnished with leaves, which for the most part have three, but some have four oval lobes; they stand upon long foot-stalks, and are of a dark green colour. The male flowers grow upon different trees from the female, and are like those of the former sort, but are of a yellowish green colour. The female flowers of this sort I have not seen, so can give no account of them; these are succeeded by fruit like that of the former, but are much smaller. This is propagated by seeds in the same manner as the former, and the plants should be treated in the same way, but require more protection in winter. There were several plants of this kind in the English gardens before the year 1740, which had lived abroad some years against walls, but that severe winter killed most of them.

The third sort grows in Italy and the South of France, but is supposed to have been transplanted there from some other country. This is a tree of a middling size, covered with a light gray bark, sending out many side branches, which are garnished with leaves which have sometimes five, and at others but three roundish lobes, which stand upon pretty long foot-stalks, and are of a light green colour. The male flowers grow upon separate trees from the fruit, as in the other sorts; the fruit of this is small, but eatable. This is propagated by nuts in the same way as the first, and the plants are equally hardy.

The fourth sort grows naturally in Barbary, and also in Spain, Italy, and the Levant. This is a tree of middling size, covered with a brown bark, and dividing into many branches, whose bark is very smooth while young, garnished with winged leaves, composed of three or four pair of oval spear-shaped lobes, terminated by an odd one. The flowers are male and female on different trees, as the former: the male flowers of this have purplish stamina; they appear in April, but I have not seen any of the female trees in flower. This is propagated by seeds, but unless they are sown in autumn soon after they are ripe, they seldom grow the first year, but remain in the ground a whole year; and unless the seeds are taken from such trees as grow near the male, the seeds will not grow, as I have several times experienced.

The plants of this sort may be treated in the same manner as the first, and are as hardy. There is a tree of this sort now growing in the gardens of the Bishop of London at Fulham, against a wall, which was planted there above fifty years ago, and has endured the winters without cover; and some trees of this kind which were planted in the open air, in the garden of his Grace the Duke of Richmond at Goodwood in Sussex, had survived several winters without any protection. From these trees the common turpentine

pentine of the ſhops was formerly taken, but there is little of that now imported, but that from ſome of the cone-bearing trees is generally ſubſtituted for it.

The fifth ſort is the common Maſtick-tree, which is better known in the gardens by its Latin title of Lentiſcus. This grows naturally in Spain, Portugal, and Italy, and being evergreen, the plants have been preſerved in the Engliſh gardens to adorn the green-houſe in winter. This in its native countries riſes to the height of eighteen or twenty feet, covered with a gray bark, ſending out many branches, which have a reddiſh brown bark, and are garniſhed with winged leaves, compoſed of three or four pair of ſmall ſpear-ſhaped lobes, without an odd one at the end. The midrib which ſuſtains the lobes, has two narrow borders or wings, running from lobe to lobe; theſe lobes are of a lucid green on their upper ſide, but pale on their under. The male flowers come out in looſe cluſters from the ſides of the branches; they are of an herbaceous colour, appearing in May, and ſoon fall off. Theſe are generally upon different plants from the fruit, which alſo grows in cluſters, and are ſmall berries, of a black colour when ripe.

The plants of this ſort are generally propagated by laying down of their young branches, which, if properly managed, will put out roots in one year, and may then be cut off from the old plants, and each tranſplanted into ſeparate ſmall pots. Theſe muſt be ſheltered in winter, and in ſummer placed abroad in a ſheltered ſituation, and treated in the ſame way as other hardy kinds of green-houſe plants. It may alſo be propagated by ſeeds in the ſame way as the Turpentine-tree; but if the ſeeds are not taken from trees growing in the neighbourhood of the male, they will not grow; and if they are kept out of the ground till ſpring, the plants rarely appear till the ſpring following. When theſe plants have obtained ſtrength, ſome of them may be turned out of the pots, and planted againſt warm walls; where, if their branches are trained againſt the walls, they will endure the ordinary winters very well, and with a little ſhelter in ſevere winters they may be preſerved.

The ſixth ſort grows naturally about Marſeilles, and in ſome other places in the South of France, where it riſes to the ſame height as the former from which it differs, in having one or two pair of lobes more on each leaf, and the lobes are much narrower, and of a paler colour. This difference holds in the plants which are propagated by ſeeds, ſo may be pronounced a diſtinct ſpecies. It is propagated in the ſame way as the former ſort, and is equally hardy.

The ſeventh ſort grows naturally in many of the iſlands in the Weſt-Indies, where it riſes to a middling ſtature, dividing into many branches, which are covered with a purpliſh bark, and garniſhed with winged leaves, compoſed of two or three pair of ſpear-ſhaped, oval, acute-pointed lobes, terminated by an odd one; theſe are an inch and three quarters long, and near an inch broad, running out in acute points; they are very thin and tender, and have long foot-ſtalks. The male flowers come out at the end of the branches; they are diſpoſed in a ſingle racemus (or long bunch) about three inches long; they are of a purpliſh colour, and have yellow ſummits. The fruit grows upon ſeparate trees from the male flowers; they are ſhaped like the nuts of Piſtachia, but are ſmaller and not eatable. This was ſent me by Dr. Creſſy from Antigua.

The eighth ſort grows naturally in Jamaica, and alſo in moſt of the other iſlands in the Weſt-Indies, where it riſes to the height of thirty or forty feet, covered with a looſe brown bark, which falls off in large pieces; the ſtems are large, and divide into many branches toward the top, which are crooked and unſightly; theſe are garniſhed with winged leaves, compoſed of five or ſix pair of oblong, oval, ſmooth lobes, about four inches long and two broad, terminated by an odd one. The flowers come out at the end of the branches, in long looſe bunches of a yellowiſh colour; theſe grow on different trees, or on different parts of the ſame tree from the fruit, which alſo hangs in long bunches, and is about the ſize of a middling Pea, having a dark ſkin covering a nut about the ſize of a common Cherry-ſtone, and of the ſame colour.

Theſe two trees are tender, ſo will not thrive in this country, unleſs they are kept in a warm ſtove. They are propagated by ſeeds, which muſt be taken from ſuch trees as grow in the neighbourhood of the males, otherwiſe they will not grow, as I have too often found true. Theſe ſhould be ſown in pots filled with light earth, and plunged into a good hot-bed of tanners bark; and when the plants are come up fit to remove, they ſhould be each planted in a ſeparate ſmall pot, and plunged into a freſh hot-bed, treating them in the ſame way as the other tender plants from the ſame countries, and in the autumn they ſhould be removed into the ſtove, plunging the pots into the tan-bed; and during the winter they muſt have but little water, eſpecially if they caſt their leaves, which is generally the caſe after the firſt winter; for the young plants generally retain their leaves the whole year, but afterward they are deſtitute of leaves for two months, in the latter part of the winter. Theſe plants ſhould conſtantly remain in the ſtove, but in warm weather they muſt have a large ſhare of air admitted to them.

PISUM. Tourn. Inſt. R. H. 394. tab. 215. Lin. Gen. Plant. 779. [Some are of opinion, that this plant takes its name from the city Piſa, where it anciently grew in plenty; others derive it from πίσω, which comes from πίπτω, to fall; becauſe, if this plant be not ſupported, it will fall to the ground.] Pea; in French, *Pois*.

The CHARACTERS are,

*The flower hath a one-leaved permanent empalement cut into five points, the two upper being broadeſt; it hath four petals, and is of the butterfly kind. The ſtandard is broad, heart-ſhaped, reflexed, and indented, ending in a point. The two wings are ſhorter, roundiſh, and cloſe together; the keel is compreſſed, moon-ſhaped, and ſhorter than the wings. It hath ten ſtamina in two bodies, the upper ſingle one is plain and awl-ſhaped, the other nine are cylindrical below the middle, awl-ſhaped above and cut; theſe are joined together, and are terminated by roundiſh ſummits. It has an oblong compreſſed germen, with a triangular riſing ſtyle, crowned by a hairy oblong ſtigma. The germen afterward becomes a large, long, taper pod, terminated by a ſharp riſing point, opening with two valves, having one row of roundiſh ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's ſeventeenth claſs, which contains thoſe plants whoſe flowers have ten ſtamina joined in two bodies.

The SPECIES are,

1. PISUM (*Sativum*) ſtipulis infernè rotundatis crenatis, petiolis teretibus, pedunculis multifloris. Hort. Upſal. 215. *Pea whoſe lower ſtipulæ are roundiſh and indented, with taper foot-ſtalks bearing many flowers.* Piſum hortenſe majus, flore fructuque albo. C. B. P. 342. *Greater Garden Pea with a white flower and fruit.*
2. PISUM (*Humile*) caule erecto ramoſo, foliis bijugatis, foliolis rotundioribus. *Pea with an erect branching ſtalk, and leaves having two pair of round lobes.* Piſum humile, caule firmo. Tourn. Inſt. R. H. 394. *Dwarf Pea with a firm ſtalk.*
3. PISUM (*Umbellatum*) ſtipulis quadrifidis acutis, pedunculis multifloris terminalibus. *Pea with four-pointed acute ſtipulæ, and foot-ſtalks bearing many flowers, which terminate the ſtalks.* Piſum umbellatum. C. B. P. 342. *The Roſe or Crown Pea.*
4. PISUM (*Maritimum*) petiolis ſuprà planiuſculis, caule angulato, ſtipulis ſagittatis, pedunculis multifloris. Flor. Suec. 608. *Pea with foot-ſtalks which are plain on their upper ſide, an angular ſtalk, arrow-pointed ſtipulæ, and foot-ſtalks bearing many flowers.*
5. PISUM (*Americanum*) caule angulato procumbente, foliolis inferioribus lanceolatis acutè dentatis, ſummis ſagittatis. *Pea with an angular trailing ſtalk, whoſe lower leaves are ſpear-ſhaped and ſharply indented, and thoſe at the top arrow-pointed, commonly called Cape Horn Pea.*

6. PISUM

6. Pisum (*Ochrus*) petiolis decurrentibus membranaceis diphyllis, pedunculis unifloris. Hort. Cliff. 370. *Pea with membranaceous running foot-stalks, having two leaves and one flower upon a foot-stalk.* Ochrus folio integro capreolos emittente. C. B. P. 343. *Winged Pea with an entire leaf sending out tendrils.*

There are a great variety of Garden Peas now cultivated in England, which are distinguished by the gardeners and seedsmen, and have their different titles; but as great part of these are only seminal variations, and if not very carefully managed, by taking away all those plants which have a tendency to alter before the seeds are formed, they will degenerate into their original state, so that all those persons who are curious in the choice of their seeds, look carefully over those which they design for seeds at the time when they begin to flower, and draw out all the plants which they dislike from the other. This is what they call roguing their Peas, meaning hereby, the taking out all the bad plants from the good, that the farina of the former may not impregnate the latter; to prevent which, they always do it before the flowers are fully open; by thus diligently drawing out the bad, and marking those which come earliest to flower, they have greatly improved their Peas of late years, and are constantly endeavouring to get forwarder varieties; so that it it would be to little purpose in this place, to attempt giving particular botanical titles to each which are now cultivated; therefore I shall only mention their titles by which they are commonly known, placing them according to their time of coming to the table, or gathering for use.

| | |
|---|---|
| The Golden Hotspur. | Sugar Dwarf. |
| The Charlton. | Sickle Pea. |
| The Reading Hotspur. | Marrowfat. |
| Masters's Hotspur. | Dwarf Marrowfat. |
| Essex Hotspur. | Rose, or Crown Pea. |
| The Dwarf Pea. | Rouncival Pea. |
| The Sugar Pea. | Gray Pea. |
| Spanish Morotto. | Pig Pea, with some others. |
| Nonpariel. | |

The English Sea Pea is found wild upon the shore in Sussex, and several other counties in England. This was first taken notice of in the year 1555, between Orford and Aldborough, where it grew upon the heath, where nothing, no not Grass, was ever seen to grow; and the poor people being in distress, by reason of the dearth of that year, gathered large quantities of these Peas, and so preserved themselves and families. This is mentioned by Stowe in his Chronicle, and Camden in his Britannia: but they were both mistaken, in imagining that they were Peas cast on shore by a shipwreck, seeing they grow in divers other parts of England, and are undoubtedly a different species from the common Pea.

The fifth sort hath a perennial root, which continues some years. This was brought from Cape Horn by Lord Anson's cook, when he passed that Cape, where these Peas were a great relief to the sailors. It is kept here as a curiosity, but the Peas are not so good for eating as the worst sort now cultivated in England; it is a low trailing plant; the leaves have two lobes on each foot-stalk, those below are spear-shaped, and sharply indented on their edges, but the upper leaves are small and arrow-pointed. The flowers are blue, each foot-stalk sustaining four or five flowers; the pods are taper, near three inches long, and the seeds are round, about the size of Tares.

The sixth sort is annual; this grows naturally amongst the Corn in Sicily and some parts of Italy, but is here preserved in botanic gardens for the sake of variety. It hath an angular stalk rising near three feet high; the leaves stand upon winged foot-stalks, each sustaining two oblong lobes. The flowers are of a pale yellow colour, and shaped like those of the other sorts of Pea, but are small, each foot-stalk sustaining one flower; these are succeeded by pods about two inches long, containing five or six roundish seeds, which are a little compressed on their sides. These are by some persons eaten green, but unless they are gathered very young, they are coarse, and at best not so good as the common Pea. It may be sown and managed in the same way as the Garden Pea. I shall now proceed to set down the method of cultivating the several sorts of Garden Peas, so as to continue them throughout the season.

It is a common practice with the gardeners near London, to raise Peas upon hot-beds, to have them very early in the spring; in order to which, they sow their Peas upon warm borders under walls or hedges, about the middle of October; and when the plants come up, they draw the earth up gently to their stems with a hoe, the better to protect them from frost. In these places they let them remain till the latter end of January, or the beginning of February, if they are preserved from frosts, observing to earth them up from time to time as the plants advance in height (for the reasons before laid down) as also to cover them in very hard frost with Peas-haulm, straw, or some other light covering, to preserve them from being destroyed; then, at the time before-mentioned, they make a hot-bed (in proportion to the quantity of Peas intended) which must be made of good hot dung, well prepared and properly mixed together, that the heat may not be too great. The dung should be laid about three feet thick, or somewhat more, according as the beds are made earlier or later in the season; when the dung is equally levelled, then the earth (which should be light and fresh, but not over rich) must be laid on about six or eight inches thick, laying it equally all over the bed. This being done, the frames (which should be two or two and a half feet high on the back side, and about eighteen inches in front) must be put on, and covered with glasses; after which it should remain three or four days, to let the steam of the bed pass off, before you put the plants therein, observing every day to raise the glasses to give vent for the rising steam to pass off; then when you find the bed of a moderate temperature for heat, you should, with a trowel, or some other instrument, take up the plants as carefully as possible, to preserve the earth to the roots, and plant them into the hot-bed in rows about two feet asunder; and the plants should be set about an inch distant from each other in the rows, observing to water and shade them until they have taken root; after which you must be careful to give them air at all times when the season is favourable, otherwise they will draw up very weak, and be subject to grow mouldy and decay. You should also draw the earth up to the shanks of the plants as they advance in height, and keep them always clear from weeds. The water they should have must be given them sparingly, for if they are too much watered it will cause them to grow too rank, and sometimes rot off the plants at their shanks just above ground. When the weather is very hot, you should cover the glasses with mats in the heat of the day, to screen them from the violence of the sun, which is then too great for them, causing their leaves to flag, and their blossoms to fall off without producing pods, as will also the keeping the glasses too close at that season. But when the plants begin to fruit, they should be watered oftener, and in greater plenty than before; for by that time the plants will have nearly done growing, and the often refreshing them will occasion their producing a greater plenty of fruit.

The sort of Pea which is generally used for this purpose is the Dwarf, for all the other sorts ramble too much to be kept in frames; the reason for sowing them in the common ground, and afterwards transplanting them on a hot-bed, is also to check their growth, and cause them to bear in less compass; for if the seeds were sown upon a hot-bed, and the plants continued thereon, they would produce such luxuriant plants as are not to be contained in the frames, and would bear but little fruit.

The next sort of Pea which is sown to succeed those on the hot-bed is the Hotspur, of which there are reckoned three or four sorts; as the Golden Hotspur, the Charlton Hotspur, the Masters's Hotspur, the Reading Hotspur, and some others, which are very little differing from each other, except in their early

bearing, for which the Golden and Charlton Hotspurs are chiefly preferred; though if either of these sorts are cultivated in the same place for three or four years, they are apt to degenerate and be later in spring. fruiting, for which reason most curious persons procure their seeds annually from some distant place; and in the choice of these seeds, if they could be obtained from a colder situation and a poorer soil, than that in which they are to be sown, it will be much better than on the contrary, and they will come earlier in the spring.

These must also be sown on warm borders, towards the latter end of October; and when the plants are come up, you should draw the earth up to their shanks in the manner before directed; which should be repeated as the plants advance in height (always observing to do it when the ground is dry) which will greatly protect the stems of the plants against frost; and if the winter should prove very severe, it will be of great service to the plants to cover them with Peas-haulm, or some other light covering; which should be constantly taken off in mild weather, and only suffered to remain on during the continuance of the frost; for if they are kept too close, they will be drawn very weak and tender, and thereby be liable to be destroyed with the least inclemency of the season.

In the spring you must carefully clear them from weeds, and draw some fresh earth up to their stems; but do not raise it too high to the plants, lest by burying their leaves you should rot their stems, as is sometimes the case, especially in wet seasons. You should also observe to keep them clear from vermin, which, if permitted to remain amongst the plants, will increase so plentifully as to devour the greatest part of them. The chief of the vermin which infest Peas are the slugs, which lie all the day in the small hollows of the earth, near the stems of the plants, and in the night time come out, and make terrible destruction of the Peas; and these chiefly abound in wet soils, or where a garden is neglected, and over-run with weeds; therefore you should make the ground clear every way round the Peas to destroy their harbours, and afterwards in a fine mild morning very early, when these vermin are got abroad from their holes, you should slack a quantity of lime, which should be sown hot over the ground pretty thick, which will destroy the vermin wherever it happens to fall upon them, but will do very little injury to the Peas, provided it be not scattered too thick upon them. This is the best method I could ever find to destroy these troublesome vermin.

If this crop of Peas succeeds, it will immediately follow those on the hot bed; but for fear this should miscarry, it will be proper to sow two more crops at about a fortnight's distance from each other, so that there may be the more chances to succeed. This will be sufficient until the spring of the year, when you may sow three more crops of these Peas; one toward the beginning of January, the other a fortnight after, and the third at the end of January. These two late sowings will be sufficient to continue the early sort of Peas through the first season, and after this it will be proper to have some of the large sort of Peas to succeed them for the use of the family; in order to which, you should sow some of the Spanish Morotto, which is a great bearer, and a hardy sort of Pea, about the middle of February, upon a clear open spot of ground. These must be sown in rows about three feet asunder, and the Peas should be dropped in the drills about an inch distance, covering them about two inches deep with earth, being very careful that none of them lie uncovered, which will draw the mice, pigeons, or rooks, to attack the whole spot; and it often happens by this neglect, that a whole plantation is devoured by these creatures; whereas, when there are none of the Peas left in sight, they do not so easily find them out.

About a fortnight after this you should sow another spot, either of this sort, or any other large sort of Pea, to succeed those, and then continue to repeat sowing once a fortnight, till the middle or latter end of May, some of these kinds, only observing to allow the Marrowfats, and other very large sorts of Peas, at least three feet and a half, or four feet between row and row; and the Rose Pea should be allowed at least eight or ten inches distance plant from plant in the rows, for these grow very large; and if they have not room allowed them, they will spoil each other by drawing up very tall, and will produce no fruit.

When these plants come up, the earth should be drawn up to their shanks (as was before directed) and the ground kept entirely clear from weeds; and when the plants are grown eight or ten inches high, you should stick some rough boughs, or brushwood, into the ground close to the Peas, for them to ramp upon, which will support them from trailing upon the ground, which is very apt to rot the large-growing sorts of Peas, especially in wet seasons; besides, by thus supporting them, the air can freely pass between them, which will preserve the blossoms from falling off before their time, and occasion them to bear much better than if permitted to lie upon the ground, and there will be room to pass between the rows to gather the Peas when they are ripe.

The dwarf sorts of Peas may be sown much closer together than those before-mentioned, for these seldom rise above a foot high, and rarely spread above half a foot in width, so that these need not have more room than two feet row from row, and not above an inch asunder in the rows. These produce a good quantity of Peas, provided the season is not over-dry, but they seldom continue long in bearing, so that they are not so proper to sow for the main crop, when a quantity of Peas is expected for the table, their chief excellency being for hot-beds, where they will produce a greater quantity of Peas (provided they are well managed) than if exposed to the open air, where the heat of the sun soon dries them up.

The Sickle Pea is much more common in Holland than in England, it being the sort mostly cultivated in that country; but in England they are only propagated by curious gentlemen for their own table, and are rarely brought into the markets. This sort the birds are very fond of, and if they are not prevented, many times destroy the whole crop. This should be planted in rows about two feet and a half asunder, and should be managed as hath been directed for the other sorts. Although I have directed the sowing of the large sorts of Peas for the great crop, yet these are not so sweet as the early Hotspur Peas; therefore it will also be proper to continue a succession of those sorts through the season, in small quantities, to supply the best table, which may be done by sowing some every week or ten days; but all those which are sown late in the season, should have a strong moist soil, for in hot light land they will burn up and come to nothing.

The large-growing sorts may be cultivated for the common use of the family, because these will produce in greater quantities than the other, and will endure the drought better, but the early kinds are by far the sweeter tasted Peas.

The best of all the large kinds is the Marrowfat, which if gathered young, is a well-tasted Pea, and this will continue good through the month of August if planted on a strong soil.

The gray and other large winter Peas are seldom cultivated in gardens, because they require a great deal of room, but are usually sown in fields in most parts of England. The best time for sowing these is about the beginning of March, when the weather is pretty dry, for if they are put into the ground in a very wet season, they are apt to rot, especially if the ground be cold; these should be allowed at least three or four feet distance row from row, and must be sown very thin in the rows; for if they are sown too thick, the haulm will spread so as to fill the ground, and ramble over each other, which will cause the plants to rot, and prevent their bearing.

The common white Pea will do best on light sandy land, or on a rich loose soil. The usual method of sowing these Peas is with a broad cast, and so harrow them in; but it is a much better way to sow them in drills

drills about three feet asunder, for less than half the quantity of seed will do for an acre, and being set regularly, the ground may be stirred with a hoe to destroy the weeds, and earth up the Peas, which will greatly improve them, and the Peas may be much easier cut in autumn, when they are ripe. The usual time for sowing these Peas is about the middle of March, or the beginning of April, on warm land, but on cold ground they should be sown a fortnight or three weeks later. In the common way of sowing, they allow three bushels or more to an acre; but if they are drilled, one bushel and a half will be full enough.

The Green and Maple Rouncivals require a stronger soil than the White, and should be sown a little later in the spring; also the drills should be made at a greater distance from each other, for as these are apt to grow rank, especially in a wet season, they should be set in rows two feet and a half or three feet asunder; and the ground between the rows should be stirred two or three times with a hoe, which will not only destroy the weeds, but, by earthing up the Peas, will greatly improve them, and also render the ground better to receive whatever crop is put on it the following season.

The gray Peas thrive best on a strong clayey land; these are commonly sown under furrow, but by this method they are always too thick, and do not come up regular; therefore all these rank-growing plants should be sown in drills, where the seeds will be more equally scattered, and lodged at the same depth in the ground; whereas in the common way some of the seeds lie twice as deep as others, and are not scattered at equal distances. These may be sown toward the end of February, as they are much hardier than either of the former sorts, but the culture for these should be the same.

The best method to sow these Peas is to draw a drill with a hoe by a line about two inches deep, and then scatter the seeds therein; after which, with a rake, you may draw the earth over them, whereby they will be equally covered, and this is a very quick method for gardens; but where they are sown in fields, they commonly make a shallow furrow with the plough, and scatter the seeds therein, and then with a harrow they cover them over again. After this, the great trouble is to keep them clear from weeds, and draw the earth up to the plants; this, in such countries where labour is dear, is a great expence to do it by the hand with a hoe; but this may be easily effected with a horse-hough, which may be drawn through between the rows, which will entirely eradicate the weeds, and by stirring the soil render it mellow, and greatly promote the growth of the plants.

When any of the best sorts are intended for seed, there should be as many rows of them left ungathered, as may be thought necessary to furnish a sufficient quantity of seed; and when the Peas are in flower, they should be carefully looked over, to draw out all those plants which are not of the right sort; for there will always be some roguish plants (as the gardeners term them) in every sort, which, if left to mix, will degenerate the kind. These must remain until their pods are changed brown and begin to split, when you should immediately gather them up, together with the haulm; and if you have not room to stack them till winter, you may thresh them out as soon as they are dry, and put them up in sacks for use; but you must be very careful not to let them remain too long abroad after they are ripe, for if wet should happen it would rot them; and heat, after a shower of rain, would cause their pods to burst, and cast forth their seeds, so that the greatest part of them would be lost; but, as I have said before, it is not advisable to continue sowing of the same seed longer than two years on the same ground, for the reasons there laid down, but rather to exchange their seeds every year, or every two years at least, whereby you may always expect to have them prove right.

PISUM CORDATUM. See CARDIOSPERMUM.

PITTONIA. See TOURNEFORTIA.

PLANTA, a Plant, is defined by the ingenious Mr. John Martyn to be an organical body, destitute of sense and spontaneous motion, adhering to another body in such a manner, as to draw from it its nourishment, and having power of propagating itself by seed. As to the parts of which a plant consists, they are the root, stalk, leaf, flower, and fruit.

Plant and vegetable are pretty near terms synonymous, all plants being vegetables. Dr. Boerhaave defines a vegetable to be a body generated of the earth, or something arising of the earth, to which it adheres, or is connected by parts called roots, through which it receives the matter of its nourishment and increase, and consists of juices and vessels sensibly distinct from each other; or a vegetable is an organical body, composed of vessels and juices, every where distinguishable from each other; to which body grow roots or parts, whereto it adheres, and from which it derives the matter of its life and growth.

This definition furnishes a just and adequate idea of a vegetable; for by its consisting of vessels and juices, it is distinguished from a fossil; and by its adhering to another body, and deriving its nourishment therefrom, it is distinguished from an animal.

A vegetable is defined an organical body, because consisting of different parts, which jointly concur to the exercise of the same functions, adhering by some of its parts to another body; for we know of no plant that is absolutely vague and fluctuating, but has still a body it adheres to, though that body may be various, e. g. Earth, as in our common plants; stone, as in rock plants; water, as in sea plants; and air, as some mucilages.

As to those few plants which appear to float in the water, their manner of growth is something anomalous. Monsieur Tournefort has shewn that all plants do not arise strictly from seeds, but that some, instead of semen, deposit or let fall a little drop of juice, which, sinking in the water, reaches the bottom, or some rock, &c. in its way, to which it sticks, strikes root, and shoots into branches; such is the origin of coral. Add, that the root of a plant may have any situation at pleasure, with respect to the body thereof, nor needs it either be lowest or highest, &c. Accordingly in Aloes, Missleto, Coral, Mosses, Funguses, &c. the root is frequently uppermost, and its growth downwards.

The vessels or containing parts of plants consist of mere earth, bound or connected together by oil, as a gluten, which being exhausted by fire, air, age, or the like, the plant moulders, or returns again into its earth or dust. Thus, in vegetables burnt by the intensest fire, the earth or matter of the vessels is left entire, and indissoluble by its utmost forces, and consequently the matter thereof is neither water, nor air, nor salt, nor sulphur, but earth alone.

The root or part whereby vegetables are connected to their matrix, and by which they receive their nutritious juice, consists of an infinite number of absorbent vessels, which, being dispersed through the interstices of the earth, attract or imbibe the juices of the same; consequently, every thing in the earth that is dissoluble in water, is liable to be imbibed, as air, salt, oil, fumes of mineral, metal, &c. and of these plants really consist.

These juices are drawn from the earth very crude, but by the structure and fabric of the plant, and the various vessels they are strained through, become changed, further elaborated, secreted, and assimilated to the substance of the plant.

The motion of the nutritious juices of vegetables is produced much like that of blood in animals, by the action of the air; in effect, there is something equivalent to respiration throughout the whole plant.

The discovery of this we owe to the admirable Malpighi, who first observed that vegetables consist of two series or orders of vessels; first, such as receive and convey the alimental juices, answering to the arteries, lacteals, veins, &c. of animals; secondly, tracheæ, or air-vessels, which are long hollow pipes,

wherein air is commonly received and expelled, i. e. inspired and expired; within which tracheæ he shews all the former series of vessels are contained.

Hence it follows, that the heat of a year, nay, of a day, of a single hour or minute, must have an effect on the air included in these tracheæ, i. e. must rarefy it, and consequently dilate the tracheæ, whence arises a perpetual spring or source of action to promote the circulation in plants.

PLANTAGO. Tourn. Inst. R. H. 126. tab. 48. Lin. Gen. Plant. 133. Plantain. To this genus Dr. Linnæus has joined the Coronopus and Psyllium of Tournefort. The first of these is called Hart's-horn, the latter Fleawort. Of these there are several distinct species, and some varieties; but as they are rarely cultivated in gardens, I shall not enumerate them all here, and shall only mention such of them as grow naturally in England. Of the Plantain there are the following sorts; the common broad-leaved Plantain, called Waybread; the great hoary Plantain or Lamb's-tongue; the narrow-leaved Plantain or Ribwort; and the following varieties have also been found in England, which are accidental; the Besom Plantain, and Rose Plantain. The Plantains grow naturally in pastures in most parts of England, and are frequently very troublesome weeds. The common Plantain and Ribwort Plantain are both used in medicine, and are so well known as to need no description. Of the Coronpus or Buck's-horn Plantain there are two varieties growing in England, viz. the common Buck's-horn, which grows plentifully on heaths every where, and the narrow-leaved Welsh sort which is found upon many of the Welsh mountains. The first of these was formerly cultivated as a sallad herb in gardens, but has been long banished from thence for its rank disagreeable flavour; it is sometimes used in medicine. There has been one species of Psyllium or Fleawort found growing naturally in England, which is the sort used in medicine, which was in the earth thrown out of the bottom of the canals which were dug for the Chelsea water-works, where it grew in great plenty. The seeds of this must have been buried there some ages, for no person remembers any of the plants growing in that neighbourhood before. The seeds of this are sometimes used, which are imported from the South of France.

There are several varieties of all these three sorts, which are sometimes preserved in botanic gardens, but having no beauty, they are not admitted into any other, so I shall pass them over here, as being weeds wherever they are permitted to seed.

PLANTAIN-TREE. See Musa.

PLANTING. Although the method of Planting the various sorts of trees is fully set down under their several articles, where each kind is mentioned, yet it may not be amiss to say something in general upon that head in this place, which shall be treated as briefly as possible. And,

First, the first thing in Planting of trees is to prepare the ground (according to the different sorts of trees intended to be planted) before the trees are taken out of the earth; for you should suffer them to remain as little time out of the ground as possible.

In taking up the trees you should carefully dig away the earth round their roots, so as to come at their several parts to cut them off; for if they are torn out of the ground without care, the roots will be broken and bruised very much to the great injury of the trees. When they are taken up, the next thing is to prepare them for Planting; in doing of which there are two things to be principally regarded; the one is to prepare the roots, and the other to prune their heads, in such a manner as may be most serviceable in promoting the future growth of the trees.

And first as to the roots; all the small fibres are to be cut off as near to the place from whence they are produced as may be (excepting such trees as are to be replanted immediately after they are taken up;) otherwise the air will turn all the small roots and fibres black, which, if permitted to remain on when the tree is planted, will grow mouldy and decay, and thereby greatly injure the new fibres which are produced, so that many times the trees miscarry for want of duly observing this. After the fibres are cut off, all the bruised or broken roots should be cut smooth, otherwise they are apt to rot and distemper the trees; and all irregular roots which cross each other, and the downright roots, (especially in fruit-trees) must be cut off; so that when the roots are regularly pruned, they may in some measure resemble the fingers of a hand when spread open; then the larger roots should be shortened in proportion to the age and strength of the tree, as also the particular sorts of trees are to be considered; for the Walnut, Mulberry, and some other tender-rooted kinds should not be pruned so close, as the more hardy sorts of fruit or forest-trees, which in young fruit-trees, such as Pears, Apples, Plums, Peaches, &c. that are one year old from budding or grafting, may be left about eight or nine inches long; but in older trees they must be left of a much greater length; but this is to be understood of the larger roots only, for the small ones must be quite cut out, or pruned very short. Their extreme parts, which are generally very weak, commonly decay after moving, so that it is the better way entirely to displace them.

The next thing is the pruning of their heads, which must be differently performed in different trees, for the design of the trees must also be considered; if they are fruit-trees, and intended for walls or espaliers, it is the better way to plant them with the greatest part of their heads, which should remain on until the spring, just before the trees begin to shoot, when they must be cut down to five or six eyes (as is fully inserted in the several articles of the various kinds of fruit) being very careful, in doing of this, not to disturb the new roots.

But if the trees are designed for standards, you should prune off the small branches close to the places where they are produced; as also irregular branches which cross each other, and by their motion, whena gitated by the wind, rub and bruise their bark, so as to occasion many times great wounds in those places; besides, it makes a disagreeable appearance to the sight, and adds to the closeness of its head, which should always be avoided in fruit-trees, whose branches should be preserved as far distant from each other, as they are usually produced when in a regular way of growth, (which is in all sorts of trees proportionable to the size of their leaves, and magnitude of their fruit) for when their heads are very thick, which is often occasioned by the unskilful shortening of their branches, the sun and air cannot freely pass between the leaves, so that the fruit must be small and ill-tasted. But to return: after having displaced these branches, you should also cut off all such parts of branches, as have by accident been broken or wounded; for these will remain a disagreeable sight, and often occasion a disease in the tree. But you should by no means cut off the main leading shoots, as is by too many practised, for those are necessary to attract the sap from the root, and thereby promote the growth of the tree; for from several experiments which I made in the winter 1729, by cutting off the branches of several sorts of trees, and putting them into phials filled with water, whose tops were closely covered to prevent the evaporating of the water, I found, that those shoots, whose leading buds were preserved, did attract the moisture in much greater quantities than those shoots whose tops were cut off; and from several experiments made by the Rev. Dr. Hales, we find that great quantities of moisture are imbibed at wounds, where branches are cut off; so that by thus shortening the branches, the wet, which generally falls in great plenty during the winter season, is plentifully imbibed, and for want of leaves to perspire it off, mixes with the sap of trees, and thereby distending the vessels, destroys their contracting force, which many times kills the tree, or at least weakens it so much as not to be recovered again for some years, as I have several times observed.

But being willing to try this experiment again in the month of October 1733, I made choice of two standard Almond-trees of equal ſtrength and age; theſe I took up as carefully as poſſible, and having prepared their roots as before directed, I pruned their heads in the following manner, viz. from one of them I only cut off the ſmall branches, and ſuch as were bruiſed or broken, but preſerved all the ſtrong ones entire; of the other, I ſhortened all the ſtrong branches, and pruned off the weak and broken ſhoots, as is the common practice. Theſe two trees I planted in the ſame ſoil and to the ſame ſituation, gave them both equal attendance, and managed them both as nearly alike as poſſible; yet in the ſpring, when theſe trees began to ſhoot, that, whoſe branches were entirely preſerved, came out early, continued to ſhoot ſtronger, and is at preſent much larger, and in better health than the other. And ſince this I have made ſeveral other experiments of the like nature, which have conſtantly ſucceeded in the ſame manner, from whence it is reaſonable to conclude, that the ſhortening of the branches is a great injury to all new-planted trees, but eſpecially to Cherries and Horſe Cheſtnuts, which are frequently killed by ſhortening their large branches when they are removed.

Having thus prepared the trees for Planting, we muſt now proceed to the placing them into the ground; but before this, I would adviſe, if the trees have been long out of the ground, ſo that the roots are dried, to place them in water eight or ten hours before they are planted, obſerving to put them in ſuch manner, that their heads may remain erect, and their roots only immerſed therein, which will ſwell the dried veſſels of the roots, and prepare them to imbibe nouriſhment from the earth. In fixing of them, great regard ſhould be had to the nature of the ſoil, which if cold and moiſt, the trees ſhould be planted very ſhallow; as alſo, if it be a hard rock or gravel, it will be much the better way to raiſe a hill of earth where each tree is to be planted, than to dig into the rock or gravel, and fill it up with earth (as is too often practiſed), whereby the trees are planted, as it were in a tub, there being but little room for their roots to extend; ſo that after two or three years growth, when their roots have extended to the ſides of the hole, they are ſtopped by the rock or gravel, can get no farther, whereby the trees will decline, and in a few years die; beſides, theſe holes detain the moiſture ſo, that the fibres of the plants are often rotted thereby. But when they are raiſed above the ſurface of the ground, their roots will extend and find nouriſhment, though the earth upon the rock or gravel be not three inches thick, as may be frequently obſerved, where trees are growing upon ſuch ſoils.

The next thing to be obſerved is to place the tree in the hole in ſuch manner, that the roots may be about the ſame depth in the ground, as they were growing before they were taken up; then break the earth fine with a ſpade, and ſcatter it into the hole, ſo that it may fall in between every root, that there may be no hollowneſs in the earth (but you ſhould by no means ſift or ſcreen the mould, for reaſons given in ſome other places); then having filled in the earth, you ſhould gently tread it cloſe with your feet, but do not make it too hard, which is a very great fault, eſpecially if the ground is ſtrong and inclineable to bind.

Having thus planted the trees, you ſhould provide a parcel of ſtakes, one of which ſhould be driven down by the ſides of the trees, and faſtened thereto to ſupport them from being blown down or diſplaced by the wind; then lay ſome mulch upon the ſurface of the ground, about their roots, to prevent the earth from drying.

This is to be underſtood of ſtandard-trees which caſt their leaves; for ſuch as are planted againſt walls, ſhould have their branches faſtened to the wall to prevent the trees from being diſplaced by the wind; but there is no difference in their management, only to preſerve their heads entire, and to place their roots about five inches from the wall, inclining their heads thereto; and the ſpring following, juſt before they ſhoot, their heads ſhould be cut down to five or ſix buds, as is fully directed under the ſeveral articles of the different kinds of fruit.

As to the watering of all new-planted trees, I ſhould adviſe it to be done with great moderation, nothing being more injurious to them than over-watering. Examples enough of this kind may have been ſeen in many parts of England, where there has been plantations made, which have been over-watered, whereby the greateſt part of the trees have failed, or thoſe which have ſurvived, have made little progreſs, occaſioned by the abundance of water given to them, whereby the fibres were rotted off as ſoon as produced. And how can any perſon imagine that a tree ſhould thrive, when the ground, in which it is planted, is continually floated with water? for by an experiment made by the Rev. Dr. Hales, in placing the roots of a dwarf Pear-tree in water, the quantity of moiſture imbibed decreaſed very much daily, becauſe the ſap-veſſels of the roots, like thoſe of the cut-off boughs in the ſame experiment, were ſo ſaturated and clogged with moiſture, by ſtanding in water, that more of it could not be drawn up. And this experiment was tried upon a tree which was full of leaves, and thereby more capable to diſcharge a large quantity of moiſture than ſuch trees as are entirely deſtitute of leaves; ſo that it is impoſſible ſuch trees can thrive, where the moiſture is too great about their roots.

The ſeaſons for planting are various, according to the different ſorts of trees, or the ſoil in which they are planted; for ſuch trees whoſe leaves fall off in winter, the beſt time is in the middle or end of October, provided the ſoil be dry; but for a very wet ſoil, it is better to defer it until the latter end of February, or the beginning of March; and for many kinds of Evergreens, the beginning of April is by far the beſt ſeaſon, though ſome ſorts may be ſafely removed at Midſummer, provided they are not to be carried very far; but you ſhould always make choice of a cloudy ſeaſon; if poſſible, at that time of the year, when they will take freſh root in a few days. And, on the contrary, when theſe trees are removed in winter, during which time they are almoſt in a ſtate of reſt, they do not take root until the ſpring advances, and ſets the ſap in motion; ſo that many times they die, eſpecially if the winter proves ſevere.

As to the preparing the ſoil for Planting, that muſt alſo be done to ſuit the different ſorts of trees, ſome requiring a light ſoil, others a ſtrong one, &c. But this is fully ſet down in the ſeveral articles of trees, under their proper heads, to which the reader is deſired to turn; though for the fruit-trees in general, a freſh ſoil from a paſture ground, which is neither too light and dry, nor over-ſtrong and moiſt, but rather a gentle, ſoft, loamy earth is to be preferred, provided it be expoſed ſome time. And if it be for wall trees, will be the better if the borders are filled with this earth ſix or eight feet wide, but it need not be above two feet and a half deep at moſt; for when the borders are made too deep, the roots of theſe trees are enticed downward, which is of bad conſequence to fruit-trees, as hath been elſewhere obſerved. The ſame alſo muſt be obſerved for ſtandard-trees (where freſh earth is brought to the places in which they are planted), not to make the holes too deep, but rather let them have the ſame quantity of earth in width, which is much to be preferred.

There are ſeveral perſons who direct the placing of the ſame ſide of the tree to the ſouth, which before removing had that poſition, as a material circumſtance to be ſtrictly regarded; but from ſeveral trials which I have made, I could not obſerve the leaſt difference in the growth of thoſe trees which were ſo placed, and others which were reverſed; ſo that I conclude, it is not of any conſequence to obſerve this method.

The diſtance which trees ſhould be planted at, muſt alſo be proportioned to their ſeveral kinds, and the ſeveral

ſeveral purpoſes for which they are intended, all which is explained under their ſeveral heads; but fruit-trees, planted either againſt walls, or for eſpaliers, ſhould be allowed the following diſtances: for moſt ſorts of vigorous-ſhooting Pear-trees, from thirty-ſix to forty feet; for Apricots, ſixteen or eighteen feet; Apples, twenty-five or thirty feet; Peaches and Nectarines, twelve feet; Cherries and Plums, twenty-five feet, according to the goodneſs of the ſoil or the height of the wall. But as theſe things are mentioned in the ſeveral articles of fruit-trees, it will be needleſs to repeat any more in this place.

What hath been mentioned on this article chiefly relates to fruit-trees and evergreens, for the adorning of gardens; but I ſhall now proceed to the planting of foreſt and other trees, which are in all large plantations of parks and extenſive gardens the moſt numerous. The modern practice of tranſplanting theſe ſorts of trees from hedge-rows and woods of large ſizes, and at a great expence, has too generally prevailed in this kingdom, the generality of planters being in too great haſte, and by a miſtaken notion of ſaving time, begin by tranſplanting ſuch large trees as they find on their own eſtates, or that they can procure in their neighbourhood, and pleaſe themſelves with the hopes of having fine plantations ſoon; but if, inſtead of removing theſe trees, they would begin by making a nurſery, and raiſing of their trees from ſeeds, they would ſet out in a right method, and ſave a great expence and much time, and they would have the conſtant pleaſure of ſeeing their trees annually advance in their growth, insteand of their growing worſe, as will always be the caſe where old trees are removed, though many perſons flatter themſelves with the hopes of ſucceſs, when they find their trees ſhoot out the following ſeaſon; and as theſe will often continue to grow for ſome years after, ſo they continue their expectations, till after waiting many years, in which time they might have had ſeedling trees grown up to a fine ſize, if they had been ſown at the time the large trees were planted, they then find their trees annually decaying, when they moſt expected their increaſe; for of all the plantations which I have yet ſeen of theſe large trees of any ſort, there is ſcarce one which has ever ſucceeded. And if thoſe perſons who are diſpoſed to plant, would be ſo kind to themſelves as to ſurvey with attention, as many of the modern plantations of this kind as they conveniently can, they will be convinced of the truth of this fact; but there are very few who give themſelves time to deliberate before they begin, ſo that until they meet with diſappointments, they ſcarce reflect on what they are doing. And it too often happens, that the perſons employed in the executing, either through ignorance, or ſome other motive, encourage this practice of Planting.

In ſome of theſe plantations, all the Elms which could be procured from the neighbouring hedge-rows have been removed, moſt of which have been ſuckers produced from the old ſtumps, ſo have ſcarce any roots: theſe have, at a great expence, been planted and watered, and perhaps many of them have made conſiderable ſhoots, the whole length of the ſtem at every knot, and many of them have continued ten or twelve years alive, but have not increaſed in the girt of their ſtems half an inch, and all that time have been decaying at their heart, and growing hollow; ſo that when a ſevere froſt in winter, or a great drought in ſummer, has happened, there has been an almoſt total deſtruction of the trees.

In other places I have ſeen great numbers of tall Oaks tranſplanted, which have appeared to thrive for ſome years when firſt planted; but in five or ſix years after have begun to decay at their top, and have leiſurely died to the ground, than which nothing can be a more diſagreeable ſight to the owner. And the method which is commonly practiſed in tranſplanting of theſe trees would deſtroy them, were there a poſſibility of ſuch large trees ſurviving their removal, which is, that of cutting off all their branches; for, were the ſame practiſed on a tree of the ſame age unremoved, it would ſtint the growth ſo much as not to be recovered in ſeveral years, nor would it ever arrive to the ſize of ſuch as have all their branches left on them. But the reaſon given for this practice is, that if the branches were left upon the trees, they could not be ſupported, the winds would throw them out of the ground; and another (which is bad philoſophy) is, that as the roots have been greatly reduced by tranſplanting, ſo the heads of the trees ſhould be reduced in the ſame proportion. As to the firſt, it muſt be allowed, that trees which are removed with great heads, are with great difficulty preſerved in their upright ſituation; for the winds will have ſuch power againſt the branches as to overſet the trees, if they are not very ſtrongly ſupported with ropes. Therefore this may be brought as an objection to the tranſplanting of large trees, rather than in ſupport of a practice which is ſo prejudicial to them; and as to the other reaſon, it has no foundation; for if large amputations are made at the root, there ſhould not be the ſame practiſed on the head; becauſe the wounded part of the head will imbibe the air at every orifice, to the great prejudice of the tree. Beſides this, if we pay any regard to the doctrine of the circulating of the juices in plants, we muſt allow, that the heads of the trees are equally uſeful to nouriſh the roots, as the roots are to the heads; ſo that if there is a waſte of ſap both at the top and bottom of the trees, it muſt weaken them in proportion. For whoever will be at the trouble to try the experiment on two trees of equal age and health, and to cut the branches off from one, and leave them upon the other at the time of tranſplanting, if the latter is well ſecured from blowing down, it will be found to ſucceed much better than the other; or if the ſame thing is practiſed upon two trees left ſtanding, the tree whoſe branches are cut off, will not make half the progreſs as the other, nor will the ſtem increaſe in its bulk half ſo faſt. Therefore where trees are tranſplanted young, there will be no neceſſity for uſing this unnatural amputation, and the ſucceſs of theſe plantations will always give pleaſure to the owner. I have ſeen ſome plantations of Oak-trees, which were made fifty years ago, and had thriven beyond expectation moſt part of the time, but are now annually decaying, and ſeem as if they would not continue many years longer, when the trees on the ſame ſoil and in the ſame ſituation, which were left ſtanding, are in perfect health and vigour; and ſome of theſe tranſplanted trees which have been cut down, were found to be of little value, their timber being ſhaken and bad.

It is common to hear perſons remarking, that from the preſent ſpirit of Planting, great advantages will accrue to the public by the increaſe of timber; but whoever is the leaſt ſkilled in the growth of timber muſt know, that little is to be expected from moſt of the plantations which have lately been made; for there are few perſons who have had this in their view when they commenced planters, and of thoſe few ſcarce any of them have ſet out right; for there never was any valuable timber produced from trees which were tranſplanted of any conſiderable ſize, nor is any of the timber of the trees which are tranſplanted young, equal in goodneſs to that which has grown from the ſeeds unremoved. Beſide, if we conſider the ſorts of trees which are uſually planted, it will be found, that they are not deſigned for timber; ſo that upon the whole, it is much to be doubted, whether the late method of planting has not rather been prejudicial to the growth and increaſe of timber, than otherwiſe.

Before I quit this ſubject of Planting, I muſt beg leave to obſerve, that moſt people are ſo much in a hurry about Planting, as not to take time to prepare their ground for the reception of trees, but frequently make holes and ſtick in the trees, amongſt all ſorts of rubbiſh which is growing upon the land: and I have frequently obſerved, that there has not been any care afterward taken to dig the ground, or

root out the noxious plants; but the trees have been left to struggle with these bad neighbours, who have had long possession of the ground, and have established themselves so strongly as not to be easily overcome; therefore, what can be expected from such plantations? This is to be understood of deciduous trees, for the Pines and Firs, if once well rooted in the ground, will soon get the better of the plants and destroy them.

There are some other persons who begin better than the former, and who will be at the expence of preparing the ground and of Planting their trees, but afterward take very little care of them; so that it is common to see them overgrown with weeds in a year after they are planted, whereby the trees receive so much injury as to retard their growth, and many times, if the trees are young, they are totally destroyed. Therefore I would advise every person who proposes to plant, to prepare the ground well before-hand, by trenching or deep ploughing it, and clearing it from the roots of all bad weeds; for by so doing, there will be a foundation laid for the future success of the plantation. Also I advise no person to undertake more of this work than he can afterward keep clean, for all plantations of deciduous trees will require this care, or at least for seven years after they are made, if they hope to see the trees thrive well. Therefore all small plantations should have the ground annually dug between the trees; and as to those which are large, it should be ploughed between them. This will encourage the roots of the trees to extend themselves, whereby they will find a much greater share of nourishment, and by loosening the ground, the moisture and air will more easily penetrate to the roots, to the no small advantage of the trees. But besides this operation, it will be absolutely necessary to hoe the ground three or four times in summer, either by hand or the hoe-plough. This I am aware will be objected to by many, on account of the expence; but if the first hoeing is performed early in the spring, before the weeds have gotten strength, a great quantity of ground may be gone over in a short time; and if the season is dry when it is performed, the weeds will presently die after they are cut; and if this is repeated before the weeds come up again to any size, it will be found the cheapest and very best husbandry; for if the weeds are suffered to grow till they are large, it will be a much greater expence to root them out, and make the ground clean; besides, the weeds will rob the trees of great part of their nourishment. I have sometimes been told, That it is necessary to let the weeds grow among trees in summer, in order to shade their roots, and keep the ground moist, but this has come from persons of no skill; but as others may have been deceived by such advice, I imagine it may not be improper to give some answer to this. And here I must observe, That if weeds are permitted to grow, they will draw away all moisture from the roots of the trees for their own nourishment, so that the trees will be thereby deprived of the kindly dews and the gentle showers of rain, which are of great service to young plantations; and these will be entirely drawn away by the weeds, which will prevent their penetrating the ground, so that it is only the great rains which can descend to the roots of the trees. And whoever has the least doubt of this matter, if they will but try the experiment, by keeping one part of the plantation clean, and suffer the weeds to grow on another, they will soon be convinced of the truth by the growth of the trees. And though this cleaning is attended with an expence, yet the success will overpay this, beside the additional pleasure of seeing the ground always clean.

In the disposition of trees in parks, and of shrubs and trees in gardens, there are very few of those who call themselves designers, who have had much regard to this particular; for in most of the modern plantations, it is not uncommon to see an Oak, an Elm, or some other large-growing tree planted where a Rose-bush, a Honeysuckle, or Sweet-briar, might with more propriety occupy the space: so that in a few years, if these large trees are left growing, the whole plantation must make a disagreeable appearance; but having already mentioned these things under the article of Gardens, I shall not enlarge farther on them here.

PLANTING REVERSE: Dr. Agricola tells us, That he has made several experiments on the branches of foreign trees, as well Orange as Laurel, which he performed after the manner following; he first stripped the branches of all the leaves; then he bent and tied them, dressed them with his noble mummy, and planted them the reverse way, so that nothing was to be seen of all the branches but the great ends, and kept them during the winter in his stove.

He adds, That those who have a mind to raise trees this way, which he calls monstrous fruit-trees, may raise Apples, Pears, Cherries, Apricots, Peaches, Mulberries, Walnut-trees, &c. also Rose-trees, Gooseberry bushes, &c. which he direct to do something more at large, as follows:

Take those branches that are furnished with long side shoots or twigs, and bend the side twigs in the joints toward the great branches, and tie them together with bass or packthread; then dress them with mummy, either with a brush only near the ligature, and here and there on the joints, or dip them entirely into it; then having made a deep hole in the ground set the branches the reverse way, so that nothing but the long end of the branch appears above ground, the rest being covered with good, fat, and well broken earth. This being done, the little branches will take root in the joints every where; then the buds will begin to shoot, so that you may see fifty or sixty more branches spring up, making an agreeable as well as monstrous figure.

Mr. Fairchild of Hoxton had begun to put the same into practice, and he gives directions for performing it as follows:

First, to make choice of a young tree of one shoot, either of Alder, Elm, or Willow, or any other tree that will take root easily by laying, and to bend the extreme part of the shoot gently down into the earth, and so let it remain till it has taken root, so that the plant then will resemble an arch or bent bow above the ground.

When this top end has well struck new roots, to dig about the first root, and raise it gently out of the ground, till the stem is upright, and so stake it up, otherwise it will be apt to bend.

Then to prune those roots that are erected in the air, from the bruises and wounds which they received in being dug up, and do over with a brush the pruned parts with the following composition, moderately warm:

Take four ounces of tallow, four ounces of bees-wax, two ounces of resin, and two ounces of turpentine, melted together in a pipkin.

After this prune off all the buds or shoots that are upon the stem or plant, and dress the wound with the same composition, to prevent any collateral shootings, that may spoil the beauty of the stem.

Besides, care is to be taken, that the new-growing roots of this reversed plant be well nourished; and therefore that part of the shoot which was the larger, is to be cut away a little below the earth, that the stem may be better nourished, and its roots translated.

These experiments are curious but not useful, because these reversed trees never shoot perpendicular, but their branches incline to the ground, retaining their former method of growing.

PLATANUS. Tourn. Inst. R. H. 590. tab. 363. Lin. Gen. Plant. 954. [πλάτανος, of πλατὺς, broad, because the leaves of this tree are broad.] The Plane-tree.

The Characters are,

*It hath male and female flowers growing separate on the same tree. The male flowers are collected in a round ball; they have no petals, but have very small empalements, which have oblong coloured stamina, terminated by four-cornered summits. The female flowers have small scaly empalements,*

*empalements, and ſeveral ſmall concave petals, with ſeveral awl-ſhaped germen ſitting upon the ſtyles, crowned by recurved ſtigmas; theſe are collected in large balls. The germen afterward turns to a roundiſh ſeed ſitting upon the briſtly ſtyle, and ſurrounded with downy hairs.*

This genus of plants is ranged in the eighth ſection of Linnæus's twenty-firſt claſs, which includes thoſe plants which have male and female flowers ſeparated on the ſame plant, whoſe male flowers have many ſtamina.

The Species are,

1. Platanus (*Orientalis*) foliis palmatis. Hort. Cliff. 447. *Plane-tree with hand-ſhaped leaves.* Platanus Orientalis verus. Park. Theat. 1427. *The true Eaſtern Plane-tree.*
2. Platanus (*Occidentalis*) foliis lobatis. Hort. Cliff. 447. *Plane-tree with lobated leaves.* Platanus Occidentalis aut Virginienſis. Park. Theat. 1427. *Occidental or Virginian Plane-tree.*

Theſe two are undoubtedly diſtinct ſpecies, but there are two others in the Engliſh gardens, which I ſuppoſe to be varieties that have accidentally riſen from ſeed; one is titled the Maple-leaved Plane-tree, and the other is called the Spaniſh Plane-tree.

The firſt ſort, or Eaſtern Plane-tree, grows naturally in Aſia, where it becomes very large; the ſtem is tall, erect, and covered with a ſmooth bark, which annually falls off; it ſends out many ſide branches, which are generally a little crooked at their joints; the bark of the young branches is of a dark brown, inclining to a purple colour; they are garniſhed with leaves placed alternate; their foot-ſtalks are an inch and a half long; the leaves are ſeven inches long and eight broad, deeply cut into five ſegments, and the two outer are ſlightly cut again into two more; theſe ſegments have many acute indentures on their borders, and have each a ſtrong midrib, with many lateral veins running to the ſides; the upper ſide of the leaves are of a deep green, and the under ſide pale. The flowers come out upon long foot-ſtalks or ropes hanging downward, each ſuſtaining five or ſix round balls of flowers; the upper, which are the largeſt, are more than four inches in circumference; theſe ſit very cloſe to the foot-ſtalks. The flowers are ſo ſmall as ſcarce to be diſtinguiſhed without glaſſes; they come out a little before the leaves, which is in the beginning of June; and in warm ſummers the ſeeds will ripen late in autumn, and if left upon the trees will remain till ſpring, when the balls fall to pieces, and the briſtly down which ſurrounds the ſeeds, help to tranſport them to a great diſtance with the wind.

The ſecond ſott grows naturally in moſt parts of North America; this tree alſo grows to a large ſize, the ſtem very ſtrait, and of equal girt moſt part of the length; the bark is ſmooth, and annually falls off like that of the other; the branches extend wide on every ſide; the young ones have a browniſh bark, but the old ones have a gray bark; the foot-ſtalks of the leaves are three inches long; the leaves are ſeven inches long, and ten broad; they are cut into three lobes or angles, and have ſeveral acute indentures on their borders, with three longitudinal midribs, and many ſtrong lateral veins. The leaves are of a light green on their upper ſide, and paler on their under. The flowers grow in round balls like the former, but are ſmaller. The leaves and flowers come out at the ſame time with the former, and the ſeeds ripen in autumn.

That which is called the Maple-leaved Plane, is certainly a ſeminal variety of the Eaſtern Plane, for the ſeeds which ſcattered from a large tree of this kind in the Chelſea Garden have produced plants of that ſort ſeveral times. This differs from the two ſorts before-mentioned, in having its leaves not ſo deeply cut as thoſe of the Eaſtern Plane, but they are divided into five ſegments, pretty deep, but are not lobed as thoſe of the Occidental Plane. The foot-ſtalks of the leaves are much longer than thoſe of either of the former, and the upper ſurface of the leaves is rougher, ſo that any perſon might take them for different ſpecies, who had not ſeen them riſe from the ſame ſeeds.

The Spaniſh Plane-tree has larger leaves than either of the other ſorts, which are more divided than thoſe of the Occidental Plane-tree, but not ſo much as the Eaſtern. Some of the leaves are cut into five and others but three lobes; theſe are ſharply indented on the edges, and are of a light green; the foot-ſtalks are ſhort, and covered with a ſhort down. This is by ſome called the middle Plane-tree, from its leaves being ſhaped between thoſe of the two other ſorts. It grows rather faſter than either of the other ſorts, but I have not ſeen any very large trees of this kind.

The firſt ſort was brought out of the Levant to Rome, where it was cultivated with much coſt and induſtry. The greateſt orators and ſtateſmen among the Romans took great pleaſure in their villas, which were ſurrounded with Platani; and their fondneſs for this tree became ſo great, that we frequently read of their irrigating them with wine inſtead of water. Pliny affirms, that there is no tree whatſoever, which ſo well defends us from the heat of the ſun in ſummer, nor that admits it more kindly in winter, the branches being produced at a proportionable diſtance to the largeneſs of their leaves (which is what holds through all the different ſorts of trees yet known) ſo that when the leaves are fallen in winter, the branches growing at a great diſtance, eaſily admit the rays of the ſun.

This tree was afterwards brought to France, where it was cultivated only by perſons of the firſt rank; and ſo much was the ſhade of it prized, as that if any of the natives did but put his head under it, they exacted a tribute from him.

It is generally ſuppoſed, that the introduction of this tree into England is owing to the great Lord Chancellor Bacon, who planted a noble parcel of them at Verulam, which were there very flouriſhing ſome years ſince, but have lately been deſtroyed. But notwithſtanding its having been ſo long in England, yet there are but very few large trees to be ſeen of it at preſent; which may, perhaps, be owing to the great eſteem the perſons of the laſt age had for the Lime-tree, which was a faſhionable tree at that time, and being much eaſier to propagate, and of a quicker growth during the three or four firſt years than the Plane-tree, thereby it became the moſt common tree for planting of avenues and ſhady walks near habitations in England. But ſince the defects of that tree have been more generally diſcovered, the Elm has had the preference, and is now the moſt commonly planted for ſuch purpoſes.

However, notwithſtanding what has been ſaid of the Plane-tree, of its backwardneſs in coming out in the ſpring, and the ſudden decay of its leaves in autumn, yet for the goodly appearance, and great magnitude to which it will grow, it deſerves a place in large plantations, or ſhady receſſes near habitations; eſpecially if the plantation be deſigned on a moiſt ſoil, or near rivulets of water, in which places this tree will arrive to a prodigious magnitude.

We read of one of theſe trees, which was growing at a villa of the Emperor Caligula, whoſe trunk was ſo large, as when hollowed, to make room therein, capacious enough to entertain ten or twelve perſons at a repaſt, and for their ſervants to wait upon them. And there is mention made of one of theſe trees, which was growing in the Eaſtern country, which was of ſo great a magnitude, that Xerxes made his army (which conſiſted of ſeventeen hundred thouſand men) halt for ſome days, to admire the beauty and tallneſs of this tree; and became ſo fond of it, as to take his own, his concubines, and all the great perſons jewels to cover it; and was ſo much enamoured with it, that for ſome days, neither the concern of his grand expedition, nor intereſt, nor honour, the neceſſary motion of his prodigious army, could diſſuade him from it; he ſtiled it, his Miſtreſs, his Minion, his Goddeſs; and when he was obliged to part with it, he cauſed a figure of it to be

ſtamped on a gold medal, which he continually wore about him.

And ſuch was the eſteem which the people of Aſia had for this tree, that wherever they erected any ſumptuous buildings, the porticoes, which opened to the air, terminated in groves of theſe trees.

The Eaſtern Plane-tree is propagated either from ſeeds, or by layers, the latter of which is generally practiſed in England; though the plants thus raiſed ſeldom make ſo large ſtrait trees, as thoſe which are produced from ſeeds; but it has been generally thought, that the ſeeds of this tree were not productive, becauſe they have not been ſown at a proper ſeaſon, nor managed in a right manner; for I have had thouſands of the young plants ſpring up from the ſeeds of a large tree, which ſcattered upon the ground in a moiſt place; and I ſince find, that if theſe ſeeds are ſown ſoon after they are ripe, in a moiſt ſhady ſituation, they will riſe extremely well; and the plants thus obtained, will make a conſiderable progreſs after the ſecond year, being much hardier and leſs liable to loſe their tops in winter, than thoſe which are propagated by layers. And ſince the ſeeds of this tree frequently ripen well in England, they may be propagated in as great plenty as any other foreſt-tree.

The Virginian Plane-tree will grow extremely well from cuttings, if they are planted the beginning of October upon a moiſt ſoil; and if they are watered in dry weather, will make a prodigious progreſs; ſo that in a few years from the planting, they will afford noble trees for planting of avenues, and other ſhady walks; and their trunks are perfectly ſtrait, growing nearly of the ſame ſize to a conſiderable height, there being the leaſt difference in the girt of this tree, for ſeveral yards upwards, of any other ſort of tree whatſoever. The Hon. Paul Dudley, Eſq; in a letter to the Royal Society, mentions one of theſe trees, which he obſerved in New England, whoſe girt was nine yards, and held its bigneſs a great way up, which tree, when cut down, made twenty-two cords of wood. He alſo ſays, in the ſame letter, That he had propagated many of theſe trees by cutting off ſticks of five or ſix feet long, and ſetting them a foot deep into the ground in the ſpring of the year, when the ſeaſon was wet, and that they always thrive beſt in a moiſt ſoil.

All the ſorts are propagated very eaſily by layers, every twig of them will take root, if they are but pegged down and covered with earth; theſe layers will be well rooted in one year, when they ſhould be cut off from the old trees or ſtools, and planted in a nurſery, where they may remain two or three years to get ſtrength, after which they may be tranſplanted where they are to remain, for the younger theſe trees are planted the better they will thrive. An experiment of this I made in 1731, when I planted four of theſe trees, one of each ſort, in the ſame ſoil and ſituation, at about twenty feet diſtance from each other; one of which, viz. the Spaniſh Plane, whoſe ſtem was eight inches in girt; next to this, I planted one of the Maple-leaved Plane-tree, whoſe girt was not three inches, but the latter is now much larger than the former, and gains more in one year than the other does in three; and the two others which were of a middle ſize, have grown in a mean proportion between them.

PLOUGHING OF LAND.

There is not a greater improvement of arable land than that of well ploughing it, by which the ſoil is pulverized, and rendered fit to receive the fibres of the plants; and the oftener this is repeated, and the better it is performed, the greater improvement is made in the land. But there are not many of the practitioners of the art of huſbandry, who attend enough to this part of it, moſt of them contenting themſelves with going on in the old beaten road of their predeceſſors; ſo that the only perſons who have made great improvement in this part of agriculture, are the great gardeners, who cultivate moſt of their land with the plough; therefore they have imitated, as near as poſſible, the uſe of the ſpade in labouring of their ground. The difference between digging of land with the ſpade, and that of ploughing, conſiſts in the parts of the earth being much more divided by the former, than the latter method; therefore thoſe gardeners, who are curious in the working of their land, oblige their labourers to ſpit the ground as thin as poſſible, that there may remain no large clods unbroken; ſo, when land is ploughed, the ſame regard ſhould be had to break and pulverize the parts as much as poſſible; for when there are great clods left unbroken, the fibres of plants never penetrate farther than the ſurface of them; ſo that all the ſalts included in theſe lumps of earth are locked up, that the plants can receive no benefit from them. And theſe clods, in proportion to their ſize, make ſuch interſtices, that the air often penetrates through, and greatly injures the tender fibres of the roots. Therefore the oftener the land is ploughed, and the more the parts are ſeparated and pulverized, the better will the plants be nouriſhed and fed; but particularly in all ſtrong land, this part of huſbandry will be the moſt beneficial; but this cannot be effected under four or five ploughings, and by uſing ſuch ploughs as have either two or four coulters, which will cut and ſeparate the clods much better than it can be performed by the common plough; and in the operation, great care ſhould be had to the breadth of the furrow, for when theſe are made too broad, it will be impoſſible to break and ſeparate the parts ſufficiently. In ſome counties, where the huſbandmen are not very expert in the uſe of the plough, I have ſeen gentlemen oblige them to plough by a line, and they have ſet out the exact width of each furrow. This not only adds a neatneſs to the ground, but likewiſe, by keeping the furrows ſtrait, and at equal diſtances, the land will be more equally worked; but many of the good ploughmen in the counties near London, will direct the plough as ſtrait by their eye, as if they were to uſe a line.

Another thing to be obſerved in ploughing of land is that of going to a proper depth, for if the ſurface only be broken up and pulverized, the roots of whatever plants are ſown upon it will in a very ſhort time reach the bottom, and meeting with the hard unbroken ſoil, they are ſtopped from getting farther, and of conſequence the plants will ſtint in their growth; for there are few perſons who have attended enough to the downright growth of the roots of plants, and only have had regard to the roots of thoſe plants, which are of a ſtrong fleſhy ſubſtance, and are called tap-roots, being in form of Carrots. Theſe they ſuppoſe will require to have the land wrought to a greater depth, that the roots may run down, and be the longer, for in that particular their goodneſs conſiſts. But they do not think that the ſmall fibrous-rooted plants ever require ſo much depth to run into the ground; in this they are greatly miſtaken, for I have traced the ſmall fibres of Graſs and Corn above three feet deep in the ground. And if any perſon is curious to obſerve the length of the fibres of plants, if they will but plant one of each ſort into a ſmall pot of earth, and keep them duly watered till the plants are advanced to flower, and then turn them out of the pots carefully, ſo as not to break any of the fibres of the roots, and after ſeparating the earth from them, meaſure the length of their roots, they will be found much greater than moſt people imagine. I have myſelf frequently traced the roots of plants, which have ſurrounded the pots upward of twelve times; and the roots of ſome ſtrong-growing plants, which have gotten through the holes in the bottom of flower-pots, have in three months time extended themſelves ten or eleven feet from the plant; therefore the deeper the ground is laboured, the greater benefit the plants will receive from it: but it muſt be underſtood of ſuch land as the ſtaple is deep enough to admit of this, for if the ſoil is ſhallow, and either gravel, chalk, or ſtone lie beneath, it will be very imprudent to turn up either of theſe; therefore the depth of the furrows in ſuch lands, muſt be determined by the ſtaple of the land. By the word ſtaple muſt be underſtood all that

depth of ſoil next the ſurface, which is proper for the growth of vegetables. Where clay is next the ſtaple, provided it is not of the blue or iron-mould ſort, there will not be the ſame danger of going a little deeper than the ſtaple, as in either of the before-mentioned ſorts of land; for if the clay be of a fat nature, when it hath been well expoſed to air, and often laboured, it will be capable of affording a large ſhare of nouriſhment to the crops.

If between each ploughing of the land a harrow with long teeth is made uſe of to tear and break the clods, it will be of great ſervice to the land; for the more it is ſtirred by different inſtruments, the better will the parts be ſeparated and pulverized; ſo that the common method, as practiſed by the farmers, when they fallow their land, is far from anſwering the intention, for they plough up the ground, leaving it in great clods for ſome months, and frequently, during this time, Thiſtles and all bad weeds are ſuffered to grow upon the land, to exhauſt the goodneſs of it; and perhaps, juſt before the ſeeds are ſown, they give it two more ploughings. This is what the farmers call good huſbandry; but if inſtead of this method they would labour the ground often with the plough, a harrow, and heavy roller, to break and ſeparate the parts, and never ſuffer any weeds to grow upon the land during its lying fallow, I am ſure they would find their account in it; firſt, by the growth and increaſe of their crops, and afterward by a ſaving in the weeding; for if no weeds are ſuffered to grow to ſhed their ſeeds, during the time of fallowing the land, there will but few come up when the ground is ſown, in compariſon with what would otherwiſe be in the common huſbandry.

In many of the old gardens near London, which are occupied by the kitchen-gardeners, when the upper ſurface of the ground is exhauſted by the continual crops which they get from it, it is a common method to trench the ground two or three ſpades depth, and turn the bottom ſoil upward; and by this the land is freſh, and produces very good crops for ſome years after. And in imitation of this many of the farming gardeners, who make uſe of the plough, have two or three men following the plough in the furrows, who turn up a ſpit in the bottom of each furrow; and where the ſoil is good, they throw it on the ſurface, but if otherwiſe, they level it in the bottom, and this looſening of the ground renders it capable of admitting the roots of the plants.

The ploughing already mentioned is intended to prepare the land for the reception of the ſeeds which are propoſed to be ſown, and as was before obſerved, the oftener and better this is performed, the more the land will produce. But, beſide this, there will be a neceſſity for ſtirring the ground to deſtroy the weeds, after the crop is growing; for if the weeds are ſuffered to grow with the crop, they will draw away moſt of the nouriſhment, and greatly leſſen their produce. Therefore in gardens this work is generally performed by hand, with an inſtrument called a hoe, unleſs when the ground is very ſtiff, and ſubject to bind; in which caſe it will be proper to make uſe of forks to break and looſen the earth between the crops, and the oftener this is repeated, the better will the crops ſucceed, and this huſbandry I have ſeen attended with great advantage. But in the large open fields of Beans, Peas, and other large-growing plants which are planted in rows, the ground between may be frequently ſtirred with a ſmall ſwing-plough, which will deſtroy the weeds, pulverize the ground, and give nouriſhment to the crop; for as all land is apt to bind, or the parts coaleſce by lying unſtirred, the more and oftener it is ſtirred, the better it will be kept looſe, and thereby rendered proper for the growth of plants. This ſort of ploughing is termed horſe-hoeing, and there being a particular treatiſe upon this ſort of huſbandry written by Mr. Jethro Tull, of Shelbourn, in Berkſhire, in which the inſtruments are figured and deſcribed, I ſhall refer thoſe, who are deſirous to practiſe this huſbandry, to the book itſelf, and ſhall only take notice, that although the inſtrument uſed in this operation is a plough, yet it is termed hoeing, as it is intended to deſtroy the weeds, and to ſtir the ground but a ſmall depth, to diſtinguiſh it from the common ploughing to prepare the land for the crop.

PLUMBAGO. Tourn. Inſt. R. H. 140. tab. 58. Lin. Gen. Plant. 196. Leadwort.

The Characters are,

*The flower has a tubulous, five-cornered, permanent empalement of one leaf, which is indented at the top into five parts; it hath one petal which is funnel-ſhaped, and a cylindrical tube which is narrow at the top. The brim is cut into five parts which are oval and ſpreading; it has five awl-ſhaped ſtamina ſituated in the tube, ſitting upon the valves of the nectarium, which includes the germen. The ſmall oval germen ſuſtains a ſingle ſtyle the length of the tube, crowned by a ſlender five-pointed ſtigma. The germen afterward becomes a ſingle oval ſeed included in the empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which includes the plants whoſe flowers have five ſtamina and one ſtyle.

The Species are,

1. Plumbago (*Europæa*) foliis amplexicaulibus. Hort. Cliff. 53. *Leadwort with leaves embracing the ſtalks.* Plumbago quorundam. Cluſ. Hiſt. 123. *Leadwort or Toothwort.*
2. Plumbago (*Zeylanica*) foliis petiolatis ovatis glabris, caule geniculis giblofis. Lin. Sp. 215. Hort. Cliff. 53. *Leadwort with leaves having foot-ſtalks.* Plumbago Americana, betæ folio ampliori. Plum. Cat. *American Leadwort with a larger Beet leaf.*

Theſe are all the ſorts which I have obſerved in the Engliſh gardens. The firſt ſort grows naturally in the ſouth of France, in Italy, and Spain; it hath a perennial root, which ſtrikes deep into the ground, from which ariſe many ſlender ſtalks about three feet and a half high, which are channelled, and garniſhed with oval ſpear-ſhaped leaves about three inches long and two broad, whoſe baſe embrace the ſtalks; they are ſmooth, entire, and of a grayiſh colour. The upper part of the ſtalks ſend out many ſide branches which are ſlender, and garniſhed with ſmall leaves. Theſe, and alſo the principal ſtalks, are terminated by tufts of either blue or white flowers, which are ſmall, funnel-ſhaped, and have pretty long tubes, and are ſucceeded by oblong, rough, hairy ſeeds. This plant ſeldom flowers till toward the end of October in England, and unleſs the autumn proves warm, does not flower here, ſo never produces ripe ſeeds. There is a variety of this with white flowers and pale ſtalks, which is ſuppoſed to have riſen from the ſeeds of the former.

The ſtalks of this decay in the winter, and new ones come up the following ſpring; they are propagated here by parting of their roots, which ſend out heads in plenty. Theſe may be divided at any time when the weather is mild, from the time the ſtalks decay, till the roots begin to ſhoot in the ſpring; it ſhould have a light ſoil and a warm ſituation, otherwiſe it will not flower here. The roots ſhould be allowed room to ſpread, and the ſtalks require ſupport, and if the plants are kept clean from weeds, and the ground between them dug every winter, it is all the culture they require.

It is called Dentillaria or Toothwort by many authors, who recommend its virtues in curing the tooth-ach, being of a hot cauſtic nature like Pellitory of Spain.

The ſecond ſort grows naturally in both Indies; this is a perennial plant, with a ſtrong fibrous root, from which ariſe many ſlender ſtalks, which grow near four feet high, garniſhed with ſmooth, oval, ſpear-ſhaped leaves about three inches long, and one and a half broad near their baſe, ending in acute points, which are placed alternate, ſtanding upon ſhort foot-ſtalks. The upper part of the ſtalks divide into ſmall branches, garniſhed with ſmall oval leaves, and terminate in ſpikes of flowers, which have long ſlender tubes, cut into five ſegments at the brim, which ſpread open; theſe are ſucceeded by oblong ſeeds covered with the prickly empalement. The upper part of the

P L U

the ſtalks, and the empalements of the flowers are very glutinous, ſticking to the fingers if touched, and the ſmall flies which ſettle upon them are faſtened, ſo cannot get off again. This plant is too tender to thrive in the open air in England, ſo requires to be kept in a moderate ſtove, where they will continue flowering great part of the year; and thoſe flowers which appear early in the ſummer, will be ſucceeded by ripe ſeeds in autumn.

This is propagated by ſeeds, which ſhould be ſown on a good hot-bed in the ſpring, where the plants will come up in about five or ſix weeks. When theſe are fit to remove, they ſhould be each planted into a ſeparate ſmall pot filled with light loamy earth, and plunged into a hot-bed of tan, obſerving to ſcreen them from the ſun till they have taken new root; afterward they muſt be treated like other plants from the ſame country. In the ſummer they ſhould have a large ſhare of freſh air admitted to them in warm weather, and require water every other day in moderation. In winter they ſhould be kept in a moderate temperature of warmth, and muſt be more ſparingly watered. With this management the roots will abide ſeveral years, and produce plenty of flowers and ſeeds.

PLUM-TREE. See Prunus.

PLUMERIA. Tourn. Inſt. R. H. 659. tab. 439. Lin. Gen. Plant. 263. Red Jaſmine; in French, *Frangipanier*.

The Characters are,

*The flower has a ſmall obtuſe empalement divided into five parts; it hath one funnel-ſhaped petal, with a long tube enlarging upward, cut into five oblong oval ſegments at the top, which ſpread open; it hath five awl-ſhaped ſtamina ſituated in the center of the tube, terminated by ſummits which cloſe together, and an oblong bifid germen with ſcarce any ſtyle, crowned by a double acute ſtigma. The germen afterward becomes a long, ſwelling, acute-pointed capſule with one cell, filled with winged ſeeds placed over each other like ſcales of fiſh, faſtened at their baſe to the ſides of the capſule.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which contains thoſe plants whoſe flowers have five ſtamina and one ſtyle.

The Species are,

1. Plumeria (*Rubra*) foliis ovato-oblongis, petiolis biglandulosis. Hort. Cliff. 76. *Plumeria with oblong oval leaves, whoſe foot-ſtalks have two glands.* Plumeria flore roſeo odoratiſſimo. Inſt. R. H. 659. *Plumeria with a Roſe-coloured ſweet-ſcented flower, commonly called in the Weſt-Indies Red Jaſmine.*
2. Plumeria (*Incarnata*) foliis ovato-oblongis, ramis patulis, floribus corymboſis. *Plumeria with oblong oval leaves, ſpreading branches, and flowers growing in a corymbus.* Plumeria flore majore odorato & incarnato. *Plumeria with a larger ſweet-ſcented and incarnate flower, called in the Weſt-Indies the Japan-tree.*
3. Plumeria (*Alba*) foliis lanceolatis revolutis, pedunculis ſupernè tuberoſis. Lin. Sp. Plant. 410. *Plumeria with ſpear-ſhaped leaves which turn backward, whoſe foot-ſtalks have ſwellings on the upper ſide.* Plumeria flore niveo, foliis longis anguſtis & acuminatis. Inſt. R. H. *Plumeria with a ſnowy flower, and long narrow-pointed leaves.*
4. Plumeria (*Nivea*) foliis lanceolatis petiolatis obtuſis. Lin. Sp. Plant. 210. *Plumeria with ſpear-ſhaped obtuſe leaves having foot-ſtalks.* Plumeria flore niveo, foliis brevioribus & obtuſis. Inſt. R. H. *Plumeria with a ſnowy flower, and ſhorter blunt leaves.*
5. Plumeria (*Africana*) foliis lineari-lanceolatis longiſſimis. *Plumeria with very long, narrow, ſpear-ſhaped leaves.*

The title of this genus was given to it by Dr. Tournefort, in honour of Father Plumer, who was botaniſt to the late King of France, and a long time in America ſearching after new plants; and has publiſhed a catalogue of the plants he diſcovered, with ſeveral new genera which he conſtituted, in two volumes in folio, with figures and deſcriptions of many of the plants.

The firſt ſort grows naturally in the Spaniſh Weſt-Indies, from whence it was tranſplanted into moſt of the iſlands in the Weſt-Indies, where it is cultivated in the gardens for ornament. It riſes to the height of eighteen or twenty feet; the ſtalk is covered with a dark green bark, having marks where the leaves are fallen off. The ſtalks are ſucculent, and abound with a milky juice, but within they are ſomewhat ligneous. Toward the top they put out a few thick ſucculent branches, which are garniſhed at their ends with oval oblong leaves of a light green colour, having a large midrib and many tranſverſe veins; theſe are full of a milky juice. At the ends of the branches come out the flowers in cluſters; they are ſhaped like thoſe of the Oleander or Roſe Bay, having one petal which is tubulous, and cut into five oval obtuſe ſegments which ſpread open, of a pale red colour, and have an agreeable odour. When the flowers are paſt, the germen becomes a long ſwelling pod filled with flat winged ſeeds, lying over each other like the ſcales of fiſh. It uſually flowers here in July and Auguſt, but is never ſucceeded by pods in England.

The ſecond ſort I received from the iſland of St. Chriſtopher's by the name of Japan-tree; this ſort is very rare in the Engliſh ſettlements at preſent, having been but lately introduced from the Spaniſh Weſt-Indies. It is in leaf and ſtem very like the firſt, but the ſtalks do not riſe ſo high; they divide into ſtrong ſpreading branches, which are filled with a milky juice; the leaves are of a thicker conſiſtence than thoſe of the firſt, and their veins are larger; the flowers of this are of a paler colour, and are produced in much larger cluſters. It is very common to have upward of twenty of theſe flowers open in one bunch, and a number to ſucceed theſe as they decay, ſo that the cluſters have continued in beauty upward of two months, during which time they make a moſt beautiful appearance in the ſtove, and have a very agreeable flavour.

The third ſort grows plentifully at Campeachy, from whence the late Dr. Houſtoun ſent the ſeeds. He alſo obſerved ſome plants of this kind at Jamaica. This is not near ſo beautiful as the two former ſorts, the flowers being ſmaller, and produced in leſs bunches, and are moreover of ſhort duration. But for the beauty of their ſtems and leaves, and for the ſake of variety, they deſerve room in every curious collection of plants.

The fourth ſort was diſcovered by Dr. Houſtoun, growing in great plenty near Carthagena in the Spaniſh Weſt-Indies, from whence he ſent the ſeeds to England. This ſort produces ſmall white flowers, reſembling thoſe of the third, ſo is leſs valuable than the two firſt.

The ſeeds of the fifth ſort were ſent me by Mr. Richard, gardener to the King of France at Verſailles; they were brought from Senegal by Monſieur Adanſon, who was ſome years in that country in ſearch of plants. This hath a ſtalk very like the firſt ſort, but the leaves are nine or ten inches long, and not more than two inches broad; they are thick, ſucculent, and full of a milky juice, a little roundiſh at their baſe, but end in acute points. The flowers of this ſort are ſaid to be yellow, but as the plants have not yet flowered here, I can give no farther account of them.

All theſe plants may be propagated by ſeeds, which muſt be procured from the countries where they naturally grow; they ſhould be ſown in pots filled with light earth, and plunged into a hot-bed of tanners bark; and when the plants are come up about two inches high, they ſhould be tranſplanted into ſeparate ſmall pots filled with light ſandy earth, and plunged into the hot-bed again, obſerving to ſhade them from the heat of the ſun in the middle of the day, until they have taken root; but they muſt not have much water, for as all the ſorts are very ſucculent, being full of a milky juice, ſomewhat like the Euphorbiums, moiſture will cauſe them to rot. In hot weather the plants ſhould have a pretty large ſhare of freſh air admitted

admitted to them, by raising the glasses of the hot-bed every day, in proportion to the warmth of the season, to prevent their drawing up weak. Toward Michaelmas, when the nights begin to be cold, the plants should be removed into the stove, and plunged into the bark-bed, where they must remain during the winter. As these plants all cast their leaves in the middle of winter, and continue destitute of them till about the beginning of May, so during that time, they should be watered very sparingly, because they are in more danger of rotting, while they are in a less active state, by too much moisture, than when they are furnished with leaves, through which the moisture is more freely perspired.

All these sorts are too tender to thrive in the open air of this country in the summer season, therefore should be constantly preserved in the stove, where, in warm weather, they must have a large share of free air, but in cold weather they must be kept very warm. While they are young, it will be proper to continue them in the bark-bed; but when they have obtained strength, they may be placed in a dry stove, where they will thrive well, provided they are kept in a moderate temperature of heat, and have not too much water.

These plants may also be propagated by cuttings, which should be taken from the old plants two months before they are planted, during which time they should be laid on the flues in the stove, that the part which joined to the old plant may be healed over before they are planted, otherwise they will rot. These cuttings should be planted in small pots filled with light sandy earth, and plunged into a moderate hot-bed of tanners bark, observing to shade them in the heat of the day from the sun, and refresh them once in a week or ten days with water, but it must be given to them sparingly each time. If the cuttings succeed, they will have taken root in about two months, when they should have a larger share of air to harden them by degrees to bear the sun and air, and afterward may be treated as the old plants.

The milky juice of these plants is very caustic, and reckoned poisonous. In cutting off any of the branches of the plants, if the knife be not immediately cleaned, the juice will corrode it, and turn the blade almost black in a very little time, so as not to be cleaned off again; and if dropped on linen will cause it to wash in holes, equal to aquafortis.

PODOPHYLLUM. Lin. Gen. Plant. 571. Anapodophyllum. Tourn. Inst. R. H. 239. tab. 122. Duck's-foot, or May Apple.

The CHARACTERS are,

*The bud of the flower is inclosed in a large, three-leaved, coloured empalement in form of a spatha or sheath. The flower has nine roundish concave petals which are plaited on their borders, smaller than the empalement; it has a roundish germen without a style, crowned by a plaited obtuse stigma. The germen afterward turns to an oval capsule of one cell, crowned by the stigma, filled with roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, which includes those plants whose flowers have many stamina and one style.

We have but one SPECIES of this genus at present in the English gardens, viz.

PODOPHYLLUM (*Peltatum*) foliis peltatis lobatis. Lin. Sp. Plant. 505. *Duck's-foot with target-shaped leaves having lobes.* Anapodophyllum Canadense Morini. Tourn. Inst. R. H. 219. *Canada Duck's-foot of Morinus.*

This plant grows naturally in many parts of North America. The root is composed of many thick tubers which are fastened together by fleshy fibres, which spread, and propagate greatly under ground, sending out many smaller fibres which strike downward. In the spring arise several foot-stalks about six inches high, which divide into two smaller, each sustaining one leaf, composed of five, six, or seven lobes, the five middle being deeply indented at the top; these join together at their base, where the foot-stalk meets, which is fastened to the under side of the leaf like the handle of a target; the leaves are smooth, and of a light green. At the division of the foot-stalk comes out the flower, with a large empalement covering it like a sheath; the flower hath nine pretty large concave white petals, which are roundish at the top, and plaited on their borders. In the center is situated a large, roundish, oval germen, crowned by a plaited obtuse stigma, and surrounded by a great number of short stamina, terminated by oblong, erect, yellow summits. The flowers appear in May, and when they fall off, the germen swells to a fruit of the size and shape of the common Hip or fruit of the wild Rose. This is at first green, but when ripe changes to a yellow colour, inclosing several roundish seeds fastened to the placenta.

This plant propagates so fast by its creeping roots, as that few persons are at the trouble of sowing the seeds. Every part of the root will grow, so they may be annually parted, either in autumn when their leaves decay, or in the spring just before the roots begin to shoot; they require no other culture but to keep them clean from weeds. It loves a light loamy soil and a shady situation, and is so hardy as seldom to be injured by the frost.

POINCIANA. Tourn. Inst. R. H. 619. tab. 391. Lin. Gen. Plant. 462. Barbadoes Flower-fence, or Spanish Carnations; in French, *Poincillade*.

The CHARACTERS are,

*The empalement of the flower is composed of five oblong concave leaves which fall off. The flower has five unequal petals; four of them are nearly equal and roundish, but the fifth is larger, deformed, and indented. It hath ten long, bristly, rising stamina, terminated by oblong summits, and an awl-shaped declining germen which sits upon the style the length of the stamina, and is crowned by an acute stigma. The germen afterward becomes an oblong compressed pod, with several transverse partitions; in each of these is lodged a single flattish seed.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which contains those plants whose flowers have ten stamina and one style.

We have but one SPECIES of this genus in the English gardens, viz.

POINCIANA (*Pulcherrima*) aculeis geminis. Hort. Upsal. 101. *Flower-fence with double spines.* Poinciana flore pulcherrimo. Tourn. Inst. R. H. 619. *Poinciana with a most beautiful flower.*

There are two varieties of this which were discovered by the late Dr. Houstoun in the Spanish West-Indies. One of these hath a red, and the other a yellow flower; but as there appears to be no other difference in the plants from the common sort, they must be supposed only accidental variations which have risen from seeds.

This plant grows naturally in both Indies; it is planted in hedges to divide the lands in Barbadoes, from whence it had the title of Flower-fence; it is also called Spanish Carnations by some of the inhabitants of the British islands in the West-Indies. It rises with a strait stalk ten or twelve feet high, which is covered with a smooth gray bark, and is sometimes as thick as the small of a man's leg, dividing into several spreading branches at the top, which are armed at each joint with two short, strong, crooked spines, and are garnished with decompound winged leaves, each leaf being composed of six or eight pair of simple winged leaves, the lower pair being composed of four or five pair of lobes, the others gradually increasing in their number toward the top, where they decrease again, and are smaller. The lobes are three quarters of an inch long, and almost half an inch broad at their points, lessening gradually to their base; they are of a light green colour, and when bruised emit a strong odour.

The branches are terminated by loose spikes of flowers, which are sometimes formed into a kind of pyramid, and at others they are disposed more in form of an umbel. The foot-stalk of each flower is near three inches long; the flower is composed of five petals

which are roundiſh at the top, but are contracted to narrow tails at their baſe; they ſpread open, and are beautifully variegated with a deep red or Orange colour, yellow, and ſome ſpots of green; they have a very agreeable odour. In the center of the flower is ſituated a ſlender ſtyle above three inches long, upon which the germen ſits, and is accompanied by ten ſtamina nearly of the ſame length with the ſtyle, terminated by oblong ſummits. After the flower is paſt, the germen becomes a broad flat pod about three inches long, divided into three or four cells by tranſverſe partitions, each including one flattiſh irregular ſeed. The leaves of this plant are uſed inſtead of Sena in the Weſt-Indies to purge, and in Jamaica the plant is titled Sena.

Ligon ſays the ſeeds of this plant were firſt carried to Barbadoes from Cape Verd Iſlands, and the beauty of the flowers was ſuch, that the inhabitants ſoon ſpread it over that iſland, and afterward it was tranſported into moſt of the neighbouring iſlands. This may have been ſo, but it is very certain that the plant grows naturally in Jamaica, where the late Dr. Houſtoun found it in the woods at a great diſtance from any ſettlements. He alſo found it growing naturally at La Vera Cruz, and at Campeachy, where he alſo found the two varieties with red and yellow flowers. The only difference between theſe and the firſt ſort being in the colour of their flowers, and their branches having fewer ſpines.

The ſeeds of this plant are annually brought over in plenty from the Weſt-Indies, which, if ſown upon a hot-bed, will riſe eaſily. When the plants are come up, they ſhould be tranſplanted each into a ſmall pot, and plunged into a hot-bed of tanners bark, obſerving to ſhade them from the ſun till they have taken root; after which you muſt give them air in proportion to the warmth of the ſeaſon; they muſt be frequently refreſhed with water in ſummer. When the plants have filled the pots with their roots, they ſhould be ſhaken out, and placed into larger ones, that their roots may have room to ſpread. If care be taken to water and ſhift them as often as is neceſſary, they will grow to be three feet high the firſt ſeaſon. At Michaelmas the pots ſhould be plunged into a freſh hot-bed of tanners bark in the ſtove, which ſhould be kept to the Ananas heat marked on the botanical thermometers, and frequently refreſhed with water, but they muſt not have it in large quantities, which is very injurious to theſe plants at that ſeaſon. The earth which theſe plants ſhould be planted in, muſt be freſh, light, and ſandy (but not over-rich,) in which they will ſtand the winter better than if planted in a ſtronger ſoil. When the plants are grown large, there muſt be great care taken when they are ſhifted into larger pots, not to ſuffer the ball of earth to fall from their roots; for when this happens, the plants ſeldom ſurvive it.

Theſe plants muſt conſtantly remain in the bark-ſtove, where in warm weather they ſhould have a large ſhare of air, but they muſt not be expoſed to cold; they are very impatient of moiſture in winter, and, if damp ſeizes their top, it very often kills the plants, or at leaſt occaſions the loſs of their heads. With proper management they will grow much taller here than they uſually do in Barbadoes, but their ſtems will not be larger than a man's finger, which is occaſioned by their being drawn up by the glaſſes of the ſtove. I have had ſome of theſe plants near eighteen feet high in the Chelſea Garden, which have produced their beautiful flowers ſome years. Theſe flowers have always appeared in December, but in the Weſt-Indies I am informed they flower twice a year, at which times they make a moſt beautiful appearance.

POKE VIRGINIAN. See Phytolacca.

POLEMONIUM. Tourn. Inſt. R. H. 146. tab. 61. Lin. Gen. Plant. 200. [ſo called, according to Pliny, from πολεμεῖν, *Gr.* to wage war, on account of the conteſts which aroſe betwixt two princes, each aſſuming the honour of the diſcovery of it to himſelf.] Greek Valerian, or Jacob's Ladder.

The Characters are,

*The flower has a permanent empalement of one leaf, which is cut into five ſegments; it has one petal, of the wheel ſhape. The tube is very ſhort; the upper part, which is divided, ſpreads open. It hath five ſlender ſtamina which are inſerted in the valves of the tube; theſe are inclined, and are ſhorter than the petal, and are terminated by roundiſh ſummits. In the bottom of the tube is ſituated an acute oval germen, ſupporting a ſlender ſtyle which is equal with the petal, crowned by a revolving trifid ſtigma. The germen afterward turns to a three-cornered oval capſule having three cells, filled with irregular acute-pointed ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and one ſtyle.

The Species are,

1. Polemonium (*Cæruleum*) calycibus corollæ tubo longioribus. Lin. Sp. Plant. 162. *Greek Valerian, with an empalement longer than the tube of the flower.* Polemonium vulgare cæruleum. Tourn. Inſt. R. H. 146. *Common blue Greek Valerian.*
2. Polemonium (*Reptans*) foliis pinnatis, radicibus reptatricibus. Flor. Virg. 22. *Greek Valerian, with winged leaves and a creeping root.*

The firſt ſort grows naturally in many parts of Europe; it has been diſcovered growing wild in Carleton Beek, and about Malham Cove near Craven, in Yorkſhire. Of this there are two or three varieties, one with a white, and the other a variegated flower, and another with variegated leaves.

This plant has winged leaves, which are compoſed of ſeveral pair of lobes placed alternately. The lower leaves have eleven or twelve pair, and are terminated by an odd one; theſe are broadeſt at their baſe, ending in points, and ſit cloſe to the midrib. The ſtalks riſe near a foot and a half high; they are hollow, channelled, and are garniſhed with winged leaves of the ſame form with the lower, but decreaſe upward in their ſize, and are terminated by bunches of flowers which ſit very cloſe; they have each one petal, which has a ſhort tube, cut into five roundiſh ſegments at the top; they are chiefly of a beautiful blue colour, and have each five ſtamina, which are terminated by yellow ſummits. Theſe flowers appear the latter end of May, and are ſucceeded by oval acute-pointed capſules, with three cells filled with irregular ſeeds, which ripen in Auguſt.

Theſe plants are eaſily propagated by ſowing their ſeeds in the ſpring upon a bed of light earth, and when they are come up pretty ſtrong, they ſhould be pricked out into another bed of the ſame light earth about four or five inches aſunder, obſerving to ſhade and water them until they have taken root; after which they will require no farther care, but to keep them clear from weeds until Michaelmas, at which time they muſt be tranſplanted into the borders of the flower-garden, where, being intermixed with different ſorts of flowers, they will make a beautiful appearance.

This plant is not naturally of long duration, but by taking them up in autumn and parting of them, they may be continued ſome years; but as the ſeedling plants always flower much ſtronger than the offſets, few perſons ever propagate them by ſlips.

The ſort with white flowers will frequently ariſe from the ſeeds of the blue, as will alſo that with variegated flowers, but theſe may be continued by parting of their roots.

The ſort with variegated leaves is preſerved by parting of their roots, becauſe the plants raiſed from ſeeds would be ſubject to degenerate and become plain. The beſt time to part them is about Michaelmas, that they may take good root before the cold weather prevents them. Theſe ſhould have a freſh light ſoil, but if it be too rich, their roots will rot in winter, or the ſtripes of the leaves will go off in the ſummer.

The ſecond ſort grows naturally in Virginia and other parts of North America. This hath creeping roots,

by which it multiplies very faſt. The leaves have ſeldom more than three or four pair of lobes, which ſtand at a much greater diſtance from each other than thoſe of the common ſort; they are of a darker green. The lobes are narrow, and are placed alternately; the ſtalks riſe nine or ten inches high, ſending out branches their whole length. The flowers are produced in looſe bunches, ſtanding upon pretty long foot-ſtalks; they are ſmaller than thoſe of the common ſort, and are of a lighter blue colour.

This ſort may be propagated by ſeeds in the ſame manner as the common ſort, or by parting of their roots in autumn, and is equally hardy with the common ſort.

POLIANTHES. Lin. Gen. Plant. 384. Hyacinthus. Tourn. Inſt. R. H. 344. tab. 180. The Tuberoſe.

The CHARACTERS are,

*The flower has no empalement; it has one petal which is funnel-ſhaped. The tube is oblong and incurved; the brim is cut into ſix oval ſegments which ſpread open. It hath ſix thick ſtamina ſituated in the chaps of the petal, terminated by linear ſummits, which are longer than the ſtamina. In the bottom of the tube is ſituated a roundiſh germen, ſupporting a ſlender ſtyle, crowned by a thick, trifid, honey-bearing ſtigma. The germen afterward turns to an obtuſe, roundiſh, three-cornered capſule having three cells, which are filled with plain half-round ſeeds diſpoſed in a double range.*

This genus of plants is ranged in the firſt ſection of Linnæus's ſixth claſs, which includes thoſe plants whoſe flowers have ſix ſtamina and one ſtyle.

We have but one SPECIES of this genus, viz.

POLIANTHES (*Tuberoſa*) floribus alternis. Hort. Cliff. 127. *Polianthes with flowers placed alternately.* Hyacinthus Indicus tuberoſus, flore Narciſſi. C. B. P. 42. *Tuberous Indian Hyacinth, with a flower like Narciſſus, commonly called Tuberoſe.*

The varieties of this are the Tuberoſe with a double flower, the ſtriped-leaved Tuberoſe, and the Tuberoſe with a ſmaller flower; the laſt is mentioned by ſeveral authors as a diſtinct ſpecies, but is certainly a variety. Caſpar Bauhin titles it Hyacinthus Indicus tuberoſus, flore Hyacinthi orientalis. Pin. 47. i. e. Indian tuberous Hyacinth, with a flower like the Eaſtern Hyacinth. This ſort is frequent in the ſouth of France, from whence the roots have been often brought to England early in the ſpring, before thoſe roots have arrived from Italy, which are annually imported; the ſtalks of this are weaker, and do not riſe ſo high, and the flowers are ſmaller than thoſe of the common Tuberoſe, but in other reſpects is the ſame.

The Tuberoſe grows naturally in India, from whence it was firſt brought to Europe, where it now thrives in the warmer parts, as well as in its native ſoil. The Genoeſe are the people who cultivate this plant, to furniſh all the other countries where the roots cannot be propagated without great trouble and care, and from thence the roots are annually ſent to England, Holland, and Germany. In moſt parts of Italy, Sicily, and Spain, the roots thrive and propagate without care, where they are once planted.

This plant has been long cultivated in the Engliſh gardens for the exceeding beauty and fragrancy of its flowers; the roots of this are annually brought from Genoa, by the perſons who import Orange-trees; for as theſe roots are too tender to thrive in the full ground in England, ſo there are few perſons who care to take the trouble of nurſing up their offſets, till they become blowing roots, becauſe it will be two or three years before they arrive to a proper ſize for producing flowers; and as they muſt be protected from the froſt in winter, the trouble and expence of covers is greater than the roots are worth; for they are generally ſold pretty reaſonable, by thoſe who import them from Italy.

The double flowering is a variety of the firſt, which was obtained from the ſeed by Monſ. Le Cour, of Leyden in Holland, who for many years was ſo tenacious of parting with any of the roots, even after he had propagated them in ſuch plenty as to have more than he could plant, ſo he cauſed them to be cut in pieces, that he might have the vanity to boaſt of being the only perſon in Europe who was poſſeſſed of this flower; but of late years the roots have been ſpread into many parts, and as there is no other method to propagate this but but by the offſets, moſt people who have had of this ſort are careful to multiply and increaſe it; which is done by planting the offſets upon a moderate hot-bed early in March, and covering the bed in cold weather with mats or ſtraw, and in ſummer they muſt have plenty of water in dry weather. In this bed the roots may remain till the leaves decay in autumn, but if there ſhould happen any froſt before that time, the bed ſhould be covered to guard the roots from the froſt, becauſe if the froſt enters ſo low as to reach the roots it will kill them; and if the leaves are injured by the froſt, it will weaken the roots. Where there is due care taken to ſcreen them from froſt, and too much wet, it will be the beſt way to let the roots remain in the bed till the end of November or the beginning of December, provided hard froſts do not ſet in ſooner; for the leſs time the roots are out of the ground, the ſtronger they will be, and the ſooner they will flower; when the roots are taken up, they ſhould be cleaned from the earth, and laid up in dry ſand, where they may be ſecure from froſt and wet; here they ſhould remain until the ſeaſon for planting them again; this ſame method ſhould be practiſed by thoſe who are deſirous to cultivate the ſingle ſort in England, and alſo that with ſtriped leaves muſt be propagated the ſame way.

I ſhall next give directions for the management of thoſe roots, which are annually brought from Italy. And firſt, in the choice of the roots, thoſe which are the largeſt and plumpeſt, if they are perfectly firm and ſound, are the beſt; and the fewer offſets they have, the ſtronger they will flower; but the under part of the roots ſhould be particularly examined, becauſe it is there that they firſt decay; after the roots are choſen, before they are planted, the offſets ſhould be taken off; for if theſe are left upon the roots, they will draw away part of the nouriſhment from the old root, whereby the flower-ſtems will be greatly weakened.

As theſe roots commonly arrive in England in the month of February or March, thoſe who are deſirous to have theſe early in flower, ſhould make a moderate hot-bed ſoon after the roots arrive, which ſhould have good rich earth laid upon the dung, about ſeven or eight inches deep; this bed ſhould be covered with a frame, and when the bed is in a proper temperature for warmth, the roots ſhould be planted at about ſix inches diſtance from each other every way. The upper part of the root ſhould not be buried more than one inch in the ground; when the roots are planted, there ſhould be but little water given them until they ſhoot above ground; for too much wet will rot them, when they are in an inactive ſtate, but afterward they will require plenty of water, eſpecially when the ſeaſon is warm. When the flower-ſtems begin to appear, the bed ſhould have a large ſhare of air given to it, otherwiſe the ſtalks will draw up weak, and produce but few flowers; for the more air theſe plants enjoy in good weather, the ſtronger they will grow, and produce a greater number of flowers; therefore, toward the beginning of May, the frame may be quite taken off the bed, and hoops faſtened over it, to ſupport a covering of mats, which need not be laid over but in the night, or in very cold weather, ſo that by enjoying the free open air their ſtems will be large; and if they are well watered in dry weather, their flowers will be large, and a great number on each ſtem.

This firſt planting will require more care than thoſe which are deſigned to come after them, for in order to have a ſucceſſion of theſe flowers, the roots ſhould be planted at three different times, viz. the firſt the beginning of March, the ſecond the beginning of April,

April, and the third at the end of that month, or the beginning of May; but these beds will require a much less quantity of dung than the first, especially that bed which is the last made; for if there is but warmth enough to put the roots in motion, it is as much as will be required; and this last bed will need no covering, for many times those roots which are planted in the full ground at this season, will produce strong flowers in autumn; but in order to secure their flowering, it is always the best way to plant them on a gentle hot-bed. As to the second bed, that should be arched over with hoops, and covered with mats every night, and in bad weather, otherwise the late frosts which frequently happen in May will pinch them.

These plants may remain in the beds until the flowers are near expanding, at which time they may be carefully taken up, preserving the earth to their roots, and planted in pots, and then placed in the shade for about a week to recover their removal; after which time the pots may be removed into halls or other apartments, where they will continue in beauty a long time, and their fragrant odour will perfume the air of the rooms where they are placed; and by having a succession of them, they may be continued from Midsummer to the end of October, or middle of November; but as the stems of these plants advance, there should be some sticks put down by each root, to which the stems should be fastened, to prevent their being broken by the wind.

It is a common practice with many people, to plant these roots in pots, and plunge the pots into a hot-bed; but there is much more trouble in raising them in this method, than in that before directed; for if the roots are not planted in very small pots, there will be a necessity of making the beds much larger, in order to contain a quantity of the roots; and if they are first planted in small pots, they should be shaken out of these into pots of a larger size, when they begin to shoot out their flower-stems, otherwise the stalks will be weak, and produce but few flowers; therefore I prefer the other method, as there is no danger in removing the roots if it is done with care.

When the roots are strong and properly managed, the stems will rise three or four feet high, and each stem will produce ten or twelve flowers or more; and in this the great beauty of these flowers consists, for when there are but a few flowers upon the stalks they will soon fade away, so their places must be frequently renewed; for the flowers are produced in spikes coming out alternately upon the stalk, the lower flowers opening first; and as these decay, those above them open, so that in proportion to the number of flowers upon each stalk, they continue in beauty a longer or shorter time.

The sort with double flowers will require a little more care, in order to have the flowers fair; but this care is chiefly at the time of blowing, for the flowers of this sort will not open, if they are exposed to the open air; therefore when the flowers are fully formed and near opening, the pots should be placed in an airy glass-case, or a shelter of glasses should be prepared for them, that the dews and rains may not fall upon them, for that will cause the flowers to rot away before they open, and the heat of the sun drawn through the glasses will cause their flowers to expand very fair. With this management, I have had this sort with very double flowers extremely fair, and upward of twenty upon one stem, so that they have made a beautiful appearance; but where this has not been practised, I have rarely seen one of them in any beauty.

POLIUM. Tourn. Inst. R. H. 206. tab. 97. Teucrium. Lin. Gen. Plant. 625. Mountain Poley.

The CHARACTERS are,

*The empalement of the flower is permanent, of one leaf, cut into five acute segments. The flower is of the lip kind; it hath one petal, with a short tube. The stamina occupy the place of the upper lip, and the lower lip is cut into five segments. It hath four awl-shaped stamina, which are terminated by small summits, and a germen divided into four parts, supporting a slender style, crowned by two narrow stigmas; the germen afterward become four naked seeds, inclosed in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, who has joined this genus, and also the Chamædrys and Chamæpitys of Tournefort to the Teucrium, making them but one genus, which includes those plants whose flowers have two long and two shorter stamina, and are succeeded by four seeds in the calyx.

The SPECIES are,

1. POLIUM (*Montanum*) foliis lanceolatis integerrimis, caulibus procumbentibus, floribus corymbosis terminalibus. *Mountain Poley with entire spear-shaped leaves, trailing stalks, and flowers growing in a corymbus at the end of the branches.* Polium lavendulæ folio. C. B. P. 220. *Mountain Poley with a Lavender leaf.*
2. POLIUM (*Luteum*) spicis oblongis foliis obtusis crenatis tomentosis. *Mountain Poley with oblong spikes of flowers, and obtuse, crenated, woolly leaves.* Polium montanum luteum. C. B. P. 220. *Yellow Mountain Poley.*
3. POLIUM (*Angustifolium*) spicis subrotundis, caulibus suffruticosis incanis, foliis linearibus tomentosis. *Mountain Poley with roundish spikes of flowers, hoary shrubby stalks, and very narrow woolly leaves.* Polium luteum angustifolium. C. B. P. 220. *Narrow-leaved yellow Mountain Poley.*
4. POLIUM (*Album*) caule ramoso procumbente, foliis lineari-lanceolatis dentatis, floribus corymbosis terminalibus. *Poley with a branching trailing stalk, narrow, spear-shaped, woolly, indented leaves, and flowers growing in a corymbus terminating the branches.* Polium montanum album. C. B. P. 221. *White Mountain Poley.*
5. POLIUM (*Capitatum*) caule erecto diffuso, foliis lineari-lanceolatis crenatis, corymbis terminalibus lateralibusque. *Poley with an erect diffused stalk, narrow, spear-shaped, crenated leaves, and flowers growing in a corymbus, terminating and proceeding out of the sides of the branches.* Polium maritimum erectum Monspeliacum. C. B. P. 221. *Upright maritime Poley of Montpelier.*
6. POLIUM (*Pyreniacum*) caulibus procumbentibus hirsutissimis, foliis cuneiformi-orbiculatis crenatis. *Poley with very hairy trailing stalks, and orbicular wedge-shaped leaves which are crenated.* Polium Pyreniacum supinum, hederæ terrestris folio. Tourn. Inst. R. H. 206. *Low Pyrenean Poley, with a leaf like that of Ground-ivy.*
7. POLIUM (*Latifolium*) caule erecto ramoso, foliis lanceolatis dentatis subtus tomentosis, floribus confertis terminalibus. *Poley with an upright branching stalk, spear-shaped indented leaves which are woolly on their under side, and flowers growing in clusters terminating the branches.* Polium montanum album serratum, latifolium, erectum majus. Barrel. Obs. 34. *Greater upright white Mountain Poley, with a broad sawed leaf.*
8. POLIUM (*Erectum*) caule erecto corymboso, foliis linearibus reflexis, floribus terminalibus. *Poley with an upright stalk branching out in form of a corymbus, narrow reflexed leaves, and flowers terminating the stalks.* Polium montanum album angustifolium. C.B.P. 221. *Narrow-leaved white Mountain Poley.*
9. POLIUM (*Ramosum*) caule ramoso, procumbente, foliis lineari-lanceolatis superne dentatis, spicis oblongis terminalibus. *Poley with a trailing branching stalk, narrow spear-shaped leaves which are indented toward the top, and oblong spikes of flowers terminating the stalks.* Polium Hispanicum supinum, flore flavescente. Tourn. Inst. 207. *Low Spanish Poley with a yellowish flower.*
10. POLIUM (*Spicatum*) caule erecto suffruticoso, foliis linearibus confertis, spicis cylindricis fastigiatis terminalibus. *Poley with an upright under shrub stalk, narrow leaves growing in clusters, and cylindrical spikes of flowers which terminate the stalks.* Polium erectum album, angustiori folio & spicâ. Phil. Trans. 417. *Upright white Poley with a narrower leaf and spike.*

11. POLIUM (*Fruticosum*) caule erecto fruticoso, foliis lanceolatis tomentosis integerrimis, corymbis terminalibus. *Poley with an upright shrubby stalk, spear-shaped woolly leaves which are entire, and flowers growing in a corymbus terminating the stalks.* Polium Valentinum fruticosum, angustifolium, flore albo. Barr. Icon. 1048. *Shrubby narrow-leaved Poley of Valentia, with a white flower.*

12. POLIUM (*Serratum*) caule procumbente, foliis linearibus serratis, corymbis confertis terminalibus. *Poley with a trailing stalk, narrow sawed leaves, and clustered flowers growing in a corymbus at the ends of the stalks.* Polium montanum album, angustifolium serratum, supinum minus. Barrel. Icon. 1091. *Low, smaller, white Mountain Poley, with a narrow sawed leaf.*

13. POLIUM (*Diffusum*) caule diffuso procumbente, foliis linearibus dentatis tomentosis, spicis subrotundis. *Poley with a trailing diffused stalk, narrow, indented, woolly leaves, and roundish spikes of flowers.* Polium montanum luteum, serratis angustioribus incanis foliis. Barrel. Icon. 1089. *Yellow Mountain Poley, with narrower, hoary, sawed leaves.*

14. POLIUM (*Integerrimum*) caule erecto suffruticoso, foliis lanceolatis integerrimis, corymbis confertis terminalibus. *Poley with an erect shrubby stalk, spear-shaped entire leaves, and clustered flowers growing in a corymbus at the ends of the branches.*

15. POLIUM (*Smyrnæum*) caule diffuso, foliis linearibus pinnato-dentatis, spicis subrotundis lateralibus. *Poley with a diffused stalk, linear, winged, indented leaves, and roundish spikes of flowers proceeding from the sides of the stalks.* Polium Smyrnæum scordii folio. Tourn. Cor. 14. *Poley of Smyrna, with a Water Germander leaf.*

The first sort grows naturally on the mountains about Basil and Geneva, as also in France. The root of this plant is composed of many ligneous fibres, which spread wide in the ground, from which arise several weak, trailing, ligneous stalks, eight or nine inches long, which send out many small branches, garnished with small spear-shaped leaves, of a deep green and entire; they are placed by pairs. The flowers are produced in a corymbus at the end of the branches; they are white, and shaped like those of the other species. These appear in June and July, but are seldom succeeded by seeds in England. There is another sort with much smaller leaves, which are hoary on their under side, but I am not certain if it is a distinct species.

The second sort grows naturally in Spain; the stalks of this are rather herbaceous, and trail upon the ground; they are about six inches long, hoary, and garnished with woolly leaves about half an inch long; some of them are wedge-shaped, others are oblong, ending in obtuse points, and are crenated toward their ends. The flowers are collected in oblong thick spikes at the end of the branches; they are of a deep yellow colour, and appear the beginning of June, but are seldom succeeded by seeds in this country.

The third sort grows naturally in Spain and Portugal; the stalks of this are ligneous, erect, and branching, covered with a hoary down; they rise six or eight inches high, and are garnished with linear woolly leaves about half an inch long, having sometimes two or three slight indentures on their edges. The flowers are collected in roundish spikes at the end of the branches; they are of a bright yellow, and have woolly empalements. These appear in June and July.

The fourth sort grows naturally in the south of France and in Italy; this hath a trailing branching stalk, which at the bottom is ligneous, but the branches are herbaceous and woolly; they are garnished with linear, spear-shaped, woolly leaves, indented on their edges. The flowers are produced in a corymbus at the end of the branches; they are small, white, and shaped like those of the other species. This flowers in June and July.

The fifth sort grows naturally near the sea, in the south of France and in Italy. This hath an erect branching stalk, which rises a foot high; the lower part becomes ligneous, but the upper is herbaceous; the leaves are linear, spear-shaped, about an inch long, crenated on their edges, of a pretty thick consistence, and a little woolly. The flowers are collected in a corymbus at the end of the branches; they are white, and like those of the other species. This flowers in July and August.

The sixth sort grows naturally on the Pyrenean Mountains; this hath slender shrubby stalks, which trail close upon the ground; they have a purple bark, and covered with white hairs; the leaves are round at the top, but at their base are contracted in form of a wedge, and are crenated on their edges, so as to resemble at first sight the leaves of Ground-ivy, but they are hairy, and of a thicker consistence. The flowers are collected in round bunches at the end of the branches, one half of their petals are purple, and the other half white; they are larger than those of the other species, but are of the same form. It flowers great part of summer, but seldom produces seeds here.

The seventh sort grows naturally in Italy and Spain; this hath a ligneous, erect, branching stalk, which rises near a foot high; it is very hoary, and branches out toward the top; the leaves are spear-shaped, indented on their edges, and woolly on their under side. The flowers are white, small, and grow in clusters at the end of the branches. It flowers in June and July.

The eighth sort grows naturally in Spain and Italy; this rises with a shrubby stalk nine or ten inches high, branching out toward the top in form of a corymbus; the leaves are linear, and their edges are reflexed. The flowers are collected in roundish woolly heads at the end of the branches; they are white, and smaller than most of the other species. This flowers in June and July.

The ninth sort grows naturally in Spain; it hath a trailing branching stalk about six or eight inches long, which is ligneous at bottom, but upward is herbaceous and hoary; the leaves are linear, spear-shaped, and indented toward the ends. The flowers are collected in oblong spikes at the end of the branches; they are of a pale yellow colour, and shaped like those of the other species. This flowers great part of summer.

The tenth sort grows naturally in Sicily; this hath slender shrubby stalks, which rise a foot and a half high; they are smooth and white, sending out a few short branches toward the top, garnished with small linear leaves growing in clusters. The flowers are collected in long cylindrical spikes, which stand at the top of the stalks, and sometimes come out in bunches on the sides; these are small and white. It flowers in July and August.

The eleventh sort grows naturally in Valencia; this hath slender ligneous stalks near two feet high, which are hoary, and garnished with small, spear-shaped, entire leaves at intervals, standing in clusters; they are woolly, and sit close to the stalk; the upper part of the stalk divides into several slender foot-stalks, each sustaining a small corymbus of white flowers. The whole plant is very hoary, and has a strong aromatic odour; it flowers late in summer.

The twelfth sort grows naturally in the south of France and in Italy; this hath trailing ligneous stalks about a foot long, garnished with linear sawed leaves, which are hoary, and have smaller leaves coming out from the bosom of the other. The flowers are collected in a corymbus at the end of the branches; they are small and white. This flowers in June and July.

The thirteenth sort grows naturally in Spain and Italy; this hath diffused trailing stalks, which are very woolly, about six or seven inches long, garnished with narrow indented leaves, which are covered with a woolly down, and are terminated by roundish heads of flowers, which are yellow; the whole plant is very hoary. It flowers in July.

The fourteenth sort grows naturally in Spain; this hath erect branching stalks about six or eight inches high; the branches come out opposite the whole length of the stalk; they are garnished with small spear-shaped leaves, of a dark green colour on their

*POLYGALA floribus imberbibus spicatis, caule erecto herbaceo simplicissimo, foliis lato-lanceolatis Amœn. Acad. p 2. 139.*

*Senega Rattle Snake Root.*

*G. D. Ehret sculp.*

upper side, but hoary on their under; the stalks and branches are terminated by clusters of blue flowers, which are collected in roundish heads. This sort flowers in July and August.

The fifteenth sort grows naturally about Smyrna; this hath diffused stalks, which rise about a foot high; they are white, and closely garnished with linear leaves near two inches long, and about a quarter of an inch broad; they are indented regularly on their edges like those of Spleenwort, but the indentures are not deep; they are of a dark green on their upper side, but hoary on their under. The flowers are collected in roundish spikes, which terminate the branches, and also come out from their side; they are white, and shaped like those of the other species. It flowers in July and August.

There are several other species of this genus, which grow naturally in the warmer parts of Europe; but those which are here mentioned, are all that I have yet seen growing in the English gardens; therefore I have omitted the other, as I have had no opportunity to examine them myself.

All the sorts, except the first, are abiding plants; they may be propagated by seeds, which must be procured from the countries where they naturally grow, because they seldom perfect their seeds in England. These should be sown upon a bed of fresh light earth in the spring, and when the plants come up, they must be carefully kept clean from weeds; about the middle of July the plants will be fit to remove, when they may be carefully taken up, and part of them planted on a warm border of dry rubbishy soil, observing to shade them from the sun, and water them till they have taken new root; after which they will require no other culture but to keep them clean from weeds. My advising these and many other aromatic plants, which are natives of the warmer parts of Europe, to be planted in rubbish, is founded upon long experience of their abiding much longer, and resisting the cold of our winters much better, than when they are growing in better ground, where they grow much freer, are fuller of moisture, and therefore more liable to be killed by frost.

The other part of the plants may be planted in small pots, filled with fresh, light, undunged earth, and placed in the shade till they have taken new root; then they may be removed into an open situation, where they may remain till the beginning of November, when they should be placed under a common frame, to secure them from the frost in winter, which sometimes destroys these plants; by this method the species may be preserved.

These plants may be disposed in a garden, so as to afford pleasure, by mixing them with Marum, Mastich, and several other aromatic plants, upon the sloping sides of banks, which are exposed to the sun, or upon little hillocks raised in a sheltered situation, where, by the diversity of their hoary branches, being of various shapes, they will make a pretty appearance; and in such places they will resist the cold much better, than when they are planted in a good soil.

They may also be propagated by cuttings or slips, which should be planted the beginning of April, just before they shoot, upon a border exposed to the East; and if the season proves dry, they must be watered and shaded until they have taken root, and afterward they will require no other care but to keep them clean from weeds, and at Michaelmas the plants should be removed where they are designed to remain; but it will be proper to put a plant of each sort in pots, that they may be sheltered in winter to preserve the kinds.

The fourth and fifth sorts are sometimes used in medicine.

POLYANTHUS. See Primula.

POLYGALA. Tourn. Inst. R. H. 174. tab. 79. Lin. Gen. Plant. 761. [This plant is so called, of πολὺ, much, and γάλα, milk, because if cattle are fed in marshes that produce this plant, they give a great quantity of milk; it is also called Ambarvalis, of Ambiendis Arvis, from lustrating the fields; because the ancients used to crown virgins with the flowers of this plant, when they perambulated the fields, to implore fertility thereto; it is also called Amarella, because it has a bitter taste.] Milkwort.

The Characters are,

*The flower has a small permanent empalement of three leaves, which are oval and acute; two of these are below the petals, and one is above. The flower is shaped like those of the butterfly kind, the number of petals is indeterminate. The wings are large, plain, and extend beyond the other petals; the standard is tubulous, short, and reflexed at the brim, where it is bifid. The keel is concave, compressed, and bellied toward the top. It hath eight stamina in two bodies, included in the keel, terminated by single summits; and an oblong germen supporting an erect style, terminated by a thick bifid stigma. The germen afterward becomes a heart-shaped capsule having two cells, each containing one seed.*

This genus of plants is ranged in the second section of Linnæus's seventeenth class, which contains those plants whose flowers have eight stamina joined in two bodies.

The Species are,

1. Polygala (*Vulgaris*) floribus cristatis racemosis, caulibus herbaceis simplicibus procumbentibus, foliis lineari-lanceolatis. Amœn. Acad. 2. p. 136. *Milkwort with branching crested flowers, single, trailing, herbaceous stalks, and linear spear-shaped leaves.* Polygala vulgaris. C. B. P. 215. *Common Milkwort.*
2. Polygala (*Monspeliaca*) floribus cristatis, racemosis, caule erecto, foliis lanceolato-linearibus acutis. Sauv. Monsp. 53. *Milkwort with branching crested flowers, an erect stalk, and acute, spear-shaped, linear leaves.* Polygala vulgaris coloris obsoleti, foliis angustissimis. J. B. 3. p. 338. *Common Milkwort with a worn-out flower, and the narrowest leaves.*
3. Polygala (*Myrtifolia*) floribus cristatis, carinâ lunulatâ, caule fruticoso, foliis lævibus oblongis obtusis. Amœn. Acad. 2. p. 138. *Milkwort with crested flowers, a moon-shaped keel, and a shrubby stalk bearing oblong leaves, which end in obtuse points.* Polygala frutescens, folio buxi, flore maximo. Tourn. Inst. 175. *Shrubby Milkwort, with a Box-tree leaf and a large flower.*
4. Polygala (*Chamæbuxus*) floribus imberbibus sparsis, carinæ apice subrotundo, caule fruticoso, foliis lanceolatis. Amœn. Acad. 2. p. 140. *Milkwort with flowers growing thinly and without beards, the point of the keel roundish, a shrubby stalk, and spear-shaped leaves.* Chamæbuxus flore coluteæ. C. B. P. 471. *Low Box with a flower like Bladder Sena.*
5. Polygala (*Senega*) floribus imberbibus spicatis, caule erecto herbaceo simplicissimo, foliis lato-lanceolatis. Amœn. Acad. 2. p. 139. *Milkwort with spiked flowers having no beards, an erect, single, herbaceous stalk, and broad spear-shaped leaves.* Polygala Virginiana, foliis oblongis, floribus in thyrso candidis, radice alexipharmicâ. Edit. Prior. *Milkwort of Virginia with oblong leaves, white flowers ranged in a loose spike, and an alexipharmic root, commonly called Senega Rattle Snakeroot.*
6. Polygala (*Mariana*) floribus imberbibus, oblongo-capitatis, caule erecto ramosa, foliis linearibus. *Milkwort with beardless flowers growing in oblong heads, an erect branching stalk, and linear leaves.* Polygala Mariana, angustiori folio, flore purpureo. Pluk. Mantiss. 153. tab. 438. fig. 5. *Maryland Milkwort with a narrower leaf and a purple flower.*
7. Polygala (*Americana*) floribus cristatis, racemo terminali, caule erecto ramoso, foliis lanceolatis tomentosis. *Milkwort with crested flowers, an erect branching stalk, terminated by a loose spike of flowers, and woolly spear-shaped leaves.* Polygala Americana erecta, flore purpuro-cæruleo, folio molli incano. Houst. MSS. *Upright American Milkwort, with a purplish blue flower and a soft hoary leaf.*

There are several other species of this genus, some of which grow naturally in Europe, and others in America, but as they are seldom cultivated in gardens, it would be to little purpose to enumerate them here.

The first sort grows naturally in pastures, and upon heaths in many parts of England; of this there are three varieties, one with a blue, another with a purple, and a third with white flowers, which are frequently found intermixed; and there is another which is larger, and supposed to be a distinct species; but I rather believe this difference is owing to the soil in which they grow; for the large one is generally found growing in moist pastures, and the small one upon dry heaths. This hath a perennial root, from which come out three or four slender, trailing, herbaceous stalks, about six inches long, garnished with linear spear-shaped leaves, about half an inch long, and an eighth part of an inch broad in the middle, terminating in points at both ends. The flowers are produced at the top of the stalks, branching out; they are small, and of a blue, purple, or white colour, having two wings, a keel and standard like the butterfly flowers. These appear in June, and are succeeded by flattish heart-shaped capsules, divided into two cells, each containing one seed.

The second sort grows naturally upon sterile ground about Montpelier; this sort is annual; it rises with an upright stalk about six inches high, which is garnished with narrow leaves placed alternate, ending in acute points. The flowers are small, of a worn-out purple colour; the keel is bearded like the common sort. This flowers in July, and has seed-vessels like the first sort, but smaller; the seeds ripen in autumn.

These sorts are very rarely admitted into gardens, nor do they thrive so well when sown or transplanted there, as in their natural situation. If these are cultivated, their seeds should be sown soon after they are ripe, otherwise they rarely grow.

The third sort grows naturally at the Cape of Good Hope; this hath a shrubby stalk, covered with a smooth brown bark, which rises four or five feet high, sending out several spreading branches toward the top, which are closely garnished with oblong, blunt-pointed, smooth leaves, about an inch long, and a quarter of an inch broad, of a lucid green, sitting close to the branches. The flowers are produced at the end of the branches; they are large, white on their outside, but of a bright purple within; the keel of the flower is hollowed like a halfmoon, and is bearded; the wings are expanded wide, and the standard is incurved; this plant continueth flowering most part of summer. The flowers are succeeded by compressed heart-shaped seed-vessels, having two cells, each containing one hard, smooth, shining seed.

This plant is propagated by seeds, which should be sown in small pots, filled with light loamy earth; soon after they are ripe, these pots may be placed where they may have the morning sun only till October, when they should be placed under a hot-bed frame, and plunged into old tanners bark, which has lost its heat, where they may be defended from frost during the winter, and in the spring the pots should be plunged into a moderate hot-bed, which will bring up the plants. When these appear, they should not be too tenderly treated, but must have a large share of free air admitted to them; when they are fit to transplant, they should be carefully shaken out of the pots, and separated, planting each into a small pot filled with soft loamy earth, and plunged into a very moderate hot-bed to forward their taking new root, observing to shade them from the sun, and gently refresh them with water as they may require it, but they must not have too much wet. When they are rooted, they must be gradually inured to the open air, and in June they may be placed abroad in a sheltered situation, where they may remain till the middle or latter end of October, according as the season proves favourable; then they must be removed into the green-house, and treated in the same way as Orange-trees, being careful not to give them too much wet during the winter season. In the summer they must be placed abroad with other green-house plants, where, by their long continuance in flower, they will make a fine appearance. The management of this plant is nearly the same as for the Orange-tree.

The fourth sort grows naturally on the Alps, and also upon the mountains in Austria and Hungary; this rises with a slender, branching, ligneous stalk about a foot high, when it grows upon good ground, but on a rocky soil seldom more than half that height. The branches are closely garnished with stiff, smooth, spear-shaped leaves of a lucid green. From between the leaves, toward the top of the branches, the flowers come out upon very short foot-stalks; they are white on their outside, but within are of a purplish colour mixed with yellow, and have a grateful odour. These appear in May, and are succeeded by seed-vessels shaped like those of the former sort.

This plant is very difficult to cultivate in gardens, for it commonly grows out of the fissures of rocks, so cannot be easily transplanted, and the seeds are with difficulty obtained from abroad; nor do these vegetate till they have been a whole year in the ground, unless they are sown soon after they are ripe, when the plants will come up the spring following; when the plants first come up, they make very little progress here, and are as difficult to transplant as almost any plant at present known, which occasions its present scarcity in England.

The best method of cultivating this is by seeds, which should be procured as fresh as possible from the places of its natural growth, and sown in pots as soon as it arrives; the pots may be plunged into the ground, where they may have only the morning sun. If these are sown before Christmas, there will be a chance of the plants coming up the following spring; but those which are not sown till toward spring, will remain in the ground a year; therefore the pots should be plunged into the ground, where they may have but little sun the following summer, and in autumn they may be removed, and plunged into an old tan-bed under a hot-bed frame, where they may be protected from severe frost; for although this plant is a native of the Alps and other cold mountains, yet as the seeds will not be covered with snow here, as they are in their native soil and situation, they are frequently spoiled here by the inconstancy of the weather in England. When the plants come up, they should be placed in shade during summer; and in autumn they may be turned out of the pots, and planted in a border where they may have only the morning sun, for this plant will not thrive long in pots. If the winter proves very severe, it will be proper to cover the surface of the ground about their roots with mulch to keep out the frost. If the plants take root in the border, they should remain there undisturbed, and be only kept clean from weeds, for the ground about their roots should not be dug or dunged.

The fifth sort grows naturally in most parts of North America. This hath a perennial root composed of several fleshy fibres, from which arise three or four branching stalks, which grow erect, and are more than a foot high; these are garnished with spear-shaped leaves placed alternately. The flowers are produced in loose spikes at the end of the branches; they are small, white, and shaped like those of the common sort, but their keels have no beards. It flowers here in July, but the plants do not produce seeds here.

The root of this sort hath been long used by the Seneka Indians to cure the bite of the rattle-snake, which, if taken in time, is an infallible remedy. And of late years it has been used by the inhabitants of Virginia in many disorders, which are occasioned by a thick sizy blood; so that the root of this plant, when its virtues are fully known, may become one of the most useful medicines yet discovered. The Seneka Indians use this root, which they powder, and generally carry about them when they travel in the woods, lest they should be bit by the rattle-snake; and whenever this happens, they take a quantity of the powder inwardly, and apply some of it to the part bitten, which is a sure remedy.

The

The ſixth ſort grows naturally in Maryland; this hath a perennial root, from which ariſe two or three ſtalks about eight inches high, which divide into ſeveral erect branches, garniſhed with ſmall linear leaves of a dark green colour. The flowers are collected into oblong heads at the end of the ſtalks; they are ſmall, and of a purpliſh blue colour.

Both theſe ſorts are difficult to obtain, for the ſeeds rarely ſucceed, ſo the beſt way is to procure their roots from America, and when they arrive plant them in a bed of light earth in a ſheltered ſituation. In ſummer they muſt be kept clean from weeds, and if the ſurface of the ground about their roots is covered with old tanners bark, or any other kind of mulch in winter, to keep out the froſt, it will be a ſecure method to preſerve them.

The ſeventh ſort was diſcovered by the late Dr. Houſtoun growing naturally at La Vera Cruz: this hath a taper perennial root which runs deep in the ground, from which ariſe ſeveral ſlender branching ſtalks about ſix or ſeven inches high, garniſhed with downy ſpear-ſhaped leaves an inch long, and half an inch broad in the middle, drawing to a point at both ends. The flowers are produced in looſe ſpikes at the end of the branches; they are larger than thoſe of the common ſort, and are of a bluiſh purple colour. The keel of the flower is bearded, as in the common ſort.

This is too tender to live in the open air in England, and it is one of thoſe plants which will not thrive in pots, ſo is difficult to preſerve here. It is propagated by ſeeds, which muſt be procured from abroad. The ſeeds, which I received from Dr. Houſtoun, remained a year in the ground before the plants appeared, and the plants lived one year; but when their roots reached the bottom of the pots, they decayed; and thoſe which were tranſplanted into larger pots did not ſurvive their removal, though it was performed with great care.

POLYGONATUM. See CONVALLARIA.

POLYMNIA. Lin. Gen. 987. Hard-ſeeded Chryſanthemum.

The CHARACTERS are,

*The flower hath a double empalement; the outer is compoſed of five large ſpreading leaves, the inner of ten erect ſpear-ſhaped leaves; it hath a radiated flower, whoſe diſk is compoſed of hermaphrodite florets, and the border, or rays, of five female half florets, which are tongue-ſhaped and trifid. The hermaphrodite florets are funnel-ſhaped, have each five ſtamina terminated by cylindrical ſummits, which are longer than the petals; they have a a ſmall germen, ſupporting a ſlender ſtyle, crowned by an obtuſe ſtigma; theſe are barren. The female half florets have a large germen, with a ſlender ſtyle the length of the tube, crowned by two pointed ſtigmas; theſe have each one oval gibbous ſeed lodged in the ſcaly receptacle, ſucceeding them.*

This genus of plants is ranged in the fourth ſection of Linnæus's nineteenth claſs, intitled Syngeneſia Polygamia neceſſaria, the plants having hermaphrodite and female florets; the former having five ſtamina whoſe ſummits are connected, the latter are fruitful.

The SPECIES are,

1. POLYMNIA (*Uvedalia*) foliis oppoſitis haſtato-ſinuatis. Lin. Sp. 1303. *Hard-ſeeded Chryſanthemum, with ſinuated leaves placed oppoſite.* Chryſanthemum anguloſis platani foliis Virginianum. Pluk. Phyt. tab. 83. f. 3.
2. POLYMNIA (*Canadenſis*) foliis alternis haſtato-ſinuatis. Lin. Sp. 1303. *Hard-ſeeded Chryſanthemum, with ſinuated leaves placed alternate.*

The firſt ſort grows naturally in Virginia, from whence I have received the ſeeds; this hath a perennial root, which runs deep in the ground, ſending up in the ſpring many ſtalks in proportion to their ſize; theſe in moiſt good ground will riſe near ten feet high, and are garniſhed with large, angular, ſinuated leaves eight or ten inches over, of a light green, placed oppoſite; the ſtalks are terminated by a cluſter of yellow flowers ſitting cloſe, having very ſhort foot-ſtalks; each having five female half florets in their borders, and ſeveral hermaphrodite florets in their middle, which are encompaſſed by a double empalement; the outer having five ſpreading leaves, the inner ten erect ones; the flowers appear in October, which is too late to be ſucceeded by ſeeds in England; the ſtalks decay in winter, and new ones ariſe in the ſpring.

The ſecond ſort grows naturally in ſeveral parts of North America; this has alſo an abiding root, which ſends up many tall ſtalks in the ſpring, which riſe almoſt as high as thoſe of the other ſort; theſe are garniſhed with large, angular, ſinuated leaves, of a deeper green than thoſe of the former, which are placed alternately; the flowers are of a paler yellow colour, and ſit cloſe on the top of the ſtalks; theſe appear late in the autumn, ſo are not ſucceeded by ſeeds in England.

Theſe plants are both propagated by ſeeds, which muſt be procured from the countries where the plants grow naturally, ſo that the ſeeds ſeldom arrive here till toward the ſpring; and being ſown at that ſeaſon, the plants ſeldom come up until the following ſpring; whereas, if the ſeeds could be obtained in November, and were immediately ſown, the plants would appear the following ſpring, whereby a year would be ſaved. The ſeeds ſhould be ſown in a bed of light ground in the open air; and when the plants come up, they ſhould be thinned if they are too cloſe, and kept clean from weeds till the following autumn, when the roots ſhould be carefully taken up, and tranſplanted to the places where they are to remain, allowing each plant at leaſt three feet room to grow, obſerving to keep them clean from weeds, and to dig the ground about them every ſpring.

POLYPODIUM. Tourn Inſt. R. H. 540. tab. 316. Lin. Gen. Plant. [of πολὺς many, and ποῦς a foot, q. d. many feet. This kind of plant ſtrikes its roots into every part it can lay hold of, whether it be ſtone, earth, or tree, it is the ſame thing, eſpeecially if it be a tree of the Oak kind.] Polypody.

The CHARACTERS are,

*This is one of the Fern tribe, which is diſtinguiſhed from the others, by the fructification being in roundiſh ſpots, diſtributed on the under ſurface of the leaf.*

It is ranged in the firſt ſection of Tournefort's ſixteenth claſs, which includes the herbs, which have no viſible flower, whoſe fruit is faſtened on the leaves.

The SPECIES are,

1. POLYPODIUM (*Vulgare*) frondibus pinnatifidis, pinnis oblongis ſubſerratis obtuſis, radice ſquamatâ. Lin. Sp. Plant. 1085. *Polypody with wing-pointed leaves having oblong obtuſe lobes, which are ſomewhat ſawed, and a ſcaly root.* Polypodium vulgare. C. B. P. 359. *Common Polypody.*
2. POLYPODIUM (*Cambricum*) frondibus pinnatifidis, pinnis lanceolatis lacero-pinnatifidis ſerratis. Lin. Sp. Plant. 1086. *Polypody with wing-pointed leaves, whoſe lobes are ſpear-ſhaped, and the jags wing-pointed and ſawed.* Polypodium Cambro-Britannicum, pinnulis ad margines laciniatis. Raii Syn. *Welſh Polypody with jagged leaves.*

There are many other ſpecies of this plant which are natives of America, ſome of which are preſerved in the curious botanic gardens for variety; but as they are rarely cultivated in other gardens, it may not be thought neceſſary to enumerate them in this place.

The firſt ſort is that which is uſed in medicine, and is found growing upon old walls and ſhady banks in divers parts of England. The ſecond ſort was brought from Wales, where it grows in great plenty, and is the moſt beautiful of all the ſorts. Theſe plants may be propagated by parting of their roots in the ſpring before they ſhoot, and ſhould be planted in a very poor moiſt ſoil under the ſhade of a wall; for if they are expoſed to the ſun, they will not thrive. They chiefly delight to grow out of the joints of walls and old buildings, but are commonly found expoſed to the North.

POMGRANATE. See PUNICA.

POMUM ADAMI. See AURANTIUM.

PONTEDERIA. Lin. Gen. Plant. 391. Michelia. Houst. MSS.

The CHARACTERS are,

*The flowers are included in an oblong sheath, which opens on one side, and hath six petals, which are divided; the three upper are erect, and form a kind of lip; the three under are reflexed. It hath six stamina which are inserted to the petals; the three which are longest, are fastened to the mouth of the tube, the other are inserted in the base; they are terminated by prostrate summits. Under the petals is situated an oblong germen, supporting a single style which declines, and is crowned by a single stigma. The germen afterward turns to a soft fruit divided into six cells, each containing several small roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes the plants whose flowers have six stamina and one style.

The SPECIES are,

1. PONTEDERIA (*Cordata*) foliis cordatis, floribus spicatis. *Pontederia with heart-shaped leaves and spiked flowers.* Sagittæ similis planta palustris Virginiana, spicâ florum cæruleâ. Mor. Hist. 3. p. 618. *Virginian marsh plant, like Arrow-head, having a spike of blue flowers.*
2. PONTEDERIA (*Hastata*) foliis hastatis, floribus umbellatis. Lin. Sp. Plant. 412. *Pontederia with spear-pointed leaves, and flowers growing in umbels.* Sagittariæ quodammodo similis planta Maderaspatana, floribus medio caule quasi ex utriculo prodeuntibus. Pluk. Phyt. tab. 220. *A plant from Madras, somewhat like Arrow-head, with flowers proceeding from the middle of the stalk.*

The first sort grows naturally in marshy places in Virginia, and most parts of North America, and the late Dr. Houstoun found it growing plentifully at La Vera Cruz. This hath a perennial root, from which arise two or three herbaceous thick stalks a foot high, each having one heart-shaped leaf about five inches long, and two and a half broad, of a pretty thick consistence. The base is deeply indented, and the two ears are rounded; the foot-stalk of the leaf closely embraces the stalk like a spatha or sheath, for near three inches in length; above this is another sheath which incloses the spike of flowers; this opens on one side, and the stalk rises near two inches above it, where the spike of flowers begin. The spikes are about three inches long; the flowers are blue, sit very close together, and have the appearance of lip flowers. These appear in June, but are not succeeded by seeds in England.

As this plant grows naturally in moist boggy places, it is very difficult to be preserved in England; nor does the plant arise from seeds here, for I have sowed the seeds in various situations, and managed them different, but could never get up any of the plants; but I had three or four of the plants sent me, inclosed in large clods of earth from New England, which I planted in pots, covering them with Moss, and constantly supplied them with water. With this management two of them flowered, but the following winter destroyed them, as they were not put under shelter; so that to preserve them, they should be placed under a hot-bed frame in winter, where they may be exposed to the open air at all times when the weather is mild.

The second sort grows naturally about Madras in watery places. This rises with a single stalk eight or nine inches high, having one arrow-pointed leaf, whose base embraces the stalk like a sheath, and from the open side of the sheath comes out the flowers, which are at first inclosed in another smaller sheath; these grow in a small kind of umbel; they are composed of six acute-pointed petals which spread open. Each flower stands upon a slender foot-stalk about an inch long; the foot stalk of the leaf rises a considerable height above the flowers, so that they appear to come out from the middle of the stalk.

This sort is much more difficult to preserve in England, because it grows naturally in a hot country, and always in places flowed with water. There was formerly one of these plants brought over to Charles Duboise, Esq; at Mitcham, but it was not long-lived here.

POPULAGO. See CALTHA.

POPULUS. Tourn. Inst. R. H. 592. tab. 365. Lin. Gen. Plant. 996. The Poplar-tree; in French, *Peuplier*.

The CHARACTERS are,

*The male and female flowers grow upon separate trees. The male flowers or katkins have one oblong, loose, cylindrical empalement, which is imbricated. Under each scale, which is oblong, plain, and cut on the border, is situated a single flower without any petal, having a nectarium of one leaf, turbinated at the bottom, and tubulous at the top, and eight stamina terminated by large four-cornered summits. The female flowers are in katkins like the male, but have no stamina; they have an oval acute-pointed germen, with scarce any style, crowned by a four-pointed stigma. The germen afterward becomes an oval capsule with two cells, including many oval seeds having hairy down.*

This genus of plants is ranged in the seventh section of Linnæus's twenty-second class, which contains those plants whose male flowers have eight stamina, and grow upon distinct plants from the fruit.

The SPECIES are,

1. POPULUS (*Alba*) foliis subrotundis dentato-angulatis subtus tomentosis. Hort. Cliff. 460. *Poplar-tree with roundish angular leaves, which are downy on their under side.* Populus alba majoribus folii. C. B. P. 429. *White Poplar with larger leaves, commonly called the Abele-tree.*
2. POPULUS (*Tremula*) foliis subrotundis, dentato-angulatis utrinque glabris. Hort. Cliff. 460. *Poplar-tree with roundish leaves, which are angularly indented, and smooth on both sides.* Populus tremula. C. B. P. 429.
3. POPULUS (*Nigra*) foliis deltoidibus acuminatis serratis. Hort. Cliff. 460. *Poplar with pointed sawed leaves, shaped like the Delta.* Populus nigra. C. B. P. 429. *Black Poplar.*
4. POPULUS (*Major*) foliis angulatis serratis, subtus tomentosis supernè virentibus. *Poplar with larger angular sawed leaves, downy on their under side, and dark green on their upper.* Populus alba majoribus foliis. C. B. P. 429. *Greater white Poplar, or Abele-tree.*
5. POPULUS (*Balsamifera*) foliis subcordatis oblongis crenatis. Hort. Cliff. 460. *Poplar-tree with oblong leaves which are crenated, and almost heart-shaped.* Populus nigra folio maximo, gemmis balsamum odoratissimum fundentibus. Catesb. Carolin. 1. p. 34. *The Carolina Poplar-tree.*
6. POPULUS (*Tacamahacca*) foliis subcordatis, infernè incanis, supernè atroviridis. *Poplar with leaves which are almost heart-shaped, hoary on their under side, and of a dark green above.* Populo similis arbor resinosa altera. C. B. P. 430. *Another resinous tree like the Poplar, commonly called Tacamahacca.*

The first sort grows naturally in the temperate parts of Europe; this and the fourth sort are frequently confounded together, but they are certainly different species. The fourth sort is commonly called Abele-tree here, and the first white Poplar. The leaves of the fourth sort are large, and divided into three, four, or five lobes, which are indented on their edges; they are of a very dark colour on their upper side, and very white and downy on their under, standing upon foot-stalks which are about an inch long. The young branches of this tree have a purple bark, and are covered with a white down, but the bark of the stem and older branches is gray. In the beginning of April the male flowers or katkins appear, which are cylindrical, scaly, and three inches long, and about a week after come out the female flowers on katkins, which have no stamina like those of the male. Soon after these come out, the male katkins fall off, and in five or six weeks after, the female flowers will have ripe seeds inclosed in a hairy covering, when the katkins will drop, and the seeds will be wafted by the winds to a great distance.

The

The leaves of the firſt ſort are rounder, and not much above half the ſize of thoſe of the fourth; they are indented on their edges into angles, and are downy on their under ſide, nor are their under ſurfaces of ſo dark green. The ſhoots of this are paler, the katkins are longer, and the down of the ſeeds is whiter and longer.

The leaves of the third ſort are oval, heart-ſhaped, and ſlightly crenated on their edges; they are ſmooth on both ſides, and of a light green colour. The katkins of this are ſhorter than thoſe of the two former.

The fifth ſort grows naturally in Carolina, where it becomes a very large tree. The ſhoots of this ſort are very ſtrong in England, and are generally cornered; they have a light green bark like ſome ſorts of the Willow. The leaves upon young trees, and alſo thoſe upon the lower ſhoots, are very large, almoſt heart-ſhaped, and crenated, but thoſe upon the older trees are ſmaller; and as the trees advance, their bark becomes lighter, approaching to a grayiſh colour. The katkins of this ſort are like thoſe of the black Poplar, and the ſummits of the ſtamina are purple.

The ſhoots of this tree while young, are frequently killed down a conſiderable length by the froſt in winter; but as the trees grow older, their ſhoots are not ſo vigorous, and become more ligneous, ſo are not liable to the ſame diſaſter; but the trees ſhould be planted in a ſheltered ſituation, for as their leaves are very large, the wind has great power over them, and the branches being tender, they are frequently broken or ſplit down by the winds in the ſummer ſeaſon, where they are much expoſed.

The ſixth ſort grows naturally in Canada, and in other parts of North America; this ſeems to be a tree of middling growth, and does not ſpire upward, but ſends out many ſhort thick ſhoots on every ſide, which are covered with a light brown bark, and garniſhed with leaves differing from each other in ſhape and ſize, moſt of them almoſt heart-ſhaped, but ſome are oval, and others near to ſpear-ſhaped; they are whitiſh on their under ſide, but of a dark green on their upper. The katkins are like thoſe of the black Poplar, but the number of ſtamina in the male flowers is uncertain, from eighteen to twenty-two. The female flowers I have not fully examined, but by the male katkins I have been induced to place it in this genus.

Theſe trees may be propagated either by layers or cuttings, which will readily take root, as alſo from ſuckers, which the white Poplars ſend up from their roots in great plenty; but theſe are leſs valuable than thoſe propagated by cuttings, being more liable to ſend up ſuckers. The beſt time for tranſplanting theſe ſuckers is in October, when their leaves begin to decay. Theſe may be placed in a nurſery for two or three years to get ſtrength, before they are planted out where they are deſigned to remain; but if you intend to propagate them from cuttings, it is better to defer the doing of that until February, at which time you may plant truncheons of two or three feet long, thruſting them about a foot and a half into the ground. Theſe will readily take root, and if the ſoil be moiſt in which they are planted, they will arrive to a conſiderable bulk in a few years.

The black Poplar is not ſo apt to take root from large truncheons, therefore it is the better method to plant cuttings about a foot and a half in length, thruſting them a foot deep into the ground; theſe will take root very freely, and may be afterward tranſplanted where they are to remain. This ſort will grow upon almoſt any ſoil, but will thrive beſt in moiſt places.

I have planted cuttings of this tree, which in four years have been bigger in the trunk than a man's thigh, and near twenty feet in height, and this upon a very indifferent ſoil; but in a very moiſt ſoil, it is common for theſe trees to ſhoot eight or ten feet in a ſeaſon; ſo that where a perſon hath a mind to make a ſhelter in a few years, there is ſcarce any tree ſo proper for that purpoſe as this; but they ſhould not be planted too near the pleaſure-garden, becauſe the katkins and down which fall from theſe trees, will make a prodigious litter in the ſpring.

The white ſorts, as alſo the Aſpen-tree, likewiſe cauſe a greater litter in the ſpring, when their katkins and down fall off; and their roots being very apt to produce a large quantity of ſuckers, but eſpecially thoſe trees that came from ſuckers, which renders them unfit to be planted near a houſe or garden; but when they are interſperſed with other trees in large plantations, they afford an agreeable variety, their leaves being very white on their under ſides, which, when blown with the wind, are turned to ſight.

A conſiderable advantage may be made by planting theſe trees upon moiſt boggy ſoils, where few other trees will thrive. Many ſuch places there are in England, which do not at preſent bring in much money to their owners; whereas, if they were planted with theſe trees, they would, in a very few years, over purchaſe the ground, clear of all expence; but there are many perſons, who think nothing except Corn worth cultivating in England; or if they plant timber, it muſt be Oak, Aſh, or Elm; and if their land be not proper for either of theſe, it is deemed little worth; whereas if the nature of the ſoil was examined, and proper ſorts of plants adapted to it, there might be very great advantage made of ſeveral large tracts of land, which at this time lie neglected.

The wood of theſe trees, eſpecially of the Abele, is very good to lay for floors, where it will laſt many years; and for its exceeding whiteneſs, is by many perſons preferred to Oak; but being of a ſoft contexture, is very ſubject to take the impreſſion of nails, &c. which renders it leſs proper for this purpoſe: it is alſo very proper for wainſcotting of rooms, being leſs ſubject to ſwell or ſhrink, than moſt other ſorts of wood; but for turnery ware, there is no wood equal to this for its exceeding whiteneſs, ſo that trays, bowls, and many other utenſils, are made of it; and the bellows-makers prefer it for their uſe, as do alſo the ſhoemakers, not only for heels, but alſo for the ſoles of ſhoes; it is alſo very good to make light carts, and the poles are very proper to ſupport Vines, Hops, &c. and the lopping will afford good fuel, which in many countries is much wanted.

The Carolina Poplar may alſo be propagated by cuttings or layers; the latter is generally practiſed by the nurſery gardeners, being the ſureſt method; and theſe plants are not ſo full of moiſture as thoſe raiſed by cuttings, ſo are leſs liable to be cut down by the froſt when young. There has been no trials made here of the wood of this tree, ſo I cannot give any account of its worth.

The Tacamahacca ſends up a great number of ſuckers from the roots, by which it multiplies in plenty, and every cutting which is planted will take root; ſo that when a plant is once obtained, there may ſoon be plenty of the plants raiſed. The buds of this tree are covered with a glutinous reſin, which ſmells very ſtrong, and this is the Tacamahacca uſed in the ſhops.

PORRUM. Tourn. Inſt. R. H. 382. tab. 204. Allium. Lin. Gen. Plant. 370. [in Greek is called πράσον, from πράω, to enkindle, as being a plant that excites a warmth in the body.] Leek.

The CHARACTERS are,

*The flower hath ſix bell-ſhaped petals, which are collected into a ſpherical head, covered by a common roundiſh ſpatha or ſheath, which opens on one ſide, and withers. Theſe have ſix ſtamina, three of which are alternately broader than the other, and have forked ſummits in their middle. They have a ſhort, round, three-cornered germen, ſupporting a ſingle ſtyle, crowned by an acute ſtigma. The germen afterward becomes a ſhort broad capſule with three lobes, having three cells filled with angular ſeeds.*

This genus of plants is joined to Linnæus's genus of Allium, which is ranged in the firſt ſection of his ſixth claſs, including the plants whoſe flowers have ſix ſtamina and one ſtyle. The joining of theſe genera together is allowable in a ſyſtem of botany, but in

in a treatise upon gardening, it would not so well please; for as the Leek has always been distinguished from Garlick and Onion by gardeners, so it would rather confuse than instruct the practitioners, if they were joined; and as the species of Garlick are numerous, so where their species are lessened, by dividing them into genera, it will be no less useful to botanists.

The SPECIES are,

1. PORRUM (*Sativum*) radice oblongâ tunicatâ, caule planifolio, floribus capitatis, staminibus tricuspidatis. *Leek with an oblong coated root, a plain leaf on the stalk, flowers collected in heads, and three-pointed stamina.* Porrum commune capitatum. C. B. P. 72. *Common-headed Leek, commonly called London Leek.*
2. PORRUM (*Ampeloprasum*) caule planifolio umbellifero, umbellâ globosâ, staminibus corolla longioribus. *Leek with a plain leaf on the stalk, which supports a globular umbel of flowers, whose stamina are longer than the petals.* Porrum Siberiense, floribus purpurascentibus. Gmel. *Siberian Leek having purplish flowers.*

The first sort is commonly cultivated in the English gardens; of this there has been generally supposed two sorts, but I have made trial of them both, by sowing their seeds several times, and find they are the same; the difference which has risen between them, has been occasioned by some persons having saved the seeds from old roots, and not from the seedling Leeks, whereby they have degenerated them, and rendered them smaller and narrower leaved; but by care this may be recovered again, as I have experienced.

The other sort grows naturally in Siberia; this hath narrower leaves than the common sort, the stalks are smaller, and do not rise so high; the heads of flowers are also smaller, and of a purplish colour; the stamina stands out beyond the flower.

Leeks are cultivated by sowing their seeds in the spring, in the same manner as was directed for Onions, with which these are commonly sown, the two sorts of seeds being mixed according to the proportion which is desired of either sort; though the most common method is, to mix an equal quantity of both, for the Onions will greatly out-grow the Leeks in the spring; but these being drawn off early in August, the Leeks will have time to grow large afterwards, so that there may be a moderate crop of both sorts. The management of Leeks being exactly the same with Onions, I shall not repeat it in this place; but shall only add, that many persons sow their Leeks very thick in beds in the spring; and in June, after some of their early crops are taken off, they dig up the ground, and plant their Leeks out thereon, in rows a foot apart, and six inches asunder in the rows, observing to water them until they have taken root; after which they will require no further culture, but to clear the ground from weeds. The Leeks thus planted will grow to a moderate size, provided the ground be good, and this method is very proper for such persons who have little room.

If you would save the seeds of this plant, you should make choice of some of the largest and best Leeks you have, which must remain in the place where they grew until February, when they should be transplanted in a row against a warm hedge, pale, or wall, at about eight inches asunder; and when their stems advance, they should be supported by a string, to prevent their being broken down, to which they are very liable, especially when in head; and the closer they are drawn to the fence in autumn, the better the seeds will ripen; for it sometimes happens in cold summers or autumns, that those which grow in the open garden, do not perfect their seeds in this country, especially if there should be sharp frosts early in autumn, which will entirely spoil the seed.

When it is ripe (which may be known by the heads changing brown) you should cut off their heads with about a foot or more of the stalk to each, and tie them in bundles, three or four heads in each, and hang them up in a dry place, where they may remain till Christmas or after, when you may thresh out the seeds for use. The husk of these seeds is very tough, which renders it very difficult to get out the seeds; therefore some persons who have but a small quantity, rub it hard against a rough tile, which will break the husks, and get the seeds out better than most other methods I have known used.

PORTULACA. Tourn. Inst. R. H. 236. tab. 118. Lin. Gen. Plant. 531. Purslane; in French, *Pourpier.*

The CHARACTERS are,

*The empalement of the flower is small, bifid, and permanent, sitting upon the germen. The flower has five plain, erect, obtuse petals, and many hair-like stamina, about half the length of the petals, terminated by single summits; and a roundish germen, supporting a short style, crowned by five oblong stigmas. The germen afterward becomes an oval capsule with one cell, containing many small seeds.*

This genus of plants is ranged in the first section of Linnæus's eleventh class, which contains the plants whose flowers have from eleven to nineteen stamina inclusive, and one style.

The SPECIES are,

1. PORTULACA (*Oleracea*) foliis cuneiformibus, floribus sessilibus. Prod. Leyd. 473. *Purslane with wedge-shaped leaves, and flowers growing close to the stalks.* Portulaca latifolia seu sativa. C. B. P. 288. *Broad-leaved, or Garden Purslane.*
2. PORTULACA (*Pilosa*) foliis subulatis alternis, axillis pilosis, floribus sessilibus terminalibus. Lin. Sp. Plant. 445. *Purslane with awl-shaped leaves placed alternately, hairy joints, and flowers sitting close to the stalks.* Portulaca Curassavica angusto longo lucidoque folio, procumbens. Hort. Amst. 1. p. 2. *Trailing Purslane of Curasso, with long, narrow, shining leaves.*
3. PORTULACA (*Anacampseros*) foliis ovatis gibbis, pedunculo multifloro, caule fruticoso. Lin. Sp. Plant. 445. *Purslane with oval gibbous leaves, foot-stalks having many flowers, and a shrubby stalk.* Telephiastrum folio globoso. Hort. Elth. 376. *Bastard Orpine with a globular leaf.*

The first sort grows naturally in America, and most of the hot parts of the globe. This is the common Purslane which is cultivated in the gardens, and is so generally known as to need no description. There are two varieties of this, one with deep green leaves, and the other hath yellow leaves, which is called Golden Purslane; but as both these arise from the same seeds, so they are only seminal variations. There is also a third variety with smaller and less succulent leaves, which is called wild Purslane, because wherever it is once sown in a garden, and the plants permitted to scatter seeds, the plants will come up as weeds the following year; but this I am sure is a degeneracy from the Garden Purslane, for I have sown it several times and let the plants shed their seeds, and it has come up from those seeds in two years, degenerated to the wild sort.

Purslane is propagated from seeds, which may be sown upon beds of light rich earth during any of the summer months; but if you intend to have it early in the season, it should be sown upon a hot-bed; for it is too tender to be sown in the open air before April, and then it must be in a warm situation. This seed is very small, so that little of it will be sufficient to supply a family. There is no other culture which this plant requires, but to keep it clear from weeds, and in dry weather to water it two or three times a week. In warm weather this plant will be fit for use in six weeks after sowing, so that in order to continue a succession of it, you should sow it at three or four different seasons, allowing a fortnight or three weeks between each sowing, which will be sufficient to last the summer, so long as it is proper to be eaten; for being of a very cold nature, it is unsafe to be eaten, except in the heat of summer in England; for which reason, it is not to any purpose to sow it upon a hot-bed, since it will come early enough for use in the open air.

If the seeds are intended to be saved, a sufficient number of the earliest plants should be left for this purpose, drawing out all those which are weak, or have small leaves, from among them; and when the seeds are ripe, the plants should be cut up, and spread upon cloths in the sun to dry, and then the seeds may be easily beaten out and sifted, to clear it from the leaves and seed-vessels.

The second sort grows naturally in most of the islands of the West Indies; this is annual; the stalks are very succulent, of a purple colour, and branch out greatly; the lower branches lie near the ground, but those above them are more erect; the leaves are narrow, awl-shaped, and of a lucid green; they are placed alternately on the branches. At the joints there come out tufts of white hairs, and between these come out the flowers sitting close to the branches; they are of a fine Pink colour, but of short duration, seldom continuing open longer than five or six hours; these are succeeded by short roundish capsules, filled with small black seeds. It flowers from the middle of June till autumn.

The third sort grows naturally at the Cape of Good Hope; this is a perennial plant with a shrubby stalk, which rises four or five inches high, garnished with thick, globular, succulent leaves; at the top of the stalk comes forth a slender foot-stalk about two inches long, sustaining four or five Rose-shaped flowers of a red colour. These appear in July, but are not succeeded by seeds in England. This plant is too tender to live in the open air in winter, so it must be kept in pots, and treated in the same way as the most succulent kinds of Aloes. It is propagated by cuttings.

**POTENTILLA.** Lin. Gen. Plant. 559. Quinquefolium pentaphylloides. Tourn. Inst. R. H. 296. tab. 153, 298. Cinquefoil; in French, *Quinte-feuille.*

The CHARACTERS are,

*The empalement of the flower is of one leaf, which is slightly cut into ten parts; the segments are alternately less and reflexed. The flower is composed of five petals, which are inserted into the empalement, and spread open. It hath twenty awl-shaped stamina inserted in the empalement, terminated by moon-shaped summits. In the center of the flower there are several germen collected into one head, with very slender styles inserted in the side of the germen, crowned by obtuse stigmas. After the flower is past, the germen becomes a head of roundish seeds, included in the empalement.*

This genus of plants is ranged in the fifth section of Linnæus's twelfth class, which includes those plants whose flowers have about twenty stamina inserted in the empalement, and have many germen.

The SPECIES are,

1. POTENTILLA (*Anserina*) foliis pinnatis serratis, caule repente. Flor. Lapp. 210. *Potentilla with winged sawed leaves, and a creeping stalk.* Pentaphylloides argenteum alatum, seu potentilla. Tourn. Inst. 298. *Silver Weed, or Wild Tansy.*
2. POTENTILLA (*Rupestris*) foliis pinnatis alternis, foliolis quinis ovatis crenatis, caule erecto. Hort. Cliff. 193. *Potentilla with alternate winged leaves, having five oval crenated lobes, and an erect stalk.* Pentaphylloides erectum. J. B. 2. p. 398. *Upright Cinquefoil.*
3. POTENTILLA (*Fruticosa*) foliis pinnatis, caule fruticoso. Hort. Cliff. 193. *Potentilla with winged leaves and a shrubby stalk.* Pentaphylloides rectum fruticosum Eboracense. Mor. Hist. 2. 193. *Upright shrubby Cinquefoil of Yorkshire, commonly called shrubby Cinquefoil.*
4. POTENTILLA (*Recta*) foliis septenatis lanceolatis serratis utrinque subpilosis, caule erecto. Lin. Sp. Plant. 711. *Potentilla with seven spear-shaped, sawed, hairy leaves, and an erect stalk.* Quinquefolium erectum luteum. C. B. P. 325. *Yellow upright Cinquefoil.*
5. POTENTILLA (*Argentea*) foliis quinatis cuneiformibus incisis subtus tomentosis, caule erecto. Lin. Sp. Plant. 497. *Potentilla with five wedge-shaped cut leaves, which are woolly on their under side, and have an erect stalk.* Quinquefolium folio argenteo. C. B. P. 325. *Cinquefoil with a silvery leaf.*
6. POTENTILLA (*Caulescens*) foliis quinatis apice conniventi-serratis, caulibus multifloris erectis, receptaculis hirsutis. Hort. Cliff. 194. *Potentilla with five leaves whose points are sawed, erect stalks with many flowers, and hairy receptacles.* Quinquefolium album minus alterum. C. B. P. 325. *Another smaller white Cinquefoil.*
7. POTENTILLA (*Monspeliensis*) foliis ternatis, caule ramoso erecto, pedunculis supra genicula enatis. Hort. Upsal. 134. *Potentilla with leaves growing by threes, an upright branching stalk, and foot-stalks rising above the joints.* Fragaria sterilis Alpina caulescens. Boerh. Ind. alt. 1. p. 42. *Stalky Alpine barren Strawberry.*
8. POTENTILLA (*Grandiflora*) foliis ternatis, dentatis utrinque subpilosis, caule decumbente foliis longiore. Lin. Sp. Plant. 715. *Potentilla with three hairy leaves, and a trailing stalk longer than the leaves.* Fragaria sterilis amplissimo folio & flore, petalis cordatis. Vaill. Paris. 55. tab. 10.
9. POTENTILLA (*Heptaphylla*) foliis septenis quinatisque, foliolis pinnato-incisis pilosis, caule erecto ramoso. *Potentilla with seven and five leaves, whose lobes are cut, winged, and hairy, and an upright branching stalk.* Quinquefolium quod pentaphyllum seu potius heptaphyllum rectum, caule rubro hirsutis. Hort. Cath. *Cinquefoil or Septfoil, with a red, upright, hairy stalk.*

There are many more species of this genus, which are preserved in botanic gardens for the sake of variety, but as they are not cultivated in other places either for use or beauty, I shall not enumerate them here.

The first sort here mentioned, grows naturally upon cold stiff land in most parts of England, and is a sure mark of the sterility of the soil. It spreads its stalks upon the ground, which send out roots from their joints, fastening into the ground, and thereby propagates so fast, as in a little time to spread over and fill the ground to a great distance. The leaves are composed of several lobes (or wings) which are generally placed alternately along the midrib, and terminated by an odd one; they are sawed on their edges, and are of a silvery colour, especially on their under side. The flowers are produced singly upon very long foot-stalks, which arise from the root; they are composed of five yellow petals, which expand in form of a Rose; these have a great number of stamina which are inserted to the petals, and many germen collected in heads, which afterward become many acute-pointed seeds wrapped up in the empalement. It flowers great part of summer. The leaves of this plant are used in medicine, and are accounted restringent and vulnerary. It is rarely cultivated in gardens, being a very common weed in England.

The second sort grows naturally on the Alps, and mountains in Germany. This hath a perennial root, which sends out several heads joined together; from these arise the foot-stalks of the leaves, which are long, and sustain three pair of roundish lobes, terminated by an odd one; these are crenated on their edges, and sit close to the midrib. Out of each head arises a hairy stalk about nine inches high, having at each joint one or two trifoliate leaves, shaped like those below, but smaller; the upper part of the stalk divides into small foot-stalks, each sustaining two or three white flowers, very like those of the Strawberry. These appear in June, and are succeeded by seeds like those of the former. It is easily propagated by seeds, or parting of the roots; the best time of sowing the seeds is in the autumn, and that is also the season for parting and transplanting the roots; it loves a moist soil and a shady situation.

The third sort grows naturally in the northern counties of England, and in many of the northern parts of Europe. This hath a shrubby stalk, which rises about four feet high, dividing into many branches, which are garnished by winged leaves, composed of

two or three pair of narrow, acute-pointed, entire lobes, which are hairy, and pale on their under side. The flowers are produced at the end of the branches in clusters; they have five yellow petals spreading open in form of a Rose, with many germen and stamina within. These appear in July, and are sometimes succeeded by seeds inclosed in the empalement. This plant is commonly cultivated in the nursery-gardens as a flowering shrub, by suckers, or laying down the tender branches, which will take root in one year, and may then be taken off from the old plants, and planted in a nursery for a year or two to get strength, before they are planted where they are designed to remain. It may also be propagated by cuttings, which may be planted in autumn in a moist shady border, where they will take root the next spring, and the Michaelmas following may be transplanted into the nursery.

The best season for transplanting of these plants is in October, that they may get new roots before the hard frost sets in; for as this plant grows naturally upon moist boggy land, so when it is removed in the spring, if due care is not taken to water it in dry weather, it is apt to miscarry; nor will this plant live in a hot dry soil, but in a shady situation and on a cool moist soil it will thrive exceedingly.

The fourth sort grows naturally in the south of France and Italy; this hath hand-shaped leaves, composed of five or seven lobes which join at their base, where they meet the foot-stalk; they are deeply crenated on their sides, and are hairy on both sides. The stalks rise nine or ten inches high, branching toward the top, and garnished at each joint with one leaf, of the same form as those below, but smaller. The flowers grow at the top of the stalk; they are white, and shaped like those of the former sort, appearing about the same time, and are succeeded by seeds like those. This is a biennial plant, which dies soon after the seeds are ripe. It may be propagated as the second sort.

The fifth sort grows naturally on the Alps, and in other rough hilly parts of Europe. This hath a thick fleshy root which strikes deep in the ground, from which arise several purple branching stalks about a foot high, garnished with leaves composed of five wedge-shaped lobes, which are deeply cut on their edges, and are very hoary on their under side. The flowers grow at the top of the stalk, which branches out into many foot-stalks; they are yellow, and shaped like those of the fourth sort, but smaller. The root is perennial, and the plant may be propagated as the second sort.

The sixth sort grows on the mountains in Austria; this hath a perennial root; the leaves stand upon foot-stalks which arise from the root, and are very long; they are composed of five oblong lobes which are a little sawed at their ends, very hoary and silky on their under sides, but green on their upper. The flowers are produced upon long slender foot-stalks, which arise immediately from the root; they are white, and shaped like those of the other species, appearing in May, but are seldom succeeded by seeds in England. It may be easily propagated by runners in the same manner as the Strawberry; the best time to transplant them is in autumn. It loves a cool soil and a shady situation.

The seventh sort grows naturally near Montpelier; this is a perennial plant; the stalks grow erect, about a foot high; they are very hairy, and garnished with trifoliate oblong leaves, sawed on their edges. The flowers are produced upon foot-stalks, which come out above the joints of the stalk; they are white, and large. This plant flowers in June, and the seeds ripen in autumn, which, if permitted to scatter, will produce plants in plenty the following spring, which will require no other culture but to keep them clean from weeds.

The eighth sort is also a perennial plant, but differs from the other in having trailing stalks; the lobes of the leaves are oval, obtuse, and bluntly indented on their edges; the flowers are larger, and the whole plant is of a deeper green. It flowers in July, and the seeds ripen in autumn. It propagates itself like the former sort.

The ninth sort grows naturally in Italy and Sicily; this is a perennial plant; the stalks rise near two feet high, they are purple and very hairy, garnished with leaves composed of five or seven narrow lobes, which are deeply cut on their sides, so as to resemble those of winged leaves; the stalks branch out greatly toward their top. The flowers are yellow, and shaped like those of the fourth sort. It flowers in June, and the seeds ripen in autumn. It may be propagated as the fourth sort.

POTERIUM. Lin. Gen. Plant. 948. Pimpinella. Tourn. Inst. R. H. 156. tab. 68. Burnet; in French, *Pimprenelle*.

The Characters are,

*It hath male and female flowers in the same spike. The male flowers have a three-leaved empalement; they have one petal, which is cut into four parts; these are oval, concave, and permanent, and a great number of long hair-like stamina, terminated by roundish twin summits. The female flowers have one wheel-shaped petal with a short tube, cut at the brim into four parts; these have no stamina, but two oblong oval germen, with two hairy styles the length of the petal, crowned by coloured pencil-shaped stigmas. The germen afterward becomes two hard seeds, inclosed in the petal of the flower.*

This genus of plants is ranged in the eighth section of Linnæus's twenty-first class, which includes those plants whose flowers are male and female in the same spike, and the male flowers have many stamina.

The Species are,

1. Poterium (*Sanguisorba*) inerme, caulibus subangulosis. Hort. Cliff. 446. *Unarmed Poterium with angular stalks.* Pimpinella sanguisorba minor hirsuta. C. B. P. 160. *Smaller hairy Burnet.*
2. Poterium (*Hybridum*) inerme, caulibus teretibus strictis. Lin. Sp. Plant. 994. *Unarmed Poterium with a narrow taper stalk.* Pimpinella agrimonoides odorata. H. R. Par. *Sweet-smelling Burnet resembling Agrimony.*
3. Poterium (*Spinosum*) spinis ramosis. Hort. Cliff. 445. *Poterium with branching spines.* Pimpinella spinosa, seu sempervirens. Mor. Umb. 57. *Prickly or evergreen Burnet.*

The first sort is the common Burnet, which grows naturally upon chalky lands in many parts of England; of this there are two or three varieties, one of them is much smoother than the other, and the third hath larger seeds than either of the former; but these differences are not constant, being only seminal variations. This is a perennial plant, from whose root arise a great number of leaves, standing on pretty long foot-stalks; they are composed of five or six pair of lobes, terminated by an odd one. The lobes are generally ranged a little alternate on the midrib, but sometimes stand by pairs; they are sawed on their edges, and are sometimes smooth, and at others hairy. The stalks rise a foot and a half high, branching out pretty much, and are terminated by long slender foot-stalks, each sustaining an oblong spike of flowers, in which there are some male and others female; they are of a purplish red colour, and appear in June. The female flowers are each succeeded by two hard seeds, which ripen in autumn.

This plant is propagated in gardens; the young tender leaves are put into sallads in winter and spring, and the leaves are used for cool tankards in hot weather. It is used in medicine, and is reckoned to be cordial and alexipharmic. The powder of the root is commended against spitting of blood.

This plant is easily propagated by seeds, which should be sown in autumn soon after they are ripe; for if it is sown in spring, the seeds frequently lie in the ground till the spring following. If the seeds are permitted to scatter, the plants will come up in plenty; and if these are transplanted out in a bed of undunged earth, at about a foot distance every way, and kept clean

clean from weeds, they will continue some years, especially if the soil is dry, and will require no other care. It may also be propagated by parting the roots in autumn; but as the plants arise so freely from scattered seeds, the latter method is seldom practised. This plant has been of late recommended by persons of little skill, to be sown as a winter pabulum for cattle; but whoever will give themselves the trouble to examine the grounds where it naturally grows, will find the plants left uneaten by the cattle, when the Grass about them has been cropped to the roots; beside, in wet winters and on strong land, the plants are of short duration, therefore very unfit for the purpose, nor is the produce sufficient to tempt any persons of skill to engage in its culture; therefore I wish those persons to make trials of it in small quantities, before they embark largely in these new schemes.

The second sort grows naturally in the south of France and Italy; this is a biennial plant, which decays soon after the seeds are ripe. The leaves of this are like those of Agrimony, and are composed of three or four pair of oblong lobes, placed a little alternate on the midrib, and terminated by an odd one: they are deeply sawed on their edges, and have an agreeable scent; the stalks rise two feet high, and are garnished at each joint with one of those winged leaves, which gradually diminish in their size at the top, and just above the leaf arises a long foot-stalk, which supports two or three small ones, each sustaining a small roundish spike of flowers. These appear in July, and are succeeded by seeds which ripen in autumn. It is propagated by seeds, which, if sown in autumn, the plants will come up the following spring. These require no other culture than to thin them where they are too close, and keep them clean from weeds; the second year they will flower and ripen their seeds, and soon after decay.

The third sort grows naturally in Crete, and in many of the islands of the Archipelago. This hath a shrubby perennial stalk, which rises about three feet high, dividing into several slender branches, which are armed with branching sharp thorns; the leaves are very small; they are winged, and have six or seven pair of very small lobes, ranged opposite along the midrib, terminated by an odd one; they are of a lucid green, and continue all the year. The flowers are produced in small heads at the end of the branches, and are of an herbaceous colour; they appear the beginning of June, and there is a succession of them most part of summer; but those only which come early, are sometimes succeeded by seeds in England.

This plant is too tender to live through the winter in the open air; but if it is sheltered under a common hot-bed frame in winter, where it may have the free air at all times when the weather is mild, and sheltered from hard frost, it will thrive better than when it is more tenderly treated. It may be propagated by slips or cuttings during any of the summer months, which, if planted in a bed of light earth, and covered down close with a hand or bell-glass, and shaded from the sun, will take root and may then be taken up, and planted each into a separate small pot, filled with fresh undunged earth, and placed in the shade till they have taken new root, and then removed to a sheltered situation, where they may stand till the frost comes on, when they should be placed under the hot-bed frame. It requires but little water, especially in cool weather, and wants no particular culture.

PRASIUM. Lin. Gen. Plant. 655. Galeopsis. Tourn. Inst. R. H. 186. Shrubby Hedge-nettle.

The CHARACTERS are,

*The flower hath a bell-shaped empalement of one leaf, divided into two lips; the upper lip is broad, and ends in three acute points; the lower lip is cut into two parts. The flower is of the lip kind; it hath one petal; the upper lip is oval, erect, and indented at the end. The lower lip is broad, reflexed, and ends in three points, the middle one being broadest. It has four awl shaped stamina under the upper lip, two of which are shorter than the other, having oblong summits on their side, and a four-pointed germen sustaining a slender style the length of the stamina, crowned by a bifid stigma. The germen afterward become four berries, each containing a single roundish seed.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and the seeds are naked.

The SPECIES are,

1. PRASIUM (*Majus*) foliis ovato-oblongis serratis. Lin. Hort. Cliff. 309. *Shrubby stinking Hedge-nettle, with oblong, oval, sawed leaves.* Galeopsis Hispanica frutescens, teucrii folio. Tourn. Inst. 186. *Spanish, shrubby, stinking Hedge-nettle, with a Tree Germander leaf.*
2. PRASIUM (*Minus*) foliis ovatis duplici utrinque crenâ notatis. Lin. Hort. Cliff. 309. *Shrubby stinking Hedge-nettle, with oval leaves which are indented on every side.* Lamium fruticans, teucrii folio lucido, calyce & flore magno candido: tantillâ purpurâ variè notato. Hort. Cath. 106. *Shrubby Dead-nettle, with a lucid Tree Germander leaf, and a large white flower with some spots of purple.*

The first sort grows naturally in Spain and Italy; this rises with a shrubby stalk two feet high, covered with a whitish bark, and divides into many branches, which are garnished with oblong oval leaves, sawed on their edges. The flowers come out from the bosom of the leaves in whorls round the stalks; they are white, and have large permanent empalements, cut into five points. The flowers are of the lip kind; they appear in June and July, and are succeeded by four small berries sitting in the empalement, which turn black when they are ripe, and have a single roundish seed in each.

The second sort grows naturally in Sicily; this hath a shrubby stalk like the former, but rises a little higher; the bark is whiter, the leaves are shorter and oval, and are doubly crenated on each side; they are of a lucid green. The flowers come out in small whorls from the bosom of the leaves, like the former; they are somewhat larger, and are frequently marked with a few purple spots; these are succeeded by small berries like the other sort, which ripen at the same time.

These plants may be propagated either by cuttings, or from the seeds: if they are propagated by cuttings, they should be planted on a shady border toward the end of April; but the cuttings should not be taken from such plants as have been drawn weak, but rather from those which have been exposed to the open air, whose shoots are short and strong; and if a joint of the former year's wood is cut to each of them, they will more certainly succeed. These cuttings may remain in the same border till they are well rooted, when they may be transplanted into the places where they are to remain, or into pots, that they may be sheltered in winter under a common frame, where they may have as much free air as possible in dry weather, but only require to be screened from hard frost. If they are propagated by seeds (which the plants produce in plenty every year) they should be sown on a bed of light earth in April; and in May the plants will come up, when they require no other care but that of keeping them clean from weeds; and in the autumn following, they may be transplanted in the same manner as before directed for those raised from cuttings; and may be afterward treated more hardily, as they acquire strength.

A plant or two of each of these species may be allowed to have a place where there are collections of the different sorts of ever-green shrubs, for the sake of variety; especially where the different sorts of Cistus, Phlomis, Tree-wormwood, and Medicago, are admitted, because these are equally hardy; and when a severe winter happens, which destroys the one, the others are sure of the same fate; but in mild winters they will live abroad, especially if they are planted in a dry rubbishy soil, and have a sheltered situation; but in rich wet ground, the plants will grow vigorous in summer, so are liable to injury from the early frosts in autumn.

PRENANTHES. Lin. Gen. Plant. 816. Vaill. Mem. ann. 1721. Wild Lettuce.

The CHARACTERS are,

*It hath a ſmooth cylindrical empalement ſpreading at the brim, having many ſcales, which are equal, but have three at the baſe unequal. This common empalement includes from five to eight hermaphrodite florets, diſpoſed in a ſingle round order; they have one petal, which is ſtretched out like a tongue, and indented in four parts at the end; they have five ſhort hair-like ſtamina, terminated by cylindrical ſummits. The germen is ſituated under the petal, ſupporting a ſlender ſtyle longer than the ſtamina, crowned by a bifid reflexed ſtigma. The germen afterward becomes a ſingle heart-ſhaped ſeed, crowned with hairy down.*

This genus of plants is ranged in the firſt ſection of Linnæus's nineteenth claſs, which includes the plants with a flower compoſed of all hermaphrodite or fruitful florets, whoſe ſtamina and ſtyle are connected.

The SPECIES are,

1. PRENANTHES (*Muralis*) floſculis quinis, foliis runcinatis. Hort. Cliff. 383. *Prenanthes with five florets and ſpear-ſhaped leaves.* Lactuca ſylveſtris murorum, flore luteo. J. B. 2. p. 1004. *Wild Wall Lettuce with a yellow flower.*
2. PRENANTHES (*Purpurea*) floſculis quinis, foliis lanceolatis denticulatis. Hort. Cliff. 383. *Prenanthes with five florets, and ſpear-ſhaped indented leaves.* Lactuca montana purpuro-cæruleo major. C.B.P. 123. *Greater purple, blue, Mountain Lettuce.*
3. PRENANTHES (*Altiſſima*) floſculiis quinis foliis trilobis, caule erecto. Lin. Sp. Plant. 797. *Upright Pernanthes with five florets, and leaves having three lobes.* Prenanthes Canadenſis altiſſima, foliis variis, flore luteo. Vaill. Act. 1721. *Talleſt Prenanthes of Canada, with variable leaves and a yellowiſh flower.*
4. PRENANTHES (*Amplexicaule*) floſculis quinis, caule ramoſo foliis ovato-lanceolatis ſemiamplexicaulibus. *Prenanthes with five florets, a branching ſtalk, and oval ſpear-ſhaped leaves half embracing the ſtalk.* Lactuca montana, purpuro-cærulea minor. C. B. P. 143. *Smaller purple, blue, Mountain Lettuce.*

The firſt ſort grows naturally upon walls and dry ſhady banks in many parts of England, ſo is never cultivated in gardens. The ſecond ſort grows naturally upon the Helvetian Mountains; this hath a creeping root, which ſpreads far in the ground, ſo becomes a troubleſome weed if admitted into gardens. The ſtalks of this riſe four feet high; the leaves are ſpear-ſhaped, and a little indented toward their ends; the flowers are of a purple blue colour, and are produced looſe in panicles from the ſides, and at the top of the ſtalks. Theſe appear in July, and are ſucceeded by ſeeds which ripen in autumn.

The third ſort grows naturally in moſt parts of North America, where it is called Dr. Witt's Rattle-ſnake root; this ſeldom lives longer than two years. The lower leaves are four or five inches long, and three broad; they are ſometimes divided into five lobes, but generally into three; they are indented a little on their edges, ſmooth, of a dark green on their upper ſide, but pale on their under. The ſtalks riſe three feet high, and are garniſhed with a few ſmall leaves which are entire; the flowers come out from the ſide of the ſtalk in ſmall bunches; theſe are of a pale yellow colour, and appear in July. They are ſucceeded by ſeeds, crowned with hairy down, which ripen in autumn. There is a variety of this with pale purple flowers which ariſe from the ſame ſeeds. The roots of theſe plants are ſaid to be an antidote to expel the venom of the rattle-ſnake, which induced me to mention theſe plants.

The fourth ſort grows naturally on the mountains in Germany; this hath a perennial root. The ſtalks riſe a foot high, and branch out on each ſide; the leaves are ſpear-ſhaped and oval; their baſe is broad, and half ſurrounds the ſtalk; the flowers grow looſely upon ſlender foot-ſtalks, which come out from the ſide, and at the end of the branches. Theſe appear in June, and the ſeeds ripen in autumn.

Theſe plants are ſeldom admitted into gardens, but if any perſon is deſirous to cultivate them, if they ſow the ſeeds ſoon after they are ripe, in a ſheltered ſituation, the plants will come up, and require no other care but to keep them clean from weeds.

PRIMULA. Lin. Gen. Plant. 180. Primula veris. Tourn. Inſt. R. H. 124. tab. 47. [This plant is ſo called, becauſe it is the firſt plant that appears in the ſpring.] The Primroſe; in French, *Primevere.*

The CHARACTERS are,

*The flower hath a five-cornered tubulous empalement of one leaf, ending in five acute points; it hath one petal, with a cylindrical tube the length of the empalement, but ſpreads open above, where it is cut into five heart-ſhaped ſegments. It has five ſhort ſtamina ſituated in the neck of the petal, terminated by erect acute-pointed ſummits, and a globular germen ſupporting a ſlender ſtyle, crowned by a globular ſtigma. The germen afteward turns to an oblong capſule with one cell, opening at the top, filled with ſmall angular ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and one ſtyle.

The SPECIES are,

1. PRIMULA (*Veris*) foliis dentatis rugoſis, pedunculis unifloris. *Primroſe with rough indented leaves, and foot-ſtalks bearing one flower.* Primula veris odorata, flore luteo ſimplici. J. B. 3. p. 495. *Sweet-ſmelling Primroſe with a ſingle yellow flower, or common Primroſe.*
2. PRIMULA (*Elatior*) foliis dentatis rugoſis, floribus faſtigiatis. *Primroſe with rough indented leaves, and flowers growing in bunches.* Primula veris pallido flore elatior. Cluſ. Hiſt. 301. *Taller Primroſe with a pale flower, called Cowſlip.*
3. PRIMULA (*Farinoſa*) foliis crenatis glabris, florum limbo plano. Hort. Cliff. 50. *Primroſe with ſmooth crenated leaves, and a plain border to the flower.* Primula veris rubro flore. Cluſ. Hiſt. 300. *Primroſe with a red flower, called Bird's-eyen.*
4. PRIMULA (*Polyantha*) foliis petiolatis ſubcordatis crenatis, floribus faſtigiatis pedunculis longiſſimis. *Primroſe or Cowſlip with heart-ſhaped crenated leaves having foot-ſtalks, and flowers growing in bunches on very long foot-ſtalks.*

The firſt ſort of Primroſe grows wild in woods, and other ſhady places in moſt parts of England, from whence their roots may be eaſily tranſplanted into the garden, where, if they are placed under hedges, and in ſhady walks, they make a beautiful appearance early in the ſpring, when few other plants are in flower.

This plant is ſo well known as to need no deſcription; the flowers and roots of this are uſed in medicine.

There are ſeveral varieties of this which have been accidentally obtained, as the paper-white Primroſe with ſingle and double flowers, the common Primroſe with double flowers, the red Primroſe with ſingle and double flowers; theſe have but one flower upon a foot-ſtalk.

The ſecond ſort is the Cowſlip, or Paigle, or Paralyſis of the ſhops; this grows naturally in meadows and moiſt paſtures in many parts of England. The flowers of this ſort grow in bunches at the top of the ſtalk, ſo are eaſily diſtinguiſhed from the former; they are much uſed in medicine, and ſometimes the leaves. As theſe grow wild, their roots may be taken up and tranſplanted into gardens.

The beſt time to tranſplant them is at Michaelmas, that their roots may have ſtrength to produce their flowers early in the ſpring. Theſe delight in a ſtrong ſoil, but will grow in almoſt any ſort of earth, provided they have a ſhady ſituation.

There are a great variety of this at preſent in the gardens, as the Hoſe in Hoſe, the double Cowſlip, and all the ſorts of Polyanthus, which have been ſo much improved within the laſt fifty years, as to almoſt equal the variety of the Auriculas; and in ſome parts of England they are ſo much eſteemed as to ſell for a guinea a root, ſo that there may be ſtill a much greater

greater variety raiſed, as there are ſo many perſons engaged in the culture of this flower.

The ſeveral varieties of Polyanthuſes are produced by ſowing of ſeeds, which ſhould be ſaved from ſuch flowers as have large upright ſtems, producing many flowers upon a ſtalk, which are large, beautifully ſtriped, open flat, and not pin-eyed. From the ſeeds of ſuch flowers there is room to hope for a great variety of good ſorts, but there ſhould be no ordinary flowers ſtand near them, leſt, by the mixture of their farina, the ſeeds ſhould be degenerated.

Theſe ſeeds ſhould be ſown in boxes filled with light rich earth in December, being very careful not to bury the ſeed too deep; for if it be only ſlightly covered with light earth, it will be ſufficient. Theſe boxes ſhould be placed where they may have the benefit of the morning ſun until ten of the clock, but muſt by no means be expoſed to the heat of the day, eſpecially when the plants begin to appear; for at that time, one whole day's ſun will entirely deſtroy them. In the ſpring, if the ſeaſon ſhould prove dry, you muſt often refreſh them with water, which ſhould be given very moderately; and, as the heat increaſes, you ſhould remove the boxes more in the ſhade, for the heat is very injurious to them.

By the middle of May theſe plants will be ſtrong enough to plant out, at which time you ſhould prepare ſome ſhady borders which ſhould be made rich with neats dung, upon which you muſt ſet the plants about four inches aſunder every way, obſerving to water them until they have taken root; after which they will require no farther care but to keep them clear from weeds, until the latter end of Auguſt following, when you ſhould prepare ſome borders which are expoſed to the eaſt, with good light rich earth, into which you muſt tranſplant your Polyanthuſes, placing them ſix inches aſunder equally in rows, obſerving, if the ſeaſon proves dry, to water them until they have taken root; in theſe borders your plants wil flower the ſucceeding ſpring, at which time you muſt obſerve to mark ſuch of them as are fine to preſerve, and the reſt may be tranſplanted into wilderneſſes, and other ſhady places in the garden, where, although they are not very valuable flowers, they will afford an agreeable variety.

Thoſe which you intend to preſerve, may be removed ſoon after they have done flowering (provided you do not intend to ſave ſeeds from them), and may be then tranſplanted into a freſh border of the like rich earth, allowing them the ſame diſtance as before, obſerving alſo to water them until they have taken root; after which they will require no farther care, but only to keep them clean from weeds, and the following ſpring they will produce ſtrong flowers, as their roots will be then in full vigour; ſo that if the kinds are good, they will be little inferior to a ſhew of Auriculas. Theſe roots ſhould be conſtantly removed and parted every year, and the earth of the border changed, otherwiſe they will degenerate, and loſe the greateſt part of their beauty.

If you intend to ſave ſeeds, which is the method to obtain a great variety, you muſt mark ſuch of them, which, as I ſaid before, have good properties. Theſe ſhould be, if poſſible, ſeparated from all ordinary flowers, for if they ſtand ſurrounded with plain-coloured flowers, they will impregnate each other, whereby the ſeeds of the valuable flowers will not be near ſo good, as if the plants had been in a ſeparate border, where no ordinary flowers grew; therefore the beſt way is to take out the roots of ſuch as you do not eſteem as ſoon as the flowers open, and plant them in another place, that there may be none left in the border, but ſuch as you would chuſe for ſeeds. The flowers of theſe ſhould not be gathered, except ſuch as are produced ſingly upon pedicles, leaving all ſuch as grow in large bunches; and if the ſeaſon ſhould prove dry, you muſt now and then refreſh them with water, which will cauſe their ſeed to be larger, and in greater quantity, than if they were entirely neglected. In June the ſeed will be ripe, which may be eaſily known by the pods changing brown and opening; ſo that you ſhould at that time look over the plants three or four times a week, gathering each time ſuch of the ſeed-veſſels as are ripe, which ſhould be laid upon a paper to dry, and may then be put up until the ſeaſon of ſowing.

As the plants which ariſe from ſeeds, generally flower much better than offſets, thoſe who would have theſe flowers in perfection, ſhould annually ſow their ſeeds.

PRIMROSE-TREE. See Onagra.

PRINOS. Lin. Gen. Plant. 398. Winterberry.

The Characters are,

*The flower hath a permanent empalement of one leaf, which is cut into ſix ſmall plain ſegments, and is permanent; it hath one wheel-ſhaped petal with no tube, cut into ſix plain ſegments; it hath ſix awl-ſhaped ſtamina ſhorter than the petal, terminated by obtuſe ſummits, and an oval germen ſitting upon the ſtyle, crowned by an obtuſe ſtigma. The germen afterward turns to a round berry opening in three parts, including one hard ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's ſixth claſs, which includes thoſe plants whoſe flowers have ſix ſtamina and one ſtyle.

The Species are,

1. Prinos (*Verticillatus*) foliis longitudinaliter ſerratis. Lin. Sp. Plant. 330. *Prinos, or Winterberry, with leaves ſawed lengthways.*
2. Prinos (*Glaber*) foliis apice ſerratis. Lin. Sp. Plant. 330. *Prinos with leaves ſawed at their points.*

The firſt ſort grows naturally in Virginia, and other parts of North America. This riſes with a ſhrubby ſtalk to the height of eight or ten feet, ſending out many branches from the ſides the whole length, which are garniſhed with ſpear-ſhaped leaves about three inches long, and one broad in the middle, terminating in acute points; they are of a deep green, veined on their under ſide, and ſawed on their edges, having ſlender foot-ſtalks ſtanding alternately on the branches. The flowers come out from the ſide of the branches, ſometimes ſingle, at others two or three at each joint; they have no tube, but are wheel-ſhaped, and cut into ſix parts; they have ſix awl-ſhaped erect ſtamina, terminated by obtuſe ſummits, and an oval germen ſitting upon the ſtyle, crowned by an obtuſe ſtigma; theſe are ſucceeded by berries about the ſize of thoſe of Holly, which turn purple when ripe. It flowers in July, and the ſeeds ripen in the winter.

The ſecond ſort grows naturally in Canada; this is of lower growth than the former. The leaves are ſhorter, and ſawed at their points, but the flowers of this I have not ſeen.

They are propagated by ſeeds, which ſhould be ſown ſoon after they are ripe upon a bed of light earth, covering them about half an inch with the ſame ſort of earth. The ſeeds which are ſo ſoon put into the ground, will many of them come up the following ſpring; whereas thoſe which are kept longer out of the ground, will remain a whole year in the ground before the plants will appear in the ſame manner as the Holly, Hawthorn, and ſome others; therefore the ground ſhould not be diſturbed, if the plants do not come up the firſt year. When the young plants come up, they may be treated in the ſame manner as hath been directed for the American Hawthorns, for theſe are full as hardy, but they delight in a moiſt ſoil and a ſhady ſituation; for in hot land they make but little progreſs, and rarely produce any fruit.

PRIVET. See Ligustrum.

PROTEA. Lin. Gen. Plant. 104. Conocarpodendron. Boerh. Ind. alt. 2. 195. Silver-tree.

The Characters are,

*The flowers are collected in an oval head; they have one common imbricated ſcaly perianthium. The flower is of one petal, having a tube the length of the empalement; the brim is cut into four parts, which ſpread open, and are equal. It has four briſtly ſtamina the length of the petal, terminated by incumbent ſummits, and a roundiſh*

*germen with an erect bristly style, crowned by an obtuse stigma. The germen afterward turns a roundish naked seed, sitting in a distinct cell of the cone.*

This genus of plants is ranged in the first section of Linnæus's fourth class, which includes those plants whose flowers have four stamina and one style.

The Species are,

1. Protea (*Conifera*) foliis lineari-lanceolatis integerrimis acutis glabris obliquatis. Lin. Sp. 138. *Protea with linear spear-shaped leaves, which are entire, sharp-pointed, smooth and oblique.*
2. Protea (*Argentea*) foliis lanceolatis obliquis acutis sparsis villoso-sericeis planis, floralibus verticillatis. Lin. Sp. 137. *Protea with spear-shaped oblique-pointed leaves, which are plain, silvery haired, and the flowers growing in whorls round the stalks.* Conocarpodendron foliis argenteis sericeis latissimis. Boerh. Ind. 2. p. 195. *Silver-tree.*
3. Protea (*Nitida*) foliis oblongo-ovatis hirsutis nitidis integerrimis. *Protea with oblong, oval, hairy, shining leaves, which are entire.* Lepidocarpodendron folio saligno lato, caule purpurascente. Boerh. Ind. alt. 2. 138. *Lepidocarpodendron, with a broad Willow leaf and a purplish stalk, otherwise called Wageboom.*

These plants are natives of the country near the Cape of Good Hope in Africa, where there is a great number of species. In the catalogue of the Leyden Garden, there are upwards of twenty sorts enumerated; not that they have them growing there, but they have good drawings of them, which were made in the country where they are natives. The three sorts here mentioned are what I had lately growing in the Chelsea Garden, but the third is now lost there.

These plants are many of them well figured in the index of the plants of the Leyden Garden, which was published by Dr. Boerhaave in 1719, by the titles of Lepidocarpodendron, Conocarpodendron, and Hypophyllocarpodendron; and, by some former writers on botany, this genus was intitled Scolymocephalus, from the resemblance which the cones of these trees have to the head of an Artichoke.

As these plants are natives of the Cape of Good Hope, they are too tender to live abroad through the winter in England, but the first sort is hardy enough to live in a good green-house. This sort will grow to the height of ten or twelve feet, and may be trained up with a regular strait stem, and the branches will naturally form a regular large head. The leaves are long and narrow, of a shining silver colour; and as they remain the whole year, the plants make a fine appearance, when they are intermixed with others in the green-house. In the summer these may be placed in the open air in a sheltered situation; for, if they are exposed to winds, the plants will be torn, and rendered unsightly, nor will they make any progress in their growth. In warm weather they must be frequently but sparingly watered, and in cold weather this must not be too often repeated, lest it should rot their fibres.

The second sort hath a strong upright stalk covered with a purplish bark, dividing into several branches, which grow erect, garnished with broad, shining, silvery, spear-shaped leaves placed on every side, so the plants make a fine appearance, when intermixed with other exotics. This should be placed in an airy dry glass-case, where it may be protected from cold, and have as much light as possible, and in winter should have little water; this rises easily from seeds, which must be procured from the Cape of Good Hope, where it grows naturally. The seeds will sometimes remain in the ground six or eight months, and at other times the plants will appear in six weeks; therefore the best way is to sow the seeds in small pots filled with soft sandy loam, and plunge them into a moderate hot-bed; and, if the plants should not come up so soon as expected, the pots should remain in shelter till the following spring, when, if the seeds remain sound, the plants will come up. The pots in which the seeds are sown, should have but little wet, for moisture frequently causes them to rot. When the plants appear, they should not be too tenderly treated, for they must not be kept too warm, nor should they have much wet; but in warm weather they must be exposed to the open air in a sheltered situation, and in winter protected from frost.

The third sort I raised from seeds, which came from the Cape of Good Hope; these seeds were long and slender, very different in shape from those of the second sort, but the plants have some resemblance to those. The leaves are very silky and white; the stalks are purple, and grow erect, but have not as yet put out any branches.

The first sort may be propagated by cuttings, which should be cut off in April, just before the plants begin to shoot; these should be planted in small pots filled with light earth, and plunged into a moderate hot-bed, shading them from the sun, and now and then gently refreshing them with water, but it must be sparingly given, for much wet will rot them. These cuttings will put out roots by Midsummer, when they may be gently shaken out of the pots and parted, planting each in a separate small pot filled with light earth, and placed in a frame, where they may be shaded till they have taken new root; then they should be gradually inured to the open air, into which they should be removed, and treated in the same way as the old plants.

PRUNING OF TREES.

There is not any part of gardening which is of more general use than that of Pruning, and yet it is very rare to see fruit-trees skilfully managed. Almost every gardener will pretend to be a master of this business, though there are but few who rightly understand it; nor is it to be learned by rote, but requires a strict observation of the different manners of growth of the several sorts of fruit-trees, some requiring to be managed one way, and others must be treated in a quite different method, which is only to be known from carefully observing how each kind is naturally disposed to produce its fruit; for some sorts produce their fruit on the same year's wood, as Vines; others produce their fruit, for the most part, upon the former year's wood, as Peaches, Nectarines, &c. and others upon cursons or spurs, which are produced upon wood of three, four, or five, to fifteen or twenty years old, as Pears, Plums, Cherries, &c. therefore, in order to the right management of fruit-trees, there should always be provision made to have a sufficient quantity of bearing wood in every part of the trees, and at the same time there should not be a superfluity of useless branches, which would exhaust the strength of the trees, and cause them to decay in a few years.

The reasons which have been laid down for Pruning of fruit-trees are as follows: First, To preserve trees longer in a vigorous bearing state; the second is, To render the trees more beautiful to the eye; and thirdly, To cause the fruit to be larger and better tasted.

1. It preserves a tree longer in a healthy bearing state; for by pruning off all superfluous branches, so that there are no more left upon the tree than are necessary, or that can be properly nourished, the root is not exhausted in supplying useless branches, which must afterwards be cut out, whereby much of the sap will be uselessly expended.

2. By skilful Pruning of a tree it is rendered much more pleasing to the eye; but here I would not be understood to be an advocate for a sort of Pruning, which I have seen too much practised of late, viz. the drawing a regular line against the wall, according to the shape or figure they would reduce the tree to, and cutting all the branches, strong or weak, exactly to the chalked line; the absurdity of which practice will soon appear to every one, who will be at the pains of observing the difference of those branches shooting the succeeding spring. All therefore that I mean by rendering a tree beautiful is, that the branches are all pruned according to their several strengths, and are nailed at equal distances, in proportion to the different sizes of their leaves and fruit, and that no

part of the wall (so far as the trees are advanced) be left unfurnished with bearing wood. A tree well managed, though it does not represent any regular figure, yet will appear very beautiful to the sight, when it thus dressed and nailed to the wall.

3. It is of great advantage to the fruit; for the cutting away all useless branches, and shortening all the bearing shoots according to the strength of the tree, will render the tree more capable to nourish those fruit and branches which are left remaining, so that the fruit will be much larger and better tasted. And this is the advantage which those trees against walls or espaliers have to such as are standards, and are permitted to grow as they are naturally inclined; for it is not their being trained either to a wall or espalier which renders their fruit so much better than standards, but because the roots have a less quantity of branches and fruit to nourish, and consequently their fruit will be larger and better tasted.

The reasons for Pruning being thus exhibited, the next thing is the method of performing it; but this being fully handled under the several articles of the different kinds of fruit, I shall not repeat it again in this place, and therefore shall only add some few general instructions, which are necessary to be understood, in order to the right management of fruit-trees.

There are many persons who suppose, that if their fruit-trees are but kept up to the wall or espalier during the summer season, so as not to hang in very great disorder, and in winter to get a gardener to prune them, it is sufficient, but this is a mistake; for the greatest care ought to be employed about them in the spring, when the trees are in vigorous growth, which is the only proper season to procure a quantity of good wood in the different parts of the tree, and to displace all useless branches as soon as they are produced, whereby the vigour of the tree will be entirely distributed to such branches only as are designed to remain, which will render them strong, and more capable to produce good fruit; whereas, if all the branches are permitted to remain which are produced, some of the more vigorous will attract the greatest share of the sap from the tree, whereby they will be too luxuriant for producing fruit, and the greatest part of the other shoots will be starved, and rendered so weak, as not to be able to produce any thing else but blossoms and leaves (as hath been before mentioned;) so that it is impossible for a person, let him be ever so well skilled in fruit-trees, to reduce them into any tolerable order by Winter-pruning only, if they are wholly neglected in the spring.

There are others who do not entirely neglect their trees during the summer season, as those before-mentioned, but yet do little more good to them by what they call Summer-pruning; for these persons neglect their trees at the proper season, which is in April and May, when their shoots are produced, and only about Midsummer go over them, nailing in all their branches, except such as are produced fore-right from the wall, which they cut out, and at the same time often shorten most of the other branches; all which is entirely wrong practice, for those branches, which are intended for bearing the succeeding year, should not be shortened during the time of their growth, which will cause them to produce one or two lateral shoots from the eyes below the place where they were stopped, which shoots will draw much of the strength from the buds of the first shoot, whereby they are often flat, and do not produce their blossoms; and, if those two lateral shoots are not entirely cut away at the Winter-pruning, they will prove injurious to the tree, as the shoots which these produce, will be what the French call water shoots; and in suffering those luxuriant shoots to remain upon the tree until Midsummer before they are displaced, they will exhaust a great share of the nourishment from the other branches (as was before observed;) and, by shading the fruit all the spring season, when they are cut away, and the other branches fastened to the wall, the fruit, by being so suddenly exposed, will receive a very great check, which will cause their skins to grow rough, and thereby render them less delicate. This is to be chiefly understood of stone fruit and Grapes, but Pears and Apples being much hardier, suffer not so much, though it is a great disadvantage to those also to be thus managed.

It must also be remarked, that Peaches, Nectarines, Apricots, Cherries, and Plums, are always in the greatest vigour, when they are the least maimed by the knife; for where these trees have large amputations, they are very subject to gum and decay; so that it is certainly the most prudent method carefully to rub off all useless buds when they are first produced, and pinch others, where new shoots are wanted to supply the vacancies of the wall, by which management trees may be so ordered, as to want but little of the knife in Winter-pruning, which is the surest way to preserve these trees healthful, and is performed with less trouble than the common method.

The management of Pears and Apples is much the same with these trees in summer, but in winter they must be very differently pruned; for as Peaches and Nectarines for the most part produce their fruit upon the former year's wood, therefore they must have their branches shortened according to their strength, in order to produce new shoots for the succeeding year; so Pears, Apples, Plums, and Cherries, on the contrary, producing their fruit upon cursons or spurs, which come out of the wood of five, six, or seven years old, should not be shortened, because thereby those buds, which were naturally disposed to form these cursons or spurs, would produce wood branches, whereby the trees would be filled with wood, but never produce much fruit; and as it often happens that the blossom buds are first produced at the extremity of the last year's shoot, by shortening the branches the blossoms are cut away, which should always be carefully avoided.

There are several authors who have written on the subject of Pruning in such a prolix manner, that it is impossible for a learner to understand their meaning. These have described the several sorts of branches which are produced on fruit-trees; as wood branches, fruit branches, irregular branches, false branches, and luxuriant branches, all which they assert every person, who pretends to Pruning, should distinguish well; whereas there is nothing more in all this but a parcel of words to amuse the reader, without any real meaning; for all these are comprehended under the description already given of luxuriant or useless branches, and such as are termed useful or fruit-bearing branches; and, where due care is taken in the spring of the year to displace these useless branches (as was before directed,) there will be no such thing as irregular, false, or luxuriant branches at the Winter-pruning; therefore it is to no purpose to amuse people with a cant of words, which, when fully understood, signify just nothing at all.

But since I have explained the different methods of Pruning the several sorts of fruits under the respective articles, I shall forbear repeating it again in this place, but shall only give some general hints for the Pruning of standard fruit-trees, and so conclude.

First, you should never shorten the branches of these trees, unless it be where they are very luxuriant, and grow irregular on one side of the tree, attracting the greatest part of the sap of the tree, whereby the other parts are unfurnished with branches, or rendered very weak; in which case the branch should be shortened down as low as is necessary, in order to obtain more branches, to fill up the hollow of the trees; but this is only to be understood of Pears and Apples, which will produce shoots from wood of three, four, or more years old, whereas most sorts of stone fruit will gum and decay after such amputations.

But from hence I would not have it understood, that I would direct the reducing of these ttees into an exact spherical figure, since there is nothing more detestable than to see a tree (which should be permitted

to grow as it is naturally diſpoſed, with its branches produced at proportionable diſtances, according to the ſize of the fruit,) by endeavouring to make it exactly regular at its head, ſo crouded with ſmall weak branches as to prevent the air from paſſing between them, which will render the trees incapable to produce fruit. All that I intend by this ſtopping of luxuriant branches, is only when one or two ſuch happen on a young tree, where they entirely draw all the ſap from the weaker branches, whereby they ſtarve them, then it is proper to uſe this method, which ſhould be done in time, before they have exhauſted the roots too much.

Whenever this happens to ſtone fruit, which ſuffer much more by cutting than the former ſorts, it ſhould be remedied by ſtopping or pinching thoſe ſhoots in the ſpring, before they have obtained too much vigour, which will cauſe them to puſh out ſide-branches, whereby the ſap will be diverted from aſcending too faſt to the leading branch (as hath been directed for wall-trees,) but this muſt be done with caution.

You muſt alſo cut out all dead or decayed branches, which cauſe their heads to look very ragged, eſpecially at the time when the leaves are upon the tree; theſe being deſtitute of them, have but a deſpicable appearance; beſides, theſe will attract noxious particles from the air, which are injurious to the trees, therefore the ſooner they are cut out the better. In doing of this you ſhould obſerve to cut them cloſe down to the place where they were produced, otherwiſe that part of the branch left will decay, and prove equally hurtful to the tree; for it ſeldom happens, when a branch begins to decay, that it does not die quite down to the place where it was produced; and, if any part is permitted to remain long uncut, does often infect ſome of the other parts of the tree. If the branches are large which you cut off, it will be very proper, after having ſmoothed the cut part exactly even with a knife, chiſel, or hatchet, to put on a plaſter of grafting clay, which will prevent the wet from ſoaking into the tree at the wounded part.

All ſuch branches as run croſs each other ſhould alſo be cut out, for theſe not only occaſion a confuſion in the head of the tree, but, by lying over each other, rub off their bark by their motion, and very often occaſion them to canker, to the great injury of the tree; and on old trees (eſpecially Apples) there are often young vigorous ſhoots from the old branches near the trunk, which grow upright into the head of the trees. Theſe therefore ſhould carefully be cut out every year, leſt, by being permitted to grow, they fill the tree too full of wood; which ſhould always be guarded againſt, ſince it is impoſſible for ſuch trees to produce ſo much, or ſo good fruit as thoſe, whoſe branches grow at a farther diſtance, whereby the ſun and air freely paſs between them in every part of the tree.

Theſe are the general directions which are proper to be given in this place, ſince not only the particular methods, but alſo the proper ſeaſons for Pruning all the different kinds of fruit, are fully exhibited under their ſeveral articles.

PRUNELLA. Lin. Gen. Plant. 735. Tourn. Inſt. R. H. 84. Self-heal.

The CHARACTERS are,

*The flower hath a permanent empalement of one leaf, with two lips; the upper is plain, broad, and ſlightly indented in three parts; the under is erect, acute-pointed, and cut into two ſegments; the flower is of the ringent kind, having a ſhort cylindrical tube with oblong chaps; the upper lip is concave, nodding, and entire; the under is reflexed, trifid, and obtuſe. It hath four awl-ſhaped ſtamina, two of which are longer than the other, with ſimple ſummits inſerted to the ſtamina, and four germen with a ſlender ſtyle, inclining to the upper lip of the flower, crowned by an indented ſtigma. The germen afterward become four ſeeds, ſitting in the empalement of the flower.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourteenth claſs, intitled Didynamia Gymnoſpermia, from the flowers having two long and two ſhort ſtamina, which are ſucceeded by four naked ſeeds ſitting in the empalement.

The SPECIES are,

1. PRUNELLA (*Vulgaris*) foliis omnibus ovato-oblongis petiolatis. Lin. Sp. Plant. 837. *Self-heal with all the leaves oblong, oval, having foot-ſtalks.* Brunella major, folio non diſſecto. C. B. P. 260. *Greater Self-heal with entire leaves.*
2. PRUNELLA (*Laciniata*) foliis ovato-oblongis petiolatis, ſupremis quatuor lanceolatis dentatis. Lin. Sp. Plant. 837. *Self-heal with oblong oval leaves having foot-ſtalks, whoſe upper part of the leaves are cut into four ſegments.* Brunella folio laciniato. C. P. B. 261. *Self-heal with cut leaves.*
3. PRUNELLA (*Hyſſopifolia*) foliis lanceolato-linearibus ciliatis ſubſeſſilibus. Sauv. Monſp. 141. *Self-heal with linear ſpear-ſhaped leaves ſitting cloſe to the ſtalks.* Brunella Hyſſopifolia. C. B. P. 261. *Self-heal with an Hyſſop leaf.*
4. PRUNELLA (*Canadenſis*) foliis linearibus ſeſſilibus glabris, internodiis longiſſimis, ſpicis interruptis. *Self-heal with linear ſmooth leaves ſitting cloſe to the ſtalks, the ſpaces between the joints very long, and the ſpikes of flowers broken.*
5. PRUNELLA (*Sulphurea*) foliis oblongis pinnato-inciſis villoſis, infimis petiolatis, ſummis ſeſſilibus. *Self-heal with oblong hairy leaves cut in form of winged leaves, the lower having foot-ſtalks, but the upper ſit cloſe to the ſtalks.* Brunella folio laciniato, flore ſulphureo elegantiſſimo. Boerh. Ind. alt.
6. PRUNELLA (*Caroliniana*) foliis lanceolatis integerrimis, infimis petiolatis, ſummis ſeſſilibus, internodiis prælongis. *Self-heal with entire ſpear-ſhaped leaves, the lower having long foot-ſtalks, but the upper ſit cloſe to the ſtalk, and the joints of the ſtalk are diſtant.* Brunella Caroliniana magno flore dilute cæruleo, internodiis prælongis. Act. Phil. N° 395.
7. PRUNELLA (*Nova Anglia*) foliis oblongis mucronatis petiolatis, ſpicis florum craſſiſſimis. *Self-heal with oblong pointed leaves having foot-ſtalks, and very thick ſpikes of flowers.* Brunella Novæ Angliæ major, foliis longius mucronatis. Hort. Chelſ.

There are ſome other varieties, if not diſtinct ſpecies, of this genus, than are here enumerated; but it is difficult to determine the ſpecies, ſome of them approaching ſo near to others, as ſcarcely to be diſtinguiſhed from them; the firſt ſort grows naturally in England, and is uſed in medicine; the dried herb is frequently imported from Switzerland, among thoſe which are called vulnerary herbs, of which this is ſuppoſed to be one of the beſt.

The ſecond ſort is leſs common than the firſt, and of this there are two or three varieties, which ſome writers on botany have enumerated as diſtinct ſpecies; one of theſe has narrower leaves, which are cut into finer ſegments; this is titled Verbennæ folio; but as the plants raiſed from the ſame ſeeds are very ſubject to vary, ſo it is difficult to determine if it is really a different plant.

The third ſort grows naturally in Italy and the ſouth of France; the leaves of this ſort are narrower than thoſe of either of the former, and are covered on both ſides with fine hairs, and have very ſhort foot-ſtalks; the ſpikes of flowers are ſlender, and are of a pale blue colour; this flowers in July, and the ſeeds ripen in the autumn.

The fourth ſort grows naturally in North America; the leaves of this are pretty long and narrow, ſhaped like thoſe of the third ſort, but are ſmooth, ſitting cloſe to the ſtalk; the ſpikes of flowers are longer, and the whorls of flowers are ſeparated.

It is uncertain where the fifth ſort grows naturally, though I think Dr. Boerhaave, late profeſſor of botany at Leyden, told me, he received the ſeeds from Auſtria; the ſtalks of this ſort generally ſpread open, and proſtrate near the ground; theſe are hairy, and garniſhed with oblong leaves, which are alſo hairy, and cut on their edges ſomewhat like winged leaves; the ſtalks are terminated by cloſe ſpikes of flowers, of a ſulphur

a sulphur colour; this flowers and ripens its seeds about the same time with the former.

The sixth sort grows naturally in Carolina, from whence I received the seeds; the stalks of this sort rise more than eight inches high, and are garnished with oblong leaves; those toward the bottom have long foot-stalks, but those on the top sit close to the stalks; the spikes of flowers are large and entire; they are of a pale blue colour, appearing at the same time with those of the two former sorts, and the seeds ripen in September.

The seeds of the seventh sort were first sent me from New England; but since then, I have received more from Virginia, so I suppose the plant grows naturally in several parts of North America. The leaves of this are large, smooth, and end in sharp points; the stalks are brown; they rise eight or nine inches high, and are terminated by thick spikes of blue flowers, which appear in July, and are succeeded by seeds which ripen in September.

These plants are seldom cultivated in any gardens, unless by such who have an inclination for the study of botany, as they are plants which make little appearance; however, those who are desirous to cultivate any of the species, may do it by sowing the seeds in the autumn, soon after they are ripe, when they will succeed much sooner, and with greater certainty, than if they are sown in the spring; for the seeds which are sown at that season seldom grow till a twelvemonth after, and sometimes do not succeed. When the plants come up, they require no other care but to thin them where they are too close, and keep them clean from weeds. They will thrive upon any soil or situation, but best on a moist soil and a shady situation, where, if the ground is not too good, they will live three or four years, but in rich land they seldom continue longer than two years; therefore to continue the species, it will be proper to sow their seeds every year, or every other year.

PRUNUS. Tourn. Inst. R. H. 622. tab. 398. Lin. Gen. Plant. 546. The Plum-tree.

The Characters are,

*The flower hath a bell-shaped empalement of one leaf, cut into five parts; it hath five large roundish petals which spread open, and are inserted in the empalement; and from twenty to thirty stamina, which are near as long as the petals, and are also inserted in the empalement, terminated by twin summits. It has a roundish germen, supporting a slender style, crowned by an orbicular stigma. The germen afterward turns to a roundish fruit, inclosing a nut of the same form.*

This genus of plants is ranged by Dr. Linnæus in the first section of his twelfth class, which includes those plants whose flowers have many stamina inserted to the empalement; and has joined to this genus the Padus, Cerasus, and Armeniaca, making them only species of the same genus; which, according to his system of ranging the plants, may be allowed; yet in a treatise of this kind it would rather puzzle the practitioners of the art of gardening to follow him, for which reason I have kept them separate.

I shall not abridge this article, but continue to mention the varieties of this fruit which are cultivated in the English gardens.

The Species are,

1. Prunus (*Jaunbâtive*) fructu parvo præcoci. *The white Primordian.* This is a small, longish, white Plum, of a clear yellow colour, covered over with a white flew, which easily wipes off. It is a pretty good bearer, and, for its coming very early, one tree may have a place in a large garden of fruit, but it is meally, and has little flavour. This ripens the middle or latter end of July.

2. Prunus (*Damas Noir*) fructu magno crasso subacido. Tourn. *The early Damask, commonly called the Morocco Plum.* This is a middle sized Plum, of a round shape, divided with a furrow in the middle (like Peaches.) The outside is of a dark black colour, covered with a light Violet bloom; the flesh is yellow, and parts from the stone. It ripens the end of July, and is esteemed for its goodness.

3. Prunus (*Small Damas*) fructu parvo dulci atro-cæruleo. Tourn. *The little black Damask Plum.* This is a small black Plum covered with a light Violet bloom. The juice is richly sugared; the flesh parts from the stone, and it is a good bearer. Ripe the beginning of August.

4. Prunus (*Gros Damas*) fructu magno dulci atro-cæruleo. Tourn. *Gros Damas Violet de Tours, i. e. great Damask Violet of Tours.* This is a pretty large Plum, inclining to an oval shape. The outside is of a dark blue covered with a Violet bloom; the juice is richly sugared; the flesh is yellow, and parts from the stone. Ripe in August.

5. Prunus (*Orleans*) fructu rotundo atro rubente. *The Orleans Plum.* The fruit is so well known to almost every person, that it is needless to describe it; it is a very plentiful bearer, which has occasioned its being so generally planted by those persons who supply the markets with fruit, but it is an indifferent Plum. It ripens in August.

6. Prunus (*Fotheringham*) fructu oblongo atro-rubente. *The Fotheringham Plum.* This fruit is somewhat long, deeply furrowed in the middle. The flesh is firm, and parts from the stone; the juice is very rich. This ripens in August.

7. Prunus (*Perdigron*) fructu nigro, carne durâ. Tourn. *The Perdigron Plum.* This is a middle-sized Plum of an oval shape. The outside is of a very dark colour, covered over with a Violet bloom; the flesh is firm, and full of an excellent rich juice. This is greatly esteemed by the curious. Ripe in August.

8. Prunus (*Violet Perdigron*) fructu magno è violaceo rubente suavissimo saccharato. Tourn. *The Violet Perdigron Plum.* This is a large fruit, rather round than long, of a bluish red colour on the outside. The flesh is of a yellowish colour, pretty firm, and closely adheres to the stone; the juice is of an exquisite rich flavour. This ripens in August.

9. Prunus (*White Perdigron*) fructu ovato ex albo flavescente. *The white Perdigron Plum.* This is a middling Plum, of an oblong figure. The outside is yellow, covered with a white bloom; the flesh is firm, and well tasted. It is a very good fruit to eat raw, or for sweetmeats, having an agreeable sweetness mixed with an acidity. It ripens the end of August.

10. Prunus (*Imperial*) fructu ovato magno rubente. Tourn. *The red imperial Plum, sometimes called the red Bonum Magnum.* This is a large oval-shaped fruit, of a deep red colour, covered with a fine bloom. The flesh is very dry, and very indifferent to be eaten raw, but is excellent for making sweetmeats; this is a great bearer. Ripe in September.

11. Prunus (*Bonum Magnum*) fructu ovato magno flavescente. Tourn. *White imperial Bonum Magnum, white Holland, or Mogul Plum.* This is a large oval-shaped fruit, of a yellowish colour, powdered over with a white bloom. The flesh is firm, and adheres closely to the stone; the juice is of an acid taste, which renders it unpleasant to be eaten raw, but it is very good for baking or sweetmeats. It is a great bearer, and is ripe the middle of September.

12. Prunus (*Cheston*) fructu ovato cæruleo. *The Cheston Plum.* This is a middle-sized fruit of an oval figure. The outside is of a dark blue, powdered over with a Violet bloom; the juice is rich, and it is a great bearer. Ripe the middle of September.

13. Prunus (*Apricot*) fructu maximo rotundo flavo & dulci. Tourn. *Prune d'Abricot, i. e. the Apricot Plum.* This is a large round fruit of a yellow colour on the outside, powdered over with a white bloom. The flesh is firm and dry, of a sweet taste, and comes clean from the stone. This ripens the end of September.

14. Prunus (*Maître Claud*) fructu subrotundo, ex rubro & flavo mixto. *The Maître Claud.* Although this name is applied to this fruit, yet it is not what the

French so call. This a middle-sized fruit, rather round than long, of a fine mixed colour between red and yellow. The flesh is firm, parts from the stone, and has a delicate flavour. Ripe the end of September.

15. Prunus (*Diaprée*) fructu rubente dulcissimo. Tourn. *La Rochecourbon, or Diaprée rouge, i. e. the red Diaper Plum.* This is a large round fruit, of a reddish colour, powdered over with a Violet bloom; the flesh adheres closely to the stone, and is of a very high flavour. Ripe the end of August.

16. Prunus fructu rotundo flavescente. *La petite Reine Claude, i. e. the little Queen Claudia.* This is a small round fruit, of a whitish yellowish colour, powdered over with a pearl-coloured bloom; the flesh is firm and thick, quits the stone, and its juice is richly sugared. Ripe the end of August.

17. Prunus fructu rotundo nigro-purpureo majori dulci. Tourn. *Myrobalan Plum.* This is a middle-sized fruit, of a round shape; the outside is a dark purple, powdered over with a Violet bloom; the juice is very sweet. It is ripe the end of August.

18. Prunus fructu rotundo è viridi flavescente, carne duro suavissimo. *La grosse Reine Claude, i. e. the large Queen Claudia, by some the Dauphiny.* At Tours it is called the Abricot verd, i. e. green Apricot; at Rouen, Le verte bonne, i. e. the good green; and in other places, Damas verd, i. e. green Damask, or Tromp-valet, the Servants Cheat. This is one of the best Plums in England; it is of a middle size, round, and of a yellowish green colour on the outside; the flesh is firm, of a deep green colour, and parts from the stone; the juice has an exceeding rich flavour, and it is a great bearer. Ripe the middle of September. This Plum is confounded by most people in England, by the name of Green Gage; but this is the sort which should be chosen, although there are three or four different sorts of Plums generally sold for it, one of which is small, round, and dry; this quits the stone, and is later ripe, so not worth preserving.

19. Prunus fructu amygdalino. Tourn. *Rognon de Coq, i. e. Cock's Testicles.* This is an oblong fruit, deeply furrowed in the middle, so as to resemble the testicles; it is of a whitish colour on the outside, streaked with red; the flesh of it adheres firmly to the stone, and it is late ripe.

20. Prunus fructu rotundo flavo dulcissimo. *Drap d'Or, i. e. the Cloth of Gold Plum.* This is a middle sized fruit, of a bright yellow colour, spotted or streaked with red on the outside; the flesh is yellow, and full of an excellent juice. It is a plentiful bearer, and ripens about the middle of September.

21. Prunus fructu cerei coloris. Tourn. *Prune de Sainte Catharine, i. e. St. Catharine Plum.* This is a large oval-shaped fruit, somewhat flat; the outside is of an amber colour, powdered over with a whitish bloom, but the flesh is of a bright yellow colour, is dry and firm, adheres closely to the stone, and has a very agreeable sweet taste. This ripens at the end of September, and is very subject to dry upon the tree, when the autumn proves warm and dry. This makes fine sweetmeats, and is a plentiful bearer.

22. Prunus fructu ovato rubente dulci. *The Royal Plum.* This is a large fruit of an oval shape, drawing to a point next the stalk; the outside is of a light red colour, powdered over with a whitish bloom; the flesh adheres to the stone, and has a fine sugary juice. This ripens the middle of September.

23. Prunus fructu parvo ex viridi flavescente. Tourn. *La Mirabelle.* This is a small round fruit, of a greenish yellow on the outside; the flesh parts from the stone, is of a bright yellow colour, and has a fine sugary juice. This is a great bearer, ripens the end of August, and is excellent for sweetmeats.

24. Prunus Brigoniensis, fructu suavissimo. Tourn. *Prune de Brignole, i. e. the Brignole Plum.* This is a large oval-shaped fruit, of a yellowish colour, mixed with red on the outside; the flesh is of a bright yellow colour, is dry, and of an excellent rich flavour. This ripens the middle of September, and is esteemed the best Plum for sweetmeats yet known.

25. Prunus fructu magno è violaceo rubente serotino. Tourn. *Imperatrice, i. e. the Empress.* This is a large round fruit, of a Violet red colour, very much powdered with a whitish bloom; the flesh is yellow, cleaves to the stone, and is of an agreeable flavour. This ripens about the beginning of October.

26. Prunus fructu ovato maximo flavo. Tourn. *Prune de Monsieur, i. e. Monsieur's Plum.* This is sometimes called the Wentworth Plum. It is a large oval-shaped fruit, of a yellow colour both within and without, very much resembling the Bonum Magnum, but the flesh of this parts from the stone, which the other doth not. This ripens towards the latter end of September, and is very good to preserve, but the juice is too sharp to be eaten raw. It is a great bearer.

27. Prunus fructu majori rotundo rubro. Tourn. *Prune Cerizette, i. e. the Cherry Plum.* This fruit is commonly about the size of the Ox-heart Cherry, is round, and of a red colour; the stalk is long like that of a Cherry, which this fruit so much resembles, as not to be distinguished therefrom at some distance. The blossoms of this tree come out very early in the spring, and being tender, are very often destroyed by cold, but it affords a very agreeable prospect in the spring; for these trees are generally covered with flowers, which open about the same time as the Almonds; so that when they are intermixed therewith, they make a beautiful appearance before many other sorts put out; but by this blossoming so early, there are few years that they have much fruit.

28. Prunus fructu albo oblongiusculo acido. Tourn. *The white Pear Plum.* This is a good fruit for preserving, but is very unpleasant if eaten raw; it is very late ripe, and seldom planted in gardens, unless for stocks to bud some tender sorts of Peaches upon, for which purpose it is esteemed the best amongst all the sorts of Plums.

29. Prunus Mytellinum. Park. *The Muscle Plum.* This is an oblong flat Plum, of a dark red colour; the stone is large, and the flesh but very thin and not well tasted, so that its chief use is for stocks, as the former.

30. Prunus fructu parvo violaceo. *The St. Julian Plum.* This is a small fruit, of a dark Violet colour, powdered over with a mealy bloom; the flesh adheres closely to the stone, and in a fine autumn will dry upon the tree. The chief use of this Plum is for stocks, to bud the more generous kinds of Plums and Peaches upon; as also for the Bruxelles Apricot, which will not thrive so well upon any other stock.

31. Prunus sylvestris major. J. B. *The black Bullace-tree.* This grows wild in the hedges in divers parts of England, and is rarely cultivated in gardens.

32. Prunus sylvestris, fructu majore albo. Raii Syn. *The white Bullace-tree.* This grows wild as the former, and is seldom cultivated in gardens.

33. Prunus sylvestris. Ger. Emac. *The Black-thorn, or Sloe-tree.* This is very common in the hedges almost every where; the chief use of this tree is to plant for hedges, as White-thorn, &c. and being of quick growth, is very proper for that purpose.

All the sorts of Plums are propagated by budding or grafting them upon stocks of the Muscle, White Pear, St. Julian, Bonum Magnum, or any other sorts of free-shooting Plums. The manner of raising these stocks hath been already exhibited under the article of Nurseries, therefore need not be repeated again in this place; but I would observe, that budding is much preferable to grafting for these sorts of stone fruit-trees, which are very apt to gum, wherever there are large wounds made on them.

The trees should not be more than one year's growth from the bud when they are transplanted, for if they are older, they seldom succeed so well, being very subject to canker; or if they take well to the ground, commonly produce only two or three luxuriant branches, therefore it is much more advisable to chuse young plants.

The

The manner of preparing the ground (if for walls) is the same as for Peaches; as is also pruning the roots and planting, therefore I shall forbear repeating it again. The distance which these trees should be planted at, must not be less than twenty-four feet against high walls; and if the wall is low, they should be placed thirty feet asunder.

Plums should have a middling soil, neither too wet and heavy, nor over light and dry, in either of which extremes they seldom do so well; and those sorts which are planted against walls, should have an east or south-east aspect, which is more kindly to these fruits than a full south aspect, on which they are subject to shrivel, and be very dry; and many sorts will be extreme meally, if exposed too much to the heat of the sun; but most sorts will ripen extremely well on espaliers, if rightly managed.

There are some persons who plant Plums for standards, in which method some of the ordinary sorts will bear very well; but then the fruit will not be near so fair as those produced on espaliers, and will be more in danger of being bruised or blown down by strong winds. The distance of placing them for espaliers must be the same as against walls, as must also their pruning and management; so that whatever may be hereafter mentioned for one, should be likewise understood for both.

Plums do not only produce their fruit upon the last year's wood, but also upon cursons or spurs, which come out of wood that is many years old; so that there is not a necessity of shortening the branches, in order to obtain new shoots annually, in every part of the tree (as in Peaches, Nectarines, &c. hath been directed) since the more these trees are pruned, the more luxuriant they grow, until the strength of them is exhausted, and then they gum and spoil; therefore the safest method to manage these trees is, to lay in their shoots horizontally, as they are produced, at equal distances, in proportion to the length of their leaves; and where there is not a sufficient quantity of branches to fill up the vacancies of the tree, there the shoots may be pinched the beginning of May (in the manner as hath been directed for Peaches, &c.) which will cause them to produce some lateral branches to supply those places; and during the growing season, all fore-right shoots should be displaced, and such as are to remain must be regularly trained in to the wall or espalier, which will not only render them beautiful, but also give to each part of the trees an equal advantage of sun and air; and hereby the fruit will be always kept in a ductile growing state, which they seldom are, when overshaded with shoots some part of the season, and then suddenly exposed to the air, by taking off, or training those branches in their proper position.

With thus carefully going over these trees in the growing season, there will be but little work to do to them in winter; for when the branches are shortened, the fruit is cut away, and the number of shoots increased; for whenever a branch is shortened, there are commonly two or more shoots produced from the eyes immediately below the cut; so that by thus unskilfully pruning, many persons crowd their trees with branches, and thereby render what little fruit the trees produce, very small and ill-tasted; which is very commonly found in too many gardens, where the manager, perhaps, thinks himself a complete master of his business; for nothing is more common than to see every branch of a fruit-tree pass the discipline of the knife, however disagreeable it be to several sorts of fruits. And it is common to see these trees planted at the distance of fourteen or sixteen feet, so that the walls are in a few years covered with branches; and then all the shoots are cut and mangled with the knife, so as to appear like a stumped hedge, and produce little fruit; therefore the only way to have Plum-trees in good order, is to give them room, and extend their branches at full length.

Those few rules before laid down, will be sufficient, if due observation be joined therewith, to instruct any person in the right management of these sorts of fruit-trees; therefore I shall not say any more on that subject, lest by multiplying instructions, it may render it more obscure to a learner.

PSEUDOACACIA. See ROBINIA.

PSEUDODICTAMNUS. See MARRUBIUM.

PSIDIUM. Lin. Gen. Plant. 541. Guajava. Tourn. Inst. R. H. 660. tab. 443. The Guava-tree.

The CHARACTERS are,

*The flower has a bell-shaped empalement of one leaf, divided into five oval points at the top. It hath five oval, concave, spreading petals, indented in the empalement, with a great number of stamina which are shorter than the petals, and are inserted in the empalement, terminated by small summits. It has a roundish germen situated under the flower, supporting a long awl-shaped style, crowned by a simple stigma; the germen afterward becomes a large oval fruit crowned by the empalement, inclosing a great number of small seeds.*

This genus of plants is ranged in the first section of Linnæus's twelfth class, which includes those plants whose flowers have many stamina which are inserted in the empalement, and one style.

The SPECIES are,

1. PSIDIUM (*Pyriferum*) foliis ovato-lanceolatis, pedunculis unifloris. *Psidium with oval spear-shaped leaves, and one flower on each foot-stalk.* Guajava alba dulcis. Hort. Amst. vol. i. p. 121. *The sweet white Guava.*
2. PSIDIUM (*Pomiferum*) foliis ovatis, pedunculis trifloris. *Psidium with oval leaves and foot-stalks with three flowers.* Guajabo pomifera Indica, pomis rotundis. C. B. P. 437. *The red Guava.*

Both these sorts grow naturally in the East and West-Indies; and there is also a third with a large white fruit, but I do not know whether this is a variety of the common Guava, or of that with the small white fruit; though I am inclined to believe it is the former, because I have raised many plants from the seeds of the small white Guava, which have produced fruit in the Chelsea Garden, and have not varied from their parent plant.

The common red Guava hath a pretty thick trunk, which rises twenty feet high, covered with a smooth bark, and divides into many branches toward the top; these are angular, and garnished with oval leaves two inches and a half long, and one inch and a half broad in the middle, rounded at both ends; they have a strong midrib, and many veins running toward the sides, of a light green colour, standing opposite upon very short foot-stalks. From the wings of the leaves the flowers come out upon foot-stalks, about an inch and a half long; they are composed of five large, roundish, concave, white petals, which are inserted in the empalement, and within these are a great number of stamina which are shorter than the petals, terminated by small summits; these stamina are also inserted in the empalement. Under the flower is situated a roundish germen, supporting a very long awl-shaped style, crowned by a simple stigma. After the flower is past, the germen becomes a large oval fruit, shaped like a Pomegranate, having one cell, crowned by the empalement of the flower, and filled with small seeds; the fruit, when ripe, has an agreeable odour. They are much eaten in the West-Indies, both by men and beasts; and the seeds, which pass whole through the body, and are voided with the excrement grow, whereby the trees are spread over the ground where they are permitted to grow. This fruit is very astringent, and nearly of the same quality with Pomegranate, so should be avoided by those persons who are subject to be costive.

The large white sort grows naturally in the islands of the West-Indies, and is often found intermixed with the former, so is supposed to be only an accidental variety arising from the same seeds. This differs from the former in the colour of the midrib of the leaves, which in this are pale, but those of the former are red. The flowers and fruit of this are larger, and the inside of the fruit is white.

The leaves of the small white Guava are like those of the larger, but the branches of the tree are not so angular; the flowers are much smaller, and the fruit is no larger than a middling Gooseberry, but when ripe has a very strong aromatic flavour. This flowers in June, and the fruit ripens in autumn.

These plants are propagated by seeds, which must be procured from the countries where they naturally grow; if these are brought over in the entire fruit, gathered full ripe, the seeds will more certainly succeed; these should be sown in pots filled with rich kitchen-garden earth, and plunged into a hot-bed of tanners bark, giving them water from time to time as the earth dries; in about six weeks the plants will appear (if the seeds are good) and must have free air admitted to them in proportion to the warmth of the season; when the plants have obtained strength enough to be removed, they should be each planted in a small pot, filled with the like rich earth, and plunged into a fresh hot-bed, shading them from the sun until they have taken new root; then they should have a large share of free air admitted to them every day in warm weather, to prevent their drawing up weak; they must also be frequently refreshed with water in summer. When the plants have filled these small pots with their roots, they should be shaken out and their roots pared, then put into larger pots filled with the same sort of earth, and plunged into the hot-bed again, where they should remain till autumn, when they must be plunged into the tan-bed in the stove: during the winter they should have a moderate warmth, and not too much water, and in summer they will require plenty of wet, and in hot weather a great share of air; with this management the plants will produce flowers and fruit the third year, and may be continued a long time.

PSORALEA. Lin. Gen. Plant. 801. Flor. Leyd. Prod. 372. Barba Jovis. Boerh. Ind. alt. 2. 40.

The CHARACTERS are,

*The empalement of the flower is of one leaf, cut into five parts, the lower segments being twice the length of the other. The flower is of the butterfly kind, it hath five petals; the standard is roundish, and indented at the top. The wings are small, obtuse, and moon-shaped; the keel is moon-shaped, and composed of two petals. It hath nine stamina joined together, and one bristly stamina standing separate, terminated by roundish summits, with a linear germen supporting an awl-shaped rising style, crowned by an obtuse stigma. The germen afterward turns to a slender compressed pod, inclosing one kidney-shaped seed.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes those plants whose flowers have ten stamina joined in two bodies.

The SPECIES are,

1. PSORALEA (*Pinnata*) foliis pinnatis, floribus axillaribus. Hort. Upsal. 225. *Psoralea with winged leaves, and flowers proceeding from the sides of the stalks.* Barba Jovis Africana, foliis viridibus pinnatis, flore cæruleo. Boerh. Ind. alt. 2. p. 40. *African Jupiter's Beard, with green winged leaves and a blue flower.*
2. PSORALEA (*Hirta*) foliis ternatis foliolis ovatis, caule fruticoso hirsuto, floribus spicatis terminalibus. *Psoralea with trifoliate oval leaves, a hairy shrubby stalk, and flowers growing in spikes terminating the branches.* Barba Jovis Americana frutescens, foliis subrotundis, floribus spicatis purpureis. Houst. MSS. *Shrubby American Jupiter's Beard, with roundish leaves and purple spiked flowers.*
3. PSORALEA (*Procumbens*) foliis pinnatis argenteis, caulibus procumbentis, floribus axillaribus. *Psoralea with silvery winged leaves, trailing stalks, and flowers proceeding from the sides of the stalks.* Barba Jovis Malabarica annua procumbens argentea, floribus minimis purpureis. Ed. Prior. *Annual, trailing, silvery Jupiter's Beard of Malabar, with the least purple flowers.*
4. PSORALEA (*Scandens*) foliis pinnatis, caule ramoso scandente, floribus alaribus sessilibus. *Psoralea with winged leaves, a climbing branching stalk, and flowers sitting close at the wings of the stalk.* Barba Jovis Americana scandens, floribus cæruleis, ad alas foliorum conglomeratis. Houst. MSS. *Climbing American Jupiter's Beard, with blue flowers growing in clusters at the wings of the leaves.*
5. PSORALEA (*Capitata*) foliis ternatis, caule fruticoso ramosissimo, floribus capitatis pedunculatis alaribus. *Psoralea with trifoliate leaves, a very branching shrubby stalk, and flowers growing in heads, which have foot-stalks proceeding from the wings of the leaves.* Barba Jovis Americana frutescens hirsuta, floribus cæruleis conglomeratis. Houst. MSS. *Shrubby, hairy, American Jupiter's Beard, with blue clustered flowers.*
6. PSORALEA (*Annua*) foliis pinnatis, spicis terminalibus. Lin. Sp. Plant. 764. *Psoralea with winged leaves, and flowers growing in spikes terminating the branches.* Barba Jovis Americana annua, humilis, ramosissima, floribus cæruleis spicatis. Houst. MSS. *Low, very branching, annual, American Jupiter's Beard, with blue spiked flowers.*
7. PSORALEA (*Humilus*) foliis pinnatis, foliolis rotundioribus villosis, floribus capitatis alaribus terminalibusque, caule fruticoso. *Psoralea with winged leaves having hairy round lobes, flowers growing in heads from the wings of the leaves, and at the end of the branches, and a shrubby stalk.* Barba Jovis Americana, humilis rotundifolia & villosa, flore vario. Houst. MSS. *Low American Jupiter's Beard, with a round hairy leaf and a variable flower.*
8. PSORALEA (*Bituminosa*) foliis omnibus ternatis, pedunculis capitatis. Hort. Upsal. 225. *Psoralea with trifoliate leaves, and flowers growing in heads.* Trifolium bitumen redolens. C. B. P. 327. *Trefoil with a bituminous scent.*
9. PSORALEA (*Angustifolia*) foliis ternatis, foliolis ovato-lanceolatis, floribus capitatis. *Psoralea with trifoliate leaves having oval spear-shaped lobes, and flowers growing in heads.* Trifolium bitumen redolens angustifolium ac sempervirens. Boerh. Ind. alt. 2. p. 32. *Trefoil smelling like Bitumen, with a narrow evergreen leaf.*
10. PSORALEA (*Corylifolia*) foliis simplicibus ovatis. Hort. Upsal. 225. *Psoralea with oval simple leaves.* Loto affinis coryli folio. Dodart. Acad. Scien. 4. p. 289.

The first sort grows naturally at the Cape of Good Hope, from whence I have frequently received the seeds. This rises with a soft shrubby stalk four or five feet high, dividing into several branches, which are garnished with deep green winged leaves, composed of three or four pair of very narrow linear lobes, terminated by an odd one, standing upon short foot-stalks, which come out without any order on every side the branches. The flowers sit very close to the branches, coming out from the wings of the leaves; they are often in clusters. The standard, which is erect and reflexed at the top, is of a fine blue; the wings are pale, and the keel white; these are succeeded by short pods the length of the empalement, each containing one kidney-shaped seed. It flowers great part of summer, and the seeds ripen in autumn. This is easily propagated by seeds, which should be sown upon a moderate hot-bed; and when the plants come up, they must not be drawn weak, for as they are not tender, so they should have air and but little heat. When they are fit to remove, they should be planted in separate small pots, filled with light earth, and plunged again into the bed, shading them from the sun till they have taken new root; then they should be gradually inured to the open air, into which they should be removed about the end of May, and kept abroad till October; then they must be placed in the green-house, and treated in the same way as other plants from the same country. It may also be propagated by cuttings, which may be planted during any of the summer months, on a bed of light earth, covering them close with either bell or hand-glasses, shading them from the sun, and gently refreshing them with water as the ground dries; when they have taken root, they must be hardened gradually, and then transplanted into small pots, and treated like the seedling plants.

The second sort was discovered by the late Dr. Houstoun at La Vera Cruz; this rises with a shrubby stalk three or four feet high, sending out a few side branches, which are garnished with oval trifoliate leaves which are hairy, standing upon slender foot-stalks. The flowers are collected in spikes at the end of the branches; they are of a purplish colour, and are succeeded by short pods, each containing one kidney-shaped seed. It is propagated by seeds, which must be sown upon a hot-bed, and the plants afterward treated in the same way as plants from hot countries; but as this is an abiding plant, so they must be removed into the stove in autumn, and kept in a moderate warmth in winter; and in summer they must have a large share of free air, but should constantly remain in the stove; the second year they will produce flowers, and sometimes their seeds will ripen in England.

The seeds of the third sort were brought me from Malabar; this is an annual plant, with trailing stalks about eight inches long, garnished with silvery leaves, composed of three or four pair of narrow lobes, terminated by an odd one. The flowers grow in small clusters at the wings of the leaves; they are small, and of a purple colour; the seed-pods are short, and have one small kidney-shaped seed in each. This is propagated by seeds, in the same manner as the second sort.

The fourth sort was discovered by the late Dr. Houstoun at Campeachy, where it grows naturally. This hath slender, shrubby, climbing stalks, which twine about any neighbouring support, and rise to the height of six or seven feet, garnished with winged leaves, composed of three pair of small, oval, obtuse lobes, terminated by an odd one. The flowers come out in small clusters from the wings of the leaves; they are small, of a bright blue colour, and are succeeded by short pods, including one kidney-shaped seed.

The fifth sort was discovered by the same gentleman, growing naturally at Campeachy. This rises with a shrubby stalk seven or eight feet high, sending out many long slender branches on every side, garnished with trifoliate leaves, whose lobes are small and wedge-shaped. The flowers are produced from the wings of the leaves in close small heads, standing upon pretty long foot-stalks; they are blue, and are succeeded by short pods, each containing a single kidney-shaped seed.

These two sorts are propagated by seeds, which must be sown upon a hot-bed; and when the plants come up, they must be treated in the same way as the third sort.

The sixth sort was discovered by the late Dr. Houstoun at La Vera Cruz; this is an annual plant, with a very branching herbaceous stalk, rising a foot and a half high, spreading wide on every side, garnished with winged leaves, composed of five or six pair of narrow wedge-shaped lobes, terminated by an odd one. The flowers are collected in close oblong spikes, terminating the branches; they are small, and of a bright blue colour, and are succeeded by short pods, each containing a single kidney-shaped seed. This is propagated by seeds, and requires the same treatment as the fourth sort.

The seventh sort grows naturally at La Vera Cruz, from whence the late Dr. Houstoun sent the seeds. This hath an upright shrubby stalk, which rises five or six feet high, having a few side branches, which are closely garnished with winged leaves, composed of three or four pair of small, roundish, hairy lobes, terminaled by an odd one. The flowers are collected in small heads, coming out from the wings of the leaves, and at the end of the branches; they are yellow and red intermixed, and are succeeded by short pods, containing one kidney-shaped seed. This sort requires the same treatment as the third.

The eighth sort grows naturally in the south of France and Italy; the root of this is perennial, but the stalk is not of long duration, seldom lasting more than two years; it rises about two feet high, sending out two or three slender branches, garnished with trifoliate leaves, whose lobes are oval, about two inches long, and one inch and a quarter broad, standing upon long foot-stalks; these, if handled, emit a strong scent of bitumen. The flowers are collected in heads, and have foot-stalks seven or eight inches long; they are blue, and are succeeded by short pods containing one seed.

The ninth sort grows naturally in Sicily, and also in Jamaica, from both which countries I have received the seeds. This has been supposed to be the same with the former, but I have many years propagated both by seeds, and have never found either of them vary. The leaves of this are much longer and narrower than those of the former sort, and are rounded at their base; the stalks are shrubby, and are of longer duration; the heads of the flowers are smaller, and the leaves have not so strong an odour. These are propagated by seeds, which should be sown on a bed of light earth in April, and in May the plants will come up, when they should be kept clean from weeds, and as soon as they are fit to remove they should be transplanted. Those of the eighth sort will live thro' the winter in the open air, if they are planted in a warm dry border; but the ninth sort requires some shelter in winter, so these should be planted in pots, and put into a common frame in winter, where they may be screened from hard frost. These plants flower from June to autumn, and perfect their seeds annually.

The tenth sort grows naturally in India; this is an annual plant; the stalks rise two feet high, and are garnished at each joint by one oval leaf about two inches long, and one inch and a half broad, having one strong midrib, from which come out several veins, which run toward the top of the leaf. The flowers stand upon long slender foot-stalks, which come out at the wings of the leaves; they are collected into small round heads, and are of a pale flesh colour. It flowers in July, and the seeds ripen in autumn. This is propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be planted into separate small pots filled with light earth, and plunged into a moderate hot-bed of tanners bark, shading them from the sun till they have taken new root, after which they must have free air admitted to them in warm weather, and gently watered as often as they require it. When the plants have filled the pots with their roots, they should be removed into larger, and the beginning of July they may be removed into an airy glass-case, where they may be defended from cold, but should have free air in warm weather; with this care the plants will flower and ripen their seeds.

PSYLLIUM. See Plantago.

PTRAMICA. See Achillea.

PTELEA. Lin. Gen. Plant. 141. Shrub Trefoil.

The Characters are,

*The empalement of the flower is small, and cut into four acute segments. The flower has four oval spear-shaped petals, which spread open flat; it hath four awl-shaped stamina terminated by roundish summits, and an orbicular compressed germen, supporting a short style, crowned by two obtuse stigmas. The germen afterward becomes a roundish membranaceous capsule with two cells, each containing one obtuse seed.*

This genus of plants is ranged in the first section of Linnæus's fourth class, which includes those plants whose flowers have four stamina and one style.

The Species are,

1 Ptelea (*Trifoliata*) foliis ternatis. Lin. Sp. Plant. 118. *Ptelea with trifoliate leaves.* Frutex Virginianus trifolius, ulmi samaris. Pluk. Alm. 159. *Virginia Trefoil Shrub, with seeds like Elm, commonly called Carolina Shrub Trefoil.*

2. Ptelea (*Viscosa*) foliis simplicibus. Lin. Sp. Plant. 118. *Ptelea with single leaves.* Carpinus viscosa, salicis folio integro oblongo. Burm. Zeyl. 55. tab. 23. *Viscous Hornbeam with an entire oblong Willow leaf.* Plumier

mier has titled it Staphyllodendron Americanum foliis lauri angustis. Cat. 18. *American Bladder Nut, with narrow Bay leaves.*

The first sort grows naturally in North America; it was first discovered in Virginia by Mr. Banister, who sent the seeds to England, from which some plants were raised at Fulham, and some other curious gardens; but being planted in the open air, they were destroyed by a severe winter, so that there were scarce any of the plants left in England. In 1724, Mr. Catesby sent over a good quantity of the seeds from Carolina, which succeeded so well as to furnish many gardens with the plants. This rises with an upright woody stem ten or twelve feet high, dividing upward into many branches, covered with a smooth grayish bark, garnished with trifoliate leaves standing upon long foot-stalks. The lobes are oval, spear-shaped, smooth, and of a bright green on their upper side, but pale on their under; these come out late in the spring, soon after which the bunches of flower-buds appear, which is generally in the beginning of June, the leaves being then but small, and afterward increase in their size, but are not fully grown till the flowers decay. The flowers are produced in large bunches at the end of the branches; they are of an herbaceous white colour, composed of four or five short petals, ending in acute points; these are fastened at their base to a short empalement, cut into four segments almost to the bottom. In the center is situated an orbicular compressed germen supporting a short style, which is attended by four awl-shaped stamina; the germen afterward turns to a capsule surrounded by a leafy border, having two cells, each containing one seed.

These shrubs may be propagated by cuttings, which should be planted in pots of fresh rich earth, and plunged into a moderate hot-bed. The best time for planting them is in the beginning of March, but they must be carefully managed so as not to have too much heat, and shaded from the sun in the middle of the day, otherwise they will not succeed. They may also be propagated by layers, but these are often two years before they take root; but if good seeds can be procured either here or from abroad, the plants raised from those will be much stronger than those which are propagated by either of the former methods.

These seeds may be sown in the beginning of April, on a bed of light earth, in a warm sheltered situation, where, if the ground is moistened in dry weather, the plants will come up in six weeks; but if the seeds are sown in pots, and placed on a very moderate hot-bed, the plants will come up sooner, and make greater progress the first year; but they must not be forced or drawn, for that will make them very tender; therefore in June the plants should be exposed to the open air, in a sheltered situation, where they may remain till the frost comes on, when those in the pots should be either placed under a common frame, to shelter them from severe frost, or the pots plunged into the ground, near a hedge, that the frost may be prevented from penetrating through the sides of the pots to the roots of the plants. The following spring the plants may be planted into a nursery-bed, at about one foot distance, where they may grow two years, by which time they will be fit to transplant where they are designed to remain.

These plants are a little tender while they are young, therefore will require some protection the first and second year, but particularly from the early frosts in autumn, which frequently kills the tops of the tender shoots before they are hardened; and the more vigorous the plants have grown the preceding summer, the greater danger there is of their being killed, therefore they should be screened either with mats or some other covering; but as they advance in strength, they become more hardy, and are rarely injured by frost.

The second sort grows naturally in both Indies; it is very common in most of the islands in the West-Indies. This sends up several stalks from the root, about the size of a man's arm, sending out several upright branches, covered with a light brown bark, which frequently separates from the wood, and hangs loose; they are garnished with stiff leaves, which vary greatly in their shape and size, some being four inches long, and an inch and a half broad; others are not three inches long, and a quarter of an inch broad; they are spear-shaped, entire, and of a light green, growing with their points upward, and have very short foot-stalks. The flowers are produced at the end of the branches in a sort of racemus, each standing upon a slender foot-stalk about an inch long; they have four solid channelled petals of an herbaceous colour, having four stamina which spread open, and in the center is situated a roundish compressed germen, which afterward turns to a compressed capsule with three cells, surrounded by a broad leafy border, each cell containing one or two roundish seeds.

This plant is propagated by seeds, which, if obtained fresh from abroad, will rise easily upon a hot-bed: when the plants are fit to remove, they should be each planted in a separate small pot filled with light loamy earth, and plunged into a hot-bed of tanners bark, shading them from the sun till they have taken new root; then they should have free air admitted to them every day in proportion to the warmth of the season, for they must not be drawn up weak, nor should they have too much water. In the autumn the plants must be removed into the stove, where they should have a temperate warmth in winter, but during that season little water should be given them; nor should they have too much heat, for either of these will soon destroy them: as the plants obtain strength, they will become more hardy, and may be set abroad in the open air for two or three months in the heat of summer, but it should be in a sheltered situation; in winter they must be placed in a stove, kept to a moderate temperature of warmth, for the plants will not live in a green-house here.

This was formerly shewn for the Tea-tree in many of the European gardens, where it many years passed for it among those who knew no better.

PULEGIUM. Raii Meth. Plant. 61. Mentha. Tourn. Inst. R. H. 189. Lin. Gen. Plant. 633. [This plant takes its name from Pulex, a flea; because being burnt, it is said to drive away fleas.] Pennyroyal, or Pudden-grass.

The Characters are,

*The empalement of the flower is permanent, of one leaf, cut into five parts. The flower is of the lip kind; it hath one petal with a short tube, divided at the brim into four parts; the helmet, or upper lip of the flower, is entire, the lower is cut into three equal segments. It hath four stamina, two being longer than the other, terminated by roundish summits, and a four-pointed germen, supporting an erect style, crowned by a bifid stigma. The germen afterward become four small seeds, sitting in the empalement of the flower.*

This genus of plants is ranged in the second section of Mr. Ray's fourteenth class, which includes the herbs with whorled flowers which have scarce any helmet, but are cut into equal segments. Tournefort and Linnæus place this under the genus of Mentha, to which it may properly be joined; but as this is a title which has been long known in the shops and gardens, so I have chose to continue it.

The Species are,

1. Pulegium (*Vulgare*) foliis ovatis obtusis, staminibus corollam æquantibus, caule repente. *Pennyroyal with oval obtuse leaves, stamina equalling the petal, and a creeping stalk.* Pulegium latifolium. C. B. P. *Common or broad-leaved Pennyroyal.*

2. Pulegium (*Erectum*) foliis lanceolatis, staminibus corollâ longioribus, caule erecto. *Pennyroyal with spear-shaped leaves, stamina longer than the petal, and an upright stalk.* Pulegium Hispanicum erectum, staminibus florum extantibus. Act. Phil. London. *Upright Spanish Pennyroyal, whose stamina stand out from the flowers.*

3. Pulegium (*Cervinum*) foliis linearibus, floribus verticillatis terminalibusque. *Pennyroyal with linear leaves, and flowers growing in whorls at the ends of the stalks.* Pulegium angustifolium. C. B. P. *Narrow-leaved Pennyroyal.*

The first sort grows naturally upon moist commons, where the water stands in winter, in many parts of England. The root is fibrous and perennial; the stalks are smooth and trail upon the ground, putting out roots at every joint, whereby it spreads and propagates very fast; the stalks are garnished at each joint by two oval leaves, which are for the most part entire. The flowers grow toward the upper part of the branches, coming out just above the leaves at each joint, in whorls; they are of a pale purple colour, small and galeated, the helmet being entire; whereas in the Mint, this is indented at the point. The stamina of the flowers are of the same length with the petal, but the style is somewhat longer; the whole plant has a very strong smell, and a hot aromatic taste. There is a distilled water of this plant and also an oil, which is kept in the shops for medicinal use. There is a variety of this with a white flower, which is sometimes found growing naturally in England.

The seeds of the second sort were sent me from Gibraltar, which succeeded in the Chelsea Garden, but had been before introduced into several gardens, where it had been cultivated to supply the markets. The stalks of this grow erect and near a foot high; the leaves are longer and narrower than those of the common sort, the whorls of flowers are much larger, and their stamina are longer than the petals. This sort hath almost superseded the first in the markets, for as the stalks grow erect, so it is much easier to cut and tie in bunches than the common sort; it also comes earlier to flower, and has a brighter appearance, but whether it is as good for use, I shall leave to be determined by those whose province it belongs to.

The third sort grows naturally in the south of France and Italy, it is called Hart's Pennyroyal. This is by some preferred to the common sort for medicinal use; the stalks of this grow erect, near two feet high, sending out side branches all their length; the leaves are very narrow, and of a thicker substance than those of the common sort, the whorls of flowers are rather larger; the scent is not quite so strong as that of the first sort, and the stalks are frequently terminated by whorls of flowers. This is cultivated in gardens here, and flowers about the same time as the common sort. There is a variety of this with white flowers, which grows taller than that with purple flowers, but I do not believe it is a different sort.

All these plants propagate themselves very fast by their branches trailing upon the ground, which emit roots at every joint, and fasten themselves into the earth, and send forth new branches; so that no more is required in their culture, than to cut off any of these rooted branches, and plant them out in fresh beds, allowing them at least a foot from plant to plant every way, that they may have room to grow; or the young shoots of these planted in the spring, will take root like Mint.

The best time for this work is in September, that the plants may be rooted before winter; for if the old roots are permitted to remain so close together, as they generally grow in the compass of a year, they are subject to rot in winter; besides the young plants will be much stronger, and produce a larger crop the succeeding summer, than if they were removed in the spring. These plants all love a moist strong soil, in which they will flourish exceedingly.

PULMONARIA. Tourn. Inst. R. H. 136. tab. 55. Lin. Gen. Plant. 184. [so called from Pulmones, *Lat.* the lungs, because supposed to be a very good medicament for the lungs.] Lungwort; in French, *Pulmonaire.*

The Characters are,

*The flower hath a cylindrical, five-cornered, permanent empalement of one leaf, cut into five segments at the top. The flower is of one petal, having a cylindrical tube the length of the empalement, cut at the top into five parts, which spread open, but the chaps are pervious. It hath five short stamina, terminated by erect summits which close together, and four germen supporting a short style, crowned by an obtuse indented stigma. The germen afterward turn to four roundish seeds, sitting in the bottom of the empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and one style.

The Species are,

1. Pulmonaria (*Officinalis*) foliis radicalibus ovato-cordatis scabris. Hort. Cliff. 44. *Lungwort whose lower leaves are oval, heart-shaped, and rough.* Pulmonaria vulgaris, maculoso folio. Clus. Hist. 169. *Common spotted Lungwort, or Jerusalem Cowslip.*
2. Pulmonaria (*Alpina*) foliis caulinis ovatis glabris, floribus patulis, segmentis obtusiusculis. *Lungwort with oval smooth leaves to the stalks, spreading flowers, and obtuse segments.* Pulmonaria Alpina, foliis mollibus subrotundis, flore cæruleo. Tourn. Inst. R. H. 136. *Lungwort of the Alps, with soft roundish leaves, and a blue flower.*
3. Pulmonaria (*Saccharata*) foliis lanceolatis basi semi-amplexicaulibus, calycibus abbreviatis. *Lungwort with spear-shaped leaves, whose base half embrace the stalk, and the empalement shorter than the tube of the flower.* Pulmonaria maxima foliis quasi saccharo incrustatis. Pluk. Alm. 359. *Greatest Lungwort with spotted leaves, as if they were incrusted with sugar.*
4. Pulmonaria (*Angustifolia*) foliis radicalibus lanceolatis. Hort. Cliff. 44. *Lungwort with the lower leaves spear-shaped.* Pulmonaria angustifolia cæruleo flore. J. B. 3. 596. *Narrow-leaved Lungwort with a blue flower.*
5. Pulmonaria (*Orientalis*) caulibus procumbentibus, floribus singularibus alaribus, calycibus inflatis corollâ longioribus. *Lungwort with trailing stalks, flowers growing singly from the sides, and swollen empalements which are longer than the petals.* Pulmonaria Orientalis, calyce vesicario, foliis echii, flore purpureo infundibuliformi. Tourn. Cor. 6. *Eastern Lungwort with an empalement like a bladder, a Viper's Buglоss leaf, and a purple funnel-shaped flower.*
6. Pulmonaria (*Virginica*) calycibus abbreviatis, foliis lanceolatis obtusiusculis. Lin. Sp. Plant. 135. *Lungwort with short empalements to the flowers, and spear-shaped obtuse leaves.* Symphytum sive pulmonaria non maculata, foliis glabris acuminatis flore patulo cæruleo. Pluk. Alm. 359. *Lungwort with smooth, unspotted, acute-pointed leaves, and a blue spreading flower.*

The first sort grows naturally in woods and shady places in Italy and Germany, and is cultivated in the English gardens chiefly for medicinal use. It hath a perennial fibrous root; the lower leaves are rough, of an oval heart-shape, about six inches long, and two inches and a half broad, of a dark green on their upper side, marked with many broad whitish spots, but pale and unspotted on their under side; the stalks rise almost a foot high, having several smaller leaves on them, standing alternately. The flowers are produced in small bunches at the top of the stalks, each having a tubulous hairy empalement as long as the tube of the flower; the brims of the petal are spread open, and are shaped like a cup; these are red, purple, and blue, in the same bunch. They appear in April, and are succeeded by four naked seeds, which ripen in the empalement. It is accounted a pectoral balsamic plant, and good for coughs and consumptions, spitting of blood, and the like disorders of the lungs; it is likewise put into wound drinks.

The second sort grows naturally on the Alps; this hath a perennial fibrous root; the leaves are large, smooth, and spotted on their upper side; the stalks rise nine inches high, and are garnished with oval leaves whose base join the stalks. The flowers grow in small bunches on the top of the stalk; they are purple, and spread open wider than those of the common sort.

The third sort grows naturally upon the Helvetian Mountains; this is a perennial plant, whose leaves are large, spear-shaped, and rough. The foot-stalks of the lower leaves are broad; the stalks rise a foot high, and are garnished with spear-shaped leaves, whose base half embrace the stalks; the leaves are greatly spotted with white, appearing as if they were incrusted with sugar-candy; the flowers grow in large bunches on the top of the stalk; their tubes are longer than the empalement, and their brims are spread more than those of the common sort. They are of a bright blue, and appear in April and May.

The fourth sort grows naturally in Austria and Hungary; this hath leaves much narrower than those of the common sort, which are covered with soft hairs. The stalks rise a foot high, and are garnished with narrow leaves of the same shape with those below, but smaller; these almost embrace the stalk with their base. The flowers are produced in bunches on the top of the stalks like the others; these appear of a red colour before they expand, but when they are fully blown, are of a most beautiful blue colour. This sort flowers early in the spring, but is very rare in England at present.

The fifth sort was discovered in the Archipelago by Dr. Tournefort, who sent the seeds to the Royal Garden at Paris; this is an annual plant. The lower leaves are oblong and hairy; the stalks trail upon the ground, and are a foot and a half long, garnished with oblong hairy leaves sitting close to the stalks; just above each leaf comes a single flower of a sullen purple colour, funnel-shaped, the brims not spreading; the empalement is swollen like an inflated bladder, and covers the petal of the flower, so as not to be seen without a near inspection. This plant flowers in May, if the plants come up in autumn, and after the flowers are past, the four seeds ripen in the empalement.

The sixth sort grows naturally upon mountains in most parts of North America. The seeds of this plant were sent many years since by Mr. Banister from Virginia, and some of the plants were raised in the gardens of the Bishop of London, at Fulham, where for several years it was growing, and was communicated to several other curious gardens; this hath a thick, fleshy, perennial root, sending out many small fibres. The stalks rise a foot and a half high, and divide at the top into several short branches; the leaves which are near the root are four or five inches long, and two inches and a half broad; they are smooth, obtuse, and of a light green, having short foot-stalks; those upon the stalk diminish in their size upward, but are of the same shape, and sit close to the stalk. Each of the small branches at the top of the stalk is terminated by a cluster of flowers, each standing upon a separate short foot-stalk; their empalements are very short, and are cut into five segments almost to the bottom; the tube of the flower is long, and at the top spreads open in shape of a funnel, the brim being entire, but appears five-cornered from the folding of the petal. The most common colour of these flowers is blue, but there are some purple, others red, and some white. They appear in April, and, if they have a shady situation, will continue in beauty great part of May, and sometimes they are succeeded by seeds in England. The leaves and stalks entirely decay in August, and the roots remain naked till the following spring.

There are some other species of this genus, which are preserved in botanic gardens for the sake of variety, but, having little beauty, they are seldom cultivated in other places.

The first, second, third, fifth, and sixth sorts have perennial roots, so may be cultivated by parting of their roots, which may be done either in the spring, or autumn; but if the ground be moist into which they are planted, it is better to be done in the spring, otherwise the autumn is the more preferable season, that the plants may be well rooted before the dry weather comes on in the spring, which will cause them to flower much stronger.

The soil in which they are planted should not be rich, but rather a fresh light sandy ground, in which they will thrive much better than in a richer soil, in which they are very subject to rot in the winter. They should have a shady situation, and the first and third sorts thrive best in a moist soil, for in a hot dry soil they burn and decay in summer, unless they are duly watered in dry weather. All these early sorts are better transplanted, and parted in autumn, that they may be well rooted to flower strong the following spring. The sixth sort should not have a soil too moist, for as the roots run deep in the ground, they will be in danger of rotting by much wet.

The other sort is annual, and propagated by seeds only. The best time to sow these is in autumn, soon after they are ripe, for the plants will resist the cold of our winters very well, so will flower early the following summer, and good seeds may be obtained; whereas those which are sown in the spring sometimes miscarry, or lie a year in the ground. These seeds should be sown where they are designed to remain, for the plants do not succeed very well when they are transplanted. When the plants come up, they require no other culture but to keep them clear from weeds; and, where they are too close, to thin them. If these plants are permitted to scatter their seeds, the plants will come up better than when they are sown.

PULSATILLA. Tourn. Inst. R. H. 284. tab. 148. Anemone. Lin. Gen. Plant. 614. [so called of Pulsando, *Lat.* because the seeds of this plant are blown, and fly away with the least wind.] Pasque-flower; in French, *Coquelourde.*

The CHARACTERS are,

*The flower hath a leafy involucrum ending in many points; it hath two orders of petals, three in each which are oblong and pointed, and a great number of slender stamina about half the length of the petals, terminated by erect twin summits, and a great number of germen collected in a head, with acute styles crowned by obtuse stigmas. The germen afterward become so many seeds, having long hairy tails sitting upon the oblong receptacle.*

This genus of plants is ranged in the seventh section of Linnæus's thirteenth class, which includes those plants whose flowers have many stamina and styles, and joins this genus to the Anemone in the later editions of his works.

The SPECIES are,

1. PULSATILLA (*Vulgaris*) foliis decompositis pinnatis, flore nutante, limbo erecto. Hort. Cliff. 223. *Pasque-flower with decompounded winged leaves, and a nodding flower having an erect rim.* Pulsatilla folio crassiore & majore flore. C. B. P. 177. *Pasque-flower with a thicker leaf, and a larger flower.*
2. PULSATILLA (*Pratensis*) foliis decompositis pinnatis, flore pendulo, limbo reflexo. Hort. Cliff. 223. *Pasque-flower with decompounded winged leaves, and a pendulous flower whose border is reflexed.* Pulsatilla flore minore nigricante. C. B. P. 177. *Pasque-flower with a smaller darkish flower.*
3. PULSATILLA (*Vernalis*) foliis simpliciter pinnatis, foliolis lobatis, flore erecto. Flor. Suec. 448. *Pasque-flower with simple winged leaves, whose wings have lobes and an erect flower.* Pulsatilla lutea apii hortensis folio. C. B. P. 177. *Yellow Pasque-flower with a Parsley leaf.*
4. PULSATILLA (*Patens*) foliis digitatis multifidis, flore erecto patente. *Pasque-flower with hand-shaped leaves having many points, and an erect spreading flower.* Pulsatilla anemones folio dissecto lanuginosa, flore majore dilutè luteo patente. Amman. Ruth. 104. *Pasque-flower with a cut Anemone leaf which is downy, and a larger pale, yellow spreading flower.*

The first of these plants is common in divers parts of England; it grows in great plenty on Gogmagog-hills on the left-hand of the highway leading from Cambridge to Haveril, just on the top of the hill; also about

about Hildersham, six miles from Cambridge, and on Bernack Heath not far from Stamford, and on Southrop Common adjoining thereto; also on mountainous and dry pastures just by Leadstone Hall near Pontefract in Yorkshire. It flowers in April.

This hath a fleshy taper root which runs deep in the ground; the leaves are hairy, and finely cut, like those of the wild Carrot, and spread near the ground; the stalk rises near a foot high, is pretty thick and hairy, and naked at the top, where there is a leafy involucrum to the flower, which is hairy, ending in many points; it is terminated by one flower composed of six petals ranged in two orders, three without, and three within; they are oblong, thick, and of a bright purple colour; they form a sort of bell-shaped flower nodding on one side, and their points turn upward. Within the petals are a great number of slender yellowish stamina terminated by erect summits, and in the center a great number of germen are collected in a head, which afterward become seeds, each having a long tail, by which they are distinguished from Anemone.

There is a variety of this with double, and another with white flowers, but these have been obtained from seeds of the other.

The second sort hath shorter leaves than the first; the stalks do not rise so high; the flowers do not expand so wide, and hang downward, but their brims are reflexed; they are of a very dark purple colour. This grows naturally in the meadows in Germany.

The third sort grows naturally on the Alps and Helvetian Mountains; this hath a perennial root. The leaves are like those of Smallage, and are simply winged; the stalk rises near a foot high, is naked almost to the top, where comes out a neat hairy involucrum, and above that one yellow flower shaped like the perennial yellow Adonis, standing erect. These appear about the same time with the former, and are succeeded by seeds which ripen at Midsummer.

The fourth sort grows in Siberia; this hath a thick fleshy root which sends out many strong fibres. The leaves are hand-shaped, composed of several roundish lobes, like some of the sorts of Ranunculi; they are downy, and cut into several segments. The stalk rises nine or ten inches high, having a hairy involucrum a considerable distance below the flower; it is terminated by one flower, which is large, spreading, and of a whitish yellow colour, with deep yellow stamina. This flowers early in the spring.

There are some other species of this plant, but those here mentioned are all the sorts which I have seen growing in England, and therefore I have not enumerated more, as it would be to little purpose, since it is difficult to procure them from the countries where they naturally grow.

These plants may be propagated by seeds, which should be sown in boxes or pots filled with very light sandy earth, observing not to cover the seeds too deep with mould, which will prevent their rising, for they require no more than just to be covered. These boxes should be placed where they may have the morning sun until ten of the clock, but must be screened from it in the heat of the day; and, if the season proves dry, the earth should be often refreshed with water. The best time for sowing of these seeds is in July or August, soon after they are ripe, for if they are kept till spring, they seldom grow.

These boxes or pots, in which the seeds are sown, should remain in this shady situation until the beginning of October, when they should be moved where they may enjoy the full sun during the winter season. About the beginning of March the plants will begin to appear, at which time the boxes should be again removed where they may have only the forenoon sun; for if they are too much exposed to the heat, the young plants will soon be destroyed. They should also be refreshed with water in dry weather, which will greatly promote their growth, and should be carefully kept clean from weeds, which, if suffered to grow among them, will in a short time overbear them.

When the leaves of this plant are entirely decayed (which is commonly in July,) you should then take up all the roots, which being nearly of the colour of the ground, will be difficult to find while small; therefore you should pass the earth through a fine wire sieve, which is the best method to separate the roots from the earth, (but notwithstanding all possible care taken, yet there will be many small roots left; so that the earth should either be put into the boxes again, or spread upon a bed of light earth, to see what plants will arise out of it the succeeding year.) The roots being taken up, should be immediately planted again on beds of light, fresh, sandy earth, about three or four inches asunder, covering them about three inches thick with the same light earth. The spring following most of these plants will produce flowers, but they will not be so large and fair as in the succeeding years, when the roots are larger.

The roots of these plants generally run down deep in the ground, and are of a fleshy substance, somewhat like Carrots, so will not bear to be kept long out of the ground; therefore, when they are removed, it should be done early in the autumn, that they may take fresh root before the frost comes on; for if they are transplanted in the spring, they will not produce strong flowers. These plants thrive best in a loamy soil, for in very light dry ground they are apt to decay in summer.

PUMPION. See Pepo.

PUNICA. Tourn. Inst. R. H. 633. tab. 407. Lin. Gen. Plant. 544. [This plant takes its name from its punicean or red appearance, for its flowers and fruit are of that colour. It is called Granatum, from the word Granis, because the fruit has many grains; or, as some suppose, of Granata, or Granada, because it grows in great plenty in that country.] The Pomegranate-tree; in French, *Grenadier*.

The Characters are,

*The empalement of the flower is permanent, bell-shaped, coloured, and of one leaf, cut into six parts at the top. The flower has five roundish, erect, spreading petals which are inserted in the empalement, and a great number of slender stamina, which are also inserted in the empalement, terminated by oblong summits. The germen is situated under the flower, supporting a single style crowned by a headed stigma; it afterward becomes a large almost globular fruit, crowned by the empalement. The fruit is divided into several cells by membranous partitions, which are filled with roundish succulent seeds.*

This genus of plants is ranged in the first section of Linnæus's twelfth class, in which he places those plants whose flowers have more than twenty stamina, which are inserted either in the petals or empalement, and one style.

The Species are,

1. Punica (*Granatum*) foliis lanceolatis, caule arboreo. Hort. Cliff. 134. *Pomegranate with linear spear-shaped leaves, and a tree-like stalk.* Punica quæ malum granatum fert. Cæsalp. *Punica which bears the Pomegranate*
2. Punica (*Nana*) foliis linearibus, caule fruticoso. *Pomegranate with linear leaves, and a shrubby stalk.* Punica Americana, nana seu humillima. Lig. Tourn. Inst. 636. *The American Dwarf Pomegranate.*

There are the following varieties of the first sort, which are supposed to be accidental variations obtained by culture from the seeds, therefore I have not enumerated them as species; but as many curious persons will expect to find them inserted here, I shall just mention them.

The wild Pomegranate with single and double flowers.
The sweet Pomegranate.
The small flowering Pomegranate with single and double flowers.
The Pomegranate with striped flowers.

These plants grow naturally in Spain, Portugal, Italy, and Mauritania. There are also many of them

in the West-Indies, but they are supposed to have been transplanted there from Europe; but they are so much improved there, as to be much preferable to any in Europe, the fruit being larger and finer flavoured.

This tree rises with a woody stem eighteen or twenty feet high, sending out branches the whole length, which likewise put out many slender twigs, so as to render them very thick and bushy. Some of these are armed with sharp thorns; they are garnished with spear-shaped leaves about three inches long, and half an inch broad in the middle, drawing to a point at each end; they are of a light lucid green, and stand opposite. The flowers come out at the end of the branches, sometimes singly, and at others three or four together; one of the largest terminates the branch, and immediately under that are two or three smaller buds, which, after the flower is past, swell larger and expand, whereby there is a continued succession of flowers for some months. The empalement of the flower is very thick, fleshy, and of one piece, cut at the top into five segments; it is of a fine red colour, and within are included five in the single flowers, but in the double a great number of scarlet petals, which are inserted in the empalement. In the center is situated the style, arising from the germen, encompassed by many slender stamina, which are terminated by oblong yellowish summits. After the flower decays, the germen swells to a roundish fruit crowned by the empalement, having a hard shell, including a pulp filled with angular seeds. This tree flowers in July, August, and September, and the fruit ripens late in autumn.

The Balaustia of the shops is the empalement of the flower of the double flowering Pomegranate.

The first of these trees is now pretty common in the English gardens, where formerly it was nursed up in cases, and preserved in green-houses with great care (as was also the double flowering kind;) but they are both hardy enough to resist the severest cold of our climate in the open air; and, if planted against warm walls in a good situation, the first sort will often produce fruit, which in warm seasons will ripen tolerably well; but as these fruits do not ripen till late in the autumn, they are seldom well tasted in England, for which reason the sort with double flowers is commonly preferred to it. The sort with sweet fruit, as also the wild sort, are less common in the English gardens than the former two.

These plants may be easily propagated by laying down their branches in the spring, which in one year's time will take good root, and may then be transplanted where they are designed to remain. The best season for transplanting of these trees is in spring, just before they begin to shoot; they should have a strong rich soil, in which they flower much better, and produce more fruit than if planted on dry poor ground; but in order to obtain these in plenty, there should be care taken in the pruning of these trees, for want of which we often see these trees very full of small shoots, but do not find many flowers produced upon them; therefore I shall set down directions for pruning of these trees, so as to obtain a great quantity of flowers and fruit.

The flowers of this tree, always proceed from the extremity of the branches which are produced the same year. This therefore directs, that all weak branches of the former year should be cut out, and that the stronger should be shortened in proportion to their strength, in order to obtain new shoots in every part of the tree. The branches may be laid in against the wall about four or five inches asunder; for, as their leaves are small, there is not a necessity of allowing them a greater distance. The best time for this work is about Michaelmas, or a little later, according to the mildness of the season, for if they are left until spring before they are pruned, they seldom put out their shoots so early, and the earlier they come out, the sooner the flowers will appear, which is of great consequence where fruit is desired. In summer they will require no other dressing, but to cut off all vigorous shoots which grow from the wall, and never produce flowers (for it is the middling shoots only which are fruitful;) and when the fruit is formed, the branches on which they grow should be fastened to the wall to support them, otherwise the weight of the fruit, when grown large, will be apt to break them down.

Though, as I said before, the fruit of this tree seldom arrives to any perfection in this country, so as to render it valuable; yet, for the beauty of its scarlet-coloured flowers, together with the variety of its fruit, there should be one tree planted in every good garden, since the culture is not great which they require; the chief care is to plant them upon a rich strong soil, and in a warm situation. Upon some trees which had these advantages, I have obtained a great quantity of fruit which have arrived to their full magnitude, but I cannot say they were well flavoured; however, they made a very handsome appearance upon the trees.

The double flowering kind is much more esteemed than the other in this country for the sake of its large, fine, double flowers, which are of a most beautiful scarlet colour; and, if the trees are supplied with nourishment, will continue to produce flowers for two months successively, which renders it one of the most valuable flowering trees yet known. This must be pruned and managed in the same manner as hath been already directed for the fruit-bearing kind, but this sort may be rendered more productive of its beautiful flowers by grafting it upon stocks of the single kind, which will check the luxuriancy of the trees, and cause them to produce flowers upon almost every shoot; by which method I have had a low tree, which was planted in the open air, extremely full of flowers, which made a very fine appearance.

The second sort grows naturally in the West-Indies, where the inhabitants plant it in their gardens to form hedges. It seldom rises more than five or six feet high in those countries, so may be kept within compass, and there the plants continue flowering great part of the year. The flowers of this kind are much smaller than those of the common sort; the leaves are shorter and narrower, and the fruit is not larger than a Nutmeg, and has little flavour, so it is chiefly propagated for the beauty of its flowers. This is undoubtedly a distinct species from the common sort, and is much tenderer.

This plant may be propagated by layers in the same manner as the former sorts, but must be planted in pots filled with rich earth, and preserved in a green-house, otherwise it is too tender to endure the cold of our winters; and in the summer, when the flowers begin to appear, if the plants are exposed to the open air, the buds will fall off, and never open; so that they should not be exposed to the open air, but placed in an airy glass-case, giving them a large share of air every day in mild weather. As they will be covered at the top by the glasses, the flowers will expand, and the fruit will grow to the full size in England with this management, though they are not very desirable; but hereby the plants may be continued in flower upward of two months, and will make a fine appearance.

PURSLAIN. See Portulaca.

PYRACANTHA. See Mespilus.

PYROLA. Tourn. Inst. R. H. 256. tab. 132. Lin. Gen. Plant. 490. Winter-green.

The Characters are,

*The flower hath a small permanent empalement cut into five segments; it hath five roundish, concave, spreading petals, and ten awl-shaped stamina terminated by large nodding summits with two rising horns, and a roundish germen supporting a slender style, which is permanent and longer than the stamina, crowned by a thick stigma. The germen afterward becomes a roundish, depressed, five-cornered capsule, with five cells opening at the angles, filled with seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which contains those plants whose flowers have ten stamina and one style.

The Species are,

1. Pyrola (*Rotundifolia*) staminibus adscendentibus, pistillo declinato. Flor. Suec. 330. *Winter-green with rising stamina, and a declining pointal.* Pyrola rotundifolia major. C. B. P. 191. *Greater round-leaved Winter-green.*
2. Pyrola (*Secunda*) racemo unilaterali. Flor. Suec. 332. *Winter-green with a bunch of flowers ranged on one side the foot-stalk.* Pyrola folio mucronato serrato. C. B. P. 191. *Winter-green with a sawed pointed leaf.*
3. Pyrola (*Uniflora*) scapo unifloro. Flor. Lapp. 167. *Winter-green with one flower in a sheath.* Pyrola rotundifolia minor. C. B. P. 191. *Smaller round-leaved Winter-green.*
4. Pyrola (*Maculata*) pedunculis bifloris. Lin. Sp. Plant. 396. *Winter-green with two flowers on a foot-stalk.* Pyrola Marylandica minor, folio mucronato arbuti. Pet. Mus. 675. *Smaller Winter-green of Maryland, with a pointed Strawberry leaf.*

The first sort grows wild in many places in the North of England, particularly near Hallifax in Yorkshire, on rocky hills and heaths, as also in shady woods; so it is very difficult to preserve in gardens in the southern parts.

This hath a perennial root, from which spring out five or six roundish leaves, about an inch and a half long, and almost as broad, of a thick consistence, of a deep lucid green, and entire, standing upon pretty long foot-stalks. Between these rise a slender upright stalk near a foot high, naked great part of the length, ending in a loose spike of flowers, which are comcomposed of five large concave petals, spreading like a Rose, but the two upper leaves are formed into a kind of helmet. In the center is situated a crooked pointal, bending downward, attended by ten slender stamina, terminated by Saffron-coloured summits. It flowers in July, and the flowers are succeeded by cornered compressed capsules, having five cells, filled with small seeds.

The second sort grows naturally upon mountains in Italy, particularly near Verona and Genoa, and I have found it growing in Westmoreland. This hath a slender, creeping, perennial root, from which arise two or three very slender ligneous stalks about five inches high, sustaining at the top four or five oval acute-pointed leaves, an inch and a half long, and one broad, of a thinner consistence, and a brighter green than those of the former, each standing upon a short foot-stalk; and between these, on the side of the stalk, comes out the foot-stalk of the flowers, upon which they are ranged along one side; they are shaped like the other, but are smaller, as are also the capsules. It flowers about the same time with the first sort.

The third sort grows naturally in shady woods in the northern parts of Europe. This hath a perennial creeping root, from which come forth four or five roundish leaves of a pretty thick consistence, and between these arises a foot-stalk about four inches high, sustaining one large white flower on the top, of the same shape as the others. It flowers in June.

The fourth sort grows naturally in North America; this hath a ligneous perennial root, from which arise two or three ligneous stalks a foot and a half high, garnished with stiff leaves two or three inches long, one broad near the base, ending in acute points, and have some sharp indentures on their borders; the midrib is remarkably broad, and very white, as are also the veins which run from it. The flowers are produced at the end of the stalk on slender foot-stalks about three inches long, each sustaining two small pale-coloured flowers at the top. It flowers in June.

These are all of them very difficult to cultivate in gardens, for as they grow on very cold hills, and in mossy moorish soil, when they are removed to a better soil, and in a warmer situation, they seldom continue long. The best time to transplant these plants into gardens is about Michaelmas, provided the roots can then be found, when they should be taken up with balls of earth to their roots, and planted in a shady situation, and on a moist undunged soil, where they should be frequently watered in dry weather, otherwise they will not thrive. Some of these plants may be planted in pots, which should be filled with earth as nearly resembling that in which they naturally grow as possible, and place them in a shady situation, where, if they are constantly watered in dry weather, they will thrive very well.

The first sort is ordered by the College of Physicians to be used in medicine, and is generally brought over from Switzerland amongst other vulnerary plants, amongst which class this plant is ranged, and by some hath been greatly commended.

PYRUS. Tourn. Inst. R. H. 628. tab. 404. Lin. Gen. Plant. 550. The Pear-tree; in French, *Poirier.*

The Characters are,

*The flower hath a permanent empalement of one leaf, which is concave, and divided into five parts at the top; it hath five roundish concave petals, which are inserted in the empalement, and many awl-shaped stamina shorter than the petals, which are also inserted in the empalement, and terminated by single summits. The germen is situated under the flower, supporting four or five styles crowned by single stigmas; it afterward becomes a pyramidal fleshy fruit indented at the top, but produced at the base, having five membranaceous cells, each containing one smooth oblong seed pointed at the base.*

This genus of plants is ranged in the fourth section of Linnæus's twelfth class, which includes those plants whose flowers have more than twenty stamina inserted in the empalement, and five styles. To this genus he has joined the Malus and Cydonia.

The Pear and Quince may be joined together with more propriety than the Apple with either, for the fruit of the the two former are produced at their base, whereas the Apple is indented both at the top and bottom; nor will the Apple grow upon either of the other two, or they upon the Apple, when grafted or budded; but the Quince and Pear will grow upon each other, so there is a boundary set by nature between those and the Apple.

The several varieties of Pears, which are now cultivated in the curious fruit-gardens, have been accidentally obtained by seeds, so must not be deemed distinct species; but, as they are generally distinguished in the fruit-gardens and nursery, by the shape, size, and flavour of their fruit, I shall continue those distinctions, that the work may not appear imperfect to such as delight in the cultivation of these fruits.

The Species are,

1. Pyrus (*Musk*) sativa, fructu æstivo parvo racemoso odoratissimo. Tourn. *Petit Muscat, i. e. Little Musk Pear, commonly called the Supreme.* This fruit is generally produced in large clusters; it is rather round than long, the stalk short; and, when ripe, the skin is of a yellow colour; the juice is somewhat musky, and, if gathered before it is too ripe, is a good Pear. This ripens the middle of July, and will continue good but for a few days.
2. Pyrus (*Chio*) sativa, fructu æstivo minimo odoratissimo. Tourn. *Poire de Chio, i. e. the Chio Pear, commonly called the little Bastard Musk Pear.* This is smaller than the former, but is in shape pretty much like that. The skin, when ripe, has a few streaks of red on the side next the sun, and the fruit seldom hangs in clusters as the former, but in other respects is nearly like it.
3. Pyrus (*Citron des Carmes*) sativa, fructu æstivo parvo, è viridi albido. Tourn. *Poire Hâtiveau, i. e. the Hasting Pear; Poire Madeleine, ou Citron des Carmes, called commonly the green Chisel.* This is a larger Pear than either of the former, and is produced more toward the pedicle. The skin is thin, and of a whitish green colour when ripe; the flesh is melting, and, if not too ripe, of a sugary flavour, but is apt to be meally. This ripens in the end of July.
4. Pyrus (*Muscadelle*) sativa, fructu æstivo partim saturatè rubente, partim flavescente. Tourn. *Muscadelles Rouges, i. e. the red Muscadelle.* It is also called La Bellissime, i. e. the Fairest or Supreme. This is a large early Pear, of great beauty; the skin is of a fine

yellow colour, when ripe, beautifully ſtriped with red; the fleſh is half melting, and has a rich flavour, if gathered before it be to too ripe, but it is apt to be mealy. This generally produces two crops of fruit in a year; the firſt is commonly ripe about the end of July, and the ſecond ripens in September, but this late crop is ſeldom well taſted.

5. Pyrus (*Muſcat*) ſativa, fructu æſtivo parvo flaveſcente moſchato. Tourn. Petit Muſcat, i. e. *the Little Muſcat*. This is a ſmall Pear, rather round than long; the ſkin is very thin, and, when ripe, of a yellowiſh colour; the fleſh is melting, and of a rich muſky flavour, but will not keep long when ripe. This comes the end of July.

6. Pyrus (*Cuiſſe Madame*) ſativa, fructu æſtivo oblongo ferrugineo, carne tenerâ moſchatâ. Tourn. *Cuiſſe Madame, Lady's Thigh, in England commonly called Jargonelle.* This is a very long Pear, of a pyramidal ſhape, having a long foot-ſtalk; the ſkin is pretty thick, of a ruſſet green colour from the ſun, but towards the ſun it is inclined to an iron colour; the fleſh is breaking, and has a rich muſky flavour; ripe the beginning of Auguſt. This is one of the beſt early ſummer Pears yet known, and is certainly what all the French gardeners call the Cuiſſe Madame, as may be eaſily obſerved by their deſcription of this Pear; but I ſuppoſe the titles of this and the Jargonelle were changed in coming to England, and have been continued by the ſame names.

7. Pyrus (*Windſor*) ſativa, fructu oblongo, è viridi flaveſcente. *The Windſor Pear.* This is an oblong fruit, which ſwells toward the crown, but near the ſtalk is drawn toward a point; the ſkin is ſmooth, and, when ripe, of a yellowiſh green colour; the fleſh is very ſoft, and, if permitted to hang but two or three days after it is ripe, grows meally, and is good for nothing.

8. Pyrus (*Jargonelle*) ſativa, fructu æſtivo oblongo, è viridi albo. *The Jargonelle, now commonly called Cuiſſe Madame.* This is certainly what the French gardeners call the Jargonelle, which, as I have before obſerved, is now in England, given to another fruit much preferable to this, ſo that the two names are changed; for the Jargonelle is always placed amongſt thoſe which the French call bad fruit, and the Cuiſſe Madame is ſet down amongſt their beſt fruit, which is certainly the reverſe with us, as they are now named. This Pear is ſomewhat like the Windſor, but is not ſo ſwelling toward the crown, and is ſmaller toward the ſtalk; the ſkin is ſmooth, of a pale green colour; the fleſh is apt to be meally if it ſtands to be ripe, but, being a plentiful bearer, is much propagated for the London markets.

9. Pyrus (*Orange Muſk*) ſativa, fructu æſtivo globoſo ſeſſili moſchato, maculis nigris conſperſo. Tourn. *Orange Moſquée, i. e. the Orange Muſk.* This is a middle-ſized Pear, of a ſhort globular form; the ſkin is of a yellowiſh colour, ſpotted with black; the fleſh is muſky, but is very apt to be a little dry and choaky. It ripens in Auguſt.

10. Pyrus (*Blanquet*) ſativa, fructu æſtivo albido majori. Tourn. *Gros Blanquet, i. e. Great Blanket.* This is alſo called La Muſſette d'Anjou, i. e. the Bagpipe of Anjou. It is a large Pear approaching to a round form; the ſkin is ſmooth, and of a pale green colour; the fleſh is ſoft, and full of juice, which hath a rich flavour; the ſtalk is ſhort, thick, and ſpotted; the wood is ſlender, and the leaf is very much like that of the tree called the Jargonelle. This ripens the beginning of Auguſt.

11. Pyrus (*Muſk Blanquet*) ſativa, fructu æſtivo albido ſaccharato odoratiſſimo. Tourn. *The Blanquette, or Muſk Blanquette; the little Blanket Pear.* This Pear is much leſs than the former, and more pinched in near the ſtalk, which is alſo ſhort, but ſlenderer than that of the former; the ſkin is ſoft, and of a pale green colour; the fleſh is tender, and full of a rich muſky juice; the wood of this tree is much ſtronger than that of the former, and the ſhoots are commonly ſhorter. This ripens the middle of Auguſt.

12. Pyrus (*Long-ſtalk Blanquet*) ſativa, fructu æſtivo albido, pediculo longo donato. Tourn. *Blanquette à longue queüe, i. e. Long-ſtalked Blanket Pear.* This Pear is in ſhape ſomewhat like the former, but the eye is larger, and more hollow at the crown; toward the ſtalk it is ſomewhat plumper, and a little crooked; the ſkin is very ſmooth, white, and ſometimes toward the ſun is a little coloured; the fleſh is between melting and breaking, and is full of a rich ſugary juice. This ripens the middle of Auguſt.

13. Pyrus (*Skinleſs*) ſativa, fructu æſtivo oblongo ruſeſcente ſaccharato. Tourn. *Poire ſans Peau, i. e. the Skinleſs Pear.* It is alſo called Fleur de Guigne, i. e. Flower of Guigne; and by ſome, Rouſſelet hâtif, i. e. the early Ruſſelet. This is a middle-ſized fruit, of a long ſhape, and a reddiſh colour, ſomewhat like the Ruſſelet; the ſkin is extremely thin; the fleſh is melting, and full of a rich ſugary juice; the ſhoots are long and ſtrait. This ripens the middle of Auguſt.

14. Pyrus (*Robine*) ſativa, fructu æſtivo turbinato, carne tenera ſaccharato. *Muſchat Robine, i. e. the Muſk Robine Pear.* This is alſo called Poire à la Reine, i. e. the Queen's Pear; Poire d'Ambre, i. e. the Amber Pear; and Pucelle de Xaintonge, i. e. the Virgin of Xaintonge. This is a ſmall round Pear, of a yellowiſh colour when ripe; the fleſh is between melting and breaking. It hath a rich muſky flavour, and is a great bearer; it ripens the middle of Auguſt.

15. Pyrus (*Drone*) ſativa, fructu æſtivo turbinato moſchato. *Le Bourdon Moſque, i. e. the Muſk Drone Pear.* This is a middle-ſized round fruit, whoſe ſkin is of a yellowiſh colour when ripe; the fleſh is melting, and has a high muſky juice, but it muſt not hang too long on the tree, for it is ſubject to grow meally in a ſhort time. This ripens the end of Auguſt.

16. Pyrus (*Orange*) ſativa, fructu æſtivo globoſo ſeſſili, è viridi purpuraſcente ſaccharato odorato. Tourn. *Orange Rouge, i. e. the red Orange Pear.* This Pear hath been the moſt common of all the ſorts in France, which was occaſioned by the general eſteem it was in ſome years ſince. This is a middle-ſized round fruit, of a greeniſh colour, but the ſide next the ſun changes to a purple colour when ripe; the fleſh is melting, and the juice is ſugared with a little perfume; the eye is very hollow, and the ſtalk is ſhort. This ripens the end of Auguſt.

17. Pyrus (*Caſſolette*) ſativa, fructu æſtivo oblongo minori cinereo odorato. Tourn. *Caſſolette Friolet, Muſcat Verd Lecheſrion.* This is ſo called from its being ſhaped like a perfuming-pot. It is a long fruit, in ſhape like the Cuiſſe Madame, of an Aſh colour; its fleſh is melting, and full of a perfumed juice, but it is very apt to rot in the middle as ſoon as ripe, otherwiſe it would be eſteemed an excellent Pear. It is ripe the end of Auguſt.

18. Pyrus (*Orange Muſk*) ſativa, fructu æſtivo turbinato è viridi albido. *Orange Muſquée, i. e. the Muſk Orange Pear.* This is a large round Pear, in ſhape like a Bergamot; the ſkin is green, and the fleſh is melting, but it is very ſubject to rot upon the tree, which renders it not near ſo valuable as ſome others. It ripens the end of Auguſt.

19. Pyrus (*Oignonnet*) ſativa, fructu æſtivo globoſo è viridi purpuraſcente. Tourn. *Gros Oignonnet, i. e. the Great Onion Pear.* It is alſo called Amiré-roux, i. e. Brown Admired; and Roy d'Eté, i. e. King of Summer; Archiduc d'Eté; i. e. the Summer Archduke. This is a middle-ſized round Pear, of a browniſh colour next the ſun; the fleſh is melting, and the juice is paſſably good. This ripens the end of Auguſt.

20. Pyrus (*Avorat*) ſativa, fructu æſtivo globoſo ſeſſili ex albido flaveſcente ſaccharato odorato. Tourn. *Robine.* It is alſo called Muſcat d'Aouſt, i. e. the Auguſt Muſcat; Poire d'Averat, i. e. the Averat Pear; and Poire Royale, i. e. the Royal Pear. This is a roundiſh flat Pear, in ſhape very like a Bergamot; the ſtalk is long, ſtrait, and a little ſpotted, and the eye is a little hollowed; the ſkin is ſmooth, and of a whitiſh yellow colour; the fleſh is breaking, but not hard, and its juice is richly ſugared and perfumed.

fumed. It is a great bearer, and is esteemed one of the best summer Pears yet known; it ripens the end of August.

21. Pyrus (*Rose*) sativa, fructu æstivo globoso sessili odorato. Tourn. *Poire-rose, i. e. the Rose-Pear*; *and L'Epine-rose, i. e. the Thorny Rose.* This is a short round fruit, shaped like the great Onion Pear, but much larger; of a yellowish green colour, but a little inclining to red on the side next the sun; the stalk is very long and slender; the flesh is breaking, and the juice is musky: this ripens the end of August. The shoots and the leaves of this tree are large.

22. Pyrus (*Pouchet*) sativa, fructu æstivo globoso albido saccharato. Tourn. *Poire du Pouchet.* This is a large, round, whitish Pear, shaped somewhat like the Besideri; the flesh is soft and tender, and the juice is sugary; this ripens the end of August.

23. Pyrus (*Parfumé*) sativa, fructu æstivo turbinato sessili saturatiùs rubente punctato. Tourn. *Poire de Parfumé, i. e. the perfumed Pear.* This is a middle-sized round fruit, whose skin is somewhat thick and tough, and of a deep red colour, spotted with brown; the flesh is melting, but dry, and has a perfumed flavour. This ripens the end of August.

24. Pyrus (*Boncrêtien*) sativa, fructu æstivo oblongo magno, partim rubro, partim albido odorato. Tourn. *Boncrêtien d'Eté, i. e. the Summer Boncrêtien, or Good Christian.* This is a large oblong fruit, whose skin is smooth and thin; the side next the sun is of a beautiful red colour, but the other side is of a whitish green; the flesh is between breaking and tender, and is very full of juice, which is of a rich perfumed flavour. It ripens the beginning of September.

25. Pyrus (*Salviati*) sativa fructu æstivo globoso, ex rubro albidoque flavescente saccharato odorato. Tourn. *Salviati.* This Pear is pretty large, round, and flat, very much like the Besideri in shape, but not in colour; the stalk is very long and slender, and the fruit is a little hollowed both at the eye and stalk; the colour is red and yellow next the sun, but on the other side is whitish; the skin is rough, the flesh is tender, but a little soft, and has no core; the juice is sugary and perfumed, somewhat like the Robine, but is not near so moist. This ripens the beginning of September.

26. Pyrus (*Caillot-rosat*) sativa, fructu æstivo globoso sessili rufescente odorato. Tourn. *Caillot-rosat, i. e. the Rose-water Pear.* This is a large round Pear, somewhat like the Messire Jean, but rounder; the stalk is very short, and the fruit is hollowed like an Apple, where the stalk is produced; the skin is rough, and of a brown colour; the flesh is breaking, and the juice is very sweet. This ripens the middle of September.

27. Pyrus (*Choak-Pear*) sativa, fructu æstivo longo, acerbitate strangulationem minitante. Tourn. *Poire d'Etrangillon, i. e. the choaky Pear.* The flesh is red. This is seldom preserved in gardens, so there needs no description of it.

28. Pyrus (*Rousselet*) sativa, fructu æstivo oblongo è ferrugineo rubente, nonnunquam maculato. *Poire du Rousselet, i. e. the Russelet Pear.* This is a large oblong Pear; the skin is brown, and of a dark red colour next the sun; the flesh is soft and tender, without much core; the juice is agreeably perfumed, if gathered before it be too ripe. This produces larger fruit on an espalier than on standard trees: it ripens the middle of September.

29. Pyrus (*Prince's Pear*) sativa, fructu æstivo subrotundo, partim rubro, partim flavescente, odorato. *Poire de Prince, i. e. the Prince's Pear.* This is a small roundish Pear, of a bright red colour next the sun, but a yellowish colour on the opposite side; the flesh is between breaking and melting; the juice is very high-flavoured: it is a great bearer. This ripens the middle of September, but will keep a fortnight good, which is what few summer-fruits will do.

30. Pyrus (*Moüille-bouche*) sativa, fructu æstivo globoso viridi, in ore liquescente. *Gros Moüille-bouche, i. e. the great Mouthwater Pear.* This is a large round Pear with a smooth green skin; the stalk is short and thick; the flesh is melting, and full of juice, if gathered before it be too ripe, otherwise it is apt to grow meally. This ripens the middle of September.

31. Pyrus (*Bergamot d'Eté*) sativa, fructu æstivo rotundo sessili saccharato, è viridi flavescente. *Bergamotte d'Eté, i. e. Summer Bergamot.* This is by some called the Hamden's Bergamot. It is a pretty large, round, flat Pear, of a greenish yellow colour, and hollowed a little at both ends like an Apple; the flesh is melting, and the juice is highly perfumed. This ripens the middle of September.

32. Pyrus (*Bergamot Autumn*) sativa, fructu autumnali sessili saccharato odorato è viridi flavescente, in ore liquescente. Tourn. *Bergamotte d'Automne, i. e. the Autumn Bergamot.* This is a smaller Pear than the former, but is nearly of the same shape; the skin is of a yellowish green, but changes to a faint red on the side next the sun; the flesh is melting, and its juice is richly perfumed. It is a great bearer, ripens the end of September, and is one of the best Pears of the season.

33. Pyrus (*Swiss Bergamot*) sativa, fructu autumnali turbinato viridi, striis sanguineis distincta. Tourn. *Bergamotte de Suisse, i. e. the Swiss Bergamot.* This Pear is somewhat rounder than either of the former; the skin is tough, and of a greenish colour, striped with red; the flesh is melting, and full of juice, but is not so richly perfumed as either of the former. This ripens the end of September.

34. Pyrus (*Beurré Rouge*) sativa, fructu autumnali suavissimo, in ore liquescente. Tourn. *Beurré Rouge, i. e. the red Butter Pear.* It is called l'Amboise, and in Normandy Isambert; as also Beurré gris, i. e. the gray Butter; and Beurré vert, i. e. the green Butter Pear. All these different names of Beurrés have been occasioned by the difference of the colours of the same sort of Pear, which is either owing to the different exposure where they grew, or from the stock, those upon free stocks being commonly of a browner colour than those which are upon Quince stocks, whence some persons have supposed them to be different fruits, though in reality they are the same. This is a large long fruit, for the most part of a brown colour. The flesh is very melting, and full of a rich sugary juice. It ripens the beginning of October, and, when gathered from the tree, is one of the very best sort of Pears we have.

35. Pyrus (*Doyenne*) sativa, fructu autumnali turbinato sessili flavescente, & in ore liquescente. Tourn. *Le Doyenne, i. e. the Dean's Pear.* It is also called by all the following names; Saint Michel, i. e. Saint Michael; Beurré blanc d'Automne, i. e. the white Autumn Butter Pear; Poire de Neige, i. e. the Snow Pear; Bonne Ente, i. e. a good Graft; the Carlisle, and Valentia. This is a large fruit, in shape somewhat like the gray Beurré, but is shorter and rounder; the skin is smooth, and, when ripe, changes to a yellowish colour; the flesh is melting, and full of juice, which is very cold, but it will not keep good much more than a week after it is gathered, being very subject to grow meally; it is a very indifferent fruit. This is a great bearer, and ripens the beginning of October.

36. Pyrus (*Verte-longue*) sativa, fructu autumnali longo viridique odorato, in ore liquescente. Tourn. *La Verte-longue, i. e. the long green Pear.* It is also called Moüille bouche d'Automne, i. e. the Autumn Mouthwater Pear. This is a long fruit, which is very green when ripe; the flesh is melting, and very full of juice, which, if it grows upon a dry warm soil, and a free stock, is very sugary, otherwise it is but a very indifferent Pear. It ripens the middle of October, but some years they will keep till December.

37. Pyrus (*Messire Jean*) sativa, fructu autumnali tuberoso sessili saccharato, carne durâ. Tourn. *Messire Jean blanc & gris, i. e. the white and gray Monsieur John.* These, although made two sorts of fruit by many persons, are indubitably the same; the difference of their colour proceeding from the different

soils

foils and situations where they grow, or the stocks on which they are grafted. This Pear, when grafted on a free stock, and planted on a middling soil, neither too wet nor over dry, is an excellent autumn Pear; but when it is grafted on a Quince stock, it is very apt to be stony; or if planted on a very dry soil, is very apt to be small and good for little, unless the trees are watered in dry seasons, which has rendered it less esteemed by some persons, who have not considered the cause of their hardness; for when it is rightly managed, there are not many Pears in the same season to be compared with it. This is a large roundish fruit, the skin is rough, and commonly of a brown colour; the flesh is breaking, and full of a rich sugared juice. It ripens the end of October, and will continue good near a month.

38. Pyrus (*Muscat flueri*) sativa, fructu autumnali globoso ferrugineo, carne tenerâ sapidissimâ. Tourn. *Muscat fleuri, i. e. the flowered Muscat.* It is also called Muscat à longue queüe d'Automne, i. e. the long-stalked Muscat of the Autumn. This is an excellent Pear, of a middling size, and round; the skin is of a dark red colour; the flesh is very tender, and of a delicate flavour. It ripens the end of October.

39. Pyrus (*Poire de Vigne*) sativa, fructu autumnali globoso ferrugineo, carne viscidâ. Tourn. *Poire de Vigne, i. e. the Vine Pear.* This is a round fruit, of a middling size; the skin of a dark red colour; the flesh is very melting, and full of a clammy juice; the stalk is very long and slender. The fruit should be gathered before it be full ripe, otherwise it grows meally and soon rots. It ripens the end of October.

40. Pyrus (*Rousseline*) sativa, fructu autumnali oblongo, dilutè rufescente, saccharato, odoratissimo. Tourn. *Poire Rousseline, i. e. the Rousseline Pear.* It is also called in Touraine, Le Muscat à longue queüe de la fin d'automne, i. e. the long-stalked Muscat of the end of autumn. This is by some English gardeners called the Brute-bonne, but that is a very different fruit from this. It is shaped somewhat like the Rousselet, but the skin of this is smooth, and of a greenish yellow from the sun, but the side next the sun is of a deep red colour, with some spots of gray; the flesh is very tender and delicate; the juice is very sweet, with an agreeable perfume. It ripens the middle of October, but must not be long kept, lest it rot in the middle.

41. Pyrus (*Pendar*) sativa, fructu autumnali oblongo majori cinereo. Tourn. *Poire Pendar, i. e. the Knave's Pear.* This is very like the Cassolette Pear, but is somewhat larger; the flesh is fine and tender; the juice is very much sugared. It ripens the end of October.

42. Pyrus (*Sucré vert*) sativa, fructu autumnali turbinato tuberoso viridi saccharato, in ore liquescente. Tourn. *Sucré vert, i. e. The green Sugar Pear.* This Pear is shaped like the Winter Thorn, but is smaller; the skin is very smooth and green; the flesh is very buttery; the juice is sugared, and of an agreeable flavour; but it is sometimes subject to be stony in the middle, especially if grafted on a Quince stock.

43. Pyrus (*Marquis*) sativa, fructu autumnali tuberosa sessili, è viridi flavescente, maculis nigris consperso, carne tenerâ saccharatâ. Tourn. *La Marquise, i. e. the Marquis's Pear.* This is often of two different shapes, according to the nature of the soil where they are planted; for when the soil is dry, the fruit very much resembles a fine Blanquet; but when the soil is very rich and moist, it grows much larger. It is a well-shaped Pear, flat at the top; the eye is small and hollowed; the skin is of a greenish yellow, a little inclining to red on the side next the sun. If this Pear does not change yellow in ripening, it is seldom good; but if it does, the flesh will be tender and delicate, very full of juice, which is sugared. It ripens the beginning of November.

44. Pyrus (*Chat-brulé*) sativa, fructu autumnali oblongo, partim albido, partim rufescente. *The Chat-brulé, i. e. the Burnt Cat.* It is also called Pucelle de Xaintogne, i. e. the Virgin of Xaintogne. This is a small oblong Pear, shaped much like the Martin Sec, but differs from it in colour, this being of a pale colour on one side, but of a dark brown on the other; the skin is smooth; the flesh is tender, but dry, and, if kept a short time, is apt to grow meally. It is in eating the beginning of November.

45. Pyrus (*Besidéri*) sativa, fructu autumnali globoso sessili, ex albido flavescente. *Le Besidéri.* It is so called from Heri, which is a forest in Bretagne, between Rennes and Nantes, where this Pear was found. This is a middle-sized round Pear, of a pale green, inclining to a yellowish colour; the stalk is very long and slender; the flesh is dry, and but very indifferent for eating, but it bakes well. It ripens the middle of November.

46. Pyrus (*Crasane*) sativa, fructu brumali sessili, è viridi flavescente, maculato, utrinque umbilicato, in ore liquescente. Tourn. *The Crasane, or Bergamot Crasane.* It is also called Beurré Plat, i. e. the flat Butter Pear. This is a middle-sized Pear, hollowed at the crown like an Apple; the stalk is very long and crooked; the skin is rough, of a greenish yellow colour when ripe, covered over with a russet coat; the flesh is extremely tender and buttery, and is full of a rich sugared juice, and is the very best Pear of the season. This is in eating the middle of November.

47. Pyrus (*Dauphine*) sativa, fructu brumali turbinato sessili flavescente saccharato odorato, in ore liquescente. Tourn. *Lansac ou la Dauphine, i. e. the Lansac or Dauphine Pear.* This Pear is commonly about the size of a Bergamot, of a roundish figure, flat towards the head, but a little produced towards the stalk; the skin is smooth, and of a yellowish green colour; the flesh is yellow, tender, and melting; the juice is sugared, and a little perfumed; the eye is very large, as is also the flower, and the stalk is long and strait. When this Pear is upon a free stock, and planted on a good soil, it is one of the best fruits of the season; but when it is on a Quince stock, or upon a very dry soil, the fruit will be small, stony, and worth little. It ripens the end of November.

48. Pyrus (*Martin Sec*) sativa, fructu brumali oblongo, partim intensè, partim dilute ferrugineo, saccharato, odorato. Tourn. *Martin Sec, i. e. the Dry Martin.* This is sometimes called the Dry Martin of Champagne, to distinguish it from another Dry Martin of Burgundy. This Pear is almost like the Rousselet in shape and colour, which has occasioned some persons to give it the name of Winter Russelet. It is an oblong Pear, whose skin is of a deep russet colour on one side, but the other side is inclining to a red; the flesh is breaking and fine; the juice is sugared, with a little perfume, and if grafted on a free stock, is an excellent Pear, but if it be on a Quince stock, it is very apt to be stony. It is in eating the end of November, but if they were permitted to hang their full time on the tree, will keep good two months.

49. Pyrus (*Bigarrade*) sativa, fructu brumali magno sessili, è cinereo flavescente. Tourn. *La Villaine d'Anjou, i. e. the Villain of Anjou.* It is also called Poire Tulipée, i. e. the Tulip Pear, and Bigarrade, i. e. the Great Orange. This is a large round Pear, with a very long slender stalk; the skin is of a pale yellow colour; the flesh is breaking, but not very full of juice. This is in eating the end of November.

50. Pyrus (*Poire de gros queüe*) sativa, fructu brumali flavescente odoratissimo, pediculo crassiori. Tourn. *Poire de gros queüe, i. e. the large stalked Pear.* This is a large roundish Pear, with a yellow skin; the stalk is very thick, from whence it had the name; the flesh is breaking and dry, and has a very musky flavour; but it is apt to be stony, especially if it be planted in a dry soil, or grafted on a Quince-stock, as are most of the perfumed Pears.

51. Pyrus (*Amadote*) sativa, fructu brumali turbinato rufescente odorato. *L'Amadote, i. e. The Amadot Pear.* This is a middle-sized Pear, somewhat long, but flat at the top; the skin is generally rough, and of a russet colour; the flesh is dry and high flavoured, if grafted on a free stock. The wood of this tree is generally

generally thorny, and is esteemed the best sort of Pear for stocks to graft the melting Pears upon, because it gives them some of its fine musky flavour. It is in eating the beginning of December, but will keep good six weeks.

52. Pyrus (*Bouvar*) sativa, fructu brumali, globoso, dilutè virente, tuberoso, punctato, in ore liquescente. Tourn. *Petit Oin, i. e. Little Lard Pear.* It is also called Bouvar and Rousette d'Anjou, i. e. the Russet of Anjou; and Amadont, and Marveille d'Hyver, i. e. the Wonder of the Winter. This Pear is of the size and shape of the Ambret or Leschasserie, but the skin is of a clear green colour, and a little spotted; the stalk is pretty long and slender; the eye is large, and deeply hollowed; the flesh is extremely fine, and melting; the juice is much sugared, and has an agreeable musky flavour. It is in eating the middle of December, and is esteemed one of the best fruits in that season. This is better on a free stock than upon the Quince.

53. Pyrus (*Louisebonne*) sativa, fructu brumali, longo, è viridi albicante, in ore liquescente. Tourn. *Louisebonne, i. e. the Good Lewis Pear.* This Pear is shaped somewhat like the St. Germain, or the Autumn Verte-longue, but is not quite so much pointed; the stalk is very short, fleshy, and somewhat bent; the eye and the flower are small; the skin is very smooth; the colour is green, inclining to a pale colour when ripe; the flesh is extremely tender and full of juice, which is very sweet, especially when it grows upon a dry soil, otherwise it is apt to be very large and ill tasted. It is in eating the beginning of December.

54. Pyrus (*Colmar*) sativa, fructu brumali, tuberoso, è viridi flavescente, punctato, saccharato. Tourn. *Poire de Colmar, i. e. the Colmar Pear.* It is also called Poire Manne, the Manna Pear, and Bergamotte tardive, the late Bergamot. This Pear is somewhat like a Boncrêtien in shape, but the head is flat; the eye is large, and deeply hollowed; the middle is larger than the head, and is sloped toward the stalk, which is short, large, and a little bent; the skin is green, with a few yellowish spots, but is sometimes a little coloured on the side next the sun; the flesh is very tender, and the juice is greatly sugared. It is in eating the latter end of December, but will often keep good till the end of January, and is esteemed one of the best fruits of that season.

55. Pyrus (*L'Eschasserie*) sativa, fructu brumali, globoso, citriformi, flavescente, punctato, in ore liquescente, saccharato, odoratissimo. Tourn. *L'Eschasserie.* It is also called Vertelongue d'Hyver, i. e. the Winter long green Pear, and Besidéri Landri, i. e. the Landry Wilding. This Pear is shaped like a Citron; the skin is smooth, and of a green colour, with some spots while it hangs on the tree, but as it ripens it becomes of a yellowish colour; the stalk is strait and long; the eye is small, and not hollowed; the flesh is melting, and buttery; the juice is sugared, with a little perfume. It is in eating the latter end of December.

56. Pyrus (*Virgouleuse*) sativa, fructu brumali longo, è viridi flavescente, in ore liquescente, saccharato. Tourn. *Le Virgoulé, or La Virgouleuse.* It is also called Bujaleuf, and Chambrette; and Poire de Glasse, i. e. the Ice Pear in Gascoigne; but it is called Virgoule, from a village of that name in the neighbourhood of St. Leonard in Limousin, where it was raised and sent to Paris by the Marquis of Chambret. This Pear is large, long, and of a green colour, inclining to yellow as it ripens; the stalk is short, fleshy, and a little bent; the eye is of a middling size, and a little hollowed; the skin is very smooth, and sometimes a little coloured towards the sun; the flesh is melting, and full of a rich juice. It is in eating the latter end of December, and will continue good till the end of January, and is esteemed one of the best fruits of the season; but the tree is very apt to produce vigorous shoots, and the blossoms being generally produced at the extreme part of the shoot, when they are shortened, the fruit will be entirely cut away, which is the reason it is condemned as a bad bearer; but when it is grafted on a free stock, it ought to be allowed at least forty feet to spread; and if upon a Quince stock, it should be allowed upwards of thirty feet, and the branches trained in against the espalier or wall, at full length, in a horizontal position, as they are produced. Where this tree is thus treated, it will bear very plentifully, and the fruit will be good.

57. Pyrus (*Ambrette*) sativa spinosa, fructu globoso, sessili, ferrugineo, in ore liquescente, saccharato, odoratissimo. Tourn. *Poire d'Ambrette.* This is so called from its musky flavour, which resembles the smell of the Sweet Sultan Flower, which is called Ambrette in France. This Pear is like the Leschasserie in shape, but is of a russet colour; the eye is larger, and more hollowed; the flesh is melting, and the juice is richly sugared and perfumed; the seeds are large and black, and the cells in which they are lodged are very large; the wood is very thorny, especially when grafted on free stocks. The fruit is in eating the latter end of December, and continues good till the latter end of January, and is esteemed a very good fruit by most people.

58. Pyrus (*Epine d'Hyver*) sativa, fructu brumali, magno, pyramidato, albido, in ore liquescente, saccharato, odorato. Tourn. *Epine d'Hyver, i. e. Winter-thorn Pear.* This is a large fine Pear, nearly of a pyramidal figure; the skin is smooth, and of a pale green colour, inclining to yellow as it ripens; the stalk is short and slender; the flesh is melting and buttery; the juice is very sweet, and in a dry season, is highly perfumed; but when it is planted on a moist soil, or the season proves wet, it is very insipid, so that it should never be planted on a strong soil. It ripens the end of December, and will continue good two months.

59. Pyrus (*Saint Germain*) sativa, fructu brumali longo, è viridi flavescente, in ore liquescente. Tourn. *La Saint Germain, i. e. the St. Germain Pear.* It is also called L'Inconnüe de la Fare, i. e. the Unknown of La Fare; it being first discovered upon the banks of a river which is called by that name, in the parish of St. Germain. This is a large long Pear, of a yellowish green colour when ripe; the flesh is melting, and very full of juice, which in a dry season, or if planted on a warm dry soil, is very sweet; but when it is planted on a moist soil, the juice is very apt to be harsh and austere, which renders it less esteemed by some persons, though in general it is greatly valued. This is in eating from the end of December till February.

60. Pyrus (*Saint Austin*) sativa, fructu brumali tuberoso subacido flavescente punctato. Tourn. *Saint Austin.* This is about the size of a middling Virgoulé Pear, but is somewhat shorter and slenderer near the stalk; the skin is of a fine Citron colour, spotted with red on the side next the sun; the flesh is tender, but not buttery, and is pretty full of juice, which is often a little sharp, which to some persons is disagreeable, but others value it on that account. This is in eating in December, and will continue good two months.

61. Pyrus (*Boncrêtien d'Espagne*) sativa, fructu brumali pyramidato, partim purpureo, punctis nigris conspersо, flavescente. Tourn. *Boncrêtien d'Espagne, i. e. the Spanish Boncrêtien.* This is a large Pear, of a pyramidal form, of a fine red or purple colour on the side next the sun, and full of small black spots; the other side is of a pale yellow colour, the flesh is breaking, and when it is on a light rich soil, and grafted on a free stock, its juice is very sweet. It ripens in the end of December, and will continue good a month or six weeks. If this be grafted on a Quince stock, it is very apt to be dry and stony. This is a very good fruit for baking.

62. Pyrus (*Poire de Livre*) sativa, fructu brumali, magno, oblongo, turbinato, ferrugineo, utrinque umbilicato. Tourn. *Poire de Livre, i. e. the Pound Pear.*

It is also called Gros Ratteau Gris, i. e. the gray raked Pear; and Poire d'Amour, i. e. the lovely Pear. In England this is called Parkinson's Warden, or the Black Pear of Worcester. This is a very large Pear, each of which commonly weighs a pound or more; the skin is rough, and of an obscure red colour on the side next the sun, but somewhat paler on the other side; the stalk is very short, and the eye is greatly hollowed. This is not fit for eating, but bakes or stews exceeding well, and is in season from December to March.

63. Pyrus (*Besi de Cassoy*) sativa, fructu brumali parvo flavescente, maculis rubris consperso. Tourn. *Besi de Cassoy, i. e. the Wilding of Cassoy*; a forest in Bretagne, where it was discovered, and passes under the name of Rousset d'Anjou. It is also called Petit Beurré d'Hyver, i. e. Small Winter Butter Pear. This is a small oblong Pear, of a yellowish colour, spotted with red; the flesh is melting, and the juice is very rich. It is in eating in December and January. This is a prodigious bearer, and commonly produces its fruit in large clusters, provided it be not too much pruned; for it generally produces its blossom-buds at the extremity of its shoots, which if shortened, the fruit would be cut away. There was a tree of this kind in the gardens of Camden-house near Kensington, which generally produced a great quantity of fruit.

64. Pyrus (*Martin-sire*) sativa, fructu brumali turbinato inæquali, ventre tumido, partim purpureo, partim flavescente. Tourn. *Ronville*. It is also called Hocrenaille and Martin-sire, i. e. the Lord Martin Pear. This Pear is about the size and shape of a large Rousselet; the eye is of a middling size, and hollowed a little; the middle of the Pear is generally swelled more on one side than on the other, but is equally extended towards the stalk; the skin is very smooth and soft, and is of a lively red colour next the sun, but on the other side it changes yellow as it ripens. The flesh is breaking and full of juice, which is very sweet and a little perfumed; but if grafted on a Quince stock, is very apt to be small and stony.

65. Pyrus (*Citron d'Hyver*) sativa, fructu brumali citriformi flavescente duro moschato odoratissimo. Tourn. *Citron d'Hyver, i. e. the Winter Citron Pear*. It is also called the Musk Orange Pear, in some places. This is a pretty large Pear, in shape and colour very like an Orange or Citron, from whence it had its name. The flesh is hard and dry, and very subject to be stony, for which reasons it is not valued as an eating Pear, but will bake very well. It is in season from December to March.

66. Pyrus (*Rousselet d'Hyver*) sativa, fructu brumali oblongo, è viridi flavescente, saccharato, saporis austeri. Tourn. *Rousselet d'Hyver, i. e. the Winter Russelet*. This is by some supposed to be the same Pear as is called the Dry Martin, but it is very different from that in several particulars. The colour of this is a greenish yellow, inclining to brown; the stalk is long and slender, and the flesh is buttery and melting, and generally full of juice, which is very sweet, but the skin is apt to contain an austere juice, so that if it be not pared, it is apt to be disagreeable to many persons palates. It is in eating in January and February.

67. Pyrus (*Portail*) sativa Pictaviensis, fructu brumali globoso sessili saccharato odorato. Tourn. *Poir Portail, i. e. the Gate Pear*. This Pear was discovered in the province of Poictou, where it was so much esteemed, that they preferred it to most other fruit, though in the opinion of the most curious judges, it does not deserve the great character which is given to it; for it rarely happens that it proves good for eating, being generally dry, stony, and hard, unless in extraordinary seasons, and upon a very good soil. This must always be grafted on a free stock, and should be planted on a light rich soil; and in very dry seasons the trees should be watered, otherwise the fruit will be stony. It is in season from January to March, and bakes well.

68. Pyrus (*Franc-real*) sativa, fructu brumali magno globoso flavescente, punctis rufis consperso. Tourn. *Franc-real*. It is also called Fin-or d'Hyver, i. e. the Golden End of Winter. This is a very large Pear, almost of a globular figure; the skin is yellow, spotted with red; the stalk is short, and the wood of the tree mealy. The flesh of this Pear is dry, and very apt to be stony, but it bakes exceeding well, and continues good from January till March.

69. Pyrus (*Easter Bergamot*) sativa, fructu brumali turbinato sessili subacido flavescente, punctis asperioribus consperso. Tourn. *Burgamotte Bugi*. It is also called Bergamotte de Pasque, i. e. the Easter Bergamot. It is a large Pear, almost round, but is a little produced in length towards the stalk; the eye is flat and the skin is green, having many rough protuberances like spots dispersed all over, but, as it ripens, becomes yellowish; the flesh is breaking, and in a good season the juice is sweet; but it must have a free stock, a south-east wall, and have a good soil, otherwise it is apt to be stony and austere. It is in eating from February till April.

70. Le (*Muscat of Germany*) Muscat d'Alaman, i. e. *The German Muscat*. This is an excellent Pear, more long than round, of the shape of the Winter-royal, but is less toward the eye, and is more russet, and of a red colour next the sun; it is buttery, melting, and a little musky. This is in eating in March, April, and sometimes in May, if it is well preserved.

71. Le Bergamotte (*Holland Bergamot*) d'Hollande, i. e. *The Holland Bergamot*. It is large and round, of the shape of the ordinary Bergamot. The colour is greenish, the flesh is half buttery and tender, the juice is highly flavoured. This is a very good Pear, and will keep till April.

72. Le Poire (*Naples Pear*) de Naples, i. e. *The Pear of Naples*. This is a pretty large, long, greenish Pear; the flesh is half breaking; the juice is sweet, and a little vinous. It is in eating in March. I am in doubt whether this Pear is not in some places taken for a Saint Germain, for there is a Pear in some gardens, very like the Saint Germain, which will keep till April, and this Pear agrees with the characters of that. It is called in England the Easter St. Germain.

73. Pyrus (*Boncrêtien d'Hyver*) sativa, fructu brumali magno pyramidato, è flavo nonnihil rubente. Tourn. *Boncrêtien d'Hyver, i. e. the Winter Boncrêtien Pear*. This Pear is very large and long, of a pyramidal figure; the skin is of a yellowish colour, but the side next the sun inclines to a soft red; the flesh is tender and breaking, and is very full of rich sugared juice. This is esteemed in France one of the best winter Pears, but in England it is seldom so good; though I am fully satisfied, if it were grafted on a free stock, and planted in a good soil, against a wall exposed to the south-east, and the branches trained at full length, it might be rendered more acceptable than it is at present in England.

74. Pyrus (*Cadillac*) sativa, fructu brumali magno, cydoniæ facie, partim flavo, partim purpurea. Tourn. *Catillac, or Cadillac*. This is a large Pear, shaped somewhat like a Quince; the skin is for the most part of a yellow colour, but changes to a deep red on the side next the sun; the flesh is hard, and the juice austere, but it is a very good fruit for baking, and being a plentiful bearer, deserves a place in every good collection of fruit. It will be good from Christmas to April, or longer.

75. Pyrus (*Pastorelle*) sativa, fructu brumali oblongo flavescente, punctis rubris consperso. *La Pastorelle*. This Pear is of the size and shape of a fine Rousselet; the stalk is short and crooked; the skin is somewhat rough, of a yellowish colour, spotted with red; the flesh is tender and buttery, and when it grows on a dry soil, the juice is very sweet; but on a wet soil, or in moist years, it is subject to have an austere taste. This Pear is in eating in February and March.

76. Pyrus (*Double Fleur*) sativa, fructu brumali sessili, partim flavescente, partim purpurascente. Tourn.

La

*La Double Fleur, i. e. the double-flowering Pear.* This is so called, because the flowers have a double range of petals or leaves. It is a large short Pear; the stalk is long and strait; the skin is very smooth, and of a yellowish colour, but the side next the sun is commonly of a fine red or purple colour. This is by some esteemed for eating, but it is generally too austere in this country for that purpose. It is the best Pear in the world for baking or composts. It is good from February to May.

77. Pyrus (*Saint Martial*) sativa, fructu brumali oblongo, partim flavescente, partim purpurascente. *Saint Martial.* It is also called in some places Poire Angelique, i. e. the Angelic Pear; and in the south of France, Poire Douce. This Pear is oblong, in shape like the Boncrêtien, but not so large, and a little flatter at the crown; it has a very long stalk; the skin is smooth and yellowish, but on the side next the sun it turns to a purplish colour; the flesh is tender and buttery, and the juice is very sweet. This is in eating in February and March.

78. Pyrus (*Besi Chaumontelle*) sativa, fructu brumali oblongo, partim albido, partim purpureo odorato, saccharato. *La Poire de Chaumontelle, or Besi de Chaumontelle, i. e. the Wilding of Chaumontelle.* This Pear is in shape somewhat like the Autumn Beurré, but is flatter at the crown; the skin is a little rough, of a pale green colour, but turns to a purplish colour next the sun; the flesh is melting; the juice is very rich, and a little perfumed. It is in eating from November to January, and is esteemed by some as the best late Pear yet known.

79. Pyrus (*Carmelite*) sativa, fructu brumali globoso sessili cinereo maculis amplis obscurioribus consperso. Tourn. *Carmelite.* This is a middle-sized Pear, of a roundish form; the skin is of a gray colour on one side, but is inclining to a red on the other, having some broad spots of a dark colour all over; the flesh is commonly hard and dry, so that it is not very much esteemed. It is in season in March.

80. Pyrus (*Union*) sativa, fructu brumali maximo pyramidato, dilutè virente. *The Union Pear, otherwise called Dr. Uvedale's St. Germain.* This is a very large long Pear, of a deep green colour, but the side next the sun doth sometimes change to a red as it ripens. This is not fit for eating, but bakes very well; and being a great bearer, and a very large fruit, deserves a place in every good collection. It is in season from Christmas to April.

There are many other sorts of Pears, which are still continued in some old gardens; but as those here mentioned are the best sorts known at present, it would be needless to enumerate a great quantity of ordinary fruit; since every one who intends to plant fruit-trees, would rather chuse those which are the most valued, the expence and trouble being the same for a bad sort of fruit as a good one. Indeed I have inserted many more than are really worth planting, in order to please such who are fond of great variety; but whoever hath a mind to make choice of such only as are good, may easily distinguish them, by attending to the account given of each sort, and hereby every person is at liberty to please himself; for it is not every one who prefers a Beurré Pear, though that is generally esteemed the very best in its proper season; there are some who admire the Messire Jean, for the firmness of its flesh, which to others is a great objection against it; so that as some esteem the breaking, and others the melting Pears, I have distinguished them by their descriptions in such a manner, that every one may make choice of the kinds of fruit which are agreeable to their palates; and the different seasons in which each kind is in eating, being exhibited (allowing a little for the difference of seasons, which are earlier some years than others) it is not very difficult for a person to make a collection of good Pears to succeed each other throughout the season of these fruits, both for eating and baking.

The time of each fruit ripening, as here set down, is taken at a medium for seven years, and in the neighbourhood of London, where all sorts of fruit generally ripen a fortnight or three weeks earlier than in almost any part of England; and it is very obvious to every person who will attend to the culture of fruit-trees, that their time of ripening is accelerated by long cultivation; for many of the sorts of Pears, which some years past rarely became ripe in England, unless they grew against the best aspected walls, are now found to ripen extremely well on espaliers and dwarfs; and those Pears which seldom were in eating till January, are ripe two months earlier. There is also a very great difference in their time of ripening in different seasons, for I have known the fruit of a Pear-tree in one year all ripe and gone by the middle of October, and the very next year the fruit of the same tree has not been fit to eat till the end of December, so that allowance should be made for these accidents. The Besi de Chaumontelle Pear, about forty years past, was seldom fit to eat before February, and has continued good till the middle of April, but now this Pear is commonly ripe in November; and when it is planted on a warm soil, and against a good aspected wall, it is in eating the middle or end of October. This forwarding of the several kinds of Pears, may be in some measure owing to the stocks upon which they are grafted; for if they are grafted upon early summer Pear stocks, they will ripen much earlier than when they are upon hard winter Pear stocks; and if some of the very soft melting Pears were grafted upon such stocks as are raised from the most austere fruit, such as are never fit to eat, and of which the best perry is made, it would improve those fruits, and continue them much longer good; or if the common free stocks were first grafted with any of these hard winter Pears, and when they have grown a year, then to graft or bud these soft melting Pears upon them, it would have the same effect; but the Pears so raised will require a year's more growth in the nursery, and consequently cannot be sold at the same price as those which are raised in the common method, these requiring to be twice budded or grafted, so that there is double labour, beside standing a full year longer; but this difference in the first expence of the trees, is not worth regarding by any person who is desirous to have good fruit; for the setting out in a right way is that which every one should be the most careful of, since by mistaking at first, much time is lost, and an after expence of new trees often attends it.

Another cause of fruits ripening earlier now than they formerly did, may be from the length of time they have been cultivated; for it is very certain, that most sorts of plants have been greatly forwarded and improved by culture, within the space of thirty or forty years, as may be known from the several sorts of esculent plants, which are cultivated in the kitchen-gardens, and of which sorts there are many which are annually improving: and if we look back to the best French authors who have written on the subject of fruit-trees, we shall find, that the times of ripening of many sorts of Pears are put down a month or six weeks later about fifty or sixty years ago, than they are now found to ripen about Paris; and here about London it is much the same, for I cannot find they are the least forwarder in the times of their ripening at Paris than at London.

The ripening of these fruits may also be accelerated by the method of pruning and managing these trees, which are greatly improved within the space of a few years past; for if we look into the directions which are given by the best writers on this subject, we shall soon discover how little they knew fifty years ago, of the true method of pruning and managing most sorts of fruit-trees, scarce one of them making any difference in the management of the different kinds of fruit.

Pears are propagated by budding or grafting them upon stocks of their own kind, which are commonly called free stocks, or upon Quince stocks, or White-thorn, upon all which these fruits will take; but the latter sort of stock is now seldom used, because they

never keep pace in their growth with the fruit budded or grafted upon them; as also because the fruit upon such stocks are commonly drier, and more apt to be stony, than when they are upon Pear stocks. Quince stocks are greatly used in the nurseries for all sorts of Pears which are designed for dwarfs or walls, in order to check the luxuriancy of their growth, so that they may be kept within compass better than upon free stocks. But against the general use of these stocks, for all sorts of Pears indifferently, there are very great objections: 1st, Because some sorts of Pears will not thrive upon these stocks, but in two or three years decay, or at most will but just keep alive. 2dly, Most of the sorts of hard breaking Pears are rendered stony, and good for little; so that whenever any of these sorts are thus injudiciously raised, the fruit, although the kind be ever so good, is condemned as good for nothing by such as are not well acquainted with it, when the fault is entirely owing to the stock on which it was grafted. On the contrary, most melting buttery Pears are greatly improved by being upon Quince stocks, provided they are planted on a strong soil; but, if the ground be very dry and gravelly, no sort of Pear will do well upon Quince stocks in such places.

These general directions being given, there is no occasion to repeat any part of the method in which these stocks are raised, and the fruits budded or grafted thereon, which has been already mentioned under the article of Nurseries.

The distance which these trees should be planted either against walls or espaliers, must not be less than forty feet; for if they have not room to spread on each side, it will be impossible to preserve them in good order, especially those on free stocks, for the more these trees are pruned, the more they will shoot; and, as I said before, many sorts of Pears produce their blossom-buds first at the extremity of the former year's shoots, so that when they are shortened, the fruit will be cut away, and this cannot be avoided, where the trees have not room allowed in their first planting.

This distance, I doubt not, will be objected to by many who have not fully attended to the growth of these trees, especially as it hath been the general practice of most gardeners to plant these trees at less than half the distance which is here mentioned; but, whoever will be at the trouble to view any of these trees which have been some years standing, they will always find, if by accident, one of these trees has been planted against a building, where the branches have had room to spread, that this tree has produced more fruit than twelve trees which have been crouded close, and have not room for their branches to extend. There are some Pear-trees now growing, which spread more than fifty feet in length, and are upward of twenty feet high, which produce a much greater quantity of fruit than if there had been three trees in the same room they would have done, as there are examples enough to prove, where trees are planted against houses and the ends of buildings at about twelve feet, or much less distance, because there is height of walling for them to grow, which is the reason commonly given by those who plant these trees so close together. But one tree will bear more fruit, when the branches are trained horizontally, than three or four trees, whose branches are led upright, and there never can be any danger of the upper part of the wall being left naked or unfurnished; for I have seen a Pear-tree which has spread more than fifty feet in width, and covered the wall upward of thirty-six feet in height; this was a summer Boncrêtien Pear, and was extremely fruitful, which rarely happens to this sort when they are not allowed a large share of room. The finest tree of this sort of Pear, which I have ever seen, was a large standard-tree in my own possession, whose stem was not more than ten feet high, where the branches came out regularly on every side, and extended near thirty feet from the trunk, many of which were by the weight of the fruit in summer brought down to the ground, so they were obliged to be supported with poles all around the tree toward the extremity of the branches, to prevent their lying upon the ground; and this tree had its branches so disposed as to form a natural parabola of forty feet in height, bearing from the lowest to the highest branches; so that in a kindly season, when the blossoms escaped the frost, it hath produced upward of two thousand Pears, which were much better flavoured than any of the same sort which I have yet tasted. This instance I mention, only to shew how much one of these trees will spread, if proper room be allowed it; and also to observe, that as the branches of this tree had never been shortened, they were fruitful to their extremities. This shews the absurdity of the French gardeners, who do not allow more than ten or twelve feet distance to these trees; and some of their most improved writers on this subject have advised the planting an Apple-tree between the Pear-trees, where they are allowed twelve feet; and yet these authors afterward say, that a good Pear-tree will shoot three feet each way in one year; therefore, according to their own observation, the trees so planted will have their branches meet together in two or three years at most, and what must be the case with such trees in five or six years is not difficult to know. But this method of planting has not been peculiar to the French, for most of the gardens in England have been little better planted. Indeed, those persons who were intrusted with the making and planting most of the English gardens, had little skill of their own, so were obliged to follow the directions of the French gardeners; of whom they had so great an opinion, as to get their books translated, and to these have added some trifling notes, which rather betray their weakness; for, where they have objected to the little room which their authors had allowed to these trees, they have, at the most, allowed them but three feet more; from which it is plain, they had not considered the natural growth of the trees, and whoever departs from nature, may be justly pronounced an unskilful gardener.

As most of the English gardens have been made and planted by persons of little judgment, it is very rare to find any of them which produce much fruit; for although many of these gardens have been totally altered and new planted, yet they have seldom been much altered for the better; and the possessors have been put to the expence of removing the old trees, also the earth of their borders, and to purchase new trees, which have been planted perhaps a foot or two farther asunder, than the old trees which were removed; so that when the young trees have grown a few years, they were in the same condition as the old, and it will be the loss of so many years to the owner: but this will constantly be the case, when it is the interest of the persons employed, who can sell so many young trees; and the planting of three times the number of trees in a garden, more than is proper, may in some measure be ascribed to the same, though in many instances I shall be inclinable to think they have proceeded from ignorance, rather than design.

But where fruit-trees have been thus injudiciously planted, if the stocks are healthy and good, the best way to recover this loss is to dig up two or three, and leave every third or fourth tree, according to the distance which they were planted, and spread down the branches of those which are left horizontally; I mean, all such as are capable of being so brought down: but those which are too stubborn for this, should be cut off near the stem, where there will be new shoots enough produced to furnish the wall or espalier; and if the sort of fruit is not the same as desired, the young branches may be budded the same summer, or grafted the following spring with any other sort of Pear, and hereby many years may be saved; for one of these old trees so budded or grafted, will spread to a much greater length, and produce more fruit, when thus managed, in three years, than a new tree will in ten or twelve, especially if the

ground is mended. This is a method which I have practised with great success, where I have been employed to mend the blunders of these great gardeners, as they are stiled, and hereby the walls and espaliers have been well furnished in a few years.

But the next thing to be done, after being furnished with proper trees, is the preparing the ground to receive them; in the doing of which, there should be great regard had to the nature of the soil, where the trees are to grow; for, if it is a strong stiff land, and subject to wet in the winter, the borders should be raised as much above the level of the ground as you conveniently can. And if under the good soil there is a sufficient quantity of lime, rubbish, or stones laid to prevent the roots of the trees from running downward, it will be of great service to the trees. The borders for these should not be less than eight feet broad, but, if they are twelve, it will be still better. And as these borders may be planted with such sorts of esculent plants as do not grow large, or whose roots do not grow deep, or mat together on the surface, these will do no harm to the Pear-trees; for these are not so nice in their culture as Peach and Nectarine-trees, so the turning the ground, and mending it for these crops, will rather improve than injure the trees, provided the plants do not shade the trees, or are not suffered to stand too long upon the borders. But all the Cabbage kind, as also Beans, should be excluded from these borders, because they root deep in the ground, and draw much nourishment from the trees.

But if the soil is shallow, and the bottom is either gravel or chalk, there must be a sufficient depth of good earth laid upon the borders, so as to make them two feet and a half deep; for if the ground is not of this depth, the trees will not thrive well. And, in doing of this, I must caution every person not to dig out the gravel or chalk in a trench, (as is by some practised) and fill this trench with good earth; for by so doing, when the roots of the trees are extended to the width of the trench, they will meet with the gravel which will stop them, so that they will be confined, as if they were in tubs of earth, whereby the trees will soon shew their distress; therefore, when the gravel or chalk is removed, it should be entirely taken away over the whole border, otherwise it will be better to raise the whole border above it.

If the garden is to be new-made from a field, then all the good earth on the surface should be carefully preserved; and, if the good ground is taken out where the walks are designed to be made, and laid upon the borders, or in the quarters, it will add to the depth of the soil, and save expence in bringing in of new earth. If the ground can be prepared one year before it is planted, the trees will thrive the better; for by laying the ground in ridges, and turning it over two or three times, it will loosen the soil, and render it much better for planting; but in trenching or ploughing of the ground, there should be great care taken not to go deeper than the ground is good, otherwise all the good soil will be buried below the roots, and the bad ground will be turned on the top, which is what I have known done at a great expence by persons, who have been at the top of their profession, and have thereby entirely ruined the gardens.

Where there is a necessity of bringing any fresh earth for the borders, it will be proper to do it as soon as possible, and to mix this with the surface of the earth of the borders, that it may be turned over two or three times, that the parts may be well mixed and incorporated before the trees are planted; and, if some very rotten dung is added to this, it will greatly improve it. In chusing of the earth which is to be brought into the garden, there should be this care, viz. That if the natural soil of the garden is light and dry, then the new earth should be loamy and stiff; but where the natural soil is strong or loamy, then the new earth should be light and sandy, which will loosen the parts of the natural soil, and greatly mend it.

There are some persons who recommend laying the whole depth of the borders with what they call virgin earth, that is, such as is taken from a pasture where the land has not been ploughed; but if this is not brought into the garden at least one year before the trees are planted, that by turning it over often it may be sweetened, it will not be so good as that which is taken from a kitchen-garden, where the land is good, and has been well wrought; for by often turning and breaking the soil, it will be better prepared to receive the trees.

Others recommend mixing a great quantity of rotten dung with the earth of the borders, but this is not so proper; for, by making the ground too rich, it will only encourage the luxuriant growth of the trees; therefore it is always better to mend the borders from time to time as they may require, and not to add so much dung in the first making them.

Another care is required in making the borders on wet ground, which is to contrive some covered drains to convey off the water in winter, otherwise, by this being detained about the roots of the trees, it will greatly prejudice them; and in building the walls round a kitchen-garden, where the ground is inclinable to be wet, there should be some arches turned in the foundations of those walls which are in the lowest part of the garden, to let off the wet.

The manner of preparing these trees for planting is the same as hath been directed for other fruit-trees, viz. to cut off all the small fibres from the roots, and to shorten some of the longest roots, and cut off all the bruised ones, or such as shoot downright; this being done, you should plant them in the places intended at the before-mentioned distance. The best time to plant these trees (if upon a middling or dry soil) is in October or November, leaving their heads on till spring, which should be fastened either to the walls or stakes, to prevent the wind from disturbing their roots; and in the beginning of March their heads should be cut off in the manner already directed for Peaches and other fruit-trees, observing also to lay some mulch upon the surface of the ground about their roots when they are planted, as hath been several times already directed for other trees; but in wet ground the trees may be planted in February, or the beginning of March, at any time before the buds are much swelled, but these may be cut down when they are planted.

The first summer after planting, the branches should be trained to a wall or espalier (against which they are planted) in a horizontal position, as they are produced, without shortening them; and the Michaelmas following, some of these shoots should be shortened down to five or six eyes, in order to obtain a sufficient quantity of branches, to furnish the lower part of the wall or espalier; but the shoots ought not to be shortened, unless where there is a want of branches to fill a vacancy; therefore the less a knife is used to these trees, the better they will succeed; for, whenever the shoots are stopped, it occasions the buds immediately below the cut to send forth two or more shoots, whereby there will be a confusion of branches, and rarely any fruit is produced with this management.

The distance which the branches of Pears should be trained, must be proportioned to the size of their fruit; therefore such sorts, whose fruit are small, may be allowed five or six inches, but the larger sorts must not be less than seven or eight inches asunder. If this be duly observed, and the branches carefully trained horizontally as they are produced, there will be no occasion for so much cutting as is commonly practised on these trees, which, instead of checking their growth, does, on the contrary, cause them to shoot the stronger.

It is very surprising to read the tedious methods, which most of the writers on fruit-trees have directed for pruning these trees; for, by their prolix and perplexed methods, one would imagine they had endeavoured to render themselves as unintelligible as possible; and this, I am sure, may be affirmed, That it is next to impossible for a learner ever to arrive at

any tolerable ſkill in pruning by the tedious and perplexed directions which are publiſhed by Monſieur Quintiny, and thoſe who have copied from him; for, as theſe have all ſet out wrong in the beginning, by allowing their trees leſs than half the diſtance which they ſhould be planted, they have preſcribed rules to keep them within that compaſs, which are the moſt abſurd, and contrary to all reaſon, therefore ſhould not be practiſed by thoſe perſons who are deſirous of having plenty of fruit.

I ſhall therefore only lay down a few neceſſary directions for pruning and managing theſe trees, which ſhall be done in as few words as poſſible, that a learner may the more eaſily underſtand it, and which (together with proper obſervations) will be ſufficient to inſtruct any perſon in the right management of them.

Pear-trees generally produce their bloſſom-buds firſt at the extremity of the laſt year's ſhoots, ſo that if theſe are ſhortened, the bloſſoms are cut off; but this is not all the damage, for (as I before ſaid) this occaſions the buds immediately below the cut to put forth two or more ſhoots, whereby the number of branches will be increaſed, and the tree crowded too much with wood; beſides, thoſe buds, which by this management produce ſhoots, would have only produced curſons or ſpurs, upon which the bloſſom-buds are produced, if the leading branch had not been ſhortened; therefore theſe ſhould never be ſtopped, unleſs to furniſh wood to fill a vacancy.

It is not neceſſary to provide a new ſupply of wood in Pear-trees, as muſt be done for Peaches, Nectarines, &c. which only produce their fruit upon young wood; for Pears produce their fruit upon curſons or ſpurs, which are emitted from branches which are three or four years old; which curſons continue fruitful many years, ſo that, where theſe trees have been ſkilfully managed, I have ſeen branches which have been trained horizontally upwards of twenty feet from the trunk of the tree, and have been fruitful their whole length. And if we do but carefully obſerve the branches of a healthy ſtandard-tree, which has been permitted to grow without pruning, we ſhall find many that are ten or twelve years old, or more, which are very full of theſe curſons, upon which a good number of fruit is annually produced.

During the ſummer ſeaſon theſe trees ſhould be often looked over to train in the ſhoots, as they are produced, regularly to the wall or eſpalier, and to diſplace fore-right and luxuriant branches as they ſhoot out, whereby the fruit will be equally expoſed to the air and ſun, which will render them more beautiful and better taſted than when they are ſhaded by the branches; and by thus managing the trees in ſummer, they will always appear beautiful, and in winter they will want but little pruning.

Where Pear-trees are thus regularly trained without ſtopping their ſhoots, and have full room for their branches to extend on each ſide, there will never be any occaſion for diſbarking the branches, or cutting off the roots (as hath been directed by ſeveral writers on gardening;) which methods, however they may anſwer the intention for the preſent, yet will certainly greatly injure the trees, as muſt all violent amputations, which ſhould ever be avoided as much as poſſible on fruit-trees; and this, I am ſure, can never be wanted, where trees have been rightly planted, and regularly trained, while young.

The ſeaſon for pruning theſe trees is any time after the fruits are gathered, until the beginning of March; but the ſooner it is done after the fruit is gathered, the better, for reaſons already given for pruning of Peach-trees; though indeed the deferring of theſe until ſpring, where there are large quantities of trees to prune, is not ſo injurious to them, as to ſome tender fruits; but if the branches are regularly trained in ſummer, and the luxuriant ſhoots rubbed off, there will be little left to do to them in winter.

All the ſorts of Summer Pears will ripen very well either on ſtandards, dwarfs, or eſpaliers, as will all Autumn Pears upon dwarfs or eſpaliers; but, where a perſon is very curious in his fruit, I would always adviſe the planting them againſt eſpaliers, in which method they take up but little room in a garden, and, if they are well managed, appear very beautiful; and the fruit is larger and better taſted than thoſe produced on dwarfs, as hath been already obſerved; but ſome of the Winter Pears muſt be planted againſt eaſt, ſouth-eaſt, or ſouth-weſt walls, otherwiſe they will not ripen well in England in bad ſeaſons.

But although this may be the caſe with ſome of the late Winter Pears in very bad ſeaſons, yet, in general, moſt ſorts of them will ripen extremely well in all warm ſituations, when they are planted in eſpalier, and the fruit will be better flavoured than that which grows againſt walls, and will keep much longer good; for, as the heat againſt walls which are expoſed to the ſun will be very great at ſome times, and at others there will be little warmth, all fruit which grow near them, will be haſtened unequally, and therefore is never ſo well flavoured as the ſame ſorts are which ripen well in the open air; and all the fruit, which is ripened thus unequally, will decay much ſooner than thoſe which ripen gradually in the open air; therefore thoſe Winter Pears which grow in eſpalier, may be kept ſix weeks longer than thoſe which grow againſt walls, which is a very deſirable thing; for to have plenty of theſe fruit at a ſeaſon when it is very rare to find any other fruit to ſupply the table but Apples, is what all lovers of fruit muſt be greatly pleaſed to enjoy; which is what may be effected by planting many of the late ſorts in eſpalier, where, although the fruit will not be ſo well coloured as thoſe from the walls, yet they will be found exceeding good. When the Beſi de Chaumontelle came firſt to England, the trees were planted in eſpalier, and ſome of them not on a very good ſoil, or in a warm ſituation, and yet from theſe trees I have eaten this Pear in great perfection in April, and ſometimes it has kept till May; whereas, all thoſe which have been ſince planted againſt walls ripen their fruit by the beginning of November, and are generally gone by the middle of December; nor are the latter ſo well taſted as thoſe off the eſpaliers.

The Virgoleuſe and St. Germain, as alſo the Colmar, are eſteemed the moſt difficult ſorts to ripen their fruit, yet theſe I have eaten in great perfection from eſpaliers, and often from ſtandard-trees, where they grew upon a warm ſoil; but the fruit was much ſmaller on the ſtandard-trees than thoſe of the ſame ſorts which grew againſt walls or eſpaliers, but they were full as well flavoured, and ſome of theſe ſorts I have eaten good in April, which is two months later than they uſually keep; but yet I would not adviſe the planting theſe late Pears in ſtandard-trees, becauſe they ſhould hang very late on the trees in autumn, at which ſeaſon the winds are generally very high; and theſe ſtandard-trees being much expoſed, the fruit is often blown off the trees before they are ripe; and thoſe of them, which may hang on the trees, are frequently bruiſed by being forced againſt the branches by the winds, ſo that they ſeldom keep well. What I mentioned this for, is to prove, that theſe Pears will ripen very well without the aſſiſtance of a wall; ſo that if they are planted in eſpaliers where the trees are kept low, the fruit will not be ſo much expoſed to the ſtrong winds in autumn as thoſe on the ſtandards, therefore can be in no danger of the fruit coming to perfection; and as the trees in eſpaliers will be conſtantly pruned, and managed in the ſame manner as thoſe againſt walls, the fruit will be as large on thoſe trees; therefore, where a perſon has a warm ſituation and a kindly ſoil, I would not adviſe the being at an expence to build walls on purpoſe for Pears, but to plant them againſt eſpaliers: and where there is any one who is very curious in having plenty of theſe fruit, and will be at the expence to procure them, I ſhould adviſe having a ſufficient quantity of Reed mats made to fix up againſt the back of the eſpalier in the ſpring, when the trees are in bloſſom, which will ſcreen them from

from cold winds, and preserve the tender fruit until they are past danger, when the Reeds may be taken down, and put under a shed to preserve them from the weather; and if the autumn should prove bad, these Reeds may be fixed up again, which will forward the ripening of the fruit, and also prevent the winds from blowing down, and bruising it. These Reeds may be purchased for one shilling per yard, running measure, at six feet and a half high; and if they are carefully laid up, and kept from the weather, these Reeds will last seven or eight years, so that the expence will not be very great; and when the advantages which these are of to the fruit are considered, I believe no person will object to the use of them.

But after the fruit is set and growing, there will be farther care necessary in order to have the fruit good; for it is not enough to have preserved a good crop of fruit on the trees, and then leave them entirely to nature during the season of their growth, but there will require some skill and attendance on the trees to help nature, or supply the deficiency of seasons; for beside the pruning and training trees in the manner before directed, there will also be wanting some management of their roots, according to the nature of the soil, and the difference of seasons. In all strong land, where the ground is apt to bind very hard in dry weather, the surface of the borders should be now and then forked over to loosen the earth, which will admit the showers and large dews to penetrate and moisten the ground, and be of great service to the trees and fruit, and also prevent the growth of weeds. And if the soil is light and dry, and the season should prove hot and dry, there should be large hollows made round the stems of the trees to hold water; and into each of these there should be poured eight or nine pots of water, which should be repeated once in a week or ten days during the months of June and July, if the season should continue dry. There should also be some mulch laid over the surface of these hollows, to prevent the sun and air from drying the ground. Where this is practised, the fruit will be kept constantly growing, and prove large and plump; whereas, if this is omitted, the fruit will often be small, grow crooked, crack, and fall off from the trees. For if the fruit is once stinted in their growth, and rain should fall plentifully after, it will occasion a great quantity of fruit to fall off the trees, and those which remain to ripen will not keep so long as those which never receive any check in their growth; and it is from this cause, that some years the fruit in general decays before the usual time. For after it has been for some time stinted in its growth, and then the season proves favourable, whereby it receives a sudden growth, it becomes so replete with juice, as to distend the vessels too suddenly, so that they will not be firm, which occasions their decay; therefore it is always best to keep the fruit constantly in a growing state, whereby it will acquire a proper size, and be rendered better flavoured.

There will also be required some dressing to the ground near the fruit-trees; but this should be laid on in autumn, after the trees are pruned. This dressing should be different, according to the nature of the soil; if the land is warm and dry, then the dressing should be of very rotten dung, mixed with loam; and if this is mixed six or eight months before it is laid upon the borders, and three or four times turned over, it will be the better; as will also the mixture, if it is made with neat's or hog's dung, both which are colder than horse dung, so more proper for hot land. But in cold stiff land, rotten horse dung, mixed with light sandy earth, or sea-coal ashes, will be the most proper, as this will loosen the ground and add a warmth to it.

These dressings should be repeated every other year, otherwise the trees will not thrive so well, nor will the fruit be so good. For, notwithstanding what many persons have advanced to the contrary, yet experience is against them; for the finest fruit in England, both as to size and flavour, is produced on land which is the most dunged and worked. Therefore I would advise trenching the ground about the fruit-trees very well every winter, for I am sure they will find it answer their expectations who shall practise this method. And where the ground in the quarters is well dressed and trenched, the fruit-trees will partake of the benefit; for as the trees advance in their growth, so their roots are extended to a great distance from their stems; and it is chiefly from the distant roots that the trees are supplied with their nourishment; therefore dressing the borders only, will not be sufficient for fruit-trees which are old.

In gathering of Pears, great regard should be had to the bud which is formed at the bottom of the footstalk, for the next year's blossoms; which, by forcing off the Pear before it be mature, is many times spoiled; for while the fruit is growing, there is always a bud formed by the side of the foot-stalk upon the same spur, for the next year's fruit; so that when the Pears are ripe, if they are gently turned upward, the foot-stalk will readily part from the spur, without injuring the bud.

The season for gathering all Summer Pears is just as they ripen, for none of these will remain good above a day or two after they are taken from the tree; nor will many of the Autumn Pears keep good above ten days or a fortnight after they are gathered. But the winter fruits should hang as long upon the trees as the season will permit; for they must not receive the frost, which will cause them to rot, and render their juices flat and ill tasted; but if the weather continue mild until the end of October, it will then be a good season for gathering them in, which must always be done in dry weather, and when the trees are perfectly dry.

In the doing of this you ought carefully to avoid bruising them, therefore you should have a broad flat basket to lay them in as they are gathered; and when they are carried into the store-room, they should be taken out singly, and each sort laid up in a close heap on a dry place, in order to sweat, where they may remain for ten days or a fortnight; during which time the windows should be open to admit the air, in order to carry off all the moisture which is perspired from the fruit; after this, the Pears should be taken singly, and wiped dry with a woollen cloth, and then packed up in close baskets, observing to put some Wheat straw in the bottoms, and round the sides of the baskets, to prevent their bruising against the baskets. And if some thick soft paper is laid double or treble all round the basket, between the straw and the Pears, this will prevent the Pears from imbibing the musty taste which is communicated to them by the straw, when they are contiguous; which taste often penetrates through the skin so strongly, that when the fruit is pared, the taste will remain. You should also observe to put but one sort of fruit into a basket, lest by their different fermentations, they should rot each other; but if you have enough of one sort to fill a basket which holds two or three bushels, it will be still better. After you have filled the baskets, you must cover them over with Wheat straw very close, first laying a covering of paper two or three times double over the fruit, and fasten them down; then place these baskets in a close room, where they may be kept dry and from frost; but the less air is let into the room, the better the fruit will keep. It will be very necessary to fix a label to each basket, denoting the sort of fruit therein contained, which will save the trouble of opening them, whenever you want to know the sorts of fruit; besides, they ought not to be opened before their season to be eaten, for the oftener they are opened and exposed to the air, the worse they will keep. I do not doubt but this will be objected to by many, who imagine fruit cannot be laid too thin; for which reason, they make shelves to dispose them singly upon, and are very fond of admitting fresh air, whenever the weather is mild,

supposing

ſuppoſing it very neceſſary to preſerve the fruit; but the contrary of this is found true, by thoſe perſons who have large ſtocks of fruit laid up in their ſtorehouſes in London, which remain cloſely ſhut up for ſeveral months, in the manner before related; and when theſe are opened, the fruit is always found plumper and ſounder than any of thoſe fruits which were preſerved ſingly upon ſhelves, whoſe ſkins are always ſhrivelled and dry. For (as Mr. Boyle obſerves) the air is the cauſe of putrefaction; and, in order to prove this, that honourable perſon put fruits of ſeveral kinds into glaſſes where the air was exhauſted, in which places they remained ſound for ſeveral months, but, upon being expoſed to the air, rotted in a very ſhort time after; which plainly ſhews the abſurdity of the common method now uſed, to preſerve fruit.

# Q.



QUAMOCLIT. See Ipomoea.

QUERCUS. Tourn. Inſt. R. H. 582. tab. 349. Lin. Gen. Plant. 949. [ſo called of κέρχω, Gr. to make rough; either from the roughneſs of its bark, or becauſe of its auſterity.] The Oak-tree; in French, *Chené*.

The Characters are,

*It hath male and female flowers on the ſame tree; the male flowers are diſpoſed in a looſe katkin; theſe have an empalement of one leaf, divided into four or five ſegments; they have no petals, but many ſhort ſtamina, terminated by large twin ſummits. The female flowers which ſit cloſe to the buds, have a hemiſpherical thick empalement of one leaf, which is rough and entire, almoſt hiding the flower, which has no petal, but a ſmall oval germen, ſupporting a ſingle five-pointed ſtyle, crowned by ſingle permanent ſtigmas. The germen afterward becomes an oval nut (or acorn) with a thick cover, having one cell, whoſe baſe is fixed into the empalement or cup.*

This genus is ranged in the eighth ſection of Linnæus's twenty-firſt claſs, which includes thoſe plants which have male and female flowers on the ſame plant, whoſe male flowers have many ſtamina. He joins to this genus the Ilex and the Suber of Tournefort, whoſe characters are the ſame as the Oak.

The Species are,

1. Quercus (*Robur*) foliis deciduis oblongis, ſupernè latioribus ſinubus acutioribus, angulis obtuſis petiolatis glandibus ſeſſilibus. *Oak with oblong deciduous leaves, broader toward the top, having acute indentures, with obtuſe angles, which have long foot-ſtalks, and acorns ſitting cloſe to the branches.* Quercus latifolia mas, quæ brevi pediculo eſt. C. B. P. 419. *Broad-leaved male Oak, the fruit of which has ſhort foot-ſtalks, or common Oak.*
2. Quercus (*Fœmina*) foliis deciduis oblongis obtuſis, pinnato-ſinuatis petiolis breviſſimis, pedunculis glandorum longiſſimis. *Oak with oblong, obtuſe, deciduous leaves, which are winged, ſinuated, and have very ſhort foot-ſtalks, with a fruit growing upon long foot-ſtalks.* Quercus cum longo pediculo. C. B. P. 429. *Oak with long foot-ſtalks to the Acorn.*
3. Quercus (*Sempervirens*) foliis oblongis ſinuatis obtuſis perennantibus, pedunculis glandorum longiſſimis. *Oak with oblong, obtuſe, indented leaves which are evergreen, having very long foot-ſtalks to the Acorns.* Quercus latifolia perpetuò virens. C. B. P. 420. *Broad-leaved evergreen Oak.*
4. Quercus (*Humilis*) foliis oblongis obtuſè dentatis, fructibus ſeſſilibus conglomeratis. *Dwarf Oak with oblong obtuſely indented leaves, and fruit growing in cluſters ſitting cloſe to the branches.* Quercus humilis gallis binis ternis aut plurimis ſimul junctis. C. B. P. 420. *Dwarf Oak with galls growing together by pairs, by threes, or in larger cluſters.*
5. Quercus (*Cerris*) foliis oblongis lyrato-pinnatifidis, laciniis tranſverſis acutis, ſubtus ſubtomentoſis. Lin. Sp. Plant. 997. *Oak with oblong leaves which are lyre-ſhaped, wing-pointed, and have tranſverſe acute jags which are downy on their under ſide.* Quercus calyce hiſpido, glande minore. C. B. P. 420. *Oak with prickly cups and ſmaller Acorns.*
6. Quercus (*Eſculus*) foliis pinnato-ſinuatis lævibus fructibus ſeſſilibus. Prod. Leyd. 80. *Oak with ſmooth wing-indented leaves, and fruit ſitting cloſe to the branches.* Quercus parva ſive Phagus Græcorum & Eſculus Plinii. C. B. P. *The ſmall Oak or Phagus of the Greeks, and the Eſculus of Pliny, commonly called the cut-leaved Italian Oak.*
7. Quercus (*Ægilops*) foliis ovato-oblongis glabris, ſerrato dentatis. Lin. Sp. Plant. 1414. *Oak with oblong, oval, ſmooth, ſawed, indented leaves.* Quercus calyce echinato, glande majore. C. B. P. 420. *Oak with a prickly cup and a larger Acorn.*
8. Quercus (*Rubra*) foliis obtuſè-ſinuatis ſetaceo-mucronatis. Lin. Sp. Plant. 996. *Oak with obtuſe ſinuated leaves, terminated by briſtly points.* Quercus Eſculi diviſurâ, foliis amplioribus aculeatis. Pluk. Alm. 309. tab. 54. fig. 4. *Oak with broad ſpiny leaves, which are divided like the Eſculus.*
9. Quercus (*Prinus*) foliis obovatis utrinque acuminatis ſinuato-ſerratis, denticulis rotundatis uniformibus. Hort. Cliff. 448. *Oak with oblong oval leaves which are pointed on both ſides, and have ſawed ſinuſes, with uniform roundiſh indentures.* Quercus caſtaneæ foliis procera arbor Virginiana. Pluk. Alm. 309. *The American Cheſtnut-leaved Oak.*
10. Quercus (*Nigra*) foliis cuneiformibus obſoletè trilobis. Flor. Virg. 117. *Oak with wedge-ſhaped leaves, having three worn-out lobes.* Quercus folio non ſerrato in ſummitate quaſi triangulo. Cateſb. Car. 1. p. 20. *The Black Oak.*
11. Quercus (*Alba*) foliis obliquè pinnatifidis, ſinubus anguliſque obtuſis. Lin. Sp. Plant. 996. *Oak with oblique many-pointed leaves, having obtuſe ſinuſes and angles.* Quercus alba Virginiana. Cateſb. Car. 1. p. 21. tab. 21. *The white Oak of Virginia.*
12. Quercus (*Phellos*) foliis lanceolatis integerrimis glabris. Flor. Virg. 149. *Oak with ſpear-ſhaped, entire, ſmooth leaves.* Quercus foliis oblongis non ſinuatis. Cateſb. Car. 1. p. 17. *The Willow-leaved Oak.*
13. Quercus (*Ilex*) foliis oblongo-ovatis ſubtus tomentoſis integerrimis. Prod. Leyd. 81. *Oak with oblong, oval, entire leaves, which are downy on their under ſide.* Ilex

folio anguſto non ſerrato. C. B. P. 424. *The narrow-leaved evergreen Oak.*

14. Quercus (*Gramuntia*) foliis oblongo-ovatis ſinuato-ſpinoſis ſubtus tomentoſis, glandibus pedunculatis. Sauv. Monſp. 96. *Evergreen Oak with oblong, oval, prickly, indented leaves, which are woolly on their under ſide, and bears Acorns with foot-ſtalks.* Ilex folio agrifolii. Bot. Monſp. 140. *The Holly-leaved evergreen Oak.*

15. Quercus (*Coccifera*) foliis ovatis indiviſis, ſpinoſo-dentatis glabris. Prod. Leyd. 80. *Oak with oval, undivided, ſmooth leaves, which are prickly and indented.* Ilex aculeata, cocciglandifera. C. B. P. 425. *Prickly Kermes Oak.*

16. Quercus (*Virginiana*) foliis lanceolato-ovatis integerrimis petiolatis ſempervirentibus. *Oak with ſpear-ſhaped, oval, entire leaves, which are evergreen, and have foot-ſtalks.* Quercus ſempervirens foliis oblongis non ſinuatis. Baniſt. *Evergreen Oak with oblong leaves which are not ſinuated, commonly called Live Oak in America.*

17. Quercus (*Suber*) foliis ovato-oblongis indiviſis ſerratis ſubtus tomentoſis, cortice rimoſo fungoſo. Hort. Cliff. 448. *Oak with oval, oblong, undivided leaves, which are ſawed and woolly on their under ſide, and have a fungous cleft bark.* Suber latifolium perpetuò virens. C. B. P. 424. *The broad-leaved evergreen Cork-tree.*

The firſt ſort here mentioned, is the moſt common Oak of this country, which is ſo well known as to need no deſcription; the leaves of this have pretty long foot-ſtalks, and the Acorns have none, but ſit cloſe to the branches.

The ſecond ſort is not ſo common here as the firſt, but in the wilds of Kent and Suſſex I have ſeen many large trees of this kind. The leaves of this are not ſo deeply ſinuated as thoſe of the firſt, nor are they ſo irregular, but the indentures are oppoſite, like the lobes of winged leaves; theſe have ſcarce any foot-ſtalks, but ſit cloſe to the branches; the Acorns ſtand upon very long foot-ſtalks, in which they differ from the common ſort. The timber of this ſort is accounted better than that of the firſt, and the trees when growing have a better appearance. Theſe have been generally ſuppoſed to be ſeminal varieties, which have accidentally come from Acorns of the ſame trees; I was long of this opinion myſelf, but having lately ſeen ſome young trees with Acorns upon them, which were raiſed from Acorns of the ſecond ſort, and finding they retain their difference, I am inclined to believe they are different.

The third ſort grows upon the Apennines, and alſo in Swabia and Portugal. The leaves of this are broader, and not ſo deeply ſinuated as thoſe of the common Oak; they are of a lighter green on their upper ſide, and pale on their under; they have very ſhort foot-ſtalks, and their points are obtuſe; the Acorns have very long foot-ſtalks, which frequently ſuſtain three or four growing in a cluſter.

The fourth ſort grows in the ſouth of France and Italy; this is a low buſhy Oak, which riſes but ſix or ſeven feet high, ſending out many ſlender branches the whole length, garniſhed with oblong leaves which are obtuſely indented; they are about three inches long, and one and a half broad, ſtanding upon ſlender foot-ſtalks; the Acorns are ſmall and grow in cluſters, and the galls grow three or four together.

The fifth ſort grows in Burgundy; the leaves of this are oblong and pointed, and are frequently indented in the middle like a lyre; they are jagged and acute-pointed, a little hoary on their under ſide, ſtanding upon ſlender foot-ſtalks. The Acorns are ſmall, and have rough prickly cups.

The ſixth ſort grows naturally in Spain and Italy; the leaves of this tree are ſmooth, and deeply ſinuated like winged leaves; ſome of the ſinuſes are obtuſe, and others end in acute points; they have very ſhort foot-ſtalks; the branches are covered with a purpliſh bark when young; the Acorns are long and ſlender, the cups rough and a little prickly, ſitting cloſe to the branches. The Acorns of this ſort are ſweet, and are frequently eaten by the poor in the ſouth of France, who in times of ſcarcity grind them and make bread with the flour.

The ſeventh ſort grows naturally in the Levant, from whence the Acorns are annually brought to Europe, where they are uſed for dyeing; theſe are called Velani, and the tree Velanida by the Greeks. It is one of the faireſt ſpecies of Oak in the world: the trunk of this riſes as high as the common Oak; the branches extend very wide on every ſide, and are covered with a grayiſh bark, intermixed with brown ſpots; the the branches are cloſely garniſhed with oblong oval leaves, about three inches long, and almoſt two broad, which are deeply ſawed on their edges; moſt of the ſaws or teeth turn backward, and terminate in acute points. The leaves are ſtiff, of a pale green on their upper ſide, and downy on their under; the Acorns have very large ſcaly cups which almoſt cover them; the ſcales are ligneous and acute-pointed, ſtanding out a quarter of an inch; ſome of the cups are as large as middling Apples.

The eighth ſort grows naturally in Virginia, and in other parts of North America. This arrives to a large ſize in the countries where it naturally grows; the bark is ſmooth, of a grayiſh colour, but that of the younger branches is darker; the leaves are ſix inches long, and two and a half broad in the middle, where they are broadeſt; they are obtuſely ſinuated, each ſinus ending with a briſtly point, of a bright green, ſtanding upon ſhort foot-ſtalks. The leaves continue their verdure very late in autumn, ſo that unleſs hard froſt comes on early, they do not fall till near Chriſtmas, and they do not change their colour long before. The Acorns of this ſort are a little longer, but not ſo thick as thoſe of the common Oak.

The ninth ſort grows naturally in North America; of this there ſeems to be two kinds, one of which grows to a much larger ſize than the other, though this may be occaſioned by the ſoil in which they grow; for the largeſt ſort grows in the rich low lands, where it becomes the largeſt tree of any of the Oaks in thoſe countries. The wood is not of a fine grain, but is very ſerviceable; the bark is gray and ſcaly; the leaves are five or ſix inches long, and two inches and a half broad in the middle, indented on the edges, and have many tranſverſe veins running from the midrib to the borders; they are of a bright green, and ſo nearly reſemble thoſe of the Cheſtnut-tree, as ſcarcely to be diſtinguiſhed from it. The Acorns of this ſort are very large, and their cups are ſhort. The leaves of the other variety are not ſo large, nor ſo ſtrongly veined, and the Acorns are ſmaller and a little longer, which may ariſe from the ſoil.

The tenth ſort grows naturally on poor land in moſt parts of North America, where it never grows to a large ſize, and the wood is of little value. The bark is of a dark brown colour; the leaves are very broad at the top, where they have two waved indentures, which divide them almoſt into three lobes; they diminiſh gradually to their baſe, where they are narrow; they are ſmooth, of a lucid green, and have ſhort foot-ſtalks. The Acorns are ſmaller than thoſe of the common Oak, and have ſhort cups.

The eleventh ſort grows naturally in North America, where the wood is eſteemed preferable to any of their other ſorts for building, being much more durable than any of them. The bark of this tree is grayiſh, the leaves are of a light green ſix or ſeven inches long, and four broad in the middle; they are regularly indented almoſt to the midrib; the indentures are obtuſe, and have ſhort foot-ſtalks. The Acorns of this greatly reſemble thoſe of the common Oak.

The twelfth ſort grows naturally in North America, where they diſtinguiſh two ſorts; one of them is called the Highland Willow Oak, which grows upon poor dry land; the leaves are of a pale green and entire, ſhaped like thoſe of the Willow-tree. The Acorns are very ſmall, but have pretty large cups.

The other grows in low moiſt land, and riſes to a much greater height; the leaves are longer and nar-

rower, and the Acorns are of the ſame ſize and ſhape, ſo that I ſuſpect their difference is owing to the ſoil in which they grow.

The thirteenth ſort is generally known by the title of Ilex, or evergreen Oak; of this there are ſeveral varieties, which differ greatly in the ſize and ſhape of their leaves; but theſe will all ariſe from Acorns of the ſame tree, as I have ſeveral times experienced; nay, the lower and upper branches of the ſame tree are frequently garniſhed with leaves, very different in ſize and ſhape from each other; thoſe on the lower branches being much broader, rounder, and their edges indented and ſet with prickles, but thoſe on the upper are long, narrow, and entire; ſo that I verily believe they are all but one ſpecies, except the Kermes Oak, which is undoubtedly a diſtinct ſort. The leaves of the Ilex are from three to four inches long, and one broad near the baſe, gradually leſſening to a point; they are of a lucid green on their upper ſide, but whitiſh and downy on their under, and are entire, ſtanding upon pretty long foot-ſtalks; theſe remain green all the year, and do not fall till they are thruſt off by young leaves in the ſpring. The Acorns are ſmaller than thoſe of the common Oak, but of the ſame ſhape.

The fourteenth ſort is ſuppoſed to be a different ſpecies, but of this I much doubt, having raiſed ſome plants from the Acorns of the thirteenth, whoſe leaves are ſo like thoſe of this, as not to be diſtinguiſhed from them; theſe are ſhorter and broader than the other, and approach in ſhape to thoſe of the Holly-tree, and are alſo ſet with prickles on their edges.

The fifteenth ſort is the Oak, from which the kermes, or what is called ſcarlet grain is collected, which is an inſect that harbours on this tree. It grows naturally in Provence and Languedoc, where it is known by the title d'Avaux. This is of ſmall growth, ſeldom riſing above twelve or fourteen feet high, ſending out branches on every ſide the whole length, ſo as to form a buſhy ſhrub; the leaves are oval and undivided; they are ſmooth on their ſurface, but indented on their edges, which are armed with prickles like thoſe of the Holly-tree. The Acorns are ſmaller than thoſe of the common Oak.

The ſixteenth ſort grows naturally in Carolina and Virginia, where it riſes to the height of forty feet. The grain of the wood is hard, tough, and coarſe; the bark is grayiſh; the leaves are ovally ſpear-ſhaped, about three inches long and one and a half broad, entire, and of a dark green, ſtanding upon ſhort foot-ſtalks; they are of a thick conſiſtence, and continue green all the year. The Acorns are ſmall, oblong, and have ſhort cups; they are very ſweet, ſo are eaten by the Indians, who lay them up in ſtore for the winter; they alſo draw a very ſweet oil from them, little inferior to that of ſweet Almonds. This is called the Live Oak in America.

The ſeventeenth ſort is the tree whoſe bark is the cork; of this there are two or three varieties, viz. one with a broad, another with a narrow leaf, which are evergreen; and there is one or two which caſt their leaves in autumn, but the broad-leaved evergreen is the moſt common; the other may probably be only varieties ariſing by accident. The leaves of this are entire, of an oblong oval, about two inches long, and one and a quarter broad, ſawed on their edges, and have a little down on their under ſides; their foot-ſtalks are very ſhort; theſe leaves continue green through the winter till the middle of May, when they generally fall off juſt before the new leaves come out, ſo that the trees are very often almoſt bare for a ſhort time. The Acorns are very like thoſe of the common Oak.

The exterior bark of this tree is the cork; this is taken off from the trees every eight or ten years, but there is an interior bark which nouriſhes the trees, ſo that the ſtripping off the outer is ſo far from injuring them, that it is neceſſary to continue the trees; for thoſe whoſe bark are not taken off, ſeldom laſt longer than fifty or ſixty years in health; whereas the trees which are barked every eight or ten years, will live a hundred and fifty years and more. The bark of the young tree is porous and good for little, however it is neceſſary to take it off when the trees are twelve or fifteen years old, without which the bark will not be good, and after eight or ten years, the bark will be fit to take off again; but this ſecond peeling is of little uſe, but the third peeling the bark will be in perfection, and will continue ſo many years, for the beſt cork is taken from the old trees. The time of year for ſtripping off this bark is in July, when the ſecond ſap flows plentifully; this is performed with an inſtrument, like that uſed for diſbarking Oaks. The aſhes of burnt cork mixed with freſh butter, and made into an ointment, is much recommended for the piles.

All the ſorts of Oaks are propagated by ſowing their Acorns, and the ſooner they are put into the ground after they are ripe, the better they will ſucceed; for they are very apt to ſprout where they are ſpread thin, and if they are laid in heaps, they ferment and rot in a little time; therefore the beſt ſeaſon for ſowing them is in the beginning of November, by which time they will be fallen from the trees.

I ſhall firſt give ſome directions for raiſing the ſeveral ſorts of Oaks in a nurſery, which are intended to be planted out for ornament, where their timber is not to be regarded. Theſe Acorns may be ſown in beds about four feet wide, with paths of two feet broad between them; in theſe beds there may be four rows ſown, at about nine inches diſtance from each other; when the beds are marked out, there ſhould be drills drawn with a hoe in a ſtrait line, into which the Acorns ſhould be dropped at about two or three inches diſtance; then they muſt be carefully covered over with the earth two inches thick, leaving none of them uncovered, which might tempt the vermin, for if they once find them out, they will make ſad havock of the Acorns.

In the ſpring, when the plants begin to appear, you muſt carefully clear them from weeds; and if the ſeaſon proves dry, you ſhould refreſh them now and then with a little water, which will greatly promote their growth. In theſe beds the plants ſhould remain until the following autumn (obſerving conſtantly to keep them clear from weeds;) at which time you ſhould prepare a ſpot of good freſh earth (in ſize proportionable to the quantity of plants,) which ſhould be well trenched and levelled; then toward the middle or latter end of October, you ſhould carefully take up the plants, ſo as not to injure their roots, and plant them out in rows three feet aſunder, and eighteen inches diſtance plant from plant; obſerving never to ſuffer the plants to abide long out of the ground, becauſe their roots would dry and endanger their growth.

When the plants have taken root in this nurſery, they will require little more care than to keep them clear from weeds, and dig the ground between the rows every ſpring; in doing of which, you ſhould cut off ſuch roots as extend very far from the trunk of the trees, which will render them better for tranſplanting again; you ſhould alſo prune off ſuch ſide-branches as extend themſelves very far, and would retard the upright ſhoot; but you ſhould by no means cut off all the ſmall lateral branches, ſome of which are abſolutely neceſſary to be left on, to detain the ſap for the augmentation of the trunk; for I have often obſerved, where trees have been thus cloſely pruned, that their heads have overgrown their bodies, ſo that they have bent downward and become crooked.

When theſe trees have remained in the nurſery three or four years, they will then be large enough to tranſplant to the places where they are to remain; for it is not proper to let them grow very large before they are planted out, becauſe theſe are very hazardous trees to remove when old, or after they have taken deep root.

The

The season for this work is (as I said before) in the autumn; at which time, if they are carefully taken up, there will be little danger of their succeeding. In transplanting these trees, you should by no means cut their heads, which is too much practised; all that should be done, must be only to cut off any bruised or ill-placed branches, which should be taken off close to the place where they are produced; but there can be no greater injury done to these trees, than to shorten their shoots; for when the leading bud (which is absolutely necessary to draw and attract the nourishment) is taken off, the branch often decays entirely, or at least down to the next vigorous bud.

The trees thus raised and managed, will, (if planted in a proper soil) grow to a considerable magnitude, and are very proper for a wilderness in large gardens, or to plant in clumps in parks, &c. but if they are designed for timber, it is much the better method to sow the Acorns in the places where they are to remain; in order to which, you should provide yourself in autumn with a sufficient quantity of Acorns, which should be always taken from strait, upright, vigorous growing trees; these should be gathered from under the trees as soon as may be after they are fallen; and, if possible, in a dry time, laid thin in some open room to dry; after which they may be put into dry sand, and preserved in a dry place until the beginning of November, when you should prepare the ground for planting them.

The directions before given are designed only for small plantations in a garden or park, which are only for pleasure; but where these trees are cultivated with a view to profit, the Acorns should be sown where the trees are designed to grow; for those which are transplanted will never grow to the size of those which stand where they are sown, nor will they last near so long sound. For in some places, where these trees have been transplanted with the greatest care, and they have grown very fast for several years after, yet they are now decaying, when those which remain in the place where they came up from the Acorns, are still very thriving, and have not the least sign of decay. Therefore, whoever designs to cultivate these trees for timber, should never think of transplanting them, but sow the Acorns on the same ground where they are to grow; for the timber of all those trees which are transplanted, is not near so valuable as that of the trees from Acorns. I shall therefore add some plain directions for sowing Acorns, and managing young trees during their minority, until they are out of danger, and require no farther care.

The first thing to be done is, that of fencing the ground very well, to keep out cattle, hares, and rabbets; for if either of these can get into the ground, they will soon destroy all the young trees. Indeed they will in a few years grow to be out of danger from hares and rabbets, but it will be many years before they will be past injury from cattle, if they are permitted to get into the plantation, therefore durable fences should be put round the ground: if in the beginning a pale fence is made about the land, which may be close at the bottom and open above, and within the pale a Quick-hedge planted, this will become a good fence by the time the pale decays, against all sorts of cattle; and then the trees will have got above the reach of hares and rabbets, so that they cannot injure them, for the bark of the trees will be too hard for them to gnaw.

After the ground is well fenced, it should be prepared, by ploughing it three or four times, and after each ploughing to harrow it well, to break the clods, and cleanse the ground from Couch, and the roots of all bad weeds. Indeed if the ground is green sward, it will be better to have one crop of Beans, Peas, or Turneps off the ground, before the Acorns are sown, provided these crops are well hoed to stir the surface and destroy the weeds; for if this is observed, the crop will mend and improve the land for sowing; but in this case the ground should be ploughed as soon as possible, when the crop is taken off, to prepare it for the Acorns, which should be sown as soon as may be after the Acorns are ripe; for although these may be preserved in sand for some time, yet they will be apt to sprout; and if so, the shoots are in danger of being broken and spoiled; therefore I should advise sowing early, which is certainly the best method.

In making choice of the Acorns, all those should be preferred, which are taken from the largest and most thriving trees; and those of pollard-trees should always be rejected, though the latter are generally the most productive of Acorns, but those of the large trees commonly produce the strongest and most thriving plants.

The season for sowing the Acorns being come, and the ground having been ploughed and levelled smooth, the next work is to sow the Acorns, which must be done by drawing drills across the ground, at about four feet asunder, and two inches deep, into which the Acorns should be scattered at two inches distance. These drills may be drawn either with a drill plough, or by hand with a hoe; but the former is the most expeditious method, therefore in large plantations should be preferred. In drawing the drills, if the land has any slope to one side, these should be made the same way as the ground slopes, that there may be no stoppage of the wet by the rows of plants crossing the hanging of the land. This should be particularly observed in all wet ground, or where the wet is subject to lie in winter, but in dry land it is not of much consequence. When the Acorns are sown, the drills should be carefully filled in, so as to cover the Acorns securely; for if any of them are exposed, they will entice the birds and mice; and if either of these once attack them, they will make great havock with them.

The reason of my directing the drills to be made at this distance, is for the more convenient stirring the ground between the rows, to keep the young plants clear from weeds; for if this is not carefully done, it cannot be expected that the young plants should make much progress; and yet this is generally neglected by many who pretend to be great planters, who are often at a large expence to plant, but seldom regard them after; so that the young plants have the difficulty to encounter the weeds, which are frequently four or five times the height of the plants, and not only shade and draw them, but also exhaust all the goodness of the ground, and consequently starve the plants. Therefore, whoever hopes to have success in their plantations, should determine to be at the expence of keeping them clean for eight or ten years after sowing, by which time the plants will have obtained strength enough to keep down the weeds; the neglecting of this has occasioned so many plantations to miscarry, as are frequently to be met with in divers parts of England.

About the middle of April the young plants will appear above ground; but before this, if the ground should produce many young weeds, it will be good husbandry to scuffle the surface over with Dutch hoes, in a dry time, either the latter end of March or the beginning of April, to destroy the weeds, whereby the ground will be kept clean until all the plants are come up so as to be plainly discerned; by which time it may be proper to hoe the ground over again, for by doing it early, while the weeds are small, a man will perform more of this work in one day than he can in three or four when the weeds are grown large; besides, there will be great hazard of cutting off or injuring the young plants when they are hid by the weeds; and small weeds being cut, are soon dried up by the sun; but large weeds often take fresh root and grow again, especially if rain should fall soon after, and then the weeds will grow the faster for being stirred; therefore it is not only the best method, but also the cheapest husbandry, to begin cleaning early in the spring, and to repeat it as often as the weeds are produced

The first summer, while the plants are young, it will be the best way to perform these hoeings by hand, but

but afterward it may be done with the hoe-plough; for as the rows are four feet asunder, there will be room enough for this plough to work; and as this will stir and loosen the ground, it will be of great service to the plants; but there will require a little hand-labour where the plough is used, in order to destroy the weeds, which will come up in the rows between the plants; for these will be out of the reach of the plough, and if they are not destroyed, they will soon overgrow and bear down the young plants.

After the plants have grown two years, it will be proper to draw out some of them, where they grow too close; but in the doing of this, great care should be had not to injure the roots of those left; for as the plants which are drawn out are only fit for plantations designed for pleasure, so these should not be so much regarded in their being removed, as to sacrifice any of those which are designed to remain. In the thinning of these plantations, the plants may at the first time be left about one foot asunder, which will give them room enough to grow two or three years longer, by which time it may be easy to judge which are likely to make the best trees; therefore these may be then fixed on as standards to remain, though it will be proper to have a greater number at this time marked than can be permitted to grow, because some of them may not answer the expectation; and as it will be improper to thin these trees too much at one time, so leaving double the number intended at the second thinning will not be amiss. Therefore, if they are then left at about four feet distance in the rows, they will have room enough to grow three or four years longer; by which time, if the plants have made good progress, their roots will have spread over the ground, therefore it will be proper to take up every other tree in the rows. But by this I do not mean to be exact in the removing, but to make choice of the best plants to stand, which ever rows they may be in, or if they should not be exactly at the distance here assigned; all that is designed here, is to lay down general rules, which should be as nearly complied with as the plants will permit; therefore, every person should be guided by the growth of the trees in the performance of this work.

When the plants have been reduced to the distance of about eight feet, they will not require any more thinning. But in two or three years time, those which are not to remain will be fit to cut down, to make stools for under-wood; and those which are to remain, will have made such progress as to become a shelter to each other; for this is what should be principally attended to, whenever the trees are thinned; therefore in all such places as are much exposed to the wind, the trees should be thinned with great caution and by slow degrees; for if the air is let too much at once into the plantation, it will give a sudden check to the trees, and greatly retard their growth; but in sheltered situations, there need not be so great caution used as in those places, for the plants will not be in so much danger of suffering.

The distance which I should chuse to allow to those trees which are designed to remain for timber is, from twenty-five to about thirty feet, which will not be too near, where the trees thrive well; in which case their heads will spread, so as to meet in about thirty or thirty-five years; nor will this distance be too great, so as to impede the upright growth of the trees. This distance is intended, that the trees should enjoy the whole benefit of the soil; therefore, after one crop of the under-wood, or at the most two crops are cut, I would advise the stubbing up the stools, that the ground may be entirely clear, for the advantage of the growing timber, which is what should be principally regarded; but in general, most people have more regard for the immediate profit of the under-wood than the future good of the timber, and frequently by so doing spoil both; for if the under-wood is left after the trees have spread so far as that their heads meet, the under-wood will not be of much worth; and yet, by their stools being left, they will draw away a great share of nourishment from the timber-trees, and retard them in their progress.

The soil in which the Oak makes the greatest progress, is a deep rich loam, in which the trees grow to the largest size; and the timber of those trees which grow upon this land, is generally more pliable than that which grows on a shallower or drier ground, but the wood of the latter is much more compact and hard. Indeed there are few soils in England, in which the Oak will not grow, provided there is proper care taken in their cultivation, though this tree will not thrive equally in all soils; but yet it might be cultivated to a national advantage upon many large wastes in several parts of England, as also to the great profit of the estates where these tracts of land now lie uncultivated, and produce nothing to the owner. And should the present temper of destroying the timber of England continue in practice some years longer, in the same degree which it has for some years past, and as little care taken to raise a supply, this country which has been so long esteemed for its naval strength, may be obliged to seek for timber abroad, or be content with such a naval strength, as the poor remains of some frugal estates may have left growing; for as to the large forests, from whence the navy has been so long supplied, a few years will put an end to the timber there; and how can it be otherwise, when the persons to whose care these are committed, reap an advantage from the destruction of the timber?

Before I quit this subject, I must beg leave to take notice of another great evil, which is of so much consequence to the public, as to deserve their utmost attention; which is, that of cutting down the Oaks in the spring of the year, at the time when the sap is flowing. This is done for the sake of the bark, which will then easily peel off; and for the sake of this, I think, there is a law, whereby people are obliged to cut down their timber at this season. But by so doing, the timber is not half so durable as that which is fallen in the winter, so that those ships, which have been built of this spring-cut timber, have decayed more in seven or eight years, than others which were built with timber cut in winter; have done in twenty or thirty. And this our neighbours the French have experienced, and therefore have wisely ordered, that the bark should be taken off the trees standing, at the proper time, but the trees are left till the next, and sometimes until the second winter, before they are cut down; and the timber of these are found to be more durable and better for use, than that of any trees which have not been peeled. Therefore I wish we were wise enough to copy after them in those things which are for public good, rather than to imitate them in their follies, which has been too much the fashion of late years.

QUICK. By the word Quick is generally understood all live hedges, of whatever sort of plants they are composed, to distinguish them from dead hedges; but, in the more strict sense of this word, it is generally applied to the Hawthorn, or Mespilus Sylvestris; under which name the young plants or sets, are commonly sold by the nursery-gardeners, who raise them for sale.

In the choice of these sets, those which are raised in the nursery, are to be preferred to such as are drawn out of the woods, because the latter have seldom good roots; though as they are larger plants than are commonly to be had in the nursery, many people prefer them on that account; but from long experience I have found, that those hedges which have been planted with young plants from the nursery, have always made the best hedges. Indeed, if persons would have patience to wait for these from seed, and to sow the Haws in the place where the hedge is designed, these unremoved plants will make a much stronger and more durable fence, than those which are transplanted; but I am aware that most people will be for condemning this practice, as tedious in raising; but if the Haws are

are buried one year in the ground, to prepare them for vegetation before they are sown, it will not be so long before this will become a good fence, as is generally imagined. Nay, from some trials of this kind, which I have made, I have found, that those plants which have remained where they came up from seed, have made such progress as to overtake, in six years, plants of two years growth, which were transplanted at the time when these seeds were sown.

And if the hedges are raised from seed, it will not be amiss to mix Holly berries with the Haws; and if so, these berries should also be buried one year, to prepare them, so that then both will come up together the following spring; and this mixture of Holly with the Quick, will not only have a beautiful appearance in the winter, but will also thicken the hedge at the bottom, and make it a better fence.

But where the hedge is to be planted, the sets should not be more than three years old from the Haws; for when they are older, their roots will be hard and woody; and as they are commonly trimmed off before the sets are planted, so they very often miscarry; and such of them as do live, will not make so good progress as younger plants, nor are they so durable; for these plants will not bear transplanting so well as many others, especially when they have stood long in the seed-bed unremoved.

The method of planting, as also of plashing and pruning of these hedges, having been fully explained under the article of Hedges, I shall not repeat that here, but shall only beg leave to add the method which is prescribed by Thomas Franklin, Esq; which he had long practised in planting of these hedges, which is as follows:

He first set out the ground for ditches and Quick ten feet in breadth; he subdivided that, by marking out two feet and a half on each side (more or less at pleasure) for the ditches, leaving five in the middle between them; then digging up two feet in the midst of those five feet, he planted the sets in; which although it required more labour and charge, he says, he soon found it repaid the cost. This done he began to dig the fosses, and to set up one row of turfs on the outside of the said five feet; namely, one row on each side thereof, the green side outmost, a little reclining, so as the Grass might grow.

After this, returning to the place he began at, he ordered one of the men to dig a spit of the under-turf mould, and lay it between the turfs placed edgewise, as before described, upon the two feet, which was purposely dug in the middle, and prepared for the sets, which the planter set with two Quicks upon the surface of the earth almost upright, whilst another workman laid the mould forwards about twelve inches, and then set two more, and so continued.

This being finished, he ordered another row of turfs to be placed on each side upon the top of the former, and filled the vacancy between the sets and turfs as high as their tops; always leaving the middle, where the sets were planted, hollow, and somewhat lower than the sides of the banks by eight or ten inches, that the rain may descend to their roots; which is of great advantage to their growth, and by far better than by the old method, where the banks are made too much sloping; and the roots of the sets are seldom wetted, even in a moist season, the summer following; but if it prove dry, many of the sets, especially the late planted, will perish; and even few of those that had been planted in the beginning of April (the summer happening to be somewhat dry) escaped.

The planting being thus advanced, the next care is fencing, by setting a hedge of about twenty inches high upon the top of the bank on each side thereof, leaning a little outwards from the sets, which will protect them as well (if not better) than a hedge of three feet or more, standing on the surface of the ground; for as these are raised with the turfs and sods about twenty inches, and the hedge about twenty inches more, it will make three feet four inches, so as no cattle can approach the dead hedge to prejudice it, unless they set their feet in the ditch itself, which will be at least a foot and a half deep; and from the bottom of the foss to the top of the hedge, about four feet and a half, which they can hardly reach over to crop the Quick, as they might in the old way; and besides, such a dead hedge will endure a year longer.

He says, he had a hedge which had stood five years; and though nine or ten feet were sufficient for both ditches and banks, yet where the ground is but indifferent, it is better husbandry to take twelve feet, which will allow of a bank at least six feet broad, and gives more scope to place the dead hedges farther from the sets, and the ditches being shallow, will in two years time graze.

As to the objection, that taking twelve feet wastes too much ground, he affirms, that if twelve feet in breadth be taken for a ditch and bank, there will no more ground be wasted than by the common way; for in that a Quick is rarely set, but there are nine feet between the dead hedges, which is entirely lost all the time of fencing; whereas with double ditches, there remain at least eighteen inches on each side where the turfs were set on edge, that bear more Grass than when it lay on the flat.

But, admitting it did totally lay waste three feet of ground, the damage would be very inconsiderable; since forty perches, in length, two hundred and twenty yards will make perches 7, 25″, 9′, or 7 poles $\frac{1}{2}$; which at 13s. and 4d. the acre, amounts not to 7d. $\frac{1}{2}$ per annum.

Now that this is not only the best, but cheapest way of Quick-setting, will appear by comparing the charge of both.

In the usual way, the charge of a three feet ditch is 4d. per pole, the owner providing sets; if the workman finds them, he will have for making the said ditch and setting them, 8 d. per pole; and for hedging, 2 d. that is, for both sides, 4 d. the pole; which renders the charge of hedging, ditching, and sets, 12 d. the pole; that is, for forty rods in length 40 s.

Then one load of wood out of the copse costs (with the carrriage, though but two or three miles distance) 10 s. which will seldom hedge above eight poles (single hedge;) but allowing to do ten, to fence forty poles, there must be at least eight loads of wood, which costs 4 l. making the whole expence for ditching, fencing, and setting forty poles, to be 6 l. reckoning with the least; for scarce any will undertake to do it for less than 3 s. 6 d. per pole, and then the forty poles cost 7 l.

Whereas with double ditches, both of them, with the plants included, will be done for 8 d. the pole, and the husbandman get as good wages as with the single ditch (for though the labour about them is more, yet the making the table is saved,) which costs 1 l. 6 s. 8 d. and the hedges being low, they will make better wages at hedging for a penny a pole, than at 2 d. for common hedges, which comes to 6 s. 8 d. for hedging forty poles on both sides. Thus one load of wood will fence thirty poles at least, and forty hedged with two thirds of wood less than in the other way, and cost but 1 l. 6 s. 8 d. which makes the other whole charge of sets, ditching, fencing, and wood, but 3 l.

QUICK-BEAM. See Sorbus Sylvestris.

QUINCE-TREE. See Cydonia.

QUINCUNX ORDER is a plantation of trees, disposed originally in a square, consisting of five trees, one at each corner, and a fifth in the middle, which disposition, repeated again and again, forms a regular grove, wood, or wilderness, and, when viewed by an angle of the square or parallelogram, presents equal or parallel alleys.

Or, the Quincunx is the figure of a plantation of trees disposed in several rows, both length and breadth.

breadthwise, in such manner, that the first tree of the second row commences in the centre of the square formed by the two first trees of the first row, and the two first of the third, resembling the figure of the five at cards. This regular disposition of trees was formerly more regarded than at present, and is still much in practice in France for planting trees to form a grove.

Trees planted in Quincunx are such as are planted in the following form:

* * * * *
* * * *
* * * * *

QUINQUEFOLIUM. See POTENTILLA.

# R.



RACEMIFEROUS signifies bearing in clusters.

RACEMUS, a cluster, is a stalk divided or branched into several foot-stalks, sustaining the flowers or fruit set together, as are the bunches of Grapes, Currants, &c. The first of these conditions distinguishes it from a spike, the last from a panicle.

RADIATED FLOWERS are such as have several semiflorets set round a disk in form of a radiant star, as are the flowers of Daisy, Cammomile, &c. These are called radiated discous flowers; those which have no such ray, are called naked discous flowers, as the Wormwood, Mugwort, Tansey, &c.

RADICLE denotes that part of the seed of a plant, which, upon its vegetation, becomes a little root, by which the tender plant at first receives its nourishment before the after-root be formed. This is that part of the seed, which, in making malt, shoots forth, and is called the come or comb.

RADISH. See RAPHANUS.

RADISH (HORSE.) See COCHLEARIA.

RAIN is generally accounted to be a crude vapour of the earth, but more especially of the sea, drawn up from thence by the attractive power of the sun, or carried thitherward by pulsion, and wafted by the winds into the aërial region, by which sublimation and rarefaction, and the virtual qualities of the sun and air, it is formed into clouds.

The crudities are dispelled, and these clouds suspend and hang in the air, and though it may be thought impossible that they should be so suspended in the air by reason of their great weight and pressure, yet it will not appear so on consideration.

When these vapours are thus drawn up to any considerable height by the strength of the air which is underneath them, and which still grows greater and greater, and by its motion, undulating this way and that way, they rise gradually through the air.

This is demonstrable by paper kites, which, after they are raised to about sixty feet high, rise easier and with greater swiftness, and the higher, still the better and stronger they fly.

These vapours, being this arrived into the upper regions of the air, are soon aggregated and condensed into bodies and clouds.

And though they are blown here and there, they are still suspended, till they are released from their imprisonment by the genial disposition of the sun, or by the natural warmth, humidity and rarefaction of the air.

It is not to be doubted, but that the Rain drops out of the clouds, because we do not find it rain, but where clouds are to be seen, and by how much the fairer the weather is, the seldomer it rains.

Rain is a very frequent and useful meteor, descending from above in form of drops of water.

Rain seems to differ from dew only in this, that dew falls at some particular times, and in very small drops, so as to be seen when it is down, but is scarce perceivable while it is falling; whereas Rain is grosser, and falls at any time.

Rain is apparently a precipitated cloud, as clouds are nothing but vapours raised from moisture, waters, &c. and vapours are demonstratively nothing else but little bubbles, or vesiculæ detached from the waters by the power of the solar or subterraneous heat, or both.

These vesiculæ, being specifically lighter than the atmosphere, are buoyed up thereby till they arrive at a region where the air is a just balance with them; and here they float, till by some new agent they are converted into clouds, and thence into either Rain, snow, hail, mist, or the like.

But the agent in this formation of clouds, &c. is a little controverted: the generality will have it the cold, which, constantly occupying the superior regions of the air, chills and condenses the vesiculæ at their arrival from a warmer quarter, congregates them together, and occasions several of them to coalesce into little masses; by this means their quantity of matter increasing in a greater proportion than their surface, they become an overload to the lighter air, and descend into Rain.

The coldness of the air may cause the particles of the clouds to lose their motions, and become less able to resist the gravity of the incumbent air, and consequently to yield to its pressure, and fall to the ground.

The wind may collect the vapours in such abundance, as first to form very thick clouds, and then to squeeze those clouds together, till the watery particles make drops too big to hang in the air.

But the grand cause, according to Monf. Rohault, is still behind; he conceives it to be the heat of the air, which, after continuing for some time near the earth, is at length carried up on high by a wind, and, there thawing the frozen villi or flocks of the half-frozen vesiculæ, reduces them into drops, which, coalescing, descend, and have their dissolution perfected in their progress through the lower and warmer stages of the atmosphere.

Monsieur Le Clerc and others ascribe this descent of the clouds rather to an alteration of the atmosphere than of the vesiculæ, and suppose it to proceed from

from a diminution of the ſpring, or elaſtic force of the air.

This elaſticity, which depends chiefly or wholly upon the dry terrene exhalations, being weakened, the atmoſphere ſinks under its burden, and the clouds fall upon the common principle of precipitation.

Now the little veſiculæ, by any or all of theſe means being once upon the deſcent, will perſiſt therein, notwithſtanding the increaſe of reſiſtance they every moment meet withal in their progreſs through ſtill denſer and denſer parts of the atmoſphere.

For as they all tend towards the ſame point, viz. the center of the earth, the farther they fall, the more coalitions will they make; and the more coalitions, the more matter there will be under the ſame ſurface, the ſurface not only increaſing as the ſquares, but the ſolidity as the cubes; and the more matter under the ſame ſurface, the leſs friction or reſiſtance there will be to the ſame matter.

Thus, if the cold, the wind, &c. happen to act early enough to precipitate the veſiculæ, ere they are arrived to any conſiderable height, the coalitions being few in ſo ſhort a deſcent, the drops will be proportionably ſmall, and thus is formed what we call dew.

If the vapours prove more copious, and riſe a little higher, we have a miſt or fog.

A little higher ſtill, and they produce a ſmall Rain.

If they neither meet with cold or wind enough to condenſe or diſſipate them, they form a heavy, thick, dark ſky, which laſt ſometimes ſeveral days or weeks.

Hence we may account for many of the phænomena of the weather, e. g. Why a cold is always a wet ſummer, and a warm a dry one, becauſe the principle of precipitation is had in the one caſe, and wanting in the other:

Why we have ordinarily moſt Rain about the equinoxes, becauſe the vapours ariſe more plentifully than ordinary in the ſpring, as the earth becomes looſened from the brumal conſtipations, and becauſe, as the ſun recedes from us in autumn, the cold increaſing, the vapours that had lingered above, during the ſummer heats, are now diſpatched down.

Why a ſettled, thick, cloſe ſky ſeldom ever rains, till it has been firſt cleared, becauſe the equally confuſed vapours muſt firſt be condenſed and congregated into ſeparate clouds to lay the foundation of Rain, by which means the reſt of the face of the heaven is left open, and pervious to the rays of the ſun, &c.

Monſ. Le Clerc obſerves, that all winds do not produce Rains, but only ſuch as collect a great quantity of vapours. Thus in Holland weſt winds are rainy, becauſe they come from the ocean, and blow up the vapours; eaſt winds blow clear, becauſe they come over vaſt tracts of land; north winds are rainy, becauſe they come from the north ſea, but not ſo rainy as the weſt, becauſe the cold north doth not yield ſuch a quantity of vapours as the kinder climate of the Britannic ocean; ſouth winds bring Rain too, for that they, conſiſting of vapours raiſed by the heat of the ſun in a hot quarter, and ſo being elevated above others in the air, ſeem to lie upon our clouds, and preſs them down towards the earth.

Again: Rain may be produced after this manner. If the vapours riſe in ſo great abundance as to reach and mingle with the clouds above them, then they cauſe Rain in very large drops, and this may happen in ſtill ſultry weather, for then the clouds, which are over our heads, have no ſenſible motion, and in the mean time the heat fills the air with vapours, which, joining with the clouds, and ſo being ſtopped in their progreſs, open a paſſage for the ſtores in the clouds to deſcend upon the earth.

Sometimes alſo the warm wind thaws the clouds into drops, as we ſee ſnow diſſolved by heat; now by how much the thicker and ſooner any ſuch cloud was gathered, the larger are the drops that come from it, becauſe a greater ſtore of vapours was condenſed there. From thence it is, that in ſummer time we have ſudden ſhowers of Rain in very large drops.

It ought alſo to be remembered, that in thoſe countries which lie between the tropics, where they have the ſun vertical, the Rain pours down for ſeveral weeks together more like pailfuls than drops. And it is very probable that this is the cauſe; viz. becauſe at that time the ſun draws up abundance of vapours, and rarefies them extremely, ſo that they are elevated as high as poſſible, and then are precipitated at once, being too copious and heavy to hang in the air; and beſides, there may ſometimes be a concurrence of neighbouring vapours, which will be ready to croud into that part of the air, which is moſt rarefied by the heat of the ſun meeting with the vapours, which are raiſed in that place, and produce very great clouds and Rain.

If any aſk, How the drops of falling water come to be round, as in Rain? it is anſwered, That this does not happen by any diſpoſition peculiar to the water, but becauſe the drops are equally preſſed by the air on every ſide, and thereby forced into a round figure, the reſiſtance of the air being equal every way; but others give other reaſons for it.

In Rain there are two diſtinct properties or ſpecies; the one which ſerves for the diſſolution of the ſalts of the earth, and the other is a terreſtrial matter, which it meets with in its ſublimation, which may with ſome propriety be called either ſalt or nitre, and both theſe are uſeful in the buſineſs of vegetation.

Rain is operative in diſſolving the ſalts that are in the earth, and cools and bathes the cortex or ſkin of all vegetables, and, by a ſort of relaxation, cauſes the ſap to paſs up more freely, and by that means to grow, and ſhoot the better.

Theſe foggy humid vapours ariſing out of the ground, &c. of which Rain is formed, would inevitably ſtagnate and poiſon the whole face of the earth, were they not ſublimated by the air, and drawn up by the aſſiſtance of the ſun into the upper regions, but, being there rarefied, they are made of ſecond uſe in vegetation.

As to the quantity of Rain that falls, its proportion in ſeveral places at the ſame time, and in the ſame place at ſeveral times, we have ſtore of obſervations, journals, &c. in the Memoires of the French Academy, the Philoſophical Tranſactions, &c. an idea of which take as follows:

Upon meaſuring then, the Rain falling yearly, its depth, at a medium, is found as in the following table:

Proportion

Proportion of RAIN falling yearly, and its proportion in several places.

| | |
|---|---|
| At Townly in Lancashire, observed by Mr. Townly - - - - | 42 $\frac{1}{2}$ Inches |
| Upminster in Essex, by Mr. Derham - - - - - - - - - - | 19 $\frac{1}{4}$ |
| Zurich in Switzerland, by Dr. Sceutcher - - - - - - - - | 32 $\frac{1}{4}$ |
| Pisa in Italy, by Dr. Mich. Angl. Tilli - - - - - - - - | 43 $\frac{1}{4}$ |
| Paris in France, by M. de la Hire - - - - - - - - - - | 19 |
| Lisle in Flanders, by M. de Vaubin - - - - - - - - - - | 24 |

Proportions of the RAIN of several years to one another.

| At UPMINSTER. | | | At PARIS. | |
|---|---|---|---|---|
| 1700 | 19 Inches | 03 Cent. | 21 Inches | 38 Cent. |
| 1701 | 18 | 69 | 27 | 78 |
| 1702 | 20 | 38 | 15 | 42 |
| 1703 | 23 | 99 | 18 | 51 |
| 1704 | 15 | 81 | 21 | 20 |
| 1705 | 16 | 93 | 14 | 82 |

Proportion of the RAIN of the several seasons to one another.

| 1708 | Depth at Pisa. | | Depth at Upminster | | Depth at Zurich. | | 1708 | Depth at Pisa. | | Depth at Upminster | | Depth at Zurich. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inch. | | Inch. | | Inch. | | | Inch. | | Inch. | | Inch. | |
| January | 6 | 41 | 2 | 28 | 1 | 64 | July | 0 | 00 | 1 | 11 | 3 | 50 |
| February | 3 | 28 | 0 | 46 | 1 | 65 | August | 2 | 27 | 2 | 94 | 3 | 15 |
| March | 2 | 65 | 2 | 03 | 1 | 51 | September | 7 | 21 | 1 | 46 | 3 | 02 |
| April | 1 | 25 | 0 | 96 | 4 | 69 | October | 5 | 33 | 0 | 23 | 2 | 24 |
| May | 3 | 33 | 2 | 02 | 1 | 91 | November | 0 | 13 | 0 | 86 | 0 | 62 |
| June | 4 | 90 | 2 | 32 | 5 | 91 | December | 0 | 00 | 11 | 97 | 2 | 62 |
| Half year | 28 | 82 | 16 | 67 | 17 | 31 | Half year | 14 | 94 | 8 | 57 | 15 | 35 |

The Reverend Dr. Hales, in his excellent Treatise of Vegetable Staticks, tells us, that the quantity of Rain and dew that falls in a year is, at a medium, 22 inches, and that the quantity of the earth's evaporation in a year is at least 9 + $\frac{1}{2}$ inches, since that is the rate at which it evaporates in a summer's day, from which 9 + $\frac{1}{2}$ Inches is to be deducted 3. 39 inches, for circulating daily dew, there remains 6. 2 inches, which 6. 2 inches deducted from the quantity of Rain which falls in a year, there remains at least 16 inches depth to replenish the earth with moisture for vegetation, and to supply springs and rivers.

Hence we find that 22 inches depth of Rain in a year is sufficient for all the purposes of nature in such flat countries as is that about Teddington near Hampton-Court; but in the hill countries, as in Lancashire, there falls 42 inches depth of Rain water, from which deducting seven inches for evaporation, there remains 35 inches depth of water, besides great supplies from much more plentiful dews than fall in plain countries.

Which vast stores seem so abundantly sufficient to answer the great quantity of water which is conveyed away by springs and rivers from those hills, that we need not have recourse for supplies to the great abyss, whose surface at high water is surmounted some hundreds of feet by ordinary hills, and some thousands of feet by those vast hills, from whence the longest and greatest rivers take their rise.

RAINBOW, a meteor in form of a particoloured arch or semicircle, exhibited in a rainy sky opposite the sun, by the rarefaction of his rays in the drops of falling rain.

The Rainbow, Sir Isaac Newton observes, never appears but where it rains in the sunshine, and may be represented artificially by contriving water to fall in little drops like rain, through which the sun shining exhibits a bow to the spectator's eye placed between the sun and the drops, especially if a dark body, e. g. a black cloth be disposed beyond the drops.

Anton. de Dominis first accounted for the Rainbow in 1611, he explained at large how it was formed by refraction and reflexion of the sun-beams in spherical drops of water, and confirmed his explication by experiments made with glass globes, &c. full of water, wherein he was followed by Des Cartes, who mended and improved upon his account.

But as they were both in the dark as to the true origin of colours, their explications are defective, and in some things erroneous, which, it it is one of the glories of the Newtonian doctrine of colours, to supply and correct.

The following properties are ascribed to the Rainbow:

1. That it never appears but in a place opposite the sun; so that, when we look directly at it, the sun is always behind us.

2. That when the Rainbow appears, it always rains somewhere.

3. That the constant order of the colours is, that the outmost is red or Saffron colour; the next is yellow; the third is green; the fourth or inmost is Violet or blue; but these colours are not equally bright.

4. Two Rainbows appear together, one of which is higher and larger than the other, and shews the aforesaid colours, but in an inverted order.

5. The Rainbow is always exactly round, but does not always appear equally entire, the upper or lower parts being very often wanting.

6. Its apparent breadth is always the same.

7. That those, who stand upon plain low ground, never see above half its circle, and oftentimes not so much.

8. The higher the sun is above the horizon, the less of the circle is seen, and, if there be no cloud to hinder, the lower, the more of it.

9. That never any Rainbow appears, when the sun is above 41 degrees 46 minutes high.

Lunar (Rainbow:) The moon also sometimes exhibits the phænomena of an iris or bow by the refraction of her rays in the drops of rain in the night time.

Ariſtotle ſays, he was the firſt that ever obſerved it; and adds, that it never happens, i. e. viſible, but at the time of the full moon, her light at other times being too faint to reflect the ſight. After two refractions and one reflexion, the lunar iris has all the colours of the ſolar very diſtinct and pleaſant, only faint, in compariſon of the other, both from the different intenſity of the rays, and the different diſpoſition of the medium.

Marine (Rainbow) is a phænomenon ſometimes obſerved in a much agitated ſea, when the wind, ſweeping part of the tops of the waves, carries them aloft, ſo that the ſun's rays falling upon them, are refracted, &c. as in a common ſhower, and paint the colours of the bow.

F. Bourzes, in the Philoſophical Tranſactions, obſerves that the colours of the Marine Rainbow are leſs lively, diſtinct, and of leſs duration, than thoſe of the common bow; that there are ſcarce above two colours diſtinguiſhable, a dark yellow on the ſide next the ſun, and a pale green on the oppoſite ſide. But theſe bows exceed as to number, there being ſometimes twenty or thirty ſeen together; they appear at noon-day, and in a poſition oppoſite to that of the common bow, i. e. the concave ſide is turned upwards, as indeed it is neceſſary it ſhould be, from what may be ſaid in accounting for the appearance of the ſolar bow.

RAMPIONS. See Campanula radice esculenta.

RAMSONS. See Allium.

RAMUS, a branch, is the diviſion of a ſtalk; in trees it is often called a bough.

RANDIA. Houſt. Gen. Nov. 28. Lin. Gen. Plant. 194.

The Characters are,

*The empalement of the flower is permanent, of one leaf, cut into five ſhort ſegments at the brim. The flower is funnel-ſhaped, of one petal, cut into five parts at the top; it hath five ſhort ſtamina terminated by oblong erect ſummits, and an oval germen ſupporting a cylindrical ſtyle, the length of the tube divided into two parts at the top, crowned by two obtuſe unequal ſtigmas. The germen afterward becomes an oval capſule with one cell, having a hard cover, including many compreſſed cartilaginous ſeeds ſurrounded with pulp.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and one ſtyle.

We know but one Species of this genus at preſent in the Engliſh gardens, viz.

Randia (*Mitis*) foliis ovatis emarginatis, ſpinis geminatis, caule fruticoſo. *Randia with oval leaves which are indented at the top, ſpines growing by pairs, and a ſhrubby ſtalk.* Randia frutescens, ſpinis bijugis, foliis ſubrotundis floribus albis. Houſt. MSS. *Shrubby Randia with double ſpines, roundiſh leaves, and white flowers.* Sir Hans Sloane titles it in the Hiſtory of Jamaica, Lycium forte, foliis ſubrotundis integris, ſpinis & foliis ex adverſo ſitis. Vol. i. p. 40. *Boxthorn with roundiſh entire leaves, which, as well as the ſpines, are placed by pairs.*

This plant grows naturally at La Vera Cruz, where the late Dr. Houſtoun found it in plenty, and ſent the ſeeds to Europe; he gave this title to the genus in honour of Mr. Iſaac Rand, who was a curious botaniſt. It was diſcovered by Sir Hans Sloane in the iſland of Barbadoes.

It riſes with a ſhrubby ſtalk to the height of ten or twelve feet, covered with a whitiſh bark. The branches come out oppoſite from the ſide of the ſtalk, each pair croſſing the other; the leaves are of a thick conſiſtence, about an inch long, and three quarters broad, a little indented at the top, and are placed by pairs ſtanding upon ſhort foot-ſtalks. At the joints immediately under the leaves are produced two ſhort ſpines ſtanding oppoſite. The flowers are produced from the ſide of the branches; they are ſmall, white, tubulous, and divided at the brim ſlightly into five parts. Theſe are ſucceeded by oval berries about the ſize of a marble, having a brittle ſhell under a thin ſkin, with one cell, incloſing many compreſſed ſeeds ſurrounded with a black pulp. It is propagated by ſeeds, which ſhould be ſown early in the ſpring in pots filled with light freſh earth, and plunged into a hot-bed of tanners bark, obſerving to water the earth frequently but gently, to promote the vegetation of the ſeeds. When the plants come up, they muſt have freſh air admitted to them every day when the weather is warm, and ſhould be often refreſhed with water. In about a month's time after the plants are up, they will be fit to tranſplant, when they ſhould be carefully ſhaken out of the pots, and each planted into a ſeparate ſmall pot filled with light freſh earth, and then plunged into the hot-bed again, where they muſt be ſcreened from the ſun until they have taken new root; after which time, they muſt have air and moiſture in proportion to the warmth of the ſeaſon. The plants may remain in the hot-bed till toward Michaelmas, when the nights begin to be cold, at which time they ſhould be removed into the ſtove, and if they are plunged into the bark-bed, it will greatly forward their growth, though they will live in the dry ſtove, if they are kept in a moderate temperature of heat. During the two firſt ſeaſons, while the plants are young, it will be proper to keep them conſtantly in the ſtove, but their leaves muſt be waſhed whenever they contract filth; this will bring them forward; but, after the plants have obtained ſtrength, they may be expoſed every ſummer to the open air in the warmeſt part of the year for two or three months, provided they are placed in a warm ſituation, but in winter they muſt be conſtantly placed in a ſtove, and kept in a moderate warmth, otherwiſe they will not live in this country.

The leaves of this plant continue green throughout the year, which renders the plant valuable, becauſe it makes an agreeable variety in the winter ſeaſon, when mixed with other tender plants.

RANUNCULUS. Tourn. Inſt. R. H. 285. tab. 149. Lin. Gen. Plant. 619. [ſo called, as ſome ſay, from Rana, *Lat.* a frog, on account of its delighting to grow in moiſt places, which frogs frequent.] Crowfoot.

The Characters are,

*The empalement of the flower is compoſed of five oval concave leaves; the flower has five obtuſe petals, which have a narrow baſe; each of theſe have an open nectarium upon their tails. It hath many ſtamina, about half the length of the petals, terminated by oblong, erect, twin ſummits, and numerous germen collected in a head having no ſtyles, but are crowned by ſmall reflexed ſtigmas. The germen afterward become ſeeds of uncertain irregular figures, faſtened to the receptacle by very ſhort foot-ſtalks.*

This genus of plants is ranged in the ſeventh ſection of Linnæus's thirteenth claſs, which contains thoſe plants whoſe flowers have many ſtamina and germen.

I ſhall not here enumerate all the ſpecies of this genus, many of which are common weeds in moſt parts of England, and others are ſo in ſeveral parts of Europe, ſo are rarely admitted into gardens, therefore I ſhall only mention thoſe ſorts which are cultivated in gardens, or have double flowers.

The Species are,

1. Ranunculus (*Acris*) calycibus patulis, pedunculis teretibus, foliis tripartito-multifidis, ſummis linearibus. Lin. Flor. Suec. 466. flore pleno. *Ranunculus with a ſpreading empalement, a taper foot-ſtalk, many-pointed leaves divided by threes, and thoſe at the top linear and bearing a double flower.* Ranunculus hortenſis erectus, flore pleno. C. B. P. 179. *Upright Garden Ranunculus with a double flower.*

2. Ranunculus (*Repens*) calycibus patulis, pedunculis ſulcatis, repentibus, foliis compoſitis. Flor. Suec. 468. flore pleno. *Ranunculus with a ſpreading empalement, furrowed foot-ſtalks, creeping ſhoots, and compound leaves with a double flower.* Ranunculus hortenſis inclinans. C. B. P. 179. *Inclining Garden Ranunculus.*

3. RANUNCULUS (*Creticus*) foliis radicalibus reniformibus crenatis sublobatis, caulinis tripartitis lanceolatis integerrimis, caule multifloro. Lin. Sp. Plant. 550. *Ranunculus with kidney-shaped lower leaves, which are crenated and almost divided into lobes, but those upon the stalks divided into three spear-shaped lobes which are entire, bearing many flowers on a stalk.* Ranunculus asphodeli radice Creticus. C. B. P. 181. *Asphodel-rooted Ranunculus of Crete.*

4. RANUNCULUS (*Aconitifolius*) foliis omnibus quinatis lanceolatis inciso-serratis. Hort. Cliff. 229. flore pleno. *Ranunculus with all the leaves divided into five spear-shaped segments which are sawed, and bear a double flower.* Ranunculus folio aconiti, flore albo multiplici. C. B. P. 179. *Ranunculus with a Wolfsbane leaf and a double white flower, commonly called Mountain Ranunculus.*

5. RANUNCULUS (*Gramineus*) foliis lanceolato-linearibus sessilibus, caule erecto radice bulboso. Lin. Sp. Plant. 773. *Ranunculus with linear leaves sitting close to the stalk, which is erect, having very long foot-stalks to the flowers.* Ranunculus montanus, folio gramineo. C.B.P. 181. *Mountain Ranunculus with a Grass leaf.*

6. RANUNCULUS (*Rutæfolius*) foliis suprà decompositis, caule simplicissimo unifolio, radice tuberosâ. Hort. Cliff. 230. flore pleno. *Ranunculus with leaves which are decompounded above, a single stalk bearing one leaf, and a tuberous root with a double flower.* Ranunculus rutaceo folio, flore pleno, luteo, minori. Flor. Bat. 2, 3. *Rue-leaved Ranunculus with a smaller double yellow flower.*

7. RANUNCULUS (*Auricomus*) foliis radicalibus reniformibus crenatis incisis, caulinis digitatis linearibus, caule multifloro. Hort. Cliff. 229. flore pleno. *Ranunculus with kidney-shaped, crenated, lower leaves, those on the stalks hand-shaped and linear, and stalks bearing many flowers.* Ranunculus dulcis multiflorus. Tab. Icon. 53. *Sweet-smelling Ranunculus bearing many flowers.*

8. RANUNCULUS (*Amplexicaulis*) foliis ovatis acuminatis amplexicaulibus, caule radice fasciculatâ. Hort. Cliff. 229. *Ranunculus with oval, acute-pointed leaves which embrace the stalks, many flowers upon a stalk, and roots growing in bunches.* Ranunculus montanus, folio plantaginis. C. B. P. 180. *Mountain Ranunculus with a Plantain leaf.*

9. RANUNCULUS (*Grandiflorus*) caule erecto bifolio, foliis multifidis, caulinis alternis sessilibus. Flor. Leyd. Prod. 492. *Ranunculus with an erect stalk, having two leaves which are many-pointed, and those upon the stalks alternate sitting close.* Ranunculus Orientalis, aconiti folio, flore maximo. Tourn. Cor. 22. *Eastern Ranunculus with a Wolfsbane leaf and a large flower.*

10. RANUNCULUS (*Sanguineus*) foliis ternatis biternatisque, foliolis trifidis obtusis, caule simplici. *Ranunculus with leaves placed by threes, which are divided again into twice trifoliate leaves, ending in three obtuse points, with a simple stalk.* Ranunculus asphodeli radice, flore sanguineo. C. B. P. 281. *Asphodel-rooted Ranunculus with a bloody flower.*

11. RANUNCULUS (*Asiaticus*) foliis ternatis biternatisque, foliolis trifidis incisis, caule infernè ramoso. Lin. Sp. 552. *Ranunculus with trifoliate and twice trifoliate leaves, whose lobes are trifid, cut, and a stalk branching at the bottom. Persian Ranunculus.*

The first sort is a variety of the common upright Meadow Ranunculus, which grows naturally in every pasture; but as this hath double flowers, so it is cultivated in gardens. The stalks of this are erect, and rise more than a foot high; the lower leaves have very long foot-stalks; they are divided into several segments, resembling those of the Aconite, or Monk's-hood; the leaves toward the top of the stalk are cut into linear segments to the bottom; the stalk branches at the top into several foot-stalks, which are terminated by double yellow flowers. These appear in May, and if they stand in a shady situation, will continue a month in flower; and many times in moist seasons, there are small flowers rising out of the middle of the others. This is propagated by parting of the roots in autumn, and should be planted in a moist soil and a shady situation.

The second sort is a variety of the common creeping Crow-foot, which grows naturally in cultivated fields in most parts of England. The shoots from the root of this sort trail upon the ground, and put out roots from every joint in the manner of the Strawberry, so that when it is once introduced into a garden, it will multiply fast enough; the leaves and stalks are hairy, the flowers are yellow and double, but small. It flowers the latter end of May.

The third sort grows naturally in Crete; this hath an Asphodel root; the lower leaves are large, kidney-shaped, and a little hairy, about three inches long and four broad; they are deeply crenated on their borders, and are divided almost into five lobes, and have long foot-stalks which are hairy. The stalks rise about nine or ten inches high, and are garnished with two or three leaves, which are cut into three segments, and are entire; the top of the stalk divides into several foot-stalks, each sustaining one large, pale, yellow flower. This sort flowers the beginning of June. It is propagated by offsets from the roots, in the same way as the Garden Ranunculus, and should be planted in a warm border, otherwise the frost will destroy the roots.

The fourth sort grows naturally upon the Alps, with a single flower, but the double has been obtained by seeds, and is preserved in many curious gardens for the beauty of its flowers. This is by some gardeners called the Fair Maid of France; it hath a perennial root, composed of many strong fibres; the leaves are divided into five spear-shaped lobes; the four side lobes are upon foot-stalks coming from the side of the principal stalk, and the middle one terminates it; they are deeply sawed on their edges, and have several longitudinal veins. The stalks rise a foot and a half high, and branch out at the top into three or four divisions, at each of which there is one leaf, of the same shape with the lower, but smaller. The flowers are pure white, and very double, each standing upon a short foot-stalk. It flowers in May. This is propagated by parting the roots in autumn, as soon as the leaves decay, and should be planted in an east border and a loamy soil, not too stiff.

The fifth sort grows naturally on the Alps; this has a perennial root; the leaves are long and narrow like those of Grass, sitting close to the stalks, which rise a little more than a foot high, dividing at the top into three or four slender foot-stalks, which are terminated by single yellow flowers like those of the common Butterflower. This flowers the beginning of May. There is a double flower of this kind in the Paris Garden, but we have not yet got it in England.

The sixth sort grows naturally in Austria, and also in the Levant. This hath a tuberous root, the leaves decompounded and smooth; the stalks rise near a foot high, and have one leaf of the same shape with the lower, but smaller; the stalk is terminated by one double flower, about the size of the common Butterflower, but of a fine bright yellow colour. This flowers in the end of May. It is propagated by offsets from the roots in the same way as the Garden Ranunculus, and must be planted in a warm border, otherwise the frost will destroy the roots in winter.

The seventh sort is a variety of the common sweet Wood Ranunculus, which hath a double flower. This is a very hardy plant; it may be easily propagated by the root, and should have a loamy soil and a shady situation.

The eighth sort grows naturally upon the Alps and Apennine Mountains, where it seldom rises more than six inches high; the leaves are narrow, and but one flower upon a stalk; but when it is planted in a garden, the stalks rise a foot and a half high, and are garnished with oval acute-pointed leaves, three inches long, and one inch and a half broad, smooth, of a grayish colour, embracing the stalks with their base; this branches out at the top into several foot-stalks, each sustaining one white flower. This flowers in the middle

middle of April, and continues near a month in beauty, if planted in a shady place. It is propagated by parting of the roots in autumn, soon after the leaves decay, and may be planted on a shady border, where it will thrive exceedingly.

The ninth sort was discovered by Dr. Tournefort in the Levant; this hath a perennial root, from which arise several leaves, cut into many points like those of Wolfsbane; the stalk rises a foot high, and is garnished with two leaves which sit close together, and are alternate. This is terminated by one single yellow flower, much larger than that of the Butterflower, and blows in May. It is propagated by parting the roots in autumn, and should be planted in a light loamy soil.

The tenth sort is common in the English gardens, and was some years past more so than at present; for since the Persian Ranunculus has been introduced here, and so many fine varieties have been obtained from seeds, they have almost banished this sort out of the gardens. It hath a grumous root like the Persian sort; the leaves are divided by threes, and those are twice again divided by threes, and are obtuse-pointed; the stalk rises about nine inches high, terminated by one large double red flower. This appears the latter end of April, and have sometimes one or two very small flowers branching out from the side.

The eleventh sort was originally brought from Persia, but since it has been in Europe, has been greatly improved by culture, and many new flowers obtained from seeds, amongst which are many with semidouble flowers, which produce seeds; and from these there are such prodigious varieties of new flowers annually obtained, which are so large, and of such variety of beautiful colours, as to exceed all other flowers of that season, and even vie with the most beautiful Carnations; these are many of them finely scented, and the roots, when strong, generally produce twenty or thirty flowers upon each; which, succeeding each other, continue in beauty a full month or longer, according to the heat of the season, or the care taken to defend them from the injuries of the weather; all which excellent qualities have rendered them so valuable, that the old sorts are almost disregarded except in some old gardens.

All the very double flowers never produce seeds, so that they are only multiplied by offsets from their roots, which they generally produce in great plenty, if planted on a good soil, and duly attended in winter. The season for planting their roots is any time in October, for if they are planted sooner, they are apt to come up in a short time, and grow pretty rank before winter, whereby they will be in greater danger of suffering by frost; and if they are planted much later, they will be in danger of perishing under ground; so that you should not keep them out of the ground any longer than the beginning or middle of October.

The beds in which the Persian Ranunculus roots are planted, should be made with fresh, light, sandy earth, at least three feet deep: the best soil for them may be composed in this manner, viz. Take a quantity of fresh earth from a rich upland pasture, about six inches deep, together with the green sward; this should be laid in a heap to rot for twelve months before it is mixed, observing to turn it over very often, to sweeten it and break the clods; to this you should add a fourth part of very rotten neats dung, and a proportionable quantity of sea or drift-sand, according as the earth is lighter or stiffer; if it be light and inclining to a sand, there should be no sand added; but if it be a hazel loam, one load of sand will be sufficient for eight loads of earth; but if the earth is strong and heavy, the sand should be added in a greater proportion; this should be mixed eight months or a year before it is used, and should be often turned over, in order to unite their parts well together before it is put into the beds.

The depth which this should be laid in the beds, must be about three feet, and should be below the surface, in proportion to the dryness or moisture of the place where the beds are situated; for in dry ground it should be two feet eight inches below the surface, and the beds raised four inches above; but in a moist place they should be two feet below, and one foot above the ground; and in this case, it will be very proper to lay some rubbish and stones in the bottom of each bed, to drain off the moisture; and if upon this, at the bottom of the beds, some very rotten neats dung is laid two or three inches thick, the roots will reach this in the spring, and the flowers will be the fairer. This earth I would by no means advise to be screened very fine, only in turning it over each time, you should be careful to break the clods, and throw out all large stones, which will be sufficient; for if it is made very fine, when the great rains in winter come on, it will cause the earth to bind into one solid lump, whereby the moisture will be detained, and the roots, not being able to extend their tender fibres, will rot. Of this I have had many examples, but one particularly to my cost: when I had procured a fine parcel of these roots from abroad, and being desirous of having them thrive very well, I took great pains to screen the earth of my beds very fine, which I had laid above two feet deep, and planted a good part of my roots therein; but the season advancing, and having a great deal of other business upon my hands, I did not screen the earth of all my beds, but planted some of them without doing any thing more than raking them; and the success was, that the roots in those beds which were screened did, great part of them, entirely rot; and the remaining part were so weak, as not to produce any good flowers; whereas those which were planted in the beds which were not screened, did thrive and flower very well, and scarce any of the roots failed, though the earth of all the beds was the same, and were in the same situation, both with regard to wind and sun; so that the damage which those roots sustained, was owing entirely to the fineness of the earth; and this I have several times since observed in other gardens.

I am aware that this depth of three feet, which I have here directed to make the beds of these flowers, will be objected to by many persons, on account of the expence and trouble of preparing them, as also supposing it necessary to make the beds so deep, for flowers whose roots are small; but if they will give themselves the trouble of making the experiment, by preparing one bed in this manner, and another in the common way, and plant them both with the same flowers, they will soon be convinced of their error, by the success of the flowers. For in the beds which have been prepared of this depth, I have seen one root produce upward of fifty flowers, each of which grew near a foot high, and were extremely large and fair; whereas in the common method of culture, they are thought to do very well when they produce eight or ten flowers on each root, and these grow six inches high; but if a person will trace the length of the small fibres of these roots, he will find them extend three or four feet downwards. And as it is by these distant fibres that the nourishment is taken in, for the increase and strength of the flowers; so if these meet with a poor barren soil below, they shrink, and the flowers are starved for want of proper nourishment in the spring, when it is most required.

The beds being thus prepared, should lie a fortnight to settle before the roots are planted, that there may be no danger of the earth settling unequally after they are planted; which would prejudice the roots, by having hollow places in some parts of the bed, to which the water would run and lodge, and so rot the roots there. Then having levelled the earth, laying the surface a little rounding, the beds should be marked out in rows by a line, at about six inches distance each way, so that the roots may be planted every way in strait lines; then you should open the earth with your fingers at each cross, where the roots are to be planted, at about two inches deep, placing the roots exactly in the middle, with their crowns upright; then with the head of a rake you should draw the earth upon

on the surface of the bed level, whereby the top of the roots will be covered with earth near two inches, which will be sufficient. This work should be done in dry weather, because the earth will then work better than if it were wet; but the sooner after planting there happens to be rain, the better it will be for the roots; for if it should prove dry weather long after, and the earth of the beds be very dry, the roots will be subject to mould and decay; therefore in such a case it will be proper to give a little water to the beds, if there should no rain happen in a fortnight's time, which indeed is very rare at that season of the year, so that they will seldom be in danger of suffering that way.

When the roots are thus planted, there will no more be required until toward the end of November, by which time they will begin to heave the ground, and the buds of their leaves appear; when you should lay a little of the fresh earth, of which the beds were composed, about half an inch thick over the beds, which will greatly defend the crown of the root from frost; and when you perceive the buds to break through this second covering, if it should prove very hard frost, it will be very proper to arch the beds over with hoops, and cover them with mats, but especially in the spring, when the flower-buds will begin to appear; for if they are exposed to too much frost, or blighting winds at that season, their flowers seldom open fairly, and many times their roots are destroyed.

In the beginning of March the flower-stems will begin to rise, at which time you should carefully clear the beds from weeds, and stir the earth with your fingers between the roots, being very careful not to injure them; this will not only make the beds appear handsome, but also greatly strengthen their flowers in blowing; and if the nights prove frosty, the beds should be covered with mats every evening, and shaded from the sun in the heat of the day. When the flowers are past and the leaves are withered, you should take up the roots, and carefully clear them from the earth; then spread them upon a mat to dry, in a shady place; after which they may be put up in bags or boxes in a dry room, until the October following, which is the season for planting them again.

These Persian sorts are not only propagated by offsets from the old roots, but are also multiplied by seeds, which the semi-double kinds produce in plenty; therefore, whoever is desirous to have these in perfection, should annually sow their seeds, from which new varieties will be every year produced; but in order thereto, you should be careful in saving your seed, or in procuring it from such persons as understand how to save it; that is, who will be careful not to leave any flowers for seeds, but such as have five or six rows of petals at least, and are well coloured; for since these flowers increase plentifully, it is not worth the trouble to sow any indifferent seeds, because there can be but little hopes of obtaining any good flowers from them.

Being prepared with seeds, about the middle of August, which is the proper season for sowing them, you should get some large pots, flat seed-pans, or boxes. These should be filled with light rich earth, levelling the surface very even; then sow the seeds thereon pretty thick, and cover it about a quarter of an inch thick with the same light earth; after which, you should remove these pots, pans, or boxes, into a shady situation, where they may have the morning sun until ten of the clock; and if the season prove dry, you must often refresh them gently with water, being very careful in doing of this, not to wash the seeds out of the ground. In this situation the pots should remain until the beginning of October, by which time the plants will sometimes begin to come up, (though often the seeds will remain in the earth until the end of November, before the plants appear;) but then you should remove the pots into a more open exposure, where they may have the full sun, which at that time is necessary to exhale the moisture of the earth; but toward the middle of November, when you are apprehensive of frost, the pots should be removed under a common hot-bed frame, where they may be covered with the glasses in the night time, and also in bad weather; but in the day, when the weather is mild, they should be entirely opened, otherwise the plants will draw up too weak. The only danger they are in, is violent rains and frosts; the first often rotting the tender plants, and the frost will often turn them out of the ground, therefore they should be carefully guarded against both these.

In the spring, as the season grows warm, these pots should be exposed to the open air, placing them at first near the shelter of a hedge, to protect them from the cold winds; but toward the beginning or middle of April, they should be removed again into a more shady situation, according to the warmth of the season; and if it should prove dry, they must be sometimes refreshed with water; but you should be careful not to give it them in great quantities, which is very apt to rot these tender roots; and in the latter end of April or beginning of May, they should be placed where they may have only the morning sun; in which place they may remain till their leaves decay, when they may be taken out of the earth, and the roots dried in a shady place; after which they may be put up in bags, and preserved in a dry place till the October following, when they must be planted in the manner before directed for the old roots

The spring following these roots will flower, at which time you should carefully mark such of them as are worthy to be preserved, and the single, or bad coloured flowers may be pulled and thrown away, which is the surest method of removing them from the good sorts; for if they are permitted to remain together until their leaves decay, there may be some offsets of the bad sorts mixed with the good flowers. You should not suffer those flowers, which you intend to blow fine the succeeding year, to bear seeds, if they are inclinable so to do, but cut off the flowers when they begin to decay; for those roots which have produced seeds, seldom flower well afterwards; nor will the principal old root, which has flowered strong one year, ever blow so fair as will the offsets, which is what should be principally observed, when a person purchases any of these roots; for a great part of the complaints made by those who have bought these roots at a dear rate, is principally owing to this. For the persons who sold them, being apprised of this matter, have parted with their old roots to their purchasers, and reserved the offsets for their own use; which old roots have so much degenerated from what they were the preceding year, as to cause a suspicion, whether the persons they were purchased from had not changed the roots: and this degeneracy always attends these flowers, after having flowered extremely large and fair, or that they have been permitted to seed; so that it is absolutely necessary to sow seeds every year, in order to preserve a succession of good flowers.

The manner of preparing the beds, and the distance and method of planting the roots, having been already directed, I shall not repeat it here, but only observe, that these flowers being tender, must be protected from hard frosts, and cutting sharp winds, especially after Christmas, when their flower-buds are forming; for if they are neglected at that season, their flowers will rarely prove fair; nor should you suffer them to receive too much wet in winter or spring, which is equally as injurious to them as frost.

In planting these roots you should observe to place the semi-double kinds, from which you intend to save seeds, in separate beds by themselves, and not intermix them with the double flowers, because they will require to be treated in a different manner; for when the flowers of the semi-double kinds begin to fade, you should carefully guard them from too much wet; for if they are permitted to receive hard rains, or are watered at that season, the seeds rarely come to maturity, or they are so weak, that scarce one in fifty of them will grow.

When

When the feed begins to ripen (which may be eafily known by feparating from the axis and falling) you fhould look it over every day, gathering it as it ripens; for there will be a confiderable diftance in the feeds of the fame bed coming to maturity, at leaft a fortnight, and fometimes three weeks or a month. When you gather the feed, it fhould not be expofed to the fun, but fpread to dry in a fhady place; after which, you muft put it up where the vermin cannot come to it, until the time of fowing it.

By this method of fowing feeds every year, you will not only increafe your ftock of roots, but alfo raife new varieties, which may be greatly mended by changing the feeds into frefh ground; for if a perfon continually fows his feed in the fame garden many years, they will not produce near fo fine flowers as if he procured his feeds at fome diftance, which is alfo the cafe with moft other plants.

It will alfo be neceffary to take away all the earth out of the beds in which the roots were blown the preceding year, and put in new, if you intend to plant Ranunculufes there again; otherwife they will not thrive near fo well, notwithftanding you may add fome new compoft to the beds, and this is what all the curious florifts continually obferve.

RAPA. Tourn. Inft. R. H. 228. tab. 112. Braffica. Lin. Gen. Plant. 734. Turnep; in French, *Navet.*

The CHARACTERS are,

*The empalement of the flower is three-leaved, coloured, and erect. The flower hath four plain fpreading petals, which are narrow at their bafe and entire. It has four oval honey glands, fituated between the ftamina and ftyle, and fix erect awl-fhaped ftamina; the two which are oppofite are the length of the empalement, the other four are longer, terminated by erect acute-pointed fummits. It hath a taper germen, fupporting a fhort thick ftyle, crowned by an entire headed ftigma. The germen afterward becomes a long taper pod depreffed on the fides, opening in two cells, which are filled with roundifh feeds.*

This genus of plants is ranged in the fecond fection of Linnæus's fifteenth clafs, which includes thofe plants whofe flowers have two fhort and four longer ftamina, and the feeds are in oblong pods; and he joins this genus to the Braffica, which, in a fyftem of botany may be allowable, though not in a treatife of gardening.

The SPECIES are,

1. RAPA (*Rotunda*) radice caulefcente orbiculata depreffâ carnosâ. *Turnep with an orbicular, depreffed, flefhy root.* Rapa fativa rotunda radice candidâ. C. B. P. 89. *Garden Turnep with a white root.*
2. RAPA (*Oblonga*) radice oblongâ carnosâ. *Turnep with an oblong flefhy root.* Rapa fativa, oblonga, feu fœmina. C. B. P. 90. *Turnep with an oblong root, or female Turnep.*
3. RAPA (*Napus*) radice caulefcente fufiformi. *Turnep with a fpindle-fhaped root.* Napus fativa, radice albâ. C. B. P. 95. *Garden Naphew with a white root, commonly called French Turnep.*

The firft is the Turnep which is commonly cultivated in the fields, of which there are the following varieties, viz. The round, red, or purple-topped Turnep, the green-topped Turnep, the yellow Turnep, the black-rooted Turnep, and the early Dutch Turnep. The laft fort is commonly fown early in the fpring, to fupply the markets in May and June, but is never cultivated for a general crop. The red-rooted Turnep was formerly more cultivated in England than at prefent; for fince the large green-topped Turnep has been introduced, all the fkilful farmers prefer it to the other forts; the root of this will grow to a large fize, and continue good much longer than the other forts. The next to this is the red or purple-topped Turnep, which will alfo grow large, and are extremely good for fome time; but the roots of this will become ftringy much fooner than thofe of the green-topped. The long-rooted Turnep, the yellow Turnep, and the blackifh-rooted Turnep, are now rarely cultivated in England, neither of them being fo good for the table or for feed as the red, and particularly the green-topped Turnep, though there are fome few perfons who fow them for the fake of variety. The early Dutch Turnep is chiefly fown in the fpring, to fupply the table before any of the forts can be procured; and when they are drawn off young, are tolerably good; but if they are left to grow large, they are ftringy and very rank, fo are unfit for ufe.

The French Turnep is not much cultivated in England, but in France and Holland they are in great efteem, efpecially for foups; their roots being fmall, are boiled whole in the foup, and fo ferved up to the table; thefe muft alfo be ufed while they are young, otherwife they will become rank and ftringy.

Thefe are by fome fuppofed to be only varieties which have been accidentally obtained from feeds, therefore I have not enumerated them as diftinct fpecies; but yet I am certain they are conftant where care is taken in the faving of their feeds, not to fuffer any mixture of plants to ftand for feeds: I have fown of three or four forts feveral years, and have always found them retain their differences; however, it is not eafy to determine, if fome of thefe were not by culture firft obtained from the feeds of the common white Turnep. The yellow Turnep feems moft unlikely to have been an accidental variety, for I have never known this alter, and the roots are yellow within, whereas all the other have white flefh, notwithftanding their outfides are of very different colours.

The long-rooted Turnep is, I think, a diftinct fpecies, the form of the root, and its manner of growth being totally different from the other forts. I have feen thefe roots as long as thofe of fome Parfneps, and nearly of the fame fhape; thefe run deep into the ground, fo are unfit for feeding cattle; and unlefs they are ufed very young, become ftrong, fo not proper for the table, which has occafioned their being rejected of late years.

The green-topped Turnep grows above the ground more than any of the other, which renders it preferable for feeding cattle, and being the fofteft and fweeteft root when grown large of any of the kinds, is moft efteemed for the table; but in very fevere winters, they are in greater danger of fuffering by froft, than thofe whofe roots lie more in the ground, efpecially if they are not covered by fnow; for when they are frequently hard frozen and thawed, it caufes them to rot fooner than thofe whofe flefh is lefs tender and fweet. I have feen the roots of this fort, which were more than a foot diameter boiled, and were as fweet and tender as many of the fmalleft roots.

Turneps delight in a light, fandy, loamy foil, which muft not be rich, for in a rich foil they grow rank and are fticky; but if it be moift, they will thrive the better in fummer, efpecially in frefh land, where they are always fweeter than upon an old worn out, or a rich foil.

The common feafon for fowing of Turneps, is any time from the beginning of June till the middle of Auguft, or a little later, though it is not advifeable to fow them much after; becaufe, if the autumn fhould not prove very mild, they will not have time to apple of a proper fize before winter; nor will the roots of thofe which are fown after the end of July grow very large, unlefs the froft keeps off long in autumn. But, notwithftanding this is the general feafon in which the greateft part of Turneps are fown in the country, yet about London they are fown fucceffively from March to Auguft, by thofe who propagate them to fupply the markets with their roots; but there is a great hazard of lofing thofe which are fown early in the year, if the feafon fhould prove dry, by the fly, which will devour whole fields of this plant while young; fo that where a fmall quantity for the fupply of a family is wanted, it will be abfolutely neceffary to water them in dry weather; and where a perfon fows thofe feeds in April and May, it fhould always be upon a moift foil, otherwife they feldom come to good, the heat of the weather at that feafon being too great for them upon a dry foil; but thofe which

are intended for the general crop, are ſown toward the latter end of June, when they commonly receive ſome refreſhing ſhowers to bring them forward; without which, it is very common to have them all deſtroyed.

Theſe ſeeds ſhould always be ſown upon an open ſpot of ground; for if it is near hedges, walls, buildings, or trees, they will draw up, and be very long topped, but their roots will not grow to any ſize. They are ſown in great plenty in the fields near London, not only for the uſe of the kitchen, but for cattle in winter, when there is a ſcarcity of other food; and by this way is become a great improvement to barren ſandy lands, particularly in Norfolk, where, by the culture of Turneps only, many perſons have doubled the yearly value of their ground.

The land upon which this ſeed is ſown, ſhould be ploughed in April, and twy-fallowed in May, that is, once more ploughed, and twice well harrowed, and made very fine; then the ſeed ſhould be ſown pretty thin (for it being ſmall, a little will ſow a large piece of ground; two pounds of this ſeed is full ſufficient for an acre of any land, but one pound is the common allowance.) The ſeed muſt be harrowed in as ſoon as it is ſown, with a ſhort tined harrow, and the ground rolled with a wooden roll, to break the clods and make the ſurface even. In ten days or a fortnight after ſowing, the plants will come up, at which time, if the ſeaſon ſhould prove dry, they will be in great danger of being deſtroyed by the fly, which is too often the caſe with this crop; but if it ſo happen, the ground muſt be ſowed again; for the ſeed being cheap, the chief expence is the labour; but the ground ſhould be firſt harrowed to looſen it, eſpecially if it is ſtiff land; there have been many directions given for to prevent this deſtruction, but ſcarce one has ſucceeded on trial.

When the plants have got four or five leaves, they ſhould be hoed to deſtroy the weeds, and to cut up the plants where they are too thick, leaving the remaining ones about ſix or eight inches aſunder each way, which will be room enough for the plants to ſtand for the firſt hoeing; and the ſooner this is performed, when the plants have four leaves, the better they will thrive; but in the ſecond hoeing, which muſt be performed about a month after the firſt, they ſhould be cut up, ſo that the remaining plants may ſtand fourteen or ſixteen inches diſtance, or more, eſpecially if they are deſigned for feeding of cattle; for where the plants are allowed a good diſtance, the roots will be proportionably large, provided the ground is good; ſo that what is loſt in number, will be overgained by their bulk, which is what I have often obſerved. But in ſuch places where they are ſown for the uſe of the kitchen, they need not be left at a greater diſtance than a foot, becauſe large roots are not ſo generally eſteemed for the table.

It is not many years ſince the practice of ſowing Turneps for feeding of cattle has been of general uſe; how it happened that this improvement ſhould have been ſo long neglected in every part of Europe, is not eaſy to determine; ſince it is very plain, that this piece of huſbandry was known to the antients. For Columella, in treating of the ſeveral kinds of vegetables which are proper for the field, recommends the cultivating Rapa in plenty; becauſe (ſays he) thoſe roots which are not wanted for the table, will be eaten by the cattle. And yet this plant was not much cultivated in the fields till within a century paſt; nor is the true method of cultivating Turneps yet known, or at leaſt not practiſed, in ſome of the diſtant counties of England at this time. For in many places the ſeed is ſown with Barley in the ſpring, and thoſe plants which come up, and live till the Barley is cut, produce a little green for the ſheep to pick up, but never have any roots. In other places, where the Turnep-ſeed is ſown by itſelf, the method of hoeing them is not underſtood, ſo that weeds and Turneps are permitted to grow together, and where the Turneps come up thick in patches, they are never thinned; ſo that they draw up to have long leaves, but never can have good roots, which is the principal part of the plant, therefore ſhould be chiefly attended to

The general method now practiſed in England, for cultivating this plant in the fields, is the ſame as is practiſed by the farming gardeners, who ſupply the London markets with theſe roots, which is as before directed. But it is only within the compaſs of half a century, that the country people have been acquainted with the method of hoeing them; ſo that the farmers uſually employed gardeners, who had been bred up in the kitchen-gardens, to perform this work. And the uſual price given per acre, for twice hoeing and leaving the crop clean, and the plants ſet out properly, was ſeven ſhillings; at which price the gardeners could get ſo much per week, as to make it worth their while to leave their habitations, and practiſe this in different counties during the ſeaſon for this work, which always happens after the greateſt hurry of buſineſs in the kitchen-garden is over; ſo that they uſually formed themſelves in ſmall gangs of ſix or ſeven perſons, and ſet out on their different routs, each gang fixing at a diſtance from the reſt, and undertaking the work of as many farmers in the neighbourhood as they could manage in the ſeaſon; but as this work is now performed by many country labourers, that practice is loſt to the kitchen-gardeners, the country labourers doing it much cheaper.

There has alſo been another method practiſed very lately, by ſome very curious farmers, in cultivating of Turneps; which is, by ſowing the ſeed in rows with the drill plough. In ſome places the rows have been ſown three feet aſunder, in others four, in ſome five, and ſome ſix. The latter has been commended by ſkilful perſons as the moſt proper diſtance; for although the intervals are ſo large, yet the crop produced on an acre has been much greater than upon the ſame quantity of land where the rows have been but half this diſtance; and upon all the fields which have been cultivated for Turneps, the crops have greatly exceeded thoſe which have been hand-hoed. The late Lord Viſcount Townſhend was at the expence of making the trial of theſe two different methods of huſbandry, with the greateſt care, by equally dividing the ſame fields into different lands, which were alternately ſown in drills, and the intermediate lands in broad-caſt. The latter were hoed by hand, in the common method, and the other cultivated by the hoeing plough; and when the roots were fully grown, his Lordſhip had an equal quantity of land, which had been ſown in different methods, meaſured, and the roots drawn up and weighed; and thoſe roots which had been cultivated by the plough, were ſo much larger than the other, that the crop of one acre, weighed a ton and a half more than that of an acre in the other huſbandry.

But when the Turneps are ſown in drills, they will require to be hoed by hand, to ſeparate and cut out the plants where they are too near together in the rows, as alſo to cut up the weeds between the plants, where the plough cannot reach them. If this is carefully performed, the ploughing of the intervals will encourage the growth of the roots, by thus ſtirring of the ground, and prepare it much better for the crop of Barley, or whatever elſe is ſown the following ſpring. This method of culture may be ſuppoſed to be more expenſive than that commonly practiſed, by thoſe unacquainted with it; but thoſe who have made trials of both, find the horſe-hoeing to be much the cheapeſt, and by far the beſt. For the country people, who are employed in hand-hoeing of Turneps, are very apt to hurry over their work, ſo that half the weeds are left growing, and the plants are ſeldom ſingled out ſo well as they ſhould be; nor are they curious enough to diſtinguiſh the Charlock (which is one of the moſt common weeds in arable land) from the Turneps; ſo that about the middle of September, it is very common to ſee the fields of Turneps full of the yellow flowers of the Charlock. Now, in the

horſe-

horse-hoing, all the weeds in the intervals will be entirely destroyed; so that if a few plants of Charlock in the rows of Turneps should be overlooked, they may be easily drawn out when they appear visible; and by this method, the land will be sooner and better cleaned from weeds.

The greatest evil which attends a crop of Turneps, is that of their being destroyed by the fly, which usually happens soon after the plants come above ground, or while they are in the seed leaf; for, after they have put out their rough leaves pretty strong, they will be past this danger. This always happens in dry weather, so that if there should be rain when the Turneps come up, they will grow so fast, as to be in a few days out of danger from the fly; and it hath been found, that those, which have been sown in drills, have escaped the fly much better than those sown in broad-cast; but if soot is sown along the surface of each drill, it will be of great service to keep off the fly, and a small quantity of it will be sufficient for a large field, where the drills only are to be covered.

Another danger of the crops being destroyed is from the caterpillars, which very often attack them, when they are grown so large as to have six or eight leaves on a plant. The surest method of destroying these insects is to turn a large parcel of poultry into the field, which should be kept hungry, and turned early in the morning into the field; these fowls will soon devour the insects, and clear the Turneps. To this evil the Turneps, which are sown in drills, are not so much exposed, for as the ground between the rows will be kept stirred, the plants will be kept growing, so will not be in danger of suffering from these insects; for the parent insects never deposit their eggs upon any plants which are in health, but as soon as they are stinted, they are immediately covered with the eggs of these insects; and this holds in general with the vegetables as with animals, who are seldom attacked by vermin when they are in perfect health; whereas, when they become unhealthy, they are soon overspread with them, so that it is the disease which occasions the vermin, and not the vermin the disease, as is commonly imagined. Therefore as the plants will always be in greater health when the ground is well stirred about them, there will be less danger of their suffering from these enemies, when they are cultivated by the horse-hoe, than in the common way.

When the Turneps are sown in drills, it will be the best way to hoe between every other row at first, and some time after to hoe the alternate intervals, by which method the plants will receive more benefit from the often stirring the ground, than they would do if all the intervals were hoed at one time, and the plants will be in less danger of suffering from the earth being thrown up too high on some rows, while others may be left too bare of earth; but, when the earth has been thrown up on one side of the drill, it may be turned down again when the next interval is hoed, and this alternate moving of the earth will prepare the ground very well for the succeeding crop, as well as greatly improve the Turneps; but, as this plough cannot well be drawn nearer to the drills than two or three inches, the remaining ground should be forked to loosen the parts, and make way for the fibres of the roots to strike out into the intervals, otherwise, if the land is strong, it will become so hard in those places which are not stirred, as to stint the growth of the Turneps, and this may be done at a small expence; a good hand will perform a great deal of this work in a day, and, whoever will make the trial, will find their account in practising it, especially on all strong land, where the Turneps are much more liable to suffer from the binding of the ground, than they will be on a loose soil; but yet, in all sorts of ground, it will be of great service to practise this.

When the ground is thus stirred in every part, one ploughing will be sufficient, after the Turneps are eaten off the ground, to prepare it for the sowing of Barley, or any other crop; so that there will be an advantage in this, when the Turneps are kept late on the ground, as will often be the case, especially when they are cultivated for feeding of ewes, because it is often the middle of April before the ground will be cleared; for late feed in the spring, before the natural Grass comes up, is the most wanted, where numbers of sheep and ewes are maintained, and one acre of Turneps will afford more feed than thirty acres of the best pasture at that season.

In Norfolk and some other counties, they cultivate great quantities of Turneps for feeding of black cattle, which turn to great advantage to their farms, for hereby they procure a good dressing for their land; so that they have extraordinary good crops of Barley upon the same ground, which would not have been worth the ploughing, if it had not been thus husbanded.

When the Turneps are fed off the ground, the cattle should not be suffered to run over too much of it at one time; for if they are not confined by hurdles to as much as is sufficient for them one day, the cattle will spoil three times the quantity of Turneps as they can eat, so that it is very bad husbandry to give them too much room; therefore the hurdles should be once or twice every day removed forward, and, if the Turneps are drawn out of the ground before the cattle or sheep are turned into the new inclosure, there will be less waste made, for they will then eat up the whole roots; whereas, if they are turned upon the Turneps growing, they will scoop the roots, and leave the rinds, which being hollow, the urine of the sheep will lodge in them; so that when they are forked out of the ground, the sheep will not eat any one of those roots which are thus tainted.

I cannot omit taking notice of a common mistake, which has generally prevailed with persons who have not been well informed to the contrary, which is, in relation to the mutton which is fattened with Turneps, most people believing it to be rank and ill tasted, whereas it is a known fact, that the best mutton this country affords is all fattened on Turneps; and that rank mutton, whose fat is yellow, is what the low marshy lands of Lincolnshire, and other rank pastures, produce.

In order to save good Turnep-seeds, you should transplant some of the fairest roots in February, placing them at least two feet asunder each way, observing to keep the ground clear from weeds, until the Turneps have spread so as to cover the ground, when they will prevent the weeds from growing; and when the seed-pods are formed, you should carefully guard them against the birds, otherwise they will devour it, especially when it is near ripe; at which time you should either shoot the birds as they alight upon the seed, or lay some birdlimed twigs upon it, whereby some of them will be caught; and, if they are permitted to remain some time, and afterwards turned loose, they will prevent the birds from coming thither again for some time, as I have experienced. When the seed is ripe, it should be cut up, and spread to dry in the sun; after which it may be threshed out, and preserved for use.

There have been many receipts for preventing the fly taking Turneps, but few of them deserve notice, therefore I shall only mention two or three which I have seen tried with success. The first was steeping the seeds in water with flower of brimstone mixed, so as to make it strong of the brimstone: another was steeping it in water with a quantity of the juice of Horse-Aloes mixed; both which have been found of use. The sowing of soot or Tobacco-dust over the young plants as soon as they appear above ground, has also been found very serviceable: in short, whatever will add vigour to the young plants will prevent their being destroyed by the fly, for these never attack them till they are stinted in their growth.

RAPHANUS. Tourn. Inst. R. H. 229. tab. 114. Lin. Gen. Plant. 736. [of ῥᾳδιος, easy, and φαίνω, to appear; q. d. a plant easily appearing, for this plant being

being ſown, quickly puts forth out of the ground.] Radiſh; in French, *Raifort.*

The CHARACTERS are,

*The empalement of the flower is erect, and compoſed of four oblong leaves. The flower has four heart ſhaped petals, placed in form of a croſs, which ſpread open, and are narrow at their baſe; it hath four honey glands, one on each ſide the ſhort ſtamina between them and the ſtyle, and one between each of the long ſtamina and the empalement; it hath ſix ſhort ſtamina which are erect; two which are oppoſite, are the length of the empalement, the other four are as long as the baſe of the petals, terminated by ſingle ſummits, and an oblong ſwelling germen narrowed the length of the ſtamina, with ſcarce any ſtyle, crowned by a beaded ſtigma. The germen afterward becomes an oblong, ſmooth, ſpongy pod having an acute point, ſwelling and almoſt jointed, having two cells divided by an intermediate partition, and filled with roundiſh ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifteenth claſs, which contains thoſe plants whoſe flowers have four long and two ſhorter ſtamina, and their ſeeds are included in pods.

The SPECIES are,

1. RAPHANUS (*Sativus*) ſiliquis teretibus toroſis bilocularibus. Hort. Cliff. 340. *Radiſh with taper pods, having two cells.* Raphanus minor oblongus. C. B. P. 96. *Smaller oblong Radiſh, or the common Radiſh.*
2. RAPHANUS (*Rotundus*) radice rotundâ. *Round-rooted Radiſh, or ſmall, round, Naples Radiſh.*
3. RAPHANUS (*Orbiculatis*) radice orbiculatâ depreſsâ. *Radiſh with an orbicular depreſſed root.* Raphanus major, orbicularis vel rotundus. C. B. P. 96. *Greater orbicular, or round Radiſh, commonly called Turnep-rooted, or white Spaniſh Radiſh.*
4. RAPHANUS (*Niger*) radice fuſiformi. *Radiſh with a ſpindle-ſhaped root.* Raphanus niger. C. B. P. 96. *The black Spaniſh Radiſh.*
5. RAPHANUS (*Chinenſus*) oleiferus. Lin. Sp. 935. *China oily Radiſh.*
6. RAPHANUS (*Raphaniſtrum*) ſiliquis teretibus articulatis lævibus unilocularibus. Hort. Cliff. 340. *Radiſh with ſmooth, taper, jointed pods having one cell.* Rapiſtrum flore albo, ſiliquâ articulatâ. C. B. P. 95. *White flowering Charlock with a jointed pod.*

The laſt ſort grows naturally on arable lands in many parts of Europe, ſo is ſeldom admitted into gardens.

The other five ſorts are ſuppoſed to be only ſeminal variations; but from forty years experience, I have never found either of theſe to vary from one to the other ſort; and I am certain whoever will make the trial, by ſaving the ſeeds of each carefully without mixture, will always find the plants prove the ſame as the ſeeds were ſaved from.

The firſt ſort here mentioned is that which is commonly cultivated in kitchen-gardens for its root, of which there are ſeveral varieties, as the ſmall-topped, the deep red, the pale red or ſalmon, and the long-topped ſtriped Radiſh; all which are varieties ariſing from culture. The ſmall-topped ſort is moſt commonly preferred by the gardeners near London, becauſe they require much leſs room than thoſe with large tops, and may be left much cloſer together; and, as the forward Radiſhes are what produce the greateſt profit to the gardener, theſe being commonly ſown upon borders near hedges, walls, or pales, if they are of the large-topped ſort, will be apt to grow moſtly to a top, and not ſwell ſo much in the root as the other, eſpecially if they are left pretty cloſe.

The ſeaſons for ſowing this ſeed are various, according to the time when they are deſigned for uſe; but the earlieſt ſeaſon is commonly the end of October, or beginning of November, that the gardeners near London ſow them to ſupply the markets; and theſe, if they do not miſcarry, will be fit for uſe in the beginning of March following, which is full as ſoon as moſt people care to eat them. Theſe are commonly ſown on warm borders near walls, pales, or hedges, where they may be defended from the cold winds; but there are ſome who ſow Radiſh-ſeeds among other crops the middle of September, and, if theſe are not deſtroyed by froſt, they will be fit for uſe early in February; but theſe muſt be eaten while they are young, for they ſoon grow ſticky and ſtrong. The ſecond ſowing is commonly about Chriſtmas, provided the ſeaſon be mild, and the ground in a fit condition to work; theſe are alſo ſowed near ſhelter, but not ſo near pales and hedges as the firſt ſowing. If theſe are not deſtroyed by froſt, they will be fit for uſe the beginning of April; but in order to have a ſucceſſion of theſe roots for the table through the ſeaſon, you ſhould repeat ſowing of their ſeeds once a fortnight, from the middle of January till the beginning of April, always obſerving to ſow the latter crops upon a moiſt ſoil and in an open ſituation, otherwiſe they will run up and grow ſticky before they are fit for uſe.

Many of the gardeners near London ſow Carrot-ſeed with their early Radiſhes, ſo that when their Radiſhes are killed, which ſometimes happens, the Carrots will remain; for the ſeeds of Carrots commonly lie in the ground five or ſix weeks before they come up, and the Radiſhes ſeldom lie above a fortnight under ground at that ſeaſon, ſo that theſe are often up and killed, when the Carrot-ſeed remains ſafe in the ground; but, when both crops ſucceed, the Radiſhes muſt be drawn off very young, otherwiſe the Carrots will be drawn up ſo weak, as not to be able to ſupport themſelves when the Radiſhes are gone.

It is alſo a conſtant practice with theſe gardeners to mix Spinach-ſeed with their latter crops of Radiſhes, ſo that when the Radiſhes are drawn off, and the ground cleaned between the Spinach, it will grow prodigiouſly, and in a fortnight's time will as completely cover the ground, as though there had been no other crop. And this Spinach, if it be of the broad-leaved kind, will be larger and fairer than it commonly is when ſown by itſelf; becauſe where people have no other crop mixed with it, they commonly ſow it too thick, whereby it is drawn up weak, but here the roots ſtand pretty far apart, ſo that after the Radiſhes are gone, they have full room to ſpread; and if the ſoil be good, it is a prodigious ſize this Spinach will grow to before it runs up for ſeed; but this huſbandry is chiefly practiſed by ſuch gardeners as pay very dear for their land, and are obliged to have as many crops in a year as poſſible, otherwiſe they could not afford to pay ſuch large rents.

When the Radiſhes are come up, and have got five or ſix leaves, they muſt be pulled up where they are too cloſe, otherwiſe they will draw up to a top, but the roots will not increaſe their bulk. In doing of this, ſome only draw them out by hand, which is a tedious method; but the beſt way is to hoe them with a ſmall hoe, which will ſtir the ground, and deſtroy the young weeds, and alſo promote the growth of the Radiſhes and Spinach. The diſtance which theſe ſhould be left, if for drawing up ſmall, may be three inches, but if they are to ſtand until they are pretty large, ſix inches are full near enough, and a ſmall ſpot of ground will afford as many Radiſhes at each ſowing, as can be ſpent in a family while they are good.

If you intend to ſave ſeeds of your Radiſhes, you ſhould, at the beginning of May, prepare a ſpot of ground in proportion to the quantity of ſeeds intended (but you ſhould always make allowance for bad ſeaſons, becauſe it often happens, in a very dry ſeaſon, that there will not be a fourth part of the quantity of ſeeds upon the ſame proportion of ground as there will be in a moiſt ſeaſon, though in a dry year the ſeeds will ripen beſt.) This ground ſhould be well dug and levelled; then you ſhould draw up ſome of the ſtraiteſt and beſt coloured Radiſhes (throwing away all ſuch as are ſhort, and that branch out in their roots;) the Radiſhes ſhould be planted in rows three feet diſtance, and two feet aſunder in the rows, obſerving, if the ſeaſon be dry, to water them until they have taken root; after which they will require no farther care, but only to hoe down the weeds between them

them, until they are advanced so high as to spread over the ground, when they will prevent the growth of weeds.

When the seed begins to ripen, you should carefully guard it against the birds, for these will otherwise destroy it. When it is ripe (which you may know by the pods changing brown,) you should cut it, and spread it in the sun to dry; after which you should thresh it out, and lay it up for use, where the mice cannot come to it, otherwise they will eat it up.

The small round-rooted Radish is not very common in England, but in many parts of Italy it is the only sort cultivated; the roots of this kind are very white, round, small, and very sweet. This may be propagated in the same manner as the common sort, but with this difference only, viz. That this must not be sown till the beginning of March, and the plants should be allowed a greater distance. The seeds of this kind are very subject to degenerate, when saved in England, unless those which are planted for seeds are at such a distance from the common sort, as that the farina of one cannot mix with the other.

The other round-rooted Radishes are seldom cultivated in England, but those who have a mind to have them, may sow them in the same manner as the last.

The black and white Spanish Radishes are commonly cultivated for medicinal use, though there are some persons who are very fond of them for the table. These are commonly sown about the middle of July, or a little earlier, and are fit for the table by the end of August, or the beginning of September, and will continue good till the frost spoils them. These must be thinned to a greater distance than the common sort, for the roots of these grow as large as Turneps, therefore should not be left nearer together than six or eight inches.

Some persons who are very curious to have these roots in winter, draw them out of the ground before the hard frost comes on, and lay them up in dry sand in the same manner as is practised for Carrots, being careful to guard them from wet and frost, and by this method they preserve them till the spring.

RAPISTRUM. See Sinapis.

RAPUNCULUS. Tourn. Inst. R. H. 113. tab. 38. Phyteuma. Lin. Gen. Plant. 203. Rampion.

The Characters are,

*The empalement of the flower is of one leaf, divided into five acute parts sitting upon the germen. The flower hath one petal, which is starry, spreading open, and cut into five linear segments which are recurved; it hath five stamina which are shorter than the petal, terminated by oblong summits. The germen, which is situated under the flower, supports a slender recurved style crowned by an oblong, twisted, three-pointed stigma. It afterward becomes a roundish capsule with three cells, filled with small roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, in which those plants are placed, whose flowers have five stamina and one style.

The Species are,

1. Rapunculus (*Spicatus*) spicâ oblongâ, capsulis bilocularibus, foliis radicalibus cordatis. *Rampion with an oblong spike of flowers, capsules containing two cells, and the lower leaves heart-shaped.* Rapunculus spicatus. C. B. P. 92. *Spiked Rampion.*
2. Rapunculus (*Comosus*) fasciculo terminali sessili, foliis dentatis, radicalibus cordatis. *Rampion with flowers growing in bunches terminating the stalks, indented leaves, and those at the bottom heart-shaped.* Rapunculus Alpinus corniculatus. C. B. P. 93. *Horned Alpine Rampion.*
3. Rapunculus (*Hemisphericus*) capitulo subrotundo, foliis linearibus integerrimis. *Rampion with roundish heads, and linear entire leaves.* Rapunculus folio gramineo. Tourn. Inst. 113. *Rampion with a Grass leaf.*
4. Rapunculus (*Pauciflorus*) capitulo subfolioso, foliis omnibus lanceolatis. *Rampion with heads which are leafy, and all the leaves spear-shaped.* Rapunculus Alpinus parvus comosus. J. B. 2. p. 811. *Small, Alpine, hairy Rampion.*
5. Rapunculus (*Orbicularus*) capitulo subrotundo, foliis serratis radicalibus cordatis. *Rampion with roundish heads and sawed leaves, the lower ones of which are heart-shaped.* Rapunculus flore globoso, purpureo. J. B. 2. 810. *Rampion with a purple globular flower.*

These are all of them hardy plants, which will thrive in the open air. They are propagated by seed, which should be sown in autumn, for if they are kept out of the ground till the spring, they frequently fail, or at least lie a year in the ground. These seeds should be sown on a bed of fresh undunged earth where they are designed to remain, for they do not thrive so well when they are transplanted; therefore the best method is to make small drills cross the bed about eighteen inches asunder, and sow the seeds therein; then cover them lightly over with earth, for if they are buried too deep, they will rot in the ground. In the following spring the plants will come up, when they should be diligently weeded, which is all the care they require; only they should be thinned where they are too close, so as to leave them six or seven inches apart in the rows, and afterward they require no farther attention but to keep them clear from weeds. In June the plants will flower, and if the summer prove favourable, they will produce ripe seeds.

As these plants do not continue above two or three years, there should be seeds sown every other year to continue the sorts, for they are plants which require little trouble to cultivate them, and their flowers make a pretty variety in large gardens, therefore they may be allowed a place amongst other hardy flowers.

RAPUNTIUM. Tourn. Inst. R. H. 163. tab 51. Lobelia. Lin. Gen. Plant. 897. Rampions, or Cardinal's-flower.

The Characters are,

*The empalement of the flower is of one leaf, cut into five linear segments, the two upper being larger than the other. The flower is of one petal; it hath a long cylindrical tube which is a little curved, and divided at the brim into five segments, two of which compose the upper lip, and are smaller than the three lower which compose the under; it hath five awl-shaped stamina the length of the tube, terminated by oblong summits which coalesce at the top in form of a cylinder, but open in five parts at their base, having an acute germen situated below the flower, supporting a cylindrical style crowned by a hairy obtuse stigma. The germen afterward becomes an oval capsule opening at the top, filled with small seeds.*

This genus of plants is ranged in the second section of Tournefort's third class, which includes the herbs with an anomalous flower of one petal, having a tube ending in a tongue. Dr. Linnæus has joined the plants of this genus to that of Plumier's Lobelia, making them but one genus; but, as the Lobelia of Plumier has a fleshy berry inclosing a stone with two seeds, and the Rapuntium hath a dry capsule, they should be separated.

The Species are,

1. Rapuntium (*Cardinalis*) caule erecto, foliis lanceolatis serratis, spicâ terminali. *Cardinal's-flower with an erect stalk, spear-shaped sawed leaves, and a spike of flowers terminating the stalk.* Rapuntium maximum, coccineo spicato flore. Col. in Rech. 880. *The largest Rapuntium with a spike of scarlet flowers, commonly called scarlet Cardinal's-flower.*
2. Rapuntium (*Siphiliticum*) caule erecto, foliis ovato-lanceolatis crenatis, calycum sinubus reflexis. *Cardinal's-flower with an erect stalk, oval, spear-shaped, crenated leaves, and the sinuses of the empalements reflexed.* Rapuntium Americanum, flore dilutè cæruleo. H. R. Par. 105. *American Cardinal's-flower with a pale blue flower, commonly called the blue Cardinal's-flower.*
3. Rapuntium (*Cliffortianum*) caule erecto, foliis cordatis obsoletè dentatis petiolatis, floribus sparsis thyrso longissimo. *Cardinal's-flower with an erect stalk, heart-shaped leaves which are somewhat indented, with foot-*

 *stalks,*

*ſtalks, and the longeſt ſpike of flowers which are placed thinly.* Rapuntium Americanum trachelii folio, flore purpuraſcente. Plum. Cat. 5. *American Cardinal's-flower, with a Throatwort leaf and a purpliſh flower.*

4. Rapuntium (*Urens*) caule erecto, foliis inferioribus ſubrotundis crenatis, ſuperioribus lanceolatis ſerratis, ſpicâ terminali. *Rapuntium with an erect ſtalk, the lower leaves roundiſh and crenated, the upper ſpear-ſhaped and ſawed, and a ſpike of flowers terminating the ſtalk.* Rapuntium urens, ſolonienſe. H. R. Blœs. *Stinging Cardinal's-flower of Blois.*

5. Rapuntium (*Inflatum*) caule erecto, foliis ovatis ſubſerratis, pedunculo longioribus, capſulis inflatis. *Cardinal's-flower with an erect ſtalk, oval leaves which are ſomewhat ſawed and longer than the foot-ſtalks, and ſwelling ſeed-veſſels.* Lobelia caule erecto brachiato, foliis ovato-lanceolatis obſoletè inciſis, capſulis inflatis. Hort. Cliff. 500. *Lobelia with an erect branching ſtalk, oval ſpear-ſhaped leaves a little cut, and ſwollen ſeed-veſſels.*

6. Rapuntium (*Hirtum*) foliis ovalibus crenatis lanatis, floribus lateralibus ſolitariis. *Cardinal's-flower with oval crenated leaves which are downy, and flowers growing ſingly from the ſides of the ſtalks.* Rapuntium foliis ſubrotundis hirtis, flore ex alis ſolitario. Burm. Afr. 105. tab. 40. *Rapuntium with roundiſh hairy leaves, and ſolitary flowers proceeding from their wings.*

7. Rapuntium (*Longiflorum*) foliis lanceolatis dentatis, pedunculis breviſſimis lateralibus tubo corollæ longiſſimo. *Cardinal's-flower with ſpear-ſhaped indented leaves, very ſhort foot-ſtalks to the flowers which proceed from the ſides of the ſtalks, and a very long tube to the petal.* Rapunculus aquaticus, foliis cichorii flore albo tubo longiſſimo. Sloan. Hiſt. Jam. 1. p. 158. *Aquatic Rampion with a Cicory leaf, and a white flower having the longeſt tube.*

8. Rapuntium (*Erinum*) caule patulo ramoſo foliis lanceolatis ſubdentatis, pedunculis longiſſimis. *Rapuntium with a ſpreading branching ſtalk, ſpear-ſhaped leaves which are ſomewhat indented, and very long foot-ſtalks to the flowers.* Campanula minor Africana, erini facie, flore violaceo, caulibus erectis. H. L. 110. *Smaller African Bell-flower with the appearance of Erinus, a Violet flower, and an upright ſtalk.*

9. Rapuntium (*Erinoides*) caulibus procumbentibus, foliis lanceolatis ſerratis, pedunculis lateralibus. *Cardinal's-flower with trailing ſtalks, ſpear-ſhaped ſawed leaves, and foot-ſtalks proceeding from their ſides.* Campanula minor Africana, erini facie, caulibus procumbentibus. H. L. 108. *Smaller African Bell-flower with the appearance of Erinus, and trailing ſtalks.*

The firſt ſort grows naturally by the ſide of rivers and ditches in great part of North America, but has been many years cultivated in the European gardens for the great beauty of its ſcarlet flowers. The root is compoſed of many white fleſhy fibres; the lower leaves are oblong, a little ſawed, and of a dark purpliſh colour on their upper ſide; the ſtalks are erect, and riſe about a foot and a half high; they are garniſhed with ſpear-ſhaped leaves about three inches long, and one and a half broad in the middle, a little ſawed on their edges, having very ſhort foot-ſtalks, and are placed alternately; the ſtalk is terminated by a ſpike of flowers of an exceeding beautiful ſcarlet colour; theſe have a pretty long tube, which is a little incurved, but at the top is cut longitudinally into five ſegments; two upper, which are the ſmalleſt, are greatly reflexed, the three under which form the lower lip, are larger, and ſpread open. Theſe appear the latter end of July and in Auguſt, when they make a fine appearance for a month or more, and when the autumn proves favourable, they will produce good ſeeds here.

This is propagated by ſeeds, which, when they ripen in England, ſhould be ſown in autumn in pots filled with rich kitchen-garden earth, and placed under a common hot-bed frame; or, if the ſeeds come from the country where the plants grow naturally, they ſhould be ſown in the ſame way as ſoon as they arrive, for if they are kept out of the ground till ſpring, they will lie a year in the ground before they vegetate. The pots in which theſe ſeeds are ſown ſhould be expoſed to the open air at all times when the weather is mild, but they muſt be ſcreened from the froſt, and the very hard rain in winter. In the ſpring the plants will appear, when they ſhould have as much free air as poſſible in mild weather, and if the ſpring proves dry, they muſt be frequently refreſhed with water. As ſoon as they are fit to remove, they ſhould be each planted in a ſeparate ſmall pot filled with the ſame rich earth, and placed in the ſhade till they have taken new root; then they may be placed where they may have the morning ſun, in which ſituation they may remain till autumn. During the ſummer, they muſt be duly watered in dry weather, and when the roots have filled the pots, they ſhould be removed into larger. In autumn they muſt be placed under a common frame to ſcreen them from hard froſt, but they ſhould enjoy the open air at all times when the weather is mild. The ſpring following they ſhould be new potted, and placed where they may have the morning ſun, always obſerving to water them duly in dry weather, which will cauſe their ſtalks to be ſtronger, and produce larger ſpikes of flowers in Auguſt. Theſe will continue long in beauty, if they are not too much expoſed to the ſun, and, if the autumn proves warm, the ſeeds will ripen well in England. The roots of this plant will ſometimes laſt two or three years, and produce offſets for increaſe, but they will not flower ſo ſtrong as the ſeedling plants, therefore an annual ſupply of them ſhould be raiſed. There are many who propagate this plant by cutting their ſtalks into proper lengths, and plant them in pots filled with good earth, or into an eaſt border, covering them cloſe with glaſſes. Theſe frequently take root, ſo produce young plants, but they are not ſo good as the ſeedlings.

The plants of this ſort will live in the full ground if they are protected from hard froſt in winter, and they will flower ſtronger than thoſe in pots.

The ſecond ſort grows naturally at Campeachy, from whence the late Mr. Robert Millar ſent the ſeeds; this hath a fibrous root like the firſt. The ſtalks are much larger, and riſe a foot higher; they are cloſely garniſhed with leaves which are above four inches long, and half an inch broad, very ſmooth and entire, ending in acute points; they are terminated by ſhort ſpikes of flowers which are larger than thoſe of the firſt ſort, but are of the ſame beautiful ſcarlet colour, and appear about the ſame time with them.

This is propagated by ſeeds in the ſame way as the firſt, but the plants are not ſo hardy, therefore require to be placed in a moderate ſtove in winter, and in ſummer they ſhould be placed in a deep frame, where they may be covered with glaſſes in bad weather, but enjoy the free air at all times when the weather is favourable. With this management the plants flowered very well in the Chelſea Garden, but they did not perfect ſeeds.

The third ſort grows naturally in Virginia, but has been long an inhabitant of the Engliſh gardens; this hath a perennial fibrous root. The leaves are ſmooth, oval, ſpear-ſhaped, and a little indented on their edges; the ſtalks riſe a foot and a half high, and are garniſhed with leaves like thoſe at the bottom, which are gradually ſmaller to the top, ſitting cloſe to the ſtalk. The flowers come out from the wings of the leaves; they are of a pale blue colour, and have large empalements whoſe edges are reflexed; they appear a little earlier in July than the firſt ſort, and the ſeeds frequently ripen in England.

It is propagated in the ſame way as the firſt ſort, and the plants require the ſame culture.

The fourth ſort grows naturally in Jamaica, from whence the late Dr. Houſtoun ſent the ſeeds; this is an annual plant. The ſtalk riſes about a foot high, then divides into four or five ſmaller, which grow erect. The lower part is garniſhed with heart-ſhaped ſmooth leaves, about one inch and a half long, and three

three quarters of an inch broad at the base, lessening to a point at the end; they have small indentures on their borders, and stand upon short foot-stalks. The upper slender stalks are thinly garnished with small purplish flowers to the top, and these are succeeded by small seed-vessels which ripen in autumn. When the seeds are permitted to scatter on the pots which stand near them, and those are sheltered from the frost, the plants will come up plentifully the following spring; or, if they are sown in pots in autumn, and sheltered in the winter, the plants will arise the following spring; and these should be transplanted into separate small pots, placing them under a frame, where they will flower in June and July, and their seeds will ripen in September, and the plants will then decay.

The fifth sort grows naturally in the forests about Blois in France; this is an annual plant. The root is composed of many fleshy fibres; the stalk rises about two feet high, and is garnished with spear-shaped leaves near three inches long, and one broad in the middle; they are very thin, and are sawed on their edges, sitting close to the stalk; the upper part of the stalk is garnished with very small leaves, and from their base arise the flowers, which are of a bright blue colour. These appear in July, and are succeeded by roundish seed-vessels with holes at the top, which are filled with small red seeds.

The seeds of this plant should be sown in autumn in pots filled with loamy earth, and placed under a hot-bed frame in winter, and when they come up in the spring, they should be transplanted either into a border of soft loamy earth, or into separate pots, shading them till they have taken new root; and afterward the must be duly watered in dry weather, which will cause them to flower strong, and produce good seeds annually.

The sixth sort grows naturally in North America; this is a biennial plant in England, which rarely flowers the same year as the plants come up, but decays soon after the seeds are ripe. The stalks of this are channelled and hairy; they grow erect to the height of two feet, and are garnished with thin oval leaves about two inches long, and one broad in the middle, sitting close to the stalk; they are of a light green, and a little sawed on their edges. The flowers stand upon long slender foot-stalks which come out from the wings of the leaves, and form a loose spike which terminate the stalk; they are small, and of a light blue colour. This flowers in July, and the seeds ripen in September. This is propagated by seeds, which should be sown in autumn, in pots filled with rich earth, and treated in the same way as the first sort.

The seventh sort grows naturally at the Cape of Good Hope; this is a biennial plant; the stalks rise a foot and a half high, they are covered with a hairy down, and are purplish toward the bottom; the leaves are oval, two inches and a half long, and an inch and a quarter broad, of a deep green colour, a little hairy on their under side, and sit close to the stalks. The flowers stand upon long slender foot-stalks, which come out from the bosom of the leaves, sometimes one proceeding from a joint, and at others they come out opposite on each side the stalk, each foot-stalk sustaining one pale blue flower, which being small makes but little appearance. This flowers about the same time with the former, and may be propagated in the same way.

The eighth sort grows naturally in moist places, on most of the islands in the West-Indies. This is also a biennial plant, whose root is composed of a few strong ligneous fibres, which strike deep in the ground; the stalk rises about eight or nine inches high, and is closely garnished with leaves on every side; these are four inches long and half an inch broad, very deeply indented on their edges; they are hairy, of a deep green, and sit close to the stalks. The flowers come out at every joint from the wings of the leaves, standing upon very short foot-stalks; the tube of the flower is from three to four inches long, very slender, and is deeply cut at the top into five segments, which spread open; they are white, and appear in June, and are succeeded by turgid seed-vessels, crowned by the five segments of the petal, having three holes at the top, and filled with small grayish seeds. The seeds of this sort should be sown soon after it is ripe, in pots filled with rich earth, and plunged into the tan-bed in the stove, observing to refresh the earth frequently with water. In the spring these pots may be removed, and plunged into a hot-bed, which will soon bring up the plants: when these are fit to remove, they should be each transplanted into a separate small pot filled with rich earth, and plunged into a fresh hot-bed, shading them from the sun till they have taken new root; then they may be treated in the same way as other tender plants from the same country, giving them a large share of air in warm weather, and frequently refreshing them with water. In autumn the plants must be plunged into the tan-bed of the stove, where they will flower the following summer and produce ripe seeds, soon after which the plants will decay. If the seeds of this plant are brought from the West-Indies, they should be sown as soon as they arrive, in pots filled with rich earth; and if it happens in the winter, the pots should be plunged into the tan-bed in the stove; but if it is in the spring or summer, they may be plunged into a hot-bed in the common frames. These seeds when sown in the spring, seldom grow the same year, therefore the following autumn the pots should be removed into the stove, and managed according to the above directions.

The ninth sort grows naturally at the Cape of Good Hope; this is an annual plant; the stalks are slender, branching, and spread out on every side; they rise about a foot high, and are garnished with small spear-shaped leaves which are indented on their edges, and sit close to the branches. The flowers are small and blue; they stand upon very slender long foot-stalks, and appear in July; these are succeeded by small roundish seed-vessels, filled with small seeds which ripen in September. If the seeds of this sort are sown in autumn, they will succeed much better than when they are sown in spring: these may be sown in pots, and sheltered under a common hot-bed frame in winter, exposing them to the open air at all times in mild weather, but screening them from the frost; and in the spring, the pots should be plunged into a moderate hot-bed, which will soon bring up the plants; when these are fit to remove, they should be each planted in a separate small pot filled with rich earth, and plunged into a moderate hot-bed again, shading them from the sun till they have taken new root; then they must have a large share of free air at all times when the weather is mild; and as the plants grow strong, they should be gradually hardened to bear the open air, into which they should be removed in June, placing them in a sheltered situation, where they will flower in July, and if the season proves favourable, the seeds will ripen in September; but if the season should prove cold, it will be proper to remove one or two plants into a glass-case, to obtain good seeds.

The tenth sort comes from the Cape of Good Hope: this hath trailing stalks, and the leaves are sawed on their edges, and the foot-stalks come out from the side of the branches, in which it differs from the last sort. It may be propagated by seeds, and treated in the same manner as the last.

RAUVOLFIA. Plum. Nov. Gen. 19. tab. 40. Lin. Gen. Plant. 259.

The name was given to this genus of plants by Father Plumier, who was the person that discovered it in America, in honour of Leonard Rauvolf, who was a curious botanist, and flourished about the year 1583. He travelled into the Holy Land, and several other places in the east, and published his travels in High Dutch, which were translated into English under the inspection of the great Mr. Ray.

The CHARACTERS are,

*The flower has a small permanent empalement of one leaf, cut into five segments at the top. The petal is funnel-shaped; the tube is cylindrical, globular at the base, and is cut at the brim into five parts. It has five stamina which are a little shorter than the tube, terminated by erect summits, and a roundish germen supporting a short style, crowned by a headed stigma. The germen afterward becomes a globular berry with two cells, inclosing one compressed seed in each.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

The SPECIES are,

1. RAUVOLFIA (*Canescens*) subpubescens. Lin. Sp. Plant. 303. *Hairy Rauvolfia.* Rauvolfia tetraphylla latifolia. Plum. Nov. Gen. 19. *Broad four-leaved Rauvolfia.*
2. RAUVOLFIA (*Nitida*) glaberrima nitidissima. Lin. Sp. 303. *Smooth neat Rauvolfia.* Rauvolfia tetraphylla angustifolia. Plum. Nov. Gen. 19. *Narrow four-leaved Rauvolfia.*

Both these sorts grow naturally in the warmest parts of America; Mr. Robert Millar sent the seeds of them from Carthagena in New Spain, where he observed the shrubs growing in great plenty. These rise with several ligneous stalks from the foot, which grow seven or eight feet high, sending out a few small side branches, covered with a smooth green bark when young, but as they are older their bark changes to a gray. The leaves are placed by fours at each joint round the branches; those of the first sort are two inches and a half long, and an inch and a half broad in the middle, a little hairy, of a light green, and have a few slight indentures on their edges; the leaves of the other sort are full as long, but are a third part narrower, of a thinner substance, and much smoother. These differences continue in the plants which are raised from seeds, for I have several times propagated them both from seeds, and have constantly found the seeds produce the same as the plants from which they were taken. The flowers are produced on slender foot-stalks, which arise from the wings of the leaves; they are tubulous, and globular at their base, and are succeeded by roundish berries about the size of those of the Privet, which turn black when they are ripe. These plants flower most part of the summer, and the fruit ripens in autumn and winter; the leaves and stalks of these plants have a milky juice, which flows out if they are broken.

These are propagated by seeds, which should be sown in autumn soon after they are ripe; for if they are kept out of the ground till spring, the plants rarely come up the same year; and this is frequently the case with those seeds which are brought to England.

The seeds of these plants should be sown in pots filled with fresh earth, and plunged into a hot-bed of tanners bark; for as they are very hard, so they frequently remain a long time in the ground; therefore when they are in pots, they may be shifted from one bed to another as their heat decays. When the plants come up, they must be frequently refreshed with water, but it must not be given them in large quantities; for as the plants are succulent and full of a milky juice, so they are in danger of rotting with too much moisture. They should also have a large share of fresh air admitted to them in warm weather, and when they are about two inches high, they should be transplanted each into a separate small pot filled with fresh light earth, and plunged into a hot-bed again, observing to shade them from the sun until they have taken new root; after which time they should have free air admitted to them every day, in proportion to the warmth of the season. In this hot-bed the plants may remain till toward Michaelmas, when they should be removed into the stove, and plunged into the tanners bark, where they must be kept warm, and not have too much moisture in cold weather.

As these plants are natives of very hot countries, they will not live in the open air in England, therefore they should constantly remain in the stove; and if they are continued in the bark-bed, they will thrive much faster than when they are placed on stands in a dry stove. But in the summer season they should have a large share of fresh air admitted to them, and the leaves of the plants must be now and then washed with a sponge, to clear them from the filth they are apt to contract; which, if suffered to remain, will retard the growth of the plants. Where due care is taken of them, they will thrive very fast, and the second year will produce flowers, and continue so to do for many years, and will perfect their seeds in England. They may also be propagated by cuttings, which should be laid to dry for two or three days before they are planted; and then should be plunged into a moderate hot-bed of tanners bark, observing to shade them until they have taken root, after which time they may be treated as the seedling plants.

RESEDA. Tourn. Inst. R. H. 423. tab. 238. Lin. Gen. Plant. 535. Bastard-rocket.

The CHARACTERS are,

*The empalement of the flower is of one leaf, cut into several segments almost to the bottom, and is permanent. The petals of the flower are unequal, and generally trifid, having a honey gland on their base the length of the empalement. The honey glands are plain, erect, and produced from the upper side of the receptacle, between the stamina and the place of the upper petal, joining with the base of the petals, dilating from the sides. It hath fifteen or sixteen short stamina, terminated by erect obtuse summits; and a gibbous germen sitting upon very short styles, crowned by a single stigma. The germen afterward becomes a gibbous angular capsule of one cell, with an aperture between the styles, filled with kidney-shaped seeds fastened to the angles of the capsule.*

This genus of plants is ranged in the third section of Linnæus's eleventh class, which includes those plants whose flowers have from eleven to nineteen stamina, and three styles.

The SPECIES are,

1. RESEDA (*Vulgaris*) foliis pinnatis, foliolis integris alternis floribus tetragynis. *Bastard-rocket with winged leaves, whose lobes are entire, placed alternate, and have four styles to the flower.* Reseda vulgaris. C. B. P. 100. *Common Bastard-rocket.*
2. RESEDA (*Crispa*) foliis omnibus trifidis, inferioribus pinnatis. Hort. Cliff. 213. *Bastard-rocket with all the leaves trifid, and the lower ones winged.* Reseda crispa Gallica. Bocc. Sic. 77. *French curled Bastard-rocket.*
3. RESEDA (*Phyteuma*) foliis integris trilobisque, calycibus sexpartitis maximis. Hort. Cliff. 412. *Bastard-rocket with entire and trifid leaves, and the largest empalement to the flower.* Reseda minor vulgaris. Tourn. Inst. R. H. 413. *Lesser common Bastard-rocket.*
4. RESEDA (*Undata*) floribus trigynis, tetragynisque calycibus quinquepartitis, foliis pinnatis undulatis. Lin. Sp. Plant. 644. *Bastard-rocket with trifid and quadrifid flowers, whose empalements are cut into five parts, and winged waved leaves.* Reseda minor alba, dentatis foliis. Barrel. Icon. 588. *Smaller white Bastard-rocket with indented leaves.*
5. RESEDA (*Alba*) foliis pinnatis, floribus tetragynis, calycibus sexpartitis. Lin. Sp. Plant. 645. Hort. Upsal. 149. *Bastard-rocket with winged leaves, flowers having four styles, and an empalement cut into six parts.* Reseda foliis calcitrapæ flore albo. Mor. Hort. R. Bl. *Bastard-rocket with Star Thistle leaves, and a white flower.*
6. RESEDA (*Odorata*) foliis integris trilobisque, calycibus florum æquantibus. Lin. Sp. Plant. 646. *Bastard-rocket with entire three-lobed leaves, whose empalement is equal with the petals of the flower, commonly called sweet Reseda, or Mignonette d'Egypt.*
7. RESEDA (*Canescens*) foliis subulatis sparsis. Sauv. Monsp. 41. *Bastard-rocket with awl-shaped leaves placed thinly.* Sesamoides flore albo, foliis canescentibus. Tourn Inst. R. H. 424. *Bastard Sesamum with a white flower and hoary leaves.*
8. RESEDA (*Luteola*) foliis lanceolatis integris, calycibus quadrifidis. Lin. Sp. Plant. 448. *Bastard-rocket with spear-shaped entire leaves, and quadrifid empalements.* Luteola

teola herba salicis folio. C. B. P. 100. *Dyer's Weed, or wild Woad, by some called Weld.*

The first sort grows naturally in the south of France, Italy, and Spain. This is a biennial plant, which flowers and seeds the second year, and perishes soon after. The root is long, white, and a little ligneous; the leaves are unequally winged, and the lobes are entire; the stalks are channelled, rising two feet high, garnished with leaves like those below, but are smaller, and are terminated by long loose spikes of pale yellow flowers, composed of several unequal petals; the two upper are the largest, the side ones less, and the lower are so small as to be scarce conspicuous; they are all of a singular figure, and appear as if one leaf came out of two others. In the middle are situated many stamina terminated by yellow summits, and at the bottom a three-cornered germen, which afterward turns to a three-cornered seed-vessel, having three or four holes at the top, and filled with black seeds.

The second sort grows naturally in chalky land in many parts of England, and has been supposed to be the common sort, it being our common sort in England, but the former is more common abroad, and is so titled; the lower leaves of this are winged, and every lobe is cut into three small parts, and are curled, having some small indentures on their edges. The stalks rise about the same height as those of the former, and are terminated by longer and looser spikes of flowers; the flowers are paler and approach to a white. This flowers in June, and the seeds ripen in September.

The third sort grows naturally in the south of France and Italy; this is an annual plant, which has generally a single fleshy tap-root running deep in the ground, sending out several trailing stalks near a foot long, which divide into smaller branches, garnished with small leaves, some of which are wedge-shaped and entire, others are cut into three obtuse segments. The ends of the branches are terminated by loose spikes of flowers, standing upon pretty long foot-stalks. The empalement of the flower is large, divided into six segments almost to the bottom; the flowers are white, and shaped like those of the other sorts. It flowers in July, and the seeds ripen in autumn.

The fourth sort grows naturally in Italy and Spain; this is a biennial plant, the lower leaves are unequally winged, some of the intermediate lobes or segments being much less than the others, and of different shapes. The stalks rise two feet and a half high, garnished with smaller difformed winged leaves, indented on their edges. The flowers are produced in slender loose spikes at the top of the stalks; they are small and white, of the same shape with the others, appearing in June, and the seeds ripen in September.

The fifth sort grows naturally in the south of France; it is a biennial plant; the lower leaves are large, winged, and composed of many narrow lobes or segments placed alternate, which are of a grayish colour; the stalks rise two feet and a half high, and are garnished with the like leaves, which diminish in their size to the top; the stalks are terminated by shorter and thicker spikes of flowers than either of the former, which are white, and shaped like those of the other species. It flowers in June, and the seeds ripen in August.

The sixth sort is supposed to grow naturally in Egypt; the seeds of this were sent me by Dr. Adrian Van Royen, the late professor of botany at Leyden. The root of this plant is composed of many strong fibres, which run deep in the ground, from which come out several stalks about a foot long, which divide into many small branches; these are garnished with oblong leaves, some of which are entire, and others are divided into three parts; they are about two inches long, and three quarters of an inch broad in the middle, ending in oval points, of a deep green colour. The flowers are produced in loose spikes at the end of the branches; they stand upon pretty long foot-stalks, have large empalements, and are of an herbaceous white colour, and smell very like fresh Raspberries, which occasions its being much cultivated in the English gardens. This plant is so like the third sort, as to be taken for the same by some, but the flowers of the third have no scent; so that those who have been imposed on, by having the seeds of the third sort sent them for this, have supposed the plant was degenerated.

The seventh sort grows naturally upon the mountains in Spain; this hath a perennial root, from which arise a few slender ligneous stalks a foot and a half high, which are thinly garnished with linear obtuse leaves, of a grayish colour; the upper part of the stalk is garnished for a good length with small, whitish, purple flowers, ranged in a very loose spike, sitting close to the stalk. These appear the latter end of May, and the seeds ripen in August.

The eighth sort grows naturally upon dry banks and old walls in many parts of England, but is cultivated in some places for the dyer's use. This is now generally believed to be the plant, with which the ancient inhabitants of this island painted themselves, and not the Woad, as has been by some supposed; for the Dyer's Weed is a native here, whereas the Woad has been since introduced into this country. This is a biennial plant; the root is composed of a few ligneous fibres; the leaves are four inches long, and half an inch broad, entire, and ending in obtuse points; these the first year spread circularly near the ground, and have some gentle wavings on their edges; the stalks rise three feet high, and are garnished with leaves of the same shape with those at bottom. They are terminated by long loose spikes of yellowish flowers, which appear the latter end of June, and the seeds ripen in September.

The five sorts first mentioned, and also the seventh, are seldom cultivated in gardens except for the sake of variety, having very little beauty to recommend them, and being of no use; but whoever has a mind to have them, need only sow their seeds in autumn, and when the plants come up, if they are thinned and kept clean from weeds, it is all the culture they require; and if their seeds are permitted to scatter, the plants will come up in plenty, and sometimes become troublesome weeds.

The seeds of the sixth sort should be sown on a moderate hot-bed in March, and when the plants are strong enough to transplant, they should be pricked out upon another moderate hot-bed to bring them forward; but they should have a large share of air in warm weather, otherwise they will draw up weak. About the latter end of May the plants may be planted out, some into pots, to place near the apartments, and others into warm borders, where they may remain to flower and seed. For the plants which grow in the full ground, often produce more seeds than those which are in pots; but at the time when the seed-vessels begin to swell, the plants are frequently infested with green caterpillars, which, if they are not destroyed, will eat off all the seed-vessels.

If the seeds of this plant are sown on a bed of light earth in April, the plants will come up very well, and when they are not transplanted, will grow larger than those which are raised in the hot-bed, but they will not flower so early, and in cold seasons will scarce ripen their seeds. The plants may also be preserved through the winter in a green-house, where they will continue flowering most part of the year, but the second year they will not be so vigorous as the first.

The eighth sort is the Weld, which is accounted a rich commodity for dyeing; where this is cultivated, the seeds are commonly sown with Barley in the spring, and after the Barley is taken off the ground, the Weld begins to make some progress, and the next season is pulled up for use. This has been long practised, and it will be difficult to prevail on the cultivaters of this plant to depart from their old customs;

 but

but if any persons will follow the directions hereafter given, I can from experience promise them much better success.

As the Weld will grow upon very poor soil, yet the crop will be in proportion to the goodness of the land; for upon very poor ground, the plants will not rise more than a foot high, whereas upon good ground I have measured them upward of three feet, and the stalks, leaves, &c. have been in proportion; so that the better the soil is upon which it is sown, the greater will be the produce.

The best way to cultivate this plant, is to sow it without any other crop; if the ground is ready by the beginning or middle of August, that will be a good season; the land should be well ploughed and harrowed fine, but unless it is very poor, it will not require dung; when the ground is well harrowed and made fine, the seeds should be sown; one gallon of the seeds is sufficient to sow an acre of land, for they are small. If rain falls in a little time after the seeds are sown, it will bring up the plants, and in two months time they will be so far advanced as to be easily distinguished from the weeds; then they should be hoed in the like manner as Turneps, always observing to do it in dry weather, for then the weeds will soon die after they are cut up; at this time the plants may be left about six inches distance; if this is done in dry weather, and the work well performed, the plants will be clean from weeds till the spring; but as young weeds will come up in March, so if in dry weather the ground is hoed again, it may be performed at a small expence while the weeds are young, and then they will soon decay; and if after this there should be many more weeds appear, it will be proper to hoe it a third time, about the beginning of May, which will preserve the ground clean till the Weld is fit to pull. The best time to pull the Weld for use, is as soon as it begins to flower, though most people stay till the seeds are ripe, being unwilling to lose the seeds; but it is much better to sow a small piece of land with this seed, to remain for a produce of new seeds, than to let the whole stand for seed; because the plants which are permitted to stand so long will be much less worth for use, than the value of the seeds; besides, by drawing off the crop early, the ground may be sown with Wheat the same season; for the plants may be drawn up the latter end of June, when they will be in the greatest vigour, so will afford a greater quantity of the dye.

When the plants are pulled, they may be set up in small handfuls to dry in the field, and when it is dry enough, it may be tied up in bundles and housed dry, being careful to stack it loosely, that the air may pass between to prevent its fermenting.

That which is left for seeds should be pulled as soon as the seeds are ripe and set up to dry, and then beat out for use; for if the plants are left too long, the seeds will scatter. The usual price of the seed is ten shillings a bushel.

RHABARBARUM. See Rheum.

RHABARBARUM MONACHORUM. See Rumex.

RHAGADIOLUS. See Lapsana.

RHAMNOIDES. See Hippophae.

RHAMNUS. Tourn. Inst. R. H. 593. tab. 366. Lin. Gen. Plant. 235. the Buckthorn; in French, *Nerprun*.

The Characters are,

*It hath male and female flowers on different plants; these have no empalements according to some, nor petals according to others. The cover of the sexes is funnel-shaped, and cut into four parts at the top, which spread open. The male flowers have five stamina the length of the tube, terminated by small summits. The female flowers have a roundish germen, supporting a short style, crowned by a quadrifid stigma. The germen afterward becomes a roundish berry, inclosing four hard seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and one style; but according to his system, it should be placed in the first section of his twenty-second class; but as he has joined to this genus the Frangula, Paliurus, Alaternus, and Ziziphus of Tournefort, so to comprehend them all he has placed them in his fifth class, which had much better be kept separate.

The Species are,

1. Rhamnus (*Catharticus*) floribus axillaribus, foliis ovato-lanceolatis serratis nervosis. *Buckthorn with flowers proceeding from the sides of the branches, and oval, spear-shaped, sawed, veined leaves.* Rhamnus catharticus. C. B. P. 478. *Purging or common Buckthorn.*
2. Rhamnus (*Minor*) floribus axillaribus, foliis ovatis acuminatis nervosis integerrimis. *Buckthorn with flowers proceeding from the sides of the branches, and oval, acute-pointed, entire leaves, having veins.* Rhamnus catharticus minor. C. B. P. 478. *Smaller purging or common Buckthorn, commonly called Dwarf Rhamnus.*
3. Rhamnus (*Longifolia*) foliis lanceolatis, floribus axillaribus. *Buckthorn with spear-shaped leaves, and flowers growing from the sides of the stalks.* Rhamnus catharticus minor, folio longiori. Tourn. Inst. 593. *Smaller purging Buckthorn with a longer leaf.*
4. Rhamnus (*Africana*) foliis cuneiformibus confertis perennantibus, floribus corymbosis alaribus. *Buckthorn with wedge-shaped evergreen leaves growing in clusters, and flowers growing in roundish bunches from the sides of the branches.* Rhamnus Afer, folio pruni longiore subrotundo, flore candicante, spinis longissimis. Boerh. Ind. alt. 212. *African Buckthorn with a longer roundish Plum leaf, a very white flower, and long spines.*

The first sort grows naturally in the hedges in many parts of England; it rises with a strong woody stalk to the height of twelve or fourteen feet, sending out many irregular branches; the young shoots have a smooth, grayish, brown bark, but the older branches have a darker and rougher bark, and are armed with a few short thorns. The leaves stand upon pretty long slender foot-stalks; they are of the oval spear-shape, about two inches and a half long, and one and a quarter broad, slightly sawed on their edges, of a dark green on their upper side, but of a pale or light green on their under, having a pretty strong midrib, and several veins proceeding from it, which diverge toward the sides, but meet again near the point of the leaf. The flowers come out in clusters from the side of the branches; those of the male have as many stamina as there are divisions in the petal; those of the female have a roundish germen, which afterward turns to a pulpy berry of a roundish form, inclosing four hard seeds. It flowers in June, and the berries ripen in autumn.

The berries of this are used in medicine; for with them there is a purging syrup made, called Syrupus è spina cervina, or syrup of Buckthorn; which is reckoned a good medicine to purge watery humours, and against the dropsy, jaundice, itch, and all manner of eruptions on the skin: of late years, the people who supply the market with these berries, have mixed several other sorts with them, so that when the syrup is made by persons who have not skill to distinguish the berries, it is often very bad; so that two ounces of the syrup of one shop will not purge so well as one from another, which has brought this medicine into disrepute with many persons. These berries may be easily known by examining their seeds, to see if there are four in each, and also by rubbing the juice upon white paper, which it will stain of a green colour.

From the juice of these berries is made a very fine green colour, called by the French Verd-de-vessie, which is much esteemed by the painters in miniature.

The second sort grows naturally in the south of France; this is an humble shrub, seldom rising more than three feet high, sending out many irregular branches, covered with a dark brown bark, garnished with oval leaves ending in acute points; they are about three quarters of an inch long, and half an inch

broad in the wideſt part, which is near the baſe; they are of a yellowiſh green, and a thin conſiſtence, having ſeveral veins diverging from the midrib toward the ſides, which converge again toward the point. The flowers come out upon ſmall curſons or ſpurs on the ſide of the branches, each ſtanding upon a ſeparate ſhort foot-ſtalk; they are of a yellowiſh herbaceous colour, having ſhort ſwelling tubes, and are cut into five acute ſegments at the top, which ſpread open; they appear in June, but are not ſucceeded by berries here.

Mr. Du Hamel de Monceaux, of the Royal Academy of Sciences at Paris, ſays, that the fruit of this ſpecies gathered green is the Grain d'Avignon, or Avignon berries, which are uſed in dyeing of yellow; but I have been aſſured by a gentleman of ſkill, who reſided long in the ſouth of France, that the Avignon berries were the fruit of the narrow-leaved Alaternus; and in order to be better ſatisfied of the truth, I gathered a quantity of the berries of the narrow-leaved Alaternus before they were full ripe, and carried them to two eminent dealers in this commodity, and aſked them if they knew what theſe berries were; they both aſſured me, after making trial of them, that they were Avignon berries, and if I had a large quantity of them, they would purchaſe them all: therefore, as the Alaternus before-mentioned is one of the moſt common ſhrubs in the ſouth of France, from whence the Avignon berries are brought, we may ſuppoſe Mr du Hamel has been ill informed.

The third ſort grows naturally in Spain and Italy; this grows to a larger ſize than the ſecond, but not ſo high as the firſt. The branches are ſtronger, and are armed with a few long ſpines; the leaves are like thoſe of the wild Plum, but are a little longer and narrower; the flowers are ſmall, of a yellowiſh colour, and are produced from the ſide of the branches; theſe appear in June, but are not ſucceeded by berries in this country.

The firſt ſort is ſo common in the hedges in many parts of England, that it is ſeldom cultivated in gardens; this riſes eaſily from ſeeds, if they are ſown in autumn ſoon after the berries are ripe; but, if they are kept out of the ground till ſpring, the plants will not come up till the year after; theſe will require no particular treatment, but may be managed in the ſame way as young Crabs, or any other hardy deciduous tree; it may alſo be propagated by cuttings or layers. If the young ſhoots are layed in autumn, they will put out roots by the following autumn, when they may be taken off from the plants, and either planted in a nurſery to remain there to get ſtrength for a year or two, or they may be planted where they are deſigned to remain. This is not ſo proper for hedges as the Hawthorn or Crab, ſo thoſe ſhould be preferred to it.

The ſecond and third ſorts are preſerved in botanic gardens for the ſake of variety; but as they are not beautiful, few perſons cultivate them here, eſpecially as theſe do not produce fruit in England. They may be propagated either by laying down the young branches in autumn, or by planting the cuttings in the ſpring, before the buds begin to ſwell. Theſe will put out roots in the ſame manner as the common ſort, and may be treated in the ſame way, for they are both hardy plants, and will thrive in the open air.

The fourth ſort grows naturally at the Cape of Good Hope, ſo is too tender to thrive in the open air in England; but if it is placed in a common green-houſe with Myrtles, Olives, and the hardier kinds of exotic plants in winter, and removed to the open air in ſummer, it will thrive very well. This riſes with a ſhrubby ſtalk to the height of four or five feet, ſending out many ſide branches, which, when young, are covered with a green bark, but as they advance, the bark changes to a dark brown; they are armed with a few long ſlender thorns, and garniſhed with wedge-ſhaped leaves, which come out in cluſters at each joint, four, five, or ſix riſing from the ſame point, which differ in ſize, the largeſt being about an inch long, and three quarters broad, and the ſmalleſt about half as large; they are of a deep green, and continue all the year; their points are broad and rounded, growing narrower to their baſe, ſitting cloſe to the branches. The flowers are produced on the ſide of the branches at each joint; they are collected into roundiſh bunches, ſtanding upon foot-ſtalks an inch long; they are white, and have ſhort tubes; their upper part is cut into five acute ſegments, which ſpread open in form of a ſtar. Theſe appear in June, at which time the whole ſhrub ſeems covered with flowers, ſo as to make a fine appearance; and as the leaves continue green all the year, it deſerves a place where there is a conveniency to ſhelter them in winter.

This ſort has not as yet produced ſeeds in England, but it may be eaſily propagated by cuttings, which ſhould be planted in pots filled with loamy earth the beginning of April. The pots ſhould be plunged into a moderate hot-bed, and the cuttings ſhould be ſhaded from the ſun in the heat of the day; they muſt alſo be ſprinkled with water two or three times a week, according as the earth in the pot dries, but they muſt by no means have too much wet. Theſe cuttings will put out roots in two months, and ſoon after will begin to make ſhoots at the top; then they muſt have a large ſhare of air admitted to them, and gradually inured to bear the open air, into which they ſhould be ſoon after removed; and when they are well hardened, they may be ſhaken out of the pots, and ſeparated, being careful to preſerve a ball of earth to each, and plant them into ſingle pots filled with ſoft loamy earth, placing them in the ſhade till they have taken new root; then they may be removed into a ſheltered ſituation, where they may remain till the froſt comes on in autumn, at which time they muſt be houſed, and treated in the ſame way as the other hardier kinds of green-houſe plants.

RHEUM. Lin. Gen. Plant. 454. Rhabarbarum. Tourn. Inſt. R. H. 89. tab. 18. The Rhubarb.

The CHARACTERS are,

*The flower has no empalement; it hath one petal, which is narrow at the baſe, and impervious. The brim is cut into ſix parts, which are obtuſe and alternately ſmaller; it hath nine hair-like ſtamina inſerted in the petal, and is of the ſame length, terminated by oblong twin ſummits which are obtuſe, and a ſhort three-cornered germen, with ſcarce any ſtyle, crowned by three feathered ſtigmas which are reflexed. The germen afterward becomes a large three-cornered ſeed, with acute membranceous borders.*

This genus of plants is ranged in the ſecond ſection of Linnæus's ninth claſs, which contains thoſe plants whoſe flowers have nine ſtamina or ſtigmas, and three ſtyles.

The SPECIES are,

1. RHEUM (*Rhaponticum*) foliis cordatis glabris ſpicis obtuſis. *Rhubarb with ſmooth heart-ſhaped leaves, and obtuſe ſpikes of flowers.* Rhaponticum. Prof. Alp. Exot. 187. *The Rhapontick, commonly called Engliſh Rhubarb.*
2. RHEUM (*Undulatum*) foliis ſubvilloſis undulatis petiolis æqualibus. Lin. Diſſ. 1. tab. 1. Sp. Plant. 372. *Rhubarb with hairy waved leaves, having equal footſtalks.* Rhabarbarum folio longiori hirſuto criſpo, florum thyrſo longiori & tenuiori. Amman. Ruth. 9. *Rhubarb with a longer hairy curled leaf, and a longer and ſlender ſpike of flowers.*
3. RHEUM (*Compactum*) foliis cordatis glabris, marginibus ſinuatis, ſpicis erectis compactis. Tab. 218. *Rhubarb with heart-ſhaped ſmooth leaves, which are ſinuated on their borders, and erect compact ſpikes of flowers.*
4. RHEUM (*Palmatum*) foliis palmatis acuminatis. Lin. Sp. 531. *Rhubarb with pointed hand-ſhaped leaves.*
5. RHEUM (*Ribes*) foliis granulatis, petiolis æqualibus. Lin. Sp. Plant. 372. *Rhubarb with granulated leaves having equal foot-ſtalks.* Lapathum Orientale aſpero & verrucoſo folio, Ribes Arabium dictum. Hort. Elth. 191. tab. 158. *Eaſtern Dock with a rough warted leaf, called by the Arabians Ribes.*

The firſt ſort grows naturally near the Pontic Sea, but has been long an inhabitant of the Engliſh gardens. When the ſeeds were firſt brought to Europe, they were ſuppoſed to be of the true Rhubarb, but

upon

upon making trial of the roots, they were found to be greatly inferior to those of the true Rhubarb, and upon farther trials and examinantion, it was found to be the Rhapontick of Prosper Alpinus, commonly called Pontick Rhubarb. This hath a large thick root, which divides into many strong fleshy fangs, running deep in the ground; the outside is of a reddish brown colour, and the inside yellow, from which arise several leaves, in number according to the size of the root; these come up folded in the spring, and afterward expand themselves; they are smooth, of a roundish heart-shape, having very thick foot-stalks of a reddish colour, which are a little channelled on their lower part, but flat at the top. When the plant grows in rich land, the foot-stalks of the leaves are near two feet long, and thicker than a man's thumb; the leaves also are often two feet long, and as much in breadth, having several strong longitudinal veins running from the foot-stalk to the borders, of a deep green, and are waved on their edges, having an acid taste, but particularly the foot-stalks, which are now frequently used for making tarts. From between the leaves arise the flower-stem, which is of a purple colour, garnished with one leaf at each joint, of the same shape with those below, but smaller, and sit close to the stalk. The stalks grow from two to three feet high, according to the strength of the ground, and are terminated by thick, close, obtuse spikes of white flowers, which appear the beginning of June, and are succeeded by large, triangular, brown seeds, having a border or wing at each angle, which ripen in August.

The seeds of the second sort were sent me from Leyden by the late Dr. Boerhaave, by the title of Rhabarbarum Chinense verum, or true China Rhubarb, which succeeded in the Chelsea Garden. The root of this sort divides into a number of thick fibres, which run deeper into the ground than those of the first, and are of a deeper yellow within. The leaves appear much earlier in the spring; the foot-stalks are not so much channelled on their under side, and are plain on their upper, not so red nor so thick as those. The leaves are longer, running more to a point, and are much waved on their edges, a little hairy on their upper side, and have many strong veins or ribs on their under. The flower-stem is of a pale brownish colour, rising about four feet high, dividing into several loose panicles or bunches of white flowers, which appear in May, and are succeeded by tringular seeds like those of the first sort, which ripen earlier in the season.

The seeds of the third sort were sent me from Petersburgh, for the true Tartarian Rhubarb. The roots of this sort are large, and divide into many fangs; they are yellow within; the leaves appear early in the spring; the foot-stalks of these are of a pale green, and almost as large as those of the first sort; they have scarce any channels, and flat on their upper side; the leaves are smooth, heart-shaped, and do not run out to so great length in a point as those of the second, but are longer than those of the first; they are very broad toward their base, and have very large pale green ribs on their under side, a little waved on their edges, having a sharp acid flavour. The flower-stalk is of a pale green; it rises five or six feet high, and are as large as a common walking cane, garnished at each joint by one leaf of the same shape with those below, but smaller, sitting close to the stalk; the upper part of the stalk divides into small branches, each sustaining a panicle or spike of white flowers standing erect, which appear the latter end of May, and are succeeded by large triangular bordered seeds, like those of the first sort.

The roots of this last approach nearer to those of the foreign Rhubarb than either of the other, both in shape and quality; and as these seeds which were sent to Petersburgh, were gathered from the plants growing on the spot where the Rhubarb is taken up, so there is little reason to doubt of its being the true sort, though the roots which have grown in England have not been equal in quality with those of the foreign; but this may have been occasioned for want of age, or by being taken out of the ground at an improper season, therefore farther trials may improve it; and as the plants produce great plenty of seeds here, so they may be propagated with great ease. Dr. Linnæus seemed first to think the second sort was the true Rhubarb, but the roots of that which have grown here are very little better than those of the Rhapontick, and I have reason to doubt if it is not a variety of it; for it is certain, these plants when growing near each other, are impregnated by each other's farina; for from the seeds of the Rhapontick, which grew close to the second sort, I had a mixture of plants of both sorts produced, though the plant of the second sort did not produce any seeds, for the stalk decayed soon after the flowers faded; and the seeds of the Rhapontick were gathered by myself from one plant, and were sown in his Grace the Duke of Bedford's garden at Wooburn Abbey, where there had not been any of these plants before growing, so that there could be no mixture of seeds, and yet a third part of the plants proved to be of the second sort.

It has been learnedly controverted by the botanists, whether the Rhapontick of the antients, and the Rhubarb of the moderns, is one and the same plant, some affirming, and others denying that there is any agreement; the reasonings on both sides may be seen in the Appendix to the second volume of John Bauhin's History of Plants.

The seeds of the fourth sort have been lately brought to England, from which many plants have been raised; these greatly differ in the form of their leaves from all the other species, for they are deeply cut into many acute segments, which spread open in form of a hand; and I am informed by a skilful botanist, who has seen this sort in flower, that it should be placed in the genus of Rumex, for there are but six stamina in each flower; but as the plant in the Chelsea Garden has not as yet flowered, nor have I seen any plants in that state, so I cannot take upon me to determine this.

However, I find the celebrated Linnæus now supposes this to be the true Rhubarb, which farther experiments must settle.

The fifth sort grows naturally on Mount Libanus, and other mountainous parts of Syria. This hath a thick fleshy root, which runs pretty deep in the ground, from which arise several leaves in the spring, which come up folded together, and afterward expand; they have very short foot-stalks, so spread near the ground; but during the spring, their borders are erect, and form a sort of hood having several folds, and are curled and waved on their edges; they are of a purplish green, and have purple veins and borders; their surface appears studded with rough protuberances, and when the leaves are fully expanded in summer, they are a foot long, and above two feet broad; their under side is paler than the upper, and their borders appear fringed. I have not seen this plant in flower, but the seeds of it were brought from Mount Libanus, by the Right Rev. Dr. Pocock, the late Bishop of Offory; these were larger than those of the other species, and covered with a succulent pulp, of a deep red colour, and very astringent taste; this succulent covering may have occasioned its being taken for a berry, by many of the old writers; the shape of the seed is like that of the other species.

These plants are all propagated by seeds, which should be sown in autumn soon after they are ripe, and then the plants will come up the following spring; but if they are kept out of the ground till spring, the plants seldom come up till the next spring, so that a whole year will be lost. The seeds should be sown where the plants are designed to remain; for as their roots are large and fleshy, so when they are transplanted, they do not recover their removal soon; nor will the roots of those plants which are transplanted, ever grow so large and fair, as those which remain where

they were fown. When the plants appear in the fpring, the ground fhould be hoed over to cut up the weeds; and where the plants are too clofe, fome fhould be cut up, to allow room for the others to grow, in the fame manner as is practifed for Carrots and Parfneps, leaving them at the firft time of hoeing fix or eight inches afunder, for fear of accidents; but at the fecond time of hoeing they may be feparated to a foot and a half diftance, or more. After this, the plants will require no other culture but to keep them clean from weeds, fo that as foon as the weeds appear, if the ground is fcuffled over with a Dutch hoe in dry weather, it may be done for a fmall expence, and thereby the ground will be kept clean. If this is begun early in the fpring before the weeds are large, they will foon die, and by repeating it two or three times at proper intervals, during the fpring, the ground will be made clean; and when the plants fpread out their leaves to cover the ground, they will prevent the growth of weeds.

In autumn the leaves of thefe plants decay, then the ground fhould be made clean, and in the fpring, before the plants begin to put up their new leaves, the ground fhould be either digged between the plants, or be hoed and made clean again; the fecond year after the plants come up, many of the ftrongeft will produce flowers and feeds, but the third year moft of them will flower. The feeds of thefe fhould be carefully gathered when ripe, and not permitted to fcatter, left they fhould grow to injure the old plants. The roots of thefe plants will remain many years without decaying; and I am informed, that the old roots of the true Rhubarb are much preferable to the young ones. They delight in a rich foil, not too dry, nor over moift; and where there is a good depth for their roots to run down in fuch land, their leaves will be very large, and their roots will grow to a great fize.

The firft fort is now frequently cultivated in gardens for the foot-ftalks of their leaves, which are peeled and made into tarts in the fpring: it is alfo kept in gardens, to fupply the fhops with the roots, which are ufed in medicine.

The true Rhubarb is now fown in many gardens, and may probably fucceed fo well here in time, as that a fufficient quantity of that valuable drug may be raifed, to fupply our confumption.

RHEXIA. Gron. Flor. Virg. 41. Lin. Gen. Plant. 423.

The Characters are,

*The empalement of the flower is permanent, oblong, tubulous, and of one leaf, fwelling below, but divided into four parts at the brim. The flower has four roundifh petals inferted in the empalement, which fpread open. It hath eight flender ftamina which are inferted in the empalement, terminated by declining furrowed fummits, which are narrow, obtufe, and moveable. It has a roundifh germen, fupporting a declining ftyle the length of the ftamina, crowned by a thick oblong ftigma. The germen afterward becomes a roundifh capfule with four cells in the fwollen empalement, opening with four valves, and filled with roundifh feeds.*

This genus of plants is ranged in the firft fection of Linnæus's eighth clafs, which includes thofe plants whofe flowers have eight ftamina and one ftyle.

The Species are,

1. Rhexia (*Virginica*) foliis feffilibus ferratis calycibus glabris. Flor. Virg. 41. *Rhexia with fmooth empalements, and fawed leaves fitting clofe to the ftalks.* Lyfimachia non papposa Virginiana, tuberariæ foliis hirfutis, flore tetrapetalo rubello. Pluk. Phyt. tab. 202. f. 8. *Virginian Loofeftrife without down, having a hairy leaf like Tuberaria, with a red flower having four petals.*
2. Rhexia (*Mariana*) foliis ciliatis. Lin. Sp. Plant. 346. *Rhexia with fine hairy leaves.* Lyfimachia non papposa, terræ Marianæ, leptoneuros, flore trepetalo rubello, folio & caule hirfutis ferruginea hifpidis. Pluk. Phyt. 428. f. 1. *Loofeftrife of Maryland having no down, but a reddifh flower with four petals, and a leaf and ftalk covered with iron-coloured hairs.*

The firft fort was difcovered by Mr. Banifter in Virginia, from whence he fent the feeds to England, which fucceeded in feveral gardens. This rifes with an erect ftalk near a foot and a half high, which is four-cornered and hairy, garnifhed with fpear-fhaped hairy leaves about two inches long, and half an inch broad, which are entire, and placed oppofite. The ftalk has two foot-ftalks coming out from the fide oppofite at the upper joint, and is terminated by two other; thefe each fuftain two or three red flowers with heart-fhaped petals, which fpread open in form of a crofs. Thefe appear in June, but I have not feen any feeds produced here.

The fecond fort grows naturally in Maryland, from whence I received the feeds. This fends up an erect ftalk about ten inches high, garnifhed with fpear-fhaped leaves about an inch long, and a third part of an inch broad, fet on by pairs; and from every joint of the ftalk comes out two fhort fhoots oppofite, garnifhed with fmall leaves of the fame fhape as the other; the whole plant is thick, fet with ftinging iron-coloured hairs. The ftalk divides at the top into two foot-ftalks, fpreading from each other, having one reddifh flower on each; thefe have four heart-fhaped petals, which fpread open like the other. It flowers about the fame time as the firft, but feldom produces feeds here. Thefe plants are propagated by feeds, which muft be procured from the places where they grow naturally. If the feeds arrive before the fpring, and are fown foon after they arrive in pots filled with good frefh earth, and placed under a garden frame to guard them from froft, the plants will come up the following fpring; but when the feeds are fown in the fpring, the plants rarely come up the firft year. When the plants come up and are fit to remove, part of them fhould be planted in an eaft border, where they may have only the morning fun, and the others may be planted into pots, that they may be fheltered under a frame in winter, for they are often deftroyed by fevere froft, though they will live abroad in the common winters very well; the fecond year the plants will flower, and with care they may be continued three or four years.

RHINANTHUS. Lin. Gen. Plant. 658. Pedicularis fpecies. Tourn. Inft. 171. Elephas. Tourn. Cor. 48. tab. 482. Rattle, or Loufewort.

The Characters are,

*The flower hath a permanent empalement of one leaf, which is roundifh, compreffed, and blown up. It hath one ringent petal, with a cylindrical tube the length of the empalament, compreffed at the bafe, but opening at the top. The upper lip is hooded, compreffed, and indented at the point; the lower lip is plain, fpreading, and cut into three obtufe fegments at the point. It has four ftamina, which are fhut up in the upper lip, two of which are fhorter than the other, terminated by hairy incumbent fummits, and an oval compreffed germen fupporting a flender ftyle, fituated with the ftamina, crowned by an inflexed obtufe ftigma. The germen afterward turns to an oval compreffed capfule with two cells, opening on the fide, and filled with compreffed feeds.*

This genus of plants is ranged in the fecond fection of Linnæus's fourteenth clafs, which includes thofe plants whofe flowers have two long and two fhorter ftamina and the feeds are lodged in a capfule.

1. Rhinanthus (*Crifta galli*) corollarum labio fuperiore compreffo, breviore. Flor. Lap. 248. *Rhinanthus with a fhorter compreffed upper lip.* Pedicularis pratenfis lutea, vel crifta galli. C. B. P. 163. *Yellow Meadow Loufewort, yellow Rattle, or Cock's-comb.*
2. Rhinanthus (*Orientalis*) corollarum labio fuperiore fubulato incurvo. Lin. Sp. Plant. 603. *Rhinanthus with an awl-fhaped incurved upper lip.* Elephas Orientalis, flore magno, probofcide incurvâ. Tourn. Cor. 48. *Eaftern Elephant's-head, with a large flower and an incurved trunk.*
3. Rhinanthus (*Elephas*) corollarum labio fuperiore fubulato erecto. Prod. Leyd. 298. *Rhinanthus with an erect awl-fhaped upper lip.* Elephas Italica, flore magno, probofcide furrectâ. Tourn. Cor. 48. *Italian Elephant's-head, with a large flower aud an erect trunk.*

The first sort is a common weed in most of the low pastures and meadows in many parts of England where it is one of the most troublesome weeds among the Grass, spreading itself over the whole ground, so that in many of the water meadows, there is more of this plant than Grass. It is an annual plant, which flowers the latter end of May, so that the seeds ripen by the time the Grass of these meadows is mowed, and the seeds scatter and fill the ground with young plants the following spring; therefore, in order to destroy it, the Grass should be cut as soon as the flowers of this plant appear.

It is well known, so requires no description; and as it is never cultivated, so it is mentioned chiefly to introduce the others: but here I must observe, that the Dutch carry on a trade with the seeds and seed-vessels of one species of this genus to Germany, whose seed-vessels appear very like those of this first sort, they call it Semen Savadillos; the use of it is to kill vermin of every sort, especially bugs; they boil a quantity of the seeds and capsules in common water, with which they wash their wainscots, bedsteads, &c. where any of these insects are lodged, and it effectually destroys them.

The second sort was discovered by Dr. Tournefort on the sides of the Black Sea, growing in a fat soil and shady situation. The flower being shaped like an Elephant's-head, induced Fabius Columna to give the title of Elephas to the third species, which he found growing naturally in the kingdom of Naples, and Tournefort after him established the genus with that title. The stalks of this rise a foot and a half high; they are hollow, four-cornered, and hairy, garnished with leaves placed opposite, having short foot-stalks; they are about two inches long, and half an inch broad, crenated on their edges, hairy, and veined. The upper part of the stalk is garnished with flowers growing opposite from the wings of the leaves; these have curved tubes, which divide into two lips; the under lip is an inch long, broad, and cut into three obtuse parts, the middle segment being the broadest; the upper lip is like a helmet, and is longer than the lower. The flower is yellow, with a spot of fillemort on the lower lip, and the upper lip has two red spots on the top; the flowers have an agreeable scent.

The third sort grows naturally in the kingdom of Naples; this is much like the former sort, but the proboscis of the flower is erect, and the lower lip has no spot.

These plants despise culture, so are with great difficulty kept in gardens; they are biennial, so are only propagated by seeds; these should be sown soon after they are ripe, otherwise they will not succeed, nor will the plants bear removing, so they should be sown where they are to remain, which should be in a moist rich soil and a shady situation: when the plants come up, they must be thinned and kept clear from weeds, which is all the culture they require. If the seeds of these plants are permitted to scatter, the plants will come up better than those which are sown by hand, but they thrive best amongst Grass.

RHIZOPHORA. Lin. Gen. Plant. 524. Mangles. Plum. Nov. Gen. 13. tab. 15. This is called Mangrove by the inhabitants of the West-Indies; there are several species of this kind, which grow in salt-water rivers both in the East and West-Indies, but as they will not grow upon land, it is needless to enumerate them here.

RHODIOLA. Lin. Gen. Plant. 997. Anacampseros. Tourn. Inst. R. H. 264. Rose-root.

The Characters are,

*It hath male and female flowers in different plants; the male flowers have an empalement of one leaf, which is cut into four or five segments almost to the bottom; they have four obtuse petals, which are much longer than the empalement, and four nectariums, which are erect and shorter than the empalement, with eight awl-shaped stamina which are longer than the petals, terminated by obtuse summits. They have four oblong acute germen without style or stigma, so are abortive. The female flowers have the same empalement as the male; they have four obtuse permanent petals equal with the empalement, and four nectariums like the male; they have four oblong acute-pointed germen sitting upon an erect style, crowned by obtuse stigmas. The germen afterward become four horned capsules, compressed on their inner side, filled with roundish seeds.*

This genus of plants is ranged in the seventh section of Linnæus's twenty-second class, which contains those plants whose male and female flowers are upon different plants, and the male flowers have eight stamina.

The Species are,

1. Rhodiola (*Rosea*) staminibus corollâ duplo longioribus. *Rose-root with stamina twice as long as the petals.* Anacampseros radice rosam spirante major. Tourn. Inst. R. H. 264. *Greater Orpine with a Rose-scented root.*
2. Rhodiola (*Minor*) staminibus corolla ferè æquantibus. *Rose-root with stamina scarcely equalling the length of the petals.* Anacampseros radice rosam spirante minor. Tourn. Inst. R. H. 264. *Smaller Orpine with a Rose-scented root.*

The first sort grows naturally in the clefts of the rocks and rugged parts of the mountains of Wales, Yorkshire, and Westmoreland. This has a very thick fleshy root, which, when bruised or cut, sends out an odour like Roses; it has many heads, from whence in the spring come out thick succulent stalks like those of Orpine, about nine inches long, closely garnished with thick succulent leaves of a gray colour, which are an inch long, and half an inch broad, indented on their edges toward the top, and are placed alternately on every side the stalk. The stalk is terminated by a cluster of yellowish herbaceous flowers, which appear early in May; the male flowers have stamina twice the length of the petals. They have a very agreeable scent, but are not of long continuance.

The second sort grows naturally on the Alps; the roots of this are smaller than those of the other sort, the stalks are small, and not above five inches long; the leaves are small, but shaped like those of the other sort, and end with a purple point; the petals of the flowers are purplish, and the stamina are but little longer than the petals. This flowers later than the other sort. I have cultivated both these plants in the same soil above thirty years, and have never found either of them vary.

These plants are preserved in the gardens of the curious, for the sake of variety; they are easily propagated, either by cuttings or parting of the roots. If by cuttings, they should be planted the beginning of April, soon after they come out from the head; if these are planted in a shady border, and covered close down with a glass, keeping them dry, they will put out roots in about six weeks; but the cuttings should be laid in a dry room at least a week before they are planted, that the wounds may be dried before they are planted, otherwise they are subject to rot.

If they are propagated by parting of the roots, that should be performed in the beginning of September, at which time their stalks begin to decay; and if the fleshy parts of the roots are cut or broken, they should be laid to dry a few days before they are planted, for the same reason as the cuttings. These plants require a shady situation and a dry undunged soil, in which they will continue many years.

RHODODENDRON. Lin. Gen. Plant. 484. Chamærhododendros. Tourn. Inst. R. H. 604. tab. 373. Dwarf Rose-bay.

The Characters are,

*The flower has a permanent empalement cut into five segments; the flower hath one wheel funnel-shaped petal, spreading open at the brim; it has ten slender stamina which decline, and are the length of the petals, terminated by oval summits, and a five-cornered germen, supporting a slender style the length of the petal, crowned by an obtuse stigma. The germen afterward becomes an oval capsule with five cells, filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which contains those plants whose flowers have ten stamina and one style.

The Species are,

1. Rhododendron (*Hirsutum*) foliis ciliatis nudis, corollis infundibuliformibus. Lin. Sp. Plant. 292. *Rose-bay with naked hairy leaves, and funnel-shaped petals.* Chamærhododendros Alpina, villosa. Tourn. Inst. R. H. 604. *Hairy Alpine Dwarf Rose-bay.*
2. Rhododendron (*Ferrugineum*) foliis glabris, subtus leprosis, corollis infundibuliformibus. Lin. Sp. Plant. 392. *Rose-bay with smooth leaves which are hoary on their under side, and funnel-shaped petals.* Chamærhododendros Alpina glabra. Tourn. Inst. R. H. 604. *Smooth Alpine Dwarf Rose-bay.*

The first sort grows naturally on the Alps, and also upon several mountains in Italy. This is a low shrub, which seldom rises two feet high, sending out many short ligneous branches, covered with a light brown bark, and garnished closely with oval spear-shaped leaves about half an inch long, and a quarter of an inch broad, sitting pretty close to the branches; they are entire, and have a great number of fine iron-coloured hairs on their edges and under side. The flowers are produced in bunches at the end of the branches; they have one funnel-shaped petal; the tube is about half an inch long; the brim is cut into five obtuse segments, which spread half open; they are of a pale red colour, and have ten stamina in each, which are the length of the tube; after the flowers are past, the germen in the center turns to an oval capsule with five cells, filled with small seeds. It flowers in May, and the seeds ripen in August.

The second sort grows naturally on the Alps and Apennines; this rises with a shrubby stalk near three feet high, sending out many irregular branches, covered with a purplish bark, and closely garnished with smooth spear-shaped leaves an inch and a half long, and half an inch broad in the middle; they are entire, and their borders are reflexed backward; the upper side is of a light lucid green, and their under side of an iron colour; they are placed all round the branches without any order. The flowers are produced in round bunches at the end of the branches; they are funnel-shaped, having short tubes, which are cut into five obtuse segments at the brim, which spread a little open; they are of a pale Rose colour, and make a good appearance. This sort flowers in June, but does not ripen seeds here.

There are some other species of this genus which grow naturally in the eastern countries, and others are natives of America, but the two sorts here mentioned are all I have seen in the English gardens; and these are difficult to propagate and preserve in gardens, for they grow naturally upon barren rocky soils and in cold situations, where they are covered with snow great part of the winter; so that when they are planted in better ground, they do not thrive, and for want of their usual covering of snow in winter, they are frequently killed by frost; but could these plants be tamed, and propagated in plenty, they would be great ornaments to the gardens.

They are propagated by seeds, but these are so very small, that if they are covered deep, they will not grow. The seeds should be sown as soon as possible after they are ripe, either in shady borders or pots filled with fresh gentle loamy earth, and very lightly covered with a little fine earth; then the pots should be plunged up to their rims in a shady border, and in hard frost they should be covered with bell or hand-glasses, taking them off in mild weather. If these seeds are sown early in autumn, the plants will come up the following spring; these must be kept shaded from the sun, especially the first summer, and duly refreshed with water, and in autumn following, they may be transplanted to a shady situation and on a loamy soil, covering the ground about their roots with Moss, which will guard them from frost in winter, and keep the ground moist in summer.

RHUS. Tourn. Inst. R. H. 611. tab. 381. Lin. Gen. Plant. 331. [ῥοῦς takes its name from ῥέω to flow, because it stops dysenterial fluxes of the bowels.] Sumach.

The Characters are,

*The empalement of the flower is permanent, erect, and cut into five parts. The flower has five oval, erect, spreading petals, and five short stamina terminated by small summits, shorter than the petals; it has a roundish germen as large as the petals, with scarce any style, crowned by three small stigmas. The germen afterward becomes a roundish hairy berry, inclosing a single hard seed of the same form.*

This genus of plants is ranged in the third section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and three styles.

The Species are,

1. Rhus (*Coriaria*) foliis pinnatis obtusiusculè serratis, ovalibus subtus villosis. Lin. Sp. Plant. 379. *Sumach with winged leaves which are obtusely sawed, oval, and hairy on their under side.* Rhus folio ulmi. C. B. P. 414. *Elm-leaved Sumach.*
2. Rhus (*Typhinum*) foliis pinnatis lanceolatis, argute serratis subtus tomentosis. Amœn. Acad. 4. p. 311. *Sumach with spear-shaped winged leaves which are sharply sawed, and woolly on their under side.* Rhus Virginianum. C. B. P. App. 517. *Virginian Sumach.*
3. Rhus (*Glabrum*) foliis pinnatis serratis lanceolatis utrinque glabris. *Sumach with winged leaves which are spear-shaped, and smooth on both sides.* Rhus Virginicum, paniculâ sparsâ, ramis patulis glabris. Hort. Elth. 323. *Virginian Sumach with a loose panicle, and smooth spreading branches.*
4. Rhus (*Carolinianum*) foliis pinnatis serratis lanceolatis, subtus incanis, paniculâ compactâ. *Sumach with sawed, spear-shaped, winged leaves which are hoary on their under side, with a compact panicle.* Rhus Carolinianum paniculâ speciosâ coccineâ. Catesb. Hist. Carol. *Carolina Sumach having a beautiful scarlet panicle.*
5. Rhus (*Canadense*) foliis pinnatis, obsoletè serratis, lanceolatis, utrinque glabris, paniculâ compositâ. *Sumach with winged spear-shaped leaves which are slightly sawed, and a compound panicle.* Rhus Canadense folio longiori utrinque glabro. Tourn. Inst. R. H. 611. *Canada Sumach, with a longer leaf which is smooth on both sides.*
6. Rhus (*Copallinum*) foliis pinnatis integerrimis, petiolo membranaceo articulato. Flor. Leyd. Prod. 24. *Sumach with entire winged leaves, and a jointed membranaceous foot-stalk.* Rhus angustifolium. C. B. P. 414. *Narrow-leaved Sumach.*
7. Rhus (*Chinense*) foliis pinnatis, foliolis ovatis, obtusè serratis, petiolo membranaceo villoso. *Sumach with winged stalks, oval lobes which are bluntly sawed, and a hairy foot-stalk having jointed membranes or wings.* Rhus Sinarum lactescens, costâ foliorum alatâ. Pluk. Am. 183. *China milky Sumach, with winged membranes to the leaves.*
8. Rhus (*Incanum*) foliis ternatis, foliolis ovatis subtus tomentosis. *Three-leaved Sumach, with oval leaves which are downy on their under side.* Rhus Africanum majus folio subrotundo integro, molli & incano. Pluk. Phyt. tab. 219. fig. 8. *Greater, three-leaved, African Sumach, with a rounder entire leaf which is soft and hoary.*
9. Rhus (*Tomentosum*) foliis ternatis foliolis subpetiolatis, rhombeis angulatis, subtus tomentosis. Lin. Sp. Plant. 266. *Three-leaved Sumach with angular rhomboid lobes having foot-stalks, and downy on their under side.* Rhus Africanum trifoliatum majus, foliis obtusis & incisis hirsutis pubescentibus. Pluk. Phyt. tab. 219. fig. 7. *Greater, African, three-leaved Sumach, with obtuse cut leaves which are covered with soft hairs.*
10. Rhus (*Lucidum*) foliis ternatis, foliolis sessilibus cuneiformibus lævibus. Vir. Cliff. 25. *Three-leaved Sumach whose lobes are smooth, wedge-shaped, and sit close to the stalk.* Rhus Africanum, trifoliatum minus glabrum, splendente folio, subrotundo integro. Pluk. Phyt. 219. fig. 9. *Three-leaved African Sumach, with a smooth, shining, roundish, entire leaf which is small.*

11. Rhus (*Africanum*) foliis ternatis, foliolis ovatis nervosis, marginibus sæpius dentatis, utrinque viridibus. *Sumach with trifoliate leaves having oval veined lobes which are generally indented on their edges, and green on both sides.* Rhus Africanum, trifoliatum majus glabrum, splendente utrinque folio subrotundo medio quandoque crenato. Boerh. Ind. alt. 2. p. 229. *Greater, African, three-leaved Sumach, with smooth roundish leaves on both sides, which are sometimes crenated in the middle.*

12. Rhus (*Argenteum*) foliis ternatis, foliolis petiolatis lineari-lanceolatis integerrimis subtus tomentosis. Hort. Cliff. 111. *Sumach with trifoliate leaves, whose lobes stand upon foot-stalks, are linear, spear-shaped, entire, and downy on their under side.* Rhus Africanum trifoliatum majus, foliis subtus argenteis acutis & margine incisis. Pluk. Phyt. tab. 219. fig. 6. *Greater African three-leaved Sumach, with leaves which are silvery on their under side, and cut on their edges.*

13. Rhus (*Radælijawel*) foliis ternatis, foliolis ovatis acuminatis integerrimis, petiolatis, floribus paniculatis terminalibus. *Three-leaved Sumach, with oval acute-pointed lobes which are entire, upon foot-stalks growing in panicles which terminate the branches.* Phaseolus arborescens Zeylanicus monocarpos, Radælijawel. Herm. Mus. Zeyl. 39. *Tree Kidney-bean of Ceylon with a single fruit, called Radælijawel.*

14. Rhus (*Rigidum*) foliis ternatis linearibus integris rigidis glabris. *Sumach with three linear, entire, rigid, smooth leaves.*

15. Rhus (*Cotinus*) foliis simplicibus obovatis. Lin. Sp. Plant. 267. *Sumach with single, obverse, oval leaves.* Cotinus Coriaria. Dod. Pemp. 780. *Venice Sumach, or Coccygria.*

The first sort of Sumach grows naturally in Italy, Spain, and Turkey; the branches of this tree are used instead of Oak bark for tanning of leather, and I have been informed that the Turkey leather is all tanned with this shrub. It hath a strong ligneous stalk which divides into many irregular branches, which rise to the height of eight or ten feet; the bark is hairy, and of an herbaceous brown colour while young; the leaves are winged, and composed of seven or eight pair of lobes terminated by an odd one; the lobes are about two inches long, and half an inch wide in the middle; they are bluntly sawed on their edges, and hairy on their under side, of a yellowish green colour; they are placed alternately on the branches; the flowers grow in loose panicles at the end of the branches, which are of a whitish herbaceous colour, each panicle being composed of several close spikes of flowers sitting close to the foot-stalks; these appear in July, but are not succeeded by seeds in England. The leaves and seeds of this sort are used in medicine, and are esteemed very restringent and stiptick, and good for all kinds of fluxes and hæmorrhages; used both inwardly and outwardly, they resist putrefaction, and stop gangrenes and mortifications.

The second sort grows naturally in almost every part of North America; this hath a woody stem, from which are sent out many irregular branches, which are generally crooked and deformed. The young branches are covered with a soft velvet like down, resembling greatly that of a young stag's-horn both in colour and texture, from whence the common people have given it the appellation of Stag's-horn; the leaves are winged, composed of six or seven pair of oblong lobes, terminated by an odd one, ending in acute points; they are entire, and hairy on their under side, as is also the midrib. The flowers are produced in close tufts at the end of the branches, which are succeeded by seeds inclosed in purple, woolly, succulent covers, so that the bunches are of a beautiful purple colour in autumn, and the leaves before they fall, change also to a purplish colour first, and before they fall, to a feuillemort. This is used for tanning of leather in America, and the roots are often prescribed in medicine in the countries where the plant grows naturally.

The third sort grows naturally in many parts of North America; this is commonly titled by the gardeners New England Sumach. The stem of this sort is stronger, and rises higher than that of the former; the branches spread more horizontally; they are not quite so downy as those of the last, and the down is of a brownish colour; the leaves are composed of many more pair of lobes, which are smooth on both sides; the flowers are disposed in loose panicles, which are of an herbaceous colour; they appear about the same time with those of the former, but are not succeeded by seeds in England.

The fourth sort grows naturally in Carolina; the seeds of this were brought from thence by the late Mr. Catesby, who has given a figure of the plant in his Natural History of Carolina. This is by the gardeners called the scarlet Carolina Sumach; it rises commonly to the height of seven or eight feet, and divides into many irregular branches, which are smooth, of a purple colour, and pounced over with a grayish powder, as are also the foot-stalks of the leaves, which are of a purplish colour. The leaves are composed of seven or eight pair of lobes terminated by an odd one; these are not always placed exactly opposite on the midrib, but are sometimes alternate; they are three or four inches long, and almost one broad in the middle, ending in acute points, and are sawed on their edges. The upper side of the lobes are of a dark green, and their under hoary, but smooth. The flowers are produced at the end of the branches in very close thick panicles which are large, and of a bright red colour; they appear in July and August, and continue till autumn, but the seeds do not ripen in England.

The fifth sort grows naturally in Canada, Maryland, and several other parts of North America; this hath smooth branches, of a purple colour, covered with a gray pounce. The leaves are composed of seven or eight pair of lobes terminated by an odd one; the lobes are spear-shaped, four inches and a half long, and one broad in the middle, terminating in acute points, and are a little sawed on their edges; they are of a lucid green on their upper surface, but hoary on their under, and are smooth. The flowers are produced at the end of the branches in large panicles, which are composed of several smaller, each standing upon separate foot-stalks; they are of a deep red colour, and the whole panicle is covered with a gray pounce, as if it had been scattered over them. This sort flowers at the same time with the fourth, but does not ripen seeds here.

The sixth sort grows naturally in most parts of North America, where it is known by the title of Beech Sumach, probably from the places where it grows. This is of humbler growth than either of the former, seldom rising more than four or five feet high, dividing into many spreading branches which are smooth, of a light brown colour, and are pretty closely garnished with winged leaves; they are composed of four or five pair of narrow lobes terminated by an odd one; they are entire, about two inches long, and half an inch broad, ending in acute points; they are of a light green on both sides, and in autumn change purplish. The midrib which sustains the lobes, has on each side a winged or leafy border, which runs from one pair of lobes to another, ending in joints at each pair, by which it is easily distinguished from the other sorts. The flowers are produced in loose panicles at the end of the branches; they are of a yellowish herbaceous colour, and appear in July, but the seeds do not ripen in England.

These six sorts are hardy plants, and will thrive in the open air in England. The first and fourth sorts are not quite so hardy as the others, so must have a better situation, otherwise their branches will be injured by severe frost in the winter; they are easily propagated by seeds, when obtained from the countries where they grow, which, if sown in autumn, the plants will come up the following spring; but if they are sown in the spring, they seldom come up till

the next ſpring; they may be either ſown in pots, or the full ground. If they are ſown in pots in autumn, the pots ſhould be placed under a common frame in winter, where the ſeeds may be protected from hard froſt, and, if in the ſpring the pots are plunged into a very moderate hot-bed, the plants will ſoon riſe, and have thereby more time to get ſtrength before winter. When the plants come up, they muſt have a large ſhare of air, and ſhould be gradually hardened to bear the open air, into which they ſhould be removed as ſoon as the weather is favourable, placing them where they may have the morning ſun, and muſt be kept clean from weeds; and in dry weather, if they are ſupplied with water, it will greatly promote their growth; but toward autumn it will be proper to ſtint their growth by keeping them dry, that the extremity of their ſhoots may harden; for if they are replete with moiſture, the early froſts in autumn will pinch them, which will ſometimes cauſe their ſhoots to decay almoſt to the bottom, if the plants are fully expoſed. If the pots are put under a common frame again in autumn, it will ſecure the plants from injury, for while they are young, and the upper part of the ſhoots are ſoft, ſo they will be in danger of ſuffering if the winter proves very ſevere; but in mild weather they muſt always enjoy the open air, therefore ſhould never be covered but in froſt. The ſpring following, juſt before the plants begin to ſhoot, they ſhould be ſhaken out of the pots, and carefully ſeparated, ſo as not to tear the roots, and then tranſplanted into a nurſery in rows three feet aſunder, and about one foot diſtance in the rows. In this nurſery they may ſtand two years to get ſtrength, and then may be tranſplanted where they are to remain.

The ſeeds which are ſown in the full ground, may be covered the firſt winter with ſome old tanners bark to keep out the froſt, and in the ſpring it may be drawn off again after the danger of the hard froſt is over; and when the plants come up, they muſt be kept clean from weeds, which is all the care they will require the firſt ſummer; but as the plants in the full ground are apt to grow luxuriant, and continue growing late in autumn, they ſhould be covered to ſcreen them from the early froſt, which will otherwiſe kill their tops, and this often occaſions them to die down a conſiderable length, and frequently almoſt to the ground in hard winters. In the ſpring following the plants may be taken up carefully, and tranſplanted into a nurſery at the ſame diſtance as before directed. This method of propagating the plants from ſeeds is ſeldom practiſed after a perſon is once poſſeſſed of the plants, for they are very ſubject to ſend up a great number of ſuckers from their roots, whereby they are eaſily propagated. The ſuckers of all the ſorts may be taken up and planted in a nurſery for a year or two to get ſtrength, and then may be planted where they are to remain.

Theſe ſhrubs are generally planted in plantations of flowering ſhrubs in large gardens, where they make a fine variety in autumn, eſpecially the ſecond, fourth, and fifth ſorts, with their large purple, or red panicles, which have a good effect; but where theſe are planted, their ſuckers muſt be every year taken off, otherwiſe they will grow up to a thicket and deſtroy the neighbouring plants.

The ſeventh ſort grows naturally in the eaſt. The ſeeds of this were ſent to the Royal Garden at Paris, where they ſucceeded, and from thence I received the plant, which grew very well in the open air at Chelſea three years, but the ſevere winter in 1740 deſtroyed it, ſo that it is not quite ſo hardy as the other ſorts. This riſes with a ſhrubby ſtalk five or ſix feet high, ſending out many irregular branches. The young ſhoots and foot-ſtalks of the leaves are covered with a ſoft brown hairy down; the leaves are compoſed of three or four pair of oval lobes terminated by an odd one; the inner lobes are ſmall, and the outer large; the firſt are not more than an inch and a half long, and three quarters of an inch broad, but the outer are more than two inches long, and an inch and a quarter broad; the end lobe is heart-ſhaped, ending in an acute point, and is three inches long and two broad at the baſe; they are ſawed on their edges, and hoary on their under ſide; the midrib which ſuſtains the lobes, has two leafy membranes running along the ſides from joint to joint, which are narrow below, and gradually increaſe in their breadth to the next joint. When the leaves are broken, they emit a milky juice from the wound. As I have not ſeen the flowers of this ſort, I can give no account of them.

This ſort does not put out ſuckers from the root like the American kinds, ſo muſt either be propagated by layers, or by cutting off ſome of the roots, and planting them upon a gentle hot-bed in the ſpring, by which method there is great probability it may be propagated, but my plant was too weak for this purpoſe when it was deſtroyed.

The eighth ſort grows naturally at the Cape of Good Hope; this hath a ſtrong woody ſtalk which riſes ten or twelve feet high, covered with a gray bark, ſending out many ſmooth branches on every ſide, garniſhed with trifoliate leaves ſtanding upon pretty long foot-ſtalks. The lobes of the leaves are oval and entire, about an inch long, and three quarters broad, hoary on their under ſide, but ſmooth and of a lucid green on their upper; the flowers are produced from the wings of the leaves in ſmall panicles; they are of an herbaceous colour, and appear in July, but fall away in England without having any ſeeds ſucceed them.

The ninth ſort alſo grows naturally at the Cape of Good Hope; this riſes with a woody ſtalk to the height of ſeven or eight feet, covered with a brown bark, having many irregular branches, garniſhed with trifoliate leaves ſtanding upon long foot-ſtalks. The lobes of this ſort are angular, and ſhaped like a rhombus; they are near two inches long, and one broad, downy on their under ſide, but of a dark green on their upper. The flowers come out in ſlender bunches from the ſide of the branches; they are of a whitiſh herbaceous colour, and ſoon fall away.

The tenth ſort grows naturally at the Cape of Good Hope; this riſes with a woody ſtalk like the eighth, dividing into many branches covered with a brown bark, garniſhed with trifoliate leaves, whoſe lobes are wedge or heart-ſhaped, of a lucid green, and ſit cloſe to the foot-ſtalk. This ſort does not flower here ſo far as I can find, for I have had ſome of the plants in my care almoſt forty years, but they have not flowered as yet.

The eleventh ſort is a native of the Cape of Good Hope. This hath ſome reſemblance of the former, but the lobes of the leaves are twice as large and oval, with ſome indentures on their edges; they have ſeveral tranſverſe veins running from the midrib to the edges, and are very ſtiff, of a bright lucid green on both ſides. This ſort has not flowered here ſo far as I can learn.

The twelfth ſort came from the Cape of Good Hope, where it grows naturally. This riſes with a woody ſtalk ſeven or eight feet high, dividing into ſeveral irregular branches, which are covered with a dark brown bark, and garniſhed with narrow, ſpear-ſhaped, trifoliate leaves, ſtanding upon pretty long foot-ſtalks. The lobes are two inches long, and half an inch broad in the middle, ending in acute points; they are downy on their under ſide, but of a lucid green on their upper. The flowers are produced in ſmall looſe bunches from the ſide of the branches; they are ſmall, of an herbaceous colour, and fall off without having any ſeeds ſucceed them.

All theſe African ſorts are too tender to live through the winter in the open air in England, ſo they are planted in pots or tubs, and houſed in autumn, and during the winter they muſt be treated in the ſame way as other hardy green-houſe plants. They all retain their leaves through the year, ſo make a good variety when intermixed with other plants in the green-houſe in winter. They may be propagated by cuttings,

tings, which should be planted in pots filled with loamy earth the beginning of April, and plunged into a very moderate hot-bed, covering them close with hand or bell-glasses, and screening them from the sun in the heat of the day. The cuttings should be now and then refreshed with water, but it should not be given in too great quantity. With this management they will put out roots in about two months, and when they begin to shoot, they should have air admitted to them, and be gradually hardened to bear the open air, into which they must be removed, placing them in a sheltered situation; and when the cuttings have filled the pots with their roots, they should be shaken out of the pots, and parted carefully, planting each into a separate small pot, placing them in the shade till they have taken new root, when they may be intermixed with other exotic plants in a sheltered situation for the summer, and in autumn removed into the green-house.

The thirteenth sort grows naturally on the Island of Ceylon; this rises with a woody stalk ten or twelve feet high, sending out many branches, which are cloathed with trifoliate leaves, standing upon pretty long foot-stalks. The lobes of the leaves are oval, about two inches long, and an inch and a half broad, terminating in acute points; they are thick, smooth, and of a lucid green. The flowers are produced in loose panicles at the end of the branches; they are of a whitish herbaceous colour, and small. They seldom appear in England, but when they do they are not succeeded by seeds here.

This plant is tender, so must be placed in a moderate stove, otherwise it will not live through the winter in England. It may be propagated by cuttings in the same way as the former sorts, but requires a warmer bed than those to promote their putting out roots. When they have good roots they should be each transplanted into a separate small pot, and plunged into the tan-bed, and treated in the same way as other tender exotic plants.

The fourteenth sort is a native of the Cape of Good Hope, where it grows to be a large shrub, but in England it seldom rises more than five or six feet high, sending out many branches covered with a bright brown bark, garnished with very narrow trifoliate leaves, standing on very long foot-stalks; the flowers come out in loose panicles at the ends of the branches, and also from the wings of the stalks, of an herbaceous colour, but are small, and fall away, without producing seeds in England.

This may be propagated by cuttings, which should be planted in pots during the summer season, plunging them into a moderate hot-bed, covering them close with hand-glasses; when they have taken root, they should be each planted in a separate pot, shading them till they have taken new root, and in the autumn they must be removed to a green-house.

The fifteenth sort grows naturally in Spain, Italy, and the Levant, where the leaves and branches are used for tanning of leather; this rises with an irregular shrubby stalk to the height of ten or twelve feet, sending out many spreading branches covered with a smooth brown bark, garnished with single, obverse, oval leaves about two inches long, and of the same breadth, rounded at their points, and stand upon long foot-stalks; they are smooth, stiff, and of a lucid green, having a strong midrib, from whence several transverse veins run toward the border. The flowers come out at the end of the branches upon long hair-like foot-stalks, which divide, and branch into large hair-like bunches of a purplish colour; they are small, white, and composed of five small oval petals which spread open; these appear in July, but are not succeeded by seeds in England.

This plant is cultivated for sale in the nursery-gardens near London; it is propagated by layers, which should be laid down in the autumn, and by next autumn they will have taken root, when they may be taken off from the old plants, and transplanted in a nursery, where they may grow a year or two to get strength, and then be planted where they are to remain. This shrub is so hardy as to be seldom injured by frost in England.

RIBES. Lin. Gen. Plant. 247. Grossularia. Tourn. Inst. 639. tab. 409. Ribesium. Dill. H. Elth. 246. The Currant-tree.

The CHARACTERS are,

*The flower has a bellied empalement of one leaf, cut at the top into five concave obtuse segments; it hath five small, obtuse, erect petals growing to the border of the empalement, and five awl-shaped stamina inserted in the empalement, terminated by incumbent compressed summits opening at their border. The roundish germen is situated under the flower, supporting a bifid style, crowned by obtuse stigmas; it afterward becomes a globular umbilicated fruit with one cell, containing many roundish compressed seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style. Dr. Linnæus and Tournefort both join this to the Gooseberry, making them the same genus, which in a system of botany is very right; but, as they are always separated by gardeners, I have chosen to continue them so here.

The SPECIES are,

1. RIBES (*Rubrum*) inerme, racemis glabris pendulis, floribus planiusculis. Lin. Sp. Plant. 200. *Currant without thorns, having smooth hanging bunches, and plain flowers.* Ribes vulgare acidum. J. B. 2. p. 97. *Common sour Currant.*
2. RIBES (*Alpinum*) inerme, racemis erectis, bracteis flore longioribus. Lin. Sp. Plant. 200. *Smooth Currant with erect bunches, and bracteæ longer than the flower.* Ribes Alpinum dulce. J. B. 2. p. 98. *Sweet Alpine Currant.*
3. RIBES (*Nigrum*) inerme, racemis pilosis, floribus oblongis. Lin. Sp. Plant. 201. *Currant without spines, having hairy branches and oblong flowers.* Ribes vulgaris fructu nigro. Rudb. Flor. Lapp. 99. *Common black Currant.*
4. RIBES (*Americanum*) inerme, racemis glabris, floribus campanulatis. *Currant with unarmed branches, and bell-shaped flowers.* Ribes Americana fructu nigro. Ed. prior. *American Black Currant.*

The first sort grows naturally in the northern parts of Europe, but has been long cultivated in the gardens, and greatly improved, so that at present there are the following varieties in the English garden; the common Currant with small red fruit, the same with white fruit, and another with pale fruit, which is commonly called the Champaign Currant; but, since the two sorts of Dutch Currants have been introduced, and become plenty in the gardens, the old red and white Currants have been almost banished, so that they are rarely to be found in the English gardens at present.

The second sort is kept in a few gardens for the sake of variety, but, as the fruit is very small and has little flavour, it is not cultivated in the gardens.

The third sort grows naturally in Helvetia, Sweden, and other northern countries, and is sometimes cultivated in gardens for its fruit, of which is made a rob, which is greatly esteemed for sore throats, from whence the fruit has been called Squinancy Berries, for their great use in quinsies. As this fruit has a strong disagreeable flavour, it is rarely admitted to the table.

The fourth sort grows naturally in Pensylvania, from whence the plants were sent to Mr. Peter Collinson several years past, and has been dispersed to most parts of England; this has been by some thought to be the same with the common black Currant, but those who have long cultivated it, know it is very different; the shoots of this being much smaller and more compact, the bark is of a darker colour, the leaves are smaller, thinner, smoother, and have not a rank smell like those of the common sort. The flowers are smaller, bell-shaped, and grow in thinner bunches; the fruit is smaller, and not so round; the plants of

this do not produce much fruit, nor is it ſo good as to merit cultivation, ſo it is only kept by way of curioſity. The fruit of the red and white Currants are greatly eſteemed for the table, and are alſo very good in fevers; they are cooling and grateful to the ſtomach, quench thirſt, and are ſomewhat reſtringent. The jelly made with the juice of this fruit and ſugar, is very grateful in fevers, and is uſed as ſauce to the table. This fruit may be procured good much longer than others upon the plants, by planting them in different ſituations; for if they are planted againſt pales or walls expoſed to the ſouth, the fruit will ripen in June; and by planting ſome againſt north walls, if they are ſcreened from birds, and covered in autumn from froſt, they may be kept till November; and as the fruit is greatly uſed for tarts, it is very convenient to have a ſucceſſion of it for ſo long a time.

The Champaign Currant differs from the other only in the colour of the fruit, which is of a pale red or fleſh colour. The taſte is ſo near to the other, as not to be diſtinguiſhed; but this being of a different colour, makes a variety on the table.

There are plants of all theſe ſorts with variegated leaves, which are kept in ſome gardens for the ſake of variety; but as theſe variegations go off when the plants are vigorous, they ſcarce deſerve notice.

Theſe ſorts may be eaſily propagated by planting their cuttings any time from the beginning of September to the middle of October, upon a ſpot of freſh earth, either in rows at one foot aſunder, or in beds, which in the ſpring muſt be kept very clean from weeds, and in very dry weather, if they are watered, it will greatly promote their growth. Theſe may remain one or two years in the nurſery, during which time they muſt be pruned for the purpoſes deſigned, i. e. either to clear ſtems about one foot high, if for ſtandards; or if for walls, pales, or eſpaliers, they may be trained up flat.

Then they ſhould be planted out where they are to remain; for the younger they are planted, the better they will ſucceed; the beſt ſeaſon for which is ſoon after the leaves begin to decay, that they may take root before winter, ſo that they may be in no danger of ſuffering from drought in the ſpring.

Theſe plants are generally planted in rows at about eight or ten feet aſunder, and four diſtance in the rows, in thoſe gardens where the fruit is cultivated for ſale; but the beſt method is to train them againſt low eſpaliers, in which manner they will take up much leſs room in a garden, and their fruit will be much fairer.

The diſtance they ſhould be placed for an eſpalier ought not to be leſs than eight or ten feet, that their branches may be trained horizontally, which is of great importance to their bearing.

Thoſe that are planted againſt pales or walls ſhould alſo be allowed the ſame diſtance. If they are planted againſt a ſouth-eaſt wall or pale, it will cauſe their fruit to ripen at leaſt a fortnight or three weeks ſooner than thoſe in the open air; and thoſe which are planted againſt a north wall or pale will be proportionably later, ſo that by this method the fruit may be continued a long time in perfection, eſpecially if thoſe againſt the north pales are matted in the heat of the day.

Theſe plants produce their fruit upon the former year's wood; and alſo upon ſmall ſnags which come out of the old wood, ſo that in pruning them, theſe ſnags ſhould be preſerved, and the young ſhoots ſhortened in proportion to their ſtrength. The only method very neceſſary to be obſerved in pruning of them is, not to lay their ſhoots too cloſe, and never to prune their ſnags to make them ſmooth. This, with a ſmall care in obſerving the manner of their growth, will be ſufficient to inſtruct any perſon how to manage this plant, ſo as to produce great quantities of fruit.

Theſe plants will thrive and produce fruit in almoſt any ſoil or ſituation, and are often planted under the ſhade of trees; but the fruit is always beſt when they are planted in the open air, and upon a light loamy ſoil.

RICINOIDES. See IATROPHA.

RICINUS. Tourn. Inſt. R. H. 532. tab. 307. Lin. Gen. Plant. 962. [ſo called, becauſe the ſeed reſembles (ricinus) the animal called by that name, i. e. a tick which infeſts dogs and oxen. It is alſo called Palma Chriſti, becauſe its leaves are ſaid to reſemble the palm of the hand.] Palma Chriſti, vulgò.

The CHARACTERS are,

*It hath male and female flowers diſpoſed in the ſame ſpike. The male flowers, which are ſituated on the lower part of the ſpike, have ſwelling empalements of one leaf cut into three parts. Theſe ſegments are oval and concave; the flowers have no petals, but have a great number of ſlender ſtamina, which are connected in ſeveral bodies, and are terminated by roundiſh twin ſummits. The female flowers, which are ſituated on the upper part of the ſpike, have empalements of one leaf, which are cut into five ſegments, and are armed with prickles; they have no petals, but in the center is ſituated an oval germen, which is cloſely ſhut up in the empalement, ſupporting three ſhort ſtyles, which are bifid, crowned by ſingle ſtigmas. The germen afterward turns to a roundiſh fruit, having three furrows, divided into three cells, opening with three valves, each cell containing one almoſt oval ſeed.*

This genus of plants is ranged in the ninth ſection of Linnæus's twenty-firſt claſs, which contains thoſe plants which have male and female flowers on the ſame plant, whoſe ſtamina are joined in various bodies.

The SPECIES are,

1. RICINUS (*Vulgaris*) foliis peltatis ſerratis, ſubtus glaucis, petiolis glanduliferis. *Ricinus with target-ſhaped ſawed leaves which are gray on their under ſide, and foot-ſtalks bearing glands.* Ricinus vulgaris. C. B. P. 432. *Common Palma Chriſti.*
2. RICINUS (*Americanus*) foliis peltatis ſubſerratis, lobis amplioribus utrinque virentibus. *Ricinus with target-ſhaped leaves, which are ſawed, whoſe lobes are large and green on both ſides.* Ricinus Americanus major. C. B. P. 432. *Great American Palma Chriſti.*
3. RICINUS (*Urens*) foliis peltatis inæqualiter ſerratis, capſulis hiſpidis. Tab. 219. *Ricinus with target-ſhaped leaves which are unequally ſawed, and prickly capſules to the fruit.* Ricinus Americanus major, caule vireſcente. H. R. Par. *Greater American Palma Chriſti with a greeniſh ſtalk.*
4. RICINUS (*Rugoſus*) foliis peltatis ſerratis, capſulis rugoſis non echinatis. Tab. 220. *Palma Chriſti with target-ſhaped ſawed leaves, and rough capſules to the fruit which are not prickly.*
5. RICINUS (*Africanus*) foliis peltatis ſerratis, lobis maximis, caule geniculato, capſulis echinatis. *Ricinus with target-ſhaped ſawed leaves, having the largeſt lobes, a jointed ſtalk, and prickly covers to the ſeeds.* Ricinus Africanus maximus, caule geniculato rutilante. H. R. Par. *Greateſt African Palma Chriſti, with a reddiſh jointed ſtalk.*
6. RICINUS (*Inermis*) foliis peltatis ſerratis, lobis maximis, caule geniculata, capſulis inermis. *Palma Chriſti with ſawed target-ſhaped leaves, having very large lobes, a jointed ſtalk, and ſmooth covers to the ſeeds.*
7. RICINUS (*Minor*) foliis palmatis ſerratis, profundiùs diviſis capſulis echinatis. *Ricinus with hand-ſhaped ſawed leaves which are deeply divided, and prickly covers to the ſeeds.* Ricinus Americanus minor. C. B. P. 432. *Small American Palma Chriſti.*

The firſt ſort grows naturally in Sicily, and other warm parts of Europe. This riſes with a ſtrong herbaceous ſtalk to the height of ten or twelve feet; the joints are at a great diſtance from each other; the ſtalk and branches are of a gray colour; the leaves are large, and have long foot-ſtalks; they are deeply divided into ſeven lobes which are ſawed on their edges, and are gray on their under ſide; at the diviſion of the lobes is a ſort of navel, where the foot-ſtalk joins the leaves on their under ſide. The flowers are diſpoſed in long ſpikes, which riſe at the diviſion of the branches; the lower part of the ſpikes are garniſhed with male flowers, which have ſwollen empalements, divided into three parts which open, and ſhew

a great

a great number of slender stamina, terminated by whitish summits, and are connected at their base into several small bunches. The female flowers which occupy the upper part of the spike, have prickly empalements which inclose the roundish germen, upon which sit three short styles, crowned by oblong stigmas. The germen afterward becomes an oval capsule with three deep channels, closely armed with soft spines, and divided into three cells, each containing one oblong striped seed.

The second sort grows naturally in the islands of the West-Indies, where it is called Agnus Castus, or Oil-tree. This is often confounded with the former, most of the botanists supposing they are the same plant; but as I have cultivated both more than thirty years, in which time I have never observed either of them to vary, so I think there can be no doubt of their being different plants. This hath brown stalks which divide into two or three branches, which rise six or seven feet high; the leaves are broader, and not so deeply divided as those of the former; they are of a deep green on both sides, and are unequally sawed. The spikes of flowers are shorter, the seed-vessels rounder, and of a brownish colour, and the seeds are much less, and of a brown colour.

The third sort grows naturally in the West-Indies, and is often confounded with the former, but is very different. The stalk of this sort is thick, herbaceous, and of a grayish green; the joints are closer than those of the former sorts; it rises about four feet high, and divides into three or four branches which spread almost horizontally; the leaves are large, of a deep green on their upper side, but grayish on their under; they are deeply cut into six or seven lobes or segments, which are unequally sawed on their edges. The spikes of flowers are loose, the covers of the capsules are green, and closely armed with soft spines, and the seeds are smaller and lighter coloured than those of the second sort.

The fourth sort grows naturally in both Indies, from both which countries I have several times received the seeds. This rises with an herbaceous stalk about four feet high; the lower part is purplish, and the upper of a deep green; the joints of this are pretty far asunder; the leaves are of a deep green on their upper side, but are paler on their under; they are not so deeply divided as some of the other sorts, and are more regularly sawed, the spikes of flowers are large. The male flowers have more stamina, and their summits are yellow; the capsules are oval and rough, but have no spines; the seeds are small, and of a brown colour.

The fifth sort grows naturally in Africa, and also in both the Indies; this rises with a large reddish stalk to the height of ten or twelve feet, which has many joints, and divides into several branches; the leaves are the largest of any species yet known, I have meat sured some of them which were more than two feeand a half diameter; they are of a dark green, and unequally sawed on their edges, and not so deeply cut as those of some other sorts. The spikes of flowers are large, the empalement of the flowers are brown, the summits on the stamina of the male flowers are whitish; the capsules are large, oval, and closely armed with soft spines; the seeds are very large, and beautifully striped.

The sixth sort grows naturally in the Spanish West-Indies, from whence the late Mr. Robert Millar sent me the seeds. The plants of this sort are in every respect like those of the fifth, but the capsules which inclose the seeds are smooth; and this difference is permanent, therefore it may be put down as a distinct species.

The seventh sort grows naturally in Carolina, and several other parts of America; of this there are two varieties, if not distinct species; one of them has a red stalk, and the other a pale green stalk; they are distinguished by the inhabitants of America, by the title of red and white Oil-seed. The stalks of these seldom rise more than three feet high, they sometimes divide at the top into two or three branches; the leaves are much less than those of the other sorts, and are deeper divided; their borders are unequally sawed, and the segments of the leaves are frequently cut on their sides. The spikes of flowers are smaller and more compact than those of the former sorts; the capsules are smaller, rounder, and of a light green, and are closely armed with soft spines; the seeds are small, and are finely striped.

There are some other species which grow naturally in both Indies, but have not been examined by any curious botanist; for I have received seeds of three or four sorts, which appeared to be very different from any of the known sorts, but the seeds of some were too old to grow, and the other were killed before their seeds were ripe.

The sorts here enumerated, I have cultivated several years, and have always found they have kept their difference, so that I have no doubt of their being distinct species; and unless they are thus tried, there is no possibility of determining their specific difference; for when the plants are found growing in different soils and situations, they have such different appearances, as may deceive the most skilful botanist.

These plants are generally annuals in these countries, though in their native places of growth they continue longer; and in England the planrs are often preserved through the winter (especially the first sort) but young plants are much preferable to those which are thus preserved; therefore few persons are at the trouble to keep them, unless when the seasons prove so bad as that their seeds do not ripen, whereby the species might be lost, if the plants are not preserved through the winter.

These plants are propagated by seeds, which must be sown upon a hot-bed in the spring, and when the plants are come up, they should be each planted into a separate pot filled with light fresh earth, and plunged into a fresh hot-bed, observing to water and shade them until they have taken root; after which they must have a great share of free air when the season is mild, otherwise they will draw up tall, and be very weak; and as these plants grow very fast, their roots will in a short time fill the pots; therefore they should be shifted into larger pots, filled with the like fresh earth; and toward the latter end of May, when the season is warm, they may be hardened to endure the open air by degrees; and then if some of the plants are shaken out of the pots, and planted out into a very rich border, and in dry weather duly watered, they will grow to a very large size, particularly the first and fifth sorts, which I have seen upward of ten feet high in one season, and these plants have produced a great quantity of flowers and seeds: but if you intend to preserve any of the plants through the winter, they must not be planted in the full ground, because after their roots have been widely extended, there will be no transplanting them with safety; therefore the best way is to shift them into larger pots from time to time, as their roots shall require, placing them in the open air during the summer season in some warm situation, where they may remain until October, when they must be removed into the house with other exotic plants, observing to water them sparingly in winter, and also to admit the free air in mild weather; for they only require to be protected from frost and cold winds, so that they will endure the winter in a warm green-house, without any addition of artificial warmth.

These plants deserve a place in every curious garden for the singular beauty of their leaves (notwithstanding their flowers make no great appearance) especially those sorts which may be propagated every year from seeds; because those persons who have no green-house to place them into in winter, may cultivate them as other annual plants, amongst which these being placed, either in pots or borders, afford an agreeable variety; but it must be observed, as these are large-growing plants, never to place them too near other plants of less growth, because they will overbear and destroy them;

them; and those which are planted in pots should be allowed room for their roots to expand, and must be frequently watered, otherwise they will not grow very large.

The inhabitants of the West-Indies draw an oil from the seeds of these plants, which serves for the use of their lamps; and as the plants come up as weeds in those warm countries, so they are at no trouble to cultivate the plants, but employ their negroes to collect the seeds from the plants which grow naturally, whereby they are furnished with the oil at a small expence. This oil is good to kill lice in children's heads; and of late years it has been a most effectual remedy for the dry belly-ach, which was a fatal distemper in the West-Indies; it has also been found serviceable in England, in such disorders where no other medicine will pass through the body. This oil is falsly called Castor Oil in the West-Indies, from the corrupt title of Agnus Castus there given to the plant.

The seeds of the first sort is the Cataputia major of the shops; these have been formerly given by some persons to purge watery humours, which they do both upward and downward with great violence, so that at present these seeds are rarely used.

RIPENING of FRUIT.

The METHOD of producing EARLY FRUITS.

In order to have early fruit, a wall should be erected ten feet high, and in length according to the number of trees intended for three years forcing; the method of constructing these walls is fully explained under the article WALL.

This being done, a border may be marked out about four feet wide on the south side of it, and some scantlings of wood, about four inches thick, must be fastened to the ground in a strait line, on the outside of the border, to rest the glass lights upon; which lights are to slope backward to the wall, to shelter the fruit as there shall be occasion.

Bars about four inches wide, cut out of the whole deal, must be placed between these glasses, so that the lights may rest on them. There must also be a door shaped to the profile of the frame at each end, that it may be opened at either of the ends, according as the wind blows.

The frame before-mentioned should be made so, that when the first part has been forced, the whole frame may be moved the next year forward, and the succeeding year forward again, so that the trees will be forced every third year; and having two years to recover themselves, will continue in vigour many years.

These trees should be well grown before they are forced, otherwise they will soon be destroyed; and the fruit produced on grown trees will be much fairer and better tasted, than on fresh planted trees.

The fruit that may be planted in these frames are;

The Avant, the Albemarle, the Early Newington, and Brown Nutmeg Peaches.

Mr. Fairchild's Early, the Elruge and Newington Nectarines; the Masculine Apricot; the May Duke and May Cherry.

As for Grapes, the Chasselas and Black Cluster.

Goosberries; the Dutch White, the Dutch Early Green, and the Walnut Gooseberries.

Currants; the large Dutch White, the large Dutch Red Currants.

It has been found by experience, that the trees will be injured, if the heat be applied before the middle or end of January; and that the time for applying the heat for bringing either Duke or May Cherries, is about the middle of that month, and applying heat at the same time would do for Apricots; so that the Masculine Apricot will, by the beginning of March, be as large as Duke Cherries, and will be ripe by the beginning of May.

Cherries thus forced will not hold so well as Apricots, though the former will last, perhaps, for seven years in good plight, but Apricots will thrive and prosper thus many years.

Fairchild's Early Nectarine commonly ripens about the end of May, if they are forced at the same time, and the Brugnon Nectarine will follow that. As to the forward sorts of Plums, they ripen about the latter end of May.

Gooseberries will produee green fruit fit for tarts in March, and probably will ripen about the beginning or middle of April at the farthest.

Currants might, by the same heat that brings Cherries in April, be forced to produce ripe fruit at the same time, if not sooner.

As for the distance of these trees one from another, it need not be so great as is directed for those planted in the open air, because they will never shoot so vigorously nor last so long, therefore eight or nine feet will be sufficient.

The higher parts of the wall being furnished with Apricots, Cherries, Nectarines, Peaches, and Plums, the lower small space between them may be filled up with Currants, Gooseberries, and Roses.

The trees against that part of the wall which is designed for forcing, should be pruned as soon as their leaves begin to decay, that the buds on the branches which are left may be benefited, by receiving all the nourishment of the branches, whereby they will become turgid and strong, by the time the walls are heated.

As to the nailing of these trees.

Every branch or shoot must be laid as close to the wall as can be; for the fruit which is near the wall will be ripe a month sooner than those that lie but four inches from it.

Sometimes it happens, that the tops of such trees have blossoms above a month or six weeks before the bottom; and sometimes one branch has been full of blossoms, when there have been half a score or more branches of the same tree, which have not stirred till the fruit of the first blossoms has been almost grown, notwithstanding which the tree has done very well; and it is no uncommon thing for such trees to have fruit ripening upon them for near three months continually.

As for Gooseberries, those plants which are planted in these frames, should be such as have been spread and trained, when as many shoots have been nailed to the wall as may conveniently be done, others may be left at a distance from it, to succeed them in ripening.

If they are taken up in autumn, and properly managed, they will bear fruit the first year as well as if they had not been transplanted, but these seldom last longer than two or three years.

The Currants may be ordered after the same manner, and also the Roses; and the best kind of Rose for this purpose, is the monthly Rose, which ought always to be topped about the end of July or the beginning of August, to make them put out a good number of flower-buds.

As to the laying dung to the wall:

This, before it be laid to the back of the wall, should be thrown up in a heap, and lie eight days, then turned over, that it may be of an equal heat every where, and constant.

When it has been thus prepared, it should be laid about four feet thick at the base, and so sloping, till it is but two feet wide at the top.

It should be laid at first within four inches of the top of the wall, for it will sink two feet in six weeks time; and then some fresh dung must be laid, because the first heat will not do much more than swell the buds of the trees, or bring them to flower.

But, according as the frosts shall have happened to have had more or less influence over the buds, this will happen sooner or later.

If these trees be covered with the glasses a month before the dung is laid against the wall, it will contribute very much to forward their blossoming; for though their blossoms will not be destroyed by the frosts, yet the more the frosts come at them, they will be the drier and more hard to open.

If the weather is tolerably mild, the trees ought not to be hindered from the benefit of the showers till the

the buds begin to stir; but afterwards the glasses should be kept constantly over them, till the influence of the sun is something considerable.

But the doors which are at each end of the frame, should in the mean time be set open, when the wind does not blow too sharp, and the sun shines warm; and if this does not happen in the space of a fortnight, then the doors at both ends may be opened, and mats of bass or canvas should be hung up over the door-ways to correct the winds, and give the air leave to circulate in the frames.

As for Cherries; about two changes of dung will be sufficient to bring them to a due ripeness in April, supposing each parcel remains six weeks at the back of the wall.

But as for Apricots, Grapes, Nectarines, Peaches, and Plums, if April proves cold, the forcing heat must be continued till May is settled; but some of the glasses should be opened in the morning in March and April, when the wind is still, and the sun warm; and they should be permitted to receive the showers that fall, while the fruit is growing; but while they are in blossom, no rain should come near them, because, if there should be any moisture lodged in the bosom of the flowers, and the sun should shine hot through the glasses, it would be apt to destroy them.

The dung that comes from these frames, having lost its heat, may be laid in heaps to rot, for the meliorating of stubborn grounds; or if it is thrown in heaps and mixed with new dung, it will ferment again, and may be used for hot-beds.

Another thing which ought to be observed in planting fruit in these frames is, to plant those fruits which come forward together, and those which come late by themselves, because it will be prejudicial to the forward fruit, to give them any more heat when they have done bearing, when at the same time the later fruits set amongst them may require more heat, and to be continued longer, some of them perhaps requiring an artificial heat till May.

There may also a row or two of Scarlet Strawberries be planted near to the back of this frame, and these you may expect will be ripe by the end of March, or beginning of April.

As for the Vines, they may probably be brought to blossom in April, and have ripe Grapes in June.

There may also be here and there planted a monthly Rose-tree, and Hyacinths, Jonquils, Narcissuses, Polyanthuses; also early Tulips might be placed in the borders.

The method of forcing fruit-trees by the help of fire-walls, is fully treated under the article WALLS.

RIVINIA. Plum. Nov. Gen. 48. tab. 39.

The CHARACTERS are,

*The empalement of the flower is permanent, and is composed of four oval, concave, coloured leaves. The flower has no petals; it has eight stamina which are longer than the empalement, terminated by small oval summits, and a large roundish germen supporting a short style, crowned by an obtuse stigma. The germen afterward turns to a roundish berry sitting in the empalement, including one hard seed.*

The title of this genus was given to it by Father Plumier, who discovered these plants in America, in honour of Augustus Quirinus Rivinus, a famous botanist of Leipsick, who published two volumes of plants in folio, in which the figures of the plants are engraven on copper plates. These were published in 1690.

Dr. Linnæus has applied the title of this genus to the Solanoides of Tournefort, which is totally different from Plumier's plants; and the Doctor has charged Father Plumier with an error in the engraving of the characters of this genus, with eight stamina instead of four, whereas Plumier's plants have eight stamina; but the plant which the Doctor has applied to this title has but four, therefore the mistake is the Doctor's and not Father Plumier's.

The SPECIES are,

1. RIVINIA (*Humilis*) foliis lanceolatis petiolatis integerrimis, caule fruticoso ramoso. *Rivinia with spear-shaped entire leaves having foot-stalks, and a shrubby branching stalk.* Rivinia humilis racemosa, baccis puniceis. Plum. Nov. Gen. 48. *Dwarf branching Rivinia with scarlet-coloured berries, sometimes called Currant-tree.*

2. RIVINIA (*Scandens*) scandens racemosa, amplis solani foliis, baccis violaceis. Plum. Nov. Gen. 48. *Climbing branching Rivinia, with Nightshade leaves and Violet-coloured berries, commonly called Hoopwith in the West-Indies.*

The first sort rises with shrubby stalks about six or eight feet high, dividing into several spreading branches, covered with a gray spotted bark, garnished with spear-shaped entire leaves, standing upon long slender foot-stalks; these are two inches and a half long, and one broad in the middle, drawing to a point at each end; they are smooth, of a lucid green, and pretty thick consistence, standing alternate, at pretty great distances on the branches. The flowers are produced in long bunches from the side and at the end of the branches, each standing upon a slender foot-stalk near half an inch long; they have no petals, but their empalements are of a scarlet colour; within these are situated eight stamina which are longer than the empalement, terminated by small oval summits; in the center is situated a roundish germen, terminating in a point, supporting a short style. The germen turns to a roundish berry with a thin pulp, surrounding one roundish hard seed; these berries are of a scarlet colour when ripe, and afterward change to a purple; they are by the inhabitants called Currants, but are generally esteemed poisonous.

The second sort rises with a climbing woody stalk to the height of twenty feet, covered with a dark gray bark, and is garnished with oval spear-shaped leaves near three inches long, and an inch and a half broad, standing upon short foot-stalks; they are smooth and entire. The flowers come out in long bunches from the side of the branches, and are shaped like those of the other, and are succeeded by blue berries about the same size as those of the former. This sort grows naturally in Antigua, from whence I have received the seeds; it was also found growing at the Havannah, by the late Dr. Houstoun, who found the first growing in Jamaica.

They are both propagated by seeds, which remain long in the ground before they vegetate; I have had them lie two years before the plants have appeared, but they never rise the same year the seeds are sown. These berries must be procured from the countries where they naturally grow, and when they arrive, should be sown in pots filled with fresh earth, and plunged into a moderate hot-bed. If this happens late in the autumn or winter, the pots must be plunged into the tan-bed of the stove; but if in the spring, they may be plunged in a common hot-bed under a frame. The earth must be moistened frequently in summer, to promote the vegetation of the seeds, but as they will not come up the same year, so the pots should be removed into the stove before winter, and plunged into the tan-bed; during the winter season, the earth must be sometimes refreshed, but must not be too moist. In the spring the pots may be taken out of the stove, and plunged into a fresh hot-bed to bring up the plants; but if they should not then rise, the earth must not be disturbed, because the plants may come up the following season.

When the plants come up and are fit to remove, they should be each transplanted into a separate small pot, filled with light loamy earth, and plunged into a hot-bed, observing to shade them from the sun till they have taken new root; after which they must be treated in the same way as other plants from the same countries.

These plants are tender, so cannot be preserved in this country, unless they are kept in a warm stove, especially while they are young; but when they have obtained strength, they will live in a moderate warmth in winter, and in summer they may be removed into the

the open air, placing them in a ſheltered ſituation, where they may remain for near three months in the warmeſt part of ſummer: during the winter ſeaſon, theſe plants ſhould be ſparingly watered, for as they grow naturally on a dry ſoil, much wet will deſtroy them, eſpecially in cold weather.

They retain their leaves all the year, ſo make a variety in the ſtove in winter, and when they flower, make a fine appearance, though their flowers are but ſmall; for as they are produced in long bunches, from almoſt every joint toward the end of the branches, ſo the whole plant is well adorned during their continuance; and if they do produce fruit, as that will remain long before it is ripe, ſo their beauty will be of longer duration.

ROBINIA. Lin. Gen. Plant. 775. Pſeudoacacia. Tourn. Inſt. R. H. 649. tab. 417. Falſe Acacia.

The CHARACTERS are,

*The empalement of the flower is ſmall, of one leaf, and divided into four parts, the three under ſegments being narrow, but the upper one is broad. The flower is of the Pea-bloom kind: the ſtandard is large, roundiſh, obtuſe, and ſpreads open. The two wings are oval, and have ſhort appendixes which are obtuſe. The keel is roundiſh, compreſſed, obtuſe, and is extended the length of the wings. In the center is ſituated ten ſtamina, nine of them being joined together, and the other ſtanding ſingle, terminated by roundiſh ſummits. It hath an oblong cylindrical germen, ſupporting a ſlender ſtyle, crowned by a hairy ſtigma; theſe are incloſed by the keel. The germen afterward becomes an oblong compreſſed pod, incloſing kidney-ſhaped ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's ſeventeenth claſs, which includes thoſe plants whoſe flowers have ten ſtamina joined in two bodies.

The SPECIES are,

1. ROBINIA (*Pſeudoacacia*) racemis pedicellis unifloris, foliis impari-pinnatis, ſtipulis ſpinoſis. Hort. Upſal. 212. *Robinia with branching foot-ſtalks each ſupporting one flower, unequal winged leaves, and prickly ſtipulæ.* Pſeudoacacia vulgaris. Tourn. Inſt. R. H. 649. *Common Baſtard Acacia, or American Acacia, called in America Locuſt-tree.*
2. ROBINIA (*Echinata*) pedunculis racemoſis, foliis impari-pinnatis, leguminibus echinatis. *Robinia with foot-ſtalks ſupporting long bunches of flowers, unequal winged leaves, and prickly pods.* Pſeudoacacia Americana, ſiliquis echinatis. Boerh. Ind. alt. 11. 39. *American Acacia with prickly pods.*
3. ROBINIA (*Hiſpida*) foliis impari-pinnatis, foliolis ovatis, ramis pedunculiſque hiſpidis. *Robinia with unequal winged leaves having oval lobes, and the branches and foot-ſtalks of the flowers armed with ſtinging ſpines.* Pſeudoacacia hiſpida, floribus roſeis. Cateſb. Car. 3. p. 20. *Stinging falſe Acacia, with a Roſe-coloured flower.*
4. ROBINIA (*Roſea*) foliis impari-pinnatis, foliolis ovatis acuminatis, ramis nodoſis glabris, pedunculis racemoſis. *Robinia with unequal winged leaves, whoſe lobes are oval, acute-pointed, knobbed ſmooth branches, and flowers growing in long bunches.* Pſeudoacacia flore roſeo. Plum. Cat. *Baſtard Acacia with a Roſe-coloured flower.*
5. ROBINIA (*Glabra*) foliis impari-pinnatis, foliolis oblongo-ovatis, pedunculis racemoſis confertis. *Robinia with unequal winged leaves having oblong oval lobes, and foot-ſtalks with long bunches of flowers growing in cluſters.* Pſeudoacacia arborea floribus racemoſis, ſiliquis compreſſis glabris. Houſt. MSS. *Tree-like Baſtard Acacia, with flowers growing in long bunches, and flat ſmooth pods.*
6. ROBINIA (*Alata*) foliis impari-pinnatis, foliolis obverſe-ovatis, racemis aggregatis axillaribus, leguminibus membranaceo-tetragonis. *Robinia with unequal winged leaves, whoſe lobes are obverſely oval, long bunches of flowers growing in cluſters from the ſides of the branches, and pods having four-winged membranes.* Pſeudoacacia ſiliquis alatis. Plum. Cat. 19. *Falſe Acacia with winged pods.* Linnæus titles it Erythrina foliis pinnatis, leguminibus membranaceo-tetragonis. Sp. Plant. 707. *Coral-tree with winged leaves and pods, having four membranaceous wings.*
7. ROBINIA (*Pyramidata*) foliis duplicato-pinnatis, foliolis ovatis ſeſſilibus, floribus ſpicatis terminalibus. *Robinia with doubly-winged leaves, whoſe lobes are oval and ſit cloſe to the midrib, and ſpikes of flowers terminating the branches.* Pſeudoacacia flore pyramidato coccineo. Plum. Cat. 19. *Falſe Acacia with a ſcarlet-coloured flower growing pyramidally.*
8. ROBINIA (*Violacea*) foliis pinnatis, foliolis lanceolatis oppoſitis, racemis axillaribus pedunculis longioribus. *Robinia with winged leaves having ſpear-ſhaped lobes placed oppoſite, and long bunches of flowers on the ſides of the branches, with longer foot-ſtalks.* Pſeudoacacia fraxini folio, floribus violaceis. Plum. Cat. 19. *Falſe Acacia with an Aſh leaf, and Violet-coloured flowers.*
9. ROBINIA (*Latifolia*) foliis impari-pinnatis, foliolis oblongis acuminatis, racemis axillaribus, leguminibus oblongo-ovatis. *Robinia with unequal winged leaves, having oblong acute-pointed lobes, and bunches of flowers proceeding from the ſides of the branches.* Pſeudoacacia latifolia, ſiliquis latis. Houſt. MSS. *Falſe Acacia with broad leaves and pods.*
10. ROBINIA (*Fruteſcens*) pedunculis ſimplicibus, foliis quaternatis ſubpetiolatis. Hort. Upſal. 212. *Robinia with ſingle foot-ſtalks, and leaves growing by fours upon ſhort foot-ſtalks.* Aſpalathus fruteſcens major latifolius cortice aureo. Am. Ruth. 283. *Greater, broad-leaved, ſhrubby Aſpalathus, with a golden bark.*
11. ROBINIA (*Caragana*) pedunculis ſimplicibus, foliis abrupte pinnatis. Hort. Upſal. 212. *Robinia with ſimple foot-ſtalks, and abrupt winged leaves.* Aſpalathus arboreſcens, pinnis foliorum crebrioribus oblongis. Amman. Ruth. 285. *Tree-like Aſpalathus with oblong lobes.*
12. ROBINIA (*Pygmæa*) pedunculis ſimpliciſſimis, foliis quaternatis ſeſſilibus. Hort. Upſal. 212. *Robinia with the moſt ſimple foot-ſtalks, with four leaves ſitting cloſe to the ſtalks.* Aſpalathus fruteſcens minor anguſtifolius, cortice aureo. Amman. Ruth. 282. tab. 35. *Smaller ſhrubby Aſpalathus, with narrow leaves and a yellow bark.*

The firſt ſort is the common Pſeudoacacia, which is a native of North America; the ſeeds of this were firſt brought to Paris from Canada by Monſ. Robine, and ſoon after the ſeeds were brought from Virginia to England, and many of the trees were raiſed in ſeveral gardens, which for ſome years, while young, were in great eſteem; but as they grew larger, their branches were frequently broken by ſtrong winds in the ſummer, which rendered them unſightly, ſo that for ſeveral years they were ſeldom planted in gardens; but of late years it is become faſhionable again, and great numbers of the trees have been raiſed in moſt parts of England, within a few years paſt, ſo that there are few gardens in which there are not ſome of theſe trees planted.

This ſort grows to a very large ſize in America, where the wood is much valued for its duration; moſt of the houſes which were built at Boſton in New England, upon the firſt ſettling of the Engliſh, was with this timber, which continues very ſound at this time.

It grows very faſt while young, ſo that in a few years from ſeed, the plants riſe to eight or ten feet high; and it is not uncommon to ſee ſhoots of this tree ſix or eight feet long in one ſummer. The branches are armed with ſtrong crooked thorns, and garniſhed with winged leaves compoſed of eight or ten pair of oval lobes, terminated by an odd one; they are of a bright green, entire, and ſit cloſe to the midrib. The flowers come out from the ſide of the branches in pretty long bunches, hanging downward like thoſe of Laburnum, each flower ſtanding on a ſlender footſtalk. They are of the butterfly or Pea bloſſom kind, are white, and ſmell very ſweet. They appear in June, and when the trees are well charged with flowers, they make a fine appearance, and their odour perfumes the circumambient air; but they are of ſhort duration, ſeldom continuing more than one week

in

in beauty; after the flowers fade, the germen becomes an oblong compressed pod, which in warm seasons comes to perfection in England; these ripen pretty late in the autumn.

The leaves of this tree do not come out till late in the spring, and they fall off pretty early in the autumn, which renders it less valuable than it would otherwise be, were these leaves to come out early in the spring.

The second sort is less common than the first. There was a large tree of this kind some years past, growing in the garden of the Bishop of London at Fulham, which produced plenty of seeds. The pods of this sort are much shorter, and closely beset with short prickles, but in other respects agrees with the first sort.

The third sort grows naturally in Carolina, where it sometimes rises to the height of twenty feet, but in England at present it seems to be of low growth; the branches spread out near the ground, and produce their flowers very young, which is a sure sign of its not growing tall here. The branches of this tree, and also the foot-stalks of the flowers, are closely armed with small brown spines, like some sorts of Roses; the leaves are like those of the first sort, but their lobes are larger and rounder. The flowers come out in bunches like those of the former, but are larger and of a deep Rose colour. It flowers about the same time with the first, but has not as yet produced any pods in England.

The fourth sort grows naturally at Campeachy, from whence the late Dr. Houstoun sent the seeds. This rises with a strong woody stem to the height of thirty or forty feet, sending out many strong branches on every side, which have large swelling knots, and are closely garnished with single winged leaves, composed of eight or nine pair of oval lobes ending in points, terminated by an odd one; these are curiously marked with purple spots on their under side, which appear faintly on their upper. The flowers are produced in long close spikes, standing almost erect; they are about half the size of the flowers of the last sort, and are of a fine Rose colour.

The fifth sort was found growing naturally at Campeachy by the late Dr. Houstoun; this rises with a woody branching stalk twelve or fourteen feet high; the old branches are covered with a dark brown bark, but the young shoots and the foot-stalks of the flowers are covered with an iron-coloured down; the leaves are unequally winged; the lobes are oblong, obtuse, and of a pretty thick consistence; they are smooth on their upper side, but have several transverse veins on their under. The flowers are produced at the end of the branches in long close bunches; there are six or seven of them gathered together in clusters. The flowers are but small, and are of a yellowish red colour; the pods of this are like those of the first sort.

The sixth sort grows naturally in Jamaica, where the inhabitants give it the appellation of Dogwood. This hath a strong woody stem which rises forty feet high, and divides into many branches, which are covered with a dark brown spotted bark, and garnished with unequal winged leaves, composed of three or four pair of obverse oval lobes, terminated by an odd one; they are two inches and a half over, smooth on their upper side, but are veined on their under, which are of a buff colour. The flowers come out in branching bunches from the side of the branches; these generally appear at a time when the trees are destitute of leaves, and as they have large clusters of flowers at every joint, so the trees seem covered with them. The bunches at the extremity of the branches are the largest, and are formed pyramidally. The flowers are but small, and do not open so fully as those of the first sort, but are of a pale Rose colour, so make a fine appearance; these are succeeded by pods, having four broad membranaceous wings running longitudinally at the four corners of the pods, and these join at their base, covering the pods entirely; each of the pods contain four or five oblong kidney-shaped seeds.

The seventh sort was discovered by Plumier, in some of the French settlements of the West-Indies, and it was afterward found by the late Dr. Houstoun growing naturally at Campeachy. This rises with a strong woody stem near thirty feet high, sending out many spreading branches, which are covered with a light gray bark spotted with white, and garnished with double winged leaves, whose lobes are oval and sit close to the midrib; they are of a lucid green on their upper side, but of a pale green on their under. The flowers are produced in long loose pyramidal bunches toward the end of the branches, those on the lower part of the bunch having long foot-stalks, which diminish gradually to the top, so as to form a pyramid; these bunches are almost erect. The flowers are of a scarlet colour, so make a fine appearance.

The eighth sort was found growing naturally at Campeachy by the late Dr. Houstoun; this rises with a woody stem to the height of twenty feet, dividing at the top into several spreading branches, which are covered with a very light gray bark, and garnished with equal winged leaves, composed of ten or eleven pair of oval lobes placed opposite; they are of a lucid green on the lower part of the branches, but those toward the end are covered with a soft iron-coloured down. The flowers come out in long bunches from the side of the branches, they are blue, and stand upon long foot-stalks; these are succeeded by pods shaped like those of the first sort, but are downy.

The ninth sort was discovered by the late Dr. Houstoun, growing naturally at Campeachy. This sort rises with a strong woody stem upward of thirty feet high, dividing at the top into many strong branches, covered with a dark grayish bark, spotted with white, and are garnished with winged leaves, composed of six or seven pair of lobes, terminated by an odd one; they are two inches and a half long, and an inch and a half broad, ending in a point, of a lucid green on their upper side, but pale on their under. The flowers are produced in long loose bunches from the side of the branches; they are of a pale Rose colour, and have very long foot-stalks; these are succeeded by oval pods two inches and a half long, and one inch and a half broad, swelling in the middle, where is lodged one or two kidney-shaped seeds.

The tenth sort grows naturally in Siberia and Tartary; this grows with a shrubby stalk eight or ten feet high, sending out several branches which grow erect, covered with a smooth yellowish bark; the leaves have each two pair of oval pointed lobes, which stand upon short foot-stalks. The flowers are produced upon single foot-stalks which come out at the joints of the branches; they are yellow, and shaped like those of the Laburnum, but are smaller; these appear in May, and if the plants stand in a moist soil and shady situation, their pods will succeed the flowers, and the seeds will ripen the end of August.

The eleventh sort grows naturally in Siberia, from whence the seeds were sent to the Imperial Garden at Petersburgh, where they succeeded and perfected seeds, which were afterward transmitted to many parts of Europe. This rises with a tree-like stem near twenty feet high, sending out many side branches, garnished with abrupt winged leaves composed of four or five pair of oval lobes placed opposite; the flowers are produced from the wings of the leaves, each foot-stalk having one yellow Pea-blossomed flower, which in a moist season is succeeded by oblong taper pods, containing three or four seeds in each.

The twelfth sort is also a native of Siberia; this is a weak low shrub, seldom rising more than three feet high in England. The branches are slender, and have a light bark, garnished with leaves composed of four oblong lobes which sit close to the branches; the flowers are produced singly upon foot-stalks which arise from the wings of the leaves; they are yellow,

and

and appear in April, but are rarely ſucceeded by ſeeds in England.

The firſt ſort is generally propagated in the Engliſh nurſeries, by ſuckers taken from the roots of the old trees, or by cutting off ſome of the roots, and planting them upon a gentle hot-bed; theſe will put out ſhoots, and become plants; but theſe are not ſo valuable as thoſe which are raiſed from ſeeds, becauſe they do not make near ſo great progreſs in their growth, and are very ſubject to ſend forth many ſuckers from their roots, whereby the ground will be filled with them to a great diſtance; and theſe ſuckers will draw away the nouriſhment from the old plants, whereby their growth will be greatly retarded.

If this is propagated by ſeeds, they ſhould be ſown on a bed of light earth about the latter end of March or the beginning of April; and if the bed is well expoſed to the ſun, the plants will appear in about five or ſix weeks, and will require no farther care but to keep them clear from weeds. In this bed the plants may remain till the following ſpring, when they ſhould be tranſplanted into a nurſery about the latter end of March, placing them in rows at three feet diſtance row from row, and a foot and a half aſunder in the rows. In this nurſery they may remain two years, by which time they will be fit to tranſplant where they are deſigned to grow; for as theſe trees ſend forth long tough roots, ſo if they ſtand long unremoved, the roots will extend themſelves to a great diſtance; therefore they muſt be cut off when the plants are tranſplanted, which ſometimes occaſions their miſcarrying.

Theſe trees will grow well upon almoſt every ſoil, but beſt in a light ſandy ground, in which they will ſhoot ſix or eight feet in one year; and while the trees are young, they make an agreeable appearance, being well furniſhed with leaves; but when they are old, the branches being frequently broken by winds, render them unſightly, eſpecially if they ſtand in an expoſed place; and when the trees grow old, their branches decay, which renders them very diſagreeable, and has occaſioned their being rooted out of ſeveral gardens ſome years paſt. This is commonly known by the title of Locuſt-tree in America, and there are quantities of the ſeeds annually ſent to England with that title.

The ſecond ſort is propagated in the ſame manner as the firſt, and the trees grow to the ſame ſize.

The third ſort is at preſent ſcarce in the gardens about London, but in Devonſhire it is in greater plenty, where the inhabitants give it the title of Raſpberry plant, from the young ſhoots being covered with briſtly hairs like the Raſpberry plants; this does not produce ſeeds in England, ſo it is propagated by cutting off part of the roots, and planting them upon a gentle hot-bed, where they will put out fibres and ſhoots, and become new plants. This ſort ſhould have a warmer ſituation than the two former, though the ordinary winters in this country never injure it, but in very ſevere winters their young ſhoots are ſometimes killed in expoſed places. It loves a light moiſt ſoil.

The fourth, fifth, ſixth, ſeventh, eighth, and ninth ſorts, are tender, ſo cannot be maintained in England, unleſs they are placed in a ſtove in winter. Theſe are propagated by ſeeds, which muſt be procured from the countries where they naturally grow, for they do not produce any here; theſe ſhould be ſown in ſmall pots filled with earth from the kitchen-garden, and plunged into a hot-bed of tanners bark; if the ſeeds are good, the plants will appear in ſix weeks or two months; when theſe are fit to tranſplant, they ſhould be carefully ſhaken out of the pots, and their roots ſeparated; then each plant ſhould be put into a ſmall pot filled with the like earth, and plunged into a hot-bed of tanners bark, obſerving to ſhade them till they have taken new root, and then they muſt have the ſame treatment as other tender plants from the ſame countries.

While the plants are young, they are more tender than afterward, therefore it will be proper to keep them in the tan-bed in the ſtove the two or three firſt years; but when they have obtained ſtrength, they may be kept in a dry ſtove of a temperate heat in winter, and in ſummer they may be expoſed to the open air in a ſheltered ſituation; with this management I have kept ſeveral of the ſpecies, ſome of which have produced flowers in the Chelſea Garden, and ſome of the ſorts I have propagated by cuttings.

The tenth, eleventh, and twelfth ſorts, are propagated from ſeeds, which ſhould be ſown in a ſhady ſituation in autumn, and then the plants will come up the following ſpring; but if the ſeeds are ſown in the ſpring, the plants ſeldom riſe the ſame ſeaſon. When the plants come up, they will require no other care but to keep them clean from weeds till autumn, when, if they have made any progreſs, they ſhould be tranſplanted on a north border, at about ſix inches diſtance, where they may grow two years, and then ſhould be planted where they are to remain, which ſhould be in a cool moiſt ſoil, not too much expoſed to the ſun.

RONDELETIA. Plum. Nov. Gen. 13. tab. 12. Lin. Gen. Plant. 206.

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, ſitting upon the germen, cut into five acute points. It has one funnel-ſhaped petal, with a cylindrical tube longer than the empalement, bellied toward the top, and cut into five roundiſh ſegments at the brim, which are reflexed. It has five awl-ſhaped ſtamina, terminated by ſingle ſummits; the roundiſh germen is ſituated under the flower, ſupporting a ſlender ſtyle the length of the tube, crowned by an obtuſe ſtigma. The germen afterward becomes a roundiſh crowned capſule with two cells, incloſing two or three angular ſeeds in each.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and one ſtyle.

The SPECIES are,

1. RONDELETIA (*Americana*) foliis ſeſſilibus, panicula dichotoma. Lin. Sp. Plant. 243. *Rondeletia with leaves ſitting cloſe to the branches, and a forked panicle.* Rondeletia arboreſcens, tini facie. Plum. Nov. Gen. 15. *Tree-like Rondeletia having the appearance of Tinus.*
2. RONDELETIA (*Aſiatica*) foliis petiolatis, oblongis acutis. Flor. Zeyl. 80. *Rondeletia with oblong leaves growing upon foot-ſtalks.* Cupi. Hort. Mal. 2. p. 37.

The firſt ſort grows naturally in the Weſt-Indies, where Plumier diſcovered it, and gave it this title in honour of Gulielmus Rondeletius, a famous phyſician and natural hiſtorian of Montpelier.

The ſeeds of this plant were firſt ſent me by Mr. Robert Millar, who collected them on the north ſide of the iſland of Jamaica; he alſo obſerved the trees growing plentifully in the Spaniſh Weſt-Indies; I have alſo ſince received the ſeeds from Barbadoes, which have ſucceeded at Chelſea. This riſes with a woody ſtalk ten or twelve feet high, branching out on every ſide; the branches are covered with a ſmooth greeniſh bark, and are garniſhed with oblong leaves ending in acute points; they are entire, and ſit very cloſe to the branches; the upper ſurface is of a lucid green, and the under of a pale green; they are a little crumpled on their ſurface, and ſtand alternate. The flowers come out in bunches at the end of the branches, they are white and have little ſcent. Theſe appear in autumn, and are not ſucceeded by ſeeds in England.

The ſecond ſort grows naturally at Malabar; this riſes with a woody ſtalk ſix or ſeven feet high, dividing into ſeveral branches, which are covered with a ſmooth bark, and garniſhed with ſtiff oblong leaves of a lucid green, ſtanding alternate on the lower part of the branches, but by pairs toward the extremity; they have ſhort foot-ſtalks, and are entire. The flowers are produced in large bunches at the end of the branches; they are of a yellowiſh white colour, and

have a fragrant odour: these are succeeded by roundish capsules having two cells, each containing three or four angular seeds.

These plants being very tender, cannot be preserved in England, unless they are kept in a warm stove. They are propagated by seeds, which should be sown on a hot-bed early in the spring; and when the plants are come up and fit to remove, they must be transplanted into separate small pots, and plunged into a moderate hot-bed of tanners bark, where they must be treated in the same manner as hath been directed for other tender plants from the same country; in winter they must be placed in the tan-bed in the stove, where these plants will thrive, and in two or three years will flower, when they will make an agreeable variety amongst other tender exotic plants, for they retain their leaves all the year; and those of the second sort being of a lively green, make a fine appearance at all seasons.

ROOT, in Latin Radix.

A Root is that part of a plant, by which it naturally draws in its nourishment. The Roots of plants being of various forms, and each distinguished by a different name, it will not be improper, in this place, to insert the principal of those which are thus distinguished. And first,

A fibrous Root, Radix fibrosa, is that which consists wholly of small fibres, as most sorts of Grass, Pinks, &c.

A tuberous Root, Radix tuberosa, is that which consists of an uniform fleshy substance, and is of a roundish figure, as Turneps, Potatoes, &c.

A bulbous Root, Radix bulbosa, is that which consists either of several coats involving one another, as Onions, Tulips, &c. or of several scales lying over one another, as Lilies, Crown Imperials, &c. The first of these is called a tunicated Root, the last a squamous Root.

A testiculated Root, Radix testiculato, is a double tuberose Root, for it consists of two knobs, resembling a pair of testicles, as in the Orchis.

A handed Root, Radix palmata, is a tuberose Root divided, as it were, into several fingers, as in the handed Satyrions.

A grumous Root, Radix grumosa, is that which is composed of several knobs, as the Anemone, &c.

A granulous Root, Radix granulata, is a kind of grumous Root, with small knobs resembling so many grains of Corn, as in the white Saxifrage.

A tap Root is a tuberose Root extended in length, as in Parsneps, Carrots, &c.

ROSA. Tourn. Inst. R. H. 636. tab. 408. Lin. Gen. Plant. 556. The Rose-tree.

The Characters are,

*The empalement of the flower is of one leaf, divided into five parts at the top, but the base is globular and bell-shaped. The segments are spear-shaped, two of these alternately have appendixes on their sides, two other alternately are naked, and the fifth has often an appendix, and sometimes none. The flower hath five oval heart-shaped petals inserted in the empalement, and a great number of short hair-like stamina inserted in the neck of the empalement, terminated by three-cornered summits. It hath many germen situated in the bottom of the empalement, each having a short hairy style, inserted to the side of the germen, crowned by obtuse stigmas. The fleshy base of the empalement afterward becomes a top-shaped coloured fruit with one cell, including many hairy oblong seeds fastened on each side to the empalement.*

This genus of plants is ranged in the fifth section of Linnæus's twelfth class, which contains those plants whose flowers have many stamina inserted in the empalement, and many styles.

The Species are,

1. Rosa (*Canina*) germinibus ovatis pedunculisque glabris, caule petiolisque aculeatis. Lin. Sp. Plant. 704. *Wild Rose with an oval fruit, having a smooth foot-stalk and prickly branches.* Rosa sylvestris vulgaris, flore odorato incarnato. C. B. P. 483. *Common wild Rose, with a flesh-coloured sweet flower, commonly called Wild Brier, Dog Rose, or Hep-tree.*

2. Rosa (*Spinosissima*) germinibus ovatis glabris, pedunculis caule petiolisque aculeatissimis. Lin. Sp. Plant. 705. *Wild Rose with oval smooth fruit, but the stalks and foot-stalks extremely armed with spines.* Rosa campestris spinosissima, flore albo odorato. C. B. P. 483. *Wild prickly Rose with a white sweet flower, commonly called the Burnet-leaved Rose.*

3. Rosa (*Villosa*) germinibus globosis aculeatis, pedunculis hispidis, caule aculeis sparsis, petiolis aculeatis, foliis tomentosis. Lin. Sp. 704. *Rose with a globular prickly fruit and foot-stalk, and woolly leaves whose foot-stalks are prickly.* Rosa sylvestris pomifera major. C. B. P. 484. *The greater, wild, Apple-bearing Rose.*

4. Rosa (*Eglanteria*) germinibus globosis pedunculisque glabris, caule aculeis sparsis rectis, petiolis scabris, foliolis acutis. Lin. Sp. 703. *Rose with a globular fruit, a smooth foot-stalk, the stalk armed with erect spines, the leaves pointed, having rough foot-stalks.* Rosa sylvestris, foliis odoratis. C.B.P. 483. *Wild Rose with sweet-scented leaves, commonly called Sweet Briar.*

5. Rosa (*Scotica*) caule petiolisque aculeatis, foliis pinnatis, foliolis apice incisis, fructu globoso. *Rose with the stalk and foot-stalk armed with spines, winged leaves whose lobes are cut at their points, and a globular fruit.* Rosa pimpinella minor Scotica, flore livide rubente. Edit. prior. *Small, Scotch, Burnet-leaved Rose, with a livid red flower.*

6. Rosa (*Inermis*) caule inermi, pedunculis hispidis, calycis foliolis indivisis, fructibus oblongis. *Rose with a smooth stalk, a prickly foot-stalk to the flower, the small leaves of the empalement undivided, and oblong fruit.* Rosa campestris, spinis carens, biflora. C. B. P. 484. *Unarmed Rose having two flowers.*

7. Rosa (*Hispanica*) foliis utrinque villosis, calycis foliolis acutè serratis, fructu glabro. *Rose with leaves which are hairy on both sides, the small leaves of the empalement sharply sawed, and a smooth fruit.*

8. Rosa (*Scandens*) caule aculeato, foliis perennantibus lucidis, flore odorato. *Climbing Rose with a prickly stalk, shining evergreen leaves, and a sweet flower.* Rosa sylvestris dumetorum scandens sempervirens, myrti folio lucido, flore albo odorato, fructu parvo rotundo & hispido. Mich. Cat. Pl. Ag. Flor. *Wild, woody, climbing Rose, with a shining evergreen Myrtle leaf, a white sweet-scented flower, and a small, round, prickly fruit.*

9. Rosa (*Sempervirens*) germinibus ovatis pedunculisque hispidis, caule petiolisque aculeatis. Lin. Sp. Plant. 704. *Evergreen Rose with an oval germina, whose foot-stalks are prickly.* Rosa moschata sempervirens. C.B.P. 482. *Evergreen Musk Rose.*

10. Rosa (*Virginiana*) inermis, foliis pinnatis, foliolis ovatis serratis utrinque glabris, calycis foliolis indivisis. *Rose without thorns, having winged leaves which are smooth on both sides, and the leaves of the empalement undivided.* Rosa sylvestris Virginiana pimpinellæ majoris foliis. Raii Hist. *Wild Virginia Rose with greater Burnet leaves.*

11. Rosa (*Lutea*) caule aculeato, foliis pinnatis, foliolis ovatis serratis utrinque glabris, pedunculis brevissimis. *Rose with a prickly stalk, winged leaves having oval sawed lobes which are smooth on both sides, and short foot-stalks to the flower.* Rosa lutea simplex. C. B. P. 483. *The single Yellow Rose.*

12. Rosa (*Punicea*) caule aculeato, foliis pinnatis, foliolis rotundioribus serratis, petalis emarginatis bicoloribus. *Rose with a prickly stalk, winged leaves having rounder sawed lobes, the petals of the flower indented at the top, and of two colours.* Rosa punicea. Corn. Can. 11. *The Austrian Rose.*

13. Rosa (*Moschata*) caule aculeato scandente, foliis senis glabris, floribus umbellatis. *Rose with a prickly climbing stalk, leaves having seven smooth lobes, and flowers growing in umbels.* Rosa moschata major. J. B. 2. p. 45. *Greater Musk Rose.*

14. Rosa (*Centifolia*) germinibus ovatis pedunculisque hispidis, caule hispido aculeato, petiolis inermibus. Lin. Sp. 704. *Rose with an oval germen, stinging foot-stalks,*

*ſtalks, and the foot-ſtalks of the leaves ſmooth.* Roſa entifolia Batavica. Cluſ. Hiſt. 1. p. 114. *The Dutch undred-leaved Roſe.*

15. Rosa (*Damaſcena*) caule aculeato, pedunculis hiſpidis, calycibus pinnatifidis hirſutis. *Roſe with a prickly ſtalk, briſtly foot-ſtalks to the flowers, and wing-pointed hairy empalements.* Roſa Damaſcena. Lob. Icon. 206. *Damaſk Roſe.*

16. Rosa (*Alba*) germinibus ovatis glabris, pedunculis hiſpidis, caule petioliſque aculeatis. Lin. Sp. 705. *Roſe with a ſmooth oval germen, whoſe foot-ſtalks are ſtinging and the branches prickly.* Roſa alba vulgaris major. C. B. P. 482. *Common great White Roſe.*

17. Rosa (*Belgica*) caule aculeato, foliis ſubtus hirſutis, calycibus ſemipinnatis villoſis. *Roſe with a prickly ſtalk, leaves which are hairy on their under ſide, and half-winged hairy empalements to the flowers.* Roſa Belgica ſive vitrea flore rubicante. Rea. Flor. *The Bluſh Belgick Roſe.*

18. Rosa (*Provincialis*) caule petioliſque aculeatis, foliis ſubtus villoſis, calycibus ſemipinnatis hiſpidis. *Roſe with prickly ſtalks and foot-ſtalks, leaves hairy on their under ſide, and briſtly half-winged empalements.* Roſa Provincialis major, flore pleno ruberrimo. Boerh. Ind. alt. 2. 252. *Larger Provence Roſe, with a very red double flower, commonly called Provence Roſe.*

19. Rosa (*Incarnata*) caule inermi pedunculis aculeatis, calycibus ſemipinnatis. *Roſe with an unarmed ſtalk, prickly foot-ſtalks, and half-winged empalements to the flowers.* Roſa incarnata. Park. Par. *The Bluſh Roſe.*

20. Rosa (*Gallica*) caule ſubinermi, foliis quinis ſubtus villoſis, calycis foliolis indiviſis. *Roſe with a ſtalk almoſt unarmed, leaves having five lobes, hairy on their under ſide, and the leaves of the empalement undivided.* Roſa rubra. Ger. *The Red Roſe.*

21. Rosa (*Cinnamomea*) germinibus globoſis pedunculiſque glabris, caule aculeis ſtipularibus, petiolis ſubinermibus. Lin. Sp. 703. *Roſe with a ſmooth globular fruit, prickly branches, and ſmooth foot-ſtalks to the leaves.* Roſa odore cinnamomi, flore pleno. C. B. P. 483. *The double Cinnamon Roſe.*

22. Rosa (*Muſcoſa*) caule petioliſque aculeatis, pedunculis calycibuſque piloſiſſimis. *Roſe with armed ſtalks, the foot-ſtalks of the leaves and the empalements of the flower very hairy.* Roſa rubra plena, ſpinoſiſſima, pedunculo muſcoſo. Boerh. Ind. alt. 2. p. 252. *The moſt thorny, double, Red Roſe, with a moſſy foot-ſtalk, commonly called Moſs Provence Roſe.*

There are a great variety of double Roſes now cultivated in the Engliſh gardens; moſt of them have been accidentally obtained from ſeeds, ſo that they muſt not be eſteemed as diſtinct ſpecies, therefore I ſhall only inſert their common names, by which they are known in the gardens, that thoſe who are inclined to collect all the varieties, may be at no loſs for their titles. The ſorts before enumerated, I believe, are diſtinct ſpecies, as their ſpecific characters are different, though it is difficult to determine which of them are really ſo; therefore I do not poſitively aſſert they are diſtinct ſpecies, though I have great reaſon to believe they are ſo.

The varieties of Garden Roſes which are not before mentioned:

The Monthly Roſe,
The ſtriped Monthly Roſe,
The York and Lancaſter Roſe,
Mrs. Hart's Roſe,
} Theſe are all ſuppoſed to be varieties of the Damaſk Roſe.

The red Belgick Roſe is ſuppoſed a variety of the Bluſh Belgick.

The ſingle Velvet Roſe,
The double Velvet Roſe,
The Royal Velvet,
} Theſe three are all varieties; the laſt I raiſed from the ſeeds of the pale Provence Roſe.

The Childing Roſe,
The Marbled Roſe,
The double Virgin Roſe,
} Theſe three have great affinity with each other.

The Cabbage Provence is only a variety of the Common Provence.

The Bluſh or Pale Provence is a variety of the Red Provence.

The white Monthly
The white Damaſk
} are varieties of the Damaſk Roſe.

The Frankfort Roſe may be a diſtinct ſpecies, but is of little value; the flowers rarely open fair, and have no odour.

The double Sweet Briar
The evergreen Sweet Briar
The double bluſh Sweet Briar,
} are varieties of the common ſort.

The Auſtrian Roſe with red and yellow flowers is only an accidental variety.

The double Yellow Roſe is a variety of the ſingle yellow.

The Roſa Mundi is a variety of the Red Roſe.

The ſmall, white, and ſemidouble white, are varieties of the common white.

The firſt here enumerated is very common in hedges in moſt parts of England, ſo is not cultivated in gardens. The Heps of this are uſed in medicine for making a conſerve. The Bedeguar, which is a hairy ſpongy excreſcence occaſioned by the bite of ſmall ichneumon flies, grows upon the ſtalks and branches of this plant, and ſometimes upon other ſorts of Roſes. There are two or three varieties of this Roſe commonly met with in hedges, one with a white, another with a red flower, and one with ſmooth leaves; the two firſt are evidently varieties, but I doubt if the laſt is not a diſtinct ſpecies.

The ſecond ſort grows naturally in many parts of England; this ſeldom riſes above three feet high. The ſtalks are ſlender, and cloſely armed with ſmall ſpines; the leaves are ſmall, and are compoſed of three pair of roundiſh lobes terminated by an odd one; the flowers are white, and have an agreeable muſky ſcent. This propagates faſt by its creeping roots.

The third ſort grows naturally in the northern counties in England; this riſes with ſtrong ſtalks to the height of ſeven or eight feet. The young branches are covered with a ſmooth brown bark; the ſpines are but few, and are very ſtrong; the leaves are large, and hairy on both ſides; they are compoſed of three pair of oblong oval lobes terminated by an odd one; theſe are deeply ſawed on their edges; the flowers are large, ſingle, and of a red colour; they appear the beginning of June, and are ſucceeded by large roundiſh Heps or fruit, which are ſet with ſoft prickles; they have a pleaſant acid pulp ſurrounding the ſeeds, therefore are by ſome perſons preſerved, and made into a ſweetmeat, which is ſerved up in deſerts to the table.

The fourth ſort is the common Sweet Briar, which is ſo well known as to need no deſcription; this is found growing naturally in ſome parts of Kent.

The fifth ſort is the Dwarf Burnet-leaved Scotch Roſe, of which there are two varieties, one with a variegated flower, and the flowers of the other are of a livid red colour; the latter is the ſame with the Roſa Alpina, pumila, montis roſarum, pimpinellæ foliis minoribus ac rotundioribus flore minimo livide rubente. Hort. Cath. for I have dried ſpecimens of this which were ſent me from Italy, and by comparing them with the Scotch Roſe, I find they are the ſame. This ſort ſeldom riſes more than a foot high. The ſtalks are covered with a brown bark, and are cloſely armed with ſmall ſpines; the leaves are very ſmall, and have a reſemblance to thoſe of Burnet; the flowers are ſmall, and ſit cloſe to the branches; the fruit is round, and of a deep purple colour, inclining to black when ripe.

The ſixth ſort riſes to the height of ſix or ſeven feet. The ſtalks and branches have no ſpines, but are covered with a ſmooth reddiſh bark; the leaves are compoſed of three pair of thin oval lobes, terminated by an odd one; they are very ſmooth, of a bright green, and very ſlightly ſawed on their edges, ſtanding pretty far aſunder upon the midrib; the foot-ſtalks of the flowers are armed with briſtly hairs; the five leaves of the empalement are long, ſlender in the middle, but terminate in an oval leafy point; the flowers are ſingle, of a bright red colour, and appear the beginning of May; theſe are ſucceeded by long

ſpear-ſhaped Heps, which are ſmooth. The plants produce a ſecond crop of flowers about the end of Auguſt, but theſe fall off, and are not ſucceeded by Heps.

The ſeeds of the ſeventh ſort were ſent me by Robert More, Eſq; from Spain, where he found the plants growing naturally; this riſes with ſtrong upright ſtalks about four feet high, armed with ſtrong thorns. The leaves are hairy on both ſides; the lobes are roundiſh, and ſawed on their edges; the ſmall leaves of the empalement are acutely ſawed; the flowers are ſingle, of a bright red colour, and appear early in May; theſe are ſucceeded by large, ſmooth, roundiſh Heps, which ripen the end of Auguſt.

The eighth ſort was diſcovered by Signior Micheli, growing naturally in the woods near Florence, who ſent it to Dr. Boerhaave of Leyden, in whoſe curious garden I ſaw it growing in the year 1727: this hath ſlender ſtalks which trail upon the ground, unleſs they are ſupported, and, if trained up to a pole or the ſtem of a tree, will riſe twelve or fourteen feet high; they are armed with crooked reddiſh ſpines, and garniſhed with ſmall leaves, compoſed of three pair of oval acute-pointed lobes, terminated by an odd one; they are of a lucid green, and are ſawed on their edges; they continue green all the year; the flowers are ſmall, ſingle, white, and have a muſky odour; theſe in their natural place of growth continue in ſucceſſion great part of the year, but their time of flowering in England is in June.

The ninth ſort grows naturally in Spain; the ſeeds of this were ſent me by Robert More, Eſq; who found the plants growing there naturally. This riſes with erect ſtalks four or five feet high, which are covered with a green bark, and armed with ſtrong crooked white ſpines. The leaves are compoſed of five oval lobes ending in acute points; they are ſmooth, of a lucid green, and are ſlightly ſawed on their edges; theſe continue all the year, and make a goodly appearance in winter. The flowers grow in large bunches or umbels at the end of the branches; they are ſingle, white, and have a ſtrong muſky odour; they appear in Auguſt, and if the autumn proves favourable, will continue in ſucceſſion till October.

The tenth ſort grows naturally in Virginia and other parts of North America; this riſes with ſeveral ſmooth ſtalks to the height of five or ſix feet. The young branches are covered with a ſmooth purple bark; the leaves are compoſed of four or five pair of ſpear-ſhaped lobes, terminated by an odd one; they are ſmooth on both ſides, of a lucid green on their upper ſide, but pale on their under, and are deeply ſawed on their edges; the flowers are ſingle, of a livid red colour, and appear in July; the empalement is divided into five long narrow ſegments which are entire. This is kept in gardens for the ſake of variety, but the flowers have little ſcent.

The eleventh ſort is the ſingle Yellow Roſe; this hath weak ſtalks which ſend out many ſlender branches, cloſely armed with ſhort, crooked, brown ſpines. The leaves are compoſed of two or three pair of oval thin lobes, terminated by an odd one; they are ſmooth, of a light green, and are ſharply ſawed on their edges; the flowers grow upon ſhort foot-ſtalks; they are ſingle, and of a bright yellow colour, but have no ſcent.

The twelfth ſort is commonly called the Auſtrian Roſe. The ſtalks, branches, and leaves are like thoſe of the laſt, but the leaves are rounder; the flowers are larger; the petals have deep indentures at their points; they are of a bright yellow within, and of a purpliſh copper colour on the outſide; they are ſingle, have no ſcent, and ſoon fall away. There is frequently a variety of this with yellow flowers upon one branch, and copper colour upon another. This ſort of Roſe loves an open free air and a northern aſpect.

The thirteenth ſort is the Muſk Roſe; this riſes with weak ſtalks to the height of ten or twelve feet, covered with a ſmooth greeniſh bark, and armed with ſhort ſtrong ſpines. The leaves are ſmooth, and compoſed of three pair of oval ſpear-ſhaped lobes, terminating in points ending with an odd one; they are of a light green colour, and ſawed on their edges; the flowers are produced in large bunches, in form of umbels, at the end of the branches; theſe appear in Auguſt, and continue in ſucceſſion till the froſt ſtops them; they are white, and have a fine muſky odour. There is one with ſingle, and another with double flowers of this ſort. The ſtalks of theſe plants are too weak to ſupport themſelves, ſo the plants ſhould be placed where they may have ſupport.

The fourteenth ſort is the Dutch hundred-leaved Roſe; this riſes with prickly ſtalks about three feet high. The leaves have ſometimes three, and at others five lobes; the lobes are large, oval, ſmooth, and of a dark green with purple edges; the foot-ſtalk of the flower is ſet with brown briſtly hairs; the empalement of the flower is ſmooth, and half winged; the flowers are very double, and of a deep red colour, but have little ſcent.

The fifteenth is the Damaſk Roſe; this riſes with prickly ſtalks eight or ten feet high, covered with a greeniſh bark, and armed with ſhort ſpines. The leaves are compoſed of two pair of oval lobes, terminated by an odd one; they are of a dark green on their upper ſide, but pale on their under; the borders frequently turn brown, and are ſlightly ſawed; the foot-ſtalks of the flowers are ſet with prickly hairs; the empalement of the flower is wing-pointed and hairy: the flowers are of a ſoft pale red, and not very double, but have an agreeable odour; the Heps are long and ſmooth.

The ſixteenth is the common large White Roſe, ſo well known as to need no deſcription. Of this there are two varieties, one with a half double flower, having but two or three rows of petals, and the other has a ſmaller flower, and the ſhrub is of lower growth.

The ſeventeenth ſort is called the Bluſh Belgick Roſe; this riſes about three feet high, with prickly ſtalks. The leaves are compoſed either of five or ſeven lobes, which are oval, hairy on their under ſide, and ſlightly ſawed on their edges; the foot-ſtalks of the flowers and the empalements are hairy, and without ſpines; the empalements are large and half-winged; the flowers are very double, of a pale fleſh colour, and have but little ſcent. It generally produces great quantities of flowers. The red Belgick Roſe differs from this only in the colour of the flower, which is of a eep red.

The eighteenth ſort is the common Provence Roſe, which is well known in the Engliſh gardens, being cultivated in great plenty in the nurſeries, and is one of the moſt beautiful ſorts yet known. The flowers of this ſort are ſometimes very large, and the petals are cloſely folded over each other like Cabbages, from whence it is called the Cabbage Roſe. The flowers of this ſort of Roſe have the moſt fragrant odour of all the ſorts, therefore is better worth propagating.

The nineteenth ſort is the Bluſh Roſe. The ſtalks of this riſe from three to four feet high, and are not armed with ſpines; the leaves are hairy on their under ſide; the foot-ſtalks of the flowers are armed with ſome ſmall ſpines; the empalement of the flower is half-winged; the flowers have five or ſix rows of petals which are large, and ſpread open; they are of a pale bluſh colour, and have a muſky ſcent.

The twentieth ſort is the common Red Roſe, which is uſed in medicine. The ſtalks of this ſort grow erect, and have ſcarce any ſpines; they riſe from three to four feet high; the leaves are compoſed of three or five large oval lobes, which are hairy on their under ſide; the ſmall leaves of the empalement are undivided; the flowers are large, but not very double, ſpread open wide, and decay ſoon; they are of a deep red colour, and have an agreeable ſcent. The Roſa Mundi is a variety of this with ſtriped flowers.

The

The twenty-first sort is the double Cinnamon Rose; this is one of the smallest flowers, and the earliest of all the kinds. The stalks rise about four feet high, are covered with a purplish smooth bark, and have no spines, but at the joints immediately under the leaves, where they are placed by pairs; they are short and crooked. The leaves are composed of three pair of oval lobes terminated by an odd one; they are hairy on their under side, and are sawed on their edges; the leaves of the empalement of the flower are narrow and entire; the flower is small, double, and has a scent like Cinnamon, from whence it had the title of Cinnamon Rose.

The twenty-second sort is called the Moss Provence Rose, from the resemblance which the flowers of this have to those of the common Provence Rose, yet it is undoubtedly a distinct species; for although the stalks and shoots of this are very like those of the common, yet the plants are difficult to propagate, which the common sort is not. This very rarely sends up suckers from the root, and when the branches are layed down, they are long before they put out roots, so that this sort has been frequently propagated by budding it upon stocks of other sorts of Roses, but the plants so raised are not so durable as those which are propagated by layers.

The stalks and branches of this sort are closely armed with brown spines; the foot-stalks of the flowers and the empalements are covered with long hair-like Moss; the flowers are of an elegant crimson colour, and have a most agreeable odour.

Most of the sorts of Roses are of foreign growth, and have been at various times introduced into the English gardens, but they are generally natives of northern countries, or grow upon the cold mountains in the warmer parts of Europe, so they are very hardy in respect to cold, but love an open free air, especially the Yellow Rose, the Austrian Rose, and the Monthly Rose. The two former will not flower in a warm soil and situation, nor near the smoke of London, and the Monthly Rose will flower much better in a free open air, than within the reach of the smoke of London.

The usual time of these shrubs producing their flowers is from the middle, or latter end of May, till the middle of July.

But in order to continue these beauties longer than they are naturally disposed to last, it is proper to plant some of the Monthly Roses near a warm wall, which will occasion their budding at least three weeks or a month before those in the open air; and, if you give them the help of a glass before them, it will bring their flowers much forwarder, especially where dung is placed to the back side of the wall (as is practised in raising early fruits;) by this method I have seen fair Roses of this kind blown in February, and they may be brought much sooner against hot walls or in stoves, where people are curious this way.

You may also cut off the tops of such shoots which have been produced the same spring early in May, from some of these sorts of Roses which are planted in the open air, and upon a strong soil; this will cause them to make new shoots, which will flower late in autumn, as will also the late removing the plants in spring, provided they do not suffer by drought, as I have several times experienced; but particularly in the year 1718, when I had occasion to remove a large parcel of these plants in May, just as they were beginning to flower; in doing of which I cut off all the flower-buds, and, after having opened a trench where they were to be planted, I poured a large quantity of water, so as to render the ground like a pap; then I took up the plants, and placed them therein as soon as possible, that their roots might not dry; and, after planting them, I watered the ground well again, and covered the surface over with mulch to prevent the drying; after this I repeated watering the plants all over two or three times a week, in the evening, until they had taken root. In three weeks or a month after, the plants shot out again, and produced a great quantity of flowers in August and September, which were as fair as those produced in June. The Monthly Rose is the best sort for this purpose, there being no other sort which will flower both early and late so well as this.

The next sort of Rose which flowers in the open air, is the Cinnamon, which is immediately followed by the Damask Rose, then the Blush, York, and Lancaster come; after which, the Provence, Dutch, Hundred-leaved, White, and most other sorts of Roses follow; and the latest sorts are the Virginia and Musk Roses, which, if planted in a shady situation, seldom flower until September; and, if the autumn proves mild, will continue often till the middle of October.

The plants of the two sorts of Musk Roses, should be placed against a wall, pale, or other building, that their branches may be supported, otherwise they are so slender and weak as to trail upon the ground. These plants should not be pruned until spring, because their branches are somewhat tender; so that when they are cut in winter, they often die after the knife; these produce their flowers at the extremity of the same year's shoots in large bunches, so that their branches must not be shortened in the summer, lest thereby the flowers should be cut off. The shrubs will grow to be ten or twelve feet high, and must not be checked in their growth, if you intend they should flower well, so that they should be placed where they may be allowed room.

The lowest shrub of all the sorts here mentioned is the Scotch Rose, which rarely grows above a foot high, so that this must be placed among other shrubs of the same growth, which should have a moist soil and a shady situation. The Red Rose, and the Rosa Mundi, commonly grow from three to four feet high, but seldom exceed that; but the Damask, Provence, and Frankfort Roses grow to the height of seven or eight feet; so that in planting them, great care should be taken to place their several kinds, according to their various growth, amongst other shrubs, that they may appear beautiful to the eye.

The Yellow Rose, as also the Austrian Rose, are both natives of America; these were originally brought from Canada by the French; the other varieties, which are now in the gardens, of these sorts, have been accidentally obtained, and are preserved by budding them on the other sorts. The shrubs of these Roses seldom shoot so strong as most of the other sorts, especially in the light land near London, where they seldom produce their flowers. These are esteemed for their colour, being very different from all the other sorts of Roses; but as their flowers have no scent, and are of short duration, they do not merit the price they are generally sold at.

The Frankfort Rose is of little value, except for a stock to bud the more tender sorts of Roses upon, for the flowers seldom open fair, and have no scent; but it being a vigorous shooter, renders it proper for stocks to bud the Yellow and Austrian Roses, which will render them stronger than upon their own stocks; but the Yellow Roses seldom blow fair within eight or ten miles of London, though in the northern parts of Great-Britain they flower extremely well. This sort must have a northern exposure, for if it is planted too warm, it will not flower.

The Damask and Monthly Rose seldom flower well in small confined gardens, nor in the smoke of London, therefore are not proper to plant in such places, tho' they frequently grow very vigorously there. These always begin to shoot the first of any of the sorts in the spring, therefore frequently suffer from frosts in April, which often destroys all their flowers.

All the sorts of Roses may be propagated either from suckers, layers, or by budding them upon stocks of other sorts of Roses; which latter method is only practised for some peculiar sorts, which do not grow very vigorous upon their own stocks, and send forth suckers very sparingly, or where a person is willing to have more sorts than one upon the same plant;



but

but where this is designed, it must be observed to bud only such sorts upon the same stock as are nearly equal in their manner of growth; for if there be a bud of a vigorous growing sort, and others of weak growth budded in the same stock, the strong one will draw all the nourishment from the weaker, and entirely starve them.

If these plants are propagated by suckers, they should be taken off annually in October, and transplanted out either into a nursery in rows (as hath been directed for several other sorts of flowering-shrubs) or into the places where they are to remain; for if they are permitted to stand upon the roots of the old plants more than one year, they grow woody, and do not form so good roots as if planted out the first year, so there is more danger of their not succeeding.

But the best method to obtain good-rooted plants is to lay down the young branches in autumn, which will take good root by the autumn following (especially if they are watered in very dry weather,) when they may be taken from the old plants, and transplanted where they are to remain. The plants, which are propagated by layers, are not so apt to send out suckers from their roots as those which are from suckers, therefore should be preferred before them; because they may be much easier kept within compass, and these will also flower much stronger. These plants may be transplanted any time from October to April; but when they are designed to flower strong the first year after planting, they should be planted early; though, as I said before, if they are planted late in the spring, it will cause them to flower in autumn, provided they do not suffer by drought.

Most of these sorts delight in a rich moist soil and an open situation, in which they will produce a greater quantity of flowers, and those much fairer, than when they are upon a dry soil or in a shady situation. The pruning which they require, is only to cut out their dead wood, and take off all the suckers, which should be done every autumn; and if there are any very luxuriant branches, which draw the nourishment from the other parts of the plant, they should be taken out, or shortened, to cause them to produce more branches, if there be occasion for them to supply a vacancy; but you must avoid crowding them with branches, which is as injurious to these plants as to fruit-trees; for, if the branches have not equal benefit from the sun and air, they will not produce their flowers so strong, nor in so great plenty, as when they are more open, and better exposed to the sun, so that the air may circulate the more freely between them.

ROSA SINENSIS. See Hibiscus.

ROSE THE GUELDER. See Opulus.

ROSMARINUS. Tourn. Inst. R. H. 195. tab. 92. Lin. Gen. Plant. 35. [so called of Ros, Dew, and Marinus, *Lat.* belonging to the sea, q. d. Sea Dew, as some say, because formerly growing in great plenty near the shore of the Mediterranean Sea; the vapours thence arising, used to fall on it in the manner of Dew.] Rosemary.

The Characters are,

*The flower has a tubulous empalement of one leaf, compressed at the top, the mouth erect, and divided into two lips; the upper lip is entire, and the under bifid. It hath one petal; the tube is longer than the empalement; the brim is ringent; the upper lip is short, erect, and divided into two parts, whose borders are reflexed; the lower lip is reflexed, and cut into three parts, the middle segment being larger and concave. It hath two awl-shaped stamina inclining toward the upper lip, terminated by single summits, and a four-pointed germen, with a style the shape, length, and in the same situation with the stamina, crowned by an acute stigma. The germen afterward become four oval seeds sitting in the bottom of the empalement.*

This genus of plants is ranged in the first section of Linnæus's second class, which includes those plants whose flowers have two stamina and one style; so that this genus, by his system, with six or seven more, are removed to a great distance from their congeners, which are ranged in his fourteenth class.

The Species are,

1. Rosmarinus (*Angustifolia*) foliis linearibus marginibus reflexis, subtus incanis. *Rosemary with linear leaves which are reflexed on their edges, and hoary on their under side.* Rosmarinus hortensis, angustiore folio. C. B. P. 217. *Garden Rosemary with a narrower leaf.*
2. Rosmarinus (*Latifolia*) foliis linearibus obtusis, utrinque virentibus. *Rosemary with obtuse linear leaves which are green on both sides.* Rosmarinus spontaneus latiore folio. C. B. P. 217. *Broad-leaved wild Rosemary.*

These two sorts have been frequently supposed the same, and the difference accidental; but I have long cultivated both, and have raised them from seeds without finding them vary, so I believe they are distinct species. The leaves of the second sort are broader than those of the first, and their points are obtuse; the flowers are also much larger, and of a deeper colour, and the stalks grow larger, and spread out their branches wider, and the whole plant has a stronger scent. These differences the gardeners, who cultivate the plants for the market, observe.

There are two other varieties of these plants, one of the first sort with striped leaves, which the gardeners call the Silver Rosemary, and is at present rare in the English gardens; all the plants of this which were here before the severe winter in 1740, having been then killed; the other is of the second sort, which is striped with yellow; this the gardeners called the Gold striped Rosemary. The plants of this sort are pretty hardy, so will live in the open air through our common winters if they are upon a dry soil.

These plants grow plentifully in the southern parts of France, in Spain and Italy, where, upon dry rocky soils near the sea, they thrive prodigiously, and perfume the air, so as to be smelt at a great distance from the land; but, notwithstanding they are produced in warm countries, yet they are hardy enough to bear the cold of our ordinary winters very well in the open air, provided they are planted upon a poor, dry, gravelly soil, on which they will endure the cold much better than upon a richer soil, where the plants will grow more vigorously in summer, and so be more subject to injury from frost, and they will not have so strong an aromatic scent as those upon a dry barren soil.

Those sorts with striped leaves are somewhat tender, especially that with silver stripes, so should either be planted near a warm wall, or in pots filled with light fresh earth, and sheltered in winter under a frame, otherwise they are subject to die in frosty weather.

These sorts may be propagated by planting slips or cuttings of them in the spring of the year, just before the plants begin to shoot, upon a bed of light fresh earth; and when they are rooted, they may be transplanted into the places where they are designed to grow; but it will be proper to do this about the beginning of September, that they may take new root before the frosty weather comes on; for if they are planted too late in the autumn, they seldom live thro' the winter, especially if the weather proves very cold; so that if you do not transplant them early, it will be the better method to let them remain unremoved until March following, when the frost is over, observing never to transplant them at a season when the dry east winds blow, but rather defer the doing of it until the season is more favourable; for, if they are planted when there are cold drying winds, their leaves are apt to dry up, which often kills them; but, if there happen to be some warm showers soon after they are removed, it will cause them to take root immediately, so that they will require no farther care but to keep them clear from weeds.

Although these plants are tender when planted in a garden, yet when they are by accident rooted in a wall (as I have several times seen them,) they will endure the greatest cold of our winters, though exposed much to the cold winds; which is occasioned by the

*Rubia Tinctorum Madder.*

RUBIA *foliis senis Hort. Cliff. 35.*

I. Miller delin et Sculp.

the plants being more ftinted and ftrong, and their roots being drier.

The flowers of the narrow-leaved garden fort are ufed in medicine, as are alfo the leaves and feeds.

ROYENA. Lin. Gen. Plant. 491.

The title of this genus was given to it by Dr. Linnæus, in honour of Dr. Adrian Van Royen, late profeffor of botany at Leyden in Holland.

The CHARACTERS are,

*The flower has a bellied permanent empalement of one leaf, whofe mouth is obtufe and five-pointed. It is of one petal, having a tube the length of the empalement, but the brim is divided into five fegments which turn back. It hath ten fhort ftamina growing to the petal, terminated by oblong, erect, twin fummits the length of the tube, and an oval hairy germen fitting upon two ftyles a little longer than the ftamina, crowned by fingle ftigmas. The empalement afterward turns to an oval capfule with four furrows, having one cell with four valves, containing four oblong triangular feeds.*

This genus of plants is ranged in the fecond fection of Linnæus's tenth clafs, which includes thofe plants whofe flowers have ten ftamina and two ftyles.

The SPECIES are,

1. ROYENA (*Lucida*) foliis ovatis fcabriufculis. Hort. Cliff. 149. *Royena with oval rough leaves.* Staphylodendrum Africanum, folio fingulari lucido. Herm. Parad. 232. *African Bladder-nut with a fingle fhining leaf.*
2. ROYENA (*Glabra*) foliis lanceolatis glabris. Prod. Leyd. 441. *Royena with fmooth fpear-fhaped leaves.* Vitis Idæa Æthiopica, buxi minoris folio, floribus albis. Hort. Amft. 1. p. 125. *Ethiopian Whortleberry, with a fmaller Box leaf and white flowers.*
3. ROYENA (*Hirfuta*) foliis lanceolatis hirfutis. Prod. Leyd. 441. *Royena with hairy fpear-fhaped leaves.* Staphylodendrum Africanum, folio lanuginofo rofmarini latiori. Boerh. Ind. alt. 2. p. 235. *African Bladder-nut, with a broader, downy, Rofemary leaf.*

The firft fort has been long an inhabitant of fome curious gardens in England, but it is not very common here, being very difficult to propagate.

This plant grows eight or ten feet high, and puts out its branches on every fide, fo may be trained up to a regular head: the branches are cloathed with oval fhining leaves, which are placed alternately, and continue all the year, fo make an agreeable variety among other exotic plants in the green-houfe, during the winter feafon. The flowers are produced from the wings of the leaves along the branches, but as they have little beauty, few perfons regard them. I have not obferved any fruit produced by thefe plants in England.

The fecond fort grows naturally at the Cape of Good Hope; this rifes with a fhrubby ftalk five or fix feet high, fending out many flender branches, covered with a purplifh bark, and garnifhed with fmall oval leaves lefs than thofe of the Box-tree; they are fmooth, entire, and of a lucid green, continuing all the year. The flowers come out from the wings of the leaves round the branches, they are fhaped like a pitcher, and are white; thefe are fucceeded by roundifh purple fruit, which ripen in the winter.

The third fort grows naturally at the Cape of Good Hope; this rifes with a ftrong woody ftalk feven or eight feet high, covered with a gray bark, fending out many fmall branches alternately, which are garnifhed with fpear-fhaped leaves about an inch long, and a quarter broad in the middle; they are hoary, and are covered with foft hairs. The flowers come out upon fhort foot-ftalks from the fide of the branches; they are of a worn-out purple colour and fmall. They appear in July, but are not fucceeded by feeds in England.

Thefe plants are too tender to live through the winter in the open air in England, therefore they muft be removed into the green-houfe in autumn, and treated in the fame way as Orange-trees, with which culture the plants will thrive. The firft and third forts are difficult to propagate here, for the branches which are laid down feldom put out roots, and thofe which do, are two or three years before they will have made roots fufficient to tranfplant, and their cuttings very rarely fucceed; and thefe being the only methods by which they can be increafed in thofe countries, where they do not produce feeds, are ufually practifed. The beft time to plant the cuttings, is early in the fpring; thefe fhould be planted in fmall pots filled with foft loamy earth, and plunged into a very moderate hot-bed. The pots fhould be clofely covered down with hand-glaffes to exclude the external air, and the cuttings refrefhed with a little water every eighth or tenth day, according as the earth becomes dry, for much moifture will kill them. If the cuttings fhoot, they muft be gradually inured to bear the open air, and when they are well rooted, they fhould be each planted in a feparate fmall pot, and afterward treated as the old plants.

If the plants put out any young fhoots from the bottom, they fhould be carefully laid down in the ground while young, becaufe when the fhoots are tender they are more apt to put out roots, than after they are become woody and hard; thefe branches fhould be flit in the fame manner as is practifed in laying of Carnations: they muft be frequently, but gently watered, during the warm weather in fummer, but in cold weather it muft be fparingly given them; when thefe are rooted, they may be taken off, and treated in the fame way as the cuttings.

The fecond fort is very apt to fend up fuckers from the roots, which may be taken off with the roots, and thereby increafed; or thofe which do not put out roots, may be laid down in the fame manner as the former; and the cuttings of this more frequently fucceed than thofe of the other, fo that this fort is much eafier propagated.

RUBEOLA. See ASPERULA, GALLIUM, and SHERARDIA.

RUBIA. Tourn. Inft. R. H. 113. tab. 38. Lin. Gen. Plant. 119. [takes its name from its red colour, becaufe the root of this plant is ufed in dyeing a red colour.] Madder; in French, *Garance.*

The CHARACTERS are,

*The empalement of the flower is fmall, cut into four fegments, and fits upon the germen. The flower has one bell-fhaped petal having no tube, but is divided into four parts. It hath four awl-fhaped ftamina which are fhorter than the petals, terminated by fingle fummits; and a twin germen under the flower, fupporting a flender ftyle divided into two parts upward, and crowned by two headed ftigmas. The germen afterward become two fmooth berries joined together, each having one roundifh feed with a navel.*

This genus of plants is ranged in the firft fection of Linnæus's fourth clafs, which contains thofe plants whofe flowers have four ftamina and one ftyle.

The SPECIES are,

1. RUBIA (*Tinctorum*) foliis fenis lanceolatis fuperne glabris. *Madder with fix fpear-fhaped leaves in whorls, whofe upper furfaces are fmooth.* Rubia tinctorum fativa. C. B. P. 333. *Cultivated Dyer's Madder.*
2. RUBIA (*Sylveftris*) foliis inferioribus fenis, fupernè quaternis binifve, utrinque afperis. *Madder with the lower leaves growing by fixes round the ftalks, and the upper ones by fours or pairs, which are rough on both fides.* Rubia fylveftris afpera, quæ fylveftris Diofcoridis. C. B. P. 333. *Rough wild Madder of Diofcorides.*
3. RUBIA (*Peregrina*) foliis quaternis. Prod. Leyd. 254. *Madder with four leaves which are placed round the ftalks.* Rubia quadrifolia afperrima lucida peregrina. H. L. 523. *Foreign four-leaved Madder, with fhining rough leaves.*

The firft fort which is cultivated for the root, which is ufed in dyeing and ftaining of linens, grows naturally in the Levant. This hath a perennial root and an annual ftalk; the root is compofed of many long, thick, fucculent fibres, almoft as large as a man's little finger; thefe are joined at the top in a head, like the roots of Afparagus, and root very deep into the ground; I have taken up roots, whofe ftrong fibres have been more than three feet long; from the upper

part

part (or head of the root) come out many side roots, which extend just under the surface of the ground to a great distance, whereby it propagates very fast; for these send up a great number of shoots, which, if carefully taken off in the spring, soon after they are above ground, become so many plants. These roots are of a dark colour on their outside, somewhat transparent, and have a yellowish red pith in the middle, which is tough and of a bitterish taste; from the root arise many large, four-cornered, jointed stalks, which in good land will grow five or six feet long, and, if supported, sometimes seven or eight; they are armed with short herbaceous prickles, and at each joint are placed five or six spear-shaped leaves, about three inches long, and near one broad in the middle, drawing to a point at each end; their upper surfaces are smooth, but their midrib on the under side are armed with rough herbaceous spines; the leaves sit close to the branches in whorls. From the joints of the stalk come out the branches, which sustain the flowers; they are placed by pairs opposite, each pair crossing the other; these have a few small leaves toward the bottom, which are by threes, and upward by pairs opposite; the branches are terminated by loose branching spikes of yellow flowers, which are cut into four segments resembling stars. These appear in June, and are sometimes succeeded by seeds which seldom ripen in England.

The second sort grows naturally in Spain, and in the south of France; this hath perennial roots like those of the first sort, but are much larger; the stalks of this are smaller than those of the first sort, and are almost smooth; their lower parts are garnished with narrow leaves, placed by sevens in whorls round the stalks, but upward they diminish to four, three, and two toward the top; these are rough on both sides; at each joint of the stalk comes out two short foot-stalks opposite, having two small rough leaves, and end with branching foot-stalks, sustaining small yellow flowers. This sort flowers the latter end of June, but does not produce seeds here.

The third sort grows naturally in Spain and the Baleriac Islands; I received the seeds of this sort from Gibraltar, and also from Minorca, where the plants grew out of the crevices of the rocks. The roots of this sort are much smaller than those of the two former, but are less succulent; they strike deep into the ground, and send up several slender four-cornered stalks which are perennial; they grow a foot and a half long, and divide into many branches, whose joints are very near each other; they are garnished with short stiff rough leaves, placed by fours round the stalk; they are about an inch long, and half an inch broad in the middle, of a lucid green, and continue all the year. This hath not produced flowers in England.

There is a sort which grows naturally in Wales, and also upon St. Vincent's rock, which has four leaves at each joint, but these are narrower and longer than those of the third sort; the stalks of this are perennial, and the leaves evergreen; so that Mr. Ray has mistaken this plant, having supposed it to be the second, which hath annual stalks rising much higher, therefore I should rather think it might be the third sort, if they were equally hardy; but the third sort is so tender, as to be always killed by severe frosts in England, if exposed to the open air.

The first sort is that which is cultivated for the use of the dyers and callico printers, and is so essential to both manufactories, as that neither of those businesses can be carried on without this commodity; and the consumption of it is so great here, as that upon a moderate computation, there is annually so much of it imported from Holland, as the price of it amounts to more than one hundred and eighty thousand pounds sterling; which might be saved to the public, if a sufficient quantity of it were planted in England, where it might be cultivated to greater advantage than in Holland, the lands here being better adapted to grow this plant. But as the growing of this plant in quantity, has been for several years discontinued, so the method of culture is not well known to many persons here; and as there is at present an inclination in the public to regain this lost branch of trade (for formerly there was not only enough of this commodity raised in England for our own consumption, but also great quantities of it were sent abroad,) so we shall here give a full account of the culture of the plant, and also of the method of preparing the root for use; and shall begin with the method now practised in Zealand, where the best and greatest quantity of Madder is now raised.

In all the Netherlands, there is no where better Madder cultivated, than in Schowen, one of the islands of Zealand, which is performed in the following manner:

The land which is designed for Madder, if it is strong and heavy, is ploughed twice in autumn, that the frost in winter may mellow it and break the clods; then it is ploughed again in the spring, just before the time of planting the Madder; but if the ground is light, then it is ploughed twice in the spring; at the last ploughing it is divided into lands of three feet broad, with furrows between each land four or five inches deep. Madder requires a loamy substantial soil, not too stiff and heavy, nor over light and sandy; for although it may thrive tolerably well in the latter, yet such land cannot have a second crop of Madder planted upon it in less than eight or ten years interval; but in Schowen, where the land is substantial, they need not stay longer than three or four years, in which interval the ground is sown with Corn, or planted with any kinds of pulse. It is granted, that the best land for producing of Madder is in Schowen, where a gemet of land, which is three hundred square rods of twelve feet each, will yield from one thousand pounds to three thousand pounds weight, according to the goodness of the land and the favourableness of the seasons; but in light land, the quantity is from five hundred to a thousand pounds weight.

The time for planting of Madder begins toward the end of April, and continues all May, and sometimes in very backward springs, there is some Madder planted the beginning of June. The young shoots from the sides of the root are taken off from the mother plant, with as much root as possible; these are called kiemen, and are planted with an iron dibble in rows at one foot asunder, and commonly four kiemen in a row.

The quantity of these slips (or kiemen) as is required to plant one gemet of land, are sold at different prices, according to the price which Madder bears, or to the demand for the plants; they are often sold from sixteen to twenty guilders, and sometimes they have been sold for ten to eleven pounds Flemish, but the lowest price is from fifteen guilders to three pounds Flemish.

The expence of planting out a gemet of land with slips (or kiemen) costs for labour only, from sixteen to twenty guilders, according as the land is heavy or light: there are generally employed six men to plant, two to rake the ground, these earn each a guilder a day; and five or six women or boys, called carpers or pluckers of the shoots or kiemen, these earn twelve Dutch pence a day, or two schillings.

The first year the Madder is planted, it is customary to plant Cabbages or Dwarf Kidney-beans, in the furrows between the beds, but there is always great care taken to keep the ground clean from weeds; this is generally contracted for at two pounds Flemish for each gemet of land.

In September or October, when the young Madder is cleaned for the last time that season, the green haulm (or stalks) of the plants, is carefully spread down over the beds, without cutting any part off, and in November the Madder is covered over the haulm with three or four inches of earth.

This covering of the Madder, is performed either with the plough or with the spade; if it is done by the

the firſt, it coſts two guilders and a half, or three guilders in ſtrong land each gemet, and over and above this, one guilder and a half to level the tops of the beds, and make them ſmooth; but it is better performed with the ſpade, only it is more chargeable, for that coſts from eight to ten guilders each gemet, but at the ſame time the clods are broken, and the ſurface of the beds is made ſmooth and even.

The ſecond year in the beginning of April, which is about the time the kiemen or young ſhoots are beginning to come out, the earth on the top of the beds ſhould be ſcuffled over and raked, to deſtroy the young weeds, and make the ſurface ſmooth and mellow, that the kiemen may ſhoot out the eaſier above ground; this labour coſts three ſhillings each gemet.

The ſecond ſummer there muſt be the ſame care taken to keep the Madder clean as in the firſt, and then nothing is planted in the furrows, or ſuffered to grow there; at the laſt time of cleaning the ground, in September or October, the green haulm is again ſpread down upon the beds; and in November the Madder is again covered with earth, in the ſame manner as the firſt year.

By this method of culture, one can ſee how neceſſary it is to plant the Madder in beds, for thereby it is much eaſier covered with the earth of the furrows; and hereby the earth of the beds is every time heightened, whereby the Madder roots will be greatly lengthened, and the kiemen or young ſhoots will have longer necks, and by being thus deeply earthed, will put out more fibres and have much better roots, without which they will not grow; and it is of equal uſe to the mother plants, for by this method the roots will be longer; and in this conſiſts the goodneſs and beauty of the Madder, for thoſe which have but few main roots, are not ſo much eſteemed as thoſe which are well furniſhed with ſide roots called tengels; a Madder plant that has many of theſe roots, is called a well bearded Madder plant; therefore one muſt never cut off theſe ſide roots, for by ſo doing there will be a leſs crop of Madder, and but few kiemen or young ſhoots can be produced; beſides, by the loſs of moiſture, ſometimes the plants will droop and become weak; and there is great profit in having a large quantity of kiemen to draw in the ſpring, which are in plenty the ſecond and third years.

The Madder roots are ſeldom dug up the ſecond year, but generally after it has grown three ſummers, therefore the culture of the third year is the ſame as in the ſecond, during the ſpring and ſummer.

Before the firſt day of September, it is forbidden to dig up any Madder in this iſland; but on that day early in the morning, a beginning is made, and the perſon who carries the firſt cart load to the ſtove, has a premium of a golden rider, or three ducats.

The digging up the Madder of a gemet of land, coſts from thirty-ſix to one hundred guilders, according to the goodneſs of the crop, and the lightneſs or ſtiffneſs of the ground, but in light land it coſts from nine to ten pounds Flemiſh; the perſons who are adroit in this buſineſs, are generally paid five ſhillings Flemiſh per day.

The Madder produces flowers in the middle of ſummer, and ſometimes a few ſeeds, but they never ripen here; nor would they be of uſe to cultivate the plants, ſince it is ſo eaſily done by the kiemen.

Some years paſt they began to plant here the great wild Madder, which was called French Madder, but this was not eſteemed ſo good for uſe as the tame Madder, from which it differs much, ſo that was not continued. The more bitter of taſte the roots of the Madder are, when taken out of the ground before it is brought to the ſtove, the leſs it will looſe of its weight in drying, and is the better afterward for uſe.

When the Madder is dug out of the ground, it is carried to the ſtove, and there laid in heaps; in that which is called the cold ſtove, and ſeparated with hurdles made of wicker, and memorandums kept of each parcel, and to what countryman it belongs, that each may be dried in their turns, and prepared or manufactured, for which turn generally lots are caſt beforehand. The Madder thus carried to the ſtove is relzyn.

This relzyn is carried about ſix o'clock in the morning, into the tower or ſteeple, hoiſted in baſkets by ropes to the rooms, and divided or ſpread, where it remains till the next day, two or three o'clock in the morning, about twenty or twenty-one hours; then thoſe roots which have lain in the hotteſt places are removed to cooler, and thoſe in the cooler are removed to the hotter places nearer the oven. This is continued for four or five days, according as there has been more or leſs carried there; but it is always the goods of one perſon, that every one may have his own, and of as equal quality as poſſible, when it is delivered out.

When the Madder is ſufficiently dried in the tower, then it is threſhed on the threſhing-floor, which is made clean from dirt or filth, and then it is brought to the kiln, and there ſpread on a hair-cloth for about twenty hours, during which time the kiln is made more or leſs hot, according as the roots are more or leſs thick, or the weather being more or leſs cold.

From the kiln the Madder is moved to the pounding-houſe, and is there pounded on an oaken block made hollow, with ſix ſtampers plated at the bottom with iron bands; theſe ſtampers are kept in motion by a mill very much reſembling a griſt mill, which is turned by three horſes; the preſence of the pounding-maſter is here always required, to ſtir the Madder continually with a ſhovel, to bring it under the ſtampers. When the Madder is thus properly pounded, it is ſifted over a tub till there is enough to fill a caſk: this firſt pounding, which chiefly conſiſts of the thinneſt and ſmalleſt roots, and the outſide huſks with ſome earth, which by drying and threſhing could not be ſeparated, is called mor-mull.

What remains in the ſieve is put on the block again, and pounded a ſecond time, and when the pounding-maſter gueſſes a third part is pounded, then the Madder is taken out again and ſifted over another tub, and put into a ſeparate caſk, and this is called gor gemeens; that which remains in this ſecond operation, not enough pounded in the ſieve, is for the third time put on the block, and pounded till it is all reduced to powder, which is called kor kraps.

When the Madder is cleanſed from the dirt and mull, and is entirely pounded at once, then it is called oor onberoofde, ſo that this onberoofde actually conſiſts of the gemeens and kraps pounded together, and ſifted without ſeparating them from each other.

When there is two thirds of kraps, and one third gemeens, which was ſeparately prepared or manufactured, then they are called two and one, or marked $\frac{2}{1}$.

The ſweepings of the ſtove, as alſo of the ground and beams being ſwept together is not loſt, but is put amongſt the mull, or ſold by itſelf.

The ſweepings of the mill, and every part of the pounding-place, is alſo gathered together, and put into a caſk; this is called den beer.

When the Madder is thus prepared and put into caſks, it is in Zealand examined by ſworn aſſayers and tried, if it is not faulty packed up; that is, whether in the preparing it is properly manufactured, or falſely packed up, and to ſee if every part of the caſk is filled with Madder of equal goodneſs and quality, not burned in the drying, or mixed with dirt; which the aſſayers by certain trials, and by weighing and waſhing of the Madder can know, if it is according to the ſtatutes of the country.

There are ſundry ſtatutes made and publiſhed by the ſtates of Zealand, concerning the preparing of Madder; as one of the 28th of July 1662, one on the 29th of September, and 31ſt of October 1671, another on the 23d of September 1699, and the laſt on the 28th of April 1735: by which ſtatutes, among other things, it is ſtrictly forbidden, That no perſon ſhall prepare kraps, in which there ſhall be more than two

two pounds of dirt in a hundred weight; nor above eight pounds in the like weight of onberoofde, or in gemeens more than twelve pounds in a hundred weight.

If the Madder upon trial is found good, the arms of the city or village, and the sign of the ftove where the Madder was prepared, is painted on the cafk with black paint. The trial of the Madder is in no place more exact, or more religioufly obferved, than in the city of Zirkzee; therefore the merchants in Germany, who know this, always prefer the Madder of that place to all others, and will not buy any which has not the arms of Zirkzee painted upon the cafks, if they are to be had.

We before mentioned the tower, the kiln, &c. where the Madder is dried and prepared for ufe, the draughts of thefe are exhibited in the annexed plates, with their explanation: but that a better judgment may be formed of their ufe, we fhall here take notice, that the tower is the place where the Madder is firft dried. This tower is heated by fifteen or fixteen pipes or flues of brick-work, which run on each fide the tower under the floor, and are covered with low burnt tiles, fome of which are loofe; fo that by taking up thefe, the heat is moderated and conducted to any part of the tower, the perfon who has the care of drying the Madder pleafes.

The tower has four or five lofts made of ftrong laths; they are four or five feet above each other, upon which the Madder is laid; thefe are heated by an oven, which is placed in the room where the work people live, and is by them called the glory.

The kiln is in a room whofe length is equal to the breadth of the ftove, and is entirely arched over at the top; the oven by which the kiln is heated, is called the hog; this is built upon a ftone wall, which rifes a foot or two above ground; and the fmall arch by which the heat paffes through every part, has feveral fquare little holes in the brick-work, that the heat may come out; over thefe holes, on the top of the kiln, are laid wooden laths the whole length, and upon them a hair-cloth, on which the Madder is laid to dry, before it is carried to the pounding-place. In the Madder-ftoves there is no other fuel ufed but Friezland turf, which gives an equal and moderate heat.

In the Madder-ftoves, the people work more by night than day; firft, becaufe at the time of the year when the Madder is brought into the ftoves, the nights are much colder than the days; and fecondly, that the mafter, who muft be always attentive to his work, may not be interrupted by vifitors; and thirdly, becaufe they fee lefs duft; but principally, becaufe the Madder which is pounded in the night is of a much better colour than that which is pounded in the day.

In the Madder-ftoves are always conftant workmen, one who is the drier, who has the care of drying the Madder in the tower and the kiln; for the right performance of this, art and experience is required, the goodnefs of the Madder greatly depending on the right drying. This perfon is a fort of foreman, and has the direction of all the workmen; his pay is five ftivers, for every hundred weight of Madder which is prepared in the ftove; he has one perfon under him for his affiftant, to perform part of the laborious work, and to be always at hand; this man is paid eighteen or nineteen fhillings per week Flemifh, which is the conftant wages.

The third perfon is the pounder, who is always prefent when the Madder is pounding, who with a particular fhovel which is fmall, and fitted to the cavity of the pounding-block, ftirs the Madder from time to time, to bring it under the ftampers; he is paid four ftivers for every hundred weight of Madder.

The fourth is a driver, who with a team of three horfes, caufes the mill to turn and pound the Madder; his pay for himfelf and the three horfes, from eight to nine ftivers per hundred weight, according as he can bargain.

Befides thefe four, there are five other affiftants, who lay the Madder on and take it off; this is often performed by the wives and boys of the other workmen; thefe five have fifty ftivers for every three thoufand pounds of Madder which is prepared, fo they have each ten ftivers.

There are nineteen or twenty Madder-ftoves in the ifland of Schowen, which, at an average, prepare in one crop, that lafts from September to February, ten thoufand weight of Madder each, which in the whole, amounts to two million pounds weight; and if we fuppofe, that the Madder is fold at an average for four pounds Flemifh per hundred weight, which is a moderate price, one may foon reckon what advantage the culture of this dyeing commodity produces to this one ifland.

The countrymen pay to the owners of the Madder-ftoves, two guilders for preparing every hundred weight of mull, and for each hundred weight of hard Madder; that is, of kraps, gemeens, or onberoofde, three guilders, according as they will have them prepared.

The building of a Madder-ftove quite new from the foundation, cofts in the whole about twenty-four hundred pounds Flemifh, which is twelve hundred pounds fterling.

## PLATE I.

An explanation of the plan of the cold ftove.

Fig. 1. Is the lower band, whofe thicknefs is fourteen by fixteen inches.
2. The upper band, which is twelve by fourteen inches.
3. The cap and band, which is ten by twelve inches.
4. The upper cap, which is fix by feven inches.
5. The two main jambs, which are thirteen by fifteen inches of ftone.
6. The half bands and pofts, of nine by feven inches.
7. The uppermoft half band, which is fmall, fix by eight inches.

## PLATE II.

A plan of the arched room cut through perpendicularly in the middle where the kiln ftands, with a reprefentation of the kiln.

AA Is the cut of the arch.
B The oven of the kiln, which is called the hog; this has no chimney; when the fire is firft kindled either with turf or other fuel, the fmoke is let out through a fmall window.
CCC A ftone foundation on which the oven and kiln is built.
CC Is properly the kiln itfelf, which muft be obferved in what manner it is built, with little holes to let out the heat.
DD Stone bands made for the greater firmnefs, about the kiln.
EEEE Iron bars placed to ftrengthen the kiln, and alfo to lay the upper long lath upon.
F Small crofs laths over the kiln, which lie from one end C to the other end C upon the kiln, but there are few of thefe reprefented, that the fmall holes of the kiln may better appear.
G The door of the entrance.

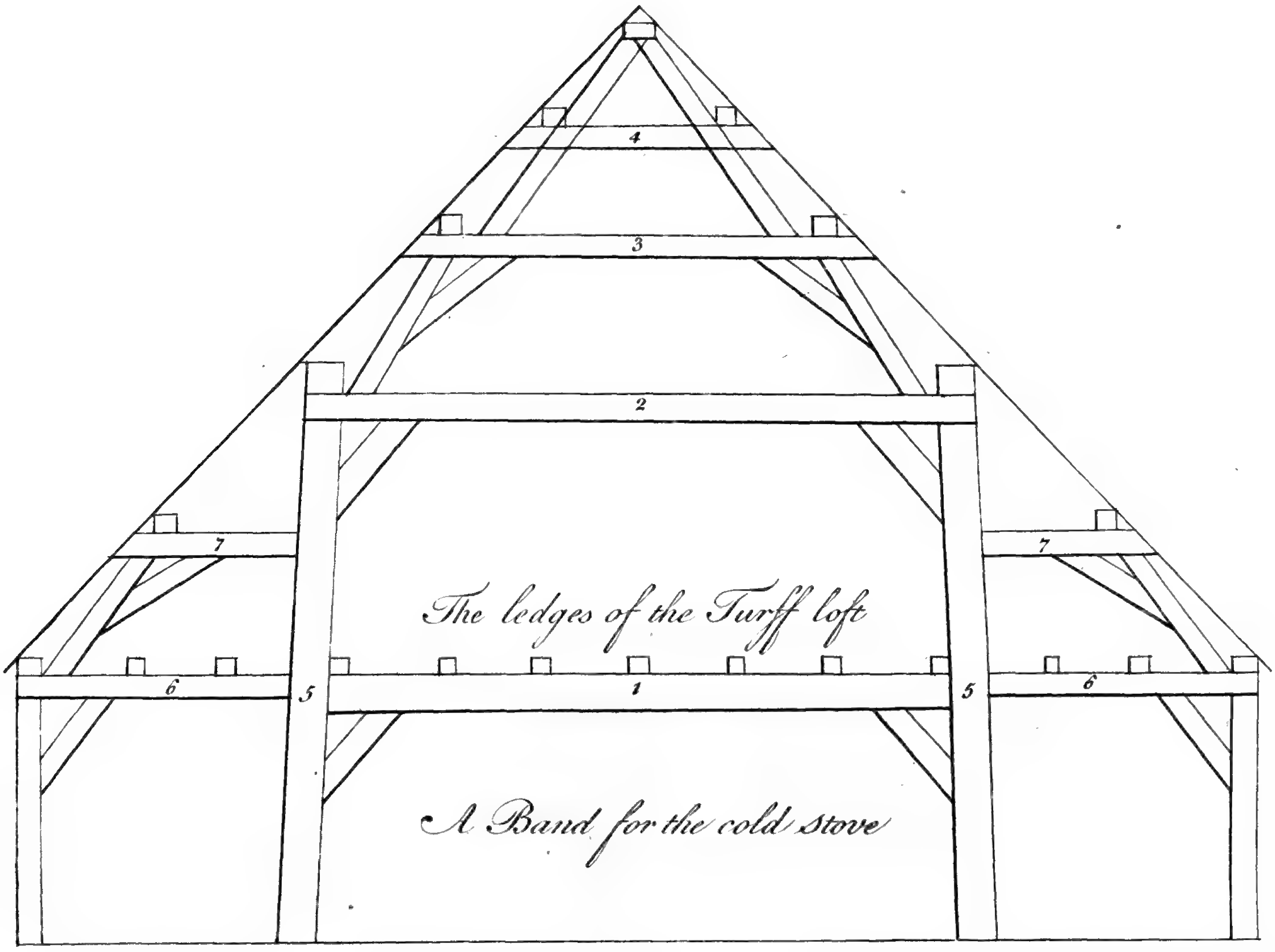
## PLATE III.

A plan of the tower where the Madder is firft laid to dry.

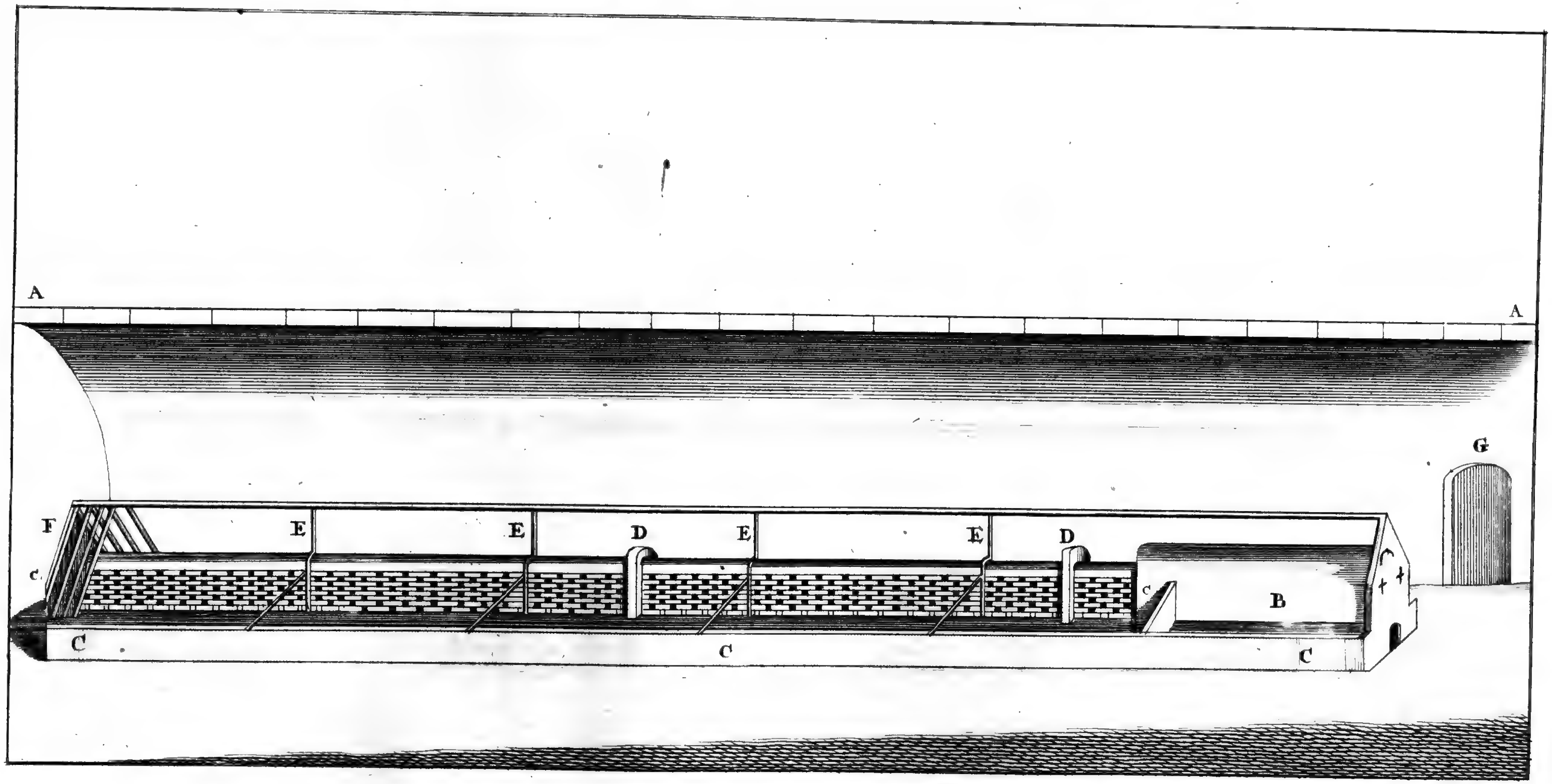
A Is the oven of the tower.
BB The pipes whereby the heat fpreads itfelf, is here fhewn by the openings where the tyles are taken off.
C A fort of ftairs by which they climb.
DD The windlafs with its rope and hook, to hoift the Madder to the lofts.

EEEE

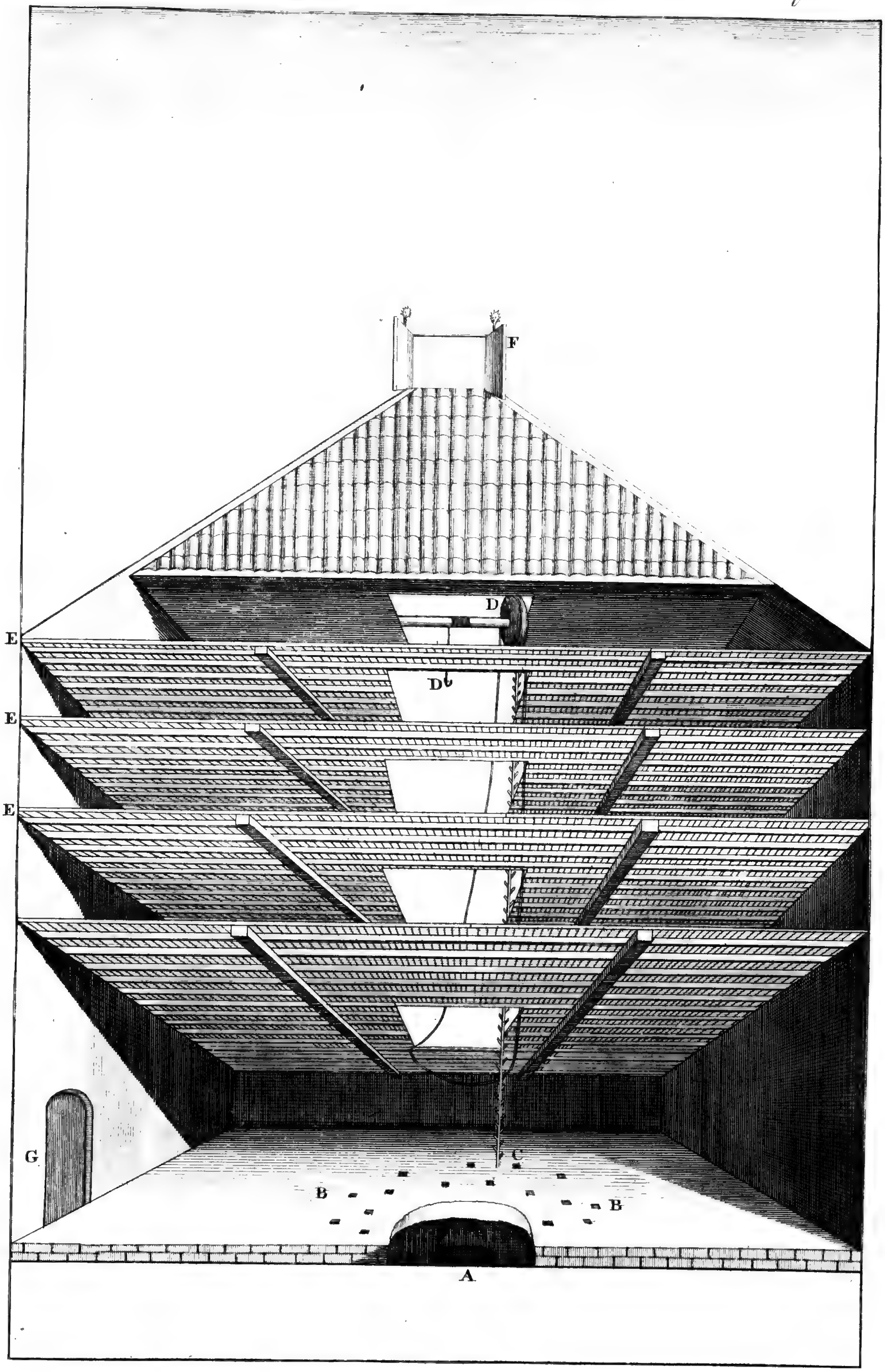
# A Plan of the Structure of the Cold Stove



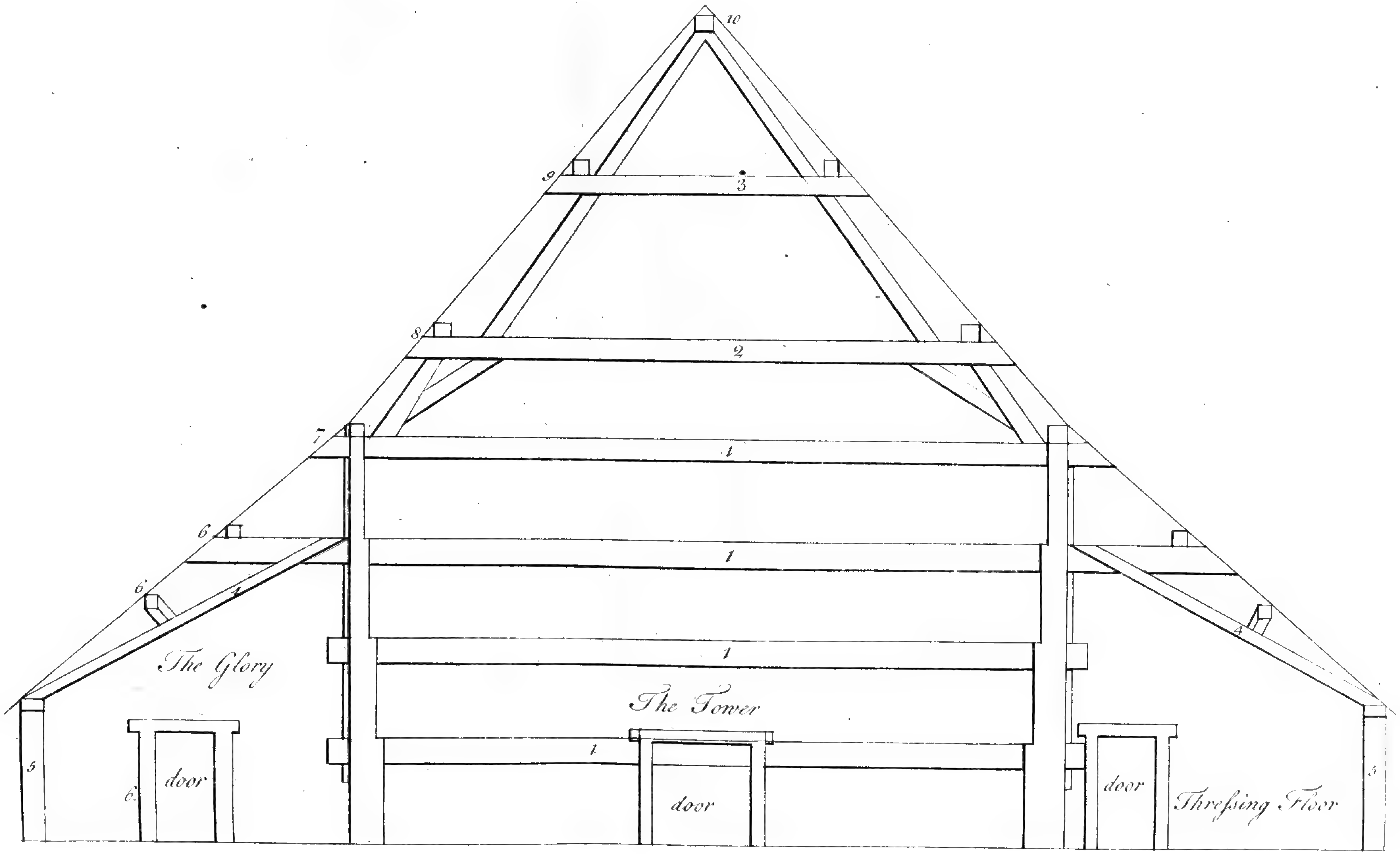
The Arched Room cut Perpendicularly thro' the middle where the Kiln stands, with a representation of the Kiln.



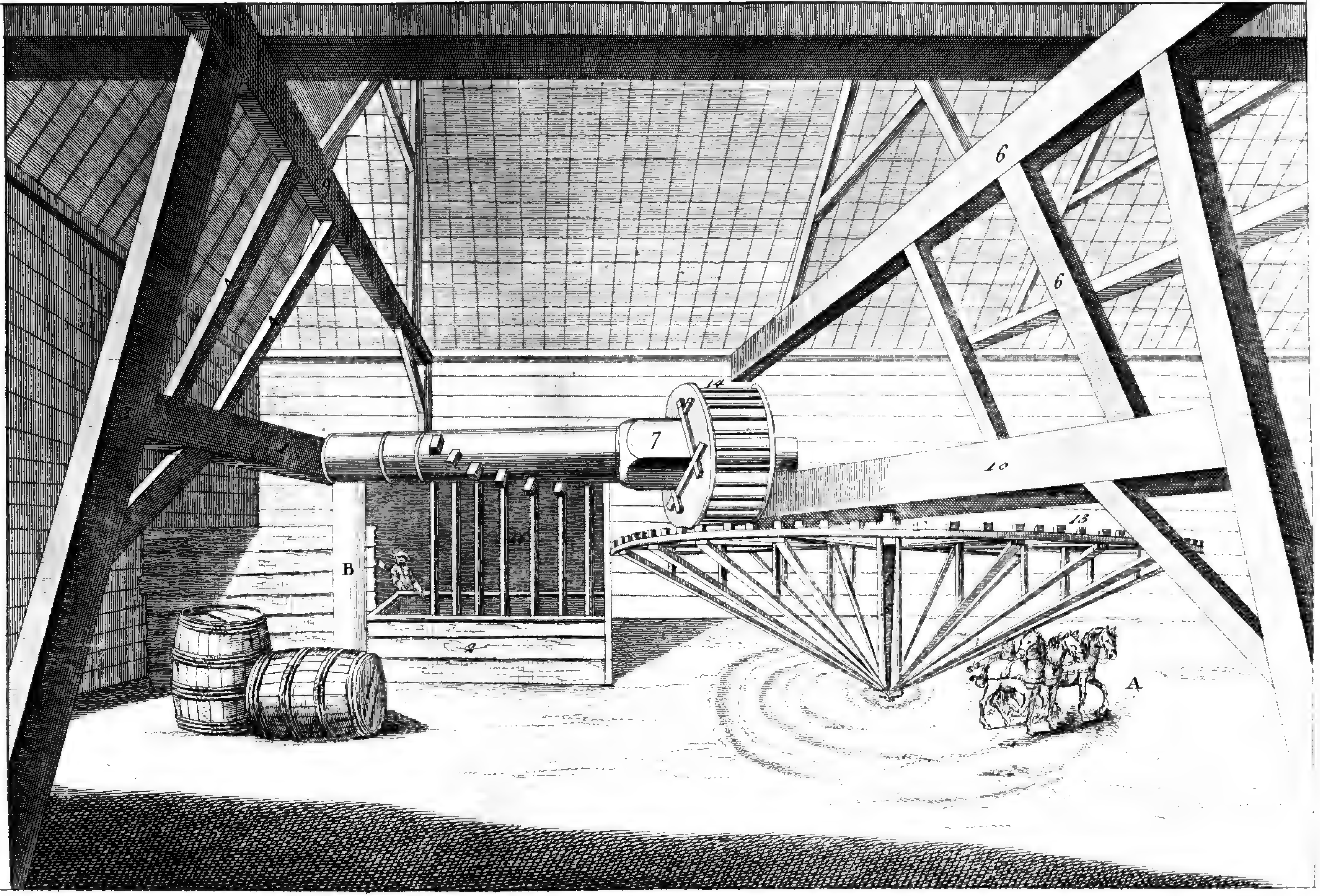
A Plan of the Tower where the Madder is first layed to dry.



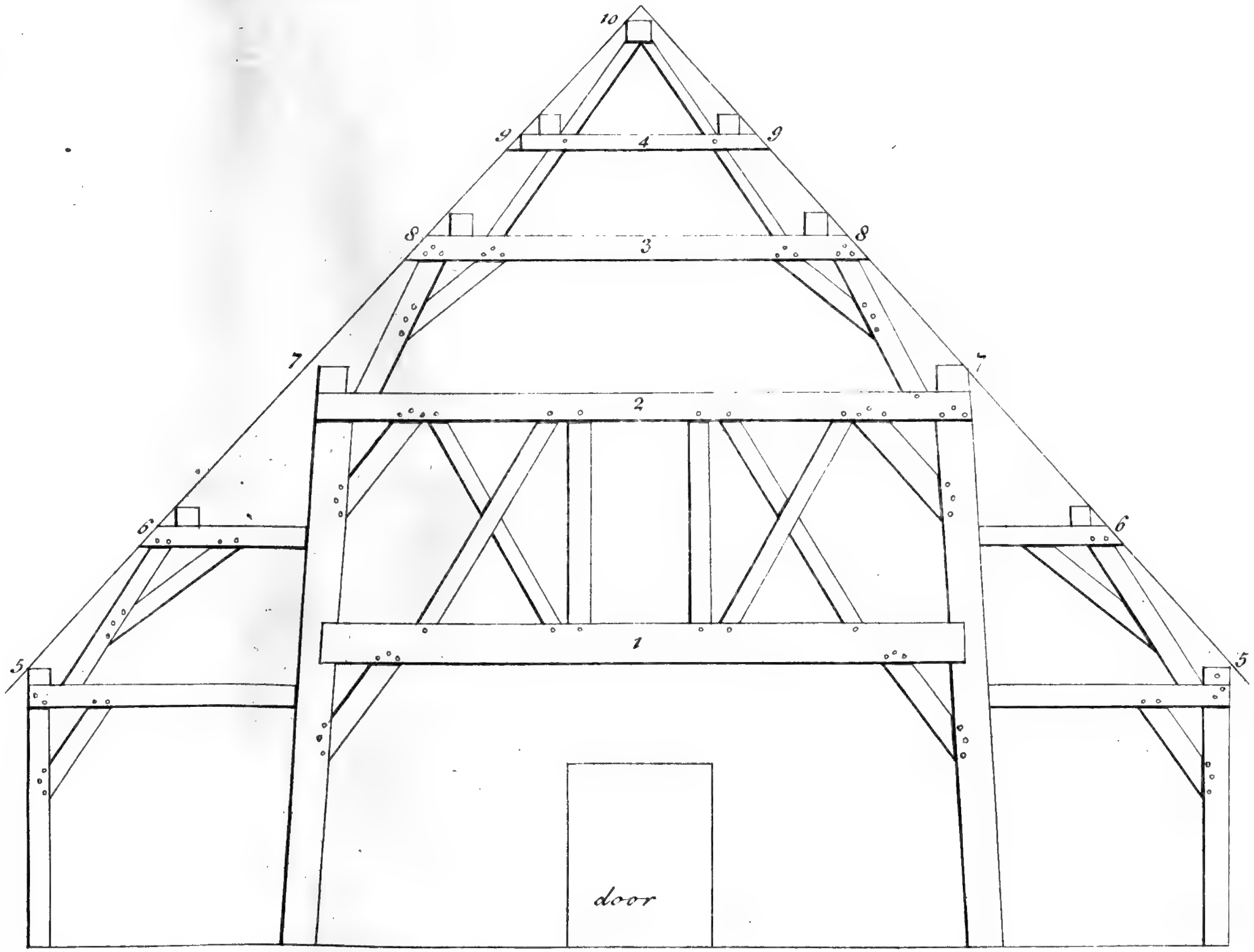
A Section of the Tower



# A Plan of the Pounding House.



# A Section of the Pounding House.



EEEE The four lofts of the lath of the oven.
F The chimney above the roof.
G The door by which they enter.

## PLATE IV.

An explanation of the plan of the fection of the tower.

Fig. 1. 1. 1. 1. The four bands of the tower which are fixteen inches fquare.
2. The cap band, ten by twelve inches.
3. The fpringing band, fix by eight inches.
4. The interftice to the tower, fix by feven inches.
5. The fpaning plate, five by feven inches.
6. 6. The lower and fecond girder, fix by feven inches.
7. The third girder, feven by nine inches.
8. The fourth girder, fix by eight inches.
9. The fifth girder, fix by feven inches.
10. The crown piece of the tower, five by fix inches.

The ribs in the tower muft be laid fourteen inches afunder from middle to middle, corner-ways, and the laths between an inch and a half diftant.

## PLATE V.

A plan of the pounding-houfe, in which is fhewn at A, the driver, who, with his three horfes, caufes the mill to turn, which works the ftampers: At B is fhewn the pounder, who, with his fhovel, continually brings the Madder under the ftampers.

Fig. 1. Is the beam which fupports the axle-tree, which is fourteen by fifteen inches.
2. The hollow Oaken block or trough, twenty-feven by twenty-nine inches.
3. The king poft, eighteen inches fquare.
4. The upper band, fix by feven inches.
5. The crofs bands, five by feven inches.
6. The crofs arms, fix by ten inches.
7. The fwaarden, fix by ten inches.
8. The axis, from fix to eight inches.
9. The feller, fix by eight inches of Elm wood.
10. The king beam, eleven by thirteen inches Fir wood.
11. The drawers under the mill, five by fix inches.
12. The plate for the running of the truckle, three by fixteen inches.
13. The wooden knobs to the wheel of Afh.
14. The ftaves made of Box wood.
15. The fix ftampers, fix inches fquare, of Afh.

## PLATE VI.

An explanation of the fection of the pounding-houfe.

Fig. 1. The under band, fixteen inches fquare.
2. The upper band, twelve by fourteen inches.
3. The band of the cap poft, ten by twelve inches.
4. The fpringing band, fix by feven inches.
5. The fpaning plate, five by feven inches.
6. The firft girder, fix by feven inches.
7. The fecond girder, nine by eleven inches.
8. The third girder, fix by eight inches.
9. The uppermoft girder, fix by feven inches.
10. The top or cap, four by five inches.

The above account is the method of cultivating Madder in Zealand, where the beft Madder is now produced; to this I fhall add, what I have obferved of the growing of Madder in other parts of Holland, as alfo the experience I have had of the growth of Madder in England, with an account of the method of planting it here.

In the year 1727, I obferved a great quantity of this plant cultivated in Holland, between Helvoetfluys and the Brill; and it being the firft time I had ever feen any confiderable parcel of it, I was tempted to make fome enquiries about its culture, and take fome minutes of it down upon the fpot, which I fhall here infert, for the ufe of fuch as may have curiofity to attempt the culture of it.

In autumn they plough the land, where they intend to plant Madder in the fpring, and lay it in high ridges, that the froft may mellow it; in March they plough it again, and at this feafon they work it very deep, laying it up in ridges eighteen inches afunder, and about a foot high; then about the beginning of April, when the Madder will begin to fhoot out of the ground, they open the earth about their old roots, and take off all the fide-fhoots which extend themfelves horizontally, juft under the furface of the ground, preferving as much root to them as poffible; thefe they tranfplant immediately upon the tops of the new ridges, at about a foot apart, obferving always to do this when there are fome fhowers, becaufe then the plants will take root in a few days, and will require no water.

When the plants are growing, they carefully keep the ground hoed, to prevent the weeds from coming up between them; for if they are fmothered by weeds, efpecially when young, it will either deftroy or weaken them fo much, that they feldom do well after. In thefe ridges they let the plants remain two feafons, during which time they keep the ground very clean; and at Michaelmas, when the tops of the plants are decayed, they take up the roots and dry them for fale. This is what I could learn of their method of cultivating this plant, to which I will fubjoin a few obfervations of my own, which I have fince made upon the culture of Madder in England.

The land upon which I have found Madder thrive beft, is a foft fandy loam, and if it has been in tillage fome years, it will be better than that which is frefh broken up. This fhould have at leaft a depth of two feet and a half, or three feet of good earth, and muft be quite clear from Couch, or the roots of any bad weeds; for as the roots of Madder fhould remain three years in the ground, fo where there are any of thofe weeds which fpread and multiply at their roots, they will intermix with the Madder roots, and in three years will have taken fuch poffeffion of the ground, as to greatly weaken the Madder, and render it very troublefome to feparate when the Madder is taken up.

The ground fhould be ploughed deep before winter, and laid in ridges to mellow; and if it is not too ftrong, there will be no neceffity for ploughing it again, till juft before the time of planting the Madder, when the land fhould be ploughed as deep as the beam of the plough will admit; and there fhould be men following the plough in the furrows, which fhould dig a full fpit below the furrow, and turn it up on the top; by preparing the ground of this depth, the roots of the Madder will ftrike down, and be of greater length, in which the goodnefs of the crop chiefly confifts. The land being thus prepared and made level, will be fit to receive the plants. The beft time for planting of the Madder is about the middle or the latter end of April, according as the feafon is more or lefs forward, which muft be determined by the young fhoots; for when thefe are about two inches above ground, they are in the beft ftate for planting.

In the taking up of thefe fhoots for planting, the ground fhould be opened with a fpade, that they may be feparated from the mother plants with as much root as poffible; for if the roots are broken off, they will not fucceed: thefe plants fhould be drawn up no fafter than they are planted; for if they lie long above ground, they will fhrink and their tops will wither, and then they often mifcarry; therefore if they are brought from a diftant place, there fhould be great care taken in the packing of them up for carriage; efpecial regard fhould be had not to pack them fo clofe, or in fo great quantity, as to caufe them to heat, for that will foon fpoil them; but if they are a little

withered

withered by lying out of the ground, their roots ſhould be ſet upright in water for a few hours, which will ſtiffen and recover them again.

In the planting of Madder, there are ſome who make the rows but one foot aſunder, others one foot and a half, ſome two feet, and others who allow them three feet diſtance; I have made trial of the three laſt diſtances, and have found when the roots have been left three years in the ground, that three feet diſtance row from row is the beſt; but if it is taken up in two years, two feet aſunder may do very well; and the diſtance in the rows, plant from plant, ſhould be one foot, or a foot and a half.

If there is no danger of the ground being too wet in winter, the plants may be planted on the level ground; but if on the contrary, the ground ſhould be raiſed in ridges where each row of plants is to be ſet, that their roots may not reach the water in winter, for if they do, it will ſtop their downright growth; and this is the reaſon why the Dutch, who plant Madder in the Low Countries, raiſe their ridges ſo high as two or three feet; and in Zealand, where the ground is drier, they raiſe the beds four or five inches above the intervals, that the wet may drain off from the beds where the Madder is planted.

The method of planting is as follows: viz. the ground being made ſmooth, a line is drawn acroſs it to mark out the rows, that they may be ſtrait, for the more convenient cleaning, and for the better digging or ploughing of the ground betwen the rows; then with an iron-ſhod dibble, holes are made, at the diſtance which the plants are to ſtand from each other. The depth of the holes muſt be in proportion to the length of the roots of the plants, which muſt be planted the ſame depth they had been while they were upon the mother plants; for if any part of the root is left above ground, the ſun and winds will dry them, which will retard the growth of the plants; and ſhould any part of the green be buried in the ground, it will not be ſo well; though of the two, the latter will be leſs prejudicial, eſpecially if there is not too much of the green buried. When the plants are put into the holes, the earth ſhould be preſſed cloſe to them to ſecure them from being drawn out of the ground, for crows and rooks frequently draw the new plants out of the ground before they get new roots, where there is not this care taken: ſo that in two or three days, I have known half the plants on a large piece of land deſtroyed by theſe birds.

If there happens to be ſome ſhowers of rain fall in a day or two after the plants are planted, it will be of great ſervice to them, for they will preſently put out new roots, and become ſtrong; ſo that if dry weather ſhould afterward happen, they will not be in ſo much danger of ſuffering thereby, as thoſe which are later planted. There are ſome who, from a covetous temper of making moſt uſe of the ground, plant a row of Dwarf Peas or Kidney Beans between each row of Madder, and pretend that thereby the land is kept cleaner from weeds; but I am very certain the crop of Madder is injured thereby much more than the value of thoſe things which grow between the rows, as I have experienced; therefore I adviſe thoſe perſons who plant Madder, never to ſow or plant any thing between the rows, but to keep the Madder quite clean from weeds, or any other kind of vegetable.

In order to keep the ground thus clean, it ſhould be ſcuffled over with a Dutch hoe, as ſoon as the young weeds appear. When a man can perform a great deal of this work in a day, and if it is done in dry weather, the weeds will die as faſt as they are cut down; whereas, when the weeds are left to grow in the ſpring, ſo as to get ſtrength, they are not ſo ſoon deſtroyed, and the expence of hoeing the ground then will be more than double; beſides, there will be danger of cutting down ſome of the weaker plants with the weeds, if the perſons employed to perform this work are not very careful; therefore it is much cheaper, as alſo better for the Madder, to begin this work early in the ſpring, and to repeat it as often as the weeds render it neceſſary; for by keeping the ground thus conſtantly clean, the Madder will thrive the better.

During the firſt ſummer, the only culture which the Madder requires, is that of keeping it clean in the manner before directed; and when the ſhoots or haulm of the plants decay in autumn, it ſhould be raked off the ground; then the intervals between the rows ſhould be either dug with a ſpade or ploughed with a hoeing plough, laying up the earth over the heads of the plants in a roundiſh ridge, which will be of great ſervice to the roots. The Dutch cover the haulm of their Madder with earth, leaving it to rot upon the ground; this perhaps may be neceſſary in their country, to keep the froſt out of the ground; but as I have never found that the ſevereſt winters in England have injured the Madder roots, there is not the ſame neceſſity for that practice here.

The following ſpring, before the Madder begins to ſhoot, the ground ſhould be hoed and raked over ſmooth, that the young ſhoots may have no obſtruction; and if there ſhould be any young weeds appearing on the ground, it ſhould be firſt ſcuffled over to deſtroy the weeds, and then raked over ſmooth; after this, the ſame care muſt be taken in the following ſummer to keep the ground clean; and if it is performed by the hoe plough, the earth of the intervals ſhould be thrown up againſt the ſide of the ridges, which will earth up the roots, and greatly increaſe their ſtrength; but before the ground of one interval is ſo hoed, the haulm of the plants ſhould be turned over to the next adjoining interval; and if they are permitted ſo to lie for a fortnight or three weeks, and then turned back again on thoſe intervals which were hoed, obſerving firſt to ſcuffle the ground to deſtroy any young weeds which may have appeared ſince the ſtirring of the ground; then the alternate intervals ſhould be ploughed in like manner, turning the earth up againſt the oppoſite ſides of the roots; by this method the intervals will be alternately ploughed, and the plants earthed up, whereby the ground will be kept clean, and ſtirred, which will greatly promote the growth of the roots; and by this method the ſuperficial ſhoots will be ſubdued, and the principal roots greatly ſtrengthened. The following autumn the ground ſhould be cleared of the haulm and weeds, and the earth raiſed in ridges over the roots, as in the foregoing year.

The third ſpring the roots will furniſh a great ſupply of young plants; but before theſe appear, the ground ſhould be cleaned and raked ſmooth, that the ſhoots may have no obſtruction to their coming up; and when the young plants are fit to take off, it ſhould be performed with care, always taking off thoſe which are produced at the greateſt diſtance from the crown of the other plants, becauſe thoſe are what rob them moſt of their nouriſhment, and the wounds made by ſeparating them from the old roots are not near ſo hurtful as thoſe near the crown; for the ſtripping off too many of the ſhoots there, will retard the growth of the plants.

The culture of the Madder in the third ſummer muſt be the ſame as the ſecond; but as the roots will then be much ſtronger, the earth ſhould be laid up a little higher to them at the times when the ground is cleaned; and if all the diſtant ſuperficial ſhoots, which come up in the intervals are hoed or ploughed off, it will be of ſervice to ſtrengthen the larger downright root; and as the haulm will now be very ſtrong and thick, the frequent turning it over from one interval to another will prevent its rotting; for if it lies long in the ſame poſition, the ſhoots which are near the ground, where there will be always more or leſs damp, and being covered with the upper ſhoots, the air will be excluded from them, which will cauſe them to rot, for the ſhoots of Madder are naturally diſpoſed to climb up any neighbouring ſupport; and in places where they have been ſupported, I have ſeen them more than ten feet high; but the expence of ſtaking the

the plants to ſupport their ſhoots would be much too great to be practiſed in general; therefore the other method of turning the haulm over from one interval to the other will be found of great uſe, for hereby it is kept from decaying, and by ſo doing the ſun is alternately admitted to each ſide of the roots, which is of more conſequence to the growth of the Madder than moſt people conceive; and from many repeated trials I have found, that where the haulm has decayed or rotted in ſummer, it has greatly retarded the growth of the roots. There have been ſome ignorant pretenders who have adviſed the cutting off the haulm in ſummer, in order to ſtrengthen the roots; but whoever practiſes this, will find to their coſt the abſurdity of this method; for I have fully tried this many years ago, and have always found that every other root, upon which this was practiſed, was at leaſt a third part ſmaller than the intermediate roots, whoſe haulm was left entire. The firſt occaſion of my making this experiment was, becauſe the plants had been ſet too near each other, and the ſeaſon proving moiſt had increaſed the number and ſtrength of the ſhoots, ſo that they were ſo thick, as that many of them began to rot; to prevent which, I cut off the ſhoots of every other plant to give room for ſpreading the others thinner, but ſoon after this was done, the plants produced a greater number of ſhoots than before, but they were weaker, and the effect it had upon the roots was as before related; ſince which time I have frequently repeated the experiment on a few roots, and have always found the effect the ſame.

As ſoon as the haulm of the Madder begins to decay in autumn, the roots may be taken up for uſe, becauſe then the roots have done growing for that ſeaſon, and will then be plumper and leſs liable to ſhrink than if they are dug up at another ſeaſon; for I have always found, that roots of every kind of plant, which are taken out of the ground during the time of their growing, are very apt to ſhrink, and loſe more than half their weight in a ſhort time; whereas, when they are taken up ſoon after their leaves decay, they will not ſoon after ſhrink much.

When the ſeaſon for digging up the Madder root is come, it ſhould be done in the following manner, viz. a deep trench ſhould be dug out at one ſide of the ground next to the firſt row of Madder to make a ſufficient opening to receive the earth, which muſt be laid therein in digging up the row of roots, ſo that it ſhould be at leaſt two feet broad, and two ſpits and two ſhovellings deep, and ſhould be made as cloſe as poſſible to the roots, being careful not to break or cut the roots in doing it; then the row of roots muſt be carefully dug up, turning the earth into the trench before-mentioned. In the doing of this there ſhould be to every perſon who digs, two or three perſons to take out the roots, that none may be loſt, and as much of the earth ſhould be ſhaken out of the roots as poſſible; and after the principal roots are taken up, there will be many of the long fibres remaining below; therefore, in order to get the roots as clean as poſſible, the whole ſpot of grouud ſhould be dug of the ſame depth as the firſt trench, and the pickers muſt follow the diggers to get them all out to the bottom. As the digging of the land to this depth is neceſſary, in order to take up the roots with as little loſs as poſſible, it is a fine preparation for any ſucceeding crop; and I have always found that the ground where Madder has grown, produced better crops of all kinds than land of equal goodneſs, which had not the like culture.

After the roots are taken up, the ſooner they are carried to the place of drying, the finer will be their colour; for if they lie in heaps, they are apt to heat, which will diſcolour them; or if rain ſhould happen to wet them much, it will have the ſame effect, therefore no more roots ſhould be taken up than can be carried under ſhelter the ſame day.

The firſt place, in which the roots ſhould be laid to dry, muſt be open on the ſides to admit the air, but covered on the top to keep out the wet. If a building is to be erected new, ſuch as the tanners have for drying their ſkins will be as proper as any, for theſe have weather-boards from top to bottom at equal diſtances to keep out the driving rain, but the ſpaces between being open admit the air freely; and if, inſtead of plank floors or ſtages above each other, they are laid with hurdles or baſket-work, upon which the roots are laid to dry, the air will have freer paſſage to the under ſide of the roots, which will dry them more equally.

In this place they may remain four or five days, by which time the earth which adhered to the roots will be ſo dry as to eaſily rub off, which ſhould be done before the roots are removed to the cold ſtove, for the ſlower the roots are dried, the leſs they will ſhrink, and the better will be the colour of the Madder; and the cleaner the roots are from earth, the better the commodity will be for uſe when prepared.

After the roots have laid a ſufficient time in this place, they ſhould be removed into another building called the old ſtove, in which there ſhould be conveniencies of flues paſſing through different parts of the floor and the ſide-walls; in this the roots ſhould be laid thin upon the floors, and turned from time to time as they dry, taking thoſe roots away, which are neareſt to the flues which convey the greateſt heat, placing them in a cooler part of the room, and removing ſuch of them as had been in that ſituation to the warmer, from whence the other are taken. The conſtant care in this particular will be of great ſervice to the quality of the Madder; for when this is properly conducted, the roots will be more equally dried, and the commodity, when manufactured, will be much fairer and better for uſe.

When the outſide of the roots have been ſufficiently dried in this cold ſtove, they ſhould be removed to the threſhing floor, which may be the ſame as in a common barn where Corn is threſhed. The floor of this ſhould be ſwept, and made as clean as poſſible; then the roots ſhould be threſhed to beat off their ſkins or outſide coverings; this is the part which is prepared ſeparately from the inner part of the root, and is called mull, which is ſold at a very low price, being the worſt ſort of Madder, ſo cannot be uſed where the permanency or beauty of the colours are regarded; theſe huſks are ſeparated from the roots, and pounded by themſelves, which are afterward packed up in ſeparate caſks, and ſold by the title of mull. If this is well prepared, and not mixed with dirt, it may be ſold for about fifteen ſhillings per hundred weight, at the price which Madder now bears; and this, as is ſuppoſed, will defray the whole expence of drying the crop.

After the mull is ſeparated from the roots, they muſt be removed to the warmer ſtove, where they muſt be dried with care; for if the heat is too great, the roots will dry too faſt, whereby they will loſe much in weight, and the colour of the Madder will not be near ſo bright; to avoid which, the roots ſhould be frequently turned, while they remain in this ſtove, and the fires muſt be properly regulated. If ſome trials are made by fixing a good thermometer in the room, the neceſſary heat may be better aſcertained than can be done any other way; but this will require to be greater at ſome times than at others, according as the roots are more or leſs ſucculent, or the weather more or leſs cold or damp; but it will always be better to have the heat rather leſs than over hot; for, though the roots may require a longer time to dry with a ſlow heat, yet the colour will be better.

When the roots are properly dried in this ſtove, they muſt be carried to the pounding houſe, where they muſt be reduced to powder in the manner before related; but whether it is neceſſary to ſeparate the kraps from the gemeens, as is now practiſed by the Dutch, the conſumers of Madder will be better judges than myſelf.

There has been ſome objections of late mentioned to the introducing, or rather retrieving the culture of Madder in England, which it may be proper here to

take notice of, lest they should have so much weight as to prevent many persons from engaging in it. The first which has been generally started is, that the land in this country is not so well adapted for growing Madder as that in Holland: to which I can with truth affirm, that, there are vast tracts of land here much better adapted for producing Madder than the best land in Zealand; and from the experience which I have had of its growth, will produce a greater crop. Another objection which I have heard, was the labour in Holland being cheaper than in England. The Dutch will always undersell us, so consequently will maintain this branch of trade; but this is certainly a great mistake: for though the labourers employed in cultivating Madder may not earn so great wages as is generally paid in England, sure I am, that the difference between an expert English labourer and that of the best Dutchman, in the ploughing, hoeing, planting, &c. of Madder, is much greater than that of their pay; for I am sure a good English gardener or ploughman will do more business, and perform it better, in four days, than the best workman in Holland can do in six. What I now say is greatly within compass, from my own knowledge; so that, supposing we were to proceed in the same manner now practised by the Dutch, this could be no objection to the cultivating of Madder; but we shall soon find ways of performing the most laborious part, at much less expence, by means of the hoeing plough, which may be used to great advantage in the cultivation of Madder, whereby the expence will be much lessened; and, when once this is well established in England, there can be no doubt but that great improvements will be made both in the culture and method of preparing the commodity for use.

There has been objections made against farther trials of growing Madder, because some who have engaged in it have not succeeded: but in answer to this, it must be observed, that their ill success was owing to a want of skill. Some of them continued to plant repeated crops of Madder on the same spot of ground, till the roots became so small, as scarce to pay the expence of digging up; and here it is proper to observe, that Madder should not be planted on the same land, till after an interval of seven or eight years; during which interval the ground may be sown with any sort of grain, or kitchen vegetables, which it will produce to great advantage after Madder, because the land will be wrought so deep. The Dutch always sow grain upon their Madder ground in the intervals of four years, and have great crops from it; and they are obliged, from the scarcity of land fit for this purpose, to plant the same ground after an interval of four yeaas; but, as we are not under the same necessity, it will be much better to stay eight years, for the roots of Madder are very similar to those of Asparagus, and draw much the same nourishment from the ground; and it is well known that, when Asparagus roots are dug up, which have been growing three years, if the same is planted with Asparagus again in a few years, it will not thrive equal to that which is planted on ground upon which Asparagus has not grown for several years; and this is always found to be the case even in kitchen-gardens near London, where, by the well working and frequent dunging the ground, it may be supposed changed in three or four years, more than the fields can possibly be in eight or ten.

Madder should not be planted in very rich dunged land, for in such there will be very large haulm, but the roots will not be in proportion; and, where there is much dung or sea-coal ashes, the Madder roots will be of a darker colour, as it will also where it is cultivated in the smoke of London, which is likewise the case with Liquorice; for that which grows in a sandy loam at a distance from London, is always much brighter and clearer than that which grows in the rich lands in the neighbourhood of London.

In Zealand the Madder is principally cultivated by the kitchen-gardeners, who, in the change of their crops, do every fourth or fifth year plant the Madder upon the same ground again, in like manner as the gardeners in the neighbourhood of London plant Asparagus for forcing in winter upon hot-beds. And as they have public kilns in Holland for drying of the Madder roots, so they know the expence of manufacturing the commodity for sale, which renders the cultivation sure and easy to them.

If the cultivation of Madder is carried on properly in England, it will employ a great number of hands from the time harvest is over, till the spring of the year, which is generally a dead time for labourers, and hereby the parishes may be eased of the poor's rate, which is a consideration worthy of public attention.

RUBUS. Tourn. Inst. R. H. 614. tab. 385. Lin. Gen. Plant. 557. [This plant is so called, of the red colour of the fruit before it comes to maturity.] The Bramble or Raspberry-bush; in French, *Ronce.*

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, which is cut into five spear-shaped segments; it hath five roundish petals, and a great number of stamina which are inserted in the empalement, and are shorter than the petals, terminated by roundish compressed summits, with a great number of germen, having small hair-like styles on the side of the germen, crowned by a single permanent stigma. The germen afterward becomes a berry composed of many acini collected into a head, each having one cell, in which is contained one oblong seed.*

This genus of plants is ranged in the fifth section of Linnæus's twelfth class, which contains those plants whose flowers have many stamina which are inserted in the empalement, and many styles.

The SPECIES are,

1. RUBUS (*Fruticosus*) foliis quinato-digitatis ternatisque, caule petiolisque aculeatis. Flor. Suec. 409. *Bramble or Blackberry with hand-shaped leaves, having five and three lobes, and the foot-stalk and branches prickly.* Rubus vulgaris sive Rubus fructu nigro. C. B. P. 479. *The common Blackberry.*
2. RUBUS (*Cæsius*) foliis ternatis subnudis laterallbus bilobis caule aculeato. Hort. Cliff. 192. *Bramble with naked trifoliate leaves and a prickly stalk.* Rubus repens fructu cæsio. C. B. P. 479. *The Dewberry.*
3. RUBUS (*Idæus*) foliis quinato-pinnatis ternatisque, caule aculeato, petiolis canaliculatis. Flor. Suec. 408. *Bramble with winged leaves, having five and three lobes, a prickly stalk, and channelled foot-stalks.* Rubus Idæus spinosis. C. B. P. 479. *Prickly Raspberry.*
4. RUBUS (*Glabro*) foliis ternatis subtus tomentosis, caule glabro. *Raspberry with trifoliate leaves, which are woolly on their under side, and have a smooth stalk.* Rubus Idæus lævis. C. B. P. 479. *The smooth Raspberry.*
5. RUBUS (*Occidentalis*) foliis quinato-pinnatis ternatisque, caule aculeato, petiolis teretibus. Lin. Sp. Plant. 493. *Bramble with winged leaves having five and three lobes, a prickly stalk, and taper foot-stalks.* Rubus Idæus fructu nigro, Virginianus. Hort. Elth. 327. *Virginia Raspberry with a black fruit.*
6. RUBUS (*Odoratus*) foliis simplicibus palmatis, caule inermi multifolio multifloro. Hort. Cliff. 192. *Raspberry with single hand-shaped leaves, and an unarmed stalk having many leaves and flowers.* Rubus odoratus. Cornut. 153. *Sweet Canada Raspberry, commonly called flowering Raspberry.*
7. RUBUS (*Hispidus*) foliis ternatis nudis, caulibus petiolisque hispidus. Lin. Sp. Plant. 493. *Bramble with naked leaves growing by threes, and hairy stalks and foot-stalks.*
8. RUBUS (*Saxatillus*) foliis ternatis nudis, flagellis repentibus herbaceis. Flor. Suec. 411. *Bramble with naked trifoliate leaves, and creeping herbaceous stalks.* Chamærubus saxatillus. C. B. P. 110. *Dwarf Rock Bramble.*
9. RUBUS (*Arcticus*) foliis ternatis, caule inermi unifloro. Flor. Suec. 412. *Bramble with trifoliate leaves, and an unarmed stalk having one flower.* Rubus humilis,

lis, flore purpureo. Buxb. Cent. p. 13. *Dwarf Bramble with a purple flower.*

10. Rubus (*Chamæmorus*) foliis simplicibus lobatis, caule unifloro. Flor. Suec. 413. *Bramble with single leaves having lobes, and a stalk bearing one flower.* Chamæmorus. Clus. Hist. 118. *The Dwarf Mulberry, or Cloudberry.*

11. Rubus (*Dalibarda*) foliis simplicibus cordatis indivisis crenatis, scapo aphyllo unifloro. Lin. Sp. Plant. 708. *Bramble with single, heart-shaped, undivided leaves, and one flower on each stalk.*

The first sort grows naturally on the side of banks, and in hedges, in most parts of England, so is not cultivated in gardens; this is so well known as to need no description. Of this there are the following varieties:

1. The common Bramble with white fruit, which was found in a hedge near Oxford by Mr. Jacob Bobart. The branches of this sort are covered with a light green bark; the leaves are of a brighter green than the common sort, and the fruit is white, but it seldom produces fruit in gardens.

2. The Bramble without thorns; this is in every respect like the first, but the branches and foot-stalks have no thorns.

3. The Bramble withe legant cut leaves; this differs from the first in the leaves, being finely cut.

4. The Bramble with double flowers; this differs from the first in having very double flowers, so is frequently planted in gardens for ornament.

5. The Bramble with variegated leaves. This is by some preserved in gardens, but is very apt to become plain, if planted in good ground.

These sorts are easily propaged by laying down their branches, which will put out roots at every joint very freely. They may be transplanted any time from September to March, and will grow in almost any soil or situation.

The second sort hath weaker trailing stalks than the first; the leaves are trifoliate, and the lobes are larger than those of the other; the fruit is smaller, the acini larger, and but few in each fruit, which are of a deeper black colour. This grows naturally in England, and is known by the title of Dewberry.

The third sort is the Raspberry, which grows naturally in the woods in the northern parts of England, but is cultivated in gardens for its fruit, which supplies the table at the season when they are ripe. There are two or three varieties of this, one with a red, and the other with a white fruit, and the third generally produces two crops of fruit annually; the first ripens in July, and the second in October, but those of the latter season have seldom much flavour. These are accidental varieties, but the fourth sort I believe to be a distinct species, for the leaves are trifoliate, larger than those of the common sort, woolly on their under side, and the branches and stalks have no thorns. This produces but few fruit, and those are small, which has occasioned its being neglected.

The Raspberry is generally propagated by suckers, though I should prefer such plants as are raised by layers, because they will be better rooted, and not so liable to send out suckers as the other, which generally produce such quantities of suckers from their roots, as to fill the ground in a year or two; and where they are not carefully taken off or thinned, will cause the fruit to be small, and in less quantities; especially when the plants are placed near each other, which is too often the case, for there are few persons who allow these plants sufficient room.

In preparing these plants, their fibres should be shortened; but the buds which are placed at a small distance from the stem of the plant, must not be cut off, because those produce the new shoots the following summer. These plants should be planted about two feet asunder in the rows, and four or five feet distance row from row; for if they are planted too close, their fruit is never so fair, nor will ripen so kindly, as when they have room for the air to pass between the rows. The soil in which they thrive best, is a fresh strong loam, for in warm light ground they do not produce so great plenty of fruit, for they naturally grow in cold land and in shade; therefore when they are planted in a warm situation and a light soil, they do not succeed.

The season for dressing them is in October, at which time all the old wood that produced fruit the preceding summer, should be cut down below the surface of the ground, and the young shoots of the same year must be shortened to about two feet in length; then the spaces between the rows should be well dug, to encourage their roots; if you bury a very little rotten dung therein, it will make them shoot vigorously the summer following, and their fruit will be much fairer. During the summer season they should be kept clean from weeds, which, with the before-mentioned culture, is all the management they will require; but it is proper to make new plantations once in three or four years, because when the plants are suffered to remain long, they will produce few and small fruit.

The Virginian flowering Raspberry, is commonly propagated in the nurseries as a flowering shrub. The flowers of this sort are as large as small Roses, and there is a succession of them for two months or more, so that they make an agreeable variety during their continuance. This sort frequently produces fruit in England, which are not so large as those of the common sort, and have little flavour. These ripen in September or the beginning of October.

The Virginian Raspberry rises with purplish stalks a little higher than the common sort; the leaves are of a lucid green on their upper side, but hoary on their under; their foot-stalks are taper; the fruit is shaped like those of the common Blackberry, and are of a deep black when ripe; the fruit has little flavour, so the plants are never cultivated for their fruit here. It ripens late in autumn.

The eighth sort grows naturally upon rocky hills in the northern counties of England, and most of the northern parts of Europe. This hath trailing herbaceous stalks, which put out roots at their joints, whereby it propagates in plenty; the leaves are trifoliate, the lobes are large, and of a lucid green; the fruit are small, so not worth cultivating.

The ninth sort grows naturally in Norway, Sweden, and Siberia; this hath an upright stalk about three inches high, garnished with small trifoliate leaves; the stalk is terminated by one purple flower, which is succeeded by a small red fruit, having the scent and flavour of Strawberries. This plant grows naturally upon mossy bogs, so cannot be cultivated to any purpose on dry ground, and is preserved in a few gardens for the sake of variety.

The tenth sort grows naturally upon some of the highest hills in the north of England and Scotland, also upon high boggy places in the northern parts of Europe. This plant cannot be transplanted into gardens so as to thrive; the stalks rise about six or eight inches high, and are generally garnished with two lobated leaves, standing at a distance from each other. The stalk is terminated by a single flower, which is succeeded by a small black fruit, not much unlike that of the Dewberry, and is by some persons much esteemed; the red and black game feed much upon it in the season.

The eleventh sort grows naturally in Canada; it has a creeping herbaceous root, sending out trailing herbaceous stalks, which frequently put out roots; the leaves are for the most part composed of three heart-shaped lobes, which are veined and hairy; the flowers have five white petals: the flowers are male and female on the same plant, and the fruit is somewhat like the last.

RUDBECKIA. Lin. Gen. Plant. 878. Obeliscotheca. Vaill. Act. Par. 1720. Bobartia. Pet. Mus. Dwarf Sunflower, vulgò.

The

The CHARACTERS are,

*It hath female and hermaphrodite florets inclosed in one common empalement, composed of two orders of leaves, the scales of which are plain, broad, and short. The rays or border of the flower is composed of female half florets, which are stretched out on one side like a tongue, and end with two or three indentures; these have germen sitting upon proper receptacles, but have neither style or stamina, and are barren. The hermaphrodite florets are tubulous, funnel-shaped, and indented in five parts at the brim. They have five short hair-like stamina in each, terminated by cylindrical summits, and a germen sitting in the common empalement, having a slender style crowned by a reflexed stigma, divided into two parts. The germen afterward become single, oblong, four-cornered seeds, crowned by their proper cup, which has four indentures.*

This genus of plants is ranged in the third section of Linnæus's nineteenth class, which includes the plants whose flowers are composed of hermaphrodite fruitful florets, and female barren half florets.

The SPECIES are,

1. RUDBECKIA (*Hirta*) foliis indivisis spatulato-ovatis, radii petalis emarginatis. Lin. Sp. Plant. 907. *Rudbeckia with oval, spattle-shaped, undivided leaves, and the petals of the rays indented.* Chrysanthemum helenii folio, umbone floris, grandiuscula prominente. Pluk. Alm. 99. tab. 242. *Corn Marygold with an Elecampane leaf, and a large prominent middle to the flower, commonly called Dwarf American Sunflower.*
2. RUDBECKIA (*Purpurea*) foliis lanceolato-ovatis alternis indivisis, petalis radii bifidis. Flor. Virg. 104. *Rudbeckia with oval, spear-shaped, undivided leaves, placed alternate, and the petals of the ray bifid.* Chrysanthemum Americanum, doronici folio, flore persici coloris, umbone magno prominente ex atro purpureo viridi & aureo fulgente. Pluk. Alm. 99. *American Corn Marygold with a Leopardsbane leaf, a Peach-coloured flower, and a large prominent middle of a dark purple, green, and shining gold colour, commonly called Dwarf Carolina Sunflower.*
3. RUDBECKIA (*Triloba*) foliis spatulatis, caulinis quibusdam trilobis, ramis indivisis. Hort. Upsal. 269. *Rudbeckia with under leaves spattle-shaped, and the upper ones with three lobes.* Chrysanthemum cannabinum Virginianum hirsutum, disco magno, petalis aureis radiato. Pluk. Alm. 100. tab. 22. fig. 2. *Virginian Hemp Agrimony, with a large disk to the flower, and the petals of the rays of a gold colour.*
4. RUDBECKIA (*Laciniata*) foliis inferioribus compositis acutè dentatis, caulinis simplicibus integris dentatisque. *Rudbeckia with compound, indented, lower leaves, those upon the stalks single, entire, and indented.* Corona solis foliis amplioribus laciniatis. Tourn. Inst. R. H. 490. *Sunflower with large jagged leaves.*
5. RUDBECKIA (*Quinata*) foliis omnibus quinatis, acutè dentatis exterioribus trilobatis. *Rudbeckia with all the leaves composed of five lobes which are sharply indented, and the outer ones divided into three.* Corona solis foliis angustioribus laciniatis. Tourn. Inst. R. H. 490. *Sunflower with narrow jagged leaves.*
6. RUDBECKIA (*Digitatis*) foliis inferioribus compositis, caulinis quinatis ternatisque, summis simplicibus. *Rudbeckia with compound lower leaves, those on the stalks quinquefoliate and trifoliate, and the top ones single.* Obeliscotheca petalis florum perangustis longis, foliis digitatis, caule glabro ferrugineo. Amman. *Sunflower with long narrow petals to the flower, hand-shaped leaves, and a smooth iron-coloured stalk.*
7. RUDBECKIA (*Angustifolia*) foliis oppositis integerrimis. Gron. Virg. 181. *Rudbeckia with linear entire leaves placed opposite.*

The first sort grows naturally in Virginia, and several other parts of North America. The root of this will continue four or five years, but unless there is care taken to shelter it in winter, the plants are sometimes destroyed by cold or too much wet. This sort sends out heads by which it may be propagated; the leaves are oblong, oval, and hairy; the stalks rise a foot and a half high, and have one or two leaves near the bottom. The foot-stalk which supports the flower, is naked near a foot in length, and is terminated by one pretty large yellow flower, shaped somewhat like the Sunflower, from whence it was titled Dwarf Sunflower. The petals or rays of the flower are very stiff, and are slightly indented at their points; the middle or disk of the flower is very prominent, pyramidal, and of a dark purple colour. These flowers are of long duration; I have frequently observed one flower has continued in beauty near six weeks, and as the plants produce many flowers, so there is a succession of them on the same plant, from the middle of July till the frost puts a stop to them, which renders them more valuable. This sort will sometimes produce good seeds in England, when the seasons are very favourable; but they are generally propagated here by offsets or slips, unless when good seeds can be procured from America, The best time to separate the offsets is in the spring, because the plants continue to flower so late in autumn, as to render it impracticable to perform it till the spring, so that the slips will flower but weak the same year. The plants will live abroad in the open air through the winter, if they are planted in a dry soil and a warm situation; but it will always be prudent to shelter two or three plants under a common hot-bed frame in winter to preserve the kind, because in very severe winters they are often killed.

The second sort grows naturally in Carolina, and also in Virginia. This is a perennial plant like the former, but very rarely produces seeds in England; nor do the plants put out heads whereby it may be propagated like the other, so that it is at present not very common here. The leaves of this sort are longer and broader than those of the other, and are smooth, having three veins; the stalks which support the flowers are taller, and have two or three narrow leaves on each, which are placed alternate: on the top is one flower with long, narrow, Peach-coloured petals, which are reflexed; the middle or disk of hermaphrodite florets is very prominent, and of a dark purple colour, but the summits upon the stamina being of a gold colour, adds a lustre to the other. This sort may be treated in the same manner as the other, by sheltering of it in winter; it flowers at the same season, but the flowers are not of so long duration as those of the former.

The third sort grows naturally in several parts of North America; this is a biennial plant, which in warm summers perfects its seeds in England; the lower leaves of this sort are divided into three lobes, but those upon the stalks are undivided; they are hairy, and shaped like those of the first sort; the stalks branch out on their sides, and are better garnished with leaves than either of the other. The flowers are very like those of the first sort, but are smaller; the plants will live through the winter in the open air in mild seasons, and may be propagated by slips or heads; but the best way is to raise the plants from seeds, because those will flower much better than such as are procured by slips; the second year the seedling plants will flower, and produce ripe seeds.

The fourth sort grows naturally in most parts of North America, and has been long an inhabitant in the European gardens, where it was generally known by the title of Sunflower. The root of this is perennial, but the stalk is annual; the lower leaves are composed of five broad lobes, which are deeply cut into acute points, and some of them are jagged almost to the midrib; the outer lobe is frequently cut into three deep segments. The stalks rise seven or eight feet high, and divide upward into several branches; they are smooth, green, and garnished with single leaves, which are oval and heart-shaped; some of these are indented on their edges, others are entire. The foot-stalks which sustain the flowers are naked, and terminated by a single flower with yellow petals or rays, shaped like those of the Sunflower, but smaller. This does not produce seeds here, but is easily propagated by parting of the roots, in the same

manner

manner as the perennial Sunflower. It is very hardy in respect to cold, but loves a moist soil.

The fifth sort has a perennial root like the former, and is a native of the same country. This hath smooth green stalks, which rise higher than those of the former; the leaves are all composed of five lobes which are much narrower, and end with sharper points than those of the former, and are very acutely indented on their sides. The flowers are smaller, and the petals narrower than those of the former sort, but appear at the same season. It is equally hardy with the former, and may be propagated in the same way.

The sixth sort grows naturally in North America, and also in Siberia, from both which countries I have received the seeds. This hath a perennial root like the two former; the leaves at bottom are composed of seven or nine lobes, some of which are entire, and others are jagged to the midrib, they are of a dark green and smooth; the stalks rise six feet high, and divide into many branches. They are of a purple or iron colour, and are very smooth; these are garnished with leaves, which toward the bottom are hand-shaped, and composed of five lobes; higher up they have but three, and at the top the leaves are single. The flowers are smaller than those of the two former sorts, but are of the same shape and colour.

The seventh sort grows naturally in Virginia. This hath a perennial root; the stalks rise four or five feet high; the leaves are narrow, smooth, and placed opposite; the rays of the flower are long, yellow, and are twelve in number; the disk of male florets are of a dark red, and the scales of the empalement spread, and are almost awl-shaped.

These four last mentioned sorts may be propagated in plenty, by parting of their roots; the best time for this is in October, when the stalks will begin to decay; for if they are removed in the spring, they will not produce many flowers the same year. They love a moist soil, and should be allowed room, for if they are too near other plants, they will rob them of their nourishment and destroy them. They are proper furniture for large gardens, where they may be allowed room, or in walks round fields, because they require little culture.

RUELLIA. Plum. Nov. Gen. 12. tab. 2. Lin. Gen. Plant. 702.

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, which is cut into five narrow acute segments at the top, which are erect. It has one petal, with a tube the length of the cup, which spreads and inclines at the neck, but the brim spreads open, where it is cut into five segments, the two upper being large and reflexed. It hath four stamina situated in the spreading part of the tube, connected in pairs, terminated by short summits, and a roundish germen supporting a slender style, crowned by a bifid stigma. The germen afterward becomes a taper capsule, pointed at each end, having two cells, inclosing roundish compressed seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two short stamina, and the seeds are included in a capsule.

The SPECIES are,

1. RUELLIA (*Tuberosa*) foliis ovatis crenatis, pedunculis bifloris. *Ruellia with oval crenated leaves, and foot-stalks bearing two flowers.* Ruellia humilis, flore cæruleo, asphodeli radice. Plum. Nov. Gen. 12. *Dwarf Ruellia, with a blue flower and an Asphodel root.*
2. RUELLIA (*Strepens*) foliis petiolatis, floribus verticillatis subsessilibus. Hort. Upsal. 178. *Ruellia with leaves having foot-stalks, and flowers growing in whorls, sitting close to the stalks.* Ruellia strepens, capitulis comosis. Hort. Elth. 328. *Snapping Ruellia with hairy heads.*
3. RUELLIA (*Clandestina*) foliis petiolatis, pedunculis longis subdivisis nudis. Lin. Hort. Upsal. 179. *Ruellia with leaves having foot-stalks, and long naked foot-stalks to the flowers, which are divided.* Ruellia capsulis teretibus. Hort. Elth. 328. *Ruellia with taper capsules.*
4. RUELLIA (*Crispa*) foliis subcrenatis lanceolato-ovatis, capitulis ovatis, foliosis hispidis. Lin. Sp. Plant. 635. *Ruellia with oval spear-shaped leaves which are somewhat crenated, oval pods, and prickly, hairy, small leaves.*
5. RUELLIA (*Paniculata*) foliis integerrimis pedunculis dichotomis lateralibus calycibus sessilibus, lacinia suprema majore. Lin. Sp. Plant. 885. *Ruellia with entire leaves, a forked stalk, and the upper segment of the flower large.* Speculum veneris majus impatiens. Sloan. Hist. Jam. 1. p. 158.

The first sort grows naturally in many of the islands in the West-Indies; the roots of this are composed of many swelling fleshy tubers, which run deep into the ground, and are like those of the Day Lily, but smaller. The stalk rises about four or five inches high, and sends out two or three short side branches, which are garnished with leaves placed opposite; some of these are small and shaped like a spatula, others are much larger; they have short foot-stalks, and are a little crenated on their edges. The flowers are produced on the side, and at the end of the stalk; those on the side have two flowers upon each foot-stalk, which come out opposite at each joint, but those at the top sustain three. The flowers have narrow tubes about an inch long, then they spread out to a sort of bell-shape, and at the top they are cut into five obtuse segments, which are large and spread open; they are of a fine blue, but of short duration, each flower seldom lasting in beauty one day; after the flower fades, the germen becomes a taper pod one inch and a half long, having two cells, which, when ripe, burst with a touch, and cast out the seeds to a distance. It flowers in July, and the seeds ripen the beginning of September.

The second sort grows naturally in Carolina; the root of this is fibrous and perennial; the stalks rise about a foot high, they are four-cornered, and have two longitudinal furrows, one on each side; the joints are three or four inches asunder, at each stand two oval leaves upon very short foot-stalks. The flowers come out from the wings of the leaves on each side, two or three rising from the same point, sitting very close to the stalks; they are small and of a pale purple colour, but are very fugacious; they open early in the morning, but are gone by ten or eleven o'clock in the forenoon; these are succeeded by short taper pods, surrounded by the hairy segments of the empalement. It flowers and perfects its seeds about the same time as the former.

The third sort grows naturally in the West-Indies; this hath a perennial root, composed of many fleshy fibres; the leaves and stalks lie close to the ground; the stalks grow five or six inches high; the leaves are placed by pairs at each joint; they are two inches long, and one inch and a quarter broad, standing upon foot-stalks half an inch long. The foot-stalks which sustain the flowers are naked, and divide into two smaller, each sustaining one small purple flower, which is very fugacious; their empalements are cut into very narrow segments to the bottom. After the flowers are past, the germen becomes a taper capsule about an inch long, including roundish compressed seeds.

The fourth sort grows naturally in both Indies; I received the seeds of this from Carthagena in New Spain. This hath a ligneous creeping root; the stalks rise about five or six inches high, they are single, taper, and jointed; the leaves are oval, spear-shaped, and have very short foot-stalks; they are a little waved on their edges, are hairy and curled. The flowers are produced from the side of the stalk at their joints; these sustain one small yellow flower, coming out between rough, hairy, small leaves. It flowers in July, and the seeds ripen in September.

The fifth sort hath a perennial root; the stalks rise four or five feet high, are very diffused and forked, and garnished with oblong, oval, entire leaves placed

opposite, standing on short foot-stalks which are hairy; the flowers are produced at the divisions of the stalks; they are small, purple, and of short duration.

These plants are propagated by seeds, which must be sown early in the spring in pots filled with light rich earth, and plunged into a moderate hot-bed; and when the plants come up, they must be transplanted each into a separate small pot filled with rich earth, and plunged into a hot-bed of tanners bark, where they must be shaded from the sun until they have taken new root; after which time they must have free air admitted to them every day in warm weather, and be constantly watered three or four times a week during the summer season. If the plants thrive well, those of the first and third sorts will produce flowers the July following, and will perfect their seeds in August; but the roots will continue, provided they are plunged into the bark-bed in the stove, and kept in a moderate temperature of heat.

The second sort is not a plant of long continuance, seldom abiding longer than two years; but if it is treated in the same manner as the two other, it will ripen seeds the second year, so may be propagated easily.

The fourth sort does not so constantly produce seeds as the three others, so it is not so common in England at present. This requires the same treatment as the other sorts.

If the seeds of these sorts are permitted to scatter, as their pods discharge them with a violent spring into the neighbouring pots, the plants will come up without care, so may be transplanted into pots filled with fresh loamy earth, and plunged into the tan-bed.

RUMEX. Lin. Gen. Plant. 407. Lapathum. Tourn. Inst. R. H. 504. tab. 287. Dock.

The Characters are,

*The empalement of the flower is permanent, composed of three obtuse reflexed leaves. The flower has three petals which are larger than the empalement, to which they are very like. It hath six short hair-like stamina, terminated by erect twin summits, and a three-cornered germen supporting three hair-like reflexed styles, thrusting out of the clefts of the petals, crowned by large jagged stigmas. The germen afterward becomes a three-cornered seed, included in the petals of the flower.*

This genus of plants is ranged in the third section of Linnæus's sixth class, which includes those plants whose flowers have six stamina and three styles; to which he has joined the Acetosa, or Sorrel of Tournefort, whose characters agree with those of the Dock; but as in the gardens and shops they are distinguished under different titles, I have separated the Sorrel from the Docks, and have placed them under their old title of Acetosa.

The Species are,

1. Rumex (*Patientia*) floribus hermaphroditis, valvulis integerrimis, foliis oblongo-lanceolatis. *Dock with hermaphrodite flowers having entire valves, and oblong spear-shaped leaves.* Lapathum hortense, folio oblongo, sive secundum Dioscoridis. C. B. P. 114. *Garden Dock with an oblong leaf, commonly called Patience, or Patience Rhubarb.*

2. Rumex (*Alpinum*) floribus hermaphroditis, valvulis integerrimis graniferis, foliis cordatis obtusis. *Rumex with hermaphrodite flowers having entire valves bearing grains, and obtuse heart-shaped leaves.* Lapathum folio rotundo Alpinum. J. B. 2. 987. *Round-leaved Alpine Dock, called Monks Rhubarb.*

3. Rumex (*Aquaticus*) floribus hermaphroditis pedicellatis, foliis lanceolatis longissimis. *Rumex with hermaphrodite flowers growing upon small foot-stalks, and the longest spear-shaped leaves.* Lapathum aquaticum, folio cubitali. C. B. P. 116. *Water Dock with a leaf a cubit long, commonly called Herba Britannica.*

4. Rumex (*Acutus*) floribus hermaphroditis, valvulis dentatis graniferis, foliis cordato-oblongis acuminatis. Hort. Cliff. 138. *Rumex with hermaphrodite flowers, indented grain-bearing valves, and oblong heart shaped leaves.* Lapathum folio acuto, plano. C. B. P. 115. *Plain sharp-pointed Dock.*

5. Rumex (*Crispus*) floribus hermaphroditis, valvulis integris graniferis, foliis lanceolatis undulatis acutis. Lin. Sp. Plant. 335. *Rumex with hermaphrodite flowers, entire grain-bearing valves, and acute, spear-shaped, waved leaves.* Lapathum folio acuto, crispo. C. B. P. 115. *Curled sharp-pointed Dock.*

6. Rumex (*Sanguineus*) floribus hermaphroditis, valvulis integerrimis, unica granifera foliis cordato-lanceolatis. Hort. Cliff. 138. *Rumex with hermaphrodite flowers, entire valves, one only bearing a seed, and heart-formed spear-shaped leaves.* Lapathum folio acuto rubente. C. B. P. 114. *The bloody Dock.*

7. Rumex (*Aureus*) floribus hermaphroditis verticillatis, valvulis acutè dentatis, foliis lanceolatis. *Rumex with hermaphrodite flowers growing in whorls, acutely indented valves, and spear-shaped leaves.* Lapathum folio acuto, flore aureo. C. B. P. 114. *Sharp-pointed Dock with a golden flower.*

8. Rumex (*Obtusifolius*) floribus hermaphroditis, valvulis dentatis, foliis cordato-oblongis, obtusiusculis crenulatis. Lin. Sp. 335. *Rumex with hermaphrodite flowers, indented valves, and blunt, oblong, heart-shaped leaves.* Lapathum vulgare, folio obtuso. J. B. 2. 985. *Common broad-leaved Rumex, or Butter Dock.*

9. Rumex (*Pulcher*) floribus hermaphroditis, foliis lyratis. Guet. Stamp. 1. p. 7. *Rumex with hermaphrodite flowers, and lyre-shaped leaves.* Lapathum pulcrum Bononiense sinuatum. J. B. 2. p. 988. *The Fiddle Dock.*

10. Rumex (*Maritimus*) floribus hermaphroditis, valvulis dentatis graniferis, foliis linearibus. Lech. Scan. 26. *Rumex with hermaphrodite flowers, indented grain-bearing valves, and linear leaves.* Lapathum aquaticum luteolæ folio. Bocc. Mus. 2. tab. 184. *Water Dock with a Weld leaf.*

11. Rumex (*Chalepensus*) floribus hermaphroditis pedunculis longioribus, valvulis profundè dentatis, foliis cordato-oblongis. *Rumex with hermaphrodite flowers growing upon longer foot-stalks, valves which are deeply indented, and oblong heart-shaped leaves.* Lapathum chalepense folio acuto, seminum involucris profundè dentatis. Mor. Hist. 2. 58. *Aleppo Dock with an acute leaf, and the covers of the seeds deeply indented.*

12. Rumex (*Ægyptiacus*) floribus hermaphroditis, valvulis trifido setaceis, unica granifera. Hort. Upsal. 89. *Rumex with hermaphrodite flowers, and bristly three-pointed valves, one of which bears the seed.* Lapathum Ægyptiacum annuum, parietariæ folio, capsulâ seminis, longiùs barbata. Hort. Piss. *Annual Egyptian Dock, with a Pellitory leaf, and long beards to the seed-vessels.*

13. Rumex (*Lunaria*) floribus hermaphroditis valvulis lævibus, caule arboreo, foliis subcordatis. Vir. Cliff. 32. *Rumex with hermaphrodite flowers, smooth valves, a tree-like stalk, and leaves which are almost heart-shaped.* Acetosa arborescens subrotundo folio, ex insulis fortunatis. Pluk. Phyt. tab. 252. fig. 3. *Tree Sorrel from the Fortunate Islands, with a roundish leaf.*

14. Rumex (*Bucephalophorus*) floribus hermaphroditis, valvulis dentatis nudis planis reflexis. Hort. Upsal. 90. *Rumex with hermaphrodite flowers, and plain, naked, indented, reflexed valves.* Acetosa ocymi folio, Neapolitana. C. B. P. 114. *Naples Sorrel with a Basil leaf.*

15. Rumex (*Vesicarius*) floribus hermaphroditis geminatis, valvularum alis maximis membranaceis reflexis, foliis indivisis. Hort. Cliff. 130. *Rumex with hermaphrodite flowers growing by pairs, very large membranaceous wings to the valves which are reflexed, and undivided leaves.* Acetosa Americana foliis longissimis pediculis donatis. C. B. P. 114. *American Sorrel, with very long leaves having foot-stalks.*

16. Rumex (*Roseus*) floribus hermaphroditis distinctis, valvularum alis maximis membranaceis reflexis, foliis erosis. Flor. Leyd. Prod. 230. *Rumex with hermaphrodite flowers growing upon distinct spikes, very large membranaceous wings to the valves, and leaves appearing as if bitten.* Acetosa Ægyptia roseo seminis involucro, folio lacero. Lipp. *Egyptian Sorrel with a Rose-coloured cover to the seed, and a torn leaf.*

The

The firſt ſort was formerly much more cultivated in the Engliſh gardens than at preſent; this has been generally uſed for the Monks Rhubarb, and has been thought the true, but others ſuppoſe the ſecond ſort ſhould be uſed as ſuch; the herb was formerly uſed in the kitchen, by the title of Patience. The root is large, and divides into many thick fibres which run downward; their outer cover is brown, but they are yellow within, with ſome reddiſh veins; the leaves are broad, long, and acute-pointed; their foot-ſtalks are of a reddiſh colour; the ſtalks riſe from four to ſix feet high, and divide toward the top into ſeveral erect branches, which are garniſhed with a few narrow leaves, terminating with ſpikes of large ſtamineous flowers. Theſe appear in June, and are ſucceeded by pretty large three-cornered ſeeds whoſe coverings are entire, which ripen in autumn.

The ſecond ſort grows naturally on the Alps, but has been long cultivated in the Engliſh gardens. This hath large roots, which ſpread and multiply by their offsets; they are ſhorter and thicker than thoſe of the firſt ſort, of a very dark brown on their outſide, and yellow within. The leaves are of the round heart-ſhape, about nine inches long, and as much in breadth near their baſe, having pretty long foot-ſtalks. The ſtalks riſe from two to three feet high; they are very thick, and have a few ſmall roundiſh leaves on the lower part, but the upper part cloſely garniſhed with ſpikes of white flowers, ſtanding erect, cloſe to the ſtalks. Theſe appear the latter end of May, and are ſucceeded by large triangular ſeeds, which ripen in Auguſt.

The third ſort grows naturally in ponds, ditches, and ſtanding waters, in many parts of England; this is ſuppoſed to be the Britannica of the antients. It hath large roots which ſtrike deep into the looſe mud, ſending out leaves which are three feet long, and four inches broad in the middle, drawing to a point at each end. The ſtalks riſe four feet when growing in water, but in dry land not more than two; theſe are garniſhed with narrow leaves among the ſpikes of flowers, to the top. The flowers ſtand upon ſlender foot-ſtalks which are reflexed; they are of an herbaceous colour, appear in June, and the ſeeds ripen in autumn.

The fourth ſort grows naturally in moiſt places in many places of England; this is the Oxylapathum of the ſhops, which is directed by the College to be uſed in medicine; but the markets are ſupplied with roots of the common Docks, which are indifferently gathered by thoſe who collect them in the fields, where the eighth ſort is much more common than this. The roots of this ſort are ſlender and run downright, ſending out a few ſmall fibres; the ſtalks riſe about two feet high, which are garniſhed with leaves below, about four inches long, and one and a half broad in the middle; they are rounded at their baſe, where they are ſlightly indented, but end in acute points; they are plain, and ſlightly crenated on their edges. From the joints of the ſtalk come out alternately ſlender long foot-ſtalks, which ſuſtain the ſpikes of flowers, which grow in ſmall whorls round the ſtalks, at about an inch diſtance; theſe have ſcarce any leaves upon the foot-ſtalks between the whorls of flowers, ſo may be eaſily diſtinguiſhed from the ſmall Water Dock, which has many. This flowers in June, and the ſeeds ripen in autumn.

The fifth ſort is more commonly found growing naturally about London than the fourth; the leaves of this are much longer than thoſe of the former, and are indented on their ſides, which are alſo waved; the ſtalks riſe about the ſame height as thoſe of the former. The ſpikes of flowers from the ſide are ſhorter, and cloſer garniſhed with flowers on pretty long foot-ſtalks; the covering of the ſeed is entire. It flowers and ſeeds about the ſame time with the former.

The ſixth ſort is very like the fourth in appearance, but the leaves have deep blood-coloured veins, and ſome ſmall ſpots of the ſame on their ſurface; the ſtalks are red, and riſe about the ſame height as the fourth, but the covering of the ſeed is entire; whereas thoſe of the fourth are indented, ſo may be readily diſtinguiſhed. It grows naturally in many parts of England.

The ſeventh ſort grows naturally in ſeveral parts of England; this is a biennial plant, which periſhes ſoon after the ſeeds are ripe; the ſtalks riſe near two feet high; they are of a deep purple colour, and are garniſhed with ſpear-ſhaped leaves toward the bottom, which are four inches long, and almoſt one broad in the middle, but thoſe on the upper part of the ſtalk are very narrow, and not more than two inches long; the ſpikes of flowers come out from the ſides of the ſtalks alternately. The flowers grow in thick whorls which ſit cloſe to the ſtalks; theſe are of a bright yellow colour, and the covers of the ſeeds are ſharply indented.

The eighth ſort is the moſt common Dock by the ſides of roads and banks in every part of England; the leaves of this ſort are broad and rounded at their points, though ſome of them end more acutely than others; they are near a foot long, and five inches broad toward their baſe, having many tranſverſe veins running from the midrib to their borders. The ſtalks riſe from two to three feet high, branching out on their ſides, having a few leaves on their lower part of the ſame ſhape with the other, but ſmaller. The flowers grow in whorls, ſitting very cloſe to the ſtalks; ſome plants have indented coverings to their ſeeds, and others have entire coverings; both theſe are frequently found intermixed, ſo that I doubt of their being diſtinct ſpecies. The leaves of this Dock were formerly much uſed for wrapping up of butter, and from thence the plant was called Butter Dock.

The ninth ſort grows naturally in many places near London; this is a biennial plant, which periſhes ſoon after the ſeeds are ripe. The ſtalks of this riſe about a foot high, and branch out from the bottom; the leaves grow near the root; they are about two inches and a half long, and are hollowed on their ſides, ſo as to reſemble the ſides of a fiddle; the ſtalks are generally bent at their joints. The flowers grow in whorls round the ſtalks, to which they ſit very cloſe; they are hermaphrodite; the covers of the ſeeds are ſharply indented.

The tenth ſort is ſometimes found growing naturally in England, upon places where the water has ſtood in winter. This ſeldom riſes more than five or ſix inches high, but divides into two or three branches; the leaves are about three inches long, and a quarter of an inch broad; they are ſmooth, and ſtand upon ſhort foot-ſtalks. The flowers grow in whorls round the branches, to which they ſit very cloſe; theſe are ſucceeded by ſmall triangular ſeeds, having indented covers.

The eleventh ſort came originally from Aleppo; this is a biennial plant; the leaves are nine or ten inches long, ſmooth, and of a light green; they are three inches broad at their baſe, where they are indented, and end in acute points. The ſtalks riſe from two to three feet high, ſending out many branches from their ſides, which are garniſhed with large whorls of herbaceous flowers, ſtanding upon pretty long foot-ſtalks; theſe are ſucceeded by three-cornered ſeeds, whoſe coverings are deeply indented.

The twelfth ſort grows naturally in Egypt; this is an annual plant; the ſtalk riſes about ten inches high, ſending out a few horizontal branches toward the bottom; the leaves are about two inches long, and half an inch broad at the broadeſt part. The flowers grow in whorls round the ſtalks, they are very ſmall, and the hair-like beards which adhere to the covering of the ſeed being long, obſcure the flowers, ſo they are ſcarce viſible to the naked eye.

All theſe ſorts of Docks riſe eaſily from ſeeds, and if introduced into a garden, will become troubleſome weeds, if their ſeeds are permitted to ſcatter; therefore few perſons care to propagate any of them, except the two firſt ſorts, which are cultivated for their uſe in medicine. The ſeeds of all the Docks ſhould be

ſown in autumn ſoon after they are ripe, for thoſe ſeeds which are ſown in the ſpring rarely grow the ſame year: when the plants come up, they will require no other care but to thin them where they are too cloſe, and keep them clean from weeds. They all delight in a moiſt rich ſoil.

The thirteenth ſort is commonly known among the gardeners by the title of Sorrel-tree. This came originally from the Fortunate, or Canary Iſlands, but has been long an inhabitant in ſome Engliſh gardens; it riſes with a ligneous ſtalk ten or twelve feet high, covered with a ſmooth brown bark, ſending out many ſlender branches; theſe are garniſhed with ſmooth, roundiſh, heart-ſhaped leaves two inches long, and an inch and a half broad, ſtanding alternately upon pretty long foot-ſtalks. The flowers come out in looſe panicles toward the end of the branches; they are of an herbaceous colour, and are ſometimes ſucceeded by triangular ſeeds with ſmooth covers, but they rarely ripen in England. This plant is eaſily propagated by cuttings, which may be planted in any of the ſummer months, in a bed of loamy earth, and ſhaded from the ſun until they have taken pretty good root; then they ſhould be taken up, and planted in pots filled with kitchen-garden earth, placing them in the ſhade till they have taken new root; after which they may be moved to a ſheltered ſituation, and placed with other hardy green-houſe plants till autumn, when they muſt be removed into the green-houſe, and treated in the ſame way as other hardy kind of plants, which only want protection from froſt.

The fourteenth ſort is a low annual plant, which grows naturally in Italy and Spain; this is generally found on ſwampy moiſt ground; the ſtalks are ſlender, branching at the bottom, and riſe about four inches high; the lower part is garniſhed with ſmall, oval, ſucculent lobes; their upper part is furniſhed with ſmall herbaceous flowers growing in whorls, and have no leaves between them; they are ſucceeded by ſmall ſeeds, whoſe covers are ſharply indented and reflexed. Theſe appear in June, and the ſeeds ripen in Auguſt, which, if permitted to ſcatter, will furniſh a ſupply of young plants the following ſpring; or if the ſeeds are then ſown, the plants will come up the following ſpring, and require no other care but to thin them, and keep them clean from weeds.

The fifteenth ſort is an annual plant; this hath pretty thick ſucculent ſtalks, which riſe a foot high, and divide into many branches; the leaves are of the round heart-ſhape and undivided, having very long foot-ſtalks. The flowers grow in looſe ſpikes at the end of the branches; theſe are herbaceous, and are ſucceeded by large covers to the ſeeds, which are inflated, and have broad membranaceous borders; the ſeeds are triangular, and ripen in autumn.

The ſixteenth ſort grows naturally in Egypt; this is alſo an annual plant, whoſe ſtalks riſe a foot and a half high, dividing upward into ſeveral branches; the ſtalks are garniſhed with arrow-pointed leaves about three inches long, whoſe ſides are irregularly torn, as if they had been gnawed by inſects; they ſtand upon pretty long foot-ſtalks, and have ſmooth ſurfaces; the flowers are diſpoſed in looſe ſpikes; ſome ſpikes have only male flowers, and others have all hermaphrodite flowers, and ſome plants have only male, and others hermaphrodite flowers. The latter are ſucceeded by triangular ſeeds, incloſed in large inflated covers of a deep red colour, having membranaceous borders. The ſeeds of this ripen in autumn.

The ſeeds of both theſe ſorts grow very freely, if ſown in a bed of light earth in the ſpring, where the plants are deſigned to remain. When they come up, they will require no other care but to keep them clean from weeds, and thin them where they are too cloſe.

RUSCUS. Tourn. Inſt. R. H. 79. tab. 15. Lin. Gen. Plant. 1008. [ſo called of ruſticus, becauſe rough and prickly. It is alſo called Laurus, becauſe fit for the making of Laurel garlands; and Alexandrina, from one of the ſorts growing in Alexandria.] Knee-holly, or Butcher's-broom; in French *Houx-frelon.*

The CHARACTERS are,

*It hath male and female flowers in diſtinct plants; the male flowers have erect ſpreading empalements, compoſed of ſix oval convex leaves, whoſe borders are reflexed; they have no petals, but have an oval nectarium the ſize of the empalement, which is erect and inflated, opening at the mouth; they have no ſtamina, but each has three ſpreading ſummits, ſitting on the top of the nectarium, which are joined at their baſe. The female flowers have empalements but no petals, and nectariums like the male: they have no ſtamina, but have an oblong oval germen hid within the nectarium, ſupporting a cylindrical ſtyle, crowned by an obtuſe ſtigma, ſtanding above the mouth of the nectarium. The germen afterward becomes a globular berry with two or three cells, incloſing two globular ſeeds.*

This genus of plants is ranged in the twelfth ſection of Linnæus's twenty-ſecond claſs, which contains the plants which are male and female in diſtinct plants, and the ſtamina or ſummits are joined together.

The SPECIES are,

1. RUSCUS (*Aculeatus*) foliis ſuprà floriferis nudis. Hort. Cliff. 465. *Ruſcus with leaves which bear flowers on their upper ſide, and are naked.* Ruſcus myrtifolius aculeatus. Tourn. Inſt. 79. *Knee-holly, or Butcher's-broom, with prickly Myrtle leaves.*
2. RUSCUS (*Hypophyllum*) foliis ſubtus floriferis nudis. Hort. Cliff. 465. *Ruſcus with leaves which bear flowers on the under ſide of the leaves, which are naked.* Ruſcus latifolius, fructu folio innaſcente. Tourn. Inſt. 79. *Butcher's-broom with broad leaves, upon which the fruit grows.*
3. RUSCUS (*Hypogloſſum*) foliis ſubtus floriferis ſub foliolo. Hort. Cliff. 465. *Ruſcus with flowers under the leaves.* Ruſcus anguſtifolius, fructu folio innaſcente. Tourn. Inſt. 79. *Butcher's-broom with narrow leaves, and fruit ſitting upon the leaves.*
4. RUSCUS (*Racemoſus*) racemo terminali hermaphroditico. Hort. Cliff. 469. *Ruſcus with hermaphrodite flowers in long bunches terminating the ſtalks.* Ruſcus anguſtifolius, fructu ſummis ramulis innaſcente. Tourn. Inſt. 79. *Butcher's-broom with narrow leaves, and fruit growing at the top of the branches.*
5. RUSCUS (*Trifoliatum*) foliis ternis ovatis acuminatis, ſupra floriferis nudis. *Ruſcus with oval acute-pointed leaves which are placed by threes, and flowers on their upper ſide.*
6. RUSCUS (*Flexuoſus*) foliis ovatis acuminatis, ſupra floriferis nudis, caulibus flexuoſis. *Ruſcus with acute-pointed leaves bearing flowers on their upper ſide, and flexible ſtalks.* Ruſcus latifolius major fructu folio innaſcente. Michel. *Greater broad-leaved Ruſcus with fruit ſitting upon the leaf.*
7. RUSCUS (*Androgynus*) foliis margine floriferis. Hort. Cliff. 464. *Ruſcus with flowers growing on the borders of the leaves.* Ruſcus latifolius è foliorum ſinu florifer & fructifer. Hort. Elth. 532. tab. 250. *Broad-leaved Ruſcus, with flowers and fruit growing on the edges of the leaves.*
8. RUSCUS (*Fruteſcens*) caule fruticoſo ramoſo, foliis lanceolatis rigidis, floribus pedunculatis terminalibus. *Ruſcus with a ſhrubby branching ſtalk, ſpear-ſhaped ſtiff leaves, and flowers growing upon foot-ſtalks terminating the branches.* Ruſcus latifolius fruteſcens, floribus racemoſis rubris. Houſt. MSS. *Shrubby broad-leaved Ruſcus, with branching red flowers.*

The firſt ſort is very common in the woods in divers parts of England, and is rarely cultivated in gardens. The roots of this kind are ſometimes uſed in medicine, and the green ſhoots are cut, bound into bundles, and ſold to the butchers, who uſe it as beſoms to ſweep their blocks, from whence it had the name of Butcher's-broom. It is alſo called by ſome Knee-holly.

This hath roots compoſed of many thick white fibres, which ſtrike deep in the ground, and twine about each other, from which ariſe ſeveral ſtiff green ſtalks,

ſtalks, which riſe about three feet high, ſending out from their ſide ſeveral ſhort branches, which are garniſhed with ſtiff, oval, heart-ſhaped leaves, placed alternately on every part of the ſtalk; they are about half an inch long, and one third of an inch broad near their baſe, ending with ſharp prickly points. The flowers are produced on the upper ſide of the leaves juſt in the middle; theſe are male in ſome, and female in other plants; they are ſmall, and cut into ſix parts, of a purple colour, ſitting cloſe to the midrib; they appear in June, and the female flowers are ſucceeded by berries almoſt as large as Cherries, of a ſweetiſh taſte, which ripen in winter, when they are of a beautiful red colour.

As this plant grows wild in moſt parts of England, it is rarely admitted into gardens; but if ſome of the roots are planted under tall trees in large plantations, they will ſpread into large clumps; and as they retain their leaves in winter, at that ſeaſon, they will have a good effect. The ſeeds of this plant generally lie a year in the ground before they vegetate, and the plants ſo raiſed are long before they arrive to a ſize enough to make any figure, ſo it is not worth while to propagate them that way, eſpecially as the roots may be eaſily tranſplanted from the woods. The roots and ſeeds of this plant have been uſed in medicine; the roots are aperitive, and eſteemed good for removing obſtructions; the ſeeds are an ingredient in the compoſition of the benedicta laxativa: the young ſhoots of this plant in the ſpring are ſometimes gathered and eaten by the poor like thoſe of Aſparagus; the branches of this plant, with their ripe fruit upon them, are frequently cut, and put into baſons of ſand, mixing them with the ſtalks of ripe ſeeds of male Piony, and thoſe of the wild Iris or Gladwyn, which together make a pretty appearance in rooms, at a ſeaſon of the year when there are few flowers, and theſe will continue a long time in beauty.

The ſecond ſort grows naturally in the mountainous parts of Italy, but is preſerved for the ſake of variety in many Engliſh gardens. The roots of this have large knotty heads, with long thick fibres like thoſe of the former ſort, from which ariſe many tough limber ſtalks near two feet high; theſe are garniſhed by ſtiff, oblong, oval leaves ending in points, which are more than two inches long and almoſt one broad; they are placed alternately on the ſtalks; the flowers are produced on the under ſurface of the leaves near the middle, ſitting cloſe to the midrib; they are ſmall, and of an herbaceous white colour; the female flowers are ſucceeded by ſmall red berries about the ſize of thoſe of Juniper. This flowers in July, and the ſeeds ripen in winter.

It ſtands in moſt diſpenſaries among the plants uſed in medicine, and has been commended for opening obſtructions of the kidneys, and to provoke urine.

The third ſort grows naturally upon ſhady mountains in Italy, Hungary, and other parts of Europe. The root of this is compoſed of many thick fibres like thoſe of the former, from which ariſe many tough limber ſtalks which are about ten inches high, garniſhed with ſpear-ſhaped leaves about three inches long and one broad in the middle, drawing to a point at both ends; they have ſeveral longitudinal veins, which run from the foot-ſtalk to the point, diverging from the midrib in the middle, but join again at the point; the leaves are for the moſt part alternate, but ſometimes they are oppoſite. On the middle of the upper ſurface of theſe, comes forth a ſmall leaf of the ſame ſhape; and at the ſame point, from the boſom of the ſmall leaves, come out the flowers, which are of a pale yellow colour. The female flowers are ſometimes ſucceeded by berries almoſt as large as thoſe of the firſt ſort, which ripen in winter, and are red. This is ſometimes called Biſlingua, or Double Tongue, from the leaves growing one out of another. It ſtands in diſpenſaries as a medicinal plant, but is ſeldom now uſed.

The fourth ſort grows naturally in the Archipelago, but is frequently planted in the Engliſh gardens; it is called Laurus Alexandrina, i. e. Alexandrian Bay, and is ſuppoſed to be the plant with which the ancients crowned their victors and poets. The ſtalks of this being very pliable, may be eaſily wrought into coronets for this purpoſe; and the leaves of this plant, having a great reſemblance to thoſe which are repreſented on the antient buſts, ſeem to confirm this opinion.

The roots of this are like thoſe of the former ſpecies; the ſtalks are ſlender, and much more pliable; they riſe about four feet high, and ſend out many ſide branches, which are garniſhed with oblong acute-pointed leaves about two inches long, and one-third of an inch broad, rounded at their baſe, but end in acute points; they are ſmooth, and of a lucid green, placed alternately, and ſit cloſe to the branches. The flowers are produced in long bunches at the end of the branches; theſe are hermaphrodite, of an herbaceous yellow colour, and are ſucceeded by berries like thoſe of the firſt ſort, but ſmaller, which ripen in winter.

The fifth ſort grows naturally in Zant, and ſome of the other iſlands in the Morea. The roots of this are like thoſe of the former ſorts; the ſtalks riſe about two feet high, they are ſlender, pliable, and garniſhed with oval leaves placed by threes round the ſtalk; they are about two inches long, and one broad, rounded at both ends, terminating in acute points, and have ſeveral longitudinal diverging veins running from the foot-ſtalk to the point. The flowers grow on the under ſide of the leaves, faſtened to the midrib; they are naked, and have pretty long foot-ſtalks; the ſegments or petals are very narrow; the fruit I have not ſeen, ſo can give no account of it.

The ſixth ſort grows naturally in Italy, where it was diſcovered by Signior Micheli of Florence. The roots of this are much longer than thoſe of the firſt ſort; the ſtalks riſe near five feet high; they are very pliant, ſend out ſeveral ſide branches their whole length, which are garniſhed with ſtiff oval leaves ending in acute points; they are one inch long, and half an inch broad. The flowers are produced on the upper ſurface of the leaves, ſitting cloſe to the midrib; they are ſmall, and of an herbaceous white colour. Theſe are ſucceeded by berries which are ſmaller than thoſe of the firſt ſort, and are of a pale red when ripe.

All theſe ſorts are very hardy, and will thrive in almoſt any ſoil or ſituation, ſo are very proper for planting round the verges of cloſe woods, or under large trees in wilderneſs quarters; for, as they are always green, they make a good appearance in winter, after the deciduous trees have caſt their leaves; they are eaſily propagated by parting of their roots. The beſt time for this is in autumn; but, when this is performed, the roots ſhould not be divided into ſmall parts, becauſe that will weaken them ſo much, that they will make but little figure, until they have had two or three years growth; they may alſo be propagated by ſowing of their ſeeds, but this is a very tedious method, ſo is ſeldom practiſed.

The ſeventh ſort grows naturally in the iſland of Madeira; this ſends out pliant ſtalks, which riſe ſeven or eight feet high, and have ſeveral ſhort branches proceeding from their ſides, which are garniſhed with ſtiff leaves about two inches long, and one broad toward their baſe, where they are rounded to the foot-ſtalk, but end in acute points; they have a great number of longitudinal veins running from the foot-ſtalk to the point. The flowers are produced in cluſters on the edges of the leaves; they are white, and are ſucceeded by berries of a yellowiſh red colour, not ſo large as thoſe of the firſt ſort.

This ſort is tender, and muſt therefore be planted in pots filled with freſh earth, and in winter removed into the green-houſe, but it ſhould be placed where it may have free air in mild weather; for it only requires to be ſcreened from froſt, and in the ſummer it muſt be ſet abroad with other hardy green-houſe plants. With this management the plants will ſend forth ſtems ſix or eight feet high, furniſhed with

leaves from bottom to top, and in June will be closely set with flowers upon their edges, which make a very beautiful and odd appearance, and renders it worthy of a place in every good collection of plants. This is also propagated by parting the roots as the former, which should not be done very often; because, if the roots are not permitted to remain some time to get strength, they will produce but weak shoots, and very few flowers; and in the strength of their shoots and number of flowers, the greatest beauty of these plants consist. This sort grows plentifully at Madeira, from whence the seeds may be procured; but these commonly lie in the ground a year before the plants come up, so should be sown in pots filled with fresh earth, and placed under a hot-bed frame in winter to screen the seeds from the frost, and the following spring the plants will appear.

The eighth sort was discovered by the late Dr. Houstoun, growing naturally at Carthagena in New Spain; this rises with shrubby stalks eight or ten feet high, which divide into many branches, and are garnished with stiff spear-shaped leaves three inches long, and one broad in the middle, ending in acute points; they are sometimes ranged in whorls round the stalks; and at others they are opposite. The flowers are produced in loose bunches at the end of the branches, standing upon slender foot-stalks; they are small, of a red colour, and shaped like those of the first sort.

This plant is tender, so must be kept in a stove during the winter, otherwise it will not live in England.

RUTA. Tourn. Inst. R. H. 257. tab. 133. Lin. Gen. Plant. 469. [This plant is called Ruta, of ῥυω to preserve, because it is a plant very good to preserve health.] Rue.

The Characters are,

*The flower has a short permanent empalement cut into five parts; it has four or five oval petals which spread open, and are narrow at their base, and eight or ten awl-shaped spreading stamina the length of the petals, crowned by short erect summits, with a gibbous germen having a cross furrow, marked with ten spots, supporting an erect awl-shaped style crowned by a single stigma. The germen afterward becomes a gibbous capsule with five lobes and five cells opening in five parts at the top, and filled with rough angular seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which contains those plants whose flowers have ten stamina and one style.

The Species are,

1. Ruta (*Hortensis*) foliis decompositis, floribus octandris, staminibus corollâ longioribus. *Rue with decompounded leaves, and flowers having eight stamina which are longer than the petals.* Ruta hortensis latifolia. C. B. P. 336. *Broad-leaved Garden Rue.*
2. Ruta (*Altera*) foliis decompositis, foliolis oblongo-ovatis, staminibus corolla æquantibus. *Rue with decompounded leaves, the small leaves oblong and oval, and stamina equalling the petals.* Ruta hortensis altera. C. B. P. 336. *Another Garden Rue.*
3. Ruta (*Sylvestris*) foliis inferioribus decompositis, foliolis linearibus, summis quinquefidis trifidisque. *Rue with decompounded linear leaves below, and the upper ones five or three-pointed.* Ruta sylvestris minor. C. B. P. 336. *Smaller wild Rue.*
4. Ruta (*Chalepensis*) foliis decompositis, floribus decandris marginibus petalorum ciliatis. *Rue with decompounded leaves, flowers having ten stamina, and the borders of the petals of the flower hairy.* Ruta Chalepensis latifolia, florum petalis villis scatentibus. H. L. *Broad-leaved Aleppo Rue with hairy petals to the flower.*
5. Ruta (*Ciliatis*) foliis compositis, floribus decandris, petalis florum ciliatis. *Rue with compounded leaves, flowers having ten stamina, and hairy petals to the flower.* Ruta Chalepensis tenuifolia, florum petalis villis scatentibus. Mor. Hist. 2. 508. *Narrow-leaved Aleppo Rue, with hairy petals to the flower.*
6. Ruta (*Linifolia*) foliis simplicibus indivisis. Lin. Sp. Plant. 384. *Rue with single undivided leaves.* Ruta sylvestris linifolia Hispanica. Bocc. Mus. 2. p. 82. *Wild Spanish Rue with a Flax leaf.*
7. Ruta (*Montana*) caule erecto corymboso, foliis compositis, floribus decandris, staminibus corollâ longioribus. *Rue with an erect corymbus stalk, compound leaves, and flowers having ten stamina which are longer than the petals.* Ruta sylvestris montana. Clus. Hist. *Wild Mountain Rue.*
8. Ruta (*Patavina*) foliis terminatis sessilibus. Lin. Sp. 549. *Rue with leaves without foot-stalks terminating the branches.* Pseudo Ruta patavina trifolia, floribus luteis umbellatis. Michel. Gen. 22. tab. 19. *Bastard Rue with trifoliate leaves, and yellow flowers in umbels.*

The first sort is the common Rue, which has been long cultivated in the gardens, and is that which is directed to be used in medicine, but of late years the second sort has so generally prevailed, as almost to supplant the first in the gardens about London; that being hardier than the first, is not so liable to be killed by severe frost.

The first rises with a shrubby stalk to the height of five or six feet, sending out branches on every side, garnished with decompounded leaves, whose small leaves (or lobes) are wedge-shaped; they are of a gray colour, and have a strong odour. The flowers are produced at the end of the branches, in bunches almost in form of umbels; they are composed of four yellow concave petals, which are cut on their edges, and eight yellow stamina which are longer than the petals, terminated by roundish summits. The germen becomes a roundish capsule, with four lobes punched full of holes, containing rough black seeds. It flowers in June, and the seeds ripen in autumn.

The second sort hath a shrubby stalk which rises three or four feet high, sending out many branches garnished with decompounded leaves, which are narrower than those of the former sort; they are of a bluish gray colour, and have a strong odour. The flowers grow in longer and looser bunches than the former; they have four short, concave, yellow petals, and eight short stamina of equal length with the petals. The feed-vessel is like that of the former, but smaller. This sort is more commonly to be found in gardens than the first.

The third sort grows naturally in Spain. The lower leaves of this are compounded of several parts, which are joined to the midrib in the same manner as other branching winged leaves, and are garnished with small linear leaves, standing without order. The stalks rise from two to three feet high, branching out from the bottom; these are garnished with leaves which are divided into five parts, and those at the top into three, which are as small and narrow as those at the bottom; they are of a gray colour, but are not so stinking as those of the other. The flowers grow at the end of the branches in loose spikes, which are generally reflexed; the petals of the flower are yellow, and appear in June; these are succeeded by small seed-vessels filled with angular black seeds. It flowers in June, and the seeds ripen in autumn.

The seeds of the fourth sort came from Aleppo, and it has also been brought from the Cape of Good Hope; this hath strong shrubby stalks which rise about three feet high, dividing into many branches, which are garnished with decompounded leaves larger than those of the common sort, and have a stronger odour. The flowers are disposed almost in form of an umbel at the end of the branches; they have five concave yellow petals, whose borders are set with fine hairs, and ten stamina which are of equal length with the petals. This sort flowers in June, and the seeds ripen in autumn. The seed-vessels of this are much larger than those of the common sort.

The fifth sort grows naturally at Aleppo; this hath shrubby stalks, which are smaller, and do not rise so high as those of the former sort. The leaves are much narrower and grayer than those, but have the same strong odour; the flowers are smaller, and have five petals, which are pretty close set with small hairs;

hairs; they have ten thick ſtamina, five of which are alternately longer than the petals; the ſeed-veſſels are like thoſe of the firſt ſort.

The ſixth ſort grows naturally in Spain; this riſes with ſeveral ſingle ſtalks from the root near a foot and a half high, which are garniſhed with ſingle leaves about three quarters of an inch long, and one eighth of an inch broad; they are of a yellowiſh green colour, and are placed alternately on the ſtalks, to which they ſit pretty cloſe; at the baſe of theſe come out one or two very ſmall leaves, of the ſame ſhape and colour. The flowers grow in ſmall cluſters at the end of the ſtalks; they have each five oblong yellow petals, and ten ſtamina of equal length with them, terminated by awl-ſhaped ſummits. This flowers in June, and the ſeeds ripen in autumn; the plants are generally biennial in England.

The ſeventh ſort riſes with an erect ſtalk about two feet high, garniſhed with compound leaves, whoſe ſmaller leaves are narrow and obtuſe, of a grayiſh colour, but have not ſo ſtrong an odour as the former. The upper part of the ſtalk divides in form of a corymbus, ſuſtaining upon naked foot-ſtalks ſmall bunches of yellow flowers, which have five concave petals, and ten ſtamina which are much longer than the petals, terminated by roundiſh ſummits.

The eighth ſort grows near Padua; this ſeems to be a plant of ſhort duration; the ſtalk riſes ſingly from the root, is about a foot high, herbaceous, and garniſhed with narrow trifoliate leaves placed alternately on the ſtalk, to which it cloſely adheres; the ſtalk branches at the top in form of an umbel, ſuſtaining many yellow flowers, compoſed of five plain petals, having no hairs on their borders. It is propagated by ſeeds, which if ſown in the autumn, ſoon after it is ripe, the plants will come up the following ſpring; but when the ſeeds are ſown in the ſpring, the plants ſeldom riſe the ſame year. If theſe grow upon poor ground, or in rubbiſh and in a warm ſituation, they will live in the open air without covering, but in rich ground they are frequently killed in winter.

All theſe plants may be propagated either by ſowing of their ſeeds, or by planting ſlips or cuttings; both of which may be done in the ſpring. The manner of propagating them from cuttings being the ſame as for Lavender, Stæchas, and other hardy aromatic plants, need not be here repeated; and if they are propagated by ſeeds, there needs no farther care but to dig a bed of freſh earth in the ſpring, making it level; then to ſow the ſeed thereon, and rake the ground ſmooth; after which, you muſt obſerve to keep the bed clear from weeds until the plants are come up about two inches high, when they ſhould be tranſplanted out into freſh beds, where they may remain for uſe. All theſe plants muſt have a dry ſoil, otherwiſe they are very ſubject to be deſtroyed in winter. The two Aleppo Rues, and the wild Rues are tenderer than the common ſort, ſo require ſhelter in winter; but the Aleppo Rues will endure our ordinary winters very well in the open air, eſpecially if they are planted on a dry ſoil.

The ſixth and ſeventh ſorts are tenderer than either of the other, and are of ſhorter duration. The ſeeds of the ſeventh ſort were ſent me from Gibraltar Hill, where the plant grows naturally; this doth not ripen its ſeeds here, unleſs the ſummers are warm; and in hard winters the plants are generally killed, unleſs they are removed into ſhelter.

The ſixth ſort will live through the winter in the open air, provided it is planted in a poor dry ſoil, and the ſecond year it will perfect ſeeds; but as it is of a ſhort duration, young plants ſhould be annually raiſed to ſucceed the others.

All the ſorts of Rue will live much longer, and are leſs liable to be injured by froſt in winter, when they grow in a poor, dry, rubbiſhy ſoil, than in good ground; for in rich moiſt land the plants grow very vigorouſly in ſummer, and are ſo replete with moiſture, that a ſmall froſt will kill their tender ſhoots; whereas in poor dry ground, or when they grow upon old walls, their growth will not be great, but their ſhoots will be hard and compact, ſo are more able to reſiſt the cold.

The firſt ſort was formerly uſed to plant for edgings on the ſides of borders; it was then called Herb of Grace, but was by no means proper for this uſe, for the plants ſhoot ſo vigorouſly, that there is no keeping them within the bounds of an edging; beſides, when they are kept cloſely ſheered, they appear to be very ragged and ſtumpy, and their roots ſpread ſo far as to exhauſt the goodneſs of the ſoil, ſo that the other plants would be deprived of their nouriſhment, which reaſons have cauſed them to be wholly neglected for this purpoſe; ſo that at preſent they are chiefly cultivated for medicinal uſe, or to furniſh the balconies for the citizens in the ſpring, eſpecially that with a variegated leaf.

RUTA CANINA. See Scrophularia.

RUTA MURARIA, Wall-rue, or white Maidenhair.

This plant is found growing out of the joints of old walls in divers parts of England, where it is gathered for medicinal uſe; but as it cannot be cultivated in gardens, ſo as to grow to advantage, I ſhall not ſay any thing more of it in this place.

RUYSCHIANA. Boerh. Ind alt. 1. p. 172. Dracocephalum. Lin. Gen. Plant. 648.

The Characters are,

*The flower hath a permanent empalement of one leaf, which is tubulous, and is cut into five ſegments at the top, the upper one being broader and blunter than the other; it is of the lip kind, having one petal which has a tube longer than the empalement. The chaps are large and ſwelling; the upper lip is erect and arched; it is gently indented at the top; the lower lip is trifid; the two ſide ſegments are narrow, and ſtand erect; the middle is broad, reflexed, and indented at the point. It hath four ſtamina, two of which are long, and ſituated under the upper lip; the other two are ſhorter, and ſituated juſt below them; they are terminated by oblong ſummits faſtened in the middle: it has four germen ſituated at the bottom of the empalement, ſupporting a ſlender ſtyle the length of the ſtamina, crowned by a bifid reflexed ſtigma. The germen afterward become four oblong ſeeds which ripen in the empalement.*

This genus of plants is joined to the Dracocephalum by Dr. Linnæus, which is ranged in the firſt ſection of his fourteenth claſs, containing the plants whoſe flowers have two long and two ſhorter ſtamina, and are ſucceeded by naked ſeeds ripening in the empalement.

The Species are,

1. Ruyschiana (*Spicata*) floribus ſpicatis, foliis bracteiſque linearibus glabris indiviſis. *Ruyſchiana with ſpiked flowers, linear leaves, and bracteæ which are ſmooth and undivided.* Ruyuſchiana flore cæruleo magno. Boerh. Ind. alt. 1. p. 172. *Ruyſchiana with a large blue flower.*
2. Ruyschiana (*Laciniata*) floribus ſpicatis, foliis linearibus trifidis hirſutis. *Ruyſchiana with ſpiked flowers, and hairy, linear, three-pointed leaves.* Ruyſchiana hirſuta, foliis laciniatis. Amman. Ruth. 50. *Hairy Ruyſchiana with jagged leaves.*
3. Ruyschiana (*Verticillata*) floribus axillaribus, foliis lanceolatis dentatis glabris. *Ruyſchiana with flowers growing at the wings of the ſtalks, and ſmooth, indented, ſpear-ſhaped leaves.* Dracocephalon foliis ex lanceolato-linearibus rariùs dentatis ſpinuloſis, floribus gemellis. Gmel. *Dragon's-head with linear ſpear-ſhaped leaves which are rarely indented, and ſomewhat prickly, and flowers growing by pairs.*

The firſt ſort grows naturally in Auſtria and Hungary; this hath a perennial root, and an annual ſtalk, which is four-cornered, and riſes about two feet high, garniſhed with two ſmooth linear leaves at each joint, about one inch long, and one-eighth of an inch broad, with a deep furrow along the middle; and at each joint, at the other ſides of the

ftalk, come out two or three very narrow fmall leaves of the fame fhape. The flowers are produced in whorled fpikes at the top of the ftalks, having fmall narrow leaves under each whorl. The flowers have tubulous empalements of one leaf, which are cut into five fegments at the top, four of which are narrow, and end in acute points; the other, which is on the upper fide of the flower is broader, and is rounded at the point. The tube of the flower is longer than the empalement, and is fwelling and large at the chaps; the upper lip is broad, erect, and arched over the tube; the lower lip is fhorter, and has two fhort fide fegments which are erect, but the middle fegment is broad, rounded, and indented at the point, and is reflexed back to the tube. It has four ftamina which lie clofe under the upper lip, and are arched in the fame manner; two of thefe are as long as the ftyle, which ftands in the fame pofition; the other two are fhorter, and are fituated juft below the other; they are terminated by oblong fummits, which are faftened in the middle to the ftamina. The ftyle is crowned by a bifid, reflexed, narrow ftigma; the flowers appear in June, and are of a fine blue colour; thefe are each fucceeded by four oblong feeds, which ripen in the empalement.

The fecond fort grows naturally in Siberia; this was fent me by the late Dr. Amman, who was profeffor of botany at Peterfburgh; it hath a perennial root. The ftalks are four-cornered, hairy, and rife a foot and a half high, fending out feveral fide branches, which are garnifhed with hairy linear leaves, cut into three parts; the flowers grow in fhort whorled fpikes at the end of the ftalk, having fome very narrow leaves under each whorl; the tube of the flower is longer, and more equal in fize than that of the former, and the middle fegment of the lower lip is not fo much reflexed. In other refpects, the flowers are the fame as thofe of the former.

The third fort grows naturally in Tartary; this hath a perennial root, and annual ftalks which do not grow erect like the firft, but fpread nearer to an horizontal pofition; they divide into feveral branches, which have two large leaves oppofite at each joint, and four fmaller, two on each fide between the larger; they are fmooth, have fharp indentures on their edges, and ftand erect. The flowers come out from the fide of the ftalks at the bafe of the leaves, two or three ftanding together on each fide the ftalk; their empalements are purple, and are cut into five acute fegments at the top, the upper lip having three broad, and the lower two narrower. The upper lip of the flower is broad, indented at the point, and erect; the lower is trifid, but the middle fegment is not fo much reflexed as that of the firft fort, and the flowers are of a paler blue than thofe. It flowers in June, and the feeds ripen in autumn.

This name was given to this genus of plants by the learned Dr. Boerhaave, profeffor of botany at Leyden, in honour of Dr. Ruyfch, who was profeffor of anatomy and botany at Amfterdam.

The plants are propagated by feed, which fhould be fown the latter end of March, in a bed of frefh light earth in an open expofure, and in about five or fix weeks after the plants will appear, when they fhould be carefully cleared from weeds; and if the feafon fhould prove dry, they muft be refrefhed now and then with water, which will greatly promote their growth. When the plants are about two inches high, they fhould be carefully tranfplanted into a bed or border of frefh, light, undunged earth, obferving to fhade them from the fun until they have taken root, as alfo to refrefh them from the fun until they are well eftablifhed in this bed; after which time they will require no farther care, but to keep them conftantly clear from weeds till Michaelmas, when they are to be removed into the places where they are defigned to remain for good.

When the plants are firft tranfplanted from the feed-bed into the nurfery-bed, they fhould be planted about fix inches afunder every way, which will be fufficient room for them the firft feafon; and this will admit of the hoe to come between the plants to deftroy the weeds, which is by much a better method than pulling out the weeds by hand, and is much fooner performed. For as the hoe ftirs the ground between the plants, it not only cuts down the weeds which were up and vifible, but alfo deftroys all thofe whofe feeds were fprouted, and would have foon after appeared; fo that one hoeing, if well performed, and in dry weather, will more effectually deftroy the weeds, than two hand-weedings would do, were they performed ever fo carefully; befides, the ftirring the ground is of great fervice to the plants.

At Michaelmas, when the plants are tranfplanted for good, they fhould be carefully taken up with balls of earth to their roots; and they muft be planted in the middle of the borders in the pleafure-garden, in frefh light earth, intermixing them with other hardy plants of the fame growth, where they will make a pretty appearance when they are in flower, and will continue three or four years; and in fome poor ftony foils I have known the roots live fix or feven years, but thefe did not produce fo large fpikes of flowers, as thofe which were younger and more vigorous plants. Therefore, as thefe plants do not continue many years, it will be proper to raife a fupply of young plants to fucceed them, for the old plants will produce feeds plentifully, which are ripe the latter end of Auguft or the beginning of September, when they fhould be gathered in dry weather, and kept in a warm dry room till the time for fowing them.

# S.



SABINA. See Juniperus.

SACCHARUM. Lin. Gen. Plant. 68. Arundo. C. B. P. 18. The Sugar Cane.

The Characters are,

*It hath no empalement, but a woolly down longer than the flower inclofes it. The flower is bivalve; the valves are oblong, acute-pointed, concave and chaffy. It has three hair-like ftamina the length of the valves, terminated by oblong fummits, and an awl-fhaped germen fupporting two rough ftyles crowned by fingle ftigmas. The germen afterward becomes an oblong acute-pointed feed, invefted by the valves.*

This genus of plants is ranged in the fecond fection of Linnæus's third clafs, which includes the plants whofe flowers have three ftamina and two ftyles.



We

We have but one SPECIES of this genus at present, viz.

SACCHARUM (*Officinarum*) floribus paniculatis. Hort. Cliff. 26. *Sugar Cane with flowers growing in panicles.* Arundo saccharifera. C. B. P. 18. *The Sugar Cane.*

This plant grows naturally in both Indies, and is there cultivated also for its juice, which, when boiled, affords that sweet salt which is called Sugar.

The Canes were formerly cultivated in the south of France for the same purpose, but it was in small quantities only, for in sharp winters they were killed, unless they were covered, so that they had only the summer for their growth, which was too short time for their getting sufficient strength to produce Sugar enough to answer the expence, so the planting of these Canes there has been long discontinued; they were also planted in several parts of Spain before they were introduced to France, and are at present cultivated in plenty in Andalusia, from whence great quantities of Sugar are annually sent to Madrid, but there are few now planted in the other parts of Spain.

The root of this plant is jointed like those of the other sorts of Cane or Reeds, from which arise four, five, or more shoots in number, proportionable to the age or strength of the root. These rise eight or ten feet high, according to the goodness of the ground in which they grow; for in some moist rich soils there have been Canes measured, which were near twenty feet long; but these were not near so good as those of middling growth, as they abounded with juice, which had but a small quantity of the essential salt in it, so that the expence of fuel and trouble of boiling, was more than the Sugar would defray. The Canes are jointed, and these joints are more or less distant from each other, in proportion to the soil. The leaves are placed at each joint, and the base or lower part of the leaf embraces the stalk or Cane to the next joint above its insertion, before it expands; these are three or four feet long from the joint where they unfold to their point, according to the vigour of the plant; they have a deep whitish furrow, or hollowed midrib, which is broad, and prominent on the under side; the edges of the leaves are thin, and armed with small sharp teeth, which are scarce to be discerned by the naked eye, but will cut the skin of a tender hand if it be drawn along it. The flowers are produced in panicles at the top of the stalks; these are from two to three feet long, and are composed of many spikes, which are nine or ten inches long, and are again subdivided into smaller spikes; these have long down which inclose the flowers, so as to hide them from sight; afterward the germen becomes an oblong-pointed seed, which ripens in the valves of the flower.

This plant is preserved by way of curiosity in several gardens in England, but being too tender to thrive here, unless it is preserved in a warm stove, so it cannot be brought to any great perfection. I have seen some of the plants growing which were seven or eight feet high, and at the bottom as large as a common walking Cane, but they have not produced their panicles of flowers here.

It is here propagated by slips taken from the sides of the older plants; those which grow near the root and have fibres to them, will most certainly grow; so that when the shoots are produced at some distance from the ground, the earth should be raised about them, that they may put out fibres before they are separated from the mother plant. These slips should be planted in pots filled with rich kitchen-garden earth, and plunged into a moderate hot-bed of tanners bark, being careful to shade them from the sun until they have taken new root, after which they must be treated in the same way as other tender plants from the same countries. They must be constantly kept plunged in the tan-bed in the stove; and as their roots increase in size, so the plants should from time to time be shifted into larger pots; but this must be done with caution, for if they are over-potted they will not thrive: they will require to have water frequently in warm weather, but it must not be given them in too great plenty, especially in cold weather. As the leaves of the plants decay, they should be cleared from about the stalks; for if these are left to dry upon them, it will greatly retard their growth. The stove in which this plant is placed, should be kept in winter to the same temperature of heat as for the Pine-apple, and in hot weather there should be plenty of free air admitted to the plants, otherwise they will not thrive.

I shall here subjoin some account of the method of propagating and cultivating the Sugar Cane in America, with some observations and experiments which have been made by a few curious persons in the British Islands, and shall propose some farther trials to be there made, in the culture and management of this useful plant, which are founded upon the experience I have had in the culture of some plants which are similar in their growth with the Sugar Cane.

The land which is most proper for the growth of Sugar Canes, is such as hath a sufficient depth of soil, and is not too moist and strong, but rather light and easy to work; for although strong moist ground will produce much taller and bigger Canes than the other, yet the quantity of Sugar will be much less, not near so good, and will require a greater quantity of fuel, and a longer time to boil, before the Sugar can be made; which is also the case with all fresh land, where there has not been any Canes growing before; therefore many of the most expert planters burn their land when it is first cleared for planting of Canes, to abate its fertility; but if when land is first cleared of the wood, and the roots of bad weeds, it is sown with Indigo, which such fresh ground will produce much better than the old, or such as has been long cultivated, there may be two or three crops of this taken, which will prepare the land for the Sugar Canes, without being at the trouble of burning it; but the growing of Indigo has been so little practised in the British Islands of America for many years past, as to be esteemed unworthy the notice of a Sugar planter; whereas if they would sometimes change their crops to other species, they would soon find an advantage in the growth, not only of their Canes, but also of their other crops: however, the usual practice is to continue the Canes always upon the same land as long as it will produce them, without changing the species, or allowing the ground a fallow to rest and recover itself. By this method there are some plantations so much exhausted, as that the crop of Sugar will scarce defray the expence of culture.

Another thing should always be observed in the planting of fresh land with Canes, which is to allow them more room than is generally done; for as the ground is strong, so there will a greater number of shoots come out from each plant, and not having room to spread at bottom, they will draw each other up to a great height, and be full of watery juice, the sun and external air being excluded from the Canes by the multiplicity of leaves, which are both absolutely necessary to ripen and prepare the salts during the growth of the Canes.

If the ground is proper for the Sugar Canes, and they are planted at a good distance from each other, and the land is carefully managed, the same plantation may be continued above twenty years without replanting, and produce good crops the whole time; whereas in the common method, they are generally replanted in six or seven years, and in some of the poor land they are continued but two or three.

The Canes are in those warm countries propagated by cuttings or joints, of proper lengths; these are from fifteen to twenty inches long, in proportion to the nearness of their joints or eyes. These cuttings are generally taken from the tops of the Canes, just below the leaves; but if they were chosen from the lower part of the Canes, where they are less succulent and better ripened, they would not produce so luxuriant shoots, and their juice would be less crude, and contain a greater quantity of salts, which will be ob-

tained by less boiling than those Canes in the close manner they are commonly planted: this is well known to the judicious to be the case, in most kinds of vegetables; and it is by thus carefully propagating all kinds of esculent plants, either in the choice of the best seeds or cuttings, that most of the kinds have been so greatly improved of late years.

The distance which the Canes are usually allowed in planting, is from three to four feet, row from row, and the hills are about two feet asunder in the rows; in each of these hills they plant from four to seven or eight cuttings, which is a very great fault, and is the cause of most of their blights so much complained of lately; for if all these grow, which is often the case, they rob each other of their nourishment; and if a dry season happens before they have acquired strength, they are very soon stinted in their growth, and are then attacked by insects, which spread and multiply so greatly, as to cover a whole plantation in a little time: when this happens, the Canes are seldom good after, so that it will be the better way to root them entirely up when they are so greatly injured, for they very rarely recover this disorder; for although the insects are not the cause of the disease, yet they confirm it, and cause it to spread.

Therefore, if instead of planting so many, there was but one good cutting planted in each hill, or to prevent miscarriage, two at most; and if both succeeded, the weakest were drawn out soon after they had taken root, if will be found of great service to prevent these blights; and although the number of Canes will not be near so great from the same space of ground, yet the quantity of Sugar will be full as much, and will require little more than a fourth part of fuel to boil it.

I have been assured by two of the most sensible and judicious planters of Sugar in America, that they have made some experiments of the horse-hoeing culture for their Canes, which answered much beyond their expectations; one of those gentlemen told me, he planted one acre in the middle of a large piece of Canes, in rows at five feet asunder, and the hills were two feet and a half distant, and but one cutting to each hill. The ground between the rows was from time to time stirred with the horse plough, to destroy the weeds and earth the plants; with this culture the Canes were double the size of those in the same piece, which were cultivated in the usual way; and when the Canes were cut, those which had been thus planted and managed were ground and boiled separately; the produce of Sugar was full as great as the best acre in the same piece, and the expence of boiling was little more than a sixth part of the other, and he sold the Sugar for six shillings per hundred weight more than he could get for the other.

The time for planting the Canes is always in the rainy seasons, and the sooner they are planted after the rains have begun to fall, the more time they will have to get strength before the dry weather sits in; for when they have put out good roots, and are well established in the ground, they will not be so liable to suffer by the drought, as those which have but newly taken root.

The season being come for planting, the ground should be marked out by a line, that the rows of Canes may be strait, and at equal distances; but first it will be proper to divide the piece into lands of sixty or seventy feet broad, leaving intervals between each of about fifteen feet; these will be found of great use when the Canes are cut, for roads in which the carriages may pass to carry off the Canes to the mill; for where there is not such provision made, the carriages are obliged to pass over the heads of the Canes to their no small prejudice: besides, by these intervals, the sun and air will have freer passage between the Canes, whereby they will be better ripened, and their juice will be fuller of salts; therefore when the Canes are ground, they will not require so much fuel to boil their juice. The middle of these intervals may be planted with Yams, Potatoes, or other esculent plants, which may be taken off before the Canes are cut, that the passages may be clear for the carriages; but a path should be left on the sides of each land, for the more convenient riding or walking of the overseer of the plantation, to view and observe how the labour is performed.

The common method now practised in planting of the Canes is, to make a trench with a hoe, which is performed by hand; into this one negro drops the number of cuttings intended for planting, at the distance the hills are designed; these are by other negroes placed in their proper position, then the earth is drawn about the hills with a hoe, all this is performed by hand; but if the right use of ploughs was well known in those countries, the work might be much better performed, and for less than half the expence; therefore instead of making a trench with a hoe, a deep furrow is made with a plough, and the cuttings properly laid therein, the ground will be deeper stirred, and there will be more depth for placing the Canes.

If the ground is to be afterward kept clean with the horse hoe, the rows of Canes should be planted five feet asunder, that there may be room for the horse and plough to pass between them; and the distance of the hills from each other should be two feet and a half, and but one Cane should be permitted to remain in each hill. After the Canes are planted and have made some shoots, the sooner the horse plough is used the better will the Canes thrive, and the ground will be easier kept clean from weeds; for if these are torn up when they are young, they will presently die; whereas when they are suffered to grow large before they are disturbed, they are with great difficulty destroyed.

As the growth of the Canes is promoted according to the cleanness of the ground, so there cannot be too much care taken to keep the Canes perfectly clear of weeds; and the beginning of this work soon will render it less troublesome, and it may be performed at a less expence, than when it is neglected for some time. When this is performed with a plough, the earth in the interval should be thrown up to the rows of Canes, first on one side of the row, being careful not to disturb the roots of the Canes, as also not to bury their new shoots; and in the second operation, the earth should be turned over to the other side of the rows, with the same care as before. By this turning and stirring of the land, it will be rendered looser, and the earthing of the plants will greatly strengthen them; so that from each hill there will be as many shoots produced as can be well nourished, and the sun and air will have free ingress among the rows, which will be of the greatest service to the Canes.

When the Canes are from seven to ten feet high, and of a proportionable size, the skin smooth, dry, and brittle, if they are heavy, their pith gray, or inclinable to brown, the juice sweet and glutinous, they are esteemed in perfection.

The time for cutting of the Canes is usually after they have grown six months; but there should not be a fixed period for this, for in some seasons and in different soils, there will be more than a month's difference in their maturity; and those who have made the experiments of cutting their Canes before they were ripe, and letting others stand till after they were ripe, have found the Sugar made from the latter, was much finer than that of the former, though the quantity was not quite so great; however, it will always be best to let them stand till they are in perfection before they are cut, but not longer.

They have also found those Canes which are cut toward the end of the dry seasons, before the rains begin to fall, have produced better Sugar than those which are cut in the rainy seasons, when they are more replete with watery juice; and there has been much less expence of fuel to boil it, which is a material article in large plantations; therefore the better the Canes are nourished in their growth, and the more air

air and fun is admitted to pafs between the rows, the lefs expence it will be in the boiling and preparing of the Sugar.

In the boiling of Sugar, they ufe a mixture of wood afhes and lime, which is called temper, without which the Sugar will not granulate. The quantity of this mixture is proportioned to the quality of the ground on which the Canes grew.

**SAFFRON.** See CROCUS.

**SAGE.** See SALVIA.

**SAGITTARIA.** Lin. Gen. Plant. 946. Sagitta. Dillen. Gen. 4. Ranunculus. Tourn. Inft. R. H. 287. Arrow-head.

The CHARACTERS are,

*It hath male and female flowers on the fame plant; the male flowers have a permanent empalement of three oval concave leaves; they have three roundifh petals which fpread open, and are larger than the empalement, and many awl-fhaped ftamina collected in a head, terminated by erect fummits. The female flowers are fituated below the male; thefe have a three-leaved empalement, and three petals as the male, but no ftamina; they have many compreffed germen collected in a head, fitting upon very fhort ftyles, and have permanent acute ftigmas. The germen afterward become oblong compreffed feeds having longitudinal borders, and are collected in globular heads.*

This genus of plants is ranged in the eighth fection of Linnæus's twenty-firft clafs, which includes thofe plants which have male and female flowers on the fame plant, whofe male flowers have many ftamina.

The SPECIES are,

1. SAGITTARIA (*Sagittifolia*) foliis omnibus fagittatis acutis petiolis longiffimis. *Arrow-head with all the leaves arrow-pointed, and long foot-ftalks.* Sagitta aquatica major. C. B. P. *The greater Arrow-head.*
2. SAGITTARIA (*Minor*) foliis fagittatis fpatulifque, petiolis longioribus. *Arrow-head with arrow-pointed and fpattle-fhaped leaves, having longer foot-ftalks.* Sagitta aquatica foliis variis. Lœfl. Pruff. 234. *Water Arrow-head with variable leaves.*

The firft fort grows naturally in ftanding waters in moft parts of England; the root is compofed of many ftrong fibres, which ftrike deep into the mud; the foot-ftalks of the leaves are in length proportionable to the depth of the water in which they grow, fo they are fometimes almoft a yard long; they are round, thick, and fungous; the leaves which float upon the water are fhaped like the point of an arrow, the two ears at their bafe fpreading wide afunder, and are very fharp-pointed. The flowers are produced upon long ftalks which rife above the leaves, and ftand in whorls round them at the joints; they have each three broad white petals which fpread open, and in the middle is a clufter of ftamina with purple fummits. It flowers in July. The flowers are fucceeded by rough heads, containing many fmall feeds.

The fecond fort grows plentifully in ftanding waters near Paris, but has not been found wild in England. This never grows fo large as the former; the leaves vary greatly, fome of them are oblong, round-pointed, and fhaped like a fpatula; others are arrow-pointed, but thefe have their points lefs acute than thofe of the former, and the flowers are fmaller, in which it differs from the former; and as all the plants where this grows retain their difference, fo it may be fuppofed a different fpecies.

There is alfo a third fort mentioned by Dr. Plukenet, under the title of Sagitta aquatica omnium minima, or the leaft Arrow-head. This grows plentifully on the borders of the Thames about Lambeth, and alfo at Chelfea; the foot-ftalks of the leaves of this are very fhort, the leaves are much lefs, and the ftalks which fupport the flowers are alfo very fhort; but thefe differences may be occafioned by the fituation of their growth, for it is always found growing in the mud, which the water ebbs from every tide, fo it is only covered in high water, which may ftint the growth of the plants, and give them this appearance.

**SALICARIA.** See LYTHRUM.

**SALICORNIA.** Tourn. Cor. App. 51. tab. 485. Lin. Gen. Plant. 10. Jointed Glaffwort, or Saltwort.

The CHARACTERS are,

*The flower hath a rugged, fwelling, four-cornered empalement, which is permanent. It has no petal, and but one ftamina the length of the empalement, crowned by an oblong twin fummit, and an oblong oval germen fupporting a fingle ftyle, crowned by a bifid ftigma. The germen afterward becomes a fingle feed, inclofed in the fwelling empalement.*

This genus of plants Dr. Linnæus places in the firft fection of his firft clafs, which contains thofe plants whofe flowers have but one ftamina and one ftyle.

The SPECIES are,

1. SALICORNIA (*Fruticofa*) articulis apice craffioribus obtufis. Lin. Mat. Med. 8. *Jointed Glaffwort with thick obtufe points.* Kali geniculatum. Ger. Emac. 535. *Common jointed Glaffwort.*
2. SALICORNIA (*Perenne*) articulis apice acutioribus, caule fruticofo ramofo. *Glaffwort with acute points to the joints, and a fhrubby branching ftalk.* Kali geniculatum perenne fruticofius procumbens. Raii Syn. Ed. 2. p. 67. *Trailing, fhrubby, perennial, jointed Glaffwort.*

The firft fort grows plentifully in moft of the faltmarfhes which are overflowed by the tides, in many parts of England. This is a trailing plant, with thick, fucculent, jointed ftalks, which trail upon the ground, and divide into feveral branches. The flowers are produced at the ends of the joints toward the extremity of the branches, which are fmall, and fcarce difcernible by the naked eye. It flowers the latter end of July, and the feeds ripen in autumn.

The fecond fort grows naturally in Sheepey Ifland; this hath a fhrubby branching ftalk about fix inches long; the points of the articulations are acute, the ftalks branch from the bottom, and form a kind of pyramid; they are perennial, and produce their flowers in the fame manner as the former.

The inhabitants near the fea-coaft where thefe plants grow, cut them up toward the latter end of fummer, when they are fully grown; and after having dried them in the fun, they burn them for their afhes, which are ufed in making of glafs and foap. Thefe herbs are, by the country people, called Kelp, and are promifcuoufly gathered for ufe.

From the afhes of thefe plants is extracted the falt, called fal kali, or alkali, which is much ufed by the chemifts.

The manner of gathering and burning of thefe herbs is mentioned under the article of SALSOLA, fo I fhall not repeat it in this place.

In fome parts of England thefe herbs are gathered and pickled for Samphire, though that is a very different plant from either of thefe.

**SALIX.** Tourn. Inft. R. H. 590. tab. 364. Lin. Gen. Plant. 976. [takes its name from falio, to leap or dance, becaufe of its quick growth.] The Sallow, or Willow-tree; in French, *Saule.*

The CHARACTERS are,

*It hath male and female flowers upon feparate plants; the male flowers are difpofed in one common, oblong, imbricated katkin. The fcales have each one oblong fpreading flower, which has no petal, but a cylindrical nectarious gland in the center. It has two flender erect ftamina, terminated by twin fummits having four cells. The female flowers are difpofed in katkins as the male; thefe have neither petals or ftamina, but an oval narrowed germen, fcarce diftinguifhable from the ftyle, crowned by two bifid erect ftigmas. The germen afterward becomes an oval awl-fhaped capfule with one cell, opening with two valves, containing many fmall oval feeds, crowned with hairy down.*

This genus of plants is ranged in the fecond fection of Linnæus's twenty-fecond clafs, which contains thofe plants which have male and female flowers on feparate plants, whofe male flowers have two ftamina.

There are feveral fpecies of this genus which grow naturally in the northern parts of Europe, of little or

no

no use, being low creeping shrubs, many of them seldom rising a foot high, so are never cultivated, therefore I shall pass them over, and only enumerate those which are planted for use.

The SPECIES are,

1. SALIX (*Alba*) foliis lanceolatis acuminatis serratis utrinque pubescentibus, serraturis infimis glandulosis. Hort. Cliff. 473. *Willow with spear-shaped, acute-pointed, sawed leaves, which are downy on both sides, and glands below the saws.* Salix vulgaris alba, arborescens. C. B. P. 453. *Common white Tree Willow.*

2. SALIX (*Triandra*) foliis serratis glabris, floribus triandris. Lin. Sp. Plant. 1015. *Willow with smooth sawed leaves, and flowers having three stamina.* Salix folio auriculato splendente flexilis. Raii Hist. 1420. *Willow with lucid eared leaves and flexible branches.*

3. SALIX (*Pentandra*) foliis serratis glabris, flosculis pentandris. Hort. Cliff. 454. *Willow with smooth sawed leaves, and flowers having five stamina.* Salix folio laureo seu lato glabro odorato. Raii Hist. 1420. *Willow with a Bay leaf, or broad-leaved, smooth, sweet Willow.*

4. SALIX (*Vitellina*) foliis serratis ovatis acutis glabris, serraturis cartilagineis, petiolis calloso punctatis. Hort. Upsal. 295. *Willow with smooth, oval, acute, sawed leaves, having cartilaginous indentures, and foot-stalks with callous punctures.* Salix sativa lutea, folio crenato. C.B.P. 473. *Yellow cultivated Willow with a crenated leaf.*

5. SALIX (*Amygdalina*) foliis serratis glabris lanceolatis petiolatis, stipulis trapeziformibus. Flor. Leyd. Prod. 83. *Willow with smooth, spear-shaped, sawed leaves having foot-stalks, and trapezium-shaped stipulæ.* Salix folio amygdalino, utrinque virente aurito. C. B. P. 43. *Almond-leaved Willow with leaves which are eared, and green on both sides.*

6. SALIX (*Fragilis*) foliis serratis glabris ovato-lanceolatis, petiolis dentato-glandulosis. Flor. Lapp. 349. *Willow with oval, spear-shaped, smooth, sawed leaves, and indented glandules to the foot-stalk.* Salix folio longo latoque splendente fragilis. Raii Syn. 3. p. 448. *The Crack Willow.*

7. SALIX (*Purpurea*) foliis serratis glabris lanceolatis, inferioribus oppositis. H. Scan. 252. *Willow with smooth, spear-shaped, sawed leaves, the lower of which grow opposite.* Salix folio longo subluteo non auriculata, viminibus rubris. Raii Syn. *The long-leaved red Willow.*

8. SALIX (*Viminalis*) foliis subintegerrimis lanceolato-linearibus longissimis acutis subtus sericeis, ramis virgatis. Flor. Suec. 813. *Willow with the longest, linear, spear-shaped, acute leaves, which are almost entire, and silky on their under side, and rod-like branches.* Salix foliis angustis & longissimis crispis, subtus albicantibus. J. B. 1. p. 212. *Willow with the longest, narrow, curled leaves, which are white on their under side.*

9. SALIX (*Auriculata*) foliis serratis glabris lanceolatis, omnibus alternis. *Willow with smooth, spear-shaped, sawed leaves, all growing alternate.* Salix folio amygdalino utrinque aurito, corticem abjiciens. Raii Syn. 3. p. 448. *Almond-leaved Willow which is eared on both sides, and casts its bark.*

10. SALIX (*Rubra*) foliis integris, glabris lineari lanceolatis acutis. Hudſ. Flor. Angl. 364. *Willow with linear, spear-shaped, smooth leaves.* Salix minimè fragilis, foliis longissimis, utrinque viridibus non serratis. D. Sherard. Raii Syn. 2. p. 293. *The least brittle Willow, with very long leaves which are green on both sides, and not sawed.*

11. SALIX (*Babylonica*) foliis serratis glabris lineari-lanceolatis, ramis pendulis. Hort. Cliff. 454. *Willow with smooth, sawed, linear, spear-shaped leaves, and hanging branches.* Salix Orientalis, flagellis deorsum pulchrè pendentibus. Tourn. Cor. 41. *The Weeping Willow.*

12. SALIX (*Helix*) foliis serratis glabris lanceolato-linearibus, superioribus oppositis obliquis. Flor. Leyd. Prod. 83. *Willow with linear, spear-shaped, smooth, sawed leaves, the upper of which are placed obliquely opposite.* Salix humilior foliis angustis subcæruleis ex adverso binis. Raii Syn. 2. p. 297. *The yellow Dwarf Willow.*

13. SALIX (*Caprea*) foliis ovatis rugosis, subtus tomentosis undatis supernè denticulatis. Flor. Leyd. Prod. 83. *Willow with oval rough leaves which are waved, woolly on their under side, and indented towards the top.* Salix latifolia rotunda. C. B. P. 474. *Broad round-leaved Willow, or Sallow.*

14. SALIX (*Acuminata*) foliis oblongo-ovatis acuminatis rugosis subtus tomentosis. *Willow with oblong, oval, acute-pointed, rough leaves, which are woolly on their under side.* Salix folio ex rotunditate acuminato. C.B.P. 474. *Willow with a rounded, acute-pointed leaf, or common Sallow.*

The first sort is the common white Willow, which is frequently found growing on the sides of rivers and ditches in many parts of England. It grows to a large size, if the branches are not lopped off; the shoots are covered with a smooth, pale, green bark; the leaves are spear-shaped, between three and four inches long, and one broad in the middle, drawing to a point at each end; they are very white on their under side, and their upper side is covered with short, white, woolly hairs, though not so closely as the under; the katkins are short and pretty thick. The wood of this sort is very white, and polishes smooth.

The second sort grows to be a large tree, the young branches are covered with a grayish bark; the leaves are smooth, of a lucid green, ending in acute points; they are eared at their base, and sawed on their edges, and are green on both sides; the branches grow pretty erect and are flexible, so this is frequently planted in Osier-grounds for the basket-makers. The katkins of this are long, narrow, and the scales open, and are acute-pointed.

The third sort hath thick strong shoots, covered with a dark green bark; the leaves are broad, rounded at both ends; they are very smooth, sawed on their edges, and when rubbed have a grateful odour. It is sometimes called the Bay-leaved Willow, and at others the Sweet Willow; it grows quick, and is a tree of middling size; the branches are brittle, so are not proper for many purposes.

The fourth sort has slender tough shoots, which are of a yellow colour; the leaves are oval, acute-pointed, smooth, and sawed on their edges; the saws are cartilaginous, and the foot-stalks of the leaves have callous punctures. This is very pliable, so is much planted in the Osier-grounds for the basket-makers, but it never grows to a large size.

The fifth sort grows to a pretty large size; the shoots are erect, they are covered with a light green bark; the leaves are spear-shaped, about two inches and a half long, and three quarters of an inch broad in the middle, drawing to a point at both ends; they are of a lucid green on both sides, sawed on their edges, standing upon short foot-stalks; they have stipulæ in form of a trapezium, at the base of the foot-stalk. The twigs of this sort are flexible, and fit for the use of basket-makers.

The sixth sort grows to a middling size; the shoots of this are very brittle, so are unfit for the basket-makers, and are covered with a brownish bark; the leaves are near five inches long and one broad; they are of a lucid green on both sides, and are sawed on their edges; the katkins are long and slender, and the scales are pretty long, acute-pointed, and stand open. It is commonly called Crack Willow, from the branches being very brittle.

The seventh sort is a tree of middling size; the shoots are very pliable, and fit for the basket-makers, so is much planted in the Osier-grounds; they are of a reddish colour; the leaves are spear-shaped, smooth, and sawed on their edges; those on the lower part of the branches are placed opposite, but on the upper they are alternate, and are of a yellowish green.

The eighth sort makes very long shoots, but the tree seldom grows to a large size; the leaves are very long and entire, and are set close upon the branches; they

are of a dark green on their upper side, but are very woolly and white on their under, ending in acute points, and stand upon very short foot-stalks: the young branches of this sort are woolly, and their buds are very turgid. This is pretty much planted in the Osier-grounds, for the use of basket-makers.

The ninth sort is a tree of middling growth; it casts its bark annually; the shoots are brittle, they have a yellowish bark; the leaves are spear-shaped, and sawed on their edges; they are eared on both sides at their base, and are all placed alternate, being of a light green on both sides. This sort is not very commonly cultivated, the twigs being too brittle.

The tenth sort hath very pliant branches, so is much planted in the Osier-grounds. The leaves of this are very long; they are spear-shaped and entire, and are green on both sides. It grows to a middling size, if planted in moist land.

The eleventh sort grows naturally in the Levant, but has been several years cultivated in the English gardens. This will grow to a middling size; the branches are long, slender, and hang down on every side, so form natural arches; the leaves are narrow, spear-shaped, smooth, and sawed on their edges. It is well known in the gardens, by the title of Weeping Willow.

The twelfth sort is a tree of lower growth; the branches of this are erect; the leaves are smooth, narrow, spear-shaped, and sawed on their edges; they are of a dark or bluish green, and toward the upper part of the branches are placed opposite. It is found by the side of ditches in many parts of England.

The thirteenth sort grows naturally upon dry land, and on high situations, but rarely is seen of a large size; the bark is of a gray dark colour, and smooth; the branches are brittle, so are unfit for basket-makers, but it is frequently cultivated in hedges, and for fuel in many parts of England: it is called Mountain Osier. The leaves are oval, rough, and woolly, and are indented toward the top; they are about an inch and a half long, and one inch broad, rounded at both ends, and have short foot-stalks. There is a variety of this in the gardens with variegated leaves.

The fourteenth sort is the common Sallow; this differs from the last, in having longer leaves which end in acute points; they are woolly on their under side, and sit close to the branches; they are not distinguished by the farmers, who cultivate them equally.

There are some other sorts of Willows which are planted in the Osier-grounds, and are distinguished by the basket-makers and dealers in them, under titles which they have applied to them, which are little known to others; these are annually cut down, and always kept low, but when they are not cut down, and have room to grow, will rise to a considerable height, and some of them will become large trees; so that they may be planted for the same purposes as the first sort, and will make a variety when intermixed with it, though they are commonly cultivated for their twigs, which produce good profit to the owner of the land.

All the sorts of Willows may be easily propagated by planting cuttings or sets, either in the spring or autumn, (but the spring is the surest season) which readily take root, and are of a quick growth. Those sorts which grow to be large trees, and are cultivated for their timber, are generally planted from sets, which are about seven or eight feet long; these are sharpened at their larger end, and thrust into the ground by the sides of ditches and banks, where the ground is moist; in which places they make a considerable progress, and are a great improvement to such estates, because their tops will be fit to lop every sixth or seventh year. This is the usual method now practised in most parts of England, where the trees are cultivated, as they are generally intended for present profit; but if they are designed for large trees, or are cultivated for their wood, they should be planted in a different manner; for those which are planted from sets of seven or eight feet long always send out a number of branches toward the top, which spread, and form large heads fit for lopping, but their principal stem never advances in height; therefore, where regard is paid to that, they should be propagated by short young branches, which should be put almost their whole length in the ground, leaving only two, or at most but three buds out of the ground; and when these have made one year's shoot, they should be all cut off, except one of the strongest and best situated, which must be trained up to a stem, and treated in the same way as timber trees. If these are planted with such design, the rows should be eight feet asunder, and the sets four feet distance in the rows; by planting them so close, they will naturally draw each other upward, and, when they are grown so large, as to cover the ground and meet, they should be gradually thinned, so as at the last to leave the rows about twelve feet asunder, and the plants in the rows eight. If they are so treated, the trees will grow to a large size, and rise with upright stems to the height of forty feet or more.

When these cuttings are planted, it is usual to sharpen those ends to a point which are put into the ground, for the better thrusting of them in; but the best way is to cut them horizontally just below the bud or eye, and to make holes with an iron instrument in the ground where each cutting is to be planted, and when they are put in, the ground should be pressed close about the cuttings with the heel to settle it, and prevent the air from penetrating deep into the ground. The after care must be to keep them clear from weeds the two first seasons, by which time they will have acquired so much strength, as to over-power and keep down the weeds; they will also require some trimming in winter to take off any lateral shoots, which, if suffered to grow, would retard their upright progress.

There are great tracts of land in England fit for this purpose, which at present produce little to the owners, and might, by planting of these trees, turn to as good account as the best Corn land. The larger wood, if found, is commonly sold for making wooden heels for shoes; as also to turners for many kinds of light ware.

The Sallows are commonly planted in cuttings made from strong shoots of the former year, about three feet long; these are commonly thrust down two feet deep into the ground, and are one foot above it. The cuttings should be placed about five feet row from row, and two feet asunder in the rows, observing always to plant the rows the sloping way of the ground (especially if the tides overflow the place;) because, if the rows are placed the contrary ways, all the filth and weeds will be detained by the sets, which will choak them up.

The best season for planting these cuttings in the Osier-grounds is in February, for if they are planted sooner, they are apt to peel, if it proves hard frost, which greatly injures them. These plants are always cut every year, and, if the soil be good, they will produce a great crop, so that the yearly produce of one acre has been often sold for fifteen pounds, but ten pounds is a common price, which is much better than Corn land; so that it is great pity these plants are not more cultivated, especially upon moist boggy soils, upon which few other things will thrive.

SALSOLA. Lin. Gen. Plant. 275. Kali. Tourn. Inst. R. H. 247. tab. 128. Glasswort; in French, *Soude*.

The CHARACTERS are,

*The empalement of the flower is permanent, and composed of five oval obtuse leaves; the flower has no petals, but hath five short stamina which are inserted in the divisions of the petals; it hath a globular germen, with a short two-pointed style, crowned by recurved stigmas. The germen afterward becomes a globular capsule with one cell, wrapped up in the empalement, inclosing one large seed.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and two styles.

The Species are,

1. Salsola (*Kali*) herbacea decumbens, foliis subulatis spinosis, calycibus marginatis axillaribus. Lin. Sp. Plant. 222. *Herbaceous trailing Salsola with awl-shaped prickly leaves, and empalements proceeding from the sides of the stalks.* Kali spinosum foliis crassioribus & brevioribus. Tragum. Matth. 1035. *Prickly Glasswort with shorter and thicker leaves.*
2. Salsola (*Tragus*) herbacea erecta, foliis subulatis spinosis lævibus, calycibus ovatis. *Herbaceous Salsola with awl-shaped prickly leaves, and oval empalements.* Kali spinosum, foliis longioribus & angustioribus. Tourn. Inst. R. H. 247. *Prickly Glasswort with longer and narrower leaves.*
3. Salsola (*Soda*) herbacea, foliis inermibus. Guett. Stamp. 426. *Herbaceous Salsola with smooth leaves.* Kali majus cochleato semine. C. B. P. 287. *Greater Glasswort with a cochleated leaf.*
4. Salsola (*Vermiculata*) frutescens, foliis ovatis acutis carnosis. Lin. Sp. Plant. 223. *Shrubby Salsola with oval, fleshy, acute-pointed leaves.* Kali fruticosum Hispanicum, tamarisci folio. Tourn. Inst. R. H. 247. *Shrubby Spanish Glasswort with a Tamarisk leaf.*
5. Salsola (*Rosacea*) herbacea, foliis subulatis mucronatis, calycibus explanatis. Lin. Sp. Plant. 222. *Herbaceous Salsola with pointed awl-shaped leaves, and spreading empalements.* Kali humile, alis purpureis florem rosaceum mentientibus. Buxb. Cent. 1. p. 9. *Dwarf Glasswort, having purple wings which resemble a Rose flower.*

The first sort grows naturally in the salt-marshes in divers parts of England; it is an annual plant, which rises about five or six inches high, sending out many side branches from the bottom, which spread on every side; these are garnished with short awl-shaped leaves which are fleshy, and terminate in acute spines. The flowers are produced from the sides of the branches, to which they sit close, and are encompassed by short prickly leaves; they are small, and of an herbaceous colour. The seeds are wrapped up in the empalement of the flower, and ripen in autumn, soon after which the plants decay.

The second sort grows naturally on the sandy shores of the south of France, Spain, and Italy; this is also an annual plant, which sends out many diffused stalks a foot and a half long, which are garnished with linear leaves an inch long, ending with sharp spines. The flowers come out from the side of the stalks in the same manner as those of the former; their empalements are blunt, and not so closely encompassed with leaves as those of the other.

The third sort rises with herbaceous stalks near three feet high, sending out hoary branches their whole length, which at bottom spread out wide, but toward the top they are short. The leaves on the principal stalk, and those on the lower part of the branches, are long, slender, and have no spines; those on the upper part of the stalk and branches are slender, short, and crooked. At the base of the leaves are produced the flowers, which are small and hardly perceptible; the empalement of the flower afterward encompasses the capsule, which contains one cochleated seed. This sort in warm countries produces its flowers in June, and the seeds ripen in August; but in this country the plants scarce ever flower, unless the summer is very warm. This plant is cultivated about Montpelier in salt-marshes, in order to make sal alkali.

The fourth sort grows naturally in Spain; this hath shrubby perennial stalks which rise three or four feet high, sending out many side branches, which are garnished with fleshy, oval, acute-pointed leaves, coming out in clusters from the side of the branches; they are hoary, and have no stiff prickles. The flowers are produced from between the leaves toward the ends of the branches; they are so small as scarce to be discerned, unless they are closely viewed. The seeds are like those of the other kinds.

The fifth sort grows naturally in Tartary; this is an annual plant whose stalks are herbaceous, and seldom rise more than five or six inches high. The leaves are awl-shaped, ending in acute points; the flowers are small, and of a Rose colour, but soon fade; the seeds are like those of the other sorts.

All the sorts of Glasswort are sometimes promiscuously used for making the sal alkali, but it is the third sort which is esteemed best for this purpose. The manner of making it is as follows: having dug a trench near the sea, they lay laths across it, on which they lay the herb in heaps, and having made a fire below, the liquor which runs out of the herbs drops to the bottom, which at length thickening becomes sal alkali, which is partly of a black, and partly of an Ash colour, very sharp and corrosive, and of a saltish taste. This, when thoroughly hardened, becomes like a stone, and is there called soude or sode. It is transported from thence to other countries for making of glass.

SALT is a fossil body, fusible by fire, and congealable again, in the cold, into brittle glebes or crystals; soluble withal in water, so as to disappear therein; never malleable, and having something in it, which, to the organ of taste, affords a sensation of acrimony and sharpness.

Dr. Grew supposes, That the chief governing principle in the juices of plants is the saline or Salt, which saline principle is to be understood as a general term. The vegetable Salts seem to be four, viz. the nitrous, the acid, the alkaline, and the marine. The nitrous Salts seem by nature to be assigned chiefly to the growth of plants, and the other three Salts are exhibited by the several ways of resolving the principles of a plant.

Salt is accounted a good dressing for cold lands, because the nature of it is such, that the drier and hotter it is kept, the more it keeps its own body, and does not turn to water: but when it stands in a cold moist place, in a little time it dissolves to water, and, when turned to water, is fit for the nourishment and feeding of plants, especially annuals.

The reason why Salt, viz. Salt water, is accounted a feeder of plants, is, that it has been often observed that Salt falling on a board, &c. will be long drying; and, if it has been dried by heat, dews, or rain, will make it moist again, and then it steams forth, and that is it which nourishes all plants; but, if it be upon a hot and dry ground, late in the spring, and dry weather comes, it does not, nor can yield its steam or fume.

Pigeons dung is by many esteemed good for cold lands, because it is hotter and salter than any other dung, it being natural to pigeons to eat Salt, for they fly to the sea side early on mornings to pick up the Salt, which the heat of the sun makes by drying up the Salt water, and leaves upon the sand.

The Rev. Dr. Hales, in his excellent Treatise of Vegetation, observes, that plants are of a less durable texture, as they abound with a greater proportion of Salt and water, which is not so strongly attracted as sulphur and air, so they are the less able to endure the cold; and, as plants are observed to have a greater proportion of Salt and water in them in the spring than in autumn, they are more easily injured by cold in the spring, than in a more advanced age, when their quantity of oil is increased, with their greater maturity.

Whence we find, that nature's chief business in bringing the parts of a vegetable, especially its fruit and seed, to a maturity, is to combine together, in a due proportion, the more active and noble principles of sulphur and air, that chiefly constitute oil, which in its most refined state is never found without some degree of earth and Salt in it.

Common Salt, if it could be obtained at a reasonable rate, would be an excellent dressing for most lands, but the exorbitant duty which is laid upon it, renders it too expensive to be used for this purpose, so that it is needless to mention its usefulness.

SALVIA. Tourn. Inst. R. H. 180. tab. 83. Lin. Gen. Plant. 36. [so called from salvus, or salus vitae, i. e. the health of life.] Sage; in French, *Sauge.*

The CHARACTERS are,

*The empalement of the flower is tubulous, of one leaf, striated, and large at the mouth, where it is cut into four parts. The flower is of the lip kind, of one petal; the lower part is tubulous, the upper is large and compressed; the upper lip is concave, incurved, and indented at the point; the lower lip is broad and trifid, the middle segment being large, roundish, and indented. It has two short stamina which stand transverse to the lip, and are fixed in the middle to the tube, to whose tops are fixed glands, upon the upper side of which sit the summits; it has a four-pointed germen supporting a long slender style, situated between the stamina, crowned by a bifid stigma. The germen afterward becomes four roundish seeds which ripen in the empalement.*

This genus of plants is ranged in the first section of Linnæus's second class, which includes those plants whose flowers have two stamina and one style. To this genus he has added the Horminum and Sclarea of Tournefort, which, according to his system, may be joined together; but as there is a difference in the lips of the flowers, I have chosen to keep the three genera distinct, because they have always been known by their different titles both in the gardens and shops.

The SPECIES are,

1. SALVIA (*Officinalis*) foliis lanceolatis-ovatis integris crenulatis, floribus verticillato-spicatis. *Sage with spear-shaped, oval, entire leaves, which are slightly crenated on their edges, and flowers growing in whorled spikes.* Salvia major. C. B. P. *The greater Sage.*
2. SALVIA (*Tomentosa*) foliis infimis cordatis, summis oblongo-ovatis serratis tomentosis, floribus verticillato-spicatis. *Sage with heart-shaped lower leaves, the upper are oblong, oval, sawed, and woolly, and flowers growing in whorled spikes.* Salvia latifolia serrata. C. B. P. 237. *Broad-leaved sawed Sage.*
3. SALVIA (*Auriculata*) foliis lanceolatis sæpius articulatis subtus tomentosis, floribus spicato-verticillatis, calycibus ventricosis. *Sage with spear shaped leaves which are frequently eared, and woolly on their under side, flowers growing in whorled spikes, and bellied empalements.* Salvia minor aurita & non aurita. C. B. P. 237. *Smaller Sage with leaves earless and eared, commonly called Sage of Virtue.*
4. SALVIA (*Hispanica*) foliis lineari-lanceolatis integerrimis tomentosis, floribus spicatis calycibus brevissimis ventricosis acutis. *Sage with linear, spear-shaped, woolly, entire leaves, spiked flowers, and the shortest bellied empalements ending in acute points.* Salvia Hispanica Lavendulæ folio. Tourn. Inst. R. H. 181. *Spanish Sage with a Lavender leaf.*
5. SALVIA (*Fruticosa*) foliis infimis pinnatis, summis ternatis rugosis, floribus spicatis, caule fruticoso tomentosa. *Sage with winged lower leaves, the upper ones trifoliate and rough, flowers growing in spikes, and a shrubby woolly stalk.* Salvia orientalis Absinthium redolens, foliis pinnatis, flore carneo elatior. Sherard. Act. Phil. Lond. 383. *Taller Eastern Sage with a Wormwood smell, winged leaves, and a flesh-coloured flower.*
6. SALVIA (*Pomifera*) foliis lanceolato-ovatis integris crenulatis, floribus spicatis, calycibus obtusis. Hort. Cliff. 12. *Sage with spear-shaped, oval, entire leaves which are slightly crenated, spiked flowers, and blunt empalements.* Salvia Cretica frutescens pomifera, foliis longioribus incanis & crispis. Tourn. Cor. 10. *Shrubby Apple-bearing Sage of Crete, with longer, hoary, and curled leaves.*
7. SALVIA (*Pinnata*) foliis compositis pinnatis. Hort. Cliff. 13. *Sage with compound winged leaves.* Salvia orientalis, latifolia, hirsutissima, viscosa, pinnata, flore & calyce purpureis inodora. Boerh. Ind. alt. 1. p. 167. *Eastern, broad-leaved, hairy, unsavoury Sage, with clammy winged leaves, and the flowers and empalements purple.*
8. SALVIA (*Orientalis*) foliis infimis pinnatis, summis simplicibus crenatis, floribus verticillatis caulibus procumbentibus hirsutissimis. *Sage with winged lower leaves, the upper ones single and crenated, flowers growing in whorls, and the most hairy trailing stalks.* Salvia orientalis, latifolia, Absinthium redolens, flore carneo magno. Boerh. Ind. alt. 1. p. 167. *Eastern, broad-leaved, Wormwood Sage, with a large flesh-coloured flower.*
9. SALVIA (*Dominica*) foliis cordatis obtusis crenatis subtomentosis, corollis calyce angustioribus. Lin. Sp. Plant. 25. *Sage with heart-shaped, blunt, crenated leaves which are somewhat woolly, and the petals narrower than the empalement.* Velezia Monier. *The Velezia of Dr. Monier.*
10. SALVIA (*Aurea*) foliis subrotundis integerrimis, basi truncatis dentatis. Hort. Cliff. 13. *Sage with roundish entire leaves which are torn, and indented at their base.* Salvia Africana frutescens, folio subrotundo glauco, flore magno aureo. Hort. Amst. 2. p. 183. *Shrubby African Sage with a roundish gray leaf, and a large golden flower.*
11. SALVIA (*Africana*) foliis subrotundis serratis, basi truncatis dentatis. Hort. Cliff. 13. *Sage with roundish sawed leaves which are torn, and indented at their base.* Salvia Africana frutescens, folio scorodoniæ, flore violaceo. Hort. Amst. 2. p. 18. *Shrubby African Sage, with a Wood Sage leaf and a Violet flower.*
12. SALVIA (*Integerrima*) foliis oblongo-ovatis integerrimis, calycibus patulis coloratis. Tab. 225. fig. 2. *Sage with oblong, oval, entire leaves, and spreading coloured empalements.*

The first sort is the common large Sage which is cultivated in gardens, of which there are the following varieties: 1. The common green Sage. 2. The Wormwood Sage. 3. The green Sage with a variegated leaf. 4. The red Sage. 5. The red Sage with a variegated leaf; these are accidental variations, and therefore are not enumerated as species. The common Sage grows naturally in the southern parts of Europe, but is here cultivated in gardens for use; but that variety with red or blackish leaves is the most common in the English gardens, and the Wormwood Sage is in greater plenty here than the common green-leaved Sage, which is but in few gardens. The common Sage is so well known as to require no description.

The second sort is generally titled balsamic Sage by the gardeners. The stalks of this do not grow so upright as those of the common Sage; they are very hairy, and divide into several branches, which are garnished with broad, heart-shaped, woolly leaves, standing upon long foot-stalks; they are sawed on their edges, and their upper surfaces are rough; the leaves, which are upon the flower-stalks, are oblong and oval, standing upon shorter foot-stalks, and are very slightly sawed on their edges; the flowers grow in whorled spikes toward the top of the branches; the whorls are pretty far distant, and but few flowers in each; they are of a pale blue, and about the size of those of the common sort. It flowers in June, and in good seasons the seeds ripen in autumn. This Sage is preferred to all the others for making tea.

The third sort is the common Sage of Virtue, which is also well known in the gardens and markets. The leaves of this are narrower than those of the common sort; they are hoary, and some of them are indented on their edges toward the base, which indentures have the appearance of ears. The spikes of flowers are longer than those of the two former sorts, and the whorls are generally naked, having no leaves between them. The flowers are smaller, and of a deeper blue than those of the common red Sage.

The fourth sort grows naturally in Spain. The leaves of this are very narrow and entire, standing in clusters on the side of the stalks; they are very hoary, and the branches are covered with a hoary down; the leaves on the upper part of the stalk are narrower than those of Rosemary; the flowers grow in closer spikes than either of the former, and are of a light blue colour.

The fifth sort grows naturally about Smyrna, from whence the late Dr. William Sherard sent the seeds, which succeeded in the Chelsea Garden. This rises with a shrubby stalk four or five feet high, and divides into

into ſeveral branches which grow erect. The leaves on the lower branches are winged, being compoſed of two or three pair of ſmall lobes, terminated by one large one. Thoſe which grow on the flowering branches are trifoliate, the two inner lobes being ſmall, and the outer one is large, ending in a point; they have the flavour of Wormwood, and their upper ſurface is rough. The flowers grow in long ſpikes at the end of the branches; the whorls are pretty cloſe to each other, and have no leaves between them; the flowers are large, and of a fleſh colour. This flowers in July, but never produces good ſeeds in England.

The ſixth ſort grows naturally in Crete; this hath a ſhrubby ſtalk which riſes four or five feet high, dividing into ſeveral branches, which are garniſhed with ſpear-ſhaped, oval, entire, woolly leaves, ſlightly crenated on their edges. The flowers grow in ſpikes at the end of the branches; they are of a pale blue colour, and have obtuſe empalements. The branches of this Sage have often punctures made in them by inſects, at which places grow large protuberances as big as Apples, in the ſame manner as the galls upon the Oak, and the rough balls on the Briar.

The ſeventh ſort grows naturally in the Levant; this is an annual or biennial plant, with trailing ſtalks. The leaves on the lower part of the ſtalks are compoſed of two or three ſmall pair of lobes, terminated by one large one; thoſe farther up are trifoliate, the outer lobe being four times the ſize of the ſide ones. The flowers grow in whorls round the ſtalks; they are large, and of a deep blue colour, as are alſo their empalements. This flowers in July, and the ſeeds ripen in autumn, ſoon after which the plants generally decay.

The eighth ſort grows naturally about Smyrna, where the late Dr. Sherard gathered the ſeeds; this is a perennial plant with trailing ſtalks, which grow near two feet long, garniſhed toward the bottom with leaves compoſed of two pair of ſmall lobes terminated by a large one, but thoſe toward the top are ſingle and ſtand oppoſite. The flowers are produced in whorls round the ſtalks; they are large, and of a fleſh colour, but are not ſucceeded by ſeeds here.

The ninth ſort grows naturally at St. Domingo; this is an annual plant, which riſes with an erect, four-cornered, branching ſtalk three or four feet high, garniſhed with large heart-ſhaped leaves of a bright green colour, which are obtuſely crenated on their edges, having ſeveral veins on their lower ſide, which diverge from the midrib to the ſides. Their foot-ſtalks are long and ſlender; the flowers are produced in cloſe ſpikes at the end of the branches; they are of a fine blue colour, and their tubes are narrower than the empalement. It flowers in July, and the ſeeds ripen in autumn.

The tenth ſort grows naturally at the Cape of Good Hope; this riſes with a ſhrubby ſtalk ſeven or eight feet high, covered with a light-coloured bark, ſending out branches the whole length, which grow almoſt horizontally; they are garniſhed with roundiſh gray leaves which are entire, and ſeem torn at their baſe, where they are alſo indented. The flowers are produced in thick ſhort ſpikes at the end of the branches; they are very large, and of a dark gold colour; they appear in May and June, but are not ſucceeded by ſeeds in England.

The eleventh ſort grows naturally at the Cape of Good Hope; this riſes with a ſhrubby ſtalk four or five feet high, dividing into branches, which are garniſhed with oval ſawed leaves of a gray colour, and have one or two indentures at their baſe that ſeem torn. The flowers come out in whorls toward the end of the branches; they are of a fine blue colour, and larger than thoſe of the common Sage; theſe appear in ſucceſſion moſt of the ſummer months, and thoſe which come early, are often ſucceeded by ſeeds which ripen in autumn.

The twelfth ſort has been lately raiſed in the Dutch gardens, from ſeeds which were brought from the Cape of Good Hope. It has great reſemblance to the former, but the branches are ſtronger and grow more erect; the leaves are longer and not ſo broad; their edges are not ſawed; the flowers grow in long looſe ſpikes at the end of the branches; they are larger, and of a paler blue than the other, and their empalements are broader, ſpread wider, and are of a pale blue colour, in which conſiſts their difference.

All the ſorts of Sage may be propagated by ſeeds if they can be procured; but as ſome of them do not perfect their ſeeds in England, and moſt of the ſorts, but eſpecially the common kinds for uſe, are eaſily propagated by ſlips, it is not worth while to raiſe them from ſeeds. The ſlips of the hardy ſorts ſhould be planted the beginning of April on a ſhady border, where, if they are now and then refreſhed with water, if the ſeaſon ſhould prove dry, they will ſoon take root. When the ſlips have made good roots, they may be taken up with balls of earth, and tranſplanted where they are to remain, which ſhould always be upon a dry ſoil, and where they may have the benefit of the ſun: for if they are planted on a moiſt ſoil, or in a ſhady ſituation, they are very ſubject to be deſtroyed in winter; nor will theſe plants endure the cold ſo well, when planted upon a rich ſoil, as thoſe which have a barren, dry, rocky ſoil, which is the caſe of moſt of the verticillate plants; for theſe will often grow upon walls, where, although they are more expoſed to the cold than thoſe plants in the ground, they are always found to remain in ſevere winters when the others are deſtroyed. The ſide ſhoots and tops of theſe plants may be gathered in the ſummer, and dried, if deſigned for tea, otherwiſe they are beſt taken green from the plants for moſt other uſes. The roots of the common ſorts of Sage will laſt ſeveral years, if they are in a dry warm ſoil; but where they are often cropped for uſe, the plants will become ragged, ſo there ſhould be a ſucceſſion of young ones raiſed every other year.

The fifth, ſixth, and eighth ſorts are ſomewhat tender, ſo will not live through the winter in the open air in England, therefore theſe muſt be planted into pots filled with freſh, light, ſandy earth, and in winter they muſt be removed under a hot-bed frame, that they may have a great ſhare of freſh air whenever the ſeaſon is mild; for if they are too much drawn, they ſeldom flower well, and make but an indifferent appearance. In ſummer they muſt be expoſed amongſt other exotic plants in ſome well-ſheltered ſituation, for they are pretty hardy, and only require to be ſheltered from the froſt. Theſe plants muſt be often refreſhed with water in warm weather, otherwiſe they will ſhrivel and decay; and they ſhould be new-potted at leaſt twice every ſummer, becauſe their roots will greatly increaſe, which, if confined in the pots too long, will turn mouldy and decay.

The ſeventh and ninth ſorts are annual plants, ſo are only propagated by ſeeds; theſe may be ſown upon a bed of light earth in the places where they are to remain. The ſeeds of the ſeventh ſort ſhould be ſown in autumn, and then the plants will come up the following ſpring; but, if they are kept out of the ground till ſpring, the plants will not come up till the next year. Thoſe of the ninth ſort may be ſown the beginning of April upon a warm border, where the plants will appear in May, and require no other care but to thin them where they grow too cloſe, and keep them clean from weeds; and if they ſhould grow tall, they muſt be ſupported, otherwiſe the ſtrong winds will break them down; but the ſeventh ſort ſpreads its branches upon the ground, ſo will require no ſupport, therefore this only requires to have room, and to be kept clean from weeds.

The tenth, eleventh, and twelfth ſorts ar natives of a warmer country, ſo theſe require protection in winter; they are eaſily propagated by cuttings in the ſpring and ſummer months. If theſe are planted early in the ſpring, it will be the better way to plant them in pots, which ſhould be plunged into a very moderate hot-bed; and, if they are ſhaded from the ſun in the heat of the day, and gently refreſhed with

SAM

water as they may require it, they will have put out good roots in about two months, when they should be inured gradually to the open air, into which they should be removed soon after. The cuttings, which are raised early in the season, will become strong plants before winter, so will be in a better condition to resist the cold than those which are weak.

If the cuttings are planted in summer, they will require no artificial heat, so that if these are planted on a bed of fresh loamy earth, and covered close down with a bell or hand-glass, and shaded from the sun in the heat of the day, giving them now and then a little water, they will take root freely; and when they begin to shoot, they should have free air admitted to them by raising the glass on one side, and so gradually exposed to the open air. When the plants are well rooted, they should be each transplanted into a separate small pot filled with fresh light earth, and placed in a shady situation till they have taken new root; then they may removed to a sheltered situation, where they may remain till the approach of frost, when they must be carried into shelter, and in winter treated in the same manner as other hardy green-house plants, which only require protection from frost, observing not to over-water them during the cold weather, but in summer, when they are in the open air, they will require it often.

SALVIA AGRESTIS. See Teucrium.

SAMBUCUS. Tourn. Inst. R. H. 606. tab. 376. Lin. Gen. Plant. 334. [so called of sambuca, a musical instrument made of this wood, and used by the ancients.] The Elder-tree; in French, *Sureau*.

The Characters are,

*The flower has a small permanent empalement of one leaf, cut into five parts; it has one concave wheel-shaped petal, cut into five obtuse segments at the brim, which are reflexed, and five awl-shaped stamina the length of the petal, terminated by roundish summits, with an oval germen situated under the flower, having no style, in room of which is a swelling gland, crowned by three obtuse stigmas. The germen afterward becomes a roundish berry with one cell, including three angular seeds.*

This genus of plants is ranged in the third section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and three styles.

The Species are,

1. Sambucus (*Nigra*) caule arboreo ramoso, floribus umbellatis. Flor. Leyd. Prod. 243. *Elder with a branching tree-like stalk, and flowers growing in umbels.* Sambucus fructu in umbellâ nigro. C. B. P. 456. *Common Elder with black berries growing in an umbel.*
2. Sambucus (*Laciniata*) foliis pinnatifidis, floribus umbellatis, caule fruticoso ramoso. *Elder with wing-pointed leaves, flowers growing in umbels, and a shrubby branching stalk.* Sambucus laciniato folio. C. B. P. 456. *Cut-leaved Elder, commonly called Parsley-leaved Elder.*
3. Sambucus (*Racemosa*) racemis compositis, ovatis, caule arboreo. Lin. Sp. Plant. 270. *Elder with oval compound bunches of flowers, and a tree-like stalk.* Sambucus racemosa rubra. C. B. P. 456. *Red-berried Mountain Elder.*
4. Sambucus (*Ebulus*) caule herbaceo ramoso, foliolis dentatis. Tab. 226. *Elder with a branching herbaceous stalk, and the small leaves indented.* Sambucus humilis, sive Ebulus. C. B. P. 456. *Dwarf Elder, or Ebulus.*
5. Sambucus (*Humilus*) caule herbaceo ramoso, foliolis lineari-lanceolatis acutè dentatis. *Elder with an herbaceous branching stalk, and linear spear-shaped lobes which are sharply indented.* Sambucus humilis, sive Ebulus folio laciniato. C. B. P. 456. *Dwarf Elder, or Ebulus, with a cut leaf.*
6. Sambucus (*Canadensis*) cymis quinquepartitis, foliis sub-bipinnatis, caule frutescente. Lin. Sp. Plant. 385. *Canada Elder with winged leaves, and a shrubby stalk.*

The first sort here mentioned is the common Elder, which is so well known as to need no description; of this there are the following varieties, viz. the white and green berried Elder, and the variegated leaved Elder. The latter is undoubtedly a variety, but I much doubt if the white is not a distinct species, for the lobes of the leaves are much less, and are very slightly sawed on their edges, whereas those of the common sort are deeply sawed; they are also smoother and of a lighter green, and the plants which have been raised from the berries have not altered, so there is great reason for supposing them different species; but as I have made but one trial of this, I am unwilling to determine upon a single experiment, but shall leave it as a doubt till further trial is made.

The second sort is generally titled Parsley-leaved Elder, by the gardeners; this is by some supposed to be only a variety of the first, but there can be little reason for doubting of its being a distinct species. The lobes of these leaves are narrower than those of the first, and are cut into several segments; these are again deeply indented on their edges regularly, in form of winged leaves. The stalks of this are much smaller than those of the first, and the shoots are short; the leaves have not so strong an odour, and their berries are a little smaller.

The third sort grows naturally upon the mountains in Germany and Italy; this sends up many shrubby stalks from the root, which rise ten or twelve feet high, and divide into many branches, which are covered with a brown bark; the leaves come out opposite; those on the lower part of the branches are composed generally of two pair of lobes, terminated by an odd one; these are shorter and broader than those of the common Elder, and are deeply sawed on their edges; the leaves on the upper part of the branches have frequently but three lobes; they are of a pale green colour, and pretty smooth. The flowers come out at the end of the shoots in oval bunches, which are composed of several smaller; they are of an herbaceous white colour, and appear in April; these are sometimes succeeded by berries in England, which are red when ripe.

The fourth sort grows naturally in many of the midland counties in England, where it is frequently a troublesome weed in the fields; this is called Dwarf Elder, Danewort, and Walwort. It hath creeping roots which spread far in the ground on every side, so propagates very fast wherever the plant once gets possession; the stalks are herbaceous, and rise from three to five feet high, in proportion to the goodness of the ground, and send out a few side branches toward the top; they are garnished with winged leaves, composed of six or seven pair of narrow lobes, terminated by an odd one; these are about four inches long, and one broad near their base, ending in acute points; they are of a deep green, a little indented on their edges, and are placed by pairs along the midrib. The flowers grow in umbels at the top of the stalks; they are of the same form with those of the common Elder, but are smaller, and are spotted with red. These appear in July, and are succeeded by black berries like those of the common Elder, but are smaller.

This plant is frequently used in medicine; it purges serous watery humours by stool, and is therefore much recommended for the dropsy, in which disorder I have known the juice of this plant perform wonders in a short time; it was administered three times a week, two spoonfuls was the dose given at each time. It is also accounted a good medicine for the gout, and scorbutic disorders. The young shoots of the common Elder are frequently sold for this in the markets, from which it may be easily distinguished, by the number and shape of the lobes on each leaf: the common Elder has seldom more than five lobes to each leaf, which are broader and much shorter than than those of the Dwarf Elder, and are pretty deeply sawed on their edges; but the leaves of the Dwarf Elder have nine, eleven, or thirteen lobes to each leaf, which are long, narrow, and very slightly indented on their edges.

The roots of the fifth sort do not creep so much in the ground as those of the fourth; the stalks are herbaceous, but do not rise so high, and are closely gar-

nished with leaves which have seldom more than seven lobes to each, and toward the top of the stalks but five; these are longer and narrower than those of the former, and are deeply cut on their edges, ending with winged acute points. The flowers are produced in umbels at the top of the stalks, which are shaped like those of the former, and are succeeded by the like berries.

The sixth sort grows naturally in North America, where it rises to the height of twenty feet, but in England it is seldom seen much more than half that height; and while the plants are young and full of sap, the frost frequently kill their young shoots almost to the ground; and in wet autumns, when the shoots are replete with moisture, the early frosts frequently injure them.

The leaves of this sort have generally seven or nine lobes, which are longer and narrower than those of the common Elder, and the berries are smaller than those of that sort, but of the same black colour, though not so full of juice, nor have the leaves so strong a scent.

The three first sorts may be easily propagated from cuttings, or by sowing their seeds; but the former being the most expeditious method, is generally practised. The season for planting of their cuttings is any time from September to March, in the doing of which, there needs no more care than to thrust the cuttings about six or eight inches into the ground, and they will take root fast enough, and may afterwards be transplanted where they are to remain, which may be upon almost any soil or situation; they are extreme hardy, and if their seeds are permitted to fall upon the ground, they will produce plenty of plants the succeeding summer.

These trees are often planted for making fences, because of their quick growth; but as their bottoms become naked in a few years, they are not so proper for that purpose; neither would I recommend them to be planted near habitations, because at the season when they are in flower, they emit such a strong scent, as will occasion violent pains in the heads of those who abide long near them; besides, the crude parts which are continually perspired through their leaves, are accounted unwholesome, though the leaves, bark, and other parts, are greatly esteemed for many uses in medicine.

The fourth sort propagates itself fast enough wherever it is once planted, by its creeping roots, so that it is very difficult to keep it within bounds, therefore is not a proper plant for gardens; but those who are inclined to keep it for medicinal use, need only plant one or two of the roots in any abject part of a garden or field, and the place will soon be spread over with it.

The fifth sort is preserved in botanic gardens for the sake of variety, but is seldom admitted into other gardens. This propagates by the root, though not so fast as the other.

The sixth sort will put out roots from cuttings, almost as well as the common Elder; but as it is liable to injury from severe frosts, so it should be planted in a sheltered situation.

The common Elder will grow upon any soil or in any situation; the trees are frequently seen growing on the top, and out of the side of old walls; and they are often seen growing close to ditches, and in very moist places; so that wherever the seeds are scattered, the plants will come up, as they often do from the hollow of another tree. The leaves and stalks of this plant are so bitter and nauseous, that few animals will browse upon it. I have often seen the trees growing in parks, where there has been variety of animals, and have observed they were untouched, when almost all the other trees within reach have been cropped by the cattle.

The young shoots of this tree are strong and very full of pith, but as the trees grow old, their wood becomes very hard, and will polish almost as well as that of the Box-tree, so is often used for the same purposes, where Box-wood is scarce.

The bark, leaves, flowers, and berries of this tree, are used in medicine. The inner bark is esteemed good for dropsies, the leaves are outwardly used for the piles and inflammations. The flowers are inwardly used to expel wind, and the berries are esteemed cordial and useful in hysteric disorders, and are frequently put into gargarisms for sore mouths and throats.

SAMOLUS. Tourn. Inst. R. H. 143. tab. 60. Lin. Gen. Plant. 205. Round-leaved Water Pimpernel.

The Characters are,

*The empalement of the flower is permanent, erect, and cut into five segments. It has one petal, with a short spreading tube; the brim is plain, obtuse, and cut into five parts. It has five short stamina placed between each segment of the petal, terminated by summits which join together. The germen is situated under the flower, supporting a slender style, crowned by a headed stigma. The germen afterward becomes an oval capsule with one cell, cut half through into five valves, filled with small oval seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and one style.

We have but one Species of this plant, viz.

Samolus (*Valerandi*) valerandi. J. B. *Round-leaved Water Pimpernel.*

This plant grows wild in swampy places, where the water usually stands in winter, and is seldom preserved in gardens. It is an annual plant which flowers in June, and the seeds are ripe in August; at which time, whoever hath a mind to cultivate this plant, should sow the seeds on a moist soil, where the plants will come up, and require no farther care but to keep them clean from weeds.

SAMYDA. Lin. Gen. Plant. 525. Guidonia. Plum. Nov. Gen. 4. tab. 24.

The Characters are,

*The flower has a rough bell-shaped empalement of one leaf, which is cut at the brim into five points, which spread open. It has no petal, but has fifteen short awl-shaped stamina inserted in the empalement, terminated by oval summits, and a hairy globular germen, supporting a cylindrical style, crowned by a headed stigma. The germen afterward becomes an oval berry with four furrows, having four cells, including many kidney-shaped seeds immersed in the oval receptacle.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and one style.

The Species are,

1. Samyda (*Serrulata*) floribus dodecandris foliis ovato-oblongis serrulatis. Lin. Sp. Plant. 558. *Samyda with oblong, oval, sawed leaves, and flowers with twelve stamina.* Guidonia ulmi foliis, flore roseo. Plum. Nov. Gen. 4. *Guidonia with Elm leaves, and a Rose-coloured flower.*
2. Samyda (*Parviflora*) floribus decandris foliis, ovato oblongis, utrinque glabris. Lin. Sp. Plant. 557. *Samyda with flowers having ten stamina, and oblong, oval, smooth leaves.* Guidonia nucis juglandis folio. Plum. Nov. Gen. 4. *Guidonia with a Walnut-tree leaf.*

These plants grow naturally in the West-Indies; the first sort rises with a shrubby stalk six or eight feet high, sending out several weak branches, which are garnished with oval leaves drawing to a point; they are an inch and a half long, and one inch broad, sawed on their edges, and of a light green colour. The flowers come out from the wings of the leaves upon short foot-stalks; they have a five-leaved empalement, which is of a bright red within; the stamina which are about ten in number, are inserted in the empalement, and stand erect; and in the center is situated an oval germen, which turns to a berry with four cells, containing small seeds.

The other sort has leaves shaped like those of the former, but are longer and smooth; the inside of the empalement is of a purple colour, in which it differs from the first.

These plants are propagated by seeds, which must be procured from the countries where they naturally grow; these must be sown upon a hot-bed in the spring, and when the plants come up, they must be planted in small pots filled with good kitchen-garden earth, and plunged into a hot-bed of tanners bark, and treated in the same way as other tender plants from the same countries. These should be kept in the bark-bed in the stove till they have acquired strength, then they may be exposed in summer, but in winter they require a good green-house.

SAND, as Dr. Boerhaave defines it, is earth properly so called, which is a fossil body, neither dissoluble by fire, water, nor air; insipid and untransparent, more fusible than stone, still friable, and containing usually a share of fatness.

Dr. Lister divides the English Sands into two classes; the first, sharp or rag Sand, consisting of small transparent pebbles, naturally found on the mountains, and not calcinable; these he farther divides into fine and coarse, and subdivides each, according to the colours, into white, gray, reddish, brown, &c.

The second, soft or smooth, which he subdivides into that with flat particles broken from lime stones, that with silver-like particles, and that with gold-like particles.

As to Sand, its use is to make the clayey earth fertile, and fit to feed vegetables, &c. for earth alone, we find, is liable to coalesce, and gather into a hard coherent mass, as is apparent in clay; and earth thus embodied, and as it were, glued together, is no ways disposed to nourish vegetables; but if with such earth, Sand, &c. i. e. hard crystals, which are not dissolvable in water, and still retain their figure, be intermixed, they will keep the pores of the earth open, and the earth itself loose and incompact, and by that means give room for the juices to ascend, and for plants to be nourished thereby.

Thus a vegetable, planted either in Sand alone, or in a fat glebe, or earth alone, receives no growth or increment at all, but is either starved or suffocated; but mix the two, and the mass becomes fertile. In effect, by means of Sand, the earth is rendered, in some manner, organical; pores and interstices being hereby maintained, something analogous to vessels, by which the juices may be conveyed, prepared, digested, circulated, and at length excerned, and thrown off into the roots of plants.

Grounds that are sandy and gravelly, easily admit both of heat and moisture; but then they are liable to these inconveniencies, that they let them pass too soon, and so contract no ligature, or else retain it too long, especially where there is a clay bottom; and by that means it either parches or chills too much, and produces nothing but Moss and cankerous infirmities; but if the Sand happens to have a surface of good mould, and a bottom of gravel or loose stone, though it do not hold the water, it may produce a forward sweet Grass; and though it may be subject to burn, yet it quickly recovers with the least rain.

Sea Sand is accounted a very good compost for stiff ground, for it effects the two following things, viz. it makes way for the tree or seed to root in stiff ground, and makes a fume to feed it.

Sand indeed is apt to push the plants that grow upon it, early in the spring, and make them germinate near a month sooner than those that grow upon clay, because the salts in the Sand are at full liberty to be raised and put into motion, upon the least approach of the warmth of the sun; but then as they are hasty, they are soon exhaled and lost.

SANGUINARIA. Dill. Hort. Elth. 252. Lin. Gen. Plant. 570. Puccoon.

The Characters are,

*The empalement of the flower is composed of two oval concave leaves, which fall away. It has eight oblong, obtuse, spreading petals, which are alternately narrow. It has many single stamina which are shorter than the petals, terminated by single summits, and an oblong compressed germen having no style, crowned by a permanent thick stigma with two channels. The germen becomes an oblong bellied capsule with two valves, pointed at both ends, inclosing round acute-pointed seeds.*

This genus of plants is ranged in the first section of Linnæus's thirteenth class, which includes those plants whose flowers have many stamina and one style.

We have but one Species of this genus, viz.

Sanguinaria (*Canadensis.*) Hort. Cliff. 202. *Puccoon.* Chelidonium majus, Canadense acaulon. Corn. Canad. 212. *Greater Celandine of Canada having no stalks.*

There are some few other varieties of this plant mentioned in the Eltham Garden, but they are not distinct species, for they vary annually, therefore it is to no purpose to mention their variations.

This plant was formerly ranged in the genus of Celandine, by the title of Chelidonium maximum Canadense acaulon; and this name of Sanguinaria was applied to it by Dr. Dillenius, who was professor of botany at Oxford. We have no proper English name for this, but as the inhabitants of America call it by the Indian name Puccoon, I have continued it here.

It is a native of most of the northern parts of America, where it grows plentifully in the woods; and in the spring, before the leaves of the trees come out, the surface of the ground is, in many places, covered with the flowers, which have some resemblance to our Wood Anemone, but they have short naked pedicles, each supporting one flower at the top. Some of these flowers will have ten or twelve petals, so that they appear to have a double range of leaves, which has occasioned their being termed double flowers; but this is only accidental, the same roots in different years producing different flowers. The roots of this plant are tuberous, and the whole plant has a yellow juice, which the Indians use to paint themselves.

This plant is hardy enough to live in the open air in England, but it should be planted in a loose soil and a sheltered situation, but not too much exposed to the sun. It is propagated by the roots, which may be taken up and parted every other year; the best time for doing of this is in September, that the roots may have time to send out fibres before the hard frost sets in. The flowers of this plant appear in April, and when they decay, the green leaves come out, which will continue till Midsummer; then they decay, and the roots remain unactive till the following autumn; so that unless the roots are marked, it will be pretty difficult to find them after their leaves decay, for they are of a dirty brown colour on the outside, so are not easily distinguished from the earth.

This plant is very proper to mix with the Dog's-tooth Violet, Spring Cyclamen, Persian Iris, Bulbocodium, Sisyrinchium, and some other low growing bulbous and tuberous-rooted flowers, which require the same culture, where these will add to the variety when they are in beauty; for when the roots are strong and grow in a good soil, they will produce a great number of flowers upon each root; the roots may be planted about four or five inches asunder every way.

SANGUIS DRACONIS. See Palma.

SANGUISORBA. Lin. Gen. Plant. 136. Pimpinella. Tourn. Inst. R. H. 156. tab. 69. Burnet, called by the French *Pimpernel.*

The Characters are,

*The empalement of the flower is composed of two short leaves placed opposite, which fall away. The flower hath one plain petal, cut into four obtuse segments, which join at their base. It has four stamina the length of the petal, terminated by small roundish summits, and a four-cornered germen situated between the empalement and petal, supporting a short slender style, crowned by an obtuse stigma,*

*ma. The germen afterward turns to a small capsule with two cells, filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's fourth class, which includes those plants whose flowers have four stamina and one style.

The Species are,

1. Sanguisorba (*Officinalis*) spicis ovatis. Hort. Cliff. 39. *Sanguisorba with oval spikes.* Pimpinella sanguisorba major. C. B. P. 160. *Greater Burnet.*
2. Sanguisorba (*Subauda*) spicis cylindricis, foliolis cordato-oblongis, rigidis, serratis. *Sanguisorba with cylindrical spikes, the lobes of the leaves oblong, heart-shaped, stiff, and sawed.* Pimpinella major, rigida, præalta, auriculata, subauda. Bocc. Mus. 2. 19. *Taller, acid, great Burnet of Savoy, with eared leaves.*
3. Sanguisorba (*Hispanica*) spicis orbiculatis compactis. *Sanguisorba with round compact spikes.* Pimpinella major Hispanica altera, conglomerato flore. H. R. Par. *Another great Burnet of Spain, with a conglomerated flower.*
4. Sanguisorba (*Canadensis*) spicis longissimis. Hort. Cliff. 39. *Sanguisorba with the longest spikes.* Pimpinella maxima Canadensis. Corn. 174. *Greatest Canada Burnet.*

The first sort grows naturally in moist meadows in divers parts of England; the stalks of this rise from two to near three feet high, branching toward the top, and are terminated by thick oval spikes of flowers, of a grayish brown colour, which are divided into four segments almost to the bottom. These appear in June, and are each succeeded by four oblong cornered seeds, which ripen in August. The leaves of this sort are composed of five or six pair of lobes placed along a midrib, terminated by an odd one; the lobes are about two inches long, and one broad at their base, drawing narrower to their point; they are thin, sawed on their edges, and a little downy on their under side.

The second sort grows naturally in Piedmont; this rises with stiff upright stalks more than three feet high, branching out toward the top, each branch being terminated by a cylindrical spike of brown flowers, shaped like those of the former sort, but are smaller. The leaves are long, the foot-stalks are very strong, and much longer than those of the first sort; the leaves have seven or eight pair of stiff lobes, terminated by an odd one; these are oblong, heart-shaped, deeply sawed on their edges, of a lucid green on their upper side, but pale on their under, having pretty long foot-stalks, at the base of which come out two small roundish leaves or ears, which are deeply indented. This retains its difference when propagated by seeds, so is undoubtedly a distinct species.

The leaves of the third sort are smaller than those of the first, having but four pair of lobes to each, terminated by an odd one; these are bluntly sawed on their edges, and have very short foot-stalks; they are of a pale green on their upper side, and hoary on their under. The stalks rise about two feet high, and branch pretty much toward their top, and are terminated by round heads or spikes of reddish flowers, which appear in July, and are succeeded by seeds which ripen in autumn. It grows naturally in Spain.

The fourth sort grows naturally in North America; this hath leaves like those of the first sort, but are a little stiffer; they are composed of four or five pair of lobes, terminated by an odd one; those on the lower part of the midrib stand alternate, but the two upper pair are opposite; they are of a light green colour, and deeply sawed on their edges. The stalks rise three feet high, dividing toward the top into small branches, which stand erect, and are terminated by long spikes of flowers of an herbaceous white colour, each standing upon a short foot-stalk.

There is another with long spikes of red flowers, which grows naturally in the same countries, whose stalks rise higher; the spikes of flowers are thicker, the lobes of the leaves are broader, and are whiter on their under side; but whether this is a distinct species, or an accidental variety of the fourth, I cannot as yet determine.

All these sorts are very hardy perennial plants, and will thrive in almost any soil or situation. They may be propagated either by seeds or parting of the roots; if they are propagated by seeds, they should be sown in the autumn, for when they are sown in the spring, they seldom grow the same year: when the plants come up, they must be kept clean from weeds till they are strong enough to transplant, when they may be planted in a shady border, at about six inches distance each way, observing to water them till they have taken new root, after which they will require no other care but to keep them clean from weeds till autumn, when they may be transplanted to the place where they are to remain; the following summer they will produce flowers and seeds, but their roots will abide many years.

If the roots are parted, it should be done in autumn, that they may get good root before the dry weather comes on in the spring.

The other sorts of Burnet are referred to the article Poterium.

SANICULA. Tourn. Inst. R. H. 326. tab. 173. Lin. Gen. Plant. 289. [so called from sanando, healing, because good in many distempers.] Sanicle.

The Characters are,

*It is a plant with an umbellated flower. The universal umbel hath but few rays, and the involucrum is situated but half round on the outside; the partial umbels have many clustered rays, and their involucrums surround them on every side; the empalement of the flower is scarce discernible; the flowers have five compressed petals which are bifid, and turn inward; they have five erect stamina which are twice the length of the petals, terminated by roundish summits, and a bristly germen situated under the flower, supporting two awl-shaped styles, which are reflexed, crowned by pointed stigmas. The germen afterward becomes a rough oval-pointed fruit, dividing into two parts, each containing one seed.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and two styles.

There is but one Species of this plant, which is a native in England, viz.

Sanicula (*Europæa*) foliis radicalibus simplicibus flosculis omnibus sessilibus. Flor. Suec. 235. *Sanicle whose lower leaves are single, and all the flowers sitting close to the stalk.* Sanicula officinarum. C. B. P. *Sanicle, or Self-heal.*

This plant is found wild in woods and shady places in many parts of England, but being a medicinal plant may be propagated in gardens for use. It may be increased by parting the roots, any time from September to March, but it is best to do it in the autumn, that the plants may be well rooted before the dry weather in spring comes on; they should have a moist soil and a shady situation, in which they will thrive exceedingly.

SANTOLINA. Tourn. Inst. R. H. 460. tab. 260. Lin. Gen. Plant. 847. [so called, on account of its great virtue; q. d. Sancta Herba, i. e. the Holy Herb.] Lavender-cotton; in French, *Petit Cyprès*, or *Garde-robe*.

The Characters are,

*It hath a compound flower with a scaly hemispherical empalement. The flower is uniform, composed of many hermaphrodite florets which are longer than the empalement; these are funnel-shaped, and cut into five parts at the top, which turn backward; they have five fine very short hair-like stamina terminated by cylindrical summits, and an oblong four-cornered germen, supporting a slender style, crowned by two oblong, depressed, torn stigmas. The germen afterward becomes a single, oblong, four-cornered seed, which is either naked, or crowned with very short down, ripening in the common empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which contains those plants whose flowers are composed only of hermaphrodite fruitful florets, and the stamina are connected with the style.

The

The Species are,

1. Santolina (*Chamæcypariſſus*) pedunculis unifloris, foliis quadrifariàm dentatis. Hort. Cliff. 397. *Lavender-cotton with one flower upon a foot-ſtalk, and leaves indented four ways.* Santolina foliis teretibus. Tourn. Inſt. 460. *Common Lavender-cotton.*
2. Santolina (*Villoſa*) pedunculis unifloris, calycibus globoſis, foliis quadrifariàm dentatis tomentoſis. *Lavender-cotton with one flower upon a foot-ſtalk, globular empalements, and woolly leaves which are indented four ways.* Santolina flore majore, foliis villoſis & incanis. Tourn. Inſt. 460. *Lavender-cotton with a larger flower and hoary leaves.*
3. Santolina (*Decumbens*) pedunculis unifloris, caulibus decumbentibus, foliis linearibus quadrifariàm dentatis. *Lavender-cotton with one flower upon a foot-ſtalk, declining foot-ſtalks, and linear leaves which are four ways indented.* Santolina repens & caneſcens. Tourn. Inſt. 460. *Creeping hoary Lavender-cotton.*
4. Santolina (*Virens*) pedunculis unifloris, foliis linearibus longiſſimis bifariàm dentatis. *Lavender-cotton with one flower upon a foot-ſtalk, and very long linear leaves which are two ways indented.* Santolina foliis obſcurè virentibus, flore aureo. Tourn. Inſt. 461. *Lavender-cotton with dark green leaves, and golden flowers.*
5. Santolina (*Roſmarinifolia*) pedunculis unifloris, capitulis globoſis, foliis linearibus integerrimis. *Lavender-cotton with one flower upon a foot-ſtalk, globular heads, and linear entire leaves.* Santolina foliis roriſmarini major. Tourn. Inſt. 491. *Great Lavender-cotton with Roſemary leaves.*
6. Santolina (*Minor*) pedunculis unifloris, foliis linearibus confertis obtuſis. *Lavender-cotton with one flower upon a foot-ſtalk, and linear obtuſe leaves growing in cluſters.* Santolina foliis roriſmarini minor. Tourn. Inſt. 461. *Smaller Lavender-cotton with Roſemary leaves.*
7. Santolina (*Chamæmelifolia*) pedunculis unifloris, foliis longioribus tomentoſis, duplicato dentatis. *Lavender-cotton with one flower upon a foot-ſtalk, and longer woolly leaves which are twice indented.* Santolina incana chamæmeli odore ſuaviore. Boerh. Ind. alt. 123. *Hoary Lavender-cotton with a ſoft Chamomile ſcent.*

The firſt ſort is the common Lavender-cotton which has been long known in the Engliſh gardens; it was formerly titled Abrotanum fæmina, or Female Southernwood, and by the corruption of words was called Brotany by the market-people; it grows naturally in Spain, Italy, and the warm parts of Europe. This hath a ſhrubby ſtalk dividing into many ligneous branches, which are garniſhed with ſlender hoary leaves, that are four ways indented, and have a rank ſtrong odour when handled. The branches divide toward the top into ſeveral ſlender ſtalks, whoſe lower parts are garniſhed with a few ſmall leaves of the ſame ſhape as the other, but are naked above, and terminated by a ſingle flower, compoſed of many hermaphrodite florets which are fiſtular, and cut into five parts at the top; they are of a ſulphur colour, and are included in one common ſcaly empalement, and have no borders or rays. Theſe appear in July, and are ſucceeded by ſmall, oblong, ſtriated ſeeds, which are ſeparated by ſcaly chaff, and ripen in the empalement; theſe will riſe near three feet high in a dry ſoil and a ſheltered ſituation. The leaves, and ſometimes the flowers, are uſed in medicine, and are reputed good to deſtroy worms; it is ſometimes called Chamæcypariſſus, or Dwarf Cypreſs.

The ſecond ſort has a ſhrubby ſtalk which branches out like the former, but the plants ſeldom grow ſo tall. The branches are divided into a great number of ſtalks, which are ſhort, hoary, and garniſhed very cloſely below with leaves ſhaped like thoſe of the other ſort, but are ſhorter, thicker, and whiter; the flowers are much larger, and the brims of the florets are more reflexed; they are of a deeper ſulphur colour than the other, but appear at the ſame time. It grows naturally in Spain.

The third ſort is of lower ſtature than either of the former, ſeldom riſing more than fifteen or ſixteen inches high. The branches ſpread horizontally near the ground, and are garniſhed with ſhorter leaves than either of the former; theſe are hoary, and finely indented; the ſtalks are ſhort, and are terminated by ſingle flowers of a bright yellow colour, which are larger than thoſe of the firſt ſort.

The fourth ſort riſes higher than either of the former. The branches are diſpoſed looſer, and are more diffuſed; they are ſlender, ſmooth, and garniſhed with very narrow long leaves, which are of a deep green colour, and but two ways indented; the ſtalks are ſlender, naked toward the top, and terminated by ſingle flowers of a gold colour, which appear at the ſame time with the former.

The fifth ſort hath ſhrubby ſtalks which riſe about three feet high, ſending out long ſlender branches, which are garniſhed with ſingle linear leaves about an inch and a half long, of a pale green colour, and entire. The ſtalks are terminated by large, ſingle, globular flowers, of a pale ſulphur colour, which appear about the ſame time as the former.

The ſixth ſort is ſomewhat like the fifth, but the branches are ſhorter, thicker, and cloſer garniſhed with leaves, which come out in cluſters; they are ſhorter, and have blunt points. The flower-ſtalks are ſparſedly diſpoſed, and have leaves to their top; the flowers are ſmall, and of a yellow colour.

The ſeventh ſort hath ſhrubby ſtalks which riſe near three feet high, and divide into many branches which are hoary, and garniſhed with broader leaves than either of the former, whoſe indentures are looſer, but double; they are hoary, and when bruiſed have an odour like Chamomile. The leaves are placed pretty far aſunder, and the ſtalks are garniſhed with them to the top. The ſtalks are divided likewiſe at the top into two or three foot-ſtalks, each ſuſtaining one pretty large ſulphur-coloured flower.

The firſt of theſe plants is cultivated in gardens for medicinal uſe, and the ſix next are propagated by the gardeners near London for furniſhing balconies, and other little places in and near the city, by way of ornament. Theſe ſeven ſorts are hardy plants, which will thrive in the open air, provided they are planted in a poor dry ſoil, for in ſuch ground the plants will be ſtinted, ſo will be hardy and better able to reſiſt the cold; and they will have a better appearance than thoſe which are in rich ground, whoſe branches will be long and diffuſed, ſo by hard rains or ſtrong winds are diſplaced, and ſometimes broken down; whereas, in poor land, they will grow compact, and the plants will continue much longer.

Theſe plants may be cultivated ſo as to become ornaments to a garden, particularly in ſmall boſquets of evergreen ſhrubs, where, if they are artfully intermixed with other plants of the ſame growth, and placed in the front line, they will make an agreeable variety, eſpecially if care be taken to trim them twice in a ſummer to keep them within bounds, otherwiſe their branches are apt to ſtraggle, and in wet weather to be borne down and diſplaced, which renders them unſightly; but, when they are kept in order, their hoary and different-coloured leaves will have a pretty effect in ſuch plantations.

Theſe plants may be propagated by planting ſlips or cuttings of any of the kinds during the ſpring, which ſhould be put into a border of light freſh earth, and watered and ſhaded in dry weather until they have taken root, after which they will require no farther care, but to keep them clear from weeds till autumn, when they ſhould be carefully taken up, and tranſplanted where they are deſigned to remain; but if the ground is not ready by that time to receive them, it will be proper to let them remain in the border until ſpring; for if they are tranſplanted late in autumn, they are liable to be deſtroyed by cold in winter.

SANTOLINA. See Athanasia and Tanacetum.

SAP: the notion of the Sap's circulation was entertained by ſeveral authors much about the ſame time, without any communication from one another, particularly M. Major, a phyſician of Hamburgh, M. Per-

rault, Mariotte, and Malpighi. It has met, however, with ſome conſiderable oppoſers, particularly the excellent M. Dodart, who could never be reconciled to it.

One of the great arguments for it is, That the ſame experiments of ligature and inciſion, which evince a circulation of the blood in animals, ſucceed in the like manner in plants, particularly in ſuch as abound with a milky ſap, as the Great Tithymale, Milkthiſtle, &c. if the ligature be faſtened tight round them, the part above is found to ſwell very conſiderably, and that below it a little, whence it appears, that there is a juice deſcending from the branches, and that the latter is thicker than the former, which quadrates exactly with the common ſyſtem, the juice being ſuppoſed to ariſe in capillary-veſſels, in form of a ſubtile vapour, which condenſed in the extremes of the plant by the neighbourhood of the cold air, turns back in form of a liquor through the more patent pipes of the inner bark.

M. Dodart, inſtead of the ſame juice's going and returning, contends for two ſeveral juices, the one imbibed from the ſoil digeſted in the root, and from thence tranſmitting from the extremes of the branches for the nouriſhing of the plant, the other received from moiſture of the air entering in at the extremities of the branches and ſurfaces of the leaves, ſo that the aſcending and deſcending juices are not the ſame.

One of his chief arguments is, That if two trees of the ſame kind be tranſplanted in one day, after firſt cutting off their roots and branches; and if, after they have taken root, ſome of the new ſhoots put forth each year be cut off one of from them, it will not thrive half ſo well, notwithſtanding its root and trunk being entire as the other.

This he conceives to be a proof of the plant's deriving nouriſhment by the branches, and concludes it to be of an aërial nature, becauſe formed of the moiſture of the air, dew, &c. whereas that imbibed from ſoil is terreſtrial, &c. Hiſt. de l'Acad. Roy. Ann. 1709.

But by this experiment we can only reaſon for the trees ſo cut, that a great part of the increaſing Sap is deſtroyed, which was contained in theſe young branches, whereby the trees were deprived of this Sap, ſo could not make ſo great progreſs.

The humour or Sap of a plant, then, is a juice furniſhed by the earth, and changed into the plant, conſiſting of ſome foſſil parts, other parts derived from the air and rain, and others from putrefied animals, plants, &c. Conſequently, in vegetables are contained all kinds of ſalts, oil, water, earth, &c. and probably all kinds of metals too, inaſmuch as the aſhes of vegetables always yield ſomewhat which the loadſtone attracts.

This juice enters the plant in form of a fine and ſubtile water; which, the nearer it is to the root, the more it retains of its proper nature, and the farther from the root, the more action it has ſuſtained, and the nearer it approaches to the nature of the vegetable. Conſequently, when the juice enters the root, the bark whereof is furniſhed with excretory veſſels, fitted to diſcharge the excrementitious part, it is earthy, watery, poor, acid, and ſcarce oleaginous at all.

In the trunk and branches it is further prepared, tho' it ſtill continues acid, as we ſee by tapping or perforating of a tree in the month of February, when it diſtils a watery juice apparently acid.

The juice, being here carried to the germs or buds, is more concocted; and here, having unfolded the leaves, theſe come to ſerve as lungs for the circulation and further preparation of the juice.

For theſe tender leaves, being expoſed to the alternate action of heat and cold, moiſt nights, and hot ſcorching days, are alternately expanded and contracted, and the more on account of their reticular texture.

By ſuch means is the juice ſtill further altered and digeſted, as it is further in the petala or leaves of the flowers which tranſmit the juice, now brought to a greater ſubtilty, to the ſtamina; theſe communicate it to the farina or duſt in the apices, which is, as it were, the male ſeed of the plant, where having undergone a further maturation, it is ſhed into the piſtil, which performs the office of an uterus or womb, and thus having acquired its laſt perfection, it gives riſe to a new fruit or plant.

The root or part, whereby vegetables are connected to their matrix, and by which they receive their nutritious juice, conſiſts of an infinite number of abſorbing veſſels, which, being diſperſed through the interſtices of the earth, attract or imbibe the juices of the ſame. Conſequently, every thing in the earth that is diſſoluble in water, is liable to be imbibed, as air, ſalt, oil, fumes of minerals, metals, &c. and of theſe plants really conſiſt.

Theſe juices are drawn from the earth very crude, but by the ſtructure and fabric of the plant, and the various veſſels they are ſtrained through, become changed, further elaborated, ſecreted, and aſſimilated to the ſubſtance of the plant.

The motion of the nutritious juices of vegetables is produced much like that of the blood in animals, by the action of the air; in effect, there is ſomething equivalent to reſpiration throughout the whole plant. The diſcovery of this is owing to the admirable Malpighi, who firſt obſerved, that vegetables conſiſt of two ſeries or orders of veſſels:

1. Such as receive and convey the alimental juices, anſwering to the arteries, lacteals, veins, &c. of animals.

2. Tracheæ or air-veſſels, which are long hollow pipes, wherein air is continually received and expelled, i. e. inſpired and expired; within which tracheæ he ſhews all the former ſeries of veſſels are contained.

Hence it follows, that the heat of a year, nay, of a day, of a ſingle hour, or minute, muſt have an effect on the air included in theſe tracheæ, i. e. muſt rarefy it, and conſequently dilate the tracheæ, whence ariſes a perpetual ſpring or ſource of action to promote the circulation in plants.

For by the expanſion of the tracheæ, the veſſels containing the juices are preſſed, and by that means the juice contained is continually propelled, and ſo accelerated, by which propulſion the juice is continually comminuted, and rendered more and more ſubtile, and ſo enabled to enter veſſels ſtill finer and finer, the thickeſt part of it being at the ſame time ſecreted and depoſited into the lateral cells or loculi of the bark to defend the plant from cold, and other external injuries.

The juice having thus gone its ſtage from the root to the remote branches, and even the flower, and having, in every part of its progreſs, depoſited ſomething both for aliment and defence, what is redundant paſſes out into the bark, the veſſels whereof are inoſculated with thoſe wherein the Sap is mounted, and through theſe it re-deſcends to the root, and then to the earth again, and thus a circulation is effected.

Thus is every vegetable acted on by heat and cold, during the day-time eſpecially, while the ſun's force is conſiderable, the Sap-veſſels ſqueezed and preſſed, and the Sap protruded and raiſed, and at length evacuated, and the veſſels exhauſted; and in the night again, the ſame tracheæ being contracted by the cold of the air, the other veſſels are eaſed and relaxed, and ſo diſpoſed to receive freſh food for the next day's digeſtion and excretion.

What courſe the juice takes after it is imbibed by the roots is not very clear. The veſſels that take it up, to convey to the plant, are too fine to be traced, and hence it has been controverted, whether it is by the bark, or the pith, or the woody part, that the plant is fed.

The more common opinion is for the bark. The juice, raiſed by the capillaries of the wood, is here ſuppoſed to deſcend by the larger fibres, placed in the inmoſt part thereof, immediately over the wood, in which deſcent, the Sap, now ſufficiently prepared, adds a part of its ſubſtance to the contiguous wood, and

and thus increases by appofition, and hence it may be, that hollow, carious, or rotten trees, which have neither pith nor wood, excepting juft enough to fuftain the bark, grow and bear.

Some contend for the wood, which they obferve to confift of flender capillary tubes running parallel to each other from the root up the trunk, being proper to receive in a fine vapour; in the afcent whereof the fibres become open, and their fubftance increafed, and thus the trunks of trees are faid to increafe in their circumference.

As for the pith; as the woody fubftance of the trunk becomes more woody, the pith is compreffed and ftreightened to fuch a degree, that in fome trees it quite difappears, whence it feems, that its office in vegetation is not very important, fince its ufe is not perpetual. By its fpongious fubftance it fhould feem fitted to receive any fuperfluous moifture transfuding through the pores of the woody fibres; and, if by the excefs of fuch moifture, or the like caufe, it corrupt and rot, as it frequently happens in Elms, the tree feems not to grow worfe for it, which is a convincing proof it is of no great ufe.

The learned Dr. Boerhaave diftributes the juices of plants into fix claffes:

1. The firft clafs comprehends the crude nutritious juice, or the juices of the root and ftem of plants, which are little more than the mere matter of the element, as drawn by the root from the body it adheres to, whether it be earth, water, or the like.

This juice is found in every part of the plant, and therefore may be held an univerfal juice; yet he confiders it as the juice of the root and ftem, becaufe it is chiefly found in them.

This he takes to be the fubacid watery lymph without any fpecific tafte or fmell, as not being yet arrived to the maturity of oilinefs.

To this clafs belong thofe juices, which diftil in great abundance from wounds or incifions made in the woody parts of plants; fuch, e. g. is that tart liquor oufing from the root of the Walnut-tree, when cut off in the month of May.

Such alfo is that limpid fubacid humour flowing out very plentifully at an incifion in the Birch-tree, in the month of March, to the quantity of feveral gallons in a few days.

Such alfo is the juice iffuing out of the Vine wounded in the fpring time, which always taftes tartifh, and ferments like the Grapes themfelves.

This juice may be efteemed as yet foffil, being generated of and in the earth; for the juice of the earth, being received into the canals of thefe plants retains its nature during two or three circulations, nor doth it immediately commence a vegetable juice.

This clafs of juices therefore he accounts as the chyle of the plant, being chiefly found in the firft order of veffels, viz. in the roots and the body of the plant, which anfwer to the ftomach and inteftines of animals.

2. The fecond clafs of the juices is that of the leaves, which are the real lungs of plants, and accordingly make a further change of the juice, which they receive from the roots and ftem by force of the air.

The juice of leaves is different therefore from the firft juice, as being more fulphureous, and farther elaborated; not that it derives any fulphur from the fun, but that, its watery part exhaling, it becomes more oily, and lefs volatile.

The juice of leaves he diftinguifhes into three kinds:

The firft is the nutritious juice of the leaves, which is that already defcribed, only further elaborated in the minute veficulæ of the leaves, and confequently lefs watery, and more oily and faccharine.

The fecond is wax, which, exfuding out of the leaves, adheres to the furface, and is fcraped off by bees with their rough thighs to build their combs withal. This is chiefly afforded by Lavender and Rofemary, upon the latter of which the wax may be plainly perceived fticking to the leaves of it.

The third is manna, not that with which the Ifraelites were fed in the defert, but a drug fold among us; it is an effential faccharine falt exfuding chiefly by night, and in the fummer feafon, from the leaves of a fort of Afh growing in Calabria and Sicily, and adhering thereto in the form of a cruft, to be gathered the next morning ere the fun is up.

The like fubftance is found to exfude from the leaves of the Linden-tree and Poplar, in the heats of May and June, at which time they have an honey tafte, and are even feen with a fatty juice on them, which, at the approach of the cold evening, gathers into grains.

3. The third clafs of juices are thofe of flowers, or the genital parts of plants: in thefe are,

Firft, a pure elaborated volatile oil or fpirit, wherein the particular fmell of the plant or flower refides, and which, by reafon of its extreme volatility, exhales fpontaneoufly, infomuch that if the flower be laid for fome time in a warm place, the odorous juice or fpirit will be all fled.

The fecond is the juice expreffed from the flower, which in reality is the fame with that of the root and leaves, only farther prepared; it is thicker than the former, and has fcarce any fmell at all. Thus, if you bruife a Hyacinth, or other fragrant flower, and exprefs the juice, it will be found altogether inodorous.

The third is the fweet juice called honey, which exfudes from all flowers, Aloes, Colocynthus, and other bitter flowers not excepted.

In all male flowers that have utricles at the bottom of the petala, which Dr. Linnæus ftyles the nectarium, is found a vifcid, ruddy, fweet juice in fome plenty, and accordingly we fee the children gather Cowflips, Dead Nettle, Honeyfuckles, &c. and fuck the honey from them. The bees too vifit thefe flowers, and putting in their probofcides or trunks, fuck out the honey, and load their ftomachs therewith to be afterward difcharged and laid up in their combs, fo that honey is a vegetable juice.

4. The fourth clafs of juices are thofe of the fruit and feed, the preparative whereof is nature's final work, which performed, the plants feem to die for a time, as all animals are feen to languifh after the emiffion of their femen.

The juice of the fruit is like that of the root, only farther elaborated.

The juice of the feed is an effential oil or balm elaborated and exalted to its laft perfection. This juice or oil is not found in the very point or embryo in the center of the placenta; all we meet with in that part is a few fine watery particles fecreted from the placenta, but it is in the placentuli or cotyledons themfelves, which confift of innumerable little folliculi or cells, wherein this juice is contained, ferving to defend the embryo, and preferve it from being corrupted by water, which, it is well known, will hardly pafs through oil.

Thus, if you take, e. g. Fennel-feed, cut it through the middle, and apply it to the microfcope, you will eafily perceive a clear fhining oil in the cells of each lobe invefting the tender embryo. Without this oil it were impoffible a feed fhould live a month, and much lefs a year or two entire and uncorrupted in the ground.

This oil is found in the feeds of all plants; in fome, e. gr. in Almonds, Cocoa-nuts, &c. in very great quanties; in others lefs, as Pepper, Arum, &c. where one would fcarce imagine any oil at all; and thefe feeds loofe their vegetative quality very foon.

5. The fifth clafs of juices are thofe of the bark, which is an artful congeries or bundle of perfpirative ducts, and abforbent veffels.

Of thefe juices there are divers fpecies, for the feveral humours raifed and diftributed through the leaves, flowers, and other parts of the plants, have all circulated through the bark, and accordingly are frequently found to diftil from wounds made therein. In fome cafes, even the whole plant is no more than bark, the pulp having been eaten out, as in Willows, Elms, &c. which live a long time in that ftate.

The

The bark serves divers purposes, for it not only transmits the nutritious juices of the plant, but also contains divers fat oily humours to defend the fleshy parts from the injuries of the weather.

6. As animals are furnished with a panniculus adiposus, usually replete with fat, which invest and covers all the fleshy parts, and screens them from external cold, so are plants encompassed with a bark replete with fat juices, by the means whereof the cold is kept out, and in winter time the spiculæ of ice prevented from fixing and freezing the juices in their vessels; whence it is, that some sorts of trees remain evergreen the year round, by reason their barks have more oil than can be spent and exhaled by the sun, and their leaves are covered with a thick oily film over their surface, which prevents their perspiring so much as other plants, and also defends them from the cold, &c.

All the juices of barks are reducible to eight, viz.

1. The crude, acid, watery juice, called the chyle of the plant.

2. An oily juice, which, bursting the bark in the beginning of the summer, exsudes out of several plants, as Cypress, Pine, Fir, Savin, Juniper, and other evergreens, and such alone. This oil dissolves by the smallest degree of warmth, and is easily inflamed, and is that which defends the plant, which is the reason why most of these plants will not thrive in very hot climates.

For balm, or fatty liquor, more glutinous than oil, is nothing but the last mentioned oily juice, which was more fluid during the spring time, but which, by the greater heat of the sun, has evaporated all its most subtile parts, and is converted into a denser liquor. Thus the finer part of oil of Olives being exhaled by the summer's warmth, there remains a thick balsam behind: thus also oil of turpentine, having lost its more liquid parts by heat, becomes of the thick consistence of a balm.

3. A pithy juice, which is the body of the oil itself, inspissates, and turns black, when put into a great warmth: this is the most observed in the Pine and Fir.

5. Resin, which is an oil so far inspissated, as to become friable in the cold, may be procured from any oil by boiling it much and long. Thus, if turpentine be set over a gentle fire, it first dissolves, and becomes an oil, then a balsam, then pitch, and then a resin, in which state it is friable in the cold, fusible by fire, withal inflammable and combustible, dissoluble in spirit of wine, but not in water, which makes the character of resin.

Hence the oil is must abundant in the barks in the winter time, the balsams in summer, and the resin in autumn.

6. Colophony, which is a resin still farther exhausted of its volatile part, being pellucid, friable, and approaching to the nature of glass.

7. Gum, which is an humour exsuding out of the bark, and, by the warmth of the sun, concocted, inspissated, and rendered tenacious, but still dissoluble in water, and at the same time inflammable, and scarce capable of being pulverized. This oily mucilage serves as a pigment to cover over, and defend the buds of trees from the injuries of wet and frost in winter, but will melt with a moist warmth, and easily run from them, when the gentle warmth of the spring approaches, nor is ever so far hardened into a crust, as to do any injury to the inclosed shoot. This oily substance always contains in it an acid spirit, which is a preservative against putrefaction.

8. A gummous resin, which is an humour secreted in the bark, and dried by the heat of the sun, and thus constituting a body that is partly gummous, and, as such, tenacious, soluble in water, partly resinous, and therefore friable, and soluble in oil, or spirit of wine, but not in water.

Botanists are now generally agreed, that all plants are furnished with organs and parts necessary both for chylification and sanguification, that they have veins, arteries, heart, lungs, adipose cellules, &c. If so, it is obvious that there must be some difference between the juices, which have not undergone the action of those parts, and such as have already circulated a number of times.

The several juices hitherto recounted are the first or nutritious juice, called also the chyle of the plant, under such alterations, and new modifications, as it undergoes in being received, and kept some time, in parts of a peculiar structure, as leaves, flower, seed, &c. This last juice, called the blood, is the same nutritious juice farther altered, by being divers times passed through each of these parts, and re-mixed, and at length converted into a new juice, with properties different from any of them all.

To prove the circulation of the Sap, instances are brought from experiments made by Mr. Fairchild, as his budding and inoculating of a Passion-tree, whose leaves are spotted with yellow, into one of that sort of Passion-tree whose leaves are plain; for though the buds did not take, yet after it had been budded a fortnight, the yellow spots began to shew themselves about three feet above the inoculation, and in a little time after that, the yellow spots appeared on a shoot, which came out of the ground from another part of the plant, which has been accounted a plain proof of the Sap's circulation.

Another instance is, another experiment of the same person, who grafted the evergreen Oak, or Ilex, upon the common Oak. The leaves of the common Oak, which was the stock, decayed, and fell off at the usual season of the year, but the evergreen Oak, which was the cyon grafted upon it, held its leaves, and continued shooting in the winter; from whence it is concluded, that when trees drop their leaves, the sap keeps full in motion, and is not gone into the root, as some persons think.

There are also other experiments of the same person, which were shewn before the Royal Society, as the New-England Cedar, or rather Juniper, grafted on the Virginian, and what is taken to prove the circulation in it, is, the branch which was grafted was left several inches below the grafting, which continued growing as well as the upper part above the grafting. And also another, which is the Viburnum, with the top planted in the ground, which was become roots, and the roots turned up, which were become branches; which plant was in as good a state of growing, as it was in its natural state.

A third experiment of his was on a Pear-tree, which he inarched upon two Pear stocks in March 1721-2, having the roots out of the ground, and was in a good flourishing state, with a branch in blossom, that receives no other nourishment but by the juices that return down the other two branches, which, though it had been done above two years, continued shooting suckers out of the root; which is esteemed as a proof, that the branches are as useful to support the roots, as the roots the branches, and thence he infers, that it is not strange that so many trees miscarry in planting, when there are no branches left to the head to maintain the circulation to the roots.

A fourth experiment he made on the Cedar of Lebanus, grafted on the Larix, which drops its leaves in the winter, yet maintained the Cedar in a flourishing condition, as if it had been on a tree which held its leaves all the winter, and the circulation of juices supported the graft below the grafting, and kept it in as good health as above the grafting.

In opposition to the notion of the circulation of the Sap in trees like that in animal bodies, the Reverend Dr. Hales, in his excellent Treatise on Vegetable Statics, presents us with various experiments, and says,

When the Sap has first passed through that thick and fine strainer, the bark of the root, we then find it in greatest quantities in the most lax part between the bark and wood, and that the same through the whole tree.

And if in the early spring, the Oak, and several other trees, were to be examined near the top and bottom, when

when the Sap firſt begins to move, ſo as to make the bark run, and eaſily peel off, he believes it would be found, that the lower bark is firſt moiſtened, whereas the bark of the top branches ought firſt to be moiſtened, if the Sap deſcends by the bark. As to the Vine, he ſays, he is pretty well aſſured, that the lower bark is firſt moiſtened.

He adds, That it is to be ſeen in many of the examamples of the experiments he has given in that book, what quantities of moiſture trees daily imbibe and perſpire; now the celerity of the Sap muſt be very great, if that quantity of moiſture muſt moſt of it aſcend to the top of the tree, then deſcend, and aſcend again, before it is carried off by perſpiration.

The defect of a circulation in vegetables ſeems, in ſome meaſure, to be ſupplied by the much greater quantity of liquor which the vegetable takes in, than the animal, whereby its motion is accelerated; for, by the firſt example he gives, we find the Sunflower, bulk for bulk, imbibes and perſpires ſeventeen times more freſh liquor than a man every twenty-four hours. Beſides, nature's great aim in vegetables being only that the vegetable life be carried on and maintained, there was no occaſion to give its Sap the rapid motion which was neceſſary for the blood of animals.

In animals it is the heart which ſets the blood in motion, and makes it continually circulate, but in vegetables we can diſcover no other cauſe of the Sap's motion, but the ſtrong attraction of the capillary Sap-veſſels, aſſiſted by the briſk undulation and vibrations cauſed by the ſun's warmth, whereby the Sap is carried up to the top of the talleſt trees, and is there perſpired off through the leaves; but, when the ſurface of the tree is greatly diminiſhed by the loſs of its leaves, then alſo the perſpiration and motion of the Sap is proportionably diminiſhed, as is plain from many of his experiments.

So that the aſcending velocity of the Sap is principally accelerated by the plentiful perſpiration of the leaves, thereby making room for the fine capillary-veſſels to exert their vaſtly attracting power; which perſpiration is effected by the briſk rarefying vibrations of warmth, a power that does not ſeem to be any ways well adapted to make the Sap deſcend from the tops of vegetables, by different veſſels, to the root.

If the Sap circulated, it muſt needs have been ſeen deſcending from the upper part of large gaſhes cut in branches ſet in water, and with columns of water preſſing on their bottoms in long glaſs tubes, in his 43d and 44th experiment.

In both which caſes it is certain that great quantities of water paſſed through the ſtem, ſo that it muſt needs have been ſeen deſcending, if the return of the Sap downward were by truſion or pulſion, whereby the blood in animals is returned through the veins to the heart, and that pulſion, if there were any, muſt neceſſarily be exerted with prodigious force to be able to drive the Sap through the finer capillaries.

So that if there be a return of the Sap downward, it muſt be by attraction, and that a very powerful one, as may be ſeen by many of theſe experiments, and particularly by experiment the 11th. But it is hard to conceive what and where that power is, which can be equivalent to that proviſion nature has made for the aſcent of the Sap, in conſequence of the great perſpiration of the leaves.

The inſtances of the Jaſmine-tree, and of the Paſſion-tree, have been looked upon as proofs of the circulation of the Sap, becauſe their branches, which were far below the inoculated bud, were gilded. But we have many viſible proofs in the Vine, and other bleeding trees, of the Sap's receding back, and puſhing forward alternately, at different times of the day and night; and there is great reaſon to think that the Sap of all other trees has ſuch an alternate receding and progreſſive motion, occaſioned by the alternacies of day and night, warm and cold, moiſt and dry.

For the Sap in all vegetables does probably recede, in ſome meaſure, from the tops of branches, as the ſun leaves them, becauſe its rarefying power then ceaſing, the greatly rarefied Sap and air mixed with it will condenſe, and take up leſs room than they did, and the dew and rain will then be ſtrongly imbibed by the leaves, as is probable from experiment 42, and ſeveral others, whereby the body and branches of the vegetable, which have been much exhauſted by the great evaporation of the day, may at night imbibe Sap and dew from the leaves.

For, by ſeveral experiments in the 1ſt chapter of the aforeſaid book of Vegetable Statics, plants were found to increaſe conſiderably in weight in dewy and moiſt nights.

And by other experiments on the Vine, in the 3d chapter, it was found that the trunk and branches of Vines were always in an imbibing ſtate cauſed by the great perſpiration of the leaves, except in the bleeding ſeaſon; but, when at night that perſpiring power ceaſes, then the contrary imbibing power will prevail, and draw the Sap and dew from the leaves, as well as moiſture from the roots.

And we have a further proof of this in experiment 12, where, by fixing mercurial gauges to the ſtems of ſeveral trees which do not bleed, it is found that they are always in a ſtrongly imbibing ſtate, by drawing up the mercury ſeveral inches; whence it is eaſy to conceive, how ſome of the particles of the gilded bud in the inoculated Jaſmine my be abſorbed by it, and thereby communicate their gilding miaſma to the Sap of the branches, eſpecially when, ſome months after the inoculation, the ſtock of the inoculated Jaſmine is cut off a little above the bud, whereby the ſtock, which was the counter-acting part of the ſtem, being taken away, the ſtem attracts more vigorouſly from the bud.

Another argument for the circulation of the Sap is, that ſome ſorts of grafts will infect and canker the ſtocks they are grafted on, but by experiment 12 and 37, where mercurial gauges were fixed to freſh-cut ſtems of trees, it is evident that thoſe ſtems were in a ſtrongly imbibing ſtate, and conſequently the cankered ſtocks might very likely draw Sap from the graft, as well as the graft alternately from the ſtock, juſt in the ſame manner as leaves and branches do from each other in the viciſſitudes of day and night.

And this imbibing power of the ſtock is ſo great, where only ſome of the branches of the ſtock will, by their ſtrong attraction, ſtarve thoſe grafts, for which reaſon it is uſual to cut off the greateſt part of the branches of the ſtock, leaving only a few ſmall ones to draw up the Sap.

The inſtance of the Ilex grafted upon the Engliſh Oak ſeems to afford a very conſiderable argument againſt a circulation, for if there were a free uniform circulation of the Sap through the Oak and Ilex, why ſhould the leaves of the Oak fall in winter, and not thoſe of the Ilex?

Another argument againſt an uniform circulation of the Sap in trees, as in animals, may be drawn from Dr. Hale's 37th experiment, viz. where it was found, by the three mercurial gauges fixed to the ſame Vine, that while ſome of its branches changed their ſtate of protruding Sap into a ſtate of imbibing, others continued protruding Sap, one nine, and the other thirteen days longer.

That the Sap does not deſcend between the bark and the wood, as the favourers of a circulation ſuppoſe, ſeems evident from hence, viz. That if the bark be taken off for three or four inches breadth quite round, the bleeding of the tree above that bared place will much abate, which ought to have the contrary effect, by intercepting the courſe of the refluent Sap, if the Sap deſcended by the bark.

But the reaſon of the abatement of the bleeding in this caſe may be well accounted for, from the manifeſt proof we have in theſe experiments, that the Sap is ſtrongly attracted upward by the vigorous operation of the perſpiring leaves, and attracting capillaries; but, when the bark is cut off for ſome breadth

below the bleeding place, then the Sap which is between the bark and the wood below that disbarked place, is deprived of the strong attracting power of the leaves, &c. and consequently the bleeding wound cannot be supplied so fast with Sap, as it was before the bark was taken off.

But the most considerable objection against this progressive motion of the Sap without a circulation, arises from hence, viz. That it is too precipitate a course for a due digestion of the Sap, in order to nutrition, whereas in animals, nature has provided that many parts of the blood shall run a long course before they are either applied to nutrition, or discharged from the animal.

But when we consider that the great work of nutrition in vegetables, as well as animals (I mean, after the nutriment is got into the veins and arteries of animals,) is chiefly carried on in the fine capillary vessels, where nature selects and combines, as shall best suit her different purposes, the several mutually attracting nutritious particles, which were hitherto kept disjoined by the motion of their fluid vehicle. We shall find that nature has made abundant provision for this work in the structure of vegetables, all whose composition is made up of nothing else but innumerable fine capillary vessels, and glandulous portions of vessels.

Upon the whole he thinks we have, from these experiments and observations, sufficient ground to believe, that there is no circulation of the Sap in vegetables, notwithstanding many ingenious persons have been induced to think there was from several curious observations and experiments, which evidently prove that the Sap does in some measure recede from the top toward the lower part of plants, whence they were, with good probability of reason, induced to think that the Sap circulated.

SAPINDUS. Tourn. Inst. R. H. 659. tab. 440. Lin. Gen. Plant. 448. The Sopeberry-tree.

The Characters are,

*The empalement of the flower is composed of four plain, oval, coloured leaves, which spread open and fall away. The flower has four oval petals which are less than the empalement; it has eight stamina which are the length of the petals, terminated by erect summits, and an oval germen with three or four lobes, supporting a short style, crowned by a single stigma. The germen afterward becomes one, two, or three globular berries, including nuts of the same form. There is rarely above one of these pregnant, the other are abortive.*

This genus of plants is ranged in the third section of Linnæus's eighth class, which contains those plants whose flowers have eight stamina and three styles.

The Species are,

1. Sapindus (*Saponaria*) foliis impari pinnatis, caule inermi. Lin. Sp. Plant. 526. *Sopeberry-tree with unequal winged leaves.* Sapindus foliis costæ alatæ innascentibus. Tourn. App. 659. *Sopeberry-tree with leaves growing from the wings of the midrib.*
2. Sapindus (*Rigidus*) foliis quaterno-pinnatis rigidis acutis. *Sopeberry-tree with winged leaves, which are composed of four stiff acute-pointed lobes.*
3. Sapindus (*Pinnatus*) foliis pinnatis supernè alternis, lobis ovato-oblongis. *Sopeberry-tree with winged leaves, whose upper lobes are placed alternate.*

The first sort grows naturally in the islands of the West-Indies, where it rises with a woody stalk from twenty to thirty feet high, sending out many branches toward the top, which are garnished with winged leaves, composed of three, four, or five pair of spear-shaped lobes, which are from three to four inches long, and an inch and a quarter broad in the middle, drawing to points at both ends. The midrib has a membranaceous or leafy border running on each side from one pair of lobes to the other, which is broadest in the middle between the lobes; they are of a pale green colour, and are pretty stiff; the flowers are produced in loose spikes at the end of the branches; they are small and white, so make no great appearance. These are succeeded by oval berries as large as middling Cherries, sometimes single, at others two, three, or four are joined together; these have a saponaceous skin or cover which incloses a very smooth roundish nut of the same form, and of a shining black when ripe. These nuts were formerly brought to England for buttons to waistcoats, some were tipped with silver, and others with different metals; they were very durable, as they did not wear, and seldom broke. The skin or pulp which surrounds the nuts, is used in America to wash linen, but it is very apt to burn and destroy it, if often used, being of a very acrid nature.

The second sort was discovered by the late Dr. Houstoun, growing naturally at La Vera Cruz in New Spain; this hath a strong woody stalk which rises about twenty feet high, sending out many short, strong, ligneous branches, which are covered with a smooth gray bark, and are garnished with winged leaves, composed of two pair of spear-shaped lobes which are very stiff and smooth; the inner pair are small, being seldom more than an inch and a half long, and half an inch broad in the middle; the two outer lobes are near three inches long, and almost an inch broad in the middle, drawing to points at both ends; they are oblique to the foot-stalk, the midrib running much nearer to the border on one side; they are of a pale green, and sit close to the midrib, which has no border or wing like the other. The end of the branches are divided into two or three foot-stalks, each sustaining a loose spike of flowers like those of the other sort; these are succeeded by roundish berries like those of the former, but there are generally two, three, or four of them joined together.

The third sort grows naturally in India; this rises with a strait jointed stem to the height of twenty feet, sending out some lateral branches at the top, covered with a pale smooth bark, which are garnished with winged leaves composed of eight or ten pair of oblong oval lobes, each near four inches long, and an inch and a half broad at their base, of a light green colour, having very short foot-stalks; those on the lower part of the midrib are ranged opposite, but on the upper part of the midrib they are alternate, and always end with two lobes. As the plants have not as yet flowered in England, so I can give no farther account of them.

These plants are propagated by seeds (which must be obtained from the countries where they naturally grow, for they have not produced fruit in Europe;) the seeds must be put into small pots filled with rich fresh earth, and plunged into a hot-bed of tanners bark. The pots must be frequently watered, otherwise the berries, whose outer cover is very hard, will not vegetate. In five or six weeks the plants will appear, when the glasses of the hot-bed should be raised every day in warm weather to admit fresh air to the plants. In a month or six weeks after the plants appear they will be fit to transplant, when they must be shaken out of the pots, and carefully parted, so as not to injure their roots, and each planted into a separate small pot filled with light rich earth, and then plunged into the hot-bed again, observing to shade them from the sun every day until they have taken new root; after which time they must have free air admitted to them every day when the weather is warm, and will require to be frequently watered.

After the plants are well rooted, they will make great progress, so as to fill these pots with their roots in a few weeks time, therefore they should be shifted into larger pots, and as the plants advance, they should be inured to bear the open air by degrees; for if they are forced too much in summer, they seldom live thro' the winter, especially the first and second sorts, which are very subject to be lost in the first winter. I have frequently raised these plants from seeds to the height of two feet in one summer, and the leaves of these plants have been a foot and a half in length, so that they made a fine appearance; but these plants did not survive the winter, whereas those which were exposed

exposed to the open air in July, and thereby stinted in their growth, continued their leaves fresh all the winter. These were placed in a stove upon shelves, where the warmth was very moderate, with which these plants will thrive better than in a greater heat.

The third sort is much more hardy than either of the other: this may be placed in a good green-house in the autumn, where it will live through the winter, and in summer should be exposed to the open air in a sheltered situation, where it will thrive very well.

SAPONARIA. Lin. Gen. Plant. 449. Lychnis. Tourn. Inst. R. H. 333. tab. 175. Sopewort.

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, which is cut into five points. It has five petals whose tails are narrow, angular, and the length of the empalement; their borders are broad, obtuse and plain. It has ten awl-shaped stamina the length of the tube of the flower, which are alternately inserted into the petals, and are terminated by obtuse prostrate summits, and a taper germen supporting two erect parallel styles, crowned by acute stigmas. The germen afterward becomes a close capsule the length of the empalement, having one cell filled with small seeds.*

This genus of plants is ranged in the second section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and two styles.

The SPECIES are,

1. SAPONARIA (*Officinalis*) calycibus cylindricis, foliis ovato-lanceolatis. Hort. Cliff. 165. *Sopewort with cylindrical empalements, and oval spear-shaped leaves.* Lychnis sylvestris que saponaria vulgò. Tourn. Inst. 336. *Wild Campion, vulgarly called Sopewort.*
2. SAPONARIA (*Hybrida*) calycibus cylindricis, foliis ovatis nervosis semiamplexicaulibus. *Sopewort with cylindrical empalements, and oval veined leaves half embracing the stalks.* Lychnis saponaria dicta, folio convoluto. Raii Syn. 339. *Campion, called Sopewort, with a twisted leaf.*
3. SAPONARIA (*Vaccaria*) calycibus pyramidatis quinquangularibus, foliis oblongo-ovatis acuminatis sessilibus. Hort. Cliff. 166. *Sopewort with pyramidal five-cornered empalements, and oblong, oval, acute-pointed leaves.* Lychnis segetum rubra, foliis perfoliatæ. C. B. P. 204. *Red Corn Campion, with Thorough-wax leaves.*
4. SAPONARIA (*Amplicimus*) calycibus pyramidatis quinquangularibus, foliis ovato-lanceolatis, semiamplexicaulibus. *Sopewort with pyramidal five-cornered empalements, and oval spear-shaped leaves, half embracing the stalks.* Lychnis segetum rubra, foliis perfoliatæ amplioribus. Juss. *Red Corn Campion, with larger Thorough-wax leaves.*
5. SAPONARIA (*Orientalis*) calycibus cylindricis villosis, caule dichotoma erecto patulo. Hort. Upsal. 106. *Sopewort with cylindrical hairy empalements, and erect spreading stalks which are divided by pairs.* Lychnis Orientalis annua supina, antirrhini folio, flore minimo purpurascente. Tourn. Cor. 25. *Low annual Eastern Sopewort, with a Snap-dragon leaf, and the least purplish flower.*

The first sort is the common Sopewort of the shops; this grows naturally in many parts of England, and is rarely admitted into gardens; it has a creeping root which spreads far on every side, so as in a short time to fill a large space of ground, from which arise many purplish stalks about a foot and a half high, which are jointed, and garnished with opposite leaves at each; these are oval, spear-shaped, and smooth, about three inches long, and an inch and a half broad, ending in points; they have three longitudinal veins on their under side, and are of a pale green. The foot-stalks of the flowers arise from the wings of the leaves opposite they sustain four, five, or more purplish flowers each, which have generally two small leaves placed under them. The stalk is also terminated by a loose bunch of flowers growing in form of an umbel; they have each a large swelling cylindrical empalement, and five broad obtuse petals which spread open, and are of a purple colour. These appear in July, and are succeeded by oval capsules with one cell, filled with small seeds.

The leaves of this plant are sometimes used in medicine; they are accounted opening and attenuating, and somewhat sudorific, so are by some recommended against the lues venerea, and outwardly applied they help hard tumours and whitloes. The decoction of this plant is used to cleanse and scour woollen cloths: the poor people in some countries use it instead of sope for washing, from whence it had its title.

There is a variety of this with double flowers, which is preserved in gardens, but the roots are very apt to spread far on every side if they are not confined, so these plants should not be placed in borders among better flowers; but as the flowers continue in succession from July to the middle of September, so a few of the plants may be allowed a place in some abject part of the garden, for they will thrive in any situation, and propagate fast enough by their creeping roots.

The second sort was found growing in a wood near Lichbarrow in Northamptonshire, by Mr. Gerard. It has been generally esteemed a lusus naturæ, and not a distinct species, but I have never found it alter in forty years; but as it doth not produce seeds, so there is no certainty of its being a distinct species. The roots of this do not spread like those of the first, the stalks are shorter, thicker, and do not grow so erect; they rise a foot or more in height, the joints are very near and swelling; the leaves are produced singly on the lower part of their stalks, but toward the top they are often placed by pairs; they are oval-shaped, about three inches long and two broad, having several longitudinal veins or plaits, and are hollowed like a ladle. The flowers are disposed loosely on the top of the stalk, they have large cylindrical empalements; they are of one petal, and scarce any visible stamina; they are of a purple colour, and flower in July. This plant is preserved for the sake of variety in some gardens, but as there is little beauty in the flowers, it does not merit a place in gardens for pleasure. It is easily propagated by parting of the roots in autumn, and loves a moist shady situation.

The third sort is an annual plant, which grows naturally among Corn in the south of France and Italy. This rises with an upright stalk near a foot and a half high, branching out upward into several divisions; these always are by pairs opposite, as are also the leaves, which are about an inch and a half long, and half an inch broad at their base, ending in acute points; they sit close to the stalks, are smooth, and of a gray colour. The flowers are produced at the end of the branches, each standing upon a long naked foot-stalk; their empalements are large, swelling, and pyramidal, having five acute corners or angles; the petals are but small; they have long necks or tails, which are narrow; their upper part is obtuse, and of a reddish purple colour. These appear in June and July, and the seeds ripen in autumn.

The fourth sort grows naturally in Spain; this is also an annual plant; it rises with a strong smooth stalk about two feet high, garnished with oval spear-shaped leaves three inches long, and an inch and a half broad near their base, drawing to a point at the end; they are fleshy, of a gray colour, and are very smooth; they are placed by pairs, and half embrace the stalks with their base; the upper part of the stalk divides into many branches, which are again subdivided into long naked foot-stalks, each sustaining a single flower; the empalement of the flower is large, pyramidal, and swelling, having five acute angles. The flowers are composed of five obtuse red petals, which spread open flat above the empalement. These appear in June and July, and the seeds ripen in autumn.

The fifth sort grows naturally in the Levant, from whence Dr. Tournefort sent the seeds. This is a low annual plant, seldom rising more than four inches high,

high, but divides into branches by pairs from the bottom, which ſpread aſunder. The leaves are very ſmall, the flowers come out ſingle from the wings of the leaves; they have hairy cylindrical empalements, out of which the petals of the flower do but juſt peep, ſo are not obvious at any diſtance. The whole plant is very clammy to the touch. As this plant makes no figure, ſo it is only kept for variety.

Theſe plants are eaſily propagated by ſeeds, which ſhould be ſown where the plants are to remain, and will require no other care but to keep them clean from weeds, and thin them where they are too cloſe. If the ſeeds are ſown in autumn, or are permitted to ſcatter, the plants will come up without care.

SAPOTA. Plum. Nov. Gen. 43. tab. 4. Acras. Lin. Gen. Plant. 438. The Mammee Sapota.

The CHARACTERS are,

*The flower has a permanent empalement compoſed of five oval leaves, which are acute-pointed and erect. It has five roundiſh heart-ſhaped petals, which are connected at their baſe, and end in acute points; and ſix ſhort ſtamina the length of the tube, terminated by arrow-pointed ſummits, with an oval germen ſupporting a ſhort ſtyle, crowned by an obtuſe ſtigma. The germen afterward becomes an oval ſucculent fruit, incloſing one or two oval hard nuts or ſtones.*

This genus of plants is ranged in the firſt ſection of Linnæus's ſixth claſs, which includes thoſe plants whoſe flowers have ſix ſtamina and one ſtyle.

The SPECIES are,

1. SAPOTA (*Achras*) foliis oblongo-ovatis, fructibus turbinatis glabris. *Sapota with oblong oval leaves, and ſmooth turbinated fruit.* Sapota fructu turbinato minori. Plum. Nov. Gen. 43. *Sapota with a ſmaller turbinated fruit.*
2. SAPOTA (*Mammoſa*) foliis lanceolatis, fructu maximo ovato, ſeminibus ovatis utrinque acutis. *Sapota with ſpear-ſhaped leaves, a very large oval fruit, and oval ſeeds which are pointed at both ends.*

The name of Sapota is what theſe fruit are called by the natives of America, to which ſome add the appellation of Mammee; but there is no other name given to theſe fruits by the Engliſh, ſince they have ſettled in the Weſt-Indies, ſo far as I can learn.

The firſt of theſe trees is common about Panama, and ſome other places in the Spaniſh Weſt-Indies, but is not to be found in many of the Engliſh ſettlements in America. The ſecond ſort is very common in Jamaica, Barbadoes, and moſt of the iſlands in the Weſt-Indies, where the trees are planted in gardens for their fruit, which is by many perſons greatly eſteemed.

The ſecond ſort grows in America to the height of thirty-five or forty feet, having a ſtrait trunk, covered with an Aſh-coloured bark. The branches are produced on every ſide, ſo as to form a regular head; theſe are beſet with leaves, which are a foot in length, and near three inches broad in the middle, drawing to a point at each end. The flowers which are produced from the branches, are of a cream colour; when theſe fall away, they are ſucceeded by large oval or top-ſhaped fruit, which are covered with a browniſh ſkin, under which is a thick pulp of a ruſſet colour, very luſcious, called natural marmelade, from its likeneſs to marmelade of Quinces.

As theſe trees are natives of very warm countries, they cannot be preſerved in England, unleſs they are placed in the warmeſt ſtoves and managed with great care. They are propagated by planting the ſtones, but as theſe will not keep good long out of the ground, the ſureſt method to obtain theſe plants is, to have the ſtones planted in tubs of earth, as ſoon as they are taken out of the fruit, and the tubs placed in a ſituation where they may have the morning ſun, and kept duly watered. When the plants come up, they muſt be ſecured from vermin and kept clear from weeds, but ſhould remain in the country till they are about a foot high, when they may be ſhipped for England; but they ſhould be brought over in the ſummer, and, if poſſible, time enough for the plants to make good roots after they arrive. During their paſſage they muſt have ſome water, while they continue in a warm climate; but as they come into colder weather, they ſhould have very little moiſture; and they muſt be ſecured from ſalt water, which will ſoon deſtroy the plants if it gets at them.

When theſe plants arrive in England, they ſhould be carefully taken out of the tubs, preſerving ſome earth to their roots, and planted into pots filled with freſh earth, and then plunged into a moderate hot-bed of tanners bark, obſerving, if the weather is hot, to ſhade the glaſſes with mats every day, to ſcreen the plants from the ſun, until they have taken new root; obſerving alſo not to water them too much at firſt, eſpecially if the earth in which they come over is moiſt; becauſe too much water is very injurious to the plants before they are well rooted, but afterward they muſt be frequently refreſhed with water in warm weather; and they muſt have a large ſhare of air admitted to them, otherwiſe their leaves will be infeſted with inſects and become foul; in which caſe they muſt be waſhed with a ſponge to clean them, without which the plants will not thrive.

In the winter theſe plants muſt be placed in the warmeſt ſtove, and in cold weather they ſhould have but little water given to them, though they muſt be frequently refreſhed when the earth is dry; eſpecially if they retain their leaves all the winter, they will require a greater ſhare of water than when they drop their leaves; ſo that this muſt be done with diſcretion, according to the ſtate in which the plants are. As theſe plants grow in magnitude, they ſhould be ſhifted into pots of a larger ſize, but they muſt not be over-potted, for that will infallibly deſtroy them.

SARRACENA. Tourn. Inſt. R. H. 657. tab. 476. Lin. Gen. Plant. 578. The Sideſaddle-flower.

The CHARACTERS are,

*The flower has a double empalement; the under is compoſed of three ſmall oval leaves which fall away; the upper has five large coloured leaves, which are permanent. It has five oval inflexed petals which incloſe the ſtamina, whoſe tails are oblong, oval, and erect, and a great number of ſmall ſtamina, terminated by target-ſhaped ſummits. In the center is ſituated a roundiſh germen, ſupporting a ſhort cylindrical ſtyle, crowned by a target-ſhaped five-cornered ſtigma covering the ſtamina, and is permanent. The germen afterward becomes a roundiſh capſule with five cells, filled with ſmall ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's thirteenth claſs, which includes thoſe plants whoſe flowers have many ſtamina and one ſtyle.

The title of this genus was given to it by Dr. Tournefort, in honour of Dr. Sarrazin, a curious botaniſt, who ſent this and many other rare plants from Canada to the Paris Garden.

The SPECIES are,

1. SARRACENA (*Purpurea*) foliis gibbis. Hort. Cliff. 427. *Sarracena with gibbous leaves.* Sarracena Canadenſis, foliis cavis & auritis. Tourn. Inſt. R. H. 657. *Sarracena of Canada, with hollowed and eared leaves.*
2. SARRACENA (*Flava*) foliis ſtrictis. Lin. Sp. Plant. 510. *Sarracena with cloſed leaves.* Sarracena foliis longioribus & anguſtioribus. Cateſb. Hiſt. Carol. 2. p. 69. *Sarracena with longer and narrower leaves.*

The firſt ſort grows naturally upon bogs in moſt parts of North America; this hath a ſtrong fibrous root, which ſtrikes deep into the ſoft earth, from which ariſe five, ſix, or ſeven leaves, in proportion to the ſtrength of the plant; theſe are about five or ſix inches long, hollow like a pitcher, narrow at their baſe, but ſwell out large at the top; their outer ſides are rounded, but on their inner ſide they are a little compreſſed, and have a broad leafy border running longitudinally the whole length of the tube; and to the rounded part of the leaf there is on the top a large appendage or ear ſtanding erect, of a browniſh colour; this ſurrounds the outſide of the leaves about two thirds of the top, it is eared at both ends, and waved round the border. From the center of the root, between the leaves, ariſes a ſtrong, round, naked

ked foot-ſtalk about a foot high, ſuſtaining one nodding flower at the top, which has a double empalement; the outer one is of one leaf, divided into five parts to the bottom, where they are connected to the foot-ſtalks; theſe ſegments are obtuſe and bent over the flower, ſo as to cover the inſide of it; they are of a purple colour on the outſide, but green within, having purple edges; the inner empalement, which is compoſed of three green leaves, falls off; within theſe are five oval petals of a purple colour, which are hollowed like a ſpoon; theſe cover the ſtamina and ſummits, with part of the ſtigma alſo. In the center is ſituated a large, roundiſh, channelled germen, ſupporting a ſhort ſtyle, crowned by a very broad five-cornered ſtigma, faſtened in the middle to the ſtyle, and covering the ſtamina like a target; this is green, and the five corners which are ſtretched out beyond the brim are each cut into two points, and are purpliſh. Round the germen are ſituated a great number of ſhort ſtamina, joining the ſides of the germen cloſely, which are terminated by target-ſhaped furrowed ſummits, of a pale ſulphur colour. When the flower decays, the germen ſwells to a large roundiſh capſule with five cells, covered by the permanent ſtigma, and filled with ſmall ſeeds. It flowers in June, and the ſeeds ripen in autumn.

The ſecond ſort grows naturally in Carolina, upon bogs and in ſtanding ſhallow waters. The leaves of this ſort grow near three feet high, being ſmall at the bottom, but widening gradually to the top. Theſe are hollow, and are arched over at the mouth like a friar's cowl. The flowers of this grow on naked pedicles, riſing from the root to the height of three feet; theſe flowers are green.

Theſe plants are eſteemed for the ſingular ſtructure of their leaves and flowers, which are ſo different from all the known plants, as to have little reſemblance of any yet diſcovered; but there is ſome difficulty in getting them to thrive in England, when they are obtained from abroad; for as they grow naturally on bogs, or in ſhallow ſtanding waters, ſo unleſs they are conſtantly kept in wet, they will not thrive; and although the winters are very ſharp in the countries where the firſt ſort naturally grows, yet being covered with water and the remains of decayed plants, they are defended from froſt.

The beſt method to obtain theſe plants is, to procure them from the places of their natural growth, and to have them taken up with large balls of earth to their roots, and planted in tubs of earth; which muſt be conſtantly watered during their paſſage, otherwiſe they will decay before they arrive; for there is little probability of raiſing theſe plants from ſeeds, ſo as to produce flowers in many years, if the ſeeds do grow; ſo that young plants ſhould be taken up to bring over, which are more likely to ſtand here, than thoſe which have flowered two or three times. When the plants are brought over, they ſhould be planted into pretty large pots, which ſhould be filled with ſoft ſpongy earth, mixed with rotten wood, Moſs, and turf, which is very like the natural ſoil in which they grow. Theſe pots ſhould be put into tubs or large pans which will hold water, with which they muſt be conſtantly ſupplied, and placed in a ſhady ſituation in ſummer; but in the winter they muſt be covered with Moſs, or ſheltered under a frame, otherwiſe they will not live in this country; for as the plants muſt be kept in pots, ſo if theſe are expoſed to the froſt, it will ſoon penetrate through them, and greatly injure, if not deſtroy the plants; but when they are placed under a common frame, where they may have the open air at all times in mild weather, and be ſheltered from hard froſt, the plants will thrive and flower very well.

SASSAFRAS. See Laurus.

SATUREJA. Tourn. Inſt. R. H. 197. Thymbra. Tourn. Inſt. 197. Lin. Gen. Plant. 626. [ſo called, becauſe ſaid to cauſe a ſatyriaſmus, or priapiſmus, this herb exciting greatly to venery.] Savory; in French, *Sarriette.*

The Characters are,

*The flower hath an erect, tubulous, ſtriated, permanent empalement of one leaf, indented at the brim in five points; it hath one ringent petal, whoſe tube is cylindrical and ſhorter than the empalement; the chaps are ſingle, the upper lip erect and obtuſe, having an acute indenture at the point. The under lip is ſpreading, divided into three parts, which are nearly equal. It has four briſtly ſtamina, two of which are almoſt the length of the upper lip; the other two are ſhorter, terminated by ſummits which touch each other, and a four-pointed germen ſupporting a briſtly ſtyle, crowned by two briſtly ſtigmas. The germen afterward become four ſeeds, which ripen in the empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourteenth claſs, which contains thoſe plants whoſe flowers have two long and two ſhorter ſtamina, and the ſeeds are naked in the empalement.

The Species are,

1. Satureja (*Hortenſis*) pedunculis bifloris. Vir. Cliff. 87. *Savory with two flowers upon each foot-ſtalk.* Satureja ſativa. J. B. 3. 272. *Garden, or Summer Savory.*
2. Satureja (*Thymbra*) verticillis ſubrotundis hiſpidis, foliis oblongis acutis. Flor. Leyd. Prod. 324. *Savory with whorled flowers, and oblong acute-pointed leaves.* Thymbra legitima. Cluſ. Hiſt. 1. p. 358. *The true Thymbra.*
3. Satureja (*Montana*) pedunculis dichotomis lateralibus ſolitariis, foliis lineari-lanceolatis mucronatis. Lin. Sp. Plant. 568. *Savory with ſingle diverging foot-ſtalks on the ſides of the branches, and linear ſpear-ſhaped leaves.* Satureja montana. C. B. P. 218. *Mountain, or Winter Savory.*
4. Satureja (*Virginiana*) capitulis terminalibus, foliis lanceolatis. Lin. Sp. Plant. 567. *Savory with heads of flowers terminating the ſtalks, and ſpear-ſhaped leaves.* Clinopodium pulegii anguſto rigidoque folio, Virginianum, floſculis in cymis diſpoſitis. Pluk. Alm. 110. tab. 54. fig. 2. *Virginian Field Baſil with a ſtiff, narrow, Pennyroyal leaf, and flowers diſpoſed on the tops of the ſtalks.*
5. Satureja (*Origanoides*) foliis ovatis ſerratis, corymbis terminalibus dichotomis. Lin. Sp. Plant. 568. *Savory with oval ſawed leaves, and flowers growing in a divided corymbus, terminating the ſtalks.* Calamintha erecta, Virginiana, mucronato folio glabro. Mor. Hiſt. 3. p. 413. *Upright Virginian Field Baſil, with a ſmooth acute-pointed leaf.*
6. Satureja (*Juliana*) verticillis faſtigiatis concatenatis foliis lineari-lanceolatis. Lin. Sp. Plant. 567. *Savory with bunched whorls of flowers, and linear ſpear-ſhaped leaves.* Thymbra ſancti Juliani ſive ſatureja verior. Lob. Icon. 245. *St. Julian's Thymbra, or the true Savory.*
7. Satureja (*Græca*) pedunculis corymboſis lateralibus geminis, bracteis calyce brevioribus. Lin. Sp. Plant. 568. *Savory with corymbuſes of flowers upon foot-ſtalks, growing by pairs from the wings of the leaves, and bracteæ ſhorter than the empalements.* Clinopodium Creticum. Alp. Exot. 265. *Cretan Field Baſil.*
8. Satureja (*Capitata*) floribus ſpicatis, foliis carinatis punctatis ciliatis. Lin. Mat. Med. 283. *Savory with ſpiked flowers, and keel-ſhaped hairy leaves having ſpots.* Thymum legitimum. Cluſ. Hiſt. 1. p. 375. *The legitimate Thyme.*

The firſt ſort is generally known in the gardens by the title of Summer Savory. This is an annual plant, which grows naturally in the ſouth of France and in Italy, but it is cultivated in the Engliſh gardens for the kitchen, and alſo for medicinal uſe. It riſes with ſlender erect ſtalks about a foot high, ſending out branches at each joint by pairs, which are garniſhed with leaves placed oppoſite, which are about an inch long, and one eighth of an inch broad in the middle; they are ſtiff, a little hairy, and have an aromatic odour if rubbed. The flowers grow from the wings of the leaves toward the upper part of the branches, each foot-ſtalk ſuſtaining two flowers, which are of the lip kind, having a ſhort cylindrical tube; the upper lip is erect and indented at the point; the lower

is divided into three almost equal parts; they are of a pale flesh colour, and appear in July, and the seeds ripen in autumn.

The second sort grows naturally in Crete; this rises with a shrubby stalk about two feet high, dividing into several slender ligneous branches, which are garnished with small, stiff, oval leaves, ending in acute points, which emit an aromatic odour when bruised. The flowers grow in thick whorls round the stalks toward the top; they have short, hairy, five-pointed empalements; the tube of the petal is longer than the cup, and the flower is shaped like that of the former, but it is larger and of a brighter red colour. This plant flowers in June, July, and August, but rarely ripens its seeds in England.

The third sort is well known in the gardens by the title of Winter Savory; this is a perennial plant, which grows naturally in the south of France and Italy, but is here cultivated in gardens both for food and physic. This hath a shrubby, low, branching stalk; the branches rise about a foot high; they are ligneous, and are garnished with two very narrow leaves about an inch long at each joint; they are stiff, and stand opposite; from the base of these come out a few small leaves in clusters. The flowers grow from the wings of the leaves upon short foot-stalks; they are shaped like those of the first sort, but are larger and of a paler colour. These appear in June, and are succeeded by seeds which ripen in autumn, but the plants will continue several years, especially if they are planted in a poor dry soil.

The fourth sort grows naturally in North America; this hath a perennial root, but the stalk is annual, and rises about a foot and a half high; it is stiff, angular, and branches out toward the top. The leaves are stiff, spear-shaped, and pointed; they are about an inch and a half long, and a quarter of an inch broad in the middle, pointed at both ends, and have a strong scent of Pennyroyal; the stalks are terminated by white flowers collected into globular heads. These appear in July, but are seldom succeeded by seeds in England.

The sixth sort grows naturally in Spain and some parts of Italy; this hath very slender ligneous stalks which grow erect, about nine inches high, sending out two or three slender side branches toward the bottom; these are garnished with narrow, spear-shaped, stiff leaves, which are placed opposite. The flowers grow in whorls above each other for more than half the length of the stalk, they seem as if they were bundled together. The flowers are small and white; they appear in July, but the seeds seldom ripen here; the whole plant has a pleasant aromatic scent.

The seventh sort grows naturally in Crete; this hath very slender ligneous stalks, which rise near a foot and a half high, garnished with small, oval, stiff, acute-pointed leaves, whose borders are reflexed. The flowers grow in roundish whorls upon foot-stalks, which rise by pairs from the wings of the leaves; these are small and white; they appear in July, and if the season proves warm, the seeds will ripen in autumn.

The eighth sort grows naturally in Crete; this has a low shrubby stalk, which sends out branches on every side, which grow about six inches long, and are hoary; they are garnished with stiff, narrow, acute-pointed leaves, which are hollowed like the keel of a boat. The flowers grow in short roundish spikes at the end of the branches; they are small and white; the whole plant is hoary, and very aromatic. This never produces seeds in England.

The first sort is only cultivated by seeds; these should be sown the beginning of April, upon a bed of light earth, either where they are to remain, or for transplanting; if the plants are to stand unremoved, the seeds should be sown thinly; but if they are to be transplanted, they may be sown closer. When the plants appear they must be kept clean from weeds, and afterward they may be treated in the same way as Marjoram.

The second, sixth, and eighth sorts, are too tender to live through the winter in the open air in England. These are generally propagated by slips or cuttings, which take root very readily during any of the summer months; if these cuttings or slips are planted in a shady border, or are shaded from the sun with mats, they will put out roots in two months, fit to be transplanted, when they should be taken up carefully, and each transplanted into a small pot, filled with fresh undunged earth, and placed in the shade till they have taken new root; then they may be placed in a sheltered situation, where they may remain till the end of October, when they should be placed under a common hot-bed frame, where they may be exposed to the open air at all times when the weather is mild; but they must be protected from hard frost, which will destroy them if exposed thereto.

As these plants seldom live above three or four years, so there should be a supply of young plants raised to preserve the species, otherwise they may be soon lost. In winter they should not have much wet, for they are very subject to grow mouldy by moisture, but especially if the free air is excluded from them; or if their branches are drawn up weak, they are very apt to get mouldy, and then they soon decay.

The third sort is very hardy, so if this is sown or planted upon a dry lean soil, it will endure the greatest cold of our winters. I have seen some of the plants growing upon the top of an old wall, where they were fully exposed to the cold, and these survived the severe frost, when most of those which were growing in the ground were destroyed. This may be propagated either by seeds in the same way as the first sort, or by slips, which, if planted in the spring, will take root very freely. These plants will last several years, but when they are old, their shoots will be short and not so well furnished with leaves, so will not be so good for use as young plants, therefore it will be proper to raise a supply of young plants every other year.

The fifth sort has a perennial root, but the stalks decay every autumn. There are two varieties of this, one of them has narrower leaves and larger heads than the other, and the leaves have very little scent; whereas those of the common sort smell so like Pennyroyal, as not to be distinguished by those who do not see the plants. This sort sometimes produces good seeds here, from which the plants may be easily propagated; they may also be increased by planting cuttings in the spring, in the same manner as is practised for Mint; these will take root freely, and if they are afterwards planted in a moist soil, they will thrive exceedingly; but as the plant is never used here, so it is only kept for variety in some curious gardens.

SATYRIUM. Lin. Gen. Plant. 901. Orchis, Tourn. Inst. R. H. 431. tab. 247, 248.

The CHARACTERS are,

*It hath a single stalk; the flowers have no empalement, but sit upon the germen: they have five oblong oval petals, three outer and two inner, rising and joined in a helmet; they have a one-leaved nectarium, situated on the side between the division of the petals, fastened to the receptacle. The upper lip is short and erect, the under is plain and hangs downward, their base represents the hinder part of the scrotum. They have two short slender stamina sitting upon the pointal, having oval summits which have double cells shut in the upper lip of the nectarium, and an oblong twisted germen situated under the flower, having a short style, growing on the upper lip of the nectarium, crowned by an obtuse compressed stigma. The germen afterward becomes an oblong capsule with one cell, having three keels and three cells, opening under the keels three ways, and filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's twentieth class, which includes those plants in whose flowers the stamina are connected to the style.

The SPECIES are,

1. SATYRIUM (*Nigrum*) bulbis palmatis, foliis linearibus, floribus resupinatis nectarii labio indiviso ovato acuminato

acuminato. Act. Upsal. 1740. p. 19. *Satyrium with handed bulbs, linear leaves, the flowers oval, bending downward, and the nectarium undivided.* Orchis palmata angustifolia Alpina, nigro flore. C. B. P. 86. *Narrow-leaved handed Orchis of the Alps, with a black flower.*

2. SATYRIUM (*Hirsinum*) bulbis indivisis, foliis lanceolatis, nectarii labio trifido, intermedia lineari, obliqua præmorsa. Act. Upsal. 1740. tab. 18. *Satyrium with an undivided bulb, spear-shaped leaves, and the lip of the nectarium trifid, the middle segment being linear and obliquely bitten.* Orchis barbata fœtida. J. B. P. 2. p. 756. *The Lizard-flower, or Great Goat-stones.*

3. SATYRIUM (*Viride*) bulbis palmatis, foliis oblongis obtusis, nectarii labio lineari trifido, intermedia obsoleta. Act. Upsal. 1740. p. 18. *Satyrium with handed bulbs, oblong blunt leaves, and the lip of the nectarium divided into three linear parts, the middle one being obsolete.* Orchis palmata minor, flore luteo viridi. Raii Syn. 11. 239. *Smaller handed Orchis with a green flower, by some called the Frog Orchis.*

4. SATYRIUM (*Albidum*) bulbis fasciculatis, foliis lanceolatis, nectarii labio trifido, acuto, intermedia majore. Act. Upsal. 1740. *Satyrium with clustered bulbs, spear-shaped leaves, and the lip of the nectarium divided into three acute parts, the middle one being the largest.* Orchis palmata Alpina, spicâ densa albo-viridi. Haller. Helv. 68. *Alpine handed Orchis, with a thick close spike of whitish green flowers.*

The first sort grows naturally upon the Alps; this has a broad, handed, bulbous root; the stalk rises about nine inches high, and is garnished with very narrow leaves; those on the lower part are about four inches long, but on the upper part they are scarce one inch; their base embraces the stalk. The flowers grow in a thick short spike at the top, they are of a dark purple colour; the lip of the nectarium has three lobes, the middle one being the largest. This flowers the beginning of June.

The second sort grows naturally in several parts of England; this has a solid bulbous root, which is not divided; the stalk is strong, and rises fifteen inches high; the lower part is garnished with leaves near five inches long and half an inch broad, which embrace the stalk with their base. The spike of flowers which occupy the upper part of the stalk, is six inches in length; the flowers are of a dirty white, with some linear stripes and spots of a brown colour; the beard or middle segment of the lip of the nectarium is two inches long, and appears as if it was obliquely bitten off. It flowers the latter end of June.

The third sort grows naturally on dry pastures, and upon chalk hills in several parts of England. This has a handed bulbous root; the stalk rises near a foot high; the lower part is garnished with leaves three inches long and half an inch broad, whose bases embrace the stalk. The flowers grow in a long slender spike on the top of the stalk; the nectarium of this varies in colour, it is sometimes of a dusky purple, and at others of a yellowish green colour. It flowers the latter end of May, or the beginning of June.

The fourth sort grows near Verona, and upon the Alps. This hath several small bulbs which are joined together; the stalk rises about eight inches high, the lower part is garnished with spear-shaped leaves about three inches long, which embrace the stalk with their base. The flowers are collected in a short thick spike on the top of the stalk, which are of an herbaceous white colour. This flowers in June.

All these plants are difficult to propagate, so the best way to obtain them is to take up their roots at a proper season, and transplant them into the gardens, putting the several sorts into different soils, as near to that in which they naturally grow as possible, and to leave the ground undisturbed; for if their roots are injured, the plants seldom thrive after. The management of this plant being the same as for the Orchis, I shall not repeat it here.

SAVINE. See JUNIPERUS.

SAVORY. See SATUREJA.

SAURURUS. Lin. Gen. Plant. 414. Lizard's-tail.

The CHARACTERS are,

*The flowers are disposed into a katkin or tail; they have an oblong permanent empalement of one leaf, coloured on the side. They have no petal, but have six long hair-like stamina, placed three on each side opposite, terminated by oblong erect summits, and an oval germen with three lobes having no style, but is crowned by three blunt permanent stigmas. The germen afterward becomes an oval berry with one cell, inclosing one oval seed.*

This genus of plants is ranged in the third section of Linnæus's seventh class, which includes those plants whose flowers have seven stamina, and three styles or stigmas.

We have but one SPECIES of this genus at present in the English gardens, viz.

SAURURUS (*Cernuus*) foliis cordatis petiolatis, amentis solitariis recurvis. Hort. Upsal. 91. *Lizard's-tail with heart-shaped leaves having foot-stalks, and single recurved spikes of flowers.* Serpentaria repens, floribus stamineis spicatis, bryoniæ nigræ folio ampliore pingui, Virginiensis. Pluk. Alm. 343. *Creeping Snake-wort of Virginia, with spiked stamineous flowers, and a large, fat, black, Briony leaf.*

This plant grows naturally in most parts of North America. The root is fibrous and perennial; the stalks generally trail upon the ground, so seldom rise more than two feet high, having some longitudinal furrows; the leaves are heart-shaped and smooth; they are about three inches long, and two broad at their base, ending in obtuse points, and have several longitudinal veins which join at the foot-stalk, but diverge from the midrib toward the borders in the middle, and join again at the point; these stand upon foot-stalks about an inch long, which are placed alternately on the stalk. The spike of flowers comes out from the wings of the leaves toward the top of the stalk, which is taper, and about two inches long; these appear in July, but make but little appearance, and are not succeeded by seeds in England. The stalk decays in autumn.

This is preserved in botanic gardens for the sake of variety; but, as it has no beauty, it is very rarely admitted into other gardens; it is propagated by parting of the root, which may be performed either in autumn, soon after the stalks decay, or in the spring, before the roots begin to shoot; it loves a moist soil and a shady situation.

The other plants, which in the former editions of this work were placed in this genus, are now removed to the genus of PIPER.

SAXIFRAGA. Tourn. Inst. R. H. 252. tab. 129. Lin. Gen. Plant. 464. [so called, q. saxa stones, and frangens, *Lat.* breaking, because, as Bauhinus says, the juice of it being drank, breaks the stone in the reins and bladder, but the truth of it is doubted. Others derive it from its growing on stony mountains, as growing out of the clefts of the stones.] Saxifrage.

The CHARACTERS are,

*The flower hath a short, permanent, acute empalement of one leaf, cut into five segments; it has five plain petals, which are longer than the empalement, and ten awl-shaped stamina, terminated by roundish summits, with a roundish acute-pointed germen sitting upon two styles, crowned by obtuse stigmas. The germen afterward becomes an oval capsule with two horns opening between their tops, and filled with small seeds.*

This genus of plants is ranged in the second section of Linnæus's tenth class, which contains those plants whose flowers have ten stamina and two styles.

The SPECIES are,

1. SAXIFRAGA (*Granulata*) foliis caulinis reniformibus lobatis, caule ramoso radice granulatâ. Hort. Cliff. 167. *Saxifrage with leaves upon the stalks which are kidney-shaped, and have lobes, a branching stalk, and roots like grains of Corn.* Saxifraga rotundifolia, alba. C. B. P. 339. *Round-leaved white Saxifrage.*

2. SAXIFRAGA (*Cotyledon*) foliis radicatis aggregatis lingulatis cartilagineo-serratis, caule paniculato. Lin. Sp. 570. *Saxifrage with tongue-shaped leaves at the root,*

*which are joined together, and have cartilaginous saws, and a panicled stalk.* Saxifraga folio sedi angustiore, serrato. Tourn. Inst. R. H. 252. *Saxifrage with a narrow Houseleek leaf, which is sawed on its edges.*

3. Saxifraga (*Paniculata*) foliis radicatis aggregatis cuneiformibus cartilagineo-serratis, caule paniculato. *Saxifrage with the lower leaves wedge-shaped and joined together, with edges having cartilaginous saws, and a paniculated stalk.* Saxifraga foliis subrotundis serratis. Tourn. Inst. 252. *Saxifrage with roundish sawed leaves.*

4. Saxifraga (*Pyramidata*) foliis radicatis aggregatis lingulatis, cartilageneo-serratis, caule pyramidato. *Saxifrage with the lower leaves joined together, which are tongue-shaped, and have cartilaginous saws, and a pyramidal stalk.* Saxifraga montana, pyramidata, folio longiore. Tourn. Inst. R. H. 253. *Mountain pyramidal Saxifrage, with a longer leaf.*

5. Saxifraga (*Rotundifolia*) foliis caulinis dentatis reniformibus petiolatis. Lin. Sp. Plant. 403. *Saxifrage with kidney-shaped leaves on the stalks, which are indented and have foot-stalks.* Geum rotundifolium majus. Tourn. Inst. 251. *Greater round-leaved Kidneywort.*

6. Saxifraga (*Hirsuta*) foliis reniformibus dentatis, caule nudo paniculato. Lin. Sp. Plant. 401. *Saxifrage with indented kidney-shaped leaves, and a naked paniculated stalk.* Geum folio circinato, pistillo floris pallido. Tourn. Inst. R. H. 251. *Round-leaved Kidneywort, with a pale pointal to the flower.*

7. Saxifraga (*Punctata*) foliis obovatis dentatis petiolatis, caule nudo paniculato. Lin. Sp. Plant. 401. *Saxifrage with oblong, oval, indented leaves having foot-stalks, and a naked paniculated stalk.* Geum folio subrotundo majore, pistillo floris rubro. Tourn. Inst. R. H. 251. *Greater roundish-leaved Kidneywort, with a red pointal to the flower, commonly called London Pride, or None-so-pretty.*

8. Saxifraga (*Pensylvanica*) foliis lanceolatis denticulatis, caule nudo paniculato, floribus subcapitatis. Lin. Sp. Plant. 399. *Saxifrage with spear-shaped indented leaves, a naked paniculated stalk, and flowers collected in heads.* Saxifraga Pensylvanica, floribus muscosis racemosis. Hort. Elth. 337. *Saxifrage of Pensylvania, with branching mossy flowers.*

9. Saxifraga (*Nivalis*) foliis obovatis crenatis subsessilibus, caule nudo, floribus congestis. Lin. Sp. Plant. 401. *Saxifrage with oblong, oval, crenated leaves sitting close to the root, a naked stalk, and flowers growing in close bunches.* Saxifraga foliis oblongo-rotundis dentatis, floribus compactis. Raii Syn. 3. 354. *Saxifrage with oblong, round, indented leaves, and compact flowers.*

10. Saxifraga (*Autumnalis*) foliis caulinis linearibus alternis ciliatis, radicalibus aggregatis. Lin. Sp. Plant. 402. *Saxifrage with linear leaves on the stalk which are set with fine hairs, are alternate, and those at the root joined together.* Geum angustifolium autumnale, flore luteo guttato. Tourn. Inst. 252. *Narrow-leaved autumnal Kidneywort, with a yellow spotted flower.*

11. Saxifraga (*Oppositifolia*) foliis caulinis ovatis oppositis imbricatis, summis ciliatis. Flor. Suec. 359. *Saxifrage with oval leaves on the stalks which are opposite, which lie over each other, and upper leaves having fine hairs.* Sedum Alpinum ericoides purpurascens. C. B. P. 284. *Alpine purplish Housleek like Heath.*

12. Saxifraga (*Hypnoides*) foliis caulinis linearibus integris trifidisve, stolonibus procumbentibus, caule erecto nudiuscula. Lin. Sp. Plant. 405. *Saxifrage with linear leaves on the stalks which are entire or trifid, trailing side-shoots, and erect stalks which are almost naked.* Saxifraga muscosa trifido folio. Tourn. Inst. 252. *Mossy Saxifrage with a trifid leaf, or Mountain Sea-green with jagged leaves, commonly called Ladies Cushion.*

There are many more species of this genus than are here enumerated, some of which grow naturally in Great-Britain; but, as they are very rarely admitted into gardens, it would be needless to mention them all in this work.

The first sort is the common white Saxifrage, which grows naturally in the meadows in most parts of England. The roots of this plant are like grains of Corn, of a reddish colour without, from which arise kidney-shaped hairy leaves, standing upon pretty long foot-stalks. The stalks are thick, a foot high, hairy, and furrowed on two sides; these branch out from the bottom, and have a few small leaves like those below, which sit close to the stalks; the flowers terminate the stalk, growing in small clusters; they have five small white petals, inclosing ten stamina and the two styles. It flowers in April: the roots and leaves of this plant are used in medicine.

There is a variety of this which was found wild by Mr. Joseph Blind, gardener at Barnes, who transplanted it into his garden, and afterward distributed it to several curious persons, since which time it has been multiplied so much, as to become a very common plant in most gardens near London, where it is commonly planted in pots to adorn court-yards, &c. in the spring, and is very ornamental at that season in the borders of the flower-garden.

This plant is propagated by offsets, which are sent forth from the old roots in great plenty. The best season for transplanting them is in July, after their leaves are decayed, when they must be put into fresh undunged earth, and placed in the shade until autumn; but in winter they may be exposed to the sun, which will cause them to flower somewhat earlier in the spring. In April these plants will flower, and, if they are in large tufts, will at that time make a very handsome appearance; for which reason most people suffer them to remain three or four years unremoved, and when they are transplanted, always plant them in bunches, that they may produce a greater number of flowers. If these plants are put into the full ground, they must have a shady situation, otherwise they will not thrive.

The second sort grows naturally on the Alps; this hath a perennial fibrous root. The leaves grow round in circular heads, embracing each other at their base, after the same manner as the common Housleek; they are tongue-shaped, about two inches long, and a quarter of an inch broad, rounded at their points, and have a white, cartilaginous, sawed border. The stalk rises about a foot high; it is of a purplish colour, a little hairy, and sends out several horizontal branches the whole length. The flowers grow in small clusters at the end of the branches; they are white, and have several small red spots on the inside. This flowers in June.

It is easily propagated by offsets, which are sent out in plenty; they may be taken off at almost any season when the weather is mild, and should be planted in a very dry soil and a shady situation.

The third sort grows naturally on the Alps. The leaves of this sort are gathered into circular heads like the former, but are not more than half an inch long, and are wedge-shaped, the upper part being broad and rounded, but they diminish all the way to their base, where they are narrow; their borders are edged and indented in the same manner as those of the former. The stalk, in the places where the plant grows naturally, seldom rises more than six inches high, but, when transplanted into gardens, is often more than a foot; these have small leaves sitting close to them their whole length. The flowers are disposed in loose panicles on the top of the stalks; they are white and spotted with red. This sort flowers in June, and may be propagated in the same manner as the former.

The fourth sort grows naturally on the mountains in Italy. The leaves of this are gathered into circular heads like those of the two former; they are two inches long, and half an inch broad, tongue-shaped, rounded at their points, and have cartilaginous sawed borders. The stalk rises a foot and a half high, branching out near the ground, forming a natural pyramid to the top; the flowers have five wedge-shaped petals which spread open; they are white, and have ten stamina placed circularly the length of the tube, terminated by roundish purple summits. It flowers in June. When these plants are strong, they produce

duce very large pyramids of flowers, which make a fine appearance, so are very ornamental for halls, or to place in chimneys, where, being kept in the shade, and screened from winds and rains, they will continue in beauty much longer than if kept in the open air.

This plant is easily propagated by offsets, which are put out from the side of the old plants in plenty. These are usually planted in pots filled with fresh light earth, and in the summer season placed in the shade, but in the winter it should be exposed to the sun, and all the offsets should be taken off, leaving the plants single, which will cause them to produce a much stronger stem for flowering; for where there are offsets about the old plant, they exhaust the nourishment from it, whereby it is rendered much weaker. These offsets must be each planted in a separate halfpenny pot, filled with fresh earth, in order to succeed the older plants, which generally perish after flowering; the offsets will produce flowers the second year, so that there should be annually some of them planted to succeed the others.

The fifth sort grows naturally on the Helvetian mountains; this hath a perennial root. The stalk is erect, about a foot high, channelled and hairy; it is garnished with kidney-shaped leaves which are sharply indented, and puts out a few slender foot-stalks from the side toward the upper part; these, and also the principal stalks, are terminated by small clusters of white flowers marked with several red spots. This sort flowers in May; it is propagated by parting the roots; the best time for this is in autumn, that the plants may have good roots before the dry weather in the spring. It loves a shady situation and a loamy soil.

The sixth sort grows naturally on the Alps and Pyrenean mountains. The root is fibrous and perennial; the leaves are thick, kidney-shaped, and crenated on their edges; they are of a deep green on their upper side, but pale on their under, standing upon long, thick, hairy foot-stalks; these branch out into a panicle, which sustains several small white flowers marked with red spots; the stamina of this sort are longer than the petals. It flowers in June, and propagates very fast by offsets, which should be taken off in autumn, and planted in a shady situation, where they will thrive fast enough.

The seventh sort is known by the titles of London Pride, or None-so-pretty; it grows naturally on the Alps, and also in great plenty upon a mountain called Mangerton, in the county of Kerry in Ireland. The roots of this are perennial; the leaves are oblong, oval, and placed circularly at bottom; they have broad, flat, furrowed foot-stalks near two inches long, deeply crenated on their edges, which are white; the stalk rises about a foot high, is of a purple colour, stiff, slender, and hairy; it sends out from the side on the upper part several short foot-stalks, which are terminated by white flowers spotted with red; the stamina are longer than the petals of the flower, as are also the two styles; these have red stigmas. It flowers in June, and may be propagated in the same way as the former; it loves a shady situation.

The eighth sort grows naturally in North America; this is a perennial plant with a fibrous root, from which arise several leaves which are spear-shaped; they are seven or eight inches long, and two broad toward the top, having several small indentures on their edges; they are of a deep green, and thick consistence, spreading near the ground. The stalk rises a foot and a half high, is naked, and branches at the top in form of a panicle, sustaining very small herbaceous flowers, which are collected into small heads. This sort flowers in June.

It is propagated by parting the root; the best time is in autumn; it loves a moist soil and a shady situation, and is never injured by cold.

The ninth sort grows naturally upon some mountains in Wales; this hath a fibrous perennial root, from which come out oblong, roundish, indented leaves; they are near two inches long, and an inch and a half broad, deeply indented, or rather sawed on their edges, sitting very close to the root. The stalk rises about five inches high; it is naked, and terminated by a close compact cluster of white flowers; these appear in July, and if they are in a shady situation, will continue almost a month. This plant must have a shady situation and a loamy soil, otherwise it will not thrive.

The tenth sort grows naturally upon the Austrian mountains; it has also been found growing in plenty on Knotsford Moor in Cheshire; this is a perennial plant. The leaves are gathered in clusters at the bottom; they are spear-shaped, about two inches long, and half an inch broad in the middle, drawing to a point at both ends; the stalk rises about six inches high, and is garnished with narrow leaves the whole length, which are placed alternately, and sit close to the stalks; the flowers are produced in small clusters at the top of the stalk; they have five yellowish petals which spread open, having several red spots on their inside. This plant flowers in August. It is difficult to propagate in gardens, for it naturally grows upon bogs; so that unless it is planted in such loose rotten earth, and kept constantly moist, it will not thrive.

The eleventh sort grows naturally upon the Pyrenean and Helvetian mountains, as also upon Ingleborough-hill in Yorkshire, Snowden in Wales, and other high places in the north of England: this is a perennial plant, whose stalks trail upon the ground, and are seldom more than two inches long; these are garnished with small oval leaves standing opposite, which lie over each other like the scales of fish; they are of a brown green colour, and have a resemblance of Heath. The flowers are produced at the end of the branches; they are pretty large, and of a deep blue, so make a pretty appearance during their continuance, which is great part of March, and the beginning of April.

This is propagated by parting of the roots; the best time for doing it is in autumn: it must have a shady situation and a moist soil, otherwise it will not thrive in gardens.

The twelfth sort grows naturally upon the Alps, Pyrenees, and Helvetian mountains; it is also found growing plentifully on Ingleborough-hill in Yorkshire, Snowden in Wales, and some other places in the north; this is a perennial plant, whose branches spread flat upon the ground, and put out roots at their joints; these are garnished with fine soft leaves like Moss, some of which are entire, and others cut into three points. The branches join so close together, as to form a soft roundish bunch like a pillow or cushion, from whence some have given it the appellation of Ladies Cushion; the stalks rise three or four inches high; they are slender, erect, and have two or three small leaves, some are entire, and others trifid; they are of a bright green colour, and soft to the touch; the flowers grow in small bunches at the top of the stalk; they are small, and of a dirty colour, so make no great appearance; these come out in June.

This sort propagates fast enough by its trailing branches, provided it is planted in a moist soil and a shady situation, but it will not thrive in dry ground, or where it is much exposed to the sun. The best time to remove any of these plants is in autumn, that they may have the benefit of the winter's rain to establish them well before the dry weather of the spring comes on; for when they are planted late, they are very subject to die, unless they are supplied with water, and those which live seldom make any figure the first year.

SCABIOSA. Tourn. Inst. R. H. 463. tab. 263, 264. Lin. Gen. Plant. 108. [so called from scabies, *Lat.* a scab, because this plant is said to heal the scab.] Scabious.

The Characters are,

*The common empalement is composed of many leaves, is spreading, containing many flowers: it has several series* of

*of leaves ſurrounding the receptacle on which they ſit; the inner are gradually ſmaller. The flowers have a double empalement, and ſit upon the germen; the outer is ſhort, membranaceous, folded, and permanent; the inner is divided into five awl-ſhaped capillary ſegments. The florets have one erect tubulous petal, cut into four or five parts at the brim; they have four weak, awl-ſhaped, hair-like ſtamina, terminated by oblong proſtrate ſummits. The germen is ſituated under the receptacle of the florets, ſupporting a ſlender ſtyle, crowned by an obtuſe ſtigma, which is obliquely indented; it afterward becomes an oblong oval ſeed ſitting in the common empalement, and crowned by the cup of the flower.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourth claſs, which contains thoſe plants whoſe flowers have four ſtamina and one ſtyle.

The Species are,

1. Scabiosa (*Arvenſis*) corollulis quadrifidis radiantibus, caule hiſpido. Hort. Cliff. 31. *Scabious with quadrifid radiated florets, and a rough hairy ſtalk.* Scabioſa pratenſis hirſuta, que officinarum. C. B. P. 269. *Hairy Meadow Scabious of the ſhops.*

2. Scabiosa (*Succiſa*) corollulis quadrifidis æqualibus, caule ſimplici, ramis approximatix, foliis lanceolato-ovatis. Hort. Cliff. 30. *Scabious with quadrifid florets which are equal, a ſingle ſtalk, and branches growing near, with ſpear-ſhaped oval leaves.* Scabioſa integrifolia, glabra, radice præmorſâ. H. L. B. *Scabious with an entire ſmooth leaf, and a bitten root, called Devil's-bit.*

3. Scabiosa (*Tranſylvanica*) corollulis quadrifidis æqualibus ſquamis calycinis ovatis obtuſis. Lin. Sp. Plant. 98. *Scabious with quadrifid florets which are equal, and the ſcales of the empalement oval and obtuſe.* Scabioſa altiſſima annua, foliis agrimoniæ nonnihil ſimilibus. H. L. B. *Talleſt annual Scabious, with leaves not unlike Agrimony.*

4. Scabiosa (*Centauroides*) corollulis quadrifidis fiſtuloſis æqualibus, ſquamis calycinis acutis, caule paniculato, foliis rigidis pinnatifidis. *Scabious with quadrifid fiſtulous florets which are equal, acute ſcales to the empalement, a paniculated ſtalk, and ſtiff wing-pointed leaves.* Scabioſa annua fiſtuloſa, centauroides. H. Cath. *Annual fiſtulous Scabious, reſembling the greater Centaury.*

5. Scabiosa (*Montana*) corollulis quadrifidis æqualibus, ſtaminibus longioribus, ſquamis calycinis acutis, foliis radicalibus lanceolatis integerrimis caulinis diviſis. *Scabious with quadrifid equal florets, longer ſtamina, acute ſcales to the empalement, and the lower leaves ſpear-ſhaped and entire, but thoſe on the ſtalks divided.* Scabioſa montana glabra, foliis ſcabioſæ vulgaris. C. B. P. 270. *Smooth Mountain Scabious, with leaves like the common ſort.*

6. Scabiosa (*Altiſſima*) corollulis quadrifidis radiantibus caule hiſpido, foliis lanceolatis pinnatifidis, foliolis imbricatis. Lin. Sp. Plant. 99. *Scabious with radiated quadrifid florets, a rough hairy ſtalk, and ſpear-ſhaped wing-pointed leaves, with lobes ſet over each other in the manner of tiles.* Scabioſa altiſſima ſegetum. Triumf. Raii Hiſt. App. 236. *The talleſt Corn Scabious.*

7. Scabiosa (*Rigida*) corollulis quadrifidis æqualibus, calycinis ovatis obtuſis, foliis pinnatifidis. *Scabious with equal quadrifid florets, neat, oval, obtuſe empalements, and wing-pointed leaves.* Scabioſa fruticans anguſtifolia. C. B. P. 270. *Narrow-leaved ſhrubby Scabious.*

8. Scabiosa (*Graminifolia*) corollulis quinquefidis foliis lineari-lanceolatis, caule herbaceo. Lin. Sp. 145. *Scabious with radiated quinquefid florets, linear leaves, and an herbaceous ſtalk.* Scabioſa argentea anguſtifolia. C. B. P. 271. *Silvery narrow-leaved Scabious.*

9. Scabiosa (*Virgæ paſtoris*) corollulis quinquefidis æqualibus, caule erecto hiſpido, foliis lanceolatis denticulatis hirſutis, ſemi-amplexicaulibus. *Scabious with equal quinquefid florets, an erect ſtalk which is rough and hairy, and ſpear-ſhaped hairy leaves which are ſomewhat indented, and half embrace the ſtalks.* Scabioſa virgæ paſtoris folio. C. B. P. 270. *Scabious with a Shepherd's Rod leaf.*

10. Scabiosa (*Alpina*) corollulis quadrifidis æqualibus floribus cernuis, foliis pinnatis foliolis lanceolatis ſerratis. Hort. Cliff. 30. *Scabious with radiated florets, and winged ſawed leaves.* Scabioſa Alpina foliis centaurii majoris. C. B. P. 270. *Alpine Scabious, with leaves like thoſe of the greater Centaury.*

11. Scabiosa (*Cretica*) corollulis quinquefidis, foliis lanceolatis confertiſſimis integerrimis, caule ſuffruticoſo. *Scabious with radiated quinquefid florets, linear, ſpear-ſhaped, entire leaves, and an under ſhrub ſtalk.* Scabioſa fruteſcens, foliis leucoii hortenſis. H. Cath. *Shrubby Scabious with a Stock Gilliflower leaf.*

12. Scabiosa (*Fruteſcens*) corollulis quinquefidis, foliis lanceolatis confertiſſimis ſubintegerrimis. Hort. Cliff. 31. *Scabious with quinquefid florets, and ſpear-ſhaped leaves in cluſters, which are almoſt entire.* Scabioſa ſtellata, folio non diſſecto. C. B. P. 271. *Starry Scabious with an undivided leaf.*

13. Scabiosa (*Ocroleuco*) corollulis pinnatis radicalibus bipinnatis petiolis perfoliatis. Lin. Sp. Plant. 101. *Scabious with radiated quinquefid florets, and linear doubly-winged leaves.* Scabioſa multifido folio, flore flaveſcente. C. B. P. 270. *Scabious with a many pointed leaf and a yellowiſh flower.*

14. Scabiosa (*Argentea*) corollulis quinquefidis, foliis pinnatis, laciniis lanceolatis, pedunculis nudis lævibus longiſſimis. Prod. Leyd. 190. *Scabious with quinquefid florets, winged leaves having ſpear-ſhaped ſegments, and long, naked, ſmooth foot-ſtalks.* Scabioſa Orientalis argentea, foliis inferioribus inciſis. Tourn. Cor. 34. *Silvery Eaſtern Scabious, whoſe lower leaves are cut.*

15. Scabiosa (*Atropurpurea*) corollulis quinquefidis, foliis diſſectis, receptaculis florum ſubulatis. Hort. Cliff. 31. *Scabious with five-pointed florets, cut leaves, and awl-ſhaped receptacles to the flowers.* Scabioſa peregrina, capitulo oblongo nigricante. C. B. P. 270. *Foreign Scabious, with an oblong head and black flowers.*

16. Scabiosa (*Stellata*) corollulis quinquefidis, foliis diſſectis, receptaculis florum ſubrotundis. Hort. Cliff. 31. *Scabious with five-pointed florets, cut leaves, and roundiſh receptacles to the flowers.* Scabioſa ſtellata folio laciniato major. C. B. P. 271. *Greater ſtarry Scabious with a cut leaf.*

17. Scabiosa (*Africana*) corollulis quinquefidis, foliis inferioribus integris crenatis, caulinis inciſo-crenatis, caule fruticoſo. *Scabious with five-pointed florets, the lower leaves entire and crenated, thoſe upon the ſtalks bluntly cut, and a ſhrubby ſtalk.* Scabioſa Africana fruteſcens. Par. Bat. 219. *Shrubby African Scabious.*

18. Scabiosa (*Inciſus*) corollulis quinquefidis, foliis inferioribus crenatis, caulinis duplicato-pinnatis, caule fruticoſo hirſuto. *Scabious with five-pointed florets, the under leaves crenated, thoſe on the ſtalks doubly winged, and a ſhrubby hairy ſtalk.* Scabioſa Africana fruteſcens, maxima, foliis tenuiſſimè inciſis. Boerh. Ind. alt. 1. 128. *Greateſt ſhrubby African Scabious, with leaves very ſlightly cut.*

19. Scabiosa (*Fimbriatus*) corollulis multifidis, calycibus florum longioribus, caule ramoſo foliis diſſectis. *Scabious with many-pointed florets, longer empalements to the flowers, a branching ſtalk, and cut leaves.* Scabioſa Orientalis ſtellata, foliis variis flore carneo, ſemifloſculis florum fimbriatis. Edit. prior. *Eaſtern ſtarry Scabious, with various leaves, a fleſh-coloured flower, and the half florets fringed.*

The firſt ſort grows naturally in the fields in divers parts of England; this hath a ſtrong, thick, fibrous root, which runs deep into the ground, ſending out many branching ſtalks, which riſe near three feet high; the lower leaves are ſometimes almoſt entire, and at others they are cut into many ſegments almoſt to the midrib; they are ſeven or eight inches long, and from three to four broad in the middle, hairy, and ſit cloſe to the root. The ſtalks are covered with ſtiff prickly hairs, and garniſhed with ſmaller leaves at each joint, which are cut into narrow ſegments almoſt to the midrib. The flowers are produced upon naked foot-ſtalks at the end of the branches; theſe have a double empalement, which is hairy, and are compoſed of ſeveral tubulous florets, cut into four points at the top, each having a particular empalement, reſting upon the common placenta. The florets round the border are larger and deeper cut

cut than those which compose the disk or middle, their outer segments being much longer than the two side ones, and those are longer than the inner segment; they have four weak stamina, which soon shrink after the flowers open. In the center is situated a style which is longer than the floret, terminated by a roundish stigma. The flowers are of a pale purple colour, and have a strong faint odour; they appear in June, and the stalks decay to the root every autumn. This sort is intended by the College of Physicians for medicinal use, under the title of Scabiosa.

The second sort grows naturally in moist woods and pastures in most parts of England, and is directed by the College of Physicians to be used, under the title of Morsus Diaboli, or Devil's-bit; this hath a short tap-root, which appears as if the end of it were bitten or cut off, from whence it had the title of Succisa, and Morsus Diaboli. The leaves are oval, spear-shaped, and smooth; they are four inches long, and two broad in the middle, drawing to a point at each end; the stalks are single, about two feet high, garnished with two leaves at each joint, shaped like those below, but are smaller; they generally send out two short foot-stalks from their upper joint standing opposite, which are each terminated by one small blue flower, as is also the principal stalk with one larger. These are constructed in the same way as the former, and appear in August. As these plants are to be found plentifully in the fields and woods, so they are seldom admitted into gardens.

The third sort grows naturally in Transylvania; this is an annual plant, which is preserved in botanic gardens for variety; but as the flowers have little beauty, so it is rarely allowed a place in other gardens. The stalks rise four or five feet high, dividing into several branches; the leaves are hairy, and cut almost to the midrib. The flowers are small, of a pale purplish colour, and appear in July; the seeds ripen in autumn, when, if they are permitted to scatter, the plants will come up without care; if these are thinned and kept clean from weeds, it is all the culture they require.

The fourth sort grows naturally in Spain and Portugal; it is an annual plant; the stalk is stiff, and rises upward of three feet high, dividing toward the top into several branches, which are again divided into naked foot-stalks, each sustaining one small, pale, purplish flower, composed of many florets; the leaves are stiff, and cut into many winged points. It flowers and seeds about the same time as the former.

The fifth sort grows naturally upon the Alps and Appenines; this hath a perennial root, from which come out many entire, smooth, spear-shaped leaves; the stalk is single, sending out two short naked foot-stalks from the upper joint; the leaves upon the stalks are cut pretty deeply on their edges. The flowers are nearly of the same size and form with those of the first sort; it may be propagated by seeds, and will thrive in a shady moist border, requiring no other care but to keep the ground clean, and allow them room to spread.

The sixth sort is a biennial plant, which grows naturally in some parts of Italy, and also in Tartary. It rises with a strong branching stalk four or five feet high, closely armed with stiff prickly hairs; the lower leaves are spear-shaped, about seven inches long, and near four broad in the middle, cut deeply on the sides in winged points; those upon the stalks are more entire, some of them are sharply sawed on their edges, and those at the top are linear and entire. The flowers grow from the sides and at the top of the stalks; they are white, and each flower sits in a bristly empalement. This flowers in July, and the seeds ripen in autumn; it rises from scattered seeds, and requires no care.

The seventh sort grows naturally in Istria; this hath a perennial root; the lower leaves are almost entire, and are sawed on their edges; the stalk is stiff, and rises two feet high, dividing into two upward, which spread asunder, and in the division arises a naked foot-stalk, which (as also the side branches, are terminated by single flowers, composed of many white florets, which are inclosed in a scaly empalement, whose scales are obtuse; the leaves on the stalks are wing-pointed and stiff. This flowers in July, but seldom produces good seeds here; it is propagated by parting of the roots in autumn, and delights in a light loamy soil.

The eighth sort grows naturally upon the mountains in Italy; this hath a perennial root, from which arise three or four stalks, whose lower parts are garnished with linear leaves about four inches long, and the eighth of an inch broad, of a silvery colour, ending in acute points: the upper part of the stalk is naked for six or seven inches in length, sustaining at the top one pale blue flower, made up of several four-pointed florets. This plant flowers in July, but does not produce seeds in England; it is propagated by slips, which should be planted on a shady border the beginning of April; when these have put out good roots, they may be taken up with balls of earth, and transplanted where they are to remain. This plant loves a soft loamy soil, and a shady situation.

The ninth sort grows naturally on the Alps; this has a perennial root, from which arise several pretty strong hairy stalks near three feet high, which are garnished with spear-shaped leaves about four inches long and two broad; these are placed opposite, and embrace the stalks half round with their base; they are of a dark green on their upper side, but pale on their under and hairy, having a few indentures on their edges, and ending in acute points. The flowers are produced at the top of the stalks, in the same manner as those of the first sort, and are like them; these appear in June, and the seeds ripen in autumn. This is hardy, and loves a light loamy soil and a shady situation; it is propagated by seeds.

The tenth sort grows naturally on the Alps; this hath a perennial root, composed of many strong fibres which root deep in the ground, from which arise several strong channelled stalks upward of four feet high, garnished with winged leaves composed of four or five pair of lobes, which are unequal in size and irregularly placed; they are sawed on their edges, and end in acute points. The flowers are produced on naked foot-stalks at the end of the branches, the receptacles are globular; the flowers are of a whitish yellow, and appear the latter end of June. The seeds ripen in autumn. This may be propagated, either by seeds, or parting of the roots; it loves a loamy soil.

The eleventh sort grows naturally in Sicily; this rises with a shrubby stalk three feet high, and divides into several ligneous knotty branches, which are garnished with narrow silvery leaves, four inches long and a quarter of an inch broad, which are entire. The flowers stand upon very long naked foot-stalks at the end of the branches; they are made up of many five-pointed tubulous florets, of a fine blue colour. These appear in July, but are not succeeded by seeds here. It is propagated by slips or cuttings, which readily take root if they are planted in any of the summer months, if they are shaded from the sun, and duly refreshed with water. When these have made good root, some of them may be planted on a dry border near to a south wall, where they will live in common winters; but as they are frequently destroyed by severe frost, so some of the plants should be planted in pots, and in winter placed under a common frame, where they may be protected from frost, but in mild weather enjoy the free air.

The twelfth sort grows naturally in Crete; this hath a shrubby stalk, which rises about the same height as the former, and divides into many branches; the leaves are shorter, much broader, and not so white as those of the former sort; the flowers are not so large, and are of a pale purple colour. This sort flowers from the end of June till autumn, but it seldom ripens seeds in England. It is propagated by slips or cuttings

in

in the ſame way as the former, and requires the ſame treatment.

The thirteenth ſort grows naturally in Germany; this hath a perennial root, from which come out many leaves that ſpread near the ground, which are about five or ſix inches long, divided into narrow ſegments to the midrib; theſe ſegments are cut on their edges into regular acute points, like winged leaves; the ſtalks riſe near two feet high, and are garniſhed with very narrow cut leaves; they divide into ſeveral long foot-ſtalks, each being terminated by a roundiſh flower, with radiated borders. This flowers in July, and the ſeeds ripen in autumn. It may be propagated by ſeeds, and will thrive any where.

The fourteenth ſort grows naturally in the Levant; this is a low perennial plant, with a branching ſtalk which ſpreads wide on every ſide; the lower leaves are cut, but the upper leaves are narrow and entire; they are of a ſilvery colour. The flowers are ſmall, of a pale colour, and have no ſcent, ſo is only kept in botanic gardens for the ſake of variety. It is propagated by ſeeds, and is hardy enough to live in the open air.

The fifteenth ſort grows naturally in India; this is an annual plant, which is commonly cultivated in gardens for ornament. Of this there are a great variety in the colour of their flowers, ſome of them are of a purple approaching to black, others are of a pale purple, ſome are red, and others have variegated flowers; theſe alſo vary in the ſhape of their leaves, ſome of them having finer cut leaves than others; and ſometimes from the ſide of the flower-cup there comes out many ſlender foot-ſtalks, ſuſtaining ſmall flowers, in like manner as the Hen and Chicken Daiſies; but as theſe are accidental varieties which come from the ſame ſeeds, they need not be particularly enumerated here.

The flowers of this ſort are very ſweet, and continue a long time. The plants are propagated by ſowing of their ſeeds, the beſt time for which is about the latter end of May or the beginning of June, that the plants may get ſtrength before winter; for if they are ſown too early in the ſpring, they will flower the autumn following; and the winter coming on ſoon, will prevent their ripening ſeeds; beſides, there will be fewer flowers upon thoſe, than if they had remained ſtrong plants through the winter, and had ſent forth their flower-ſtems in ſpring; for theſe will branch out on every ſide, and produce a prodigious number of flowers, and continue a ſucceſſion of them on the ſame plants from June to September, and produce good ſeeds in plenty.

The ſeeds of theſe plants ſhould be ſown upon a ſhady border of freſh earth (for if they are ſown upon a place too much expoſed to the ſun, and the ſeaſon ſhould prove dry, few of them will grow.) When the plants are come up, they may be tranſplanted into other beds or borders of freſh earth, obſerving to water and ſhade them until they have taken root; after which they will require no farther care but to keep them clear from weeds till Michaelmas, when they may be tranſplanted into the middle of the borders in the pleaſure-garden, where the ſeveral ſorts being intermixed, will make an agreeable variety. They are extreme hardy, being rarely injured by cold, unleſs they have ſhot up to flower before winter, but do not continue after ripening their ſeeds.

The ſixteenth ſort grows naturally in Spain; this is an annual plant; the ſtalks riſe three feet high, they are hairy, and are garniſhed with oblong leaves which are deeply notched on their edges, and thoſe on the upper part of the ſtalk are cut almoſt to the midrib into fine ſegments. The flowers ſtand upon long foot-ſtalks at the top of the ſtalks, theſe have globular receptacles; the florets are large, and ſpread open like a ſtar; they are of a pale purple colour, appearing in July, and in favourable ſeaſons the ſeeds ripen in September, but in cold moiſt years the ſeeds do not ripen here.

It is propagated by ſeeds, which ſhould be ſown in beds of light loamy earth, where the plants are to remain; when the plants come up they muſt be thinned and kept clear from weeds, which is all the culture they require.

The ſeventeenth ſort grows naturally at the Cape of Good Hope; this hath a weak ſhrubby ſtalk which divides into ſeveral branches, and riſes about five feet high; the branches are garniſhed with oval ſpear-ſhaped leaves three inches long, and an inch and a half broad, which are entire, and deeply crenated on their edges; they are of a light green, and are a little hairy. The flower-ſtalk is produced at the end of the branches, ſuſtaining one pale fleſh-coloured flower, compoſed of many five-pointed florets. This plant continues flowering great part of ſummer, and ſometimes it produces good ſeeds in England.

The eighteenth ſort is alſo a native of the Cape of Good Hope; it hath a ſhrubby ſtalk like the former; the ſtalks are hairy, and divide into ſeveral branches, which are garniſhed toward the bottom with ſpear-ſhaped leaves which are crenated and entire, but thoſe on the upper part of the ſtalk are doubly winged. The flowers are produced upon long naked ſtalks from the end of the branches, they are of a pale fleſh colour, and are large, but have no ſcent; theſe are continued in ſucceſſion all the ſummer, and ſometimes the early flowers are ſucceeded by ſeeds which ripen in autumn.

Both theſe ſorts may be propagated by cuttings, which may be planted in a ſhady border during any of the ſummer months; when theſe have put out good roots, they ſhould be taken up and planted in pots filled with light loamy earth, and placed in the ſhade till they have taken new root; then they may be removed to a ſheltered ſituation, where they may remain till the froſts begin, when they ſhould be removed to ſhelter, for they are too tender to live in the open air through the winter; but as they only require protection from froſt, ſo they ſhould have as much free air as poſſible in mild weather, to prevent their being drawn up weak; therefore if they are placed in a common frame in winter, they will ſucceed better than in a green-houſe; and in the middle or latter end of April, they may be placed in the open air in a warm ſituation, afterward treating them as other hardy foreign plants.

The nineteenth ſort grows naturally near Aleppo; this is an annual plant, with a branching ſtalk near three feet high, which is garniſhed with leaves at each joint that are variouſly cut. The flowers are produced upon long foot-ſtalks at the end of the branches, theſe have very long empalements; the florets round the border are cut into ſeveral fringed ſegments. They are of a fleſh colour, and continue in ſucceſſion from July to autumn, and in favourable ſeaſons the ſeeds ripen here pretty well. This is propagated by ſeeds, which ſhould be ſown, and the plants afterward treated in the ſame way as the common Sweet, or Indian Scabious.

There are ſeveral other ſpecies of this genus, but as they are plants which have little beauty, ſo they are rarely admitted into gardens, therefore they are not enumerated here.

SCANDIX. Tourn. Inſt. R. H. 326. tab. 173. Lin. Gen. Plant. 319. Shepherd's-needle, or Venus-comb.

The CHARACTERS are,

*It hath an umbelliferous flower; the general umbel is long and has few rays, the particular umbels have many: the general umbel has no involucrum, the particular have a five-leaved one the length of the umbels: the general umbel is deformed, and has hermaphrodite florets in the diſk, and female in the rays. The flowers have five inflexed heart-ſhaped petals, the inner are ſmall, and the outer large; they have five ſlender ſtamina terminated by roundiſh ſummits, and an oblong germen ſupporting two permanent ſtyles, crowned by obtuſe ſtigmas. The germen afterward turns to a long fruit divided in two parts, each having one furrowed ſeed, convex on one ſide and plain on the other.*

This

This genus of plants is ranged in the second section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and two styles; and to this genus he has added some species of Myrrhis and Cerefolium.

The Species are,

1. Scandix (*Pecten*) seminibus lævibus rostro longissimo. Hort. Cliff. 101. *Scandix with smooth seeds and the longest beak.* Scandix semine rostrato vulgaris. C. B. P. 152. *Common Shepherd's-needle with beaked seeds.*
2. Scandix (*Australis*) seminibus subulatis hispidis, floribus radiatis, caulibus lævibus. Lin. Sp. Plant. 257. *Scandix with prickly awl-shaped seeds, radiated flowers, and smooth stalks.* Scandix Cretica minor. C. B. P. 152. *Smaller Shepherd's-needle of Candy.*
3. Scandix (*Grandiflora*) seminibus pedunculo villoso brevioribus. Flor. Leyd. 111. *Scandix with short hairy foot-stalks to the seeds.* Scandix Orientalis flore maximo. Tourn. Cor. 23. *Eastern Shepherd's-needle with a very large flower.*
4. Scandix (*Cretica*) seminibus hispidis, involucris umbello multifidis, caulibus aspersis. *Scandix with bristly seeds, many-pointed involucrums to the umbels, and rough stalks.* Scandix Cretica major. C. B. P. 152. *Greater Shepherd's-needle from Candy.*
5. Scandix (*Odorata*) seminibus sulcatis angulatis. Hort. Cliff. 101. *Scandix with angular furrowed seeds.* Myrrhis major cicutaria odorata. C. B. P. 160. *Sweet Cecily, or great sweet Chervil, by some sweet Fern.*
6. Scandix (*Anthriscus*) seminibus ovatis hispidis, corollis uniformibus, caule lævi. Lin. Sp. Plant. 257. *Scandix with oval rough seeds, the petals of the flowers uniform, and a smooth stalk.* Myrrhis sylvestris seminibus asperis. C. B. P. 160. *Wild Myrrh with rough seeds.*
7. Scandix (*Procumbens*) seminibus nitidis ovato-subulatis, foliis decompositis. Gron. Virg. 147. *Trailinging Scandix with neat, oval, awl-shaped seeds, and decompounded leaves.* Cerefolium Virginianum procumbens, fumariæ foliis. Mor. Hist. 3. p. 303. *Trailing Virginian Chervil with Fumitory leaves.*

The first sort grows naturally in stiff lands amongst the Corn in many parts of England, so is not cultivated in gardens. It is an annual plant; the leaves are finely divided into small segments, and have long foot-stalks; the stalks branch and rise six inches high. The flowers are small, white, and like those of wild Chervil, and sit upon the top of the beak or horns, which are the rudiment of the horn. At the bottom of the small umbel five leaves embrace the stalk with broad and short foot-stalks, which are afterward cut into small segments like the rest: the seed is long, and runs into a small point, resembling a large needle, but the umbels have great resemblance to the umbels of Musk Crane's-bill. It flowers in June, and the seeds ripen the end of July, which, if permitted to scatter, there will be a plentiful supply of young plants.

The second sort grows naturally in the south of France, in Italy, and Crete. This is an annual plant with low spreading stalks, garnished with very narrow fine cut leaves, placed thinly. The flowers are small, white, and stand in small umbels at the top of the stalks; these are succeeded by awl-shaped rough seeds. It flowers and seeds about the same time as the former.

The third sort grows naturally in the Levant; this is an annual plant, with fine cut leaves; the stalks rise eight inches high, garnished at each joint with a fine cut leaf, and are terminated by an umbel of white flowers, with large heart-shaped petals. The horns of this are longer than of any other sorts, and their foot-stalks are very short and hairy.

The fourth sort grows naturally in Crete; this hath larger leaves than either of the former, and are finely cut; the stalks grow a foot long, and divide into many branches, they are rough and channelled; the umbels have many-leaved involucrums, and the seeds are rough. It flowers at the same time as the former.

These four sorts will sow themselves wherever they are once introduced, and require no other care but to thin them and keep them clean from weeds.

The fifth sort grows naturally in Germany, but has been long kept in the English gardens; and of late years the seeds have been thrown out of gardens, so that the plants are frequently found growing naturally in the neighbourhood of those gardens. It has a very thick perennial root, composed of many thick fibres, of a sweet aromatic taste like Aniseed, from which come forth many large leaves that branch out somewhat like those of Fern, from whence it was titled Sweet Fern. The stalks grow four or five feet high, they are hairy and fistulous. The flowers are disposed in an umbel at the top of the stalk, they are white, and have a sweet aromatic scent; the outer petal of the flowers is large, the two side ones are of a middle size, but the two inner are small; these appear the latter end of May, and are succeeded by long angular furrowed seeds, having the taste and scent of Aniseed, which ripen in July.

This sort propagates fast by seeds, which, if permitted to scatter, there will be plenty of the plants arise, and these may be transplanted to any abject part of the garden, for it will grow in any soil or situation, and will require no care.

It stands in the list of medicinal plants, but is rarely used. Formerly the young leaves of this plant were put into sallads, but it has been long disused for the table in England, but in Germany it is put into soups.

The sixth sort grows naturally on the side of banks and foot-ways in many parts of England; this is an annual plant, whose seeds drop early in the summer; the plants come up in autumn, and flower early in the spring. The leaves of this are finely divided, very like those of the Garden Chervil, but are hairy; the stalks rise a foot and a half or two feet high, dividing into branches. These sustain umbels of small white flowers which come out early in April, and are succeeded by short, hairy, crooked seeds, which ripen in June, and soon after the plants decay.

There have been some instances of the ill effects of this plant when taken inwardly; some who have eaten this herb in soups, by mistaking it for Garden Chervil, have narrowly escaped with their lives.

The seventh sort grows naturally in Virginia; it is a low trailing plant of no great beauty or use, so is only preserved in botanic gardens for variety.

SCHEUCHERIA. Lin. Gen. Plant. 452. Sp. Plant. 482.

The Characters are,

*The empalement of the flower is divided into six oblong, reflexed, permanent segments; it has no corolla, but hath six capillary stamina crowned by long compressed summits; and three oval compressed germina the size of the empalement having no styles, but oblong stigmas sitting on the germen.*

This genus of plants is ranged in the third section of Linnæus's sixth class, which contains those plants whose flowers have six stamina and three stigmas.

We have but one Species of this plant, viz.

Scheucheria (*Palustris.*) Flor. Lapp. 133. *Marsh Scheucheria.* Juncus floribus minor. C. B. P. 12. *Smaller flowering Rush.*

This plant grows naturally in marshes, so is rarely admitted into gardens, therefore I shall not trouble the reader with any further account of it.

SCHINUS. Lin. Gen. Plant. 1130. Molle. Tourn. Inst. R. H. 661. Indian Mastick.

The Characters are,

*It is male and female in different plants. The empalement of the male flowers are of one leaf, divided into five acute segments which spread open; the flower hath five oval spreading petals on foot-stalks, and ten slender stamina the length of the corolla, crowned by roundish summits; these have no rudiments of fruit. The female flowers have a one-leaved empalement, divided into five acute segments which are permanent; and five oblong spreading petals, with a germen having no style, but three oval stigmas.* The

*The germen becomes a globular berry with three cells, inclosing one globular seed.*

This genus of plants is ranged in the second section of Linnæus's twenty-second class, which includes those plants which have male and female flowers on different plants.

The SPECIES are,

1. SCHINUS (*Molle*) foliis pinnatis, foliolis serratis, impari longissimo, petiolo æquali. Lin. Sp. Plant. 338. *Schinus with winged leaves whose lobes are sawed, the end one being very long, and the foot-stalks equal.* Lentiscus Peruviana. C. B. P. 399. *Peruvian Mastick-tree; and the Molle.* Clus. Mon. 322. *the Arbor Molle.*
2. SCHINUS (*Areira*) foliis pinnatis, foliolis integerrimis æqualibus, petiolo æquali. Lin. Sp. Plant. 1467. *Peruvian Mastick-tree with winged leaves, whose lobes and foot-shalks are equal, and the lobes entire.* Molle foliis non serratis. Feuill. Peruv. 3. p. 43. *Molle with unsawed leaves.*

Both these sorts grow naturally in Peru and Mexico, from which countries I have received the seeds. The first sort rises with a woody stem eight or ten feet high, dividing into many branches, covered with a brown rough bark; the leaves are placed alternate on the branches; they are composed of several pair of lobes, from ten to fifteen, and are terminated by one lobe which is longer than the others; the lobes are about an inch and a half long, and a quarter of an inch broad at their base, lessening gradually to the point, and have a few saws on their edges; they are of a lucid green, and emit a turpentine odour when bruised. The flowers are produced in loose bunches at the end of the branches; they are very small, white, and have no odour, composed of five small petals which spread open; these have small empalements of one leaf, indented in five parts at the brim. They appear in July, but are not succeeded by seeds in England.

This plant is propagated best by seeds, which must be procured from the countries where they naturally grow: these should be sown in pots filled with fresh earth, and plunged into a moderate hot-bed. If the seeds are good, the plants will appear in about five or six weeks; and if they are properly managed by admitting fresh air daily to them, according to the warmth of the season, and are duly refreshed with water, they will be fit to transplant in about five or six weeks after, when they should be carefully turned out of the pots and their roots separated; then they must be each planted in a small pot filled with soft loamy earth, and plunged again into a moderate hot-bed, shading them from the sun till they have taken fresh root; then they must be gradually inured to the open air, into which they should be removed soon after, placing them in a sheltered situation, where they may remain till autumn, but they must be removed into shelter before the first frosts, otherwise their tops will be killed, and thereby the plants are frequently destroyed.

These plants are tender when young, so require a little warmth in winter; but after two or three years growth, they will live in a good green-house, where, as they retain their leaves all the year, they will make a good variety. It may also be propagated by layers and cuttings; the layers should be put down in the spring, and by the following spring they will be rooted; the cuttings should be planted in April, which will put out roots in about two months, and may afterward be treated as the seedling plants.

The second sort differs from the first, in having entire lobes to the leaves, which are not sawed and are equal in size.

This sort is propagated in the same manner as the first, but as the young plants of it are much tenderer than those, so they will require to be placed in a moderate stove for four or five winters, after which time they may be kept in a good green-house, giving them little water in winter.

SCILLA. Lin. Gen. Plant. 378. Lilio-Hyacinthus. Tourn. Inst. R. H. 371. tab. 196. [so called of σκέλλω, to make dry, because this plant grows in dry places; or as others will have it, of σκύλλω, I am molested; because the bulb of this plant, by its acrimony, irritates the parts to which it is applied.] Squills.

The CHARACTERS are,

*The flower has no empalement; it has six oval petals which spread open like a star, and six awl-shaped stamina not more than half the length of the petals, terminated by oblong prostrate summits. It has a roundish germen supporting a single style, crowned by a single stigma. The germen afterward becomes a smooth oval capsule with three furrows, divided into three cells, which are filled with roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes those plants whose flowers have six stamina and one style. To this genus he added the Lilio-Hyacinthus, and several of Tournefort's species of Ornithogalums.

The SPECIES are,

1. SCILLA (*Maritima*) nudiflora bracteis refractis. Lin. Sp. Plant. 442. *Squill with naked flowers, whose bractea are broken.* Scilla vulgaris, radice rubra. C. B. P. 73. *Common Squill with a red root.*
2. SCILLA (*Lilio-Hyacinthus*) radice squamatâ. Hort. Cliff. 123. *Squill with a scaly root.* Lilio-Hyacinthus vulgaris, flore cæruleo. Tourn. Inst. 372. *Common Lily Hyacinth with a blue flower.*
3. SCILLA (*Italica*) corymbo conferto hemisphærico. Lin. Sp. Plant. 442. *Squill with an hemispherical corymbus of flowers.* Ornithogalum spicatum cæruleum. Tourn. Inst. R. H. 380 *Blue spiked Star-flower.*
4. SCILLA (*Peruviana*) corymbo conferto conico. Lin. Sp. Plant. 309. *Squill with a conical corymbus of flowers.* Ornithogalum cæruleum Lusitanicum, latifolium. Tourn. Inst. 381. *Portugal, blue, broad-leaved Star-flower, commonly called Hyacinth of Peru.*
5. SCILLA (*Amœna*) floribus lateralibus alternis subnutantibus. Hort. Cliff. 123. *Squill with flowers growing alternately from the sides of the stalk, which almost nod.* Hyacinthus stellaris cæruleus amœnus. C. B. P. *Fine blue starry Hyacinth.*
6. SCILLA (*Bifolia*) radice solidâ, floribus lateralibus erectiusculis paucioribus. Hort. Cliff. 123. *Squill with a solid root, and erect flowers growing thinly.* Ornithogalum bifolium Germanicum cæruleum. Tourn. Inst. 380. *Blue German Star-flower with two leaves, commonly called the early blue starry Hyacinth.*
7. SCILLA (*Autumnalis*) foliis filiformibus linearibus floribus corymbosis, pedunculis nudis adscendentibus longitudine floris. Lin. Sp. Plant. 443. *Squill with slender linear leaves, flowers growing in a corymbus, and naked foot-stalks rising over each other to the length of the flowers.* Ornithogalum autumnale minus, floribus cæruleis. Tourn. Inst. 381. *Smaller autumnal Star-flower with blue flowers, commonly called autumnal starry Hyacinth.*
8. SCILLA (*Hispanica*) radice solidâ, floribus paniculatis subnutantibus. *Squill with a solid root, and flowers growing in panicles which almost nod.* Ornithogalum Hispanicum sature cæruleum. Tourn. Inst. 381. *Star-flower of Spain with deep blue flowers.*
9. SCILLA (*Purpurea*) radice solidâ, racemo conico, floribus numerosis adscendentibus. *Squill with a solid root, and a conical spike of many flowers rising above each other.* Ornithogalum purpureum. Tourn. Inst. 380. *Purple Star-flower.*
10. SCILLA (*Eriophora*) radice solidâ, corymbo conferto hemispherico, scapo longissimo. *Squill with a solid root, an hemispherical corymbus, and the longest stalk.* Ornithogalum Eriophorum, Peruvianum. Tourn. Inst. 381. *Woolly Star-flower of Peru.*

The first is the Squill or Sea Onion whose roots are used in medicine, of which there are two sorts, one with a red, and the other a white root, which are supposed to be accidental varieties, but the white are generally preferred for medicinal use. The roots are very large, somewhat Pear-shaped, composed of many coats lying over each other like Onions; at the bottom come out several fibres which strike deep in the ground. From the middle of the root arise several

ral ſhining leaves a foot long, and two inches broad at their baſe, leſſening all the length to the top, where they end in points; they continue green all the winter, and decay in the ſpring, and then the flower-ſtalk comes out which riſes two feet high, is naked about half way, and is terminated by a pyramidal thyrſe of flowers which are white, compoſed of ſix petals which ſpread open like the points of a ſtar. This grows naturally on the ſea-ſhores, and in the ditches, where the ſalt water flows in with the tides, in moſt of the warm parts of Europe, ſo cannot be propagated in gardens, the froſt in winter always deſtroying the roots, and for want of ſalt water they do not thrive in ſummer. Sometimes the roots, which are brought for uſe, put out their ſtems and produce flowers without being planted in earth, as they lie in the druggiſt's ſhops.

The ſecond ſort grows naturally in Spain, Portugal, and the Pyrenees; this hath a ſcaly root like the Lily, for which reaſon Tournefort ſeparated it from the ſtarry Hyacinth, and conſtituted a genus of it with the title of Lilio-Hyacinthus. The root is oblong and yellow, very like thoſe of Martagon; the leaves are ſhaped like thoſe of the white Lily, but are ſmaller; the ſtalk is ſlender, and riſes a foot high; it is terminated by blue flowers like thoſe of the ſtarry Hyacinth. It flowers in June, and the flowers are ſucceeded by oval ſeed-veſſels having three cells, filled with roundiſh ſeeds.

The third ſort grows naturally in Portugal; this hath a roundiſh, ſolid, bulbous root like the Hyacinth. The leaves come out ſparſedly, and are very like thoſe of the Engliſh Hair-bells; the ſtalk riſes ſeven or eight inches high, and is terminated by cluſtered flowers of a pale blue colour, which at firſt are diſpoſed in a ſort of umbel or depreſſed ſpike, but afterward draws up to a point, forming a conical corymbus; the flowers appear the latter end of April, which are ſucceeded by oval capſules with three cells, filled with roundiſh ſeeds.

The fourth ſort grows naturally in Spain and Portugal, from whence I have received the roots; this has been long known in the Engliſh gardens by the title of Hyacinth of Peru. There are two varieties of this, one with a deep blue, and the other has a white flower; the latter is more rare here than the former. The root of this is large, ſolid, and raiſed in the middle a little pyramidal, covered with a brown coat, from which come out five or ſeven leaves before winter, which are ſix or eight inches long, broadeſt at their baſe, terminating in points; they are of a lucid green, keeled, and ſpread almoſt flat on the ground. From the center of theſe come out one, two, or three ſtalks according to the ſtrength of the root; theſe are thick, ſucculent, and riſe ſix or eight inches high, terminated by a conical corymbus of flowers, of a deep blue on ſome, and others are white, ſtanding upon pretty long foot-ſtalks; they are compoſed of ſix petals which ſpread open like a ſtar. In the center of the petals is ſituated a large roundiſh germen ſupporting a ſhort ſtyle, crowned by a ſingle ſtigma, and round the germen come out ſix ſhort ſtamina which ſpread aſunder, terminated by oblong proſtrate ſummits. The germen afterward turns to a roundiſh three-cornered capſule having three cells, which are filled with roundiſh ſeeds. It flowers in May, and the ſeeds ripen in July.

The fifth ſort grows naturally in Byzantium, and was introduced here about the year 1590. The root of this is large, ſolid, and of a purpliſh colour, from which come out five or ſix leaves which lie on the ground; they are above a foot long, and an inch broad; they are keeled, channelled, and of a lucid green; between theſe ariſe two, three, or four purpliſh ſtalks about eight or nine inches high, ſuſtaining toward the top five or ſix Star-flowers, which come out ſingly from the ſide of the ſtalk; they are of a Violet blue colour, having a prominent germen in the center, ſupporting a ſlender ſtyle, and attended by ſix ſlender ſtamina terminated by purple ſummits. It flowers in April, and the ſeeds ripen in June.

The ſixth ſort is commonly known in the gardens by the title of early ſtarry Hyacinth. There are two varieties of this, one with a deep blue, and the other with a white flower; theſe grow naturally in ſome parts of France and Germany. The roots are ſolid, roundiſh, and about the ſize of a nutmeg, from which comes out a ſlender channelled ſtalk about ſix inches high, having generally two leaves near the bottom, one ſituated above the other, which embrace the ſtalk with their baſe; theſe are about ſix inches long, and almoſt three quarters of an inch broad, channelled, and of a bright green. The flowers are thinly placed toward the top of the ſtalk; the lower ones have foot-ſtalks an inch and a half long, but thoſe of the others ſhorten gradually to the top; they are compoſed of ſix petals ſpreading open in form of a ſtar, having a turgid germen in the center, ſupporting a ſhort ſtyle, attended by ſix ſtamina, which in the blue flowers are of the ſame colour, and thoſe in the white flowers are white. The flowers appear in March, and are ſucceeded by roundiſh three-cornered capſules having three cells, filled with browniſh ſeeds.

The ſeventh ſort is the ſmall autumnal ſtarry Hyacinth, which grows naturally in ſeveral parts of England, particularly on St. Vincent's Rock near Briſtol, at the Lizard Point in Cornwall, and upon Blackheath in Kent; this hath a round, white, bulbous root, from which come forth a few ruſhy leaves about ſix inches long. In the center of theſe ariſe one or two ſlender ſtalks about ſix or ſeven inches high, naked, and ſuſtaining a ſmall corymbus of flowers at the top, which are ſmall, ſtar-pointed, and of a pale blue colour; theſe appear the beginning of September, at which time the leaves come out, and continue growing all the winter, and in the ſpring they die away.

The eighth ſort grows naturally in Spain and Portugal; this hath an oblong, white, bulbous root, from which come out five or ſix leaves a foot long, and half an inch broad, of a lucid green, and a little keeled. The flower-ſtalk riſes nine or ten inches high, is firm, and ſuſtains many ſtarry flowers at the top, diſpoſed in a looſe panicle, each ſtanding upon a pretty long foot-ſtalk which is erect, but the flower nods on one ſide; they are of a deep blue Violet colour, having a prominent germen, which afterward turns to a three-cornered capſule having three cells, filled with roundiſh ſeeds. It flowers in May.

The ninth ſort grows naturally in Italy; this hath a ſolid, white, bulbous root, from which riſe ſeveral leaves like thoſe of the common ſort. The ſtalk riſes ten or eleven inches high, and is terminated by a conical racemus of flowers, which are of a deep purple colour. This ſort flowers in May, and the ſeeds ripen in July.

The tenth ſort has a very large bulbous root, from which come out ſeveral leaves which at firſt are upright, but afterward bend toward the earth; they are of a thick ſubſtance and keeled; they are of a lucid green, and when broken yield downy threads; they are a foot and a half long, and more than an inch broad. Between the leaves ariſes the flower-ſtalk, which is a foot and a half long, round, firm, and naked, ſuſtaining at the top a large cluſter of flowers, which are gathered into an hemiſpherical corymbus: theſe have ſix petals which ſpread open in form of a ſtar; they are of a purple colour, and have blue bottoms, and a dark blue vein running lengthwiſe in the middle of each petal. This flowers the beginning of June, and produces ſeeds which ripen in Auguſt.

There is another ſort of this which grows naturally in the Levant, whoſe leaves are ſhaped liked thoſe of the Peruvian Hyacinth, but are longer, and ſtand erect; this propagates very faſt by offsets, but never flowers here. I have kept the roots in all ſituations

tions more than thirty years, and have not seen one flower.

These plants are all of them hardy, and may be propagated by seeds or offsets, the latter being the more expeditious way is generally practised. The roots may be transplanted after the leaves are decayed, but, if they are removed after they have put out new fibres, they rarely succeed, at least they will not flower the following spring; they may be treated in every respect like the ordinary kinds of Hyacinths.

If they are propagated by seeds, they should be sown in autumn soon after they are ripe, either in shallow boxes or pans in the same manner as has been before directed for Hyacinths, to which the reader is desired to turn, to avoid repetition.

SCLAREA. Tourn. Inst. R. H. 179. tab. 82. Salvia. Lin. Gen. Plant. 36. [This plant is so called of σκληρὸς, hard, because it has a hard and dry stalk.] Clary; in French, *Toute-bonne.*

The Characters are,

*The empalement of the flower is tubulous, of one leaf, which widens at the top, and has five acute points at the brim; it is of the lip kind, with one petal having a crooked tube, which enlarges at the chaps, where it is divided into two lips; the upper lip is erect and arched, the under lip is cut into three segments, the middle one being largest and hollowed like a spoon; it has but two stamina which appear, and are situated under the upper lip, terminated by oblong erect summits, and a four-pointed germen, supporting a forked style longer than the upper lip, crowned by a bifid stigma. The germen afterward become four roundish seeds which ripen in the empalement.*

This genus of plants is ranged in the first section of Linnæus's second class, which includes those plants whose flowers have two stamina and one style.

And he has joined this genus, and also the Horminum to the Salvia, the characters of each agreeing so well as to admit of their being joined; but in a book of gardening it would not be so well understood, which has occasioned my separating them again.

The Species are,

1. Sclarea (*Vulgaris*) foliis rugosis cordatis oblongis villosis serratis, bracteis floribus calyce longioribus concavis acuminatis. *Clary with rough, oblong, heart-shaped, sawed leaves, and the bractea among the flowers concave, pointed, and longer than the empalement.* Sclarea. Tab. Icon. 373. *Common Clary.*

2. Sclarea (*Æthiopis*) folis oblongis erosis lanatis, verticillis lanatis. *Clary with oblong, hairy, eaten, woolly leaves, and the whorls of the flowers covered with down.* Sclarea vulgaris lanuginoso amplissimo folio. Tourn. Inst. R. H. 179. *Common woolly Clary with the largest leaf.*

3. Sclarea (*Lusitanica*) foliis oblongo-ovatis dentato-serratis tomentosis, verticillis lanatis sessilibus. *Clary with oblong oval leaves which are woolly and indented like a saw, and woolly whorls of flowers sitting close to the stalk.* Sclarea Lusitanica glutinosa, amplissimo folio. Tourn. Inst. 179. *Clammy Portugal Clary with a very large leaf.*

4. Sclarea (*Pratensis*) foliis cordato-oblongis crenatis summis amplexicaulibus, verticillis subnudis, corollarum galeis glutinosis. *Clary with oblong, heart-shaped, crenated leaves, those on the top embracing the stalk, almost naked whorls, and the helmet of the flower glutinous.* Sclarea pratensis, foliis serratis, flore cæruleo. Tourn. Inst. 180. *Meadow Clary with sawed leaves and a blue flower.*

5. Sclarea (*Syriaca*) foliis lanceolatis obsoletè crenatis subtus tomentosis, verticillis minoribus subnudis. *Clary with spear-shaped leaves which are slightly crenated, and woolly on their under side, and very small whorls of flowers which are almost naked.* Sclarea Syriaca, flore cæruleo. Tourn. Inst. 180. *Syrian Clary with a blue flower.*

6. Sclarea (*Nemerosa*) foliis cordato-oblongis crenatis glabris, floribus verticillato-spicatis. *Clary with oblong, heart-shaped, crenated, smooth leaves, and spiked whorled flowers.* Sclarea folio salviæ minor, sive glabra. Tourn. Inst. 180. *Smaller Clary with a smooth Sage leaf.*

7. Sclarea (*Sylvestris*) foliis cordato-lanceolatis acutis, bracteis coloratis, flore brevioribus. *Clary with heart-shaped acute-pointed leaves, and coloured bracteæ which are shorter than the flower.* Sclarea folio salviæ major, vel maculata. Tourn. Inst. 180. *Clary with a greater, or spotted Sage leaf.*

8. Sclarea (*Ceratophylla*) foliis rugosis pinnatifidis lanatis, verticillis summis sterilibus. *Clary with rough, wing-pointed, woolly leaves, whose upper whorls are barren.* Sclarea rugoso verrucoso & laciniato folio. Tourn. Inst. R. H. 180. *Clary with rough, warted, cut leaves.*

9. Sclarea (*Indica*) foliis cordatis acutè crenatis, summis sessilibus, verticillis subnudis remotissimis. *Clary with heart-shaped leaves which are sharply crenated, those on the top sitting close to the stalks, and naked whorls placed far asunder.* Sclarea Indica, floribus variegatis. Tourn. Inst. 179. *Indian Clary with variegated flowers.*

10. Sclarea (*Orientalis*) foliis lanceolatis acuminatis, serratis, summis sessilibus, floribus verticillato-spicatis. *Clary with spear-shaped, acute-pointed, sawed leaves, the upper one sitting close to the stalks, and spiked whorled flowers.* Sclarea Orientalis, folio betonicæ acutissimo, comâ purpurascente. Tourn. Cor. 10. *Eastern Clary with an acute Betony leaf, and a purplish top.*

11. Sclarea (*Glutinosa*) foliis cordato-sagittatis serratis acutis. *Clary with heart-shaped crenated leaves which are acutely sawed.* Horminum luteum glutinosum. C.B.P. 238. *Yellow glutinous Clary.*

12. Sclarea (*Tuberosa*) foliis cordato-ovatis rugosis tomentosis, calycibus hispidis, radice tuberosâ. *Clary with oval, heart-shaped, rough, woolly leaves, prickly empalements, and a tuberous root.* Sclarea asphodeli radice. Tourn. Inst. R. H. 179. *Clary with an Asphodel root.*

13. Sclarea (*Tomentosa*) foliis hastato-triangularibus obsoletè crenatis, caule tomentoso paniculato. *Clary with triangular halbert-pointed leaves which are slightly crenated, and a woolly paniculated stalk.* Sclarea folio triangulari, caule tomentoso. Tourn. Inst. 180. *Clary with a triangular leaf and a woolly stalk.*

14. Sclarea (*Mexicana*) foliis obtusis erosis, staminibus corollâ duplo longioribus. Prod. Leyd. 309. *Clary with obtuse bitten leaves, and stamina twice the length of the petal of the flower.* Sclarea Mexicana altissima, facie heliotropii. Hort. Elth. 339. *Tallest Mexican Clary, with the appearance of Turnsol.*

15. Sclarea (*Argentea*) foliis dentato-angulatis lanatis, verticillis summis sterilibus, bracteis concavis. *Sclarea with angular, indented, woolly leaves, concave bractea, and the upper whorls of flowers barren.* Æthiopis tota argentea Cretica lanuginosa. Hort. Carrol. *Æthiopis with silvery woolly leaves.*

The first sort grows naturally in Syria, but has been long cultivated in the European gardens, both for the kitchen and shops; it is a biennial plant, which perishes after it has borne seeds. The lower leaves of this are large, rough, and wrinkled; they are oblong and heart-shaped; in good ground they are seven or eight inches long, and four broad at their base, ending in blunt points, and are sawed on their edges. The stalks are large, four-cornered, and clammy; they rise about two feet high, and are garnished at bottom with leaves of the same shape, but smaller; they send out small side branches which are opposite, as are also the leaves; the flowers are disposed in large loose spikes at the top of the stalks; they are placed in whorls round them, and are of a pale blue colour, having two short, hollow, acute-pointed leaves under each, which are thin, and of a whitish colour. The empalement of the flower is divided into two parts or lips, the upper ending in three, and the under in two spiculæ. The upper lip of the flower stands erect; it is long, and arched at the top, under which is the style which is nearly of the same length, and the two stamina, which are shorter, sit close

close to the ſtyle. After the flowers are paſt, the germen turn to four roundiſh ſeeds, which ripen in the empalement. The whole plant has a very ſtrong ſcent; it flowers in June and July, and the ſeeds ripen in September.

It is propagated by ſeeds, which ſhould be ſown in the ſpring, and when the plants are fit to remove, they ſhould be either tranſplanted into beds, or if a large quantity is required, they may be planted in an open ſpot of ground in rows two feet aſunder, and one foot diſtance in the rows. After the plants have taken root, they will require no farther care but to keep them clean from weeds. The winter and ſpring following the leaves, which are the only part uſed, will be in perfection, and in the ſummer they will run up to flower, and after they have ripened their ſeeds decay, ſo that there ſhould be annually young plants raiſed for uſe. It will thrive upon almoſt any ſoil that is not very wet, for in moiſt ground the plants frequently rot in winter.

The ſecond ſort grows naturally in Iſtria and Dalmatia; there are two varieties of this, one with very broad leaves which are but ſlightly indented on the ſides, the other has longer leaves which are deeply jagged. The leaves of both ſorts are of a thick ſubſtance, and very woolly, eſpecially on their under ſide; their upper ſides are rugged and wrinkled like the firſt ſort, and have ſeveral longitudinal veins, which diverge from the midrib. The ſtalks are ſquare, and riſe about two feet high, ſending out many branches by pairs oppoſite, which are garniſhed in the firſt with entire, oval, acute-pointed leaves, which embrace the ſtalks with their baſe, but thoſe of the other are long, narrow, and have ſeveral deep indentures on their edges. The upper part of the ſtalk and branches are garniſhed with ſpikes of flowers in whorls; under each of theſe whorls, are two hollow green leaves which are ſhorter than the empalements of the flowers; theſe empalements are divided into two lips, the upper ending in three, and the under in two ſpiculæ. The under lip or beard of the flower is white, and the helmet or galea is of a pale blue colour. This ſort flowers and perfects its feeds at the ſame time as the firſt, and periſhes ſoon after; it may be treated in the ſame way as the firſt.

The third ſort has ſome reſemblance of the ſecond, but the leaves are larger, very woolly, and glutinous; they are oblong, oval, deeply indented in ſharp points, and end with very acute points The ſtalks are woolly, four-cornered, and riſe about two feet and a half high, ſending out ſide branches by pairs; theſe terminate in looſe ſpikes of whorled flowers which are white, and the whorls are ſmaller than thoſe of the other ſorts. It flowers and ſeeds about the ſame time as the former, and the plants ſoon after decay; it grows naturally in Portugal and alſo in Syria; it is propagated by ſeeds in the ſame way as the firſt.

The fourth ſort grows naturally in ſome parts of France and Germany: it is generally found in meadows and rich paſtures; this has a perennial root, compoſed of many ſtrong ligneous fibres, from which come out many oblong heart-ſhaped leaves of a deep green colour, whoſe ſurfaces are rough; they are crenated on their edges, and ſtand upon pretty long footſtalks. The ſtalks riſe three feet high; they are four-cornered, and their lower parts are garniſhed with leaves whoſe baſe embrace them; the flowers grow in long whorled ſpikes at the top; they are ſmaller than thoſe of the former ſorts, and are of a fine blue colour, having ſcarce any ſmall leaves under the whorls. This flowers the latter end of May, and the ſeeds ripen in July; it is propagated by ſeeds, but the roots continue long.

The fifth ſort grows naturally in Syria; this is an abiding plant, whoſe roots run deep in the ground. The leaves are ſpear-ſhaped; the lower ones are about four inches long, and an inch and a half broad in the middle; they are crenated on their edges, and a little woolly on their under ſide. The ſtalks are ſlender, ſtiff, and riſe a foot and a half high; they are garniſhed with ſmaller leaves of the ſame ſhape, ſet on by pairs; the flowers grow in ſmall whorls, diſpoſed in looſe ſpikes at the top of the ſtalks; they are ſmall, blue, and ſhaped like thoſe of the other ſorts. This flowers in July, and the ſeeds ripen in autumn; it is propagated by ſeeds in the ſame way as the other ſorts.

The ſixth ſort grows naturally on the ſides of highways about Vienna and all over Hungary; this has an abiding root, ſending out many ſmooth leaves about the ſize and ſhape of thoſe of broad-leaved Sage, but are indented on their edges. The ſtalks are ſlender, four-cornered, and riſe a foot and a half high toward the bottom; they are garniſhed with ſmaller leaves; the upper parts are garniſhed with ſpiked ſmall whorls of blue flowers which appear in June, and are ſucceeded by ſeeds which ripen in Auguſt. It is propagated by ſeeds in the ſame way as the firſt ſort, but the roots will continue ſeveral years.

The ſeventh ſort grows naturally in Auſtria and Bohemia; this has an abiding root, from which come out many heart ſpear-ſhaped leaves about four inches long, and one and a half broad; they are crenated on their edges, of a bright green colour, and have many white ſpots diſperſed on their ſurface. The ſtalks are thick, four-cornered, and riſe near three feet high, garniſhed below with leaves by pairs ſitting cloſe to the ſtalks, but their upper parts have long looſe ſpikes of flowers in ſmall whorls, whoſe bracteæ are coloured. This flowers in June, and the ſeeds ripen in Auguſt; it is propagated by ſeeds as the former ſorts.

The eighth ſort grows naturally in Syria; this is a biennial plant, which dies after it has borne ſeeds. The leaves of this ſort are very thick and woolly; they are eight or nine inches long, narrow and wing-pointed, being cut into obtuſe ſegments nearly oppoſite on their ſides, almoſt to the midrib, ſomewhat like a ſtag's-horn in ſhape; theſe ſpread flat on the ground. The ſtalk riſes more than a foot high; it is thick, four-cornered, and very woolly, ſending out branches by pairs, and is garniſhed with narrow long leaves placed by pairs at each joint, which are ſawed on their edges. The flowers grow in looſe whorled ſpikes, but thoſe are barren at the top of the ſtalks; they are white, and ſhaped like thoſe of the fourth ſort. This flowers in June, and the ſeeds are ripe in Auguſt; it may be propagated by ſeeds in the ſame way as the firſt ſort, but ſhould have a dry ſoil, otherwiſe the plants are apt to rot in winter.

The ninth ſort grows naturally in India, but is hardy enough to live in the open air in England. The root of this will abide ſeveral years in a dry ſoil; the lower leaves are heart-ſhaped, acutely crenated on their edges, and of a thick conſiſtence; they are ſeven or eight inches long, and four broad at their baſe, where they are eared. The ſtalk is four-cornered, and riſes four feet high, having two or three pair of ſmaller leaves on the lower part, which ſtand oppoſite at the joints. The upper part of the ſtalk, for the length of two feet, is garniſhed with whorls of flowers which ſtand two or three inches diſtance from each other, having no leaves under the whorls. The empalement of the flower is hairy and blunt; the galea or helmet of the flower is arched, erect, and blue, terminating in a blue point; the two ſide ſegments of the under lip are of a Violet colour; the middle ſegment, which is indented at the point is white, and curiouſly ſpotted with Violet on the inſide; the two ſide indentures turn yellow before the flower drops. When the flower is paſt, the germen turn to four large roundiſh ſeeds which ripen in the empalement. This ſort flowers in May, and the ſeeds ripen in July; it is propagated by ſeeds in the ſame manner as the other ſorts.

The tenth ſort grows naturally in the Levant, where it was diſcovered by Dr. Tournefort, who ſent the ſeeds to the Royal Garden at Paris; this hath a perennial root, from which come out many ſpear-ſhaped leaves about four inches long, and one inch and a

half broad in the middle, of a dark green colour, sawed on their edges, and ending in acute points. The stalks rise three feet high, sending out branches by pairs their whole length; these are garnished with leaves by pairs, which toward the top sit close to the stalk. The flowers grow in whorled spikes at the top, having no leaves under them; they are small, of a bright blue colour, and the top of the spike is terminated with very deep blue flowers, which are barren; these appear in July, and are succeeded by seeds which ripen in September. It is propagated by seeds in the same manner as the other sorts, and the roots will abide many years.

The eleventh sort grows naturally in moist land both in Germany and Italy; this hath an abiding root, composed of strong ligneous fibres. The leaves are heart-shaped and pointed like a halbert; they are four inches long, and three broad at their base, of a pale yellowish green colour, and sawed on their edges, standing upon foot-stalks three or four inches long. The stalks are strong, four-cornered, and rise near four feet high; they are garnished below with smaller leaves, but the upper part of the stalk is closely set with whorls of large yellow flowers, which appear in June, and are succeeded by seeds which ripen in August. The whole plant is very clammy, and has a strong scent somewhat like the first species; this is propagated by seeds in the same way as the other sorts; it is very hardy, and will continue several years, and may be increased by parting of the roots in autumn.

The twelfth sort grows naturally in Italy; this has large swelling roots like dugs, or those of the Piony, from which arise many oval heart-shaped leaves lying on the ground; they are five or six inches long, and almost four broad at their base, where they are eared; they have pretty long foot-stalks, and are hairy; their edges are indented and a little wrinkled. Between these arise strong four-cornered stalks about four feet high, garnished with leaves placed opposite. The upper part of the stalk is garnished with loose spikes of whorled flowers, of a purple colour, which appear in June, and are succeeded by seeds which ripen in autumn. This is propagated by seeds in the same way as the other sorts, and the roots will continue several years.

The thirteenth sort grows naturally in the Canary Islands; this hath a perennial shrubby stalk which rises five or six feet high, dividing into many branches which are covered with a flocky down, and are garnished with halbert-shaped triangular leaves three inches and a half long, and one and a half broad at their base, where are two acute angular ears; they are placed opposite, standing upon long woolly foot-stalks. The top of the stalk branches out in many foot-stalks, forming a sort of panicle. The flowers are of a light blue colour, and are ranged in whorled spikes, having two small leaves under each whorl. This plant flowers from June to autumn, but rarely produces any seeds here. It is propagated by cuttings, which may be planted any time in summer; if these are planted in a bed of soft loamy earth, and covered close with a bell or hand-glass, observing to shade them from the sun, and refresh them with water as they may require it, they will take root very freely, then they must be inured to the open air; after they have put out good roots, they should be carefully taken up, and each planted in a separate small pot filled with light fresh earth, placing them in the shade till they have taken new root; then they may be placed among other hardy kinds of green-house plants in a sheltered situation till October, when they should be removed into shelter before hard frost comes on; but as they only require protection from hard frost, so they should have as much free air as possible in mild weather.

The fourteenth sort grows naturally in Mexico; this rises with a shrubby stalk eight or ten feet high, sending out slender four-cornered branches, of a purplish colour, garnished with oval leaves which are pointed at both ends and sawed on their edges; they have long slender foot-stalks, are thin, of a pale green colour, and hairy on their under side. The flowers grow in close thick spikes at the end of the branches; they are of a fine blue colour, and appear in winter, so make a pretty variety in the green-house at that season. This plant never produces seeds in England, so it is only propagated by cuttings, which may be planted during any of the summer months, in the same manner as the former sort; and the plants may be treated afterward in the same way, with this difference, which is, to give it a dry situation in winter, for the young shoots are very apt to grow mouldy upon being in a damp air.

The fifteenth sort grows naturally in Sicily, and also in the Archipelago. This hath an abiding root, which in dry soils will live several years; the leaves are oval, of a thick consistence, and are very woolly, having several irregular indentures on their borders; the stalk rises near a foot and a half high, sending out two or four branches near the bottom, which grow erect; these are garnished with pretty large whorls of white flowers, which appear in June; those whorls on the lower part of the stalks are fruitful, but toward the top they are barren; the seeds of the fruitful flowers will ripen the beginning of August, which should be then gathered, otherwise they will drop. This is propagated by seeds, which should be sown the beginning of April, in a dry or rubbishy soil, where the plants will live through the winter in the open air, and the second year will produce flowers and seeds.

There are some other sorts of less note, which are preserved in botanic gardens for the sake of variety; but those here mentioned are worthy of a place in large gardens, where, if they are intermixed among other large growing plants, they will afford a pretty variety, especially the fifth, eighth, tenth, and eleventh sorts, which produce long spikes of beautiful flowers, and continue a long time in flower. The flowers of the eleventh sort are used in Holland, to give a flavour to the Rhenish wines, which are brewed at Dordt. All these sorts may be propagated by sowing of their seeds upon a bed of fresh earth in March or April; and when the plants are come up, they should be transplanted into beds of fresh earth about eight inches asunder, observing to water them until they have taken root; after which they will require no farther care but to keep them clear from weeds until Michaelmas, when they should be transplanted into the places where they are to remain, placing them at a large distance, for they spread pretty far provided the soil be good. If so, they should be planted eight or ten feet distant, being intermixed with other plants. Some of these sorts will endure several years, provided they are planted on a fresh soil, not over moist or rich.

SCLERANTHUS, German Knot-Grass, or annual Knawel.

There are two species of this genus which grow naturally wild in England, so are rarely admitted into gardens, therefore I shall not trouble the reader with any farther account of them.

SCOLYMUS. Tourn. Inst. 480. tab. 273. Lin. Gen. Plant. 922. The Golden Thistle; in French, *Epine Jaune.*

The Characters are,

*It hath a flower composed of many hermaphrodite florets, included in an oval imbricated empalement, having many loose sharp-pointed scales. The florets are tongue-shaped, of one petal, which is torn and slightly indented in five parts. They have five short hair-like stamina, terminated by tubulous summits. The germen is situated under the floret, supporting a slender style longer than the stamina, crowned by two reflexed stigmas. The germen afterward becomes a single seed, which is oblong, triangular, and ripens in the empalement, the seeds being separated by plain, roundish, indented chaff.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which contains those plants whose

whose flowers are composed of hermaphrodite fruitful florets, and the stamina and style are connected.

The SPECIES are,

1. SCOLYMUS (*Maculatus*) foliis margine attenuatis. Lin. Sp. Plant. 813. *Golden Thistle with leaves which are thinner on the borders.* Scolymus chrysanthemus annuus. Act. Reg. Par. 111. *Annual Golden Thistle.*
2. SCOLYMUS (*Hispanicus*) foliis margine incrassatis. Lin. Sp. Plant. 813. *Golden Thistle with leaves which are thicker on the borders.* Scolymus chrysanthemus. C. B. P. 384. *Golden Thistle.*

The first sort grows naturally in the south of France and in Italy; this is an annual plant, which rises with a branching stalk four or five feet high, that have two leafy wings running along the sides from joint to joint; these are scollopped and indented; the borders of these are thinner than the other parts, and are armed all the way with very sharp spines; at each joint are placed stiff leaves, which are jagged and armed with strong spines; they are of a pale green, and sit close to the stalks. The flowers are produced at the top of the stalks inclosed in leafy involucrums, which are longer than the flowers, and are armed with very strong spines; within these are scaly empalements, which lie over each other like the scales of fish, and are armed with short spines. The flowers are composed of many golden florets, which do not appear till the middle or latter end of July; and unless the autumn proves warm and dry, the seeds do not ripen in England.

The second sort grows naturally in Spain and Sicily; this hath a perennial root, from which spring up many thick stalks that rise about three feet high, branching out on the sides the whole length, and are garnished with stiff jagged leaves, whose borders are thicker than the other part, and are armed with spines like the former sort; the stalks have leafy borders as the other, which are strongly armed with spines. The flowers are produced at the top of the stalks, and are shaped like those of the former sort. These appear in July, and if the season proves warm and dry, they will be succeeded by seeds which ripen in autumn.

They are propagated by seeds, which should be sown in March or April, on a bed of fresh undunged earth, in an open situation; and when the plants are come up, they should be kept clear from weeds; and where they grow too close, some of them should be pulled out, so as to leave those which are designed to remain about two feet asunder. This is all the culture which these plants require, for as they send forth tap-roots they do not bear transplanting well, therefore they must be sown where they are to remain; and if they are kept clear from weeds, they will thrive very well, and when the season proves dry, will perfect their seeds in autumn; but in wet seasons they rarely ever produce good seeds in England, which renders it difficult to continue the species, without procuring fresh seeds from abroad.

These plants are preserved by those persons who are curious in botany for variety's sake, but are rarely planted in other gardens.

SCOPARIA. Sweet-weed, or Wild Liquorice.

The CHARACTERS are,

*It hath an empalement of one leaf, which is concave, and divided into four slender rough segments. The flower is of one petal, which spreads open, is concave, and divided into four segments, which are equal, obtuse, and bearded: it hath four awl-shaped stamina which are equal and shorter than the petal, terminated by simple summits; and a conical germen supporting an awl-shaped style longer than the corolla, crowned by an acute stigma; the germen becomes an oblong oval-pointed capsule with one cell, filled with oblong seeds.*

This genus of plants is ranged in the first section of Linnæus's fourth class, which includes those plants whose flowers have four stamina and one style.

We have but one SPECIES at present in England, viz.

1. SCOPARIA (*Dulcis*) foliis ternis, floribus pedunculatis. Lin. Sp. 168. *Sweet Weed with three leaves surrounding the stalks, and flowers upon foot-stalks.* Veronica fruticosa erecto dulci hexangulari caule. Sloan. Hist. 1. p. 195. *Shrubby erect Speedwell, with an hexangular stalk.*

This plant in Europe is generally an annual, for after it has ripened its seeds it dies. It hath an hexangular stalk which rises near two feet high, sending out many branches which are garnished with three leaves placed round at each joint; these are about an inch long and a quarter of an inch broad, sawed on their edges, and of a deep green colour; the flowers come out from the side of the stalks at each joint, standing upon foot-stalks; they are small, white, and their petals have bearded threads on their edges; these are succeeded by capsules having one cell, opening with two valves, containing many oblong seeds.

It is propagated by seeds which should be sown upon a hot-bed in the spring; and when the plants are come up fit to remove, they should be planted upon a fresh hot-bed to bring them forward, observing to shade and water them until they have taken new root; after which, they should have the air admitted to them daily, according to the warmth of the season, and they must be frequently refreshed with water. In June they may be taken up with balls of earth to their roots, and planted into open borders, where they will flower, and perfect their seeds in the autumn, and soon after perish.

SCORDIUM. See TEUCRIUM.

SCORPIURUS. Lin. Gen. Plant. 886. Scorpioïdes. Tourn. Inst. R. H. 402. tab. 226. [so called, because the husk being wreathed, resembles the tail of a dragon: it is by some called Campoïdes, of Κάμπη, a canker-worm, and εἶδος, form.] Caterpillars; in French, *Chenille.*

The CHARACTERS are,

*The empalement of the flower is of one leaf, and is erect, blown up, lightly compressed, ending in five acute points. The flower is of the butterfly kind; it has a roundish standard which is indented at the point, where it is reflexed and spreading. The wings are loose, almost oval, having obtuse appendages. The keel is halfmoon-shaped, the belly is gibbous, pointed, and erect, cut into two parts below. It hath ten stamina, nine joined and one separate, terminated by small summits; and an oblong taper germen a little reflexed, supporting a rising inflexed style, terminated by a point for a stigma. The germen afterward becomes an oblong, taper, leathery, rough, channelled pod, twisted in many longitudinal cells divided within, and on the outside contracted into knotty joints, each cell containing one seed.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes those plants whose flowers have ten stamina joined in two bodies.

The SPECIES are,

1. SCORPIURUS (*Vermiculata*) pedunculis unifloris, leguminibus tectis undique squamis obtusis. Lin. Sp. Plant. 744. *Caterpillar with one flower upon a foot-stalk, and a pod covered with obtuse scales on every side.* Scorpioïdes siliquâ crassâ boelii. Tourn. Inst. 402. *Caterpillar with a thick pod.*
2. SCORPIURUS (*Muricata*) pedunculis bifloris, leguminibus extrorsum obtusè aculeatis. Lin. Sp. Plant. 745. *Caterpillar with two flowers on each foot-stalk, and the outside of the pods armed with blunt spines.* Scorpioïdes bupleuri folio siliquis lenibus. Park. 1117. *Caterpillar with a Hare's-ear leaf and a smother pod.*
3. SCORPIURUS (*Sulcata*) pedunculis subtrifloris, leguminibus extrorsum spinis distinctis acutis. Lin. Sp. Plant. 745. *Caterpillar with foot-stalks having three flowers, and the outside of the pods armed with sharp distinct spines.* Scorpioïdes bupleuri folio. C. B. P. *Caterpillar with a Hare's-ear leaf.*
4. SCORPIURUS (*Subvillosa*) pedunculis subquadrifloris, leguminibus extrorsum spinis confertis acutis. Lin. Sp. Plant. 745. *Caterpillar with four flowers sometimes upon a foot-stalk, and the outside of the pods armed with sharp spines which grow in clusters.* Scorpioïdes bupleuri

pluri folio, corniculis asperis, magis in se contortis convolutis. Mor. Hist. 2. 127. *Caterpillar with a Hare's-ear leaf, and a rough pod greatly contorted and twisted.*

5. Scorpiurus (*Pinnata*) foliis pinnatis. *Caterpillar with a winged leaf.* Scorpioïdes foliis viciæ minima. Mor. Hist. 2. 127. *Smallest Caterpillar with a Vetch leaf.*

The first sort grows naturally in Italy and Spain; this is an annual plant, with trailing herbaceous stalks above a foot long; they lie upon the ground, and at each joint have one spatule-shaped leaf with a long foot-stalk. From the wings of the leaves come out the foot-stalks of the flowers, which are nine inches long, sustaining at the top one yellow butterfly flower, which is succeeded by a twisted thick pod, in size and appearance of a large green caterpillar, from whence it had this title. It flowers in July, and the seeds ripen in autumn.

The second sort has stronger stalks than the first; the leaves are much broader; the foot-stalks support two smaller flowers; the pods are slender, longer, and more twisted than those of the first, and are armed with blunt spines on their outside.

The third sort hath slenderer stalks than either of the former; the leaves stand upon shorter foot-stalks, but are shaped like those of the first sort; the foot-stalks of the flowers are slender, and frequently support three flowers; the pods are slender, not so much twisted as the former, and are armed on their outside with sharp distinct spines.

The stalks and leaves of the fourth sort are very like those of the first, but the foot-stalks of the flowers are longer, and each of them have three or four small yellow flowers at the top; the pods are very slender, greatly contorted, and armed with sharp spines in clusters on their outside.

The fifth sort has very short stalks; the leaves are winged; they are composed of four pair of small lobes, terminated by an odd one. The flowers are small, as are also their pods, which are less twisted than those of the three former.

All these plants are annual, and grow naturally in most of the warm countries in Europe, but the first sort has been long cultivated in the English gardens. These plants are preserved in several curious gardens, for their oddness more than for any great beauty: they are all of them annual plants, which are propagated by sowing their seeds upon a bed of light fresh earth; and when the plants are come up they should be thinned, so as to leave them about ten inches or a foot asunder, because their branches trail upon the ground; and if they have not room, they are apt to overbear each other, and thereby are very often rotted, especially in moist seasons. The weeds should also be diligently cleared from them, otherwise they will grow over and destroy them. In June these plants will produce small, yellow, papilonaceous flowers, which are succeeded by pods so much like caterpillars, that a person at a small distance would imagine they were real caterpillars feeding on the plants; and it is for this oddness of their pods, that these plants are chiefly preserved.

These plants seldom thrive well if they are transplanted; therefore the best method is, to put in three or four good seeds in each place where you would have the plants remain (which may be in the middle of large borders in the pleasure-garden, where, being intermixed with other plants, they will afford a pleasing variety.) When the plants come up, there should be only one of the most promising left in each place, which should be constantly kept clear from weeds; and when their pods are ripe, they should be gathered and preserved in a dry place till the following spring, in order to be sown.

The first sort is the best worth cultivating, the pods being large and more visible than the other, and are more in form of a caterpillar.

SCORZONERA. Tourn. Inst. R. H. 476. tab. 269. Lin. Gen. Plant. 811. [of escorsa, a Catalonian word, signifying a viper, because it is said to be of great efficacy against the bite of vipers. Authors write, that the herb, being applied, takes away the venom of the bite of vipers. They say, that if a viper be touched with its juice, it languishes; and that a man may touch vipers safely, if his hand be first dipped in the juice of this plant.] Viper's-grass; in French, *Scorzonere.*

The Characters are,

*The common empalement is scaly, cylindrical, and imbricated. The flower is composed of several hermaphrodite florets, those on the outside being the longest; they are narrow, tongue-shaped, and indented in five parts. They have five short hair-like stamina, terminated by cylindrical summits. The germen is situated under the floret, supporting a slender style, crowned by two reflexed stigmas. The germen afterward turns to a single, oblong, channelled seed, crowned with a feathery down.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which includes those plants whose flowers are composed of hermaphrodite or fruitful florets, and their stamina and style are united.

The Species are,

1. Scorzonera (*Hispanica*) caule ramoso, foliis amplexicaulibus integris serrulatis. Hort. Cliff. 383. *Scorzonera with a branching stalk, whose leaves embrace them, which are slightly sawed.* Scorzonera latifolia sinuata. C. B. P. 275. *Common Viper's-grass.*
2. Scorzonera (*humilis*) caule subnudo unifloro, foliis lato-lanceolatis nervosis planis. Hort. Cliff. 382. *Scorzonera with an almost naked stalk having one flower, and broad, spear-shaped, plain, veined leaves.* Scorzonera humilis latifolia nervosa. C. B. P. 275. *Dwarf Viper's-grass, with broad veined leaves.*
3. Scorzonera (*Graminifolia*) foliis lineari-ensiformibus integris carinatis. Lin. Sp. Plant. 791. *Scorzonera with linear, sword-shaped, entire leaves, which are keeled.* Scorzonera Lusitanica, gramineo folio, flore pallidè luteo. Tourn. Inst. 477. *Portugal Viper's-grass with a Grass leaf, and a pale yellow flower.*
4. Scorzonera (*Purpurea*) foliis lineari-subulatis integris planis pedunculis cylindricis. Lin. Sp. Plant. 791. *Scorzonera with linear, awl-shaped, entire, plain leaves, and cylindrical foot-stalks.* Scorzonera angustifolia subcærulea. C. B. P. 275. *Narrow-leaved Viper's-grass, with a flower almost blue.*
5. Scorzonera (*Angustifolia*) foliis subulatis integris, pedunculo incrassato, caule simplicissimo basi villoso. Lin. Sp. Plant. 791. *Scorzonera with awl-shaped entire leaves, a thick foot-stalk, and the stalk hairy at its base.* Scorzonera humilis angustifolia pannonica. Clus. Hist. 2. p. 137. *Low, narrow-leaved, Hungarian Viper's-grass.*
6. Scorzonera (*Laciniata*) foliis linearibus dentatis acutis, caule erecto squamis calycinis patulo-mucronatis. Lin. Sp. 1114. *Scorzonera with narrow, acute, indented leaves, and an erect stalk.* Scorzonera laciniatis foliis. Tourn. Inst. 477. *Viper's-grass with cut leaves.*
7. Scorzonera (*Resedifolia*) foliis obtuse dentatis, caule prostrato calycum apicibus tomentosis. Lin. Sp. 1113. *Scorzonera with obtuse indented leaves, a prostrate stalk, and the tops of the calyx woolly.* Scorzonera foliis laciniatis supina. Bocc. Boerh. Ind. alt. 1. 89. *Low Viper's-grass with cut leaves.*

The first is the sort which is commonly cultivated in the English gardens for food and physic; this grows naturally in Spain. The root of this plant is Carrot-shaped, about the thickness of a finger, and covered with a dark brown skin; it is white within, and has a milky juice; the lower leaves are nine or ten inches long, and one and a half broad in the middle, ending with a long acute point. The stalk rises three feet high, it is smooth, branching at the top, and garnished with a few narrow leaves, whose base embrace the stalk. The flowers grow on the top of the stalks in scaly empalements, composed of many narrow, tongue-shaped, hermaphrodite florets, lying imbricatim over each other like the scales on fish; they are of a bright yellow colour, and appear in June and July. After these are decayed, the germen which sits in

in the common empalement, turns to oblong cornered seeds, having a roundish ball of feathery down at the top.

The second sort is shorter than either of the former; the leaves are broader, the stalk is almost naked, and has one yellow flower at the top.

The third sort has narrow, keeled, sword-shaped leaves; the stalks are slender, they rise about two feet high, branch toward the top, and sustain pale yellow flowers, which are smaller than those of the former sorts.

The fourth sort has narrow awl-shaped leaves, which are shorter than those of the former; the stalk is taper, and branches at the top; the flowers are of a pale purple colour.

The fifth sort grows a foot and a half high; the leaves are narrow and awl-shaped; the foot-stalk immediately under the flower is thicker than below, and the lower part of the stalk is hairy; the flower is yellow.

The sixth sort rises with a smooth branching stalk two feet high, and is garnished with narrow leaves having many winged points, resembling those of Buck's-horn Plantain, but larger. The flowers are yellow, and stand upon long naked foot-stalks at the end of the branches.

The seventh sort is very like the sixth, excepting that of the stalks spreading on the ground, which is not accidental; the indentures on the leaves are more obtuse, and the tops of the cups are woolly. I have cultivated both sorts above thirty years, and have never found either of them alter.

The first sort is only cultivated for use, the others are preserved in botanic gardens for variety, but are seldom admitted into other gardens.

These plants may be propagated by sowing their seeds in the beginning of April, upon a spot of light fresh soil. The best method of sowing them is, to draw shallow furrows by a line about a foot asunder, into which you should scatter the seeds, thinly covering them over about half an inch thick with the same light earth; and when the plants are come up, they should be thinned where they are too close in the rows, leaving them at least six inches asunder; and at the same time, you should hoe down all the weeds to destroy them; and this must be repeated as often as is necessary, for if the weeds are permitted to grow among the plants, they will draw them up weak.

There are many people who sow their seeds promiscuously in a bed, and afterward transplant them out the distance they would have them grow; but this is not so well as the former method, because their roots commonly shoot downright, which, in being transplanted, are often broken, so that they never will make such fair roots as those which remain in the same place where they are sown; for when the extreme part of the root is broken, it never extends itself in length afterwards, but only shoots into many forked small roots, which are not near so valuable as those which are large and strait. These roots may be taken up when the leaves begin to decay, at which time they have done growing, though they may remain in the ground until spring, and may be taken up as they are used; but those which remain in the ground till March, will shoot up their flower-stems, after which they are not so good, being sticky and strong.

If you intend to save seeds of these plants, you should let a parcel of the best remain in the places where they grew; and when their stems are grown to their height, they should be supported with stakes, to prevent their falling to the ground, or breaking. In June they will flower, and about the beginning of August their seeds will ripen, when they should be gathered, and preserved dry till the spring following for use.

SCROPHULARIA. Tourn. Inst. R. H. 166. tab. 74. Lin. Gen. Plant. 674. [so called, on account of its resembling Scrophuli, by its inequality; not because it is good to cure the scrophula in the neck, as is vulgarly thought.] Figwort; in French, *Scrofulaire.*

The Characters are,

*The flower has a permanent empalement of one leaf, cut into five parts at the top. It hath one unequal petal, with a large globular tube. The brim is cut into five small parts; the two upper are large and erect, the two side ones spread open, and the under is reflexed. It has four slender deflexed stamina, two of which are the length of the petal, and two are shorter, terminated by twin summits; and an oval germen supporting a single style the length of the stamina, crowned by a single stigma. The germen afterward turns to a roundish-pointed capsule with two cells, which open at the top, and are filled with small seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, which contains those plants whose flowers have two long and two shorter stamina, and their seeds are included in a capsule.

The Species are,

1. Scrophularia (*Nodosa*) foliis cordatis basi transversis, caule acutangulo. Lin. Sp. Plant. 863. *Figwort with heart-shaped leaves, whose base are transverse, and a stalk having acute angles.* Scrophularia nodosa fœtida. C. B. P. *Figwort with a knobby root and a stinking smell.*
2. Scrophularia (*Aquatica*) foliis cordatis petiolatis decurrentibus obtusis, caule membranis angulato, racemis terminalibus. Hort. Upsal. 177. *Figwort with heart-shaped leaves having running foot-stalks, and an angular membranaceous stalk, terminated by a racemus of flowers.* Scrophularia aquatica major. C. B. P. 236. *Greater Water Figwort, by some called Water Betony.*
3. Scrophularia (*Sulphurea*) foliis cordato-oblongis, basi appendiculatis, racemis terminalibus. Lœfl. Lin. Sp. Plant. 620. *Figwort with oblong heart-shaped leaves having appendages at their base, and stalks terminated by a racemus of flowers.* Scrophularia aquatica, flore sulphureo. Michel. *Water Figwort with a brimstone-coloured flower.*
4. Scrophularia (*Cordato*) foliis cordato-sagittatis, acutè serratis, racemis terminalibus. *Scrophularia with heart-shaped arrow-pointed leaves which are acutely sawed, and stalks terminated by a racemus of flowers.* Scrophularia betonicæ folio. Tourn. Inst. R. H. 166. *Figwort with a Betony leaf.*
5. Scrophularia (*Scorodonia*) foliis cordatis duplicato serratis racemo compositis. *Figwort with heart-shaped doubly-sawed leaves, and a compound racemus of flowers.* Scrophularia melissæ folio. Tourn. Inst. R. H. 166. *Figwort with a Baum leaf.*
6. Scrophularia (*Italica*) foliis cordatis duplicato-serratis, racemo composito. Flor. Leyd. Prod. 296. *Figwort with heart-shaped doubly-sawed leaves, and compound bunches of flowers.* Scrophularia nemorensis, folio urticæ rugoso, flore atro-punicante. Hort Cath. *Wood Figwort with a rough Nettle leaf, and a dark red flower.*
7. Scrophularia (*Trifoliata*) foliis glabris, inferioribus ternato-pinnatis obtusis, superioribus simplicibus, pedunculis subtrifloris axillaribus. Lin. Sp. 865. *Figwort with smooth leaves, the lower being winged and placed by threes, but the upper are single, and have foot-stalks with three flowers.* Scrophularia Hispanica, sambuci folio glabro. Tourn. Inst. 166. *Spanish Figwort with a smooth Elder leaf.*
8. Scrophularia (*Sambucifolia*) foliis interrupte pinnatis cordatis inæqualibus, racemoso terminali, pedunculis axillaribus geminis dichotomis. Lin. Sp. 865. *Figwort with unequal heart-shaped leaves having interrupted wings, and flowers produced on forked foot-stalks by pairs.* Scrophularia maxima Lusitanica, sambuci folio languinoso. Tourn. Inst. 167. *Greatest Portugal Figwort with a woolly Elder leaf.*
9. Scrophularia (*Canina*) foliis inferioribus pinnatis, summis integris duplicato-serratis, racemis axillaribus. *Figwort with the lower leaves winged, those at the top entire, doubly sawed, and bunches of flowers at the wings of the stalk.* Scrophularia ruta canina dicta vulgaris. C. B. P. 236. *Common Figwort, called Dog's-rue.*

10. Scrophularia (*Filicifolia*) foliis pinnatis, foliolis acutè dentatis, racemis terminalibus. *Figwort with winged leaves whose lobes are acutely indented, and bunches of flowers terminating the stalk.* Scrophularia folio filicis modo laciniatis, vel ruta canina latifolia. C. B. P. 236. *Figwort with leaves cut like Fern, or broad-leaved Dog's-rue.*

11. Scrophularia (*Lucida*) foliis bipinnatis glaberrimis lucidis racemis bipartitis terminalibus. *Figwort with winged leaves which are smooth and shining, and stalks terminated by divided bunches of flowers.* Scrophularia saxatilis lucida, laserpitii Massiliensis foliis. Bocc. Mus. p. 2. 166. *Shining Rock Figwort, with leaves like Laserwort of Marseilles.*

12. Scrophularia (*Orientalis*) foliis lanceolatis serratis, petiolatis caulinis ternis ramis oppositis. Lin. Sp. Plant. 864. *Figwort with spear-shaped leaves which are sharply sawed, those on the stalks placed by threes, and the branches opposite.* Scrophularia Orientalis, foliis cannabinis. Tourn. Cor. 9. *Eastern Figwort with leaves like Hemp.*

13. Scrophularia (*Verna*) foliis cordatis, pedunculis axillaribus solitariis dichotomis. Hort. Cliff. 322. *Figwort with heart-shaped leaves, and single foot-stalks proceeding from the wings, and divided by pairs.* Scrophularia flore luteo. C. B. P. 236. *Figwort with a yellow flower.*

14. Scrophularia (*Peregrina*) foliis cordatis, superioribus alternis, pedunculis axillaribus bifloris. Hort. Cliff. 322. *Figwort with heart-shaped leaves, the upper of which are alternate, and foot-stalks proceeding from the wings of the stalks, bearing two flowers.* Scrophularia urticæ folio. C. B. P. 236. *Figwort with a Nettle leaf.*

15. Scrophularia (*Pinnata*) foliis pinnatis, foliolis incisis, racemis simplicissibus terminalibus. *Figwort with winged leaves whose lobes are cut, and single bunches of flowers terminating the stalks.* Scrophularia Orientalis, chrysanthemi folio, flore minimo variegato. Tourn. Cor. 9. *Eastern Figwort with a Corn Marygold leaf, and the least variegated flower.*

16. Scrophularia (*Marylandica*) foliis cordatis serratis acutis basi rotundatis, caule obtusangulo. Hort. Upſ. 177. *Figwort with heart-shaped, acute, sawed leaves, which are rounded at their base, and obtuse angles to the stalks.* Scrophularia Marylandica, longo profundè serrato urticæ folio. Raii Suppl. 396. *Maryland Figwort with a long Nettle leaf which is deeply sawed.*

17. Scrophularia (*Frutescens*) foliis lanceolatis obtusis serrato-dentatis, pedunculis bifidis. Lin. Sp. Plant. 866. *Figwort with spear-shaped obtuse leaves which are indented, and bifid foot-stalks.* Scrophularia Lusitanica frutescens, verbenaceæ foliis. Tourn. Inst. *Figwort with shrubby stalks and Vervain leaves.*

18. Scrophularia (*Coccinea*) foliis quaternis ovatis, floribus verticillatis spicatis. Prod. Leyd. 294. *Figwort with oval leaves placed by fours round the stalk, and flowers in spikes.* Scrophularia flore coccineo, foliis urticæ ternis caulem ambientibus. Houst. MSS. *Figwort with a scarlet flower, and leaves like those of the Nettle, placed by threes round the stalk.*

The first sort grows naturally in woods and under hedges in most parts of England, so is seldom admitted into gardens; but being a medicinal plant, it is here mentioned to introduce the others. This hath a spreading root composed of many whitish knobs, from which arise several four-cornered stalks three feet high, which are garnished with heart-shaped leaves that are sawed on their edges, and have their base transverse; they are placed by pairs, and are of a dark green, or brownish colour on their upper side, but pale on their under, having an odour of Elder. The flowers are produced in small clusters from the sides of the stalks opposite, forming a kind of loose spike to the top; they are of one petal, of a dark purple colour, and shaped almost like a lip flower; the upper lip or crest being a little arched, the two side segments spread open, and the under segment is recurved. These appear in June, and are succeeded by roundish capsules ending in acute points, having two cells filled with small seeds, which ripen in August.

The second sort grows naturally by the side of ditches and watery places in every part of England; this hath a fibrous root, sending out strong four cornered stalks, which grow near four feet high, garnished with heart-shaped leaves, which are rounded at their points and crenated on their edges, somewhat like those of Betony, from whence it has been titled Water Betony. The flowers are larger than those of the former, and are a little more coloured, but of the same shape, and appear at the same time. This sort is sometimes used in medicine, but as it grows wild by the sides of ditches, so it is seldom admitted into gardens. There is a variety of this with variegated leaves, which is by some preserved in gardens.

The third sort grows naturally in Italy and Spain, by the side of rivers and other moist places. The stalks of this are stronger, taller, and greener, than those of the former; the leaves have generally small appendages at their base; the flowers are greener, and grow thinner upon the stalks than those of the former, and in these particulars consist their differences.

The fourth sort grows naturally in Sicily; this hath a perennial fibrous root. The stalks rise near four feet high, and have sharp angles; the leaves are arrow-pointed, heart-shaped, and are sharply sawed on their edges; the flowers grow in loose bunches to the top of the stalks; they are in shape like those of the former, but are of a dark red colour.

The fifth sort grows naturally in Italy; it hath a perennial root. The stalks rise four feet high, and branch out on their side; they are garnished with heart-shaped sawed leaves, which on the upper part of the stalk are placed alternate. The flowers are produced in bunches at the wings of the stalk, each foot-stalk supporting two flowers; these are small, of a brown colour, and appear in June. The seeds ripen in August.

The sixth sort grows naturally in Sicily; this hath a perennial root. The stalks rise four feet high, and are garnished with heart-shaped leaves which are doubly sawed on their edges; the flowers are disposed in compound spikes, which sit upon long foot-stalks; these arise from the wings of the stalks, and have generally two narrow leaves placed at their base, but the flowers terminate the stalks like the three first sorts.

The seventh sort grows naturally in Spain; this hath a perennial root. The leaves at the bottom are irregularly cut, and have two appendages at their base; they are smooth, of a lucid green, and are sawed on their edges. The stalks rise four feet high; they are four-cornered, smooth, and garnished with oval leaves, some of which are entire, and others have small lobes or appendages at their base. The flowers grow from the wings of the stalks in clusters, each standing upon a separate foot-stalk; they are of a bright red colour with greenish bottoms, and are much larger than either of the former. It flowers the beginning of June, and the seeds ripen in August.

The eighth sort grows naturally in Portugal; this resembles the seventh, but the stalks are larger, rise higher, and are hairy. The leaves are much longer, and have four appendages, irregularly sawed on their edges, and running out into longer points; the flowers grow in compound bunches at the wings of the stalks; they are larger than those of the former sort, and have a greater mixture of green in them.

The ninth sort grows naturally in Italy; this hath a root composed of a few thick fleshy fibres. The stalks are slender, four-cornered, and rise about two feet high; the lower leaves are composed of several pinnæ or lobes which are sharply sawed, but those on the stalks are entire; on the lower part of the stalk they are placed opposite, but toward the top they are alternate and small. The flowers come out in bunches from the wings of the stalk; they are small, and of a dark purple

purple colour with a mixture of green; the feed-veffels are fmall and roundifh. This flowers at the fame time with the former.

The tenth fort grows naturally in Crete; this hath a root compofed of flefhy fibres. The lower leaves are broad and jagged, not much unlike thofe of the Indian Scabious; the ftalks rife near three feet high; they are four-cornered, green, and fmooth, and are garnifhed with winged leaves having very long foot-ftalks; they are compofed of two or three pair of fmall lobes, terminated by a large one, which are acutely indented on their edges, and end in fharp points. The ftalks are terminated by flender bunches of flowers which are fituated fparfedly; they are fmall, of a purplifh colour at their rims, and are edged with white; they are fucceeded by fmall roundifh feed-veffels filled with very fmall feeds. It flowers in June, and the feeds ripen in September.

The eleventh fort grows naturally in the kingdom of Naples, where it is frequently found upon rocks and old ftone walls; this is a biennial plant, which perifhes after it has produced ripe feeds. The ftalks rife fifteen inches high; they are thick, fmooth, and have fcarce any corners; the leaves are winged, narrow, and of a lucid green; they are thick, fucculent, and divided into many fmall lobes which are again divided, and are wing-pointed; the flowers are produced in loofe bunches on the fides and at the top of the ftalk; they are of a dark brown colour, with a mixture of green, and are fucceeded by pretty large roundifh capfules, filled with angular dark-coloured feeds. It flowers about the fame time as the former fort.

The twelfth fort grows naturally in the Levant; this hath a perennial creeping root. The ftalks rife two feet and a half high; their lower parts are clofely garnifhed with fpear-fhaped leaves which are fharply fawed, and cut at bottom; the upper part of the ftalk is garnifhed with compound bunches of fmall brown flowers which appear in May, and are fucceeded by fmall roundifh capfules filled with fmall feeds, which ripen in July.

The thirteenth fort grows naturally in Helvetia; this is a biennial plant, which flowers and produces feeds the fecond year, and then decays. The lower leaves of this fort are four or five inches long, and three broad; they are heart-fhaped, hairy, and of a pale green colour. The ftalks rife three feet high, and are garnifhed with fmaller leaves, of the fame fhape with thofe at bottom, placed by threes round the ftalk; the flowers ftand upon pretty long foot-ftalks; three of thefe come out at each joint round the ftalk, and fupport clufters of pretty large flowers of a pale yellow colour; thefe appear in April, and are fucceeded by large oval capfules filled with fmall feeds, which ripen in June.

The fourteenth fort is a biennial plant which grows naturally in Italy. The leaves of this are heart-fhaped, ending in acute points, and are fawed on their edges; they are of a lucid green, and on the upper part of the ftalk are placed alternate; the foot-ftalks of the flowers come out at the wings of the leaves; thefe each fuftain two or three flowers, which are of a dark red or purple colour; they appear in May and June, and the feeds ripen in July and Auguft, after which the plants die.

The fifteenth fort grows naturally in the Levant, and alfo upon Gibraltar hill; this is a biennial plant, generally dying foon after the feeds are ripe. The lower leaves of this fort are doubly winged, and the fegments are varioufly cut and indented; the ftalk is flender, and rifes three feet high, the lower part of which is garnifhed with fmaller winged leaves, of a lucid green, which are indented and fit clofe to the ftalks; the upper part has very flender bunches of fmall flowers, coming out of the fide quite to the end of the branches. The flowers are thinly ranged, they are very fmall, and of a purple colour with white borders; thefe appear in June and July, but unlefs the autumn proves warm, they will produce no good feeds in England.

The fixteenth fort grows naturally in Portugal, where the ftalks become woody, but in England they are generally killed in winter, unlefs the plants are preferved in fhelter; the ftalks are garnifhed with fpear-fhaped leaves which are bluntly fawed on their borders; the flowers are produced from the fide of the ftalks, where at each joint come out two foot-ftalks. This hath dark herbaceous flowers which appear in June, and the feeds ripen in autumn.

The feventeenth fort grows naturally in Maryland; this hath a perennial fibrous root. The ftalks are four-cornered; the leaves are heart-fhaped, fharply fawed on their edges, and rounded at their bafe; the flowers are produced in bunches on the upper part of the ftalk, and are like thofe of the firft fort, but are of an herbaceous colour. This flowers in June and July, and the feeds ripen in autumn.

The eighteenth fort was difcovered by the late Dr. Houftoun, growing naturally at La Vera Cruz in New Spain; this is a biennial plant. The ftalk rifes two feet high, and is garnifhed with oval acute-pointed leaves which are fawed on their edges, and fit clofe to the ftalks; thofe at the bottom and top of the ftalk are placed by pairs, but in the middle there are three or four leaves at each joint placed round the ftalk; they are of a pale green colour, and at the top of the ftalk the flowers are produced in roundifh bunches; they are about the fize of thofe of the firft fort, and are of a fine fcarlet colour. This fort flowered in the Chelfea Garden, but did not perfect its feeds.

Thefe plants are propagated by feeds, which if fown in the fpring, the plants feldom rife the fame feafon. Some of them may come up in autumn, and others the fpring following; but, if they are fown in autumn, foon after they are ripe, the plants will come up the fpring following. Thefe feeds may be moft of them fown in the place where the plants are to remain, for the plants are in general all of them hardy enough to bear the cold of our ordinary winters in the open air (except the laft fort, which is tender;) therefore when the plants come up, they will require no other care but to thin them where they are too clofe, and keep them clear from weeds. The fecond year the plants will flower and produce ripe feeds; after which thofe forts which are biennial will die, but the others will continue fome years.

The feventh and eighth forts are ornamental plants, fo may be allowed to have a place in the pleafure-garden, where, when the plants are ftrong, they will make a good appearance during their continuance in flower, which generally lafts two months, unlefs the feafon proves very hot and dry. The roots of thefe forts will abide many years, unlefs by a very fevere winter they are deftroyed; therefore it will be proper to put fome of thefe plants in pots, which may be fheltered under a common frame in winter; but, as young plants flower ftronger than the old ones, there fhould be a fucceffion of them annually propagated by feeds.

The other forts are proper furniture for botanic gardens, but are feldom cultivated in any other. The ninth, tenth, eleventh, and fixteenth forts fhould have a dry foil, for as they naturally grow upon rocks and old walls, if they are in good ground, the plants will grow vigorous in fummer, and thereby will be fo replete with moifture, as that they are often killed by ordinary frofts, or rot with wet in winter; whereas in a poor dry foil, they are feldom injured by the cold in England.

The laft fort is too tender to live through the winter in the open air in this country, but the feeds fhould be fown in pots in autumn, which may be fheltered under a common frame in winter, and in the fpring plunged into a moderate hot-bed, which will bring them up. When thefe are fit to remove, as many of them as are required fhould be planted into

separate small pots, and plunged into a very moderate hot-bed, shading them from the sun till they have taken new root; after which they must be gradually hardened to bear the open air, into which they may be removed the latter end of June, placing them in a sheltered situation, where they may remain till September, when they should be removed into shelter before any morning frosts come on, and in winter they must be placed in a stove, kept moderately warm, where they will thrive and produce flowers the following summer.

SCUTELLARIA. Lin. Gen. Plant. 653. Cassida. Tourn. Inst. R. H. 181. tab. 84. Skull-cap; in French, *La Toque*.

The CHARACTERS are,

*The flower has a very short tubulous empalement of one leaf, whose brim is entire, having an incumbent scaly operculum which seems closed; it is of the lip kind, with a very short crooked tube, long compressed chaps, and a concave trifid upper lip, the middle segment being concave and indented, the two side ones plain. The under lip is broad and indented; it has four stamina hid under the upper lip, two of which are longer than the other, terminated by small summits, and a four-pointed germen supporting a slender style situated with the stamina, crowned by a single recurved stigma; the empalement afterward becomes a helmet-shaped capsule, including the four seeds which are roundish.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and are succeeded by naked seeds sitting in the empalement.

The SPECIES are,

1. SCUTELLARIA (*Peregrina*) foliis subcordatis serratis, spicis elongatis secundis. Hort. Cliff. 317. *Skull-cap with almost heart-shaped sawed leaves, and spikes of fruitful flowers.* Cassida. Col. Ecph. 1. p. 187. *Skull-cap.*

2. SCUTELLARIA (*Cretica*) foliis cordatis obtusis obtusèque serratis, spicis villosa imbricatis bracteis setaceis. Prod. Leyd. 311. *Skull-cap with woolly, obtuse, heart-shaped leaves which are bluntly sawed, and imbricated spikes of flowers.* Cassida Cretica fruticosa, catariæ folio flore albo. Tourn. Cor. 11. *Shrubby Cretan Skull-cap, with a Cat-mint leaf and a white flower.*

3. SCUTELLARIA (*Altissima*) foliis cordato-oblongis, acuminatis serratis, spicis subnudis. Lin. Sp. Plant. 600. *Skull-cap with oblong, acute-pointed, heart-shaped, sawed leaves, and almost naked spikes of flowers.* Cassida Orientalis altissima, urticæ folio. Tourn. Cor. 11. *Tallest Eastern Skull-cap with a Nettle leaf.*

4. SCUTELLARIA (*Orientalis*) foliis incisis, subtus tomentosis, spicis rotundato tetragonis. Hort. Upsal. 173. *Skull-cap with cut leaves which are woolly on their under side, and round four-cornered spikes.* Cassida Orientalis Chamædryos folio, flore luteo. Tourn. Cor. 11. *Eastern Skull-cap, with a Germander leaf and a yellow flower.*

5. SCUTELLARIA (*Integrifolia*) foliis sessilibus ovatis, interioribus obsoletè serratis, superioribus integerrimis. Lin. Sp. Plant. 599. *Skull-cap with oval leaves sitting close to the stalks, the under of which are sometimes sawed, and the upper entire.* Cassida folio melissæ, flore purpureo, longiore. Boerh. Ind. alt. 1. 177. *Skull-cap with a Baum leaf, and a longer purple flower.*

6. SCUTELLARIA (*Lupulina*) foliis cordatis inciso-serratis utrinque glabris, spicâ rotundato-tetragonâ. Hort. Upsal. 173. *Skull-cap with sawed cut leaves which are smooth on both sides, and a roundish four-cornered spike of flowers.* Cassida Alpina supina, magno flore. Tourn. Inst. R. H. 182. *Low Alpine Skull-cap with a large flower.*

There are some other species of this genus, which are plants of little beauty, so are seldom admitted into gardens, for which reason they are not enumerated here.

The first sort grows naturally in Italy. Mr. Ray observed it about Leghorn and Florence, in the hedges and uncultivated places in plenty: this hath a perennial root. The stalk is four-cornered, hairy, and rises two feet high; it is garnished with leaves placed opposite, which are almost heart-shaped and sawed on their edges. The flowers grow in long fruitful spikes at the top of the stalks; they are of a purple colour in some, and in others they are white; these appear in June, and after they decay, the empalement, which represents a helmet, contains four roundish seeds which ripen in August.

The second sort grows naturally in Crete; this hath a ligneous stalk which rises about two feet high, sending out slender side branches, garnished with obtuse heart-shaped leaves, which are bluntly sawed on their edges; they are hoary on their under side, and of a light green on their upper. The flowers are disposed in pretty long spikes at the top of the stalks; they are white, and have small leaves growing between them. This flowers in July, and the seeds ripen in autumn.

The third sort grows naturally in the Levant; this hath a perennial root. The stalks rise from three to four feet high, sending out a few slender branches from their sides; they are garnished with oblong heart-shaped leaves, ending in acute points, which are sawed on their edges. The flowers are disposed in naked spikes at the top of the stalks; they are purple, and have longer tubes than any of the other sorts. This flowers about the same time as the former.

The fourth sort grows naturally in the Levant; this is a perennial plant, with shrubby stalks which spread on the ground, and divide into small branches which are garnished with cut leaves placed opposite; they are almost triangular, of a light green on their upper side, and downy on their under, standing upon slender foot-stalks. The flowers are disposed in short four-cornered spikes at the end of the branches; they are of a bright yellow colour, and are succeeded by gray seeds which ripen in the empalement. This plant begins to flower the latter end of May, and there is commonly a succession of flowers on the same plant upward of two months.

The fifth sort grows naturally in North America; it has a perennial root, from which come forth several four-cornered stalks, which rise two feet high, sending out many side branches. The lower leaves are heart-shaped and sawed on their edges, standing upon pretty long foot-stalks; the upper leaves are oval and entire. The flowers are disposed in very long loose spikes at the end of the branches; they are of a purple colour, and appear the latter end of June; these are succeeded by seeds which ripen in September.

The sixth sort grows naturally on the Alps and Apennines. The stalks of this are shrubby and trailing; the leaves are cut on their edges, and smooth on both sides; the flowers are disposed at the top of the stalks in roundish four-cornered spikes; in one they are white, and in another variety they are blue; they are larger than the flowers of any other known species, so make a pretty appearance in gardens. This flowers in June, July, and August, and the seeds ripen in autumn.

These plants are all of them propagated by seeds. If these are sown in autumn soon after they are ripe, they will more certainly succeed than when they are sown in the spring, for sometimes these miscarry, and, if they succeed, the plants seldom come up the same season. The seeds may either be sown where the plants are to remain, or in a border to be afterward removed; but, as the fourth sort does not bear transplanting well, unless they are removed young, the seeds of that had better be sown where the plants are to stand. This should be on a dry warm border of poor earth, where the plants will live much longer, and make a better appearance than on a rich soil, though they seldom continue more than two or three years. When the plants come up, they will require no other care but to thin them, and keep them clean from weeds.

When the other sorts come up, and are fit to remove, they may be transplanted into a nursery-bed at five or six

six inches distance, where they may stand till autumn, but must be kept clean from weeds during that time; then they may be transplanted into the borders of the flower-garden, where they are to remain.

As these plants are not of long duration, it will be proper to sow a succession of seeds every other year at least, to supply the places of those which decay.

SECALE. Tourn. Inst. R. H. 513. tab. 294. Lin. Gen. Plant. 92. Rye; in French, *Sègle.*

The CHARACTERS are,

*There are two flowers in each involucrum; they have two leaves which are opposite, narrow, erect, and sharp-pointed. The petals have two leaves; the outer valve is rigid, bellied, acute-pointed, and compressed; the lower border is hairy, ending in a long awn; the inner is plain and spear-shaped; they have two oval erect nectariums, and three hair-like stamina hanging without the flower, terminated by oblong forked summits, with a top-shaped germen supporting two reflexed hairy styles, crowned by a single stigma. The germen afterward becomes an oblong almost cylindrical seed, which ripens in the empalement.*

This genus of plants is ranged in the second section of Linnæus's third class, which contains those plants whose flowers have three stamina and two styles.

We have but one distinct SPECIES of this genus which is cultivated in England, though it is often supposed the two varieties are essentially different; but from several years cultivating them on the same land, I could find no real difference between them. Dr. Linnæus titles this Secale glumarum ciliis scabris. Hort. Upsal. 22. *Rye with rough hairs to the awns.* Secale hybernum vel majus. C. B. P. *Winter or greater Rye.*

The farmers distinguish the two varieties by the titles of Winter and Spring Rye, but, when these are sown three or four years, at the same season, and on the same soil, it will be difficult to know them asunder; but, where Rye is sown upon a warm land, it will ripen much earlier than on cold stiff ground, and by continuing it two or three years, it will be forwarded so much, as to ripen a month earlier than the seeds which have long grown upon a strong cold soil; so those who are obliged to sow Rye toward spring, generally provide themselves with this early seed.

There are some kinds of Grass which are now ranged under this generical title, but as these do not merit cultivation, I shall not trouble the reader with the mention of them here.

Rye is so well known to every one who is the least acquainted with the different grains, as to need no description.

The Winter Rye is what the generality of farmers propagate; it is usually sown in autumn at the same season with Wheat, and in many of the northern counties, as also in Wales, they are often mixed together, though I think it must be very bad husbandry, for the Rye will always ripen sooner than Wheat; so that if the latter is permitted to be fully ripe, the former will shatter; nor can this be practised, where the people are not accustomed to eat Rye bread; for although it is by some accounted good when mixed, yet being so very clammy, few people who have been fed with Wheat, will ever care to eat bread made of this.

It is generally sown upon poor, dry, gravelly, or sandy land, where Wheat will not thrive, and in such places may answer very well; but on such land as will bear Wheat it is not proper to sow Rye, as the value of it is greatly inferior to that of Wheat.

When Rye is sown, the ground should not be too wet; and if it should happen that much rain falls before the Rye is come up, it often rots in the ground; but it is not long in coming up, it being much sooner out of the ground than Wheat.

The small Rye may be sown in the spring about the same time with Oats, and is usually ripe as soon as the other sort; but if the season proves wet, it is apt to run much to straw, and then the grain is generally lighter than the other; so the only use of this sort, is to sow upon such lands where the autumnal crop may have miscarried.

The general use of Rye is for bread, either alone, or mixed with Wheat; but (as was before observed) it is only fit for such persons who have been used to this food, few other persons caring to eat of it; nor have I ever heard of its having been exported, so can never be worth cultivating in general; though I have been informed it will yield a strong spirit, which perhaps may occasion its being more cultivated, since the pernicious use of spirituous liquors is now tolerated.

Rye is also sown in autumn to afford green feed for ewes and lambs in the spring, before there is plenty of Grass. When this is intended, the Rye should be sown early in autumn that it may have strength to furnish early feed. The great use of this is to supply the want of Turneps in those places where they have failed, as also, after the Turneps are over, and before the Grass is grown enough, to supply green feed for the ewes; so that in those seasons, when the Turneps in general fail, it is very good husbandry to sow the land with Rye, especially where there are stocks of sheep, which cannot be well supported, where green feed is wanting early in the spring; therefore those farmers who have large live stocks, should have several methods of supplying themselves with sufficient feed, lest some should fail; for as Turneps are a very precarious crop, some land should be sown with Cole-seed, which will supply the want of Turneps in winter; and if some of the ground, which was sown late with Turneps which had failed, was sown in autumn with Rye, that would be fit to supply the want of Cole-seed afterward.

SECURIDACA. Tourn. Inst. R. H. 399. tab. 224. Coronilla. Lin. Gen. Plant. 789. [so called from securis, *Lat.* a hatchet, because the ancients fancied the seeds of it resembled a hatchet.] Hatchet-vetch.

The CHARACTERS are,

*The empalement of the flower is short, compressed, and of one leaf, cut into two segments which are erect. The flower is of the butterfly kind; the standard is heart-shaped, reflexed on both sides, and scarce longer than the wings; these are oval, joining at the top, but open at the bottom; the keel is compressed and pointed. It hath ten stamina, nine joined, and one separate, terminated by small summits, and an oblong compressed germen, with a bristly style, crowned by an obtuse stigma. The germen afterward turns to a long, compressed, sword-shaped pod, with a thick border on one side, plain on the other, opening in two cells, filled with square seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which contains those plants whose flowers have ten stamina joined in two bodies; he has also joined it to the genus of Coronilla.

We have but one SPECIES of this genus at present, which is,

SECURIDACA (*Lutea*) herbacea leguminibus falcato-gladiatis. *Herbaceous Hatchet-vetch, with hooked sword-shaped pods.*

This plant grows naturally in the Corn-fields in Spain and Italy; it is annual, and perishes soon after the seeds are ripe; this hath trailing herbaceous stalks which grow a foot and a half long, and divide into many branches which spread on the ground, and are garnished with winged leaves composed of seven or eight pair of oval obtuse lobes, terminated by an odd one; they are of a deep green and smooth. From the wings of the leaves arise the foot-stalks of the flowers; these come out by pairs opposite at each joint, are five or six inches long, sustaining at the top a large cluster of yellow flowers of the butterfly kind; these are succeeded by compressed pods four or five inches long, ending in acute points; they have a suture on each side, one plain, and the other rising and thick; they are joined at their base to the foot-stalk, but spread open like the rays of a star, and are divided by a longitudinal partition into two cells, each containing a row of square flat seeds of a reddish colour. This

plant flowers in July, and the feeds ripen in autumn. It is propagated by fowing the feeds in borders of light frefh earth in the fpring, in the places where the plants are to abide, for they feldom fucceed well if they are tranfplanted; they fhould be allowed at leaft two feet diftance, becaufe their branches trail upon the ground. When the plants come up, they will require no other care but to thin them where they are too clofe, and keep them clean from weeds. A few of thefe plants may be admitted into every good garden for variety, though there is no great beauty in their flowers.

SEDUM. Lin. Gen. Plant. 513. Tourn. Inft. 262. tab. 140. Anacampferos. Tourn. Inft. 264. [fo called from fedendo, *Lat.* fitting, becaufe this plant does, as it were, fit upon the walls where it grows; or from fedando, appeafing, becaufe it appeafes the pains of inflammations.] Houfeleek; in French, *Joubarbe.*

The CHARACTERS are,

*The empalement of the flower is erect, acute, permanent, and cut into five fegments. The flower has five plain, fpear-fhaped, acute-pointed petals which fpread open, and five nectariums, with fmall fingle fcales indented at the top, each being inferted at their bafe to the outfide of the germen; it has ten awl-fhaped ftamina the length of the petals, terminated by roundifh fummits, and five oblong germen ending in flender ftyles, crowned by obtufe ftigmas. The germen afterward become five erect fpreading capfules which are compreffed, acute-pointed, opening from top to bottom, and filled with fmall feeds.*

This genus of plants is ranged in the fifth fection of Linnæus's tenth clafs, which includes thofe plants whofe flowers have ten ftamina and five ftyles; and to this he joins the Anacampferos of Tournefort, making them but one genus.

The SPECIES are,

1. SEDUM (*Album*) foliis oblongis obtufis teretiufculis feffilibus patentibus, cymâ ramofâ. Hort. Cliff. 177. *Houfeleek with oblong, obtufe, taper leaves fitting clofe to the ftalks, fpreading open, and a branching ftalk.* Sedum minus teretifolium album. C. B. P. 177. *Stone Crop, or fmaller Houfeleek, with taper leaves and white flowers.*
2. SEDUM (*Dafyphyllum*) foliis oppofitis ovatis obtufis carnofis, caule infirmo floribus fparfis. Lin. Sp. Plant. 431. *Houfeleek with oval, flefhy, blunt leaves which are placed oppofite, a weak ftalk, and flowers growing thinly.* Sedum minus, circinato folio. C. B. P. 223. *Leffer Houfeleek with a roundifh leaf.*
3. SEDUM (*Rupeftre*) foliis fubulatis quinquefariam confertis bafi folutis floribus cymofis. Hort. Cliff. 176. *Houfeleek with awl-fhaped leaves growing in clufters, whofe bafe has a loofe membrane, and flowers in bunches.* Sedum minus à rupe St. Vincenti. Raii Syn. 2. 155. *Leffer Houfeleek, or Stone Crop of St. Vincent's Rock.*
4. SEDUM (*Hifpanicum*) foliis teretibus acutis, radicalibus fafciculatis, cyma pubefcente. Amœn. Acad. 4. p. 273. *Spanifh Houfeleek with acute taper leaves, thofe at the bottom growing in bunches, and the tips are hairy.* Sedum Hifpanum, folio glauco acuto, flore albido. Boerh. Ind. alt. 1. 287. *Spanifh Houfeleek with a gray-coloured acute leaf, and a white flower.*
5. SEDUM (*Acre*) foliis fubovatis adnato-feffilibus gibbis erectiufculis alternis, cymâ trifidâ. Hort. Cliff. 177. *Stone Crop with oval, gibbous, erect, alternate leaves fitting clofe to each other, and a trifid top.* Sedum parvum acre, flore luteo. J. B. 3. 994. *The common Stone Crop, or Wall Pepper.*
6. SEDUM (*Rubens*) foliis fuciformibus fubdepreffis, infimis quaternis, cyma fubquadrifida, floribus pentandris, ftaminibus reflexis. Lin. Sp. Plant. 619. *Houfeleek with depreffed leaves, thofe at the bottom being ranged by fours; the flowers have but five ftamina which are reflexed.* Sedum arvenfe, flore rubente. C. B. P. 283. *Field Houfeleek with a red flower.*
7. SEDUM (*Annuum*) caule erecto folitario annuo, foliis ovatis feffilibus gibbis alternis, cymâ recurvâ. Flor. Suec. 319. *Houfeleek with an erect, annual, fingle ftalk, oval gibbous leaves which are placed alternate, and a recurved top.* Sedum minimum non acre flore albo. Raii Syn. 2. p. 115. *The leaft Stone Crop, not biting with a white flower.*
8. SEDUM (*Reflexum*) foliis fubulatis fparfis bafi folutis, inferioribus recurvatis. Flor. Suec. 2. p. 1296. *Stone Crop with awl-fhaped fparfed leaves, whofe under ones are turned back.* Sedum minus luteum, ramulis reflexis. C. B. P. 283. *Smaller yellow Houfeleek with reflexed branches.*
9. SEDUM (*Sexangulari*) foliis fubovatis adnato-feffilibus gibbis erectiufculis fexfariam imbricatis. Flor. Suec. 390. *Stone Crop with almoft oval, gibbous, erect leaves growing clofe to each other, and imbricated fix ways.* Sempervivum minus vermiculatum. C. B. P. 204. *Infipid Stone Crop.*
10. SEDUM (*Villofum*) caule erecto, foliis planiufculifque fubpilofis. Lin. Sp. Plant. 423. *Houfeleek with an erect ftalk, plain leaves, and foot-ftalks which are fomewhat hairy.* Sedum paluftre fubhirfutum purpureum. C. B. P. 285. *Hairy Marfh Houfeleek with purple flowers.*
11. SEDUM (*Stellatum*) foliis planiufculis angulatis, floribus lateralibus fubfeffilibus folitariis. Hort. Cliff. 176. *Houfeleek with plain angular leaves, and fingle flowers fitting clofe to the fides of the ftalk.* Sedum echinatum, vel ftellatum, flore albo. J. B. 3. 680. *Prickly or ftarry Houfeleek with a white flower.*
12. SEDUM (*Cepæa*) foliis planis, caule ramofa, floribus paniculatis. Hort. Cliff. 176. *Houfeleek with plain leaves, a branching ftalk, and flowers growing in panicles.* Sedum Cepæa dictum. H. L. B. *Houfeleek called Cepæa.*
13. SEDUM (*Aizoon*) foliis lanceolatis ferratis planis, caule erecto, cymâ feffili terminali. Lin. Sp. Plant. 430. *Houfeleek with plain, fpear-fhaped, fawed leaves, and an erect ftalk terminated by a head of flowers fitting clofe to it.* Anacampferos flore flavo. Amman. Ruth. 96. tab. 11. *Orpine with a yellow flower.*
14. SEDUM (*Telephium*) foliis planiufculis ferratis, corymbo foliofo, caule erecto. Lin. Sp. 616. *Houfeleek with plain fawed leaves, a leafy corymbus, and an erect ftalk.* Telephium vulgare. C. B. P. 287. *Common Orpine, or Live-long.*
15. SEDUM (*Hæmatodes*) foliis ovatis integerrimis, fummis amplexicaulibus, corymbo terminali. *Houfeleek with oval entire leaves which at the top embrace the ftalk, and a corymbus of flowers terminating the branches.* Telephium Lufitanicum hæmatodes maximum. H. R. Par. *The greateft Portugal bloody Orpine.*
16. SEDUM (*Anacampferos*) foliis cuneiformibus integerrimis, caulibus decumbentibus, floribus corymbofis. Lin. Sp. Plant. 430. *Houfeleek with wedge-fhaped entire leaves, trailing ftalks, and flowers growing in a corymbus.* Anacampferos minor, rotundiore folio, fempervirens. J. B. 3. 682. *Smaller and rounder-leaved evergreen Orpine.*

The firft fort grows naturally upon old walls in many parts of England, fo is feldom planted in gardens; but as it is a medicinal plant, I have placed it here; this hath flender trailing branches, which are garnifhed with taper fucculent leaves about half an inch long, ftanding alternately round the branches. The flower-ftalks rife four or five inches high; their lower part is garnifhed with leaves which fpread out horizontally; the upper part of the ftalk divides into fmall foot-ftalks, fupporting many white ftar-pointed flowers, gathered into a fort of umbel. Thefe appear in July, and are fucceeded by five-cornered capfules filled with fmall feeds which ripen in autumn.

The fecond fort alfo grows upon old walls in many parts of England. The ftalks of this are very flender and infirm; the leaves are very fhort, oval, and of a gray colour; they are placed by pairs oppofite. The flowers are fet thinly at the top of the ftalks; they are fmall, white, and their petals are obtufe; the fummits upon the ftamina are pretty large, and of a bright purple colour. It flowers about the fame time as the former.

The third fort grows naturally upon St. Vincent's Rock near Briftol, and in feveral parts of Wales; this has flender purple ftalks which trail upon the ground,

ground, and are closely garnished with short awl-shaped leaves placed all round the stalks, which have a short loose membrane at their base, which falls off on being touched; the leaves toward the top of the stalk close together; they are of a sea-green colour, and not very succulent. The flowers grow at the top of the stalks in roundish bunches; they are of a bright yellow colour, and come out about the same time as the former. This plant, when it is once placed upon a wall, will propagate itself in plenty by its trailing branches, which put out roots from their joints.

The fourth sort grows naturally in Spain; this is an annual plant with upright stalks, which rise three or four inches high, garnished with fleshy awl-shaped leaves near an inch long, which spread out on every side; they are of a gray colour. The top of the stalk divides into two slender erect branches, which have small, white, star-pointed flowers ranged above each other, and the top of the stalk at the division of the branches is terminated by two or three flowers sitting close. This flowers in June, and the seeds ripen the beginning of August, which, if permitted to scatter, the plants will come up without care.

The fifth is the common Stone Crop or Wall Pepper, so called for the acrid biting quality of the leaves; this grows very common upon old walls and buildings in every part of England, and is so well known as to require no description. There are two varieties of it, one with large, and the other a small yellow flower.

The sixth sort grows upon moist rocks in several parts of France and Germany, and is seldom seen in gardens; this rises with an erect stalk about three inches high, garnished with obtuse, cylindrical, succulent leaves. The stalk divides upwards into three or four branches, which sustain small purplish flowers standing erect.

The seventh sort grows naturally on dry barren rocks in the north of England; this is an annual plant with an erect stalk, garnished with oval leaves placed alternate. The stalk seldom rises above two or three inches high; the leaves sit close to the stalks, and are of a grayish colour; the flowers grow at the top of the stalk in a reflexed spike; they are small and white.

The eighth sort grows naturally upon old walls and buildings in most parts of England, and is by some called Prick-madam; this has long trailing stalks, which are garnished with fleshy awl-shaped leaves, spreading out almost horizontally; they are of a gray colour, and end in acute points. The flowers grow in reflexed bunches at the top of the stalks; they are star-pointed, and of a bright yellow colour.

The ninth sort is less common than either of the former. I have found it growing upon the rocks in Wales. This hath the appearance of common Stone Crop, but the stalks and leaves are larger, and have no biting taste: the leaves are ranged in six rows, like the grains of the six-rowed Barley; the flowers are yellow, and larger than those of the common Stone Crop.

The tenth sort grows naturally upon moist rocks and boggy soils in several parts of the north of England and in Wales; this seldom rises more than two or three inches high. The stalks are garnished with a few plain hairy leaves, and are terminated by purple flowers growing thinly. It flowers in June.

The eleventh sort grows naturally in Italy and Germany; this is a low annual plant. The leaves are plain and angular; the stalks rise three inches high, dividing at the top into two or three parts; the flowers come out singly from the side of the stalk; they are white, star-pointed, and are succeeded by star-pointed rough capsules.

The twelfth sort is an annual plant, which grows naturally in the south of France and Italy; this hath plain succulent leaves. The stalks rise six or seven inches high, dividing into smaller branches, which sustain small white flowers growing in large panicles; these appear in June, and the seeds ripen the beginning of August, which, if permitted to scatter, the plants will come up without care. This loves a warm dry soil.

The thirteenth sort grows naturally in Siberia; this has a perennial root, composed of many thick fleshy fibres, from which come out several stalks which rise near a foot high, and are garnished with spear-shaped, plain, thick leaves, placed alternately on every side; they are two inches and a half long, and three quarters of an inch broad, and are slightly sawed on their edges. The stalk is terminated by a flat corymbus of flowers, which sit very close on the top; they are of a bright yellow colour, composed of five spear-shaped petals which are erect, and spread out at the top; the stamina are large, erect, and are terminated by oval sulphur-coloured summits. This flowers in June, and the seeds ripen in August.

The fourteenth sort is the common Orpine, which grows naturally in woods and shady places in many parts of England. Of this there are two varieties, one with white, the other with purple flowers. This has a perennial root composed of many glandulous knobs, from which come out round succulent stalks about two feet high, dividing toward the top into smaller branches; these are garnished with fleshy, oval, oblong leaves a little keel-shaped, which stand round the stalks without order; they are two inches long and one broad, of a gray colour, and sawed toward their points. The stalk is terminated by a corymbus of flowers which are star-pointed; in some they are white, and in others purple; they appear in July, and are succeeded by capsules filled with small seeds, which ripen in autumn.

This sort is used in medicine; it is vulnerary and astringent, and is greatly recommendeded for its wonderful virtue in easing of pains. The leaves, bruised and laid on the part, produce this effect both in green wounds and putrid ulcers; and, if applied to corns, will in a short time take them away.

The fifteenth sort grows naturally in Portugal; there are two varieties of this, one with white, and the other with purple flowers. The roots of this are composed of many thick fleshy knobs; the stalks are thick, succulent, and round; they rise near three feet high, and are garnished with oval succulent leaves which are entire; they are three inches long, and two inches and a quarter broad, placed by pairs, and those on the upper part embrace the stalk with their base; they are of a pale herbaceous colour. The flowers are collected in large bunches which terminate the stalks; these appear in July, and are succeeded by seeds which ripen in autumn.

The sixteenth sort grows naturally in Italy. The roots of this are fibrous; the stalks trail on the ground, and are garnished with wedge-shaped leaves standing alternately round the stalks; they are almost an inch long, and half an inch broad. The flowers are disposed in a compact corymbus, which sits close on the the top of the stalks; they are star-shaped, of a purple colour, and appear in July. This plant is an evergreen, which renders it more valuable than the other sorts.

All the sorts of Stone Crop are easily propagated, by planting their trailing stalks either in spring or summer, which soon put out roots; but, as these thrive much better upon rocks, old walls or buildings, than in the ground, they may be disposed upon rock-work in such a manner as to have a good effect; and where there are unsightly buildings, their tops may be covered with these plants so as to hide their deformity: in such places, these plants will appear to greater advantage than on the ground. If the cuttings or roots of the perennial sort are planted in some soft mud laid upon the walls or buildings, they will soon take root, and then spread into every joint or crevice, and in a short time will cover the place; or if the seeds of those annual sorts which grow naturally in dry places are sown soon after they are ripe on the top of walls, the plants will come up, and maintain themselves without farther care.

The

The several sorts of Orpine may be easily propagated by cuttings during the summer months, or by parting of their roots either in spring or autumn; these thrive best in a dry soil and a shady situation, but may also be planted for the same purposes as the other sorts, especially the sixteenth sort, which is evergreen. The stalks of this kind hang down, and have a very good effect in rock-work, and the plants require no care; for when they are fixed in the place, they will spread and propagate fast enough.

The stalks of the common Orpine are frequently cut in summer, and fastened to laths of the size of chimney-boards, which being framed together, are used for screening the sight of the fire-grates in rooms; these stalks will shoot and spread over the frame, and if the frames are taken out once a week, and the stalks watered over to refresh them, they will continue in verdure for two months.

SEED: The Seed of a plant consists of an embryo with its coat or cover. The embryo, which contains the whole plant in miniature, and which is called the germ or bud, is rooted in the placenta or cotyledon, which makes the coat or involucrum, and serves the same purposes as the secundines, i. e. the chorion and amnis in animals.

The placenta or cotyledon of a plant is always double, and in the middle and common center of the two is a point or speck, which is the embryo or plantule. This plantule, being acted on and moved by the warmth of the sun and the earth, begins to expand, and protrudes or shoots out its radicle or root both upward and downward. By this it absorbs the nutritious juice from the earth, and so grows and increases, and the requisite heat continuing, the growth continues.

Thus, e. g. a Pea or Bean being committed to the ground, is first found to cleave into two parts, which are, as it were, two leaves or lobes of the placenta, and in the fissure appears a point, which shoots out a root downward, and a bud upward; the first spreading itself in the soil to catch the moisture thereof, and the latter, mounting into the air, becomes the stem or body of the new plant.

It is very remarkable how the plumule, or future stem, should always get uppermost, and the radicle or root be turned downward, and this too perpendicularly to the horizon; and not only this, but if, by any external means, the stem be diverted from this perpendicular, and bent, for instance, toward the earth, instead of persevering in that direction, it makes an angle or elbow, and redresses itself.

The same is observed in trees, &c. blown down, with their roots by the wind, or in those planted in pots, upon turning the pots upon one side.

Now the Seed, from which a plant arises, being the plant itself in miniature, it is easy to suppose that, if it be deposited in the ground with the plumule perpendicularly upward, and the radicle downward, the disposition should be maintained in its future growth.

But it is known that Seeds, sown either of themselves, or by the help of man, fall at random, or among an infinite number of situations of the plumule, &c. The perpendicular one upward is but one, so that in all the rest it is necessary the stem and root each make a bend, to be able the one to emerge directly upwards, the other downward. Now what force is it that effects this change, which is certainly an action of violence?

Mr. Dodart, who first took notice of the phænomenon, accounts for it by supposing the fibres of the stem of such a nature, as to contract and shorten by the heat of the sun, and lengthen by the moisture of the earth; and on the contrary, the fibres of the root to contract by the moisture of the earth, and lengthen by the heat of the sun.

On this principle, when the plantule is inverted and the root a-top, the fibres of the root being unequally exposed to the moisture, viz. the lower parts more than the upper, the lower will contract, and this contraction be promoted by the lengthening of the upper from the action of the sun; the consequence whereof will be, the roots recoiling, insinuating farther into the earth, and getting beneath the body of the Seed.

In a word: the earth draws the root toward itself, and the sun promotes its descent; on the contrary, the sun draws up the plume, and the earth in some measure, sends it towards the same.

M. De la Hire accounts for the same perpendicularity, by only conceiving the root to draw a coarser and heavier juice, and the stem a finer and more volatile one. In the plantule therefore we may conceive a point of separation, such as, that all on one side, e. g. the radial part is unfolded by the grosser; and all on the other by more subtile juices.

If the plantule then be inverted, and the root a-top, as it still imbibes the grosser and heavier juices, and the stem the lighter; the point of separation being conceived as the fixed point of a lever, the root must descend, and at the same time that the volatile juices imbibed by the stem, tend to make it mount. Thus is the little plant turned on its fixed point of separation till it be perfectly erect.

The plant thus erected, M. Parent accounts for the stem's continuing to rise in the vertical direction, thus: the nutritious juice being arrived at the extremity of a rising stalk, and there fixing into a vegetable substance, the weight of the atmosphere must determine it to fix in a vertical position, so that the stalk will have acquired a new part of perpendicularity over the rest; just as in a candle, which held any how obliquely to the horizon, the flame will still continue vertical, by the pressure of the air.

The new drops of juice that succeed, will follow the same direction; and as all together form the stem, that must of course be vertical, unless some particular circumstances intervene.

And that, whereas the branches are likewise observed, as much as possible, to affect perpendicularity in most instances, insomuch, that though they be forced to shoot out of the stem horizontally, yet in their progress they erect themselves; M. Parent solves this, from the vertical tendency of the nutritious juice, up the stem; for the juice, being received in this direction into the new tender buds, finds at first little resistance; and afterwards as the branch grows firmer, it furnishes a longer arm of a lever to act by.

Mr. Astruc accounts for the perpendicular ascent of the stem, and their redressing themselves when bent, on these two principles.

1. That the nutritious juice arises from the root to the top in longitudinal tubes, parallel to the side of the plant, which communicates either by themselves, or by means of other horizontal tubes, proceeding from the circumference of the plant, and terminated in the pith.

2. That fluids contained in tubes, either parallel or oblique to the horizon, gravitate on the lower part of the tubes, and not at all on the upper.

From hence it easily follws, that in a plant posited either obliquely or parallel to the horizon, the nutritious juice will act more on the lower part of the canals than the upper; and by that means insinuate more into the canals communicating therewith, and be collected more copiously therein; thus the parts on the lower side will act more on the lower part, and will receive more accretion, and be more nourished than those on the upper; the consequence whereof must be, that the extremity of the plant will be obliged to bend upward.

The same principle brings the seed into its due situation at first. In a Bean planted upside down, the plume and radicle are easily perceived with the naked eye, to shoot at first directly for about an inch; but thenceforth they begin to bend, the one downward, and the other upward.

The two placentulæ or cotyledons of a seed are, as it were, a case to this little tender plantule or point, covering it up, sheltering it from injuries, and feeding it

it from their own proper ſubſtance; which the plantule receives and draws to itſelf, by an infinite number of little filaments or ramifications, called funes umbilicales, or navel-ſtrings, which it ſends into the body of the placenta.

The cotyledons, for the moſt part, abound with a balſam diſpoſed in proper cells; and this ſeems to be oil brought to its greateſt perfection, while it remains humid, and then lodged in theſe repoſitories; one part of the compoſition of this balſam is oily and tenacious, and ſerves to defend the embryo from any extraneous moiſture, and by its viſcidity, to entangle and retain that fine, pure, volatile ſpirit, which is the ultimate production of the plant.

This oil is never obſerved to enter into the veſſels of the embryo, which are too fine to admit ſo thick a fluid, but this ſerves to preſerve the growing quality of the ſeed. The ſpirit, however, being quickened by an active power, may poſſibly breathe a vital principle into the juices that nouriſh the embryo, and ſtamp upon it the character that diſtinguiſhes the family; after which every thing is changed into the proper nature of that particular plant. That this ſpirit now is truly the efficacious part, is evident, for when that is gone off, the oil that remains is quite vapid and inactive. It is this that gives plants their fragrant ſmell and peculiar taſtes, nor do their particular colours a little depend upon it.

Now when the Seed is committed to the earth, the placenta ſtill adheres to the embryo for ſome time, guards it from the acceſs of noxious colds, &c. and even prepares and purifies the cruder juice the plant is to receive from the earth, by ſtraining it, &c. thro' its own body.

This it continues to do, till the placentula being a little inured to its new element, and its root tolerably fixed in the ground and fit to abſorb the juice thereof, it then periſhes, and the plants may be ſaid to be delivered; ſo that nature obſerves the ſame method in plants contained in fruits, as in animals in the mother's womb.

It is very ſurpriſing, how many ſorts of Seeds will continue good for ſeveral years, and retain their growing faculty, whereas many other ſorts will not grow when they are more than one year old; which is, in a great meaſure, owing to their abounding more or leſs with oil, as alſo the nature of the oil, whether it is of a cold or hot quality, and the texture of their outward covering. As for example; the Seeds of Cucumbers, Melons, and Gourds, which have thick horny coverings, and the oil of this Seed being of a cold nature, continue good eight or ten years; and Radiſh, Turnep, Rape, &c. with other oily Seeds (whoſe coats, though they are not ſo hard and cloſe as the others, yet) abounding with oil, which is of a warmer nature, the Seeds will keep good three or four years; whereas the Seeds of Parſley, Carrots, Parſneps, and moſt other umbelliferous plants, whoſe Seeds are, for the moſt part, of a warm nature, and have little oil in them, loſe their growing faculty often in one year, but ſeldom remain good longer than two years. Indeed all ſorts of Seeds are preſerved beſt, if kept in the pods or huſks wherein they grow; eſpecially if they are not ſeparated from the placenta, to which they are faſtened by an umbilical cord, thro' which they received their nouriſhment in their embryo-ſtate; ſo that whoever would ſend Seeds to a diſtant country, ſhould always take care they are full ripe before they are gathered, and that they are preſerved in their pods or huſks; and when they are packed up for exportation, there ſhould be great care taken, that they are not ſhut up too cloſely from the air; which is abſolutely neceſſary to maintain the principle of vegetation in the Seed (though in a leſs degree) as it is to nouriſh the plant when germinated, as I have found by trying the following experiment, viz. Having ſaved a parcel of freſh Seeds of ſeveral kinds, as Lettuce, Parſley, Onions, &c. I took a parcel of each kind, and put into glaſs phials; theſe I ſtopped down cloſe, and ſealed hermetically, then put them up in a trunk; the other parts of the ſame ſeeds I put into bags, and hung them up in a dry room, where the air had free admittance, in which place they remained a whole year; and in the following ſpring I took out a part of each parcel of ſeeds from the phials, as alſo from the bags, and ſowed them at the ſame time, and upon the ſame bed where they had an equal advantage of ſun, air, &c. The reſult of this experiment was, that almoſt all the ſeeds which I took out of the bags grew extremely well, but of thoſe which were kept in the phials not one came up; after which, I ſowed the remaining part of the ſeeds in the phials, but had not one ſingle plant from the whole, whereas thoſe preſerved in the bags grew very well both the ſecond and third years. And this experiment was afterward tried by one of my particular friends, with whom the effect was the ſame as with me. And ſome years after this, a gentleman of great eminence for his knowledge of plants, being very deſirous to procure Seeds from every country, where the Britiſh nation had any commerce, gave his inſtructions to all the agents abroad, to ſend him over all the ſorts of Seeds they could collect in their different countries, and to put them up in bottles, ſealing the mouths of the bottles as cloſe as poſſible, to exclude the air; which was done by ſeveral of his correſpondents, who ſent him great quantities of Seeds, but not one of them grew when they were ſown; ſo that thoſe perſons who ſend Seeds to a diſtant country, ſhould never be guilty of the like error.

Theſe experiments prove, that all Seeds require ſome ſhare of freſh air, to keep the germen in a healthy ſtate; and that where the air is abſolutely excluded, the vegetative quality of the Seeds will ſoon be loſt; therefore the anointing of the Seeds, or covering them over with fat or oil, ſhould not be practiſed; for as this will in a great meaſure ſhut up the pores of the Seeds, it will prevent the tranſpiration and inſpiration of air, whereby the ſeeds will ſoon be ſpoiled.

The earth, which is the natural nurſe to all Seeds, will preſerve them much longer than any other body, provided they are buried ſo deep, as to be beyond the influence of ſun and ſhowers, whereby they are prevented from vegetating. I have known ſeeds of ſeveral plants remain buried three feet deep above twenty years, and when turned up to the air, have grown as well as freſh Seeds; and a particular friend of mine ſhewed me a ſpot of ground, which was covered with Corn-ſallad, the Seeds of which he aſſured me had been buried thirty-two years in that place, and when turned up again to the air, were as productive as new Seeds.

How the vegetative life is ſo long preſerved in Seeds, by being ſo deeply immerſed in the ground, is very difficult to explain; but as the fact is very notorious, it well accounts for the production of plants out of earth taken from the bottom of vaults, houſes, and wells; and from the earth which has been taken at a very great depth in thoſe places, there have been many plants produced, which were not inhabitants of the neighbouring ſoil; and this has been brought as a proof to ſupport the doctrine of ſpontaneous productions, by ſome who have aſſerted, that plants are often produced without Seed.

The earth which has been brought to England, from very diſtant countries, having many of the Seeds of thoſe plants which grew in thoſe places buried therein, when this has been placed in a proper degree of heat and ſpread abroad, the Seeds have vegetated, and great numbers of plants have come up; whereby many plants, which would have eſcaped the notice of thoſe perſons who collect Seeds to ſend to Europe, have been obtained.

*A method for raiſing ſuch Seeds which have hard coats or ſhells ſurrounding them, and that have been judged very difficult, if not impoſſible, to be raiſed in England.*

In the year 1724, I had a parcel of freſh Cocoa-nuts given me, which were brought over from Barbadoes:

part of these nuts I divested of their outward coat or husk, and the other part I left entire, as I received them.

Both these parcels I planted in large pots filled with good fresh earth, and plunged the pots into hot-beds made of tanners bark, giving them gentle and frequent waterings, as the earth in the pots seemed to require; but not one of the whole number had made any attempt to shoot, as I could perceive; and upon taking them out of the pots, I found they were rotten.

About four months after, I received another fresh parcel of Cocoa-nuts from Barbadoes, which I treated in another manner; from that part of these I cut off the outer coat or husk, and the other part I left entire, as before: but supposing it was owing to my planting the other parcel in pots, that they did not succeed, I made a fresh hot-bed with horse-dung, and covered it over with fresh earth about eighteen inches thick, in which I planted the nuts, observing, as before, to supply it with convenient moisture, as also to keep the hot-bed in an equal temper of heat, which I was guided to do by a thermometer, graduated for the use of hot-beds; but with all my care, I had no better success than before, not one of the nuts making any essay towards shooting.

The year following, I had another parcel of Cocoa-nuts given me, which, considering my former ill success, I planted in a different manner, as follows:

Having a hot-bed, which had been lately made with tanners bark, and which was filled with pots of exotic plants, I removed two of the largest pots, which were placed in the middle of the bed; and, opening the tanners bark under the place where the two pots stood, I placed the two Cocoa-nuts therein, laying them side-ways, to prevent the moisture (which might descend from the pots) from entering the hole at the base of the fruit, and thereby rotting the seminal plant upon its first germinating.

I then covered the nuts over with the bark two or three inches thick, and placed the two pots over them in their former station.

In this place I let the nuts remain for six weeks, when removing the two pots and uncovering the nuts, I found them both shot from the hole in the base of the fruit an inch in length, and from the other end of the fruit were several fibres emitted two or three inches in length.

Upon finding them in such a forwardness, I took them out of the bark, and planted them in large pots filled with good fresh earth, plunging the pots down to the rims in tanners bark, and covering the surface of the earth in the pots half an inch with the same; soon after which, the young shoots were above two inches long, and continued to thrive very well.

I communicated this method to some of my acquaintance, who have tried it with the same success; and if the nuts are fresh, scarce any of them miscarry. This led me to try, if the same method would succeed as well with other hard-shelled exotic seeds, which I could not, by any method I had before tried, get to grow; as the Bonduck or Nickar-tree, the Phaseolus Brasilianus lobis villosis pungentibus, Maximus Hermanni, or Horse-eye Bean, with several others; and I have found it both a sure and expeditious way to raise any sort of hard-shelled fruit or seeds.

For the heat and moisture (which are absolutely necessary to promote vegetation) they here enjoy in an equal and regular manner, the tanners bark (if rightly managed) keeping near an equality of heat for three months; and the water which descends from the pots, when they are watered, is by the bark detained from being too soon dissipated, which cannot be obtained in a common hot-bed, the earth in such being worked away by the water, and thereby leaving the seeds often destitute of moisture.

Some of these Seeds I have had shoot in a fortnight's time, which, I am informed, would not have so done in a month, in their natural soil and climate.

I have also found it an excellent method to restore Orange, or any other exotic trees, which have suffered by a tedious passage, in being too long out of the ground, by laying their roots and stems in a moderate tan-bed for three or four days before they are planted; insomuch that I recovered two Orange-trees, which had been ten months without either earth or water.

In the common method of sowing seeds, there are many kinds which require to be sown soon after they are ripe; and there are many others which lie in the ground a year, sometimes two or three years, before the plants come up; so that when the seeds which come from distant countries are sown, the ground should not be disturbed, but wait with patience, in expectation of the plants, at least two years; for it has often happened to seeds which I have sown, that have been brought from America, that part of them have come up the first season, some the next, and others not until the third year; so that if the ground had been disturbed, I should have lost many plants, which, by my waiting so long, came up and succeeded very well.

As there is such difference in the length of time, which some seeds will keep good over others, I thought it would not be unacceptable, if I should add an account of those seeds which require to be sown soon after they are ripe; and of others, how long they may be kept good, if they are carefully saved; which I have drawn out in the following table, which will, in a great measure, direct how those seeds, which are not here included, require to be treated.

The first class of seeds which I shall enumerate, is of those which should be sown in autumn, soon after they are ripe; otherwise many of them will not succeed, and others will often remain in the ground a whole season, if they are kept out of the ground till spring, whereby a full year will be lost.

Adonis, or Flos Adonis, see Adonis.
Alexanders, or Alissanders, see Smyrnium.
Anemony, or Windflower, see Anemone.
Angelica.
Arse-smart the eastern sort, see Persicaria.
Ash-keys, see Fraxinus.
Asphodel, or King-spear, see Asphodelus.
Auricula.
Beech-mast, see Fagus.
Bishop's-weed, see Ammi.
Christopher-herb, see Actæa.
Ciceli, see Myrrhis.
Colchicum, or Bastard-saffron.
Corn-sallad, see Valeriana.
Cornflag, see Gladiolus.
Crocus.
Crown Imperial, see Fritillaria.
Fennel-giant, see Ferula.
Flower-de-luce, see Iris.
Fraxinella, see Dictamnus.
Fritillaria, or chequered Tulip.
Gentian, see Gentiana.
Ground Pine, see Teucrium.
Hare's-ear, see Bupleurum.
Hartwort, see Bupleurum and Seseli.
Hog's-fennel, see Peucedanum.
Hornbeam, see Carpinus.
Hyacinth, see Hyacinthus.
Juniper, see Juniperus.
Laserwort, see Laserpitium.
Lilly, see Lilium.
Lilly-asphodel, see Crinum and Hemerocallis.
Lilly-hyacinth, see Scilla.
Lilly-narcissus, see Amaryllis.
Lovage, see Ligusticum.
Mandrake, see Mandragora.
Maple, see Acer.
Masterwort, see Imperatoria and Astrantia.
Mercury, see Mercurialis.
Moly, see Allium.
Muscari.

Narcissus, or Daffodil.
Oak, see Quercus.
Oak of Jerusalem, see Chenopodium.
Pasque-flower, see Pulsatilla.
Piony, see Pæonia.
Polyanthus, see Primula.
Ranunculus, or Crowfoot.
Samphire, see Crithmum.
Scurvy-grass, see Cochlearia.
Seseli, or Sermountain, see Siler.
Snow-drop, see Galanthus.
Sowbread, see Cyclamen.
Spiderwort, see Anthericum.
Spignel, see Meum.
Star of Bethlehem, see Ornithogalum.
Stavesacre, see Delphinium.
Tulip, see Tulipa.
Turnsole, see Heliotropium.
Yew-tree, see Taxus.

In the next class I shall enumerate those sorts of seeds, which are best the first spring after they are saved, many of which will not grow if they are kept longer; wherefore those who deal in seeds, should destroy the seeds they have remaining after the season is over, and not sell them to impose on their dealers, to the great loss of their crops, nor keep them to mix with new seeds, as is too often practised.

African Marygold, see Tagetes.
Agrimony, see Agrimonia.
Alkanet, see Buglossum.
Amaranthoides, or Globe Amaranthus, see Gomphrena.
Anise, see Pimpinella.
Asparagus, or Spearage.
Balsamine, see Impatiens.
Basil, see Ocymum.
Bastard Saffron, see Carthamus.
Bay-tree, see Laurus.
Bean, see Faba.
Beet, see Beta.
Blue-bottle, see Cyanus.
Borrage, see Boraga.
Buckwheat, see Fagopyrum.
Buglose, see Buglossum.
Canterbury-bell, see Campanula.
Carraway, see Carum.
Carnation, see Dianthus.
Carrot, see Daucus.
Caterpillar, see Scorpiurus.
Celeri, see Apium.
Chervil, see Chærophyllum.
Chestnut, see Castanea.
Chichling Pea, see Cicer.
Clary, see Horminum and Sclarea.
Columbine, see Aquilegia.
Coriander, see Coriandrum.
Crane's-bill, see Geranium.
Cress, see Nasturtium.
Cumin, see Cuminum.
Cypress, see Cupressus.
Dame's Violet, see Hesperis.
Everlasting Pea, see Lathyrus.
Fennel, see Fœniculum.
Fennel-flower, see Nigella.
Fenugreek, see Trigonella.
Finochia, see Fœniculum.
Firr, see Abies.
French Honeysuckle, see Hedysarum.
French Marygold, see Tagetes.
Goat's-rue, see Galega.
Globe Thistle, see Echinops.
Gromwel, or Graymil, see Lithospermum.
Henbane, see Hyoscyamus.
Hemp, see Cannabis.
Hollyhock, see Alcea.
Hyssop, see Hyssopus.
Indian Pepper, see Capsicum.
Kidney-bean, see Phaseolus.



Larch-tree, see Larix.
Larkspur, see Delphinium.
Lavender, see Lavendula.
Laurel, see Padus.
Leek, see Porrum.
Lentil, see Lens.
Love-apple, see Lycopersicon.
Lupine, see Lupinus.
Lychnis, or Catchfly.
Mad-apple, see Melongena.
Mallow, the Venetian, see Hibiscus.
Marjoram, see Majorana.
Marvel of Peru, see Mirabilis.
Marygold, see Calendula.
Millet, see Milium.
Mullein, see Verbascum.
Moth-mullein, see Blattaria.
Navew, see Napus.
Oil-nut, or Palma Christi, see Ricinus.
Roman Nettle, see Urtica.
Onion, see Cepa.
Orach.
Origany, see Origanum.
Panic, see Panicum.
Parsley, see Apium.
Parsnep, see Pastinaca.
Peas, see Pisum.
Pink, see Dianthus.
Poppy, see Papaver.
Purslain, see Portulaca.
Radish, see Raphanus. This will grow well two years.
Rape, see Napus.
Rue, see Ruta.
Savory, see Satureja.
Scabious, see Scabiosa.
Skirret, see Sisarum.
Snails, see Medica.
Snapdragon, see Antirrhinum.
Spinach, see Spinachia.
Stock-gilliflower, see Leucoium.
Succory, see Cichorium.
Sun-flower, see Helianthus.
Thyme, see Thymus.
Tobacco, see Nicotiana.
Trefoil, see Trifolium.
Turnep, see Rapa.
Venus Looking-glass, see Campanula.
Venus Navelwort, see Omphalodes.
Vetch, see Vicia.
Woad, see Isatis.
Wall-flower, see Leucoium.

The next class of seeds are such as may be kept two years and will not be the worse, provided they are well saved, though these are equally good for use the first year.

Amaranthus, or Flower-gentle.
Cabbage, } see Brassica.
Cauliflowers, }
Citrul, or Water Melon, see Anguria.
Clover, see Trifolium.
Convolvulus, or Bindweed.
Endive, see Endivia.
Flax, see Linum.
Indian Flowering-reed, see Cannacorus.
La-lucern, see Medica.
Lavender, see Lavendula.
Lettuce, see Lactuca.
Mellilot, see Trifolium.
Mustard, see Sinapi.
Sorrel, see Acetosa.

The fourth class of Seeds are such as may be kept three years or more, and will grow very well afterward, provided they are well saved; and some of the sorts are generally preferred for being three years old, particularly the Cucumber and Melon-seeds; because, when the Seeds are new, the plants grow too vigorous, and produce a small quantity of fruit; but

but it is not proper to keep these longer than four or five years, notwithstanding they will grow at eight or nine years old; because when the seeds are too old, the plants will be weak, and the fruit which they produce will be small.

Amaranthus, or Flower-gentle.
Cabbage, see Brassica.
Cedar of Libanus, see Larix, if kept in the cones.
Cucumber, see Cucumis.
Gourd, see Cucurbita.
Lettuce, see Lactuca.
Melon, see Melo.
Pinus, the Pine-tree, if kept in the cones.
Pumpion, see Pepo.
Savoy, see Brassica.
Simnel, or Squash, see Cucurbita.
Water Melon, see Anguria.

The following is a list of such Seeds as will frequently remain in the earth a whole year, especially if they are sown in the spring; so that whenever the plants do not come up the first year, the ground should remain undisturbed till the following spring (but must be kept clear from weeds) when the plants will come up.

Adonis, or Flos Adonis.
Alaternus.
Alexanders, see Smyrnium.
Angelica.
Corn-sallad, see Valerianella.
Fennel, see Fœniculum.
Fraxinella, or White Dittany, see Dictamnus.
Golden-rod, see Solidago.
Gromwel, or Gramil, see Lithospermum.
Hare's-ear, } see Bupleurum.
Hartwort, }
Hawthorn, see Mespilus.
Hog's-fennel, see Peucedanum.
Holly, see Ilex.
Juniper, see Juniperus.
Laserwort, see Laserpitium.
Lovage, see Ligusticum.
Maple, see Acer.
Masterwort, see Astrantia.
Mercury, see Mercurialis.
Moly.
Piony, see Pæonia.
Seseli, or Sermountain, see Siler.
Spignel, see Meum.
Starwort, see After.
Stavesacre, see Delphinium.
Turnsole, see Heliotropium.
Yew, see Taxus.

If the seeds mentioned in this list are sown soon after they are ripe, many of the sorts will come up the following spring; but whenever they fail so to do, there will be no danger of their growing the following year, provided the Seeds were good, therefore people should not despair of them the first year. Most of the umbelliferous plants have this property of remaining in the ground several months, and sometimes a whole year, before the plants appear; therefore they should be managed accordingly, by sowing their seeds on a border, which can be suffered to remain undisturbed till the plants come up. There are some particular sorts of seeds, which I have known remain in the ground eighteen months, and sometimes two years, after which time the plants have come up very well: of these sorts are the Morina, Tribulus terrestris, Stavesacre, Mercury, and some others; but as they do not constantly remain so long in the ground, there can be no certainty of the time when the plants will appear.

The rules here laid down, concerning the length of time which seeds may be kept out of the ground and prove good, will in general be found true; being drawn up from several years experience, having taken notes every year from the times of sowing great varieties of seeds, to the appearance of the plants above ground. And in this I have observed such oddness in the growth of seeds, as is not to be accounted for; as that of sowing seeds of the same plant for two or three years successively, and not having had one plant arise; and the fourth year, from the remaining part of the seeds, I have had some plants come up, notwithstanding the age of the Seeds. At other times it has happened, that some Seeds have grown the same spring they were sown, and a great part of them have remained in the ground till the following autumn, when the plants have come up, so that there have been two different crops from the same sowing.

I have also tried many experiments in keeping of Seeds, and find the best method to preserve them good is, to keep them in a moderate temperature of warmth, where they may not suffer from any inclemencies in the outward air, nor have too much warmth, which will exhale the moisture too freely, and cause the Seeds to decay sooner than they otherwise would do. This is well known to most people who cultivate Melons, who, when their Seeds are new, which would occasion the plants being too vigorous, and therefore not so fruitful, put them into the inner pocket of their breeches, which are in constant wear, where they keep them for six weeks or two months before they sow them, which will weaken the seeds as much as two years longer keeping them in the ordinary way.

All sorts of Seeds will keep much longer in their pods, or outer coverings, where they can be thus preserved; because the covering not only preserves them from the injuries of the outward air, but if the Seeds are not separated from them, they supply them with nourishment, and thereby keep them plump and fair. But the Seeds of all soft fruits, such as Cucumbers, Melons, &c. must be cleansed from the fruit and mucilage which surrounds them, otherwise the rotting of these parts will corrupt and decay the Seeds in a short time.

When Seeds are gathered, it should always be done in dry weather, when there is no moisture upon them; and then they should be hung up in bags (especially those which vermin eat) in a dry room; in which situation they will keep longer than if they were closely shut up, and the air excluded from them.

There are but few people who are curious enough in saving their Seeds; some, for want of judgment, not distinguishing the best plants of their kinds, to let them grow for seeds; and others, out of covetousness to save a great quantity of seeds, frequently let a whole spot of ground, filled with any particular sort of plants run up to seed, so that the good and bad plants are saved indifferently, which is the occasion of the general complaint of the badness of the Seeds which are commonly vended, and is what the dealers in Seeds should endeavour to remedy.

There is a common method of trying the goodness of many sorts of Seeds, which is, by putting them in water, and those of them which sink to the bottom are esteemed good, but what swim on the surface are rejected as good for little; but this will not hold in many sorts, for I have saved the Seeds of Melons, which have floated on the surface of the water when they were washed from the pulp, and after keeping them two years, they have grown well; but the Melons produced on these plants were not so thick fleshed, as those which were produced from heavy Seeds of the same Melon. The lightness of many sorts of Seeds, I apprehend, may be owing to their not having been sufficiently impregnated by the farina fœcundans; which is frequently the case with those plants that are kept in stoves, or under frames, where the external air is often too much excluded from them, which may be absolutely necessary to the conveying of the farina in substance, or the gentle effluvia thereof, to the uterine cells; and this more particularly may be the case, in those sorts which are male and female in different plants; or where the male flowers grow

at remote distances from the female, on the same plant; which in the Melons, Cucumbers, Gourds, and many other sorts of plants, is constant. Therefore of late years, since the doctrine of the generation of plants has been better known amongst gardeners, they have been curious enough to assist nature in this operation; but they have had more regard to the production of fruit, than to the obtaining of perfect Seeds; though by procuring of the one, the other must of course receive the benefit. This practice has been principally confined to the setting of the fruit of their Melons, and early Cucumbers. The method is this; when the fruit appears upon the plants, and the flower at the top is just fully expanded, they take some of the most vigorous male flowers, and with a pin move the apice which sustain the farina fœcundans, gently up and down, over the blossom of the female flowers, whereby the farina is scattered into them; and also lay one of the fresh blown male flowers with the open side over the mouth of the female flowers, that hereby the fruit may be sufficiently impregnated; and where there are male flowers so situated, as that they may be joined without pulling them off the plant, it is always to be chosen. By this method, the gardeners have succeeded in setting the first fruits of this sort which have appeared on the plants, which before this was practised, generally dropped off, and never grew to any size; so that very often, when the weather has proved so unfavourable as to render it unsafe to admit the external air to the plants, the fruit have been produced successively for three weeks or a month, before any of them have been set to grow, but have fallen off soon after they appeared. Therefore this is a convincing proof of the necessity for the ovary of the fruit to be impregnated, especially where good Seeds are to be obtained; and this will explain the cause of new Seeds often failing, as hath been already mentioned under the article of GENERATION; so that many persons have been deceived by sowing Seeds of their own saving, without knowing how it has happened. I have several times been deceived in obtaining good Seeds of tender exotic plants, which have flowered, and produced (to all appearance) very good Seeds, but many times they have all failed; which I apprehend was owing to the keeping of the glasses so close, during the time the plants were in flower, as that the external air was excluded; which, if it had been admitted, might have assisted the farina in the impregnation of the Seed, and thereby have rendered it good; because from the same plants, in more favourable seasons, when the free air has been admitted, have produced plenty of good Seeds.

In the tables here subjoined, I have given the common English names of the Seed, opposite to which I have added the Latin names, that the reader may with ease turn to the several articles in the Gardeners Dictionary, where each sort is particularly treated of, and directions are given for their management.

SEGMENTS OF LEAVES are the parts of such leaves of plants as are divided or cut into many shreds.

SELAGO. Lin. Gen. Plant. 687. Camphorata. Com. Santolina. Boerh.

The CHARACTERS are,

*The flower has a small permanent empalement of one leaf, cut into four parts at the top. The flower is of one petal, it has a very small tube, a little perforated; the brim is spreading, and cut into five parts, the two upper segments are the least. It hath four hair-like stamina the length of the petal, to which they are inserted, two of which are longer than the other, terminated by single summits; and a roundish germen supporting a single style, crowned by an acute stigma. The germen afterward becomes a single seed, wrapped up in the petal of the flower.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and the seeds are included in a capsule.

We have but one SPECIES of this genus at present, in the English gardens, viz.

SELAGO (*Corymbosa*) corymbo multiplici. Lin. Sp. Plant. 629. *Selago with a multiplied corymbus.* Camphorata Africana, umbellata, frutescens. Hort. Amst. 2. p. 79. *Shrubby, African, umbellated Camphorata.*

This plant grows naturally at the Cape of Good Hope; it has slender ligneous stalks which rise seven or eight feet high, but are so weak as to require support; they send out many slender branches, which are garnished with short, linear, hairy leaves, that come out in clusters from the same point. The flowers are produced in umbels at the top of the stalks, the general umbel being composed of a multiplicity of small umbels; they are very small, and of a pure white; they appear in July and August, but are not succeeded by seeds here.

This plant is preserved in gardens more for the sake of variety than for its beauty, for the branches grow very irregular, and hang downward, and the leaves being small make little appearance, and the flowers are so small as not to be distinguished at any distance.

It is propagated by cuttings, which puts out roots freely if they are planted in any of the summer months; if these are planted in a bed of fresh earth, and covered close down with a bell or hand-glass, shading them from the sun, and refreshing them now and then with water, they will soon put out roots; then they must be gradually hardened, and afterward transplanted into small pots, placing them in the shade till they have taken root; then they may be placed with other hardy green-house plants, where they may remain till the end of October, when they must be removed into shelter, for these plants will not live in the open air in England; but as they only require protection from hard frost, so they should be treated in the same way as other of the hardiest kinds of green-house plants.

SELINUM. Lin. Gen. Plant. 300. Thysselinum. Tourn. Inst. R. H. 319. Milky Parsley.

The CHARACTERS are,

*It has an umbellated flower; the general umbel is plain and spreading, and the particular umbels are the same; the involucrum is composed of many linear spear-shaped leaves which spread open; the umbel is uniform; the flowers have five inflexed heart-shaped petals which are unequal; they have five hair-like stamina terminated by roundish summits. The germen is situated under the flower, supporting two reflexed styles, crowned by single stigmas; it afterward becomes a plain compressed fruit channelled on both sides, parting in two, containing two oblong elliptical plain seeds, channelled in the middle, and have membranes on their sides.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and two styles.

The SPECIES are,

1. SELINUM (*Sylvestre*) radice fusi-formi multiplici. Hort. Cliff. 93. *Milky Parsley with spindle-shaped roots.* Thysselinum Plinii. Lob. Icon. 711. *Pliny's wild Milky Parsley.*
2. SELINUM (*Palustre*) sublactescens radice unica. Haller. Helv. 443. *Selinum which is almost milky, and having a single root.* Thysselinum palustre. Tourn. Inst. 319. *Marsh, wild, Milky Parsley.*

The first sort grows by the sides of lakes and standing waters in several parts of Germany; this hath many spindle-shaped roots, hanging by fibres which spread and multiply in the ground. The stalks rise five or six feet high; they are streaked, and of a purple colour at bottom, sending out several branches toward the top; the leaves are finely divided like those of the Carrot, and when broken there issues out a milky juice; the stalks are terminated by umbels of whitish flowers which come out in June, and are succeeded by compressed bordered seeds which ripen in August.

The ſecond ſort grows naturally in marſhy places in Germany. The leaves of this are much longer and cut into narrower ſegments than thoſe of the former; the ſtalks riſe higher; the umbels are larger, as are alſo the ſeeds. The whole plant abounds with a cauſtic milky juice.

Theſe plants are preſerved in botanic gardens for variety, but are rarely cultivated any where elſe; they are eaſily propagated by ſeeds, which ſhould be ſown in autumn, and the plants afterward treated in the ſame way as Angelica.

SEMIFISTULAR FLOWERS are ſuch whoſe upper part reſembles a pipe cut off obliquely, as in Ariſtolochia or Birthwort.

SEMINAL LEAVES are thoſe plain, ſoft, and undivided leaves that firſt ſhoot forth from the greateſt part of all ſown ſeeds, which leaves are very different from thoſe which ſucceed on the ſame plant, in ſize, figure, ſurface, and poſition.

A SEMINARY is a ſeed-plot which is adapted or ſet apart for the ſowing of ſeeds. Theſe are of different natures and magnitudes, according to the ſeveral plants intended to be raiſed therein. If it be intended to raiſe foreſt or fruit-trees, it muſt be proportionably large to the quantity of trees deſigned, and the ſoil ſhould be carefully adapted to the various ſorts of trees. Without ſuch a place as this every gentleman is obliged to buy, at every turn, whatever trees he may want to repair the loſſes he may ſuſtain in his orchard, wilderneſs, or larger plantations, ſo that the neceſſity of ſuch a ſpot of ground will eaſily be perceived by every one; but, as I have already given directions for preparing the ſoil, and ſowing the ſeeds in ſuch a Seminary, under the article of Nursery, I ſhall not repeat it in this place, but refer the reader to that article.

It is alſo as neceſſary for the ſupport of a curious flower-garden, to have a ſpot of ground ſet apart for the ſowing of all ſorts of ſeeds of choice flowers; in order to obtain new varieties, which is the only method to have a fine collection of valuable flowers, as alſo for the ſowing of all ſorts of biennial plants to ſucceed thoſe which decay in the flower-garden, by which means the borders may be annually repleniſhed, which, without ſuch a Seminary, could not be ſo well done.

This Seminary ſhould be ſituated at ſome diſtance from the houſe, and be entirely cloſed either with a hedge, wall, or pale, and kept under lock and key, that all vermin may be kept out, and that it may not be expoſed to all comers and goers, who many times do miſchief before they are aware of it. As to the ſituation, ſoil, and manner of preparing the ground, it has been already mentioned under the article of Nursery, and the particular account of raiſing each ſort of plant being directed under their proper heads, it would be needleſs to repeat it here.

SEMINIFEROUS. Bearing or producing ſeed.

SEMPERVIVUM. Lin. Gen. Plant. 538. Sedi ſpecies. Tourn. Inſt. R. H. 262. tab. 140.

The Characters are,

*The flower has a concave permanent empalement cut into many acute ſegments; it has ten oblong, ſpear-ſhaped, pointed petals a little longer than the empalement, and twelve or more narrow awl-ſhaped ſtamina terminated by roundiſh ſummits; it has twelve germen placed circularly, ſitting upon ſo many ſtyles which ſpread out, and are crowned by acute ſtigmas. The germen afterward become ſo many ſhort compreſſed capſules, pointed on the outſide, and open on the inſide, filled with ſmall ſeeds.*

This genus of plants is ranged in the fifth ſection of Linnæus's eleventh claſs, which includes thoſe plants whoſe flowers have twelve ſtamina and many ſtyles.

The Species are,

1. Sempervivum (*Tectorum*) foliis ciliatis, propaginibus patentibus. Lin. Sp. Plant. 464. *Houſeleek with hairy-edged leaves, and ſpreading offſets.* Sedum majus vulgare. C. B. P. 283. *Common large Houſeleek.*
2. Sempervivum (*Globiferum*) foliis ciliatis, propaginibus globoſis. Lin. Sp. Plant. 464. *Houſeleek with hairy-edged leaves, whoſe offſets are globular.* Sedum majus vulgari ſimile, globulis decidentibus. Mor. Hiſt. 3. p. 472. *Greater Houſeleek reſembling the common, and having globular offſets which fall off.*
3. Sempervivum (*Montanum*) foliis ciliatis, propaginibus patulis. Lin. Sp. Plant. 665. *Houſeleek with hairy edges and ſpreading offſets.* Sedum montanum majus foliis non dentatis, floribus rubentibus. C.B.P. 283. *Greater Mountain Houſeleek whoſe leaves are not indented, and having red flowers.*
4. Sempervivum (*Arachnoideum*) foliis pilis intertextis, propaginibus globoſis. Lin. Sp. Plant. 465. *Houſeleek with threads from leaf to leaf, and globular offſets.* Sedum montanum tomentoſum. C. B. P. 284. *Woolly Mountain Houſeleek, commonly called Cobweb Sedum.*
5. Sempervivum (*Arboreum*) caule arboreſcente lævi ramoſo. Lin. Sp. Plant. 464. *Houſeleek with a ſmooth, tree-like, branching ſtalk.* Sedum majus arboreſcens. J. B. 3. 686. *Greater Tree Houſeleek.*
6. Sempervivum (*Canarienſe*) caule foliorum ruderibus lacero, foliis retuſis. Lin. Sp. Plant. 464. *Houſeleek with ſtalks torn by the rudiments of the leaves, and blunt-pointed leaves.* Sedum Canarinum, foliis omnium maximis. Hort. Amſt. 2. p. 189. *Canary Houſeleek with the largeſt leaves.*
7. Sempervivum (*Africanum*) foliorum marginibus ſerrato-dentatis, propaginibus patulis. *Houſeleek with leaves whoſe borders are indented like a ſaw, and ſpreading offſets.* Sedum Afrum montanum, foliis ſubrotundis, dentibus albis ſerratis confertim natis. Boerh. Ind. alt. 1. p. 286. *African Mountain Houſeleek, with roundiſh, indented, ſawed leaves, having white edges.*

The firſt ſort is our common Houſeleek, which is ſeen in every part of England growing on the tops of houſes and walls, but is not a native of this country; it has many thick ſucculent leaves ſet together in a round form; they are convex on their outſide and plain within, ſharp-pointed, and their borders are ſet with ſhort fine hairs. The leaves ſpread open, and lie cloſe to the earth in which they grow, ſending out on every ſide offſets of the ſame form. From the center of theſe heads ariſes the flower-ſtalk which is about a foot high, ſucculent and round, of a reddiſh colour, and is garniſhed at bottom with a few narrow leaves; the upper part of the ſtalk divides into two or three parts, each ſuſtaining a ſpike or range of flowers which are reflexed. The flowers are compoſed of ſeveral petals which ſpread open, and end in acute points; they are red, and in the center is ſituated the crown or germen which are placed circularly, and, after the petals are fallen off, they ſwell and become ſo many horned capſules filled with ſmall ſeeds. It flowers in July, and the ſeeds ripen in autumn.

This plant is eaſily propagated by offſets, which the plants put out in plenty on every ſide. If theſe are planted in mud or ſtrong earth placed on a building or old wall, they will thrive without farther care.

The ſecond ſort grows naturally in the northern parts of Europe. The leaves of this ſort are much narrower, and the heads are furniſhed with a greater number of leaves than thoſe of the former, which grow more compact, and are cloſely ſet on their edges with hairs. The offſets of this are globular, their leaves turning inward at the top, and lie cloſe over each other; theſe are thrown off from between the larger heads, and falling on the ground take root, whereby it propagates very faſt. The flower-ſtalks of this are ſmaller, and do not riſe ſo high as thoſe of the former, and the flowers are of a paler colour.

The third ſort grows naturally upon the Helvetian mountains; this greatly reſembles the firſt, but the leaves are ſmaller and have no indentures on their edges; the offſets of this ſort ſpread out from the ſide of the older heads, and their leaves are more open and expanded. Out of the center of the crown comes forth the flower-ſtalk, which riſes nine or ten inches high, garniſhed below with ſome narrow leaves; the upper part is divided into three or four branches, which are cloſely furniſhed with deep red flowers, compoſed

posed of twelve star-pointed pointals, set round the circle or germen, which is attended by twenty-four stamina terminated by purple summits. This flowers at the same time with the first sort.

The fourth sort grows naturally upon the Alps and Helvetian mountains; this has much shorter and narrower leaves than either of the former. The heads are small and very compact; the leaves are gray, sharp-pointed, and have slender white threads crossing from one to the other, intersecting each other in various manners, so as in some measure to represent a spider's web. The flower-stalks rise about six inches high, they are succulent, round, and garnished with awl-shaped succulent leaves placed alternately; the upper part of the stalk divides into two or three branches, upon each of which is a single row of flowers ranged on one side above each other, composed of eight spear-shaped petals, of a bright red colour, with a deep red line running longitudinally in the middle; these spread open in form of a star, and in the center is situated the crown or germen of an herbaceous colour, surrounded by sixteen purple stamina which are erect and spreading, terminated by yellow summits. This sort flowers in June and July.

All the above-mentioned sorts are extremely hardy, and propagate very fast by offsets; they love a dry soil, so are very proper to plant in rock-work, where they will thrive better than in the full ground, and they want no care; for when they are once fixed, they will propagate and spread fast enough, so that the larger sorts may require to be annually reduced to keep them within proper compass. When any of these heads flower, they die soon after, but the offsets soon supply their place.

The fifth sort grows naturally at the Cape of Good Hope, and also in Portugal; the old walls about Lisbon are covered with this plant. This rises with a fleshy smooth stalk eight or ten feet high, dividing into many branches, which are terminated by round heads or clusters of leaves lying over each other like the petals of a double Rose; they are succulent and spear-shaped, of a bright green, and have very small indentures on their edges like the teeth of a very fine saw. The stalks are marked with the vestiges of the fallen leaves, and have a light brown bark; the flowers rise from the center of the heads, forming a large pyramidal spike; they are of a bright yellow colour, and the petals spread open like the points of a star; the other parts are like those of the other species. This sort generally flowers in autumn or winter, and the flowers continue long in beauty, during which time they make a fine appearance.

There is a variety of this with variegated leaves, which is much esteemed by the curious; this was obtained by a branch which had been accidentally broken from a plant of the plain kind at Badmington, the seat of his Grace the Duke of Beaufort, which, after having laid some time, was planted, and when the young leaves pushed out, they were variegated. These plants are easily propagated by cutting off the branches, which, when planted, soon put out roots; these should be laid in a dry place for a week before they are planted, that the bottom may be healed over, otherwise they are apt to rot, especially if they have much wet. When the cuttings are planted in pots, they should be placed in a shady situation, and must have but little wet, and if they are planted in a shady border, they will require no water, for the moisture of the ground will be sufficient for them. Some years past these plants were tenderly treated; their cuttings were put into a hot-bed to forward their putting out roots, and in winter the plants were kept in stoves, but later experience has taught us that they will thrive better with hardier treatment; for, if they are protected from frost and wet in winter, and have a good share of air in mild weather, they will thrive better, and flower oftener than when they are tenderly nursed. I have frequently seen the branches of these plants, which have been accidentally broken off and fallen on the ground, put out roots as they have laid, and have made good plants. The sort with striped leaves is tenderer than the other, and more impatient of wet in winter.

The sixth sort grows naturally in the Canary Islands; this seldom rises high, unless the plants are drawn up by tender management. The stalk is thick and rugged, chiefly occasioned by the vestiges of the decayed leaves; it seldom rises above a foot and a half high, supporting at the top one very large crown of leaves, disposed circularly like a full-blown double Rose. The leaves are large, and end in obtuse points which are a little incurved; they are succulent, soft to the touch, and pliable. The flower-stalk comes out of the center, and rises near two feet high, branching out from the bottom, so as to form a regular pyramid of flowers, which are of an herbaceous colour, and shaped like those of the other species; they appear in June and July, and are succeeded by horned capsules filled with small seeds which ripen late in autumn or winter, and then the plant dies.

This is propagated by seeds, which should be sown soon after it is ripe in pots filled with light sandy earth, covering them over very lightly with the same earth. These pots should be placed under a common frame to keep out the frost, but should be exposed to the open air at all times in mild weather; here the pots may remain till the spring, when the danger of hard frosts is over, and then they should be removed to a situation where they may have only the morning sun, and in dry weather the earth should be watered gently. This will soon bring up the plants, which must be kept clean from weeds, and, when they are fit to remove, they should be planted in pots filled with light loamy earth, and placed in the shade till they have taken new root; then they may be placed with other hardy succulent plants in a sheltered situation for the summer, and if in winter they are placed in a frame where they may be protected from hard frost, and enjoy the free air in mild weather, they will thrive better than with tender treatment.

The seventh sort grows naturally at the Cape of Good Hope; this is a very low plant, whose heads spread close on the ground; they are much smaller than those of the common Houseleek. The leaves have white edges, which are indented like the teeth of a saw; they spread open flat; the flowers are produced in loose panicles upon naked foot-stalks; they are small and white, so make but little appearance.

This is propagated by offsets, which are put out in plenty from the sides of the heads; this must be planted in pots, sheltered from the frost in winter, and in summer placed in the open air with other hardy succulent plants.

SENECIO. Tourn. Inst. R. H. 456. tab. 260. Lin. Gen. Plant. 857. [so called from senescere, *Lat.* to wax old, because in a hot climate or weather it soon flourishes, and grows old, and the seed afterward represents the head of old men. It is also called Erigeron from ἦρι, in the spring, and γεράω, to wax old, because it flourishes in winter, and become old in the spring. It is also called Herba Pappa, because its seeds are very downy.] Groundsel; in French, *Seneçon.*

The Characters are,

*The flower is composed of many hermaphrodite florets which form the disk, and female half florets which make the border or rays; these are included in one common cylindrical empalement which is rough, scaly, and contracted above. The hermaphrodite florets are tubulous, funnel-shaped, and cut into five parts at the brim, which are reflexed; they have five small hair-like stamina connected at the top, terminated by cylindrical summits, and an oval germen covered with down, situated under the petal, supporting a slender style, crowned by two oblong revolving stigmas. The germen afterward turns to an oval seed, covered with down, inclosed in the empalement. The female half florets, which form the rays are stretched out like a tongue, and are indented in three parts at the top.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, which contains those plants whose flowers are composed of hermaphrodite fruitful florets, and female half florets which are barren. To this genus he has added several of Tournefort's species of Ragwort.

We shall not trouble the reader with the mentioning those species of this genus which are esteemed common weeds, so are not cultivated in gardens, but confine ourselves to those which are the most valuable here.

The Species are,

1. Senecio (*Hieracifolius*) corollis nudis, foliis amplexicaulibus laceris, caule herbaceo erecto. Hort. Upsal. 261. *Groundsel with naked petals, torn leaves embracing the stalk, and an erect herbaceous stalk.* Senecio Americanus altissimus, maximo folio. Tourn. Inst. 456. *Tallest American Groundsel with a very large leaf.*
2. Senecio (*Pseudo China*) corollis nudis, scapo subnudo longissimo. Flor. Leyd. Prod. 164. *Groundsel with naked stalks which are very long.* Senecio Madraspatanus, rapi folio, floribus maximis cujus radix à nonnullis China dicitur. Hort. Elth. 345. *Groundsel of Madrass, with a Turnep leaf and a very large flower, whose root is called China-root.*
3. Senecio (*Aureus*) corollis radiantibus, foliis crenatis, infimis cordatis petiolatis, superioribus pinnatifidis lyratis. Flor. Virg. 98. *Groundsel with radiated flowers and crenated leaves, the lower ones of which are heart-shaped and have foot-stalks, but the upper lyre-shaped and wing-pointed.*
4. Senecio (*Hastulatus*) corollis radiantibus, petiolis amplexicaulibus, pedunculis folio triplo longioribus, foliis pinnato-sinuatis. Flor. Leyd. Prod. 164. *Groundsel with radiated flowers, foot-stalks embracing the stalks, foot-stalks to the flowers three times the length of the leaves, and winged sinuated leaves.* Jacobæa Afra, perennis viscosa lutea, asplenii folio. Vaill. Act. 1720. *African, perennial, yellow, clammy Ragwort, with a Spleenwort leaf.*
5. Senecio (*Elegans*) corollis radiantibus, foliis pinnatifidis æqualibus patentissimis, rachi infernè angustatâ. Hort. Cliff. 406. *Groundsel with radiated flowers, wing-pointed leaves which are equal and spreading, and the midrib below narrowed.* Jacobæa Africana frutescens, flore amplo purpureo elegantissimo, senecionis folio. Volk. Norimb. 225. *Shrubby African Ragwort, with a large, elegant, purple flower, and a Groundsel leaf.*
6. Senecio (*Abrotanifolius*) corollis radiantibus, foliis pinnato-miltifidis linearibus, nudis acutis floribus corymbosis. Lin. Sp. Plant. 869. *Groundsel with radiated flowers, and wing-pointed, multifid, linear leaves.* Jacobæa foliis ferulaceis, flore minore. Tourn. Inst. R. H. 486. *Ragwort with leaves like Giant Fennel, and a smaller flower.*
7. Senecio (*Paludosus*) corollis radiantibus, foliis ensiformibus acutè serratis subtus subvillosis, caule stricto. Lin. Sp. Plant. 870. *Groundsel with radiated flowers, sword-shaped leaves which are acutely sawed, a little hairy on their under side, and a close stalk.* Jacobæa palustris altissima, foliis serratis. Tourn. Inst. 485. *Tallest Marsh Ragwort with sawed leaves.*
8. Senecio (*Sarracenicus*) corollis radiantibus, floribus corymbosis, foliis lanceolatis serratis glabriusculis. Hort. Upsal. 266. *Groundsel with radiated flowers growing in a corymbus, and spear-shaped, sawed, smooth leaves.* Jacobæa Alpina, foliis longioribus serratis. Tourn. Inst. R. H. 485. *Alpine Ragwort with longer sawed leaves.*
9. Senecio (*Altissimus*) corollis radiantibus, floribus corymbosis, foliis lanceolatis serratis semiamplexicaulibus. *Groundsel with radiated flowers growing in a corymbus, and spear-shaped sawed leaves half embracing the stalks.* Jacobæa pratensis altissima, limonii folio. Tourn. Inst. 485. *Tallest Meadow Ragwort, with a Sea Lavender leaf.*
10. Senecio (*Orientalis*) corollis radiantibus, floribus corymbosis, foliis ensiformibus dentatis amplexicaulibus. *Groundsel with radiated flowers growing in a corymbus, and sword-shaped indented leaves which embrace the stalks.* Jacobæa Orientalis, latifolia altissima. Tourn. Cor. 36. *Tallest Eastern Ragwort with a broad leaf.*
11. Senecio (*Incanus*) corollis radiantibus, foliis utrinque tomentosis subpinnatis laciniis subdentatis, corymbo subrotundo. Haller. Helv. 731. *Groundsel with radiated flowers, half-winged leaves which are downy on both sides, segments which are somewhat indented, and a roundish corymbus of flowers.* Chrysanthemum Alpinum incanum, foliis laciniatis. C. B. P. 133. *Alpine, hoary, Corn Marygold with cut leaves.*
12. Senecio (*Rigidus*) corollis radiantibus, spatulaceis repandis amplexicaulibus scabris erosis, caule fruticoso. Hort. Cliff. 406. *Groundsel with radiated flowers, spatulæ-shaped, rough-pointed, sawed leaves, embracing the stalks, which are shrubby.* Jacobæa Africana frutescens, foliis rigidis & hirsutis. Hort. Amst. 2. p. 149. *Shrubby African Ragwort, with stiff and hairy leaves.*
13. Senecio (*Ilicifolius*) corollis radiantibus, foliis sagittatis amplexicaulibus dentatis, caule fruticoso. Vir. Cliff. 84. *Groundsel with radiated flowers, and arrow-pointed indented leaves embracing the stalks, which are shrubby.* Jacobæa Africana frutescens, foliis incisis & subtus cinereis. Com. Rar. Plant. 42. *African shrubby Ragwort, with cut leaves, which are gray on their under side.*
14. Senecio (*Halamifolius*) corollis radiantibus, foliis obovatis carnosis subdentatis, caule fruticoso. Lin. Sp. Plant. 871. *Groundsel with radiated flowers, oval fleshy leaves which are somewhat indented, and a shrubby stalk.* Doria Africana arborescens foliis crassis & succulentis atriplicem referentibus. Boerh. Ind. alt. 1. 98. *African tree-like Doria, with thick and succulent leaves like Atriplex.*

The first sort grows naturally in North America; this is an annual plant. The stalk is round, channelled, and hairy; it rises three feet high, and is garnished with torn leaves which embrace the stalks with their base; the flowers are produced in a sort of umbel on the top of the stalks, and are composed of florets having no rays; they are of a dirty white, and are succeeded by oblong seeds crowned with a long down. This plant is preserved in some botanic gardens for the sake of variety, but has very little beauty. The seeds of this must be sown upon a hot-bed in the spring, and when the plants are come up fit to remove, they should be transplanted to another hot-bed to bring them forward, and afterward they may be planted in a warm border, where they will flower in July, and their seeds will ripen in autumn.

The second sort grows naturally at Madrass; this hath a perennial root, which has been supposed to be the China-root, but is now generally believed to be a spurious kind. The roots are composed of some thick fleshy tubers, sending out many fibres on every side, from which come out some large cut leaves shaped like those of the Turnep, but are smooth. The flower-stalk is slender, almost naked, and rises a foot and a half high, sustaining at the top a few yellow flowers, composed of several hermaphrodite florets, having no rays or borders; these are succeeded by oval seeds crowned with down, but they rarely ripen in England.

This sort is tender, so will not thrive in this country, unless it is kept in a warm stove; it is propagated by parting of the roots in the spring. The offsets should be planted in pots filled with light kitchen-garden earth, and should then be plunged into the tan-bed in the stove, and treated in the same way as other tender exotics.

The third sort grows naturally in North America; this hath a perennial root, from which come out many roundish leaves upon long, slender, hairy foot-stalks; they are about an inch and a half over each way; they are of a purplish colour on their under side, and are crenated on their edges. The stalks rise near two feet high, and are garnished with a few leaves which are indented on each side in form of a lyre. The upper part of the stalk divides into several slender long foot-

foot-ſtalks, each ſuſtaining one erect flower compoſed of ſeveral hermaphrodite florets in the center, and a few female florets from the rays or border. They are yellow, and appear in June and July, and the ſeeds ripen in autumn, which are crowned with down.

It is propagated by offsets, which come out in plenty from the root; theſe may be ſeparated in autumn, and planted in an eaſt border of loamy earth, allowing each plant two feet room to ſpread. When they have taken new root, they will require no other care but to keep them clean from weeds.

The fourth ſort grows naturally in Africa; this hath an herbaceous perennial ſtalk, which branches out at the bottom, and riſes about two feet and a half high, garniſhed at bottom with narrow leaves, which are ſeven or eight inches long, ſinuated on the ſides ſo as to reſemble winged leaves, and are alſo indented. The upper leaves are ſmaller, and embrace the ſtalks; they are very clammy, and ſtick to the fingers on being handled; the upper part of the ſtalk divides into ſeveral very long foot-ſtalks, each ſuſtaining one yellow radiated flower. Theſe plants continue in flower moſt part of the ſummer, and the ſeeds ſometimes ripen in autumn.

This is propagated by cutting off the ſide ſhoots in any of the ſummer months, and planting them in a ſhady border, where in five or ſix weeks they will take root, and may then be taken up and planted in pots, placing them in the ſhade till they have new roots; then they may be removed to an open ſituation, obſerving to water them duly in dry weather, and in winter they muſt be placed under a frame, where they may be ſcreened from hard froſt, for they will not live abroad through the year here.

The fifth ſort grows naturally at the Cape of Good Hope; it is an annual plant, which hath many herbaceous branching ſtalks that riſe near three feet high, garniſhed with equal wing-pointed leaves which ſpread flat. The flowers are produced in bunches on the top of the ſtalks; they are large and radiated, the border or rays being of a beautiful purple colour, and the middle or diſk yellow. Theſe plants flower from July till the froſt ſtops them, and make a fine appearance. The ſeeds ripen in autumn, which, if permitted to ſcatter, there will be plenty of plants riſe the ſpring following without care; they may be alſo ſown upon a bed of earth in the ſpring, and when the plants are fit to remove, they may be tranſplanted about the borders of the flower-garden. If ſome of the plants are planted in pots and houſed in winter, they may be preſerved till ſpring.

The ſixth ſort grows naturally on the Alps and Pyrenees; this hath a perennial root and an annual ſtalk. The root is compoſed of a great number of long ſlender fibres which ſtrike deep in the ground, and ſpread on every ſide; the ſtalks riſe two feet high, and become a little ligneous in autumn; they are garniſhed their whole length with very narrow wing-pointed leaves, reſembling thoſe of Hogs Fennel; the flowers are produced in bunches on the top of the ſtalks; they are yellow, and have rays or borders reſembling thoſe of the other ſpecies. This ſort flowers in June and July, and the ſeeds ripen in autumn.

It is propagated by ſeeds, which ſhould be ſown upon a bed of loamy earth, where it is expoſed only to the morning ſun, where the plants will riſe better than in a warmer ſituation. When the plants are fit to remove, they may be tranſplanted on a ſhady border, where they may remain till autumn, obſerving to keep them clear from weeds all the ſummer; then they ſhould be tranſplanted to the places where they are to remain. The following ſummer the plants will flower and produce ripe ſeeds, and the roots will continue, if they are in a ſhady ſituation and a loamy ſoil.

The ſeventh ſort grows naturally about Paris, by the ſides of waters and in moiſt meadows. The root is perennial; the ſtalks riſe three or four feet high, are cloſe channelled, and garniſhed with ſword-ſhaped leaves, five or ſix inches long and one broad, which are ſharply ſawed on their edges, and are hairy on their under ſide. The upper part of the ſtalk divides into ſeveral ſlender foot-ſtalks, ſuſtaining yellow radiated flowers which appear in June and July, and the ſeeds ripen in autumn, ſoon after which the ſtalks decay to the root.

The eighth ſort grows naturally on the Helvetian mountains, and is ſometimes found growing in low marſhy places in the Iſle of Ely; this hath a creeping root, by which it propagates and ſpreads wide whereever it is once eſtabliſhed. The ſtalks of this riſe four feet high, and are garniſhed with ſmooth ſpear-ſhaped leaves five inches long, and one and a quarter broad; they are ſawed on their edges, and placed alternate. The flowers are yellow, radiated, and produced in a ſort of corymbus on the top of the ſtalk; theſe come out in July, and are ſucceeded by ſeeds having down, which ripen in autumn.

The ninth ſort grows naturally in France; this hath ſome reſemblance of the eighth, but the root does not creep like that. The leaves are ſhorter, and the ſerratures on their edges are very ſmall; they embrace the ſtalks with their baſe, and end in ſharper points. The flowers are produced in larger and looſer bunches on the top of the ſtalk, are of a paler yellow colour than thoſe of the former, and appear about the ſame time.

The tenth ſort grows naturally in the Levant, where it was diſcovered by Dr. Tournefort, who ſent the ſeeds to the Royal Garden at Paris; this hath a perennial root and an annual ſtalk. The lower leaves are a foot long, four inches broad in the middle, and ſomewhat ſhaped like a ſcymitar, the midrib being curved outward toward the point; they are ſmooth, and ſlightly indented on their edges. The ſtalk riſes four feet high, and is garniſhed with leaves growing ſmaller all the whole length, which embrace it half round with their baſe; at the top of the ſtalk the flowers are produced in a compact corymbus; they are of a deep yellow, and have rays like thoſe of the former ſorts, which appear about the ſame time.

Theſe ſorts are eaſily propagated by ſeeds or parting of their roots; the latter is generally practiſed when the plant is once obtained, as that is the moſt expeditious method, eſpecially for the eighth ſort, whoſe roots are apt to ſpread and increaſe too faſt where they are not confined. The beſt time to tranſplant and divide theſe roots is in autumn, when their ſtalks decay, that they may get good root before the ſpring. Theſe plants are too large for ſmall gardens, ſo are proper furniture for large borders, in extenſive gardens, or to plant on the ſides of woods, where they may be allowed room, for they ſhould have at leaſt four feet allowed to each. When theſe are intermixed with other tall growing plants in ſuch places, they will add to the variety.

If they are propagated by ſeeds, they ſhould be ſown on a ſhady border in the ſpring, obſerving, if the ſeaſon proves dry, to water the ground from time to time, which will bring up the plants; theſe muſt be kept clean from weeds, and when they are fit to remove, they ſhould be tranſplanted into beds at a foot diſtance, where they may remain till autumn, and then they ſhould be tranſplanted to the places where they are to ſtand for flowering.

The eleventh ſort grows naturally on the Alps; this is a perennial plant of low growth. The ſtalks ſeldom riſe a foot high; the whole plant is covered with a very white hoary down; the leaves are winged and indented; the flowers are collected into a cloſe round corymbus on the top of the ſtalk; they are of a gold colour, and are radiated; theſe appear in June, but are rarely ſucceeded by good ſeeds in England.

It is propagated by ſlipping off the heads in the ſpring, and planting them in a bed of loamy earth in a ſhady ſituation, where they will put out roots, and may afterward be tranſplanted into an eaſt border, where they may have the morning ſun only, for this plant loves a gentle loamy ſoil, and a ſituation not too much expoſed to the ſun. The plant having fine

hoary leaves, will make a pretty diverſity when intermixed with other plants; and, as it requires but little culture, and takes up but little room, they deſerve a place in ſmall gardens.

The twelfth ſort grows naturally at the Cape of Good Hope; this riſes with a ſhrubby branching ſtalk ſix or ſeven feet high, which is cloſely garniſhed with rough leaves, whoſe baſe embrace the ſtalks; thoſe on the lower part are four inches long, and an inch and a half broad, but they gradually diminiſh in their ſize to the top; they are ſtiff, hairy, and of a dark green, oblong, heart-ſhaped, and indented on their edges. The flowers are produced at the end of the branches; they are radiated, and of a bright yellow colour. This plant continues flowering great part of the ſummer, and the ſeeds ripen in autumn.

The thirteenth ſort grows naturally at the Cape of Good Hope; this hath a very branching ſhrubby ſtalk, which riſes four or five feet high, ſending out branches irregularly on every ſide, garniſhed with ſtiff leaves, whoſe baſe embraces the ſtalks; they are irregular in their figure, about three inches long, and three quarters of an inch broad, deeply cut on their edges, and of a gray colour on their under ſide. The flowers grow in looſe bunches at the end of the branches, are radiated, and of a pale yellow colour. This ſort flowers great part of ſummer, and the ſeeds ripen in autumn.

The fourteenth ſort grows naturally at the Cape of Good Hope; this has a ſhrubby ſtalk which riſes ſeven or eight feet high, ſending out branches on every ſide the whole length, which are garniſhed with oblong oval leaves indented on their edges; they are about two inches and a half long, and almoſt two broad, fleſhy and hoary. The flowers are produced in looſe bunches at the extremity of the branches, almoſt in form of an umbel; they are radiated, and of a pale yellow colour. This ſort flowers in July and Auguſt, but rarely produces good ſeeds here.

The three ſorts laſt mentioned are too tender to live in the open air through the winter in England, but are ſo hardy as to only require protection from hard froſts; ſo if they are kept in pots and placed either under a frame in winter, or in a common green-houſe with other hardy kinds of plants, which require a large ſhare of air in mild weather, and only require to be ſcreened from hard froſt, they may be preſerved in England. They are all eaſily propagated by ſeeds or cuttings, but the latter being the moſt expeditious method is generally practiſed here. If the cuttings are planted in a ſhady border during any of the ſummer months, they will readily take root, and then they ſhould be taken up with balls of earth to their roots, and each planted in a ſeparate pot filled with good kitchen-garden earth, and placed in the ſhade till they have taken new root; then they may be removed to a more open ſituation, where they may remain till there is danger of ſharp froſt, when they ſhould be removed into ſhelter, and treated in the ſame way as other hardy kinds of green-houſe plants.

If theſe plants are propagated by ſeeds, they ſhould be ſown on a bed of freſh earth, expoſed only to the morning ſun the beginning of April, obſerving in dry weather to moiſten the ground now and then, which will forward the vegetation of the ſeeds. When the plants come up, they muſt be kept clean from weeds till they are fit to remove, when they ſhould be planted in pots, and treated in the ſame way as thoſe raiſed from cuttings.

SENNA. Tourn. Inſt. R. H. 618. tab. 390. Caſſia. Lin. Gen. 461. [ſo called from ſana, *Lat.* healthy, becauſe its leaves reſtore health.] Senna.

The Characters are,

*The flower has an empalement of five concave leaves; it has five roundiſh concave petals which ſpread open, and ten declining ſtamina, terminated by oblong arched ſummits. The germen is roundiſh and compreſſed, ſupporting a ſhort ſtyle, crowned by an obtuſe ſtigma. The germen afterward becomes a plain, roundiſh, compreſſed pod, a little incurved, having two cells divided by an intermediate partition, each containing one or two oblong-pointed ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's tenth claſs, where he has joined it to the genus of Caſſia; this ſection contains thoſe plants whoſe flowers have ten ſtamina and one ſtyle.

The Species are,

1. Senna (*Alexandrina*) foliolis quadrijugatis lanceolatis acutis. *Senna with four pair of ſpear-ſhaped pointed lobes to the leaves.* Senna Alexandrina ſive foliis acutis. C. B. P. *Alexandrian Senna with acute leaves.*
2. Senna (*Italica*) foliolis quinquejugatis cordatis obtuſis. *Senna with five pair of lobes to the leaves, which are heart-ſhaped and obtuſe.* Senna Italica ſive foliis obtuſis. C. B. P. 397. *Italian Senna with obtuſe leaves.*

The firſt ſort grows naturally in Egypt; this is an annual plant, which riſes with an upright branching ſtalk about a foot high, garniſhed with winged leaves, compoſed of four pair of ſmall ſpear ſhaped lobes, ending in acute points. The flowers are produced in looſe bunches at the top of the ſtalk; they are yellow, compoſed of five roundiſh concave petals, with ten ſtamina in the center ſurrounding the ſtyle; after the flower is paſt, the germen turns to a roundiſh gibbous pod having two cells, each containing one or two oblong ſeeds. The leaves of this ſort are uſed in medicine, and are commonly known in the ſhops by the title of Senna; theſe are annually imported from Alexandria, which occaſioned the title of Alexandrina being added to it. This plant is propagated by ſeeds, which ſhould be ſown early in the ſpring upon a good hot-bed; and when the plants are come up, and are ſtrong enough to tranſplant, they ſhould be each planted in a ſmall pot filled with light rich earth, and plunged into a freſh hot-bed, ſhading them from the ſun till they have taken new root, after which they muſt be treated in the ſame way as the moſt tender exotics; for as this is an annual plant, unleſs they are brought forward in the ſpring, they will not flower in this country; therefore they muſt be conſtantly kept in the hot-bed all the ſummer, obſerving to admit plenty of air in warm weather; by which method I have frequently had theſe plants in flower, but it is very rare that they perfect their ſeeds in England.

If the ſeeds of this plant were ſent to South Carolina, the plants might be propagated there, ſo as to furniſh plenty of the leaves to ſupply the conſumption of Great-Britain.

In the Weſt-Indies, the inhabitants make uſe of the leaves of ſeveral ſpecies of Caſſia inſtead of this plant, and alſo thoſe of the Poinciana, or Flower-fence, which is frequently by them called the true Senna.

The ſecond ſort grows naturally in India, from whence I have received the ſeeds; for although it is called Italian, yet the plant does not grow there naturally. This is alſo an annual plant, riſing with a branching ſtalk a foot and a half high; the leaves are winged, each having five pair of heart-ſhaped lobes which are inverted, the point joining the branches, and the obtuſe part is upward; they are of a ſea-green colour, and of a thick conſiſtence. The flowers are produced at the end of the branches; they are ſhaped like thoſe of the firſt ſort, but are larger, and of a brighter yellow colour. If the plants are brought forward early in the ſpring, they will flower in July, and by ſo doing good ſeeds may be obtained here. This ſort is propagated in the ſame way as the firſt, and the plants require the ſame treatment.

The leaves of this ſort have been ſometimes uſed in medicine, but they are not eſteemed equal in quality with thoſe of the firſt.

SENNA THE BLADDER. See Colutea.

SENNA THE SCORPION. See Emerus.

SENSIBLE PLANT. See Mimosa.

SEPTIFOLIOUS PLANTS, are ſuch as have juſt ſeven leaves.

SERAPIAS. Lin. Gen. Plant. 903. Helleborine. Tourn. Inſt. R. H. 436. tab. 249. Baſtard Hellebore.

The CHARACTERS are,

*It has a single stalk; the sheath of the flower is at a distance. The germen sustains the flower which has no empalement, but has five oblong oval petals which are spreading, but close at the top. The nectarium is the length of the petal, hollowed at the base, oval, and gibbous below, cut into three points, the middle being heart-shaped and obtuse, the others are acute. The flower has two short stamina sitting upon the pointal, terminated by erect summits placed under the upper lip of the nectarium, and an oblong contorted germen situated under the flower, the style growing to the upper lip of the nectarium, crowned by an obsolete stigma. The germen afterward becomes an oval, obtuse, three-cornered capsule, armed with three keels, opening with a valve under each, having one cell filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's twentieth class, which includes those plants whose flowers have but two stamina which are connected to the style.

The SPECIES are,

1. SERAPIAS (*Helleborine*) bulbis fibrosis floribus erectis bractea brevioribus. *Serapias with fibrous bulbs, and erect flowers with short bractea.* Helleborine montana latifolia. C. B. P. 186. *Broad-leaved, Mountain, Bastard Hellebore.*
2. SERAPIAS (*Damasonium*) bulbis fibrosis, petalis nectario longioribus obtusis, foliis lanceolatis nervosis. *Serapias with fibrous bulbs, obtuse petals which are longer than the nectarium, and veined spear-shaped leaves.* Helleborine flore albo vel Damasonium montanum latifolium. C. B. P. 187. *Bastard Hellebore with a white flower, or broad-leaved Mountain Damasonium.*
3. SERAPIAS (*Palustre*) bulbis fibrosis. *Serapias with fibrous bulbs, reflexed petals, the lip of the nectarium obtuse, and sword-shaped veined leaves.* Helleborine angustifolia palustris, sive pratensis. C. B. P. 187. *Narrow-leaved Marsh, or Meadow Bastard Hellebore.*
4. SERAPIAS (*Latifolium*) bulbis fibrosis, nectari labio quinquefido clauso, foliis lanceolatis nervosis amplexicaulibus. *Serapias with fibrous bulbs, the lip of the nectarium cut into five parts closed, and spear-shaped veined leaves embracing the stalks.* Helleborine latifolia, flore albo clauso. Raii Syn. 2. 242. *Broad-leaved Bastard Hellebore, with a white closed flower.*

There are some other species of this genus which grow naturally in Great-Britain and Ireland, but as I have not had the good fortune to meet with them, so I shall not trouble the reader with an imperfect account of them from books: there are also a greater number of them which grow naturally in the West-Indies, of which I have samples in my collection; but having never seen any growing plants of them, I shall not insert them here.

The first sort grows naturally in woods and shady places in many parts of England; the roots are composed of many thick fleshy fibres, from which arise a single stalk a foot high, which is jointed; it is garnished at each joint with one veined leaf, those on the lower part of the stalk are oval, but those above are spear-shaped, ending in acute points; they embrace the stalks at their base. The stalk is adorned with flowers toward the top, which have some resemblance to those of Orchis; they are composed of two whitish, and three herbaceous petals, which expand; and in the middle appears the nectarium, which has a resemblance of a disboweled body of a fly, of a purplish colour. Under the flower is situated a channelled oblong head, which after the flower is past, swells and becomes a seed-vessel filled with very small seeds. This flowers in June and July, and the seeds ripen in autumn.

The second sort grows naturally in Stoken Church woods in Oxfordshire, and in several parts of Westmoreland and Lancashire. This hath fleshy fibrous roots, not quite so thick as those of the former; the stalks rise more than a foot high, and are garnished with spear-shaped veined leaves, ending in acute points; they are three inches long and one broad, of a lucid green, and sit close to the stalk. The flowers are disposed alternately on the upper part of the stalk; they are white, and have three outer petals which are large, and two smaller within; in the center is situated the gaping nectarium, which appears to have two wings. This sort flowers about the same time as the former.

The third sort grows naturally in marshy woods in many parts of England; this hath a fleshy fibrous root, from which arise a single stalk a foot and a half high, garnished at bottom with sword-shaped veined leaves, four inches long and one broad, embracing the stalk with their base, ending in acute points. The upper part of the stalk is garnished with faded purplish-coloured flowers, disposed in a loose spike; they have five petals, inclosing a large nectarium like the body of a fly, with a yellowish head striped with purple and a white body; the lip which hangs down, is white and fringed on the edge. This sort flowers in July.

The fourth sort was discovered first in Hertfordshire, but since it has been found growing in many other places. The root of this is composed of fleshy fibres; the stalks rise more than a foot high, and are garnished with spear-shaped veined leaves, which embrace the stalks with their base. The stalk is terminated by a loose spike of white flowers, composed of five petals, and a large five-pointed nectarium which is shut; the germen is oblong and channelled; this afterward becomes a capsule of the same form, filled with small seeds. It flowers in July.

These plants are rarely kept in gardens, and being difficult to propagate, there are few who have attempted to keep them in gardens. They may be taken up from the places where they naturally grow, when their leaves begin to decay, and planted in a shady moist place, where they will thrive and flower.

SERJANIA. See PAULLINIA.

SERPENTARIA. See ARISTOLOCHIA.

SERPYLLUM. See THYMUS.

SERRATULA. Dillen. Nov. Gen. 8. Lin. Gen. Plant. 831. Jacea. Tourn. Inst. R. H. 444. Saw-wort.

The CHARACTERS are,

*The flowers are composed of many hermaphrodite florets, contained in one common cylindrical empalement, which is bellied, and the scales are spear-shaped, ending in acute points. The hermaphrodite florets are equal, funnel-shaped, and of one petal. The tube is inflexed, the brim is bellied, and cut into five points; they have each five short hair-like stamina terminated by cylindrical summits, and an oval-crowned germen, supporting a slender style, crowned by two oblong reflexed stigmas. The germen afterward turns to a vertical, oval, single seed, crowned with down, which ripens in the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which includes those plants whose flowers are composed of fruitful florets, and the stamina are connected to the style.

The SPECIES are,

1. SERRATULA (*Tinctoria*) foliis pinnatifidis, pinna terminali maxima. Hort. Cliff. 391. *Saw-wort with wing-pointed leaves, whose end lobe is the largest.* Serratula. C. B. P. 235. *Common Saw-wort.*
2. SERRATULA (*Altissima*) foliis lanceolato-oblongis serratis subtus tomentosis. *Saw-wort with oblong spear-shaped leaves, which are sawed, and downy on their under side.* Serratula Noveboracensis, altissima, foliis Doriæ mollibus subincanis. Par. Bat. Prod. *Tallest New-York Saw-wort, with soft Doria leaves, hoary on their under side.*
3. SERRATULA (*Glauca*) foliis ovato-oblongis acuminatis serratis, floribus corymbosis, calycibus subrotundis. Flor. Virg. 92. *Saw-wort with oblong, oval, acute-pointed, sawed leaves, and flowers in a corymbus whose empalements are roundish.* Serratula Virginiana, foliis rigidis. Par. Bat. Prod. 227. *Virginian Saw-wort with stiff leaves.*
4. SERRATULA (*Squarosa*) foliis linearibus, calycibus squarrosis sessilibus acuminatis. Hort. Cliff. 392. *Saw-wort with linear leaves, and rough empalements which sit*

close

*close to the stalks, ending in acute points.* Cirsium tuberosum, capitulis squarrosis Hort. Elth. 83. *Tuberous melancholy Thistle with rough heads.*

5. Serratula (*Scariosa*) foliis lanceolatis integerrimis, calycibus squarrosis pedunculatis obtusis lateralibus. Lin. Sp. Plant. 818. *Saw-wort with entire spear-shaped leaves and rough empalements, having obtuse foot-stalks proceeding from the side of the stalks.* Jacea latifolia Virginiana, radice tuberosâ. Banist. Cat. *Broad-leaved Virginian Knap-weed with a tuberous root.*

6. Serratula (*Spicata*) foliis linearibus, floribus sessilibus lateralibus spicatis, caule simplici. Lin. Sp. Plant. 819. *Saw-wort with linear leaves, flowers in spikes from the side of the stalks sitting close, and a single stalk.* Jacea non ramosa, tuberosâ radice, floribus plurimis rigidis peranguftis. Banist. Cat. 1927. *Unbranched Knap-weed with a tuberous root, and many narrow rigid flowers.*

7. Serrulata (*Caroliniana*) foliis lanceolatis rigidis, acutè serratis, caule corymboso. *Saw-wort with stiff spear-shaped leaves sharply sawed, and stalks forming a corymbus.* Serratula Caroliniensis, virgæ pastoris folio. Hort. Elth. 353. *Carolina Saw-wort with a Shepherd's Rod leaf.*

8. Serratula (*Præalta*) foliis oblongo-lanceolatis, integerrimis subtus hirsutis. *Saw-wort oblong, spear-shaped, entire leaves, hairy on their under side.* Serratula Virginiana, persicæ folio subtus incano. Hort. Elth. 356. *Virginian Saw-wort with a Peach-tree leaf, hoary on the under side.*

9. Serratula (*Alpina*) calycibus subhirsutis ovatis foliis indivisis. Lin. Sp. Plant. 816. *Saw-wort with oval empalements a little hairy.* Cirsium humile montanum cynoglossi folio polyanthemum. Mor. Hist. 3. p. 148. *Low mountain melancholy Thistle, with a Hound's-tongue leaf, and many flowers.*

The first sort grows naturally in moist woods and marshes in many parts of England, so is rarely admitted into gardens. There are two varieties of this, one with a white, and the other a purple flower. The root is perennial; the lower leaves are sometimes entire, and sometimes are cut almost to the midrib into many jags; they are smooth, of a deep green, and neatly sawed on their edges. The stalks rise two feet high, and are garnished with wing-pointed leaves, whose extreme lobe is much larger than the other; these are sawed on their edges; the upper part of the stalk divides into several foot-stalks, sustaining at the top oblong squamous heads or empalements, which include several hermaphrodite florets. These appear in July, and are succeeded by seeds which ripen in autumn.

The second sort grows naturally in North America; this hath a perennial root, from which come out several channelled stalks which rise seven or eight feet high, garnished with spear-shaped leaves from four to five inches long, and one inch broad in the middle, drawing to a point at each end; they are slightly sawed on their edges, and are downy on their under side, sitting close to the stalk; the upper part of the stalk divides into foot-stalks, which sustain purple flowers in scaly empalements. These appear the latter end of July, but are seldom succeeded by good seeds in England.

The third sort is a native of North America; the root is perennial, and the stalks rise six or seven feet high; they are purple and channelled. The leaves are oblong, oval, about three inches long, and an inch and a half broad in the middle, ending in acute points; they are stiff, sawed on their edges, and are of a light green on both sides. The flowers grow in a loose corymbus at the top of the stalk; they are purple, and have roundish empalements. This sort flowers in August, but the seeds seldom ripen in England.

The fourth sort grows naturally in Carolina, from whence I received the seeds. This hath a tuberous root, from which comes out a single stalk rising near three feet high, garnished with stiff linear leaves about three inches long, which are entire, and rough to the touch, of a pale green on both sides. The upper part of the stalk is adorned with purple flowers, having oblong, rough, prickly empalements; these come out from the side of the stalk alternately, and the stalk is terminated by one head which is larger than the other; these sit close to the stalks. The flowers appear in August, but this sort never ripens seeds here.

The fifth sort grows naturally in most parts of North America; this has a large tuberous root, from which comes out one strong channelled stalk, which rises three or four feet high, closely garnished with narrow spear-shaped leaves which are entire; they are about three inches long, and half an inch broad. The upper part of the stalk is adorned with a long loose spike of purple flowers, which come out from the side upon pretty long blunt foot-stalks; they have large rough empalements, composed of wedge-shaped scales. The flowers on the top of the spike blow first, and are succeeded by the other downward, which is contrary to the greatest number of plants, whose flowers are ranged in spikes, for most of them begin to flower at the bottom, and are succeeded by those above. The flowers of this sort appear in August, but the seeds do not ripen here.

The sixth sort is a native of North America; this has a tuberous root, from which comes forth a single stalk rising from two to three feet high, garnished with very narrow smooth leaves, which at bottom are more than three inches long, but gradually diminish to the top; they are placed round the stalk without any order, sitting close to it at their base. The upper part of the stalk is adorned with smaller purple flowers than those of the former, sitting close to the stalk, forming a long loose spike; they appear about the same time as those of the former sort.

The seventh sort is also a native of North America; it has a perennial fibrous root, from which arise several strong purple stalks upward of six feet high; they are channelled, and garnished with spear-shaped leaves, which toward the bottom of the stalks are more than six inches long, and an inch and a half broad in the middle, drawing to points at both ends; they are gradually less to the top of the stalks, and are stiff, deeply sawed on their edges, of a pale green on their under side. The upper part of the stalk divides into small branches, forming a loose corymbus of purple flowers, which are irregular in height, some of the flowers standing upon shorter foot-stalks than the other; their empalements are round, and the scales terminate in bristly points. This sort flowers in July and August, but does not produce good seeds in England.

The eighth sort grows naturally in Carolina; this has a fibrous perennial root; the stalk is branching, and rises four feet high; the leaves are seven inches long, and an inch and a half broad in the middle, ending in acute points; they are entire and hairy on their under side, sitting close to the stalk. The flowers grow in loose bunches at the end of the branches; they have oval empalements, composed of a few scales which terminate in bristles. The flowers are of a pale purple colour, and appear late in summer, so are not succeeded by seeds here.

The ninth sort grows naturally on the tops of mountains in Wales and the North of England, and is but seldom kept in gardens. The root is perennial, from which come out one, two, or three stalks, which rise a foot and a half high; they are of a deep green colour, are channelled, and garnished with deep green leaves their whole length; those at the bottom are indented, but those on the upper part of the stalks are entire; they are about three inches long, and almost one broad, of a dark green colour. From the middle of the stalk upward, there are branches sent out from the side, which grow erect, and sustain at the top small bunches of purple flowers, which have oblong slender empalements a little hairy. The flowers appear in June and July.

The eight sorts which are first mentioned, are hardy perennial plants, so will thrive in the open air in England. The first is rarely admitted into gardens, but the other sorts are frequently preserved in the gardens of the curious. The fourth, fifth, and sixth sorts, have large knobbed roots; these are propagated only by seeds, which seldom ripen in England, so that the seeds must be procured from abroad. These should be sown on an east-aspected border, where the morning sun only comes; for if the seeds are exposed to the mid-day sun, they seldom succeed well. These seeds will often grow the first summer, if they are sown early in the spring, but sometimes they will remain in the ground a year before the plants appear; so that if they should not come up the first season, the ground should not be disturbed, and must be kept clean from weeds till the following spring, when, if the seeds were good, the plants will come up; when these appear they must be kept clean from weeds; and if they are too close, some of the plants should be carefully drawn out while they are young, and planted into another border of light loamy earth, four inches asunder; in this place they may remain till autumn, when these, and also those in the seed-beds, should be carefully removed to the places where they are designed to remain; the following summer these plants will flower, and the roots will abide several years, if they are planted in a light loamy soil not over wet.

The other perennial sorts may be propagated by parting of the roots; the best time for doing this is in autumn, when their stalks begin to decay; for when they are removed in the spring, if the season should prove dry, their roots will not be sufficiently established to flower well the same year. These plants should not be removed or parted oftener than every third year, if they are expected to grow strong; nor should they be parted into small heads, for those will make no figure the first year. As these plants grow tall, so they should be planted in the middle of large borders, or with other tall plants; they may be planted in spaces between shrubs, or on the borders of woods, where they will have a good effect during their continuance in flower; and as they require no other culture than to dig the ground between them every spring, and keep them clean from weeds, so they are proper furniture for such places.

These sorts are also propagated by seeds, when they can be obtained good; these may be sown in the same way as the bulbous-rooted kinds, and when the plants come up, they must be treated in the same manner, only that these should be allowed more room, for the fibres of their roots spread out on every side to a great distance; for which reason these plants should not be planted in small gardens, where they will overbear the neighbouring plants.

SESASUM. Lin. Gen. Plant. 700. Digitalis. Tourn. Inst. R. H. 156. Oily Grain.

The Characters are,

*The flower has an erect permanent empalement of one leaf, cut at the top into five very short equal segments. It has one ringent petal, with a roundish tube the length of the empalement; the chaps are swollen, bell-shaped, and spreading; the brim is cut into five points, four of which are spreading and almost equal; the other is twice their length, oval, and erect. It has four stamina rising from the tube which are shorter than the petal, the two inner being shorter than the other, terminated by erect pointed summits, and an oval hairy germen, supporting a slender style longer than the stamina, crowned by a spear-shaped stigma divided in two parts. The germen afterward becomes an oblong, almost four-cornered capsule, which is compressed and acute-pointed, having four cells, filled with oval compressed seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and their seeds are included in capsules.

The Species are,

1. Sesasum (*Orientale*) foliis ovato-oblongis integris. Hort. Cliff. 318. *Sesamum with oblong, oval, entire leaves.* Digitalis Orientalis, sesamum dicta. Tourn. Inst. 165. *Eastern Foxglove, called Sesamum.*
2. Sesamum (*Indicum*) foliis inferioribus trifidis. Prod. Leyd. 292. *Sesamum with trifid lower leaves.* Sesamum alterum, foliis trifidis, Orientale semine obscuro. Pluk. Alm. 344. *Another Eastern Sesamum, with trifid leaves and black seeds.*
3. Sesamum (*Trifoliatum*) foliis omnibus trifidis. *Sesamum with all the leaves trifid.* Sesamum Orientale, trifidum, flore niveo. Hort. Compt. *Eastern Sesamum, with a trifid leaf and snow white flower.*

The first sort is cultivated in great plenty in the Levant, but is supposed to have been brought there from India. It is an annual plant, rising with an herbaceous four-cornered stalk about two feet high, sending out a few short side-branches; the leaves are oblong, oval, a little hairy, and stand opposite. The flowers are produced in loose spikes at the top of the stalks; they are small, and of a dirty white colour, shaped somewhat like those of the Foxglove. These appear in July, and after the flowers are past, the germen turns to an oval acute-pointed capsule with four cells, filled with oval compressed seeds which ripen in autumn.

The second sort grows naturally in India; this is also an annual plant; the stalk rises taller than that of the former; the lower leaves are cut into three parts, which are the only differences between them.

The third sort grows naturally in Africa; this is also an annual plant, with a taller and more branched stalk than either of the former, and all the leaves are cut into three parts, in which it differs from both the other.

I have raised two other species of this genus from seeds which were brought from Africa, but these being sown late in the spring, did but just shew their flowers before winter, so there could be no good seeds obtained from them. These grew near four feet high, the leaves of one sort were much longer than any of the other, and those toward the top of the stalk were divided into three, and some into four parts; the seeds of this were black, the other had broader leaves, which were sawed on their edges. The flowers were large and of a pale blue colour, and the seeds were of a pale yellow colour.

The first sort is frequently cultivated in all the eastern countries, and also in Africa, as a pulse; and of late the seeds of this have been introduced in Carolina by the African negroes, where they have succeeded extremely well. The inhabitants of that country make an oil from the seed, which will keep many years, and not take any rancid smell or taste, but in two years becomes quite mild; so that when the warm taste of the seed, which is in the oil when first drawn, is worn off, they use it as sallad oil, and for all the purposes of sweet oil.

The seeds of this plant are also used by the negroes for food, which seeds they parch over the fire, and then mix them with water, and stew other ingredients with them, which makes an hearty food. Sometimes a sort of pudding is made of these seeds, in the same manner as with Millet or Rice, and is by some persons esteemed, but is never used for these purposes in Europe. This is called Benny, or Bonny, in Carolina. In England, these plants are preserved in botanic gardens as curiosities. Their seeds must be sown in the spring upon a hot-bed, and when the plants are come up, they must be transplanted into a fresh hot-bed to bring them forward. After they have acquired a tolerable degree of strength, they should be planted into pots filled with a rich, light, sandy soil, and plunged into another hot-bed, managing them as hath been directed for Amaranthuses, to which I shall refer the reader, to avoid repetition: for if these plants are not thus brought forward in the former part of the summer, they will not produce good seeds in this country; though after they have flowered, if the season is favourable, they may be exposed in a warm situation with other annual plants. When these plants have perfected their seeds they decay, and never continue longer than one season.

The feed of the firft fort is mentioned in the lift of officinal fimples in the College Difpenfatory, but is rarely ufed in medicine in England. From nine pounds of this feed which came from Carolina, there were upwards of two quarts of oil produced, which is as great a quantity as hath been known to be drawn from any vegetable whatever; and this, I fuppofe, might occafion its being called Oily Grain.

SESELI. Boerh. Ind. alt. 1. p. 50. Lin. Gen. Plant. 322. Wild Spignel.

The CHARACTERS are,

*It has an umbellated flower; the figure of the greater umbel is uncertain, the particular umbels are very fhort, multiplex, and almoft globular. The principal umbel has no involucrum, the particular ones have a many narrow-leaved involucrum, which is as long as the umbel; the empalement of the flower is fcarce difcernible; the principal umbel is uniform. The flowers have five inflexed heart-fhaped petals, which are a little unequal; they have each five awl-fhaped ftamina, terminated by fingle fummits. The germen is fituated under the flower, fupporting two reflexed ftyles, crowned by obtufe ftigmas The germen afterward turns to a fmall, oval, channelled fruit, dividing into two parts, each containing one oval ftreaked feed, flat on one fide and convex on the other.*

This genus of plants is ranged in the fecond fection of Linnæus's fifth clafs, which includes thofe plants whofe flowers have five ftamina and two ftyles.

The SPECIES are,

1. SESELI (*Montanum*) petiolis ramiferis membranaceis. Hort. Cliff. 103. *Sefeli with membranaceous foot-ftalks.* Fœniculum fylveftre annuum, tragofelini odore, umbella alba. Bot. Parif. 54. *Annual wild Fennel fmelling like Burnet Saxifrage, and a white umbel.*
2. SESELI (*Caruifolia*) foliis bipinnatis fublinearibus, petiolis bafi membranaceis, feminibus ovalibus. Lin. Sp. Plant. 360. *Sefeli with double-winged leaves almoft linear, with a membranaceous bafe to the foot-ftalks, and oval feeds.* Caruifolia. C. B. P. 158. *Carraway leaf.*
3. SESELI (*Glaucum*) petiolis ramiferis membranaceis oblongis integris, foliolis fingularibus binatifque canaliculatis lævibus petiolo longioribus. Guett. 64. *Sefeli with branching, oblong, entire, membranaceous foot-ftalks, and the fmall leaves either fingle or by pairs, which are lightly channelled.* Fœniculum fylveftre glauco folio. Tourn. Inft. 311. *Wild Fennel with a gray leaf.*
4. SESELI (*Pumilum*) petiolis ramiferis membranaceis oblongis integris, foliis caulinis anguftiffimis. Hort. Cliff. 102. *Sefeli with oblong, entire, membranaceous, branching foot-ftalks, and very narrow leaves on the ftalks.* Fœniculum fylveftre perenne, ferulæ folio breviore. Tourn. Inft. 311. *Wild perennial Fennel, with a fhorter Giant's Fennel leaf.*
5. SESELI (*Tortuofum*) caule alto rigido, foliolis linearibus fafciculatis. Lin. Sp. Plant. 260. *Sefeli with a tall ftiff ftalk, and very narrow leaves in clufters.* Fœniculum tortuofum. J. B. 3. p. 16. *Crooked or contorted Fennel.*
6. SESELI (*Ammoides*) petiolis membrana deftitutis. Flor. Leyd. Prod. 112. *Sefeli with foot-ftalks without membranes.* Fœniculum Lufitanicum minimum acre. Tourn. Inft. 312. *The leaft acrid Portugal Fennel.*

The firft fort grows naturally in France amongft the Corn; this rifes with an erect ftalk near two feet high, fending out branches from the fide, and is garnifhed with fhort leaves divided into fmall fegments or leaves like Hog's Fennel. At the foot-ftalk of each branch or leaf is a bellied membrane, which embraces it. The ftalk is terminated by an umbel of white flowers which appear in June, and the feeds ripen the beginning of Auguft.

The fecond fort grows naturally in Germany; this hath a perennial root. The leaves are long, and made up of eight or nine pair of winged lobes which are cut like thofe of Parfley; the ftalk rifes near two feet and a half high, branching out into feveral divifions; at each of thefe there is a membrane embracing the bafe, and one fmall leaf compofed of a few linear lobes. The ftalks are terminated by compound umbels of yellow flowers, which appear in June, and are fucceeded by feeds which ripen in autumn.

The third fort grows naturally in uncultivated places in the fouth of France and Italy; this has a perennial root which runs deep in the ground, fending out flender fmooth ftalks near two feet high. The leaves are long and narrow, compofed of feven or eight pair of wings, whofe lobes are fometimes fingle, and at others are divided into two parts; they have a membrane embracing their foot-ftalks, and are of a gray colour. The ftalks are terminated by umbels of flowers, which are purple on their outfide and white within; thefe appear in July and Auguft, and the feeds ripen in autumn.

The fourth fort grows naturally on the dry hills in many parts of France and Italy; this has a perennial root, from which come out leaves like thofe of Spignel, but the fegments are broader and of a gray colour. The ftalks rife a foot high, and are garnifhed with a few very narrow leaves, whofe foot-ftalks are embraced by a long entire membrane; they branch out on every fide, and thefe are terminated by umbels of white flowers which appear in July, and are fucceeded by feeds which ripen in autumn.

The fifth fort grows naturally in the fouth of France, Italy, and Spain; this has a thick ligneous root, from which come out ftiff ftalks near four feet high, which are crooked at their joints, and garnifhed with narrow leaves coming out in bunches. The ftalks divide into flender branches, which have fmall umbels of flowers coming out of their fides, and are terminated by larger. The flowers are fmall, yellow, appear in July, and are fucceeded by feeds which ripen in autumn.

The fixth fort is an annual plant, which grows naturally in Portugal. The leaves of this fort are like thofe of Spignel, but are much fmaller, and have a very acrid biting tafte. The ftalks rife four inches high, and fuftain a fmall umbel of flowers which appear in July; and, if the feafon is warm, the feeds will ripen in autumn.

Thefe plants are preferved in the gardens of botanifts for the fake of variety, but at prefent their virtues are unknown; and as they have little beauty to recommend them, they are rarely admitted into other gardens.

Thefe may be propagated by fowing their feeds, which is beft done in autumn, for when the feeds are fown in the fpring, they frequently lie in the ground till the next year before the plants will appear; whereas thofe which are fown in autumn, always rife the following fpring. Thefe feeds fhould be fown in drills, about eighteen inches afunder, in a bed of frefh earth, where they are defigned to remain, and in the fpring when the plants come up, they fhould be thinned where they are too clofe, leaving them about fix inches diftance in the rows; after this the plants will require no farther care, but to keep them conftantly clear from weeds, and the fecond feafon they will produce feeds. The perennial forts, which are permitted to remain after they have feeded, fhould have the ground gently dug every fpring between the rows to loofen the earth, but there fhould be care taken not to injure their roots with the fpade. Thefe plants love a moift foil, for when they are fown on dry ground, they do not thrive near fo well, and feldom perfect their feeds, unlefs the feafon proves moift, or they are duly watered.

SHERARDIA. Dillen. Gen. Nov. 3. Lin. Gen. Plant. 112. Aparine. Tourn. Inft. R. H. 114. Little Field Madder.

The CHARACTERS are,

*The flower has a fmall, four-pointed, permanent empalement fitting upon the germen; it has one long tubulous petal, cut into four plain acute parts at the brim; it has four ftamina fituated on the top of the tube, terminated by fingle fummits, and an oblong twin germen below the flower, fupporting a flender bifid ftyle crowned by two headed ftigmas. The germen afterward becomes an oblong crowned fruit, containing two oblong feeds which are feparated.*

This

This genus of plants is ranged in the first section of Linnæus's fourth class, which includes those plants whose flowers have four stamina and one style. This title of the genus was given to it by Dr. Dillenius, in honour of the late Dr. William Sherard, whom Boerhaave calls the prince of botanists.

We have but one Species of this genus, viz.

Sherardia (*Arvensis*) foliis omnibus verticillatis, floribus terminalibus. Lin. Sp. Plant. 102. *Sherardia with all the leaves placed in whorls round the stalks, and flowers terminating them.* Aparine supina, pumila, flore cæruleo. Tourn. Inst. 114. *Low supine Clivers with a blue flower.*

It grows naturally amongst the Corn in many parts of England; it is an annual plant, with trailing stalks which spread on the ground, are sometimes a foot long, and garnished with short acute-pointed leaves growing in whorls, some of which have four, others five and six, and some have eight leaves in each whorl. From the side of the stalks come out the foot-stalks of the flowers, which sustain one whorl of leaves upon which the flowers sit very close; there are generally five or six flowers upon each whorl; they are blue, and have pretty long tubes, which are cut into four segments at the the top spreading open. These flowers appear in June, and their seeds ripen in autumn.

SHERARDIA. Vaill. See Verbena.

SIBBALDIA. Lin. Gen. 393. Bastard Cinquefoil.

The Characters are,

*The flower hath a permanent empalement of one leaf, cut half way into ten segments, and five oval petals inserted into it, and five hair-like stamina which are shorter than the corolla, joined to the empalement, terminated by small obtuse summits. It hath five oval short germen, with a style fastened to the middle, crowned by headed stigmas; the calyx incloses five oblong seeds.*

This genus of plants is ranged in the fifth section of Linnæus's fifth class, which includes such plants whose flowers have five stamina and five styles.

The Species are,

1. Sibbaldia (*Procumbens*) foliolis tridentatis. Flor. Lap. 111. *Trailing Bastard Cinquefoil.* Fragariæ sylvestris affinis planta, flore luteo. Sibb. Scot. 2. p. 25. *A plant near of kin to the Wild Strawberry.*
2. Sibbaldia (*Octopetala*) floribus octopetalis. *Bastard Cinquefoil with eight petals to the flower.*

The first sort has been known many years; this grows upon moist ground on the Highlands in Scotland, and is with difficulty preserved in gardens; it is a low plant, whose leaves end in three points; the flowers are small and yellow, but it rarely produces seeds in gardens, therefore the plants must be procured from the places where they naturally grow; and if they are planted in a moist soil and a shady situation, they will thrive tolerably well and produce flowers.

The second sort has been lately discovered in the west part of Scotland; this hath larger flowers than the first, and have eight petals to each.

This may be treated in the same manner as the other sort.

SIBTHORPIA. Lin. Gen. Plant. 775. Bastard Moneywort.

The Characters are,

*The flower hath a permanent empalement of one leaf, cut into five spreading segments; it hath one spreading petal divided into five equal parts, and four hair-like stamina, terminated by heart-shaped summits, with a roundish compressed germen, supporting a cylindrical style the length of the flower, crowned by a depressed stigma; the empalement becomes an orbicular compressed capsule opening with two valves, containing roundish convex seeds.*

This genus of plants is ranged in the second section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two short stamina, and the seeds are included in a capsule.

We have but one Species of this genus in England, viz.

Sibthorpia (*Europæa*) foliis reniformibus subpeltatis crenatis. Amœn. Acad. 3. p. 22. *Bastard Moneywort, with kidney-shaped crenated leaves.*

This plant grows naturally in moist places in Cornwall, Devonshire, and other parts of England, from whence the plants or seeds may be procured, which, if planted or sown in pots, and placed in the shade and kept moist, will thrive very well in gardens.

SICYOS. Lin. Gen. Plant. 971. Sicyoides. Tourn. Inst. 103. Single-seeded Cucumber.

The Characters are,

*It hath male and female flowers on the same plant; the male flowers have a bell-shaped empalement of one leaf, with five indentures. The petal is bell-shaped, of one leaf, growing on the empalement; they have each three stamina, which are united above, terminated by summits joined in a head. The female flowers are like the male, and sit upon the germen; they have no stamina, but the germen supports a cylindrical style crowned by a thick three-pointed stigma. The germen afterward becomes an oval fruit set with bristly hairs, having one cell, containing a single seed of the same shape.*

This genus of plants is ranged in the tenth section of Linnæus's twenty-first class, which includes those plants which have male and female flowers on the same plant, and their stamina are connected together. Tournefort places it in the seventh section of his first class, which contains the herbs with a bell-shaped flower of one petal, whose empalement turns to a fruit for the most part fleshy.

The Species are,

1. Sicyos (*Angulata*) foliis angulatis. Hort. Cliff. 452. *Sicyos with angular leaves.* Sicyoides Americana, fructu echinato, foliis angulatis. Tourn. Inst. 103. *American, prickly, one-seeded Cucumber with angular leaves.*
2. Sicyos (*Laciniata*) foliis laciniatis. Lin. Sp. Plant. 1013. *Sicyos with cut leaves.* Sicyoides Americana, fructu echinato, foliis laciniatis. Plum. Cat. 3. *American, prickly, one-seeded Cucumber with cut leaves.*

The first sort grows naturally in North America; this is an annual plant, which rises with two large seed-leaves like those of the Cucumber; the stalk is trailing, and has tendrils, by which it fastens itself to the neighbouring plants, and will rise fifteen or sixteen feet high, dividing into many branches, which are garnished with angular leaves like those of the Cucumber. The flowers come out upon long foot-stalks from the side of the branches, standing in clusters; they have male, which are barren flowers, and female fruitful flowers on the same plant, which are small, of a pale sulphur colour, and are succeeded by prickly oval fruit containing one seed; the flowers appear in June and July, and the seeds ripen in autumn. If these are permitted to scatter, the plants will come up in the spring better than when sown by hand, and require no other care but to keep them clean from weeds. These plants ramble, and take up too much room for small gardens, and therefore should be allowed a place near a hedge upon which they may climb; they do not bear transplanting well, unless when they first come up.

The second sort grows naturally in the West-Indies; this is also an annual plant, with trailing stalks like the former, but the leaves of this are cut into several segments. The flowers are larger than those of the former, and are of a deeper colour; the fruit are not quite so large, nor so closely armed with prickly hairs, in which consists their difference.

This sort is not so hardy as the first, therefore whoever has a mind to cultivate it, must sow the seeds upon a hot-bed in the spring, and treat the plants in the same way as Cucumbers and Melons, keeping them under frames, otherwise the seeds will not ripen in England; but the plants will require more room than either of the former, so that one or two plants will be enough for curiosity, as they have no great beauty or use.

SIDA. Lin. Gen. Plant. 747. Malvinda. Dillen. Hort. Elth. 171, 172. Indian Mallow.

The Characters are,

*The empalement of the flower is single, permanent, angular, and five-pointed. The flower is of one petal, cut into five broad segments which are joined at their base, and are*

*indented at their points; it has many stamina which are joined in a column at bottom, but spread open above, and are terminated by roundish summits, and an orbicular germen, supporting a short multifid style, crowned by headed stigmas. The germen afterward becomes a five-cornered capsule having five cells, each containing an angular roundish seed.*

This genus of plants is ranged in the third section of Linnæus's sixteenth class, which includes those plants whose flowers have their male and female organs joined in one body, and have many stamina. To this genus he joins the Abutilon of Tournefort, but as the fruit of that genus is composed of many capsules, and these have several seeds in each, that character is sufficient to separate the two genera, which may be the more necessary as there are many species of each.

The Species are,

1. Sida (*Ulmifolia*) foliis ovato-lanceolatis serratis, floribus solitariis axillaribus, semine rostrato bidente. *Indian Mallow with oval, spear-shaped, sawed leaves, single flowers on the side of the stalk, and seeds with two horns.* Malvinda ulmifolia semine rostrato bidente. Act. Phil. Lond. 399. *Indian Mallow with an Elm leaf, and seeds with two horns or teeth.*
2. Sida (*Carpinifolia*) caule ramoso hirsuto, foliis lanceolatis serratis floribus confertis axillaribus, semine rostrato simplici. *Sida with a branching hairy stalk, spear-shaped sawed leaves, flowers in clusters from the wings of the stalk, and seeds with a single horn or tooth.* Malva erecta minor, carpini folio, seminibus singulis simplici aculeo longiore donatis. Sloan. Cat. *Smaller upright Mallow with a Hornbeam leaf, and the seeds have a single longer horn.*
3. Sida (*Angustifolia*) caule erecto ramoso, foliis lineari-lanceolatis dentatis subtus villosis, pedunculis axillaribus unifloris. *Sida with an erect branching stalk, linear spear-shaped leaves, hairy on their under side, and foot-stalks with one flower at the wings of the stalks.* Malvinda pimpinellæ folio angustiore semine bidente. Act. Phil. Lond. vol. 35. *Indian Mallow with a narrow Burnet leaf, and seeds with two horns.*
4. Sida (*Pimpinellifolia*) foliis cordatis serratis, pedunculis unifloris axillaribus, semine rostrato bidente. *Sida with heart-shaped sawed leaves, foot-stalks with one flower from the wings of the stalk, and seeds with two horns.* Malvinda pimpinellæ majoris folio, semine bidente. Act. Phil. Lond. 399. *Indian Mallow with a greater Burnet leaf, and seeds with two teeth.*
5. Sida (*Jamaicensis*) foliis ovato-lanceolatis serratis, floribus axillaribus sessilibus, semine tridente. *Sida with oval spear-shaped leaves which are sawed, flowers sitting close at the wings of the stalks, and seeds with three teeth.* Malvinda profundius serrato folio, semine tridente. Act. Phil. Lond. 399. *Indian Mallow with leaves deeply sawed, and seeds with three teeth.*
6. Sida (*Villosa*) caule erecto hirsuto, foliis subcordatis sessilibus serratis subvillosis, floribus confertis axillaribus sessilibus. *Sida with a hairy stalk, leaves almost heart-shaped sitting close to the stalk, which are a little woolly, and flowers in clusters sitting close to the stalk.* Malvinda carpini folio villoso, floribus conglobatis ad foliorum alas. Houst. MSS. *Indian Mallow with a Hornbeam leaf, and clustered flowers at the wings of the leaves.*
7. Sida (*Alnifolia*) foliis orbiculatis plicatis serratis. Hort. Cliff. 346. *Sida with orbicular plaited leaves which are sawed.* Malvinda stellata alnifolia. Hort. Elth. 172. *Starry Indian Mallow with an Alder leaf.*
8. Sida (*Cordifolia*) foliis cordatis subangulatis serratis villosis. Lin. Sp. Plant. 684. *Sida with heart-shaped leaves almost angular, which are woolly and saved.* Malvinda bicornis, ballotes folio molli. Hort. Elth. 211. *Indian Mallow with two horns, and a soft black Horehound leaf.*
9. Sida (*Hirsuta*) foliis orbiculato-cordatis crenatis, caule petiolisque hirsutis, pedunculis longis axillaribus unifloris. *Sida with orbicular, heart-shaped, crenated leaves, the stalks and foot-stalks of the leaves hairy, and long foot-stalks from the wings of the stalk with one flower.*
10. Sida (*Capitata*) capitulis pedunculatis triphyllis septemfloris. Lin. Act. Upsal. 1743. p. 137. *Sida with heads on foot-stalks which have three leaves and seven flowers.* Malva aspera major aquatica, ex hortensium seu rosarum genere, flore minore luteo, semine aculeato. Sloan. Cat. Jam. 96. *Greater, aquatic, rough Mallow of the garden, or Rose Mallow Kind, with small yellow flowers and prickly seeds.*
11. Sida (*Hirsutissima*) foliis lanceolatis serratis villosis, caule erecto piloso, pedunculis axillaribus unifloris. *Sida with spear-shaped, woolly, sawed leaves, an erect hairy stalk, and foot-stalks from the wings of the stalk with one flower.* Malvinda hirsutissima carpini folio longiore floribus singulis ad foliorum alas, semine bidente. Houst. MSS. *Indian Mallow very hairy, with a longer Hornbeam leaf, and single flowers at the wings of the leaves, and seeds with two teeth.*
12. Sida (*Abutifolia*) foliis cordatis crenatis acuminatis villosis caule petiolisque pilosis, pedunculis axillaribus unifloris. *Sida with heart-shaped, pointed, crenated, woolly leaves, and the stalks and foot-stalks hairy, and foot-stalks with one flower at the wings of the stalk.* Malvinda abutili folio minore, caulibus hirsutissimis, floribus ad foliorum alas. Houst. MSS. *Indian Mallow with a smaller yellow Mallow leaf, very hairy stalks, and flowers proceeding from the wings of the leaves.*
13. Sida (*Ciliaris*) caulibus procumbentibus, foliis oblongo-ovatis serratis hirsutis, floribus sessilibus terminalibus. *Sida with trailing stalks, oblong, oval, hairy, sawed leaves, and flowers sitting close at the end of the branches.* Malva minor supina, betonicæ folio, flore coccineo seminibus asperis. Sloan. Cat. Jam. 97. *Smaller supine Mallow with a Betony leaf, a scarlet flower, and rough seeds.*
14. Sida (*Glabra*) foliis cordatis serratis acuminatis glabris, caule ramoso, pedunculis axillaribus unifloris. *Sida with heart-shaped, sawed, acute-pointed, smooth leaves, a branching stalk, and foot-stalks from the wings of the stalks with one flower.* Malvinda abutili folio acuminato, floribus parvis luteis, ex alis foliorum, semine bidente. Houst. MSS. *Indian Mallow with a pointed, yellow, Mallow leaf, and small yellow flowers at the wings of the leaves, and seeds with two teeth.*
15. Sida (*Sericea*) caulibus procumbentibus, foliis ovatis serratis tomentosis nitidis, floribus solitariis axillaribus sessilibus. *Sida with trailing stalks, oval, sawed, neat, woolly leaves, and single flowers sitting close to the wings of the stalk.* Malvinda supina, foliis subrotundis sericeis, seminibus non dentatis. Houst. MSS. *Supine Indian Mallow, with roundish satten leaves, and the seeds without teeth.*
16. Sida (*Americana*) foliis subcordatis crenatis subtus tomentosis, floribus aggregatis axillaribus sessilibus. *Sida with almost heart-shaped leaves, which are crenated and woolly on their under side, and flowers in clusters sitting close at the wings of the stalk.* Malva Americana abutili folio, floribus conglobatis ad foliorum alas. Houst. MSS. *Indian Mallow with a yellow Mallow leaf, and flowers in clusters at the wings of the leaves.*
17. Sida (*Pilosa*) foliis subovatis serratis nervosis subtus tomentosis, caule piloso, pedunculis axillaribus multifloris. *Sida with veined sawed leaves almost oval, and woolly on their under side, a hairy stalk, and foot-stalks with many flowers at the wings of the stalks.* Malvinda carpini folio, flore luteo caule & aversa foliorum parte villoso. Houst. MSS. *Indian Mallow with a Hornbeam leaf, and a yellow flower whose stalk and the under part of the leaf are hairy.*
18. Sida (*Fruticosa*) foliis lanceolatis inæqualiter serratis acuminatis, floribus capitatis terminalibus, caule fruticoso. *Sida with spear-shaped acute-pointed leaves unequally sawed, flowers collected in heads at the end of the branches, and a shrubby stalk.* Malvinda frutescens ulmifolia, seminibus singulis tribus aculeis lappaceis armatis Houst. MSS. *Indian Mallow with an Elm leaf, and single seeds armed with three burry prickles.*

19. SIDA (*Alba*) foliis cordatis acuminatis ferratis nervosis, floribus aggregatis axillaribus sessilibus. *Sida with acute-pointed, heart-shaped, sawed, veined leaves, and flowers in clusters sitting close to the wings of the stalk.* Malvinda foliis subrotundis acuminatis, floribus albis conglomeratis ad foliorum alas. Houst. MSS. *Indian Mallow with roundish acute-pointed leaves, and white flowers in clusters at the wings of the leaves.*

These plants grow naturally in the West-Indies, from whence I have received the seeds of three or four species by the title of Broom Weed; and I have been informed that the inhabitants cut these plants in the same manner as we do Heath, and make it up into brooms for sweeping. Sometimes I have received the seeds by the title of West-India Thea, so that I suppose the leaves of these plants are sometimes used as the Thea. There are certainly more species of this genus than are here mentioned, which have escaped the notice of those who have been in the West-Indies in search for plants, for we frequently have new sorts come up in the earth which is brought from thence with other plants. Those here enumerated are undoubtedly distinct species, for I have cultivated them several years, and have never observed either of them change, when raised from seeds.

The first sort grows as far north as Virginia, from whence I have several times received the seeds; this grows with an upright branching stalk three or four feet high, garnished with oval spear-shaped leaves, about two inches long and one broad, sawed on their edges, and sit close to the branches. The flowers come out singly from the wings of the stalks, standing upon very short foot-stalks; they have a single empalement, cut into five obtuse segments, and are small, of a pale copper colour, and of one petal, which is cut into five parts almost to the bottom, where they are joined. In the center arises a small column composed of the several stamina and style which are connected together at bottom, but are separated above. When the flowers decay, the germen turns to a capsule with five cells inclosed by the empalement; in each cell is contained one angular seed, gibbous on one side, having two horns or teeth at the point. This plant flowers till the frost stops it, and the seeds ripen in autumn.

The second has hairy branching stalks which rise near three feet high. The branches of this come out from the bottom almost to the top, and form a pyramidal bush; the leaves are longer and narrower, the saw on the edges deeper, of a brighter green than those of the former, and stand upon short foot-stalks; the flowers come out at the foot-stalks of every leaf; they are single toward the bottom of the stalk, but upward they are in clusters; the empalement of the flower is in five angles, each being terminated by a bristly hair; the flowers are of a pale sulphur colour, and the seeds have but one horn or tooth. It flowers at the same time with the former.

The third sort rises with a slender ligneous stalk about two feet high, sending out many erect branches, which are garnished with narrow spear-shaped leaves an inch and a half long, and a third broad in the middle; they are indented on their edges, and end in acute points, having pretty long slender foot-stalks. The flowers come out singly from the wings of the stalks; they are small, of a pale yellow colour, and appear at the same time with the former.

The fourth sort has very slender stalks, which seldom rise much more than a foot high, sending out a few slender branches, garnished with small heart-shaped leaves which are sawed on their edges, and are a little hoary on their under side, standing upon pretty long foot-stalks. The flowers are small, of a pale yellowish colour, and come out singly from the wings of the stalk; these are succeeded by seeds having two teeth. It flowers at the same time with the former.

The fifth sort has a hairy stalk covered with a dark brown bark, and rises three feet high, sending out many branches from the side, which are garnished with oval spear-shaped leaves standing upon long foot-stalks; they are more than two inches long, and one and a quarter broad, ending in an obtuse point, and are deeply sawed on their edges. The flowers come out by pairs at the foot-stalk of each leaf, sitting close to the stalk; they are larger than those of the former sorts, and of a deeper yellow colour; the seeds of this are larger, and have three teeth.

The sixth sort rises with a ligneous hairy stalk between three and four feet high, sending out a few slender branches toward the top. The leaves are a little woolly, and sit close to the stalk; they are near two inches long, and one broad near their base, being almost heart-shaped; they are veined, and sawed on their edges. The flowers come out in clusters on the side of the branches, to which they sit very close; they have hairy empalements, cut into acute segments at the top; they are small, of a pale yellow colour, and appear at the same time with the former, and the seeds have two teeth.

The seventh sort has a slender ligneous stalk which rises more than two feet high, sending out several slender branches garnished with roundish leaves having long foot-stalks, and are a little hairy on their under side. The flowers come out at the foot-stalks of the leaves, sometimes singly, and at others there are two or three upon slender foot-stalks; they are of a pale copper colour, and appear at the same time with the former.

The eighth sort rises with an herbaceous stalk more than three feet high, sending out several erect branches from the sides, which are garnished with heart-shaped leaves two inches and a half long, and two broad; they are sawed on their edges, are of a light green colour, soft to the touch, and stand upon very long foot-stalks which are hairy. The flowers stand upon long foot-stalks which come out from the wings of the stalk; they are small, of a sulphur colour, and appear at the same time with the former.

The ninth sort has very slender stiff stalks, which are covered with fine hairs, and rise a foot and a half high, sending out a few side branches, which are garnished with roundish heart-shaped leaves two inches long, and one inch and three quarters broad at the base; they are thin, of a light green colour, crenated on their edges, and stand upon long, slender, hairy foot-stalks. The flowers come out upon long foot-stalks from the wings of the stalks singly; their empalements terminate with ten stiff acute points or hairs; the flowers are small and white, appearing at the same time with the former.

The tenth sort rises with an herbaceous prickly stalk near four feet high, sending out several branches, which are garnished with rough hairy leaves standing upon long foot-stalks. These are of different forms, some are divided into five obtuse lobes, others into three, some are hollowed on the sides in shape of a fiddle; they are indented on their edges, and are of a pale green colour. The flowers are collected in heads, which stand upon very long hairy foot-stalks arising from the wings of the stalks. Under each head are placed three obtuse small leaves, upon which rest seven pale yellow flowers which are small, and are almost hid by their empalements; these are succeeded by seeds having acute spines. This flowers at the same time as the former.

The eleventh sort rises with a ligneous stalk three feet high, which is covered with yellowish hairs very closely garnished with spear-shaped hairy leaves sitting close to the stalks; they are two inches long, and one broad in the middle, sawed on their edges and of a pale green on their under side. The flowers come out singly from the wings of the stalk, standing upon short foot-stalks; they are small, white, and appear about the same time with the former.

The twelfth sort rises with very slender infirm stalks three feet high, covered with long white hairs, and garnished with soft, woolly, heart-shaped leaves, sitting upon long, slender, hairy foot-stalks. The

leaves are little more than one inch long, and three quarters broad at their baſe, and are crenated on their edges. The flowers ſtand upon long ſlender foot-ſtalks which ariſe from the wings of the ſtalk, two of them generally coming out at each leaf; they are of a pale yellow colour, and appear at the ſame time with the former.

The thirteenth ſort has many trailing ſtalks, which divide into ſlender branches, covered with a light brown bark, and garniſhed with ſmall, oblong, oval leaves ſawed on their edges, and hairy on their under ſide, ſtanding upon ſhort foot-ſtalks. The flowers are produced in ſmall cluſters ſitting cloſe at the end of the branches; they are ſmall, of a bright ſcarlet colour, and are ſucceeded by ſeeds having two ſtiff briſtly teeth. This flowers about the ſame time as the former.

The fourteenth ſort hath ſmooth round ſtalks which riſe three feet high, ſending out long ſlender branches. The leaves are ſmooth, heart-ſhaped, of a light green colour, and ſtand upon long foot-ſtalks; the lower leaves are near three inches long, and almoſt two broad at their baſe, ſawed on their edges, and ending in acute points. The flowers ſtand upon very long foot-ſtalks, ariſing from the wings of the ſtalks ſingly; they are ſmall, and of a whitiſh yellow colour, appearing at the ſame time with the former.

The fifteenth ſort ſends out ſeveral ſtalks from the root, which ſpread flat on the ground, ſending out ſeveral ſhort ſide branches; the ſtalks grow nine or ten inches long, and are garniſhed with oval ſatteny leaves ſawed on their edges, and have ſhort foot-ſtalks; the flowers come out ſingly at the wings of the ſtalks, ſitting very cloſe thereto; they are ſmall, of a yellow colour, and appear at the ſame time with the former, and are ſucceeded by ſeeds which have no teeth.

The ſixteenth ſort has a ligneous ſtalk with a purpliſh bark, riſing two feet high, ſending out ſeveral branches from the lower part. The leaves are pretty thick, and almoſt heart-ſhaped, ending with obtuſe points; they are crenated on their edges, and woolly on their under ſide; they are an inch and a half long, and three quarters broad near their baſe, ſtanding upon pretty long foot-ſtalks, and have many veins which ariſe from the midrib, and diverge to the borders. The flowers are of a pale yellow colour, and are gathered in cluſters ſitting cloſe at the wings of the ſtalk; their empalements are hairy, and cut into many acute ſegments at the top. This flowers at the ſame time with the former, and the ſeeds have two teeth at their points.

The ſeventeenth ſort has a ligneous ſtalk which riſes four feet high, covered over with brown hairs, ſending out a few long ſlender branches, the lower parts of which are garniſhed with oval leaves an inch and a half long, and three quarters broad; they are ſlightly ſawed on their edges, have many longitudinal veins, and are downy on their under ſide. The upper part of the branches are deſtitute of leaves more than a foot in length, and from their ſides come out foot-ſtalks two inches long, ſuſtaining ſeveral ſmall yellow flowers in cluſters, having hairy empalements, which are cut at the top into ſeveral acute ſegments. This ſort flowers at the ſame time with the former.

The eighteenth ſort was diſcovered by the late Dr. William Houſtoun, growing naturally at La Vera Cruz in New Spain; this riſes with a ſtrong ſhrubby ſtalk ſix or ſeven feet high, covered with a rough brown bark, and ſends out ſeveral ligneous branches from the ſide, which are hairy, and garniſhed with ſpear-ſhaped leaves ſtanding upon long foot-ſtalks; they are ſix inches long, and two broad in the middle, ending in acute points, and are unequally ſawed on their edges, ſome of the indentures being large and deep, others are ſmall and ſhallow, and do not extend ſo far from the border. The upper ſurface of the leaves are of a dark green, and their under is of a pale or light green colour. The flowers are collected in heads, ſtanding upon long naked foot-ſtalks which terminate the branches; each of theſe heads contain ſeven or eight flowers, whoſe petals extend much beyond their empalements. The flowers are of a pale ſulphur colour when they firſt open, but afterward fade to an almoſt white; their empalements are ſmooth, but are terminated by five hairy points which ſtand erect. The flowers being paſt, the germen ſwells to a ſhort roundiſh capſule ſitting in the empalement of the flower, having five cells, each containing one angular ſeed, having three ſharp teeth which are burry, and ſtick to the clothes of thoſe who rub againſt them when ripe.

The nineteenth ſort was diſcovered by the late Dr. Houſtoun, growing naturally in Jamaica; this riſes with a ſhrubby ſtalk ſeven or eight feet high, ſending out ſeveral very ſlender branches, extending to two feet or more in length, and bending downward at their ends; they are garniſhed at each joint (which are two inches aſunder) by one large heart-ſhaped leaf, ſtanding upon a pretty long foot-ſtalk; they are above four inches long, and two inches and a half broad near their baſe, ſawed on their edges, and run out to a long ſharp point, having many ſtrong veins which riſe from the midrib, and diverge toward their borders; they are of a light green on their upper ſurface, and pale on their under. The flowers grow in cluſters at the wings of the ſtalks; thoſe on the lower part of the branches are formed in cloſe obtuſe ſpikes about an inch in length, but on the upper part of the branches they are in globular heads which are placed nearer together, and have no leaves under them, the branches being terminated by one of theſe heads. The empalements of the flowers end with five acute hairy points; the flowers are ſmall, and when they firſt open are white, but afterward they fade to a browniſh colour. When theſe are paſt, the germen becomes a roundiſh capſule with five cells, ſitting in the empalement of the flower, each cell having one angular ſeed with two teeth.

Theſe plants are moſt of them annual in England, but ſome of them are of longer duration in their native countries, and might be ſo here, if they were placed in a warm ſtove in winter; but as moſt of them perfect their ſeeds the ſame year, if the plants are brought forward in the ſpring, few perſons have room in their ſtoves to receive theſe plants, as there are ſo many perennial exotic plants at preſent in the Engliſh gardens, which require a warm ſtove to preſerve them.

They are propagated by ſeeds, which ſhould be ſown upon a moderate hot-bed the beginning of April, and when the plants are come up fit to remove, they ſhould be tranſplanted to another hot-bed, planting them four inches diſtance every way; they muſt be ſhaded from the ſun till they have taken new root, and then they muſt have a large ſhare of free air admitted to them when the weather is mild, to prevent their drawing up weak; they will alſo require water pretty frequently. If the plants thrive well, they will have ſtrength enough to be fit to tranſplant in the open air; for which purpoſe they ſhould be gradually hardened, and the beginning of June they may be taken up with balls of earth to their roots, and planted in a warm ſheltered part of the garden, at about three feet diſtance, obſerving to ſhade and water them until they have taken new root; after which they will require no other care but to keep them clean from weeds. In July the plants will begin to flower, and there will be a continued ſucceſſion of flowers until the froſt comes on. If the ſeaſon proves warm, they will ripen their ſeeds very well in autumn; but leſt theſe ſhould miſcarry by the unfavourableneſs of the ſeaſon, it may be proper to put one plant of each ſort in pots filled with light kitchen-garden earth, placing them in the ſhade till they have taken new root, and then they may be removed to a warm ſituation, where they will thrive very well in a good ſeaſon; but if the ſummer proves cold, they ſhould be placed in a dry airy glaſs-caſe, where they may be kept warm, which will ripen their ſeeds.

The eighteenth ſpecies will not flower the firſt year, ſo the plants muſt be placed in a warm ſtove in autumn, and during the winter they muſt be treated in the ſame way as other tender plants from the ſame country. The following ſummer they will flower and produce ripe ſeeds, but the plants are not of long duration, ſo that there ſhould be a ſucceſſion of young plants raiſed from ſeeds.

SIDERATION, a blaſting of trees or plants by an eaſterly wind, of exceſſive heat or drought.

SIDERITIS. Tourn. Inſt. R. H. 191. tab. 90. Lin. Gen. Plant. 632. [of Σίδηρος, iron, q. Iron-herb; ſo Dioſcorides calls thoſe herbs, that are good againſt wounds made by the ſword. It is alſo called Ferrum matrix, on the ſame account; alſo Herba Judaica, becauſe the Jews in old time made uſe of this herb in medicine.] Ironwort; in French, *Crapaudine.*

The Characters are,

*The flower has an oblong tubulous empalement of one leaf, cut into five ſegments at the top. The flower is of the lip kind, of one petal, almoſt equal; the tube is oblong and cylindrical, the chaps oblong and taper. The upper lip is erect, and cut into two acute ſegments, the under lip is cut into three; the two ſide ſegments are acute, the middle is round and crenated. It has four ſtamina within the tube, two of which are as long as the tube, the other are ſhorter, terminated by twin ſummits; and a four-pointed germen ſupporting a ſlender ſtyle a little longer than the ſtamina, crowned by two ſtigmas, the upper being cylindrical, concave, and torn, the lower is ſhort and membranaceous. The germen afterward turn to four ſeeds, which ripen in the empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourteenth claſs, which contains thoſe plants whoſe flowers have two long and two ſhorter ſtamina, and the ſeeds are naked in the empalement.

The Species are,

1. Sideritis (*Hirſuta*) foliis lanceolatis obtuſis dentatis piloſis, bracteis dentato-ſpinoſis, caule hirto, ſpicis interruptis elongatis. Lin. Sp. Plant. 803. *Ironwort with ſpear-ſhaped, obtuſe, hairy, indented leaves, a hairy ſtalk, and long interrupted ſpikes of flowers.* Sideritis hirſuta procumbens. C. B. P. 233. *Hairy trailing Ironwort.*
2. Sideritis (*Romana*) herbacea ebracteata, caulibus ſpinoſis, lacinia ſuperiore majore ovata. Lin. Sp. Plant. 802. *Herbaceous Ironwort with prickly empalements, the upper ſegment being oval and larger than the other.* Sideritis verticillis ſpinoſis, minor procumbens. Mor. Hiſt. 3. p. 388. *Smaller trailing Ironwort with prickly whorls.*
3. Sideritis (*Perfoliata*) herbacea hiſpido-piloſa, foliis ſuperioribus amplexicaulibus. Lin. Sp. Plant. 802. *Hairy, ſtinging, herbaceous Ironwort, whoſe upper leaves embrace the ſtalks.* Sideritis Orientalis, phlomidis folio. Tourn. Cor. 12. *Eaſtern Ironwort with a Jeruſalem Sage leaf.*
4. Sideritis (*Olææfolia*) tomentoſa, foliis lineari-lanceolatis ſeſſilibus, calycibus ſpinoſis. *Woolly Ironwort with narrow ſpear-ſhaped leaves ſitting cloſe to the ſtalks, and prickly empalements to the flowers.* Sideritis incana, oleæ folio. Bocc. Muſ. *Hairy Ironwort with an Olive leaf.*
5. Sideritis (*Scordioides*) foliis lanceolatis acutis dentatis, bracteis ovatis dentato-ſpinoſis, calycibus æqualibus, ſpicis ovatis. Lin. Sp. Plant. 803. *Ironwort with ſpear-ſhaped, acute, indented leaves, oval prickly bractea, equal empalements, and oval ſpikes of flowers.* Sideritis foliis hirſutis profundè crenatis. C. B. P. 233. *Ironwort with hairy leaves deeply crenated.*
6. Sideritis (*Syriaca*) fruticoſa tomentoſo-lanata, foliis lanceolatis integerrimis floribus verticillatis. Lin. Sp. Plant. 801. *Shrubby, downy, woolly Ironwort, with ſpear-ſhaped entire leaves, and flowers in whorls.* Sideritis Cretica tomentoſa candidiſſima, flore luteo. Tourn. Cor. 12. *The whiteſt downy Ironwort of Candia.*
7. Sideritis (*Hiſpanica*) fruticoſa, foliis lanceolatis integerrimis, floribus ſpicatis terminalibus, calycibus ſpinoſis. *Shrubby Ironwort with ſpear-ſhaped entire leaves, and ſpiked flowers terminating the ſtalks, having prickly empalements.* Sideritis Hiſpanica fruteſcens ſeu lignoſior. Tourn. Inſt. 192. *Shrubby, or ligneous Spaniſh Ironwort.*
8. Sideritis (*Hyſſopifolia*) foliis lanceolatis glabris integerrimis, bracteis cordatis dentato-ſpinoſis, calycibus æqualibus. Lin. Sp. Plant. 575. *Ironwort with ſmooth, entire, ſpear-ſhaped leaves, heart-ſhaped, prickly, indented bractea, and equal empalements.* Sideritis Alpina hyſſopifolia. C. B. P. 233. *Alpine Ironwort with a Hyſſop leaf.*
9. Sideritis (*Canarienſis*) fruticoſa tomentoſa, foliis cordato-oblongis acutis petiolatis ſpicis verticillatis. Lin. Sp. Plant. 574. *Shrubby woolly Ironwort with heart-ſhaped oblong leaves, and the flowers growing in whorls.* Stachys Canarienſis, fruteſcens, verbaſci folio. Tourn. Inſt. 186. *Shrubby Baſe Horehound of the Canaries, with a Moth Mullein leaf.*

The firſt ſort grows naturally in France, Spain, and Italy; the root is perennial, the ſtalks are herbaceous, hairy, and trail upon the ground; they are a foot and a half long, ſending out branches at the bottom, which are garniſhed with oblong, oval, hairy, crenated leaves; the upper part of the ſtalk is furniſhed with whorls of purple flowers, theſe ſtand pretty far aſunder. The flowers appear in ſummer, and the ſeeds ripen in autumn. It is a plant of no great beauty or uſe, ſo is ſeldom kept in gardens.

The ſecond ſort is an annual plant with trailing ſtalks; the leaves are ſmall, ſpear-ſhaped, and ſit cloſe to the ſtalks; the whole plant is hairy. The flowers grow in whorled ſpikes at the end of the branches, they have prickly empalements and are yellow. It grows in all the ſouthern parts of Europe, and is ſeldom admitted into gardens.

The third ſort grows naturally in the Levant, where it was diſcovered by the late Dr. Tournefort. The roots of this ſort ſeldom continue longer than two years in England; the lower leaves are oblong, entire, and hairy; the ſtalks are ſmooth, hoary, and riſe near four feet high, branching out into ſeveral long ſlender branches, and garniſhed with hoary acute-pointed leaves, furniſhed with whitiſh flowers in whorls which are placed far aſunder; the whorls are ſmall, compact, and have two very ſhort leaves immediately under them, which end with a ſharp ſpine; the empalements of the flowers are prickly, and the flowers are ſmall. This flowers in July, and the ſeeds ripen in autumn.

The fourth ſort grows naturally in Crete; this is a low ſhrubby plant, whoſe ſtalks riſe a foot high, and are ligneous, ſending out branches a foot long, which are garniſhed with narrow ſpear-ſhaped leaves an inch and a half long, they are downy and very white; the upper part of the ſtalk is furniſhed with whorls of whitiſh yellow flowers, having prickly empalements. This ſort flowers in July, but unleſs the ſeaſon proves warm, the ſeeds will not ripen here.

The fifth ſort grows naturally in the ſouth of France and Italy; this hath a perennial root; the ſtalks riſe a foot high, and are garniſhed with ſpear-ſhaped leaves which are deeply crenated on their edges; they are an inch long and half an inch broad, and have ſhort heart-ſhaped bractea which are prickly. The flowers grow in whorled ſpikes at the end of the ſtalks; they are yellow, and have prickly empalements which are equal. It flowers in July, and if the ſeaſon proves warm, the ſeeds will ripen in autumn.

The ſixth ſort grows naturally in Crete; this hath a ſhort ligneous ſtalk, from which is ſent out a few branches about a foot long, garniſhed with thick wedge-ſhaped leaves which are very downy and white. The flowers are produced in whorls toward the end of the branches; they are yellow, and have ſmooth downy empalements. It flowers in July, but does not produce ſeeds in England.

The ſeventh ſort grows naturally in Spain and Italy; this hath a low ſhrubby ſtalk, ſending out ſeveral hairy branches a foot long, garniſhed with hairy ſpear-ſhaped leaves, one inch long and half an inch broad, of a yellowiſh green colour. The flowers grow in

close whorled spikes at the end of the branches; they are of a sulphur colour, and have very prickly empalements. This sort flowers in July, and the seeds ripen in autumn.

The eighth sort grows naturally on the mountains of Valentia; this hath a short ligneous stalk, sending out branches a foot and a half long, garnished with narrow smooth leaves an inch long, of a strong scent when bruised. The flowers are yellow, and grow in in large spiked whorls at the end of the branches. It flowers in June, and the seeds ripen in autumn.

The ninth sort grows naturally in the Canary Islands, but has been long an inhabitant in the English gardens. It rises with a soft shrubby stalk five or six feet high, sending out several ligneous branches which are covered with a soft down, and are garnished with heart-shaped leaves, having long foot-stalks. These differ greatly in size, according to the age and vigour of the plants; for in young plants they are often five or six inches long, and two and a half broad near their base, but in older plants they are not more than half that size; they are very woolly, especially on their under side, which is white, but their upper surface is of a dark yellowish green. The flowers grow in thick whorled spikes at the end of the branches; they are of a dirty white, shaped like those of the other sorts, and appear early in June, and the seeds ripen in August, but the plants frequently produce flowers again in autumn.

These plants are preserved in some curious gardens for the sake of variety. The five sorts first mentioned, and also the ninth, are hardy enough to thrive in the open air in England: they are propagated by seeds, which, if sown in autumn, will succeed better than those which are sown in the spring. The seeds may be sown in shallow drills upon a dry spot of ground, and in the spring when the plants come up, they must be kept clean from weeds; and when the plants are fit to remove, part of each sort may be drawn out, and planted in a bed at about nine or ten inches distance, which will give those which are left in the seed-bed room to grow. The plants which are removed should be shaded and watered until they have taken new root, after which they will require no other care but to keep them clean from weeds till the following autumn, when they should be transplanted to the places where they are to remain. The fourth sort should have a dry soil and a warm situation, but neither of the sorts should be planted in rich ground, for that will cause them to grow so luxuriant in summer, that the frost or much wet will destroy them in winter.

The annual sort should not be removed, but the plants thinned and left in the place where they were sown, keeping them clean from weeds.

The sixth and seventh sorts will often live through the winter in the open air, especially if their seeds are sown upon dry rubbish; for when either of these happen to grow in the joints of old walls, they will endure the greatest cold of this country, therefore their seeds should be sown in such places. The sixth sort does not produce good seeds in England, so this is propagated by slipping off the heads, planting them in a shady border during the spring or summer months, which will readily take root; some of these may then be taken up and put into pots, that they may be screened under a frame in winter. The other may be removed in autumn, and planted close to warm walls in rubbish, where they will abide some years.

The ninth sort is generally kept in green-houses in England, but in moderate winters I have had these plants live abroad without cover in a warm dry border: however, if they are screened from hard frost under a common frame, where they may be exposed to the open air at all times when the weather is mild, and protected from hard frosts, they will thrive better than with more tender treatment. It is propagated by seeds which should be sown in autumn, for those which are sown in the spring seldom succeed, or if they do, the plants rarely come up the first year.

SIDEROXYLUM, Iron Wood.

The Characters are,

*The empalement of the flower is permanent and consists of one leaf, which is cut into five segments. The flower is bell-shaped, and divided into five parts at the brim. It has five awl-shaped stamina the length of the petal, terminated by single summits, and a round germen supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes a roundish berry having one cell, containing four seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

The Species are,

1. Sideroxylum (*Inerme*) inerme. Lin. Hort. Cliff. 69. *Smooth Iron Wood.* Sideroxylum primum, sc. dein coriæ Indorum nomine data arbor. Hort. Elth. 357. *The first Iron Wood, called by the Indians Dein Coria.*
2. Sideroxylum (*Oppositifolia*) foliis lanceolatis ex adverso sitis. *Iron Wood with spear-shaped leaves growing opposite.*

These plants grow natutally at the Cape of Good Hope, from whence they were first brought into the Dutch gardens, and of late years they have been introduced into several curious gardens in England, where they are preserved for the beauty of their evergreen leaves, for they rarely produce flowers here.

The first sort hath large oval leaves, shaped somewhat like those of the Bay-tree, but smoother and blunter at the end. These are placed on the branches without order, as the branches also are produced. The stalks are shrubby, and rise five or six feet high, sending out many branches, covered with a dark brown bark.

The second sort grows more upright and regular; the leaves which are smaller, and more pointed than those of the first, are placed opposite on the branches, and these continue green through the year.

The wood of these trees being very close and solid, has given occasion for this name being applied to them, it being so heavy as to sink in water; and the title of Iron Wood having been applied to the wood, by the inhabitants of the countries where it grows, has occasioned the botanists to constitute a genus by this name. But as the characters of the plants have not been so well examined as could be wished, occasioned by their not flowering in Europe, it is very probable, that the plants which have been ranged under this genus, do not properly belong to it; for Dr. Plukenet has figured a plant under the title of Ebenus Jamaicensis, whose characters are very different from those assigned to this genus: and the Jamaica Iron Wood is totally different from both in its characters, for this has male and female flowers on different trees; the male flowers have no petals, as appears by dried samples in my collection.

These plants are natives of warm countries, so cannot be preserved in England, unless they are placed in a moderate stove. They are propagated by seeds, when these can be procured from abroad. These must be sown in pots filled with light rich earth, and plunged into a good hot-bed in the spring, in order to get the plants forward early in the season. When the plants are fit to transplant, they should be each put into a separate small pot filled with good earth, and plunged into a fresh hot-bed while they are young. In winter they must be plunged into the tan-bed in the stove, and treated in the same manner as hath been directed for several tender plants from the same countries. As the plants obtain strength, they may be treated more hardily, by placing them in a dry stove in the winter, and giving them a greater share of free air in summer; and when they have obtained strength, they may be placed abroad in summer in a sheltered situation.

I have propagated them by layers, but these were two years before they had made good roots; and some-

ſometimes they will take from cuttings, but this is a very uncertain method of propagating them; nor do the plants ſo raiſed, ever grow ſo vigorouſly as thoſe which come from ſeeds; ſo that when thoſe can be procured, it is the beſt method to propagate them.

SIGESBECKIA. Lin. Sp. Plant. 873.

The CHARACTERS are,

*The proper involucrum of the flower is compoſed of five linear, taper, obtuſe leaves, which open beyond the petal, and is permanent. The common cover is five-leaved, ſitting cloſe; it has five angles; the leaves are oval, concave, equal, and diſpoſed in ſeveral ſeries; it is permanent, and between each leaf is contained a floret. The flower is compoſed of hermaphrodite florets in the diſk, and the border or ray is made up of female half florets, which are tongue-ſhaped. The hermaphrodite florets are funnel-ſhaped, and cut into five parts at the brim; theſe have five ſhort ſtamina, with tubulous ſummits joined together, and an oblong incurved germen as large as the empalement, ſupporting a ſlender ſtyle, crowned by a bifid ſtigma. The germen afterward turns to an oblong, fourcornered, blunt ſeed; the female half florets have a ſhort, broad, tongue-ſhaped petal, indented in three parts; theſe have a germen, ſtyle, and ſtigma, like the hermaphrodite florets, but have no ſtamina, and are ſucceeded by ſingle ſeeds like the other.*

This genus of plants is ranged in the ſecond ſection of Linnæus's nineteenth claſs, which includes the plants whoſe flowers are compoſed of hermaphrodite and female florets which are both fruitful, and have their parts of generation connected together.

We have but one SPECIES of this genus, viz.

SIGESBECKIA (*Orientalis.*) Lin. Hort. Cliff. Sigeſbeckia. We have no Engliſh name for this plant; this here mentioned was applied to it by Dr. Linnæus, in honour of Dr. Sigeſbeck, who was profeſſor of botany at Peterſburgh.

The plant is annual, periſhing at the approach of winter. The ſeeds of it were brought from the East-Indies, where it is a troubleſome weed, but in England it ſeldom perfects ſeeds, unleſs the plants are raiſed on a hot-bed, and brought forward in the ſpring; then they may be planted out in warm borders the beginning of June, and if they are ſupplied with water in dry weather, they will grow near four feet high, and ſend out many branches. The flowers are produced at the extremity of the ſhoots, which are ſmall, and of a yellow colour, ſo make no great appearance, therefore it is only preſerved in the gardens of thoſe perſons who are curious in the ſtudy of plants.

SILAUM. See PEUCEDANUM.

SILENE. Lin. Gen. Plant. 503. Viſcago. Dill. Hort. Elth. 309. Lychnis. Tourn. Inſt. R. H. 333. tab. 175. Viſcous Campion, or Lychnis.

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, which is indented at the top into five parts. It has five plain obtuſe petals indented at their points, whoſe tails are narrow the length of the empalement, and a nectarium compounded of two ſmall indentures in the neck of each petal, conſtituting a crown to the chaps, and ten awl-ſhaped ſtamina, inſerted alternately to the tail of the petals abovee ach other, terminated by oblong ſummits. In the center is ſituated a cylindrical germen, ſupporting three ſtyles which are longer than the ſtamina, crowned by ſtigmas that are reflexed againſt the ſun. The germen afterward becomes a cloſe cylyndrical capſule with three cells, opening at the top five ways, incloſing many kidney-ſhaped ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's tenth claſs, which includes thoſe plants whoſe flowers have ten ſtamina and three ſtyles.

The SPECIES are,

1. SILENE (*Quinquevulnera*) petalis integerrimis ſubrotundis, fructibus erectis alternis. Hort. Cliff. 171. *Silene with entire roundiſh petals to the flower, and erect alternate fruit.* Lychnis hirſuta, flore eleganter variegato. Raii Hiſt. 997. *Hairy Campion with an elegant variegated flower, commonly called Dwarf Lychnis.*

2. SILENE (*Nocturna*) floribus ſpicatis alternis ſecundis ſeſſilibus, petalis bifidis. Lin. Sp. Plant. 416. *Silene with ſpikes of flowers ſitting cloſe and turned all one way, and the petals bifid.* Viſcago hirta noctiflora, floribus obſoletis ſpicatis. Dillen. Hort. Elth. 420. *Night-flowering, hairy, viſcous Campion, with worn-out flowers in ſpikes.*

3. SILENE (*Nutans*) petalis bifidis, floribus lateralibus ſecundis cernuis panicula nutante. Lin. Sp. Plant. 417. *Silene with bifid petals, nodding flowers growing from the ſide of the ſtalks, and a recurved panicle.* Lychnis montana, viſcoſa, alba, latifolia. C. B. P. 205. *Broad-leaved, white, viſcous, Mountain Campion.*

4. SILENE (*Fruticoſa*) petalis bifidis, caule fruticoſo, foliis lato lanceolatis, panicula trichotoma. Lin. Sp. Plant. 417. *Silene with bifid petals, a ſhrubby ſtalk, broad ſpear-ſhaped leaves, and panicles divided in threes.* Lychnis fruteſcens, myrtifolia, behen albo ſimilis. C. B. P. 205. *Shrubby Campion, with a Myrtle leaf like the white Behen.*

5. SILENE (*Viridiflora*) petalis ſemibifidis, foliis ovatis ſcabriuſculis acutis, panicula elongata ſubaphylla. Lin. Sp. 597. *Silene with bifid petals, oval, rough, acute-pointed leaves, and long panicles without leaves.* Lychnis ocymaſti facie, flore viridi. Herm. Par. 199. *Campion with the appearance of Ocymaſtrum, and a green flower.*

6. SILENE (*Conoidea*) calycibus fructus globoſis acuminatis ſtriis triginta, foliis glabris petalis integris. Hort. Upſal. 110. *Silene with globular acute-pointed capſules having thirty ſtripes, ſmooth leaves, and entire petals.* Lychnis ſylveſtris, latifolia caliculis turgidis ſtriatis. C. B. P. 205. *Broad-leaved wild Campion, with a turgid ſtriped empalement.*

7. SILENE (*Pendula*) calycibus fructiferis pendulis inflatis, angulis decem ſcabris. Hort. Upſal. 106. *Silene with pendulous ſwollen empalements to the fruit, with ten rough angles.* Lychnis ſupina Sicula, calyce ampliſſimo ſtriato. Tourn. Inſt. R. H. 337. *Low Sicilian Campion, with a large ſtriped empalement.*

8. SILENE (*Noctiflora*) calycibus decem angularibus, dentibus tubum æquantibus caule dichotomo. Lin. Sp. Plant. 419. *Silene with empalements having ten angles, and the indentures as long as the tube.* Lychnis noctiflora. C. B. P. 205. *Night-flowering Campion.*

9. SILENE (*Valleſia*) caulibus ſubunifloris decumbentibus, foliis lanceolatis longitudine calycis. Lin. Sp. 603. *Silene with decumbent ſtalks with one flower, and ſpear-ſhaped woolly leaves the length of the empalement.* Lychnis maritima pinguis e Corſica. Bocc. Muſ. tab. 84. *Maritime Lychnis of Corſica.*

10. SILENE (*Orientalis*) calycibus conicis ſtriis hirſutis fructibus erectioribus, caule erecto hirſuto, foliis nervoſis. *Silene with conical empalements having hairy ſtripes, erect fruit, a hairy upright ſtalk, and veined leaves.* Lychnis Orientalis, longifolia nervoſa, flore purpuraſcente. Tourn. Cor. 24. *Eaſtern Campion with a long veined leaf and a purpliſh flower.*

11. SILENE (*Muſcipula*) petalis bifidis, caule dichotomo, floribus axillaribus ſeſſilibus, foliis glabris. Lin. Sp. Plant. 420. *Silene with bifid petals, a ſtalk divided by pairs, flowers ſitting cloſe to the wings of the ſtalk, and ſmooth leaves.* Lychnis ſylveſtris viſcoſa, rubra altera. C. B. P. 205. *Wild viſcous Campion with a red flower.*

12. SILENE (*Armeria*) floribus faſciculatis faſtigiatis, foliis ſuperioribus cordatis glabris. Hort. Upſal. 110. *Silene with flowers gathered into bunches, whoſe upper leaves are ſmooth and heart-ſhaped.* Lychnis viſcoſa purpurea, latifolia lævis. C. B. P. 205. *Purple viſcous Campion with a broad ſmooth leaf, commonly called Lobel's Catchfly.*

13. SILENE (*Gigantea*) foliis radicalibus cochleariformibus ſimis caule ſubverticillato. Lin. Sp. 598. *Silene with obtuſe, ſpoon-ſhaped, lower leaves, and whorled ſtalks.* Lychnis facie auriculæ urſi. C. B. P. 206. *Campion with the appearance of Auricula.*

14. SILENE (*Bupleuroides*) petalis bifidis, floribus pedunculatis oppoſitis bractea brevioribus, foliis lanceolatis acutis glabris. Lin. Sp. 598. *Silene with bifid petals, flowers placed oppoſite on foot-ſtalks, and ſmooth*

 *acute*

*acute leaves.* Lychnis Orientalis bupleuri folio. Tourn. Cor. 24. *Eastern Campion with a Hare's-ear leaf.*

There are several other species of this genus whose flowers have no beauty, so the plants are never cultivated but in botanic gardens for the sake of variety, therefore I have not enumerated them, which would swell the work too much; many of them grow wild in England.

The first sort grows naturally in Portugal, but has been long cultivated in the English gardens by the title of Dwarf Lychnis. The seeds of this were formerly sown in drills on the edges of borders, as were several other low annual plants, these being very fashionable for edgings of borders at that time; but as all these were of short duration, so they soon were rejected for this purpose; after which the seeds were usually sown in patches in the borders, where they made a better appearance than in the former way: but in both these methods the plants were generally left so close as to spoil their growth, for their stalks were drawn up very weak, and had not room to branch out, and their flowers were small; therefore those who are desirous to have this plant in beauty, should sow the seeds thin upon a border of light earth in autumn, and in the spring the plants should be thinned to the distance of four inches, and keep them afterward clean from weeds. When they are so managed, the plants will rise near a foot and a half high, with hairy channelled stalks, and divide into many branches, garnished with oval, spear-shaped, hairy leaves placed opposite, sitting close to the stalks. The flowers grow in short spikes at the end of the branches; they are placed alternately, and are of a bright purple colour, edged with white. The autumnal plants will flower in May and June, but those which are sown in the spring, will come a month later.

The second sort grows naturally in Sicily, and also at the Cape of Good Hope, from whence I have received the seeds. This is an annual plant, with a low branching stalk, which seldom rises more than eight or nine inches high; the stalks are smooth, the leaves are very narrow and smooth, placed by pairs; the stalks are terminated by spikes of dark purple flowers standing alternate, whose petals are bifid; they open in the evening, but are closely shut in the day. If the seeds of this plant are sown in autumn, upon a warm border, the plants will flower in May and June, so good seeds may be obtained; but when the seeds are sown in the spring, they often fail; and if any of the plants do come up, they are generally so late as that their seeds seldom ripen well.

The third sort is a perennial plant which grows naturally on the Alps; the lower leaves of this are smooth and spear-shaped, the stalk rises near two feet high, and is garnished with two narrow leaves placed opposite at each joint, and immediately below them; the stalk is very clammy; the flowers come out on short foot-stalks from the wings of the leaves, each foot-stalk for the most part sustaining three flowers, with long, white, bifid petals. These appear in June, and the seeds ripen in August. This plant rises easily from seeds if they are sown in autumn, and the only culture the plants require is to keep them clean from weeds, and allow them room to spread; they love a cool soil and a shady situation.

The fourth sort grows naturally in Sicily; this has a low shrubby stalk, which divides into several short shrubby branches, garnished with broad, smooth, spear-shaped leaves, ending in acute points. The flower-stalks rise about a foot high, and divide into spreading panicles, sustaining two and three flowers, of an herbaceous white colour; they appear in June and July, and are succeeded by oval smooth capsules having thick covers, filled with small seeds which ripen in autumn. This sort rises easily from seeds as the former, or may be propagated by slips, which, if planted in a shady border will take root very freely; and if the plants are planted in a warm border of dry earth, they will live several years and require no shelter, but in moist ground they frequently rot in winter.

The fifth sort grows naturally in Portugal; this has a perennial root; the lower leaves are roundish and hollowed like a spoon; those upon the stalks are obtuse, and stand sometimes by pairs, at others by threes or fours round the stalks; they are of a deep green, smooth, and sit close to the stalks; the stalks are round, smooth, and rise from two to three feet high. The flowers grow in loose spikes at the top; they are of a green colour, and appear in June, and the seeds ripen in August. This rises easily from seeds sown in autumn, and if the plants have a dry soil they will continue several years, and require no other culture but to keep them clean from weeds.

The sixth sort grows naturally among Corn in France, Spain, and Italy. It is an annual plant, with an upright branching stalk a foot and a half high, having swelling viscous joints, garnished with narrow, acute-pointed, smooth leaves, near three inches long, sitting close to the stalks. The flowers are produced at the end of the branches, they are small and red; these are succeeded by globular capsules ending in acute points, whose empalements are striped. It flowers in June, and the seeds ripen in August. The seeds of this should be sown in autumn, and in the spring the plants should be thinned and kept clean from weeds, which is all the culture they require.

The seventh sort grows naturally in Sicily and Crete; this is an annual plant, from whose root comes out several branching stalks near a foot and a half long, which trail upon the ground, and are garnished with oval acute-pointed leaves placed opposite. The flowers come out singly from the wings of the stalk, upon short foot-stalks; they are large, and of a bright red colour, resembling those of the common, wild, red Campion. These appear in May, and are succeeded by large capsules included in inflated empalements, having ten rough angles, containing many large roundish seeds, whose weight causes the capsules to hang downward. If the seeds of this are permitted to scatter, the plants will come up without care, and require nothing more but to keep them clean from weeds.

The eighth sort is an annual plant, which is found naturally in England growing among Corn. It rises with a thick clammy stalk eight or nine inches high, garnished with small oblong leaves by pairs, whose base embrace the stalks; the top of the stalk sustains one or two small red flowers, which open only in the night. This flowers in June, and the seeds ripen early in August, which, if permitted to scatter, the plants will come up without farther trouble.

The ninth sort grows naturally upon the Alps; this plant seldom rises more than six inches high, sending out many shrubby decumbent branches, garnished with woolly spear-shaped leaves; the flowers grow erect, they are of a pale red colour, and are succeeded by turgid capsules filled with roundish seeds.

This is propagated by seeds, which if sown in dry rubbish, the plants will live many years in the open air, but in rich moist soils they rarely live through the winter.

The tenth sort grows naturally in the Levant; this is an annual plant, with a strong, erect, hairy, branching stalk, which rises two feet high. The branches grow erect, as do also the flowers, which are red, and have large, conical, striped empalements, whose stripes are hairy and of a brownish colour. The flowers appear in June, and the seeds ripen in August; this must be treated in the same way as the first sort.

The eleventh sort grows naturally in the south of France, Spain, and Italy; this is biennial. The stalk is round, clammy, and rises a foot and a half high, having swelling joints; the leaves grow round the stalks in clusters; they are very narrow and smooth. The upper part of the stalk divides into spreading branches by pairs, and are adorned by red flowers coming out singly from the wings of the leaves, sitting

ting close to the stalks. These appear in May, and are succeeded by oblong viscous capsules filled with angular seeds, which ripen in July.

This sort is easily propagated by seeds, which, if sown in autumn, will succeed much better than in the spring. When the plants come up and are fit to remove, they should be transplanted into a bed of fresh earth, at six inches distance, shading them from the sun, and watering them until they have taken new root; after which they must be kept clean from weeds till autumn, when they should be transplanted to the places where they are designed to remain for flowering. When the seeds of this plant happen to scatter upon a wall, and plants arise there, they will continue much longer than in the ground.

The twelfth sort is an annual plant, which grows naturally in the south of France and Italy, but has been many years cultivated in the English gardens, from whence the seeds have spread out upon walls and buildings so far, as to induce some to believe it a native of England.

There are three varieties of this, which generally retain their differences; one has a bright purple flower, the other a pale red, and the third a white flower; these do not differ in any other respect, so cannot be reckoned as different species.

The stalks grow erect a foot and a half high; the lower leaves are broad, oblong, and smooth, and sit close to the stalks; the stalk, for more than an inch in length below each stalk is so glutinous, that the small flies which light thereon are fastened and cannot get off again, from whence it had the title of Catchfly. The flowers grow in bunches at the top of the stalk; they stand erect, forming a kind of umbel. These appear in June, and are succeeded by slender oblong capsules, filled with angular seeds which ripen in August.

These seeds should be sown in autumn, for those which are sown in the spring often fail; and if the plants do come up, they never grow so large, or make so good appearance as the autumnal plants.

The thirteenth sort is biennial; this grows naturally in Sicily and Crete; the lower leaves of this plant are obtuse, and are gathered in circular heads like some of the Houseleeks, or those of the Auricula; they are smooth, and of a pretty thick consistence. The stalks rise five or six feet high; they are viscous, and are garnished with spear-shaped leaves placed opposite. The flowers come out upon short foot-stalks from the wings of the stalks in whorls, each foot-stalk sustaining three or four greenish flowers; these are succeeded by oval capsules which spread open at the top, and are filled with angular seeds.

If the seeds of this plant are sown in autumn upon a warm border, they will more certainly succeed than those sown in the spring. When the plants come up and are fit to remove, they should be planted on a dry soil and in a warm situation, where they will live through the winter, and the following summer they will flower and ripen their seeds, and then decay.

The fourteenth sort grows naturally in the Levant; this has a perennial root; the lower leaves are narrow, spear-shaped, and smooth; they are gathered in clustered heads, from the middle of which rises an erect clammy stalk a foot and a half high, garnished with very narrow leaves. The flowers come out from the wings of the leaves toward the top of the stalk; their foot-stalks are short, and each sustains two white flowers having long tubes, standing erect; the flowers are closed in the day, and expand at night. This flowers in July, but rarely produces ripe seeds in England.

As the seeds seldom ripen here, so it is difficult to propagate it: the only way is to slip off the heads in June, and plant them under a glass; these will take root, if they are shaded from the sun and duly watered.

SILER. See Laserpitium.

SILIQUA. See Ceratonia.

SILIQUASTRUM. See Cercis.

SILIQUOUS, are plants whose seeds are in a husk, pod, or shell.

SILPHIUM. Lin. Gen. Plant. 882. Chrysanthemum. Mor. Hist. 3. Bastard Chrysanthemum.

The Characters are,

*The common empalement of the flower is oval, imbricated, and permanent; the scales are oval, prominent, and reflexed in the middle. The disk of the flower is composed of hermaphrodite florets which are tubulous, of one leaf, indented in five parts at the top. These have five short hair-like stamina, terminated by cylindrical summits, and a slender taper germen supporting a long hairy style, crowned by a single stigma; these are barren. The rays of the flower are composed of a few female half florets, which are long, spear-shaped, and for the most part have three indentures at their points; these have a heart-shaped germen with a short single style, having two bristly stigmas of the same length. These are succeeded by single heart-shaped seeds with a membranaceous border, indented at the top, each point ending with a horn or tooth, and are separated by linear chaff, ripening in the empalement.*

This genus of plants is ranged in the fourth section of Linnæus's nineteenth class, which includes those plants whose flowers have their male and female parts connected, and their hermaphrodite flowers are barren, but the female are fruitful.

The Species are,

1. Silphium (*Trifoliatum*) foliis ternis. Roy. Prod. Leyd. 181. *Silphium with leaves by threes at a joint.* Chrysanthemum Virginianum, foliis asperis tribus vel quaternis ad genicula sitis. Mor. Hist. 3. p. 24. *Virginian Corn Marygold, with rough leaves placed by threes or fours at a joint.*
2. Silphium (*Asteriscus*) foliis indivisis sessilibus oppositis inferioribus alternis. Lin. Sp. Plant. 920. *Silphium with undivided leaves set opposite close to the stalks, whose lower leaves are alternate.* Asteriscus coronæ solis folio & facie. Hort. Elth. 42. *Asteriscus with the leaf and appearance of Sunflower.*
3. Silphium (*Solidaginoides*) foliis oppositis lanceolatis petiolatis acute serratis. Lin. Sp. 1302. *Silphium with spear-shaped sawed leaves having foot-stalks.* Chrysanthemum Marianum virgæ aureæ Americanæ foliis, florum petalis tridentatis. Pluk. Mant. 46. *Maryland Corn Marygold, with an American Golden Rod leaf, and the petals of the flower indented in three parts.*
4. Silphium (*Arborescens*) foliis lanceolatis alternis scabris, obsoletè serratis caule fruticoso. *Silphium with rough spear-shaped leaves placed alternate, which have slight sawed edges, and a shrubby stalk.* Corona solis Americana arborescens, flore parvo luteo, semine alato. Houst. MSS. *Tree American Sunflower, with a small yellow flower and a winged seed.*

The first sort grows naturally in many parts of North America; the root is perennial and ligneous, the stalks are annual; these rise five feet high or more in good land, they are of a purplish colour, and branch toward the top. The leaves are oblong, rough, and have some sharp teeth on their edges; they are from three to four inches long, and almost two broad; toward the bottom of the stalk they stand by fours round it at each joint; higher up they are by threes, and at the top by pairs, sitting close to the stalks. The flowers stand upon pretty long foot-stalks, each sustaining one flower, whose empalement is composed of three orders of leaves placed imbricatim, like the scales of fish, the outer order being the smallest. The ray or border of the flower is composed of thirteen female half florets, which are yellow, tongue-shaped, and indented in three points at the end. The disk or middle of the flower is made up of hermaphrodite tubulous flowers, which are slightly cut into five parts at the top; these have five stamina and a style connected together, which are longer than the tube of the floret. This plant flowers in July and August, and when the autumn proves warm, it will produce ripe seeds.

It is propagated by parting of the roots, in the same way as is practised for the perennial Sun-flowers; the best time for this is in autumn, when their stalks begin

gin to decay, and the plants may afterward be treated in the ſame way as the perennial Sun-flower.

The ſecond ſort grows naturally in Carolina; the root of this is perennial; the ſtalk is thick, ſolid, and ſet with prickly hairs; it riſes four or five feet high, and has many purple ſpots; the leaves on the lower part of the ſtalk are placed alternate, but upward they are oppoſite, and ſit cloſe to the ſtalk; they are rough, about two inches long, and one broad near their baſe, having a few ſlight indentures on their edges. The upper part of the ſtalk divides into five or ſix ſmall branches, which are terminated by yellow radiated flowers like thoſe of the perennial Sun-flower, but ſmaller, having generally nine female half florets which compoſe the border or ray; the other parts are like thoſe of the former ſort. It flowers in Auguſt, but the ſeeds do not ripen in England. This ſort is propagated by parting the roots in the ſame way as the former, but as this is not quite ſo hardy, it ſhould be planted in a ſheltered ſituation.

The third ſort grows naturally in many parts of North America; this is a perennial plant, whoſe ſtalks riſe near three feet, and are garniſhed with oblong ſawed leaves placed by pairs upon ſhort foot-ſtalks. The flowers are looſely diſpoſed at the top of the ſtalks; they are yellow, and have their half florets which compoſe the ray, indented in three parts at the end. This plant flowers in Auguſt, but the ſeeds do not ripen here. It may be propagated in the ſame way as the former, and the plants require the ſame treatment.

The fourth ſort was diſcovered by the late Dr. William Houſtoun, growing naturally at La Vera Cruz in New Spain. This riſes with a ſhrubby ſtalk to the height of eight or ten feet, ſending out ligneous branches, which are garniſhed with ſpear-ſhaped leaves placed alternately on every part of the ſtalk; they are four inches long, and one and a half broad in the middle, ending in acute points; their ſurface is rough, and their edges ſlightly ſawed. The flowers are produced at the end of the branches, ſome ſingly on ſlender foot-ſtalks, others are by two or three upon each foot-ſtalk; they are unequal in height, and have ſhort ſcaly empalements. The florets are ſhort which compoſe the ray, and thoſe of the diſk are more prominent than thoſe of the other ſorts. They are of a deep yellow colour, but are not ſucceeded by ſeeds in England.

This ſort is with difficulty propagated here, for unleſs the ſeeds are procured from the country where the plants grow naturally, they cannot be obtained that way, and the cuttings are not apt to take root. The only method of getting them to grow, is to ſlip off the young ſhoots in July, and plant them in a pot filled with ſoft loam, and plunge the pot into a gentle hot-bed, covering the pot cloſely with a bell or hand-glaſs, and ſhade them from the ſun. When the cuttings are rooted, they ſhould be each planted in a ſeparate pot, filled with light loamy earth; and during the warm months, they may be placed in the open air in a warm ſituation, but in winter they ſhould be kept in a moderate ſtove.

SINAPIS. Lin. Gen. Plant. 735. Sinapi. Tourn. Inſt. R. H. 227. tab. 112. [σίνηπι, of σίνειν ὄφθαλμοῦς, becauſe it forces tears from the eyes of thoſe that uſe it incautiouſly, makes the noſe red, and the eyes ſwell.] Muſtard; in French, *Moutarde.*

The Characters are,

*The empalement of the flower is compoſed of four narrow leaves placed in form of a croſs, which ſpread open and fall off. The flower has four roundiſh petals in form of a croſs, and four oval nectariums, one on each ſide of the ſhort ſtamina and the pointal, and one on each ſide of the longer ſtamina and the empalement. It has ſix awl-ſhaped erect ſtamina, two of which are oppoſite and as long as the empalement, the other four are longer. In the center is placed a taper germen, with a ſtyle the length of the germen, crowned by a headed ſtigma. The germen afterward turns to an oblong pod, which is very rough at bottom, having two cells opening with two valves, whoſe intermediate partition is large, compreſſed, and almoſt twice the length of the valves, and the ſeeds are globular.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifteenth claſs, which includes thoſe plants whoſe flowers have four long and two ſhorter ſtamina, and the ſeeds are included in long pods.

The Species are,

1. Sinapis (*Alba*) ſiliquis hiſpidis, roſtro obliquo longiſſimo. Hort. Cliff. 338. *Muſtard with prickly pods, and a very long oblique beak.* Sinapi apii folio. C. B. P. 96. *Muſtard with a Smallage leaf, commonly called white Muſtard.*
2. Sinapis (*Nigra*) ſiliquis glabris apice tetragonis. Hort. Cliff. 338. *Muſtard with a ſmooth four-cornered pod.* Sinapi rapi folio. C. B. P. 99. *Muſtard with a Rape leaf, or common Muſtard.*
3. Sinapi (*Arvenſis*) ſiliquis multangulis toroſo-turgidis, roſtro longioribus. Hort. Cliff. 338. *Muſtard with many-angled, rough, ſwelling pods, having a longer beak.* Sinapi arvenſe præcox, ſemine nigro, foliis integris. Tourn. Inſt. 226. *Early Field Muſtard, with a black ſeed and entire leaves.*
4. Sinapis (*Erucoides*) ſiliquis lævibus æqualibus, foliis lyratis oblongis glabris, caule ſcabro. Amœn. Acad. 4. p. 322. *Muſtard with ſmooth equal pods, lyre-ſhaped, oblong, ſmooth leaves, and rough branches.* Sinapi Hiſpanicum, pumilum album. Tourn. Inſt. 227. *Low white Spaniſh Muſtard.*
5. Sinapis (*Juncea*) ramis faſciculatis, foliis ſummis lanceolatis integerrimis. Hort. Upſal. 191. *Muſtard with bundled branches, and the upper leaves ſpear-ſhaped and entire.* Sinapi Indicum maximum, lactucæ folio. Par. Bat. 230. *Greateſt Indian Muſtard with a Lettuce leaf.*
6. Sinapis (*Hiſpanica*) foliis duplicato-pinnatis, laciniis linearibus. Hort. Cliff. 338. *Muſtard with doubly-winged leaves having linear ſegments.* Sinapi Hiſpanicum naſturtii folio. Tourn. Inſt. 227. *Spaniſh Muſtard with a Creſs leaf.*

The firſt ſort is the common white Muſtard, which is generally cultivated as a ſallad herb for winter and ſpring uſe. This riſes with a branched hairy ſtalk two feet high, the leaves are deeply jagged on their edges and are rough. The flowers are diſpoſed in looſe ſpikes at the end of the branches, ſtanding upon horizontal foot-ſtalks; they have four yellow petals placed in form of a croſs, which are ſucceeded by hairy pods that end with long, compreſſed, oblique beaks; the pods generally contain four white ſeeds. It flowers in June, and the ſeeds ripen in Auguſt.

The ſecond ſort is the common Muſtard, which is frequently found growing naturally in many parts of England, but is alſo cultivated in fields for the ſeed, of which the ſauce called Muſtard is made. This riſes with a branching ſtalk four or five feet high; the lower leaves are large, rough, and very like thoſe of Turnep, the upper leaves are ſmaller and leſs jagged. The flowers are ſmall, yellow, and grow in ſpiked cluſters at the end of the branches; they have four petals placed in form of a croſs, theſe are ſucceeded by ſmooth pods ending with four corners. It flowers and ſeeds at the ſame time with the former.

The third ſort grows naturally on arable land in many parts of England. The ſeed of this is commonly ſold under the title of Durham Muſtard-ſeed; of this there are two varieties, if not diſtinct ſpecies; one with cut, and the other has entire leaves. The ſtalks riſe about two feet high, the leaves are rough, and in one they are jagged like Turnep leaves, and in the others are oblong and entire. The flowers are yellow, the pods are turgid, angular, and have long beaks. Theſe flower in April and May, and the ſeeds ripen in June.

The fourth ſort grows naturally in Spain; this ſeldom riſes more than eight or nine inches high; the leaves are ſmooth and much jagged, the ſtalk branches toward the top, and is terminated by a looſe ſpike of white flowers; theſe are ſucceeded by ſmooth, taper, blunt pods, filled with ſmall brown ſeeds. It flowers in June, and the ſeeds ripen in Auguſt.

The fifth sort grows naturally in China, from whence the seeds are frequently brought to England. This plant is used as a boiled sallad by the Chinese, where it may prove acceptable to those who have not better herbs for that purpose, but in England it is not regarded. The stalks of this rise three or four feet high, and toward the bottom are garnished with broad, smooth, jagged leaves, but those on the top are entire. The flowers are yellow like those of the first sort, and the pods are smooth and turgid. It flowers in June, and the seeds ripen in August.

The first sort is chiefly cultivated in gardens, for a sallad herb in the winter season. The seeds of this are commonly sown very thick in drills, either upon a warm border, or in very cold weather upon a moderate hot-bed, with Cresses and other small sallad herbs, which are commonly fit for use in ten days or a fortnight after the time of sowing; for if they are large and have rough leaves, they are too strong to put into sallads. In order to save the seeds of this plant, a spot of ground must be sown with it in the spring, and when the plants have four leaves, the ground should be hoed in the same manner as for Turneps, to cut down the weeds, and thin the plants where they are too close; this should be done in dry weather, for then the weeds will soon die after they are cut. If this is well performed, the ground will remain clean for a month, by which time young weeds will spring up again; therefore the ground should be again hoed over, and the plants now left about eight or nine inches asunder, which will be sufficient room for this sort to grow. If this is well performed, and in dry weather, the ground will remain clean till the seeds are ripe. As soon as the pods change brown, the plants should be cut off and spread upon cloths two or three days to dry, and threshed out for use.

The second sort is cultivated only for the seeds; these should be sown in the same way as those of the first, and the plants treated in the same manner, with this difference of allowing the plants twice as much room, because they grow much larger, so these should be hoed out to the distance of eighteen inches; and as the seeds will not ripen so soon as the other, so the ground may be required to be hoed three times over, but that may be easily seen by the growth of the weeds.

The seeds of these two first species are ordered for medicinal use.

The third sort is a pretty common weed on arable lands in most parts of England; this comes up early in the spring amongst the Corn, so flowers and seeds in May; therefore where it is not weeded out, the seeds will scatter long before the Corn is ripe, and the ground will be stocked with the weeds.

The other three sorts are preserved in botanic gardens for variety, but are never cultivated for use; these may be treated in the same way as the two first species.

SINAPISTRUM. See Cleome.

SISARUM. See Sium.

SISON. Lin. Gen. Plant. 311. Sii species. Tourn. Inst. R. H. 301. Bastard Stone Parsley; in French, *Berle.*

The Characters are,

*It hath an umbellated flower; the general umbel is composed of six thin rays or small umbels, which are unequal, as are also the smaller, which have ten. The involucri of both are four-leaved and unequal; the empalement of the flower is scarce discernible. The outer petals of the general umbel are uniform; the flowers have five equal petals which are spear-shaped and inflexed. They have five hair-like stamina the length of the petals, terminated by single summits. The oval germen is situated under the flower, supporting two reflexed styles crowned by obtuse stigmas. The germen afterward becomes an oval streaked fruit dividing in two parts, each containing one oval streaked seed, convex on one side and plain on the other.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and two styles.

The Species are,

1. Sison (*Amomum*) foliis pinnatis, umbellis erectis. Prod. Leyd. 105. *Sison with winged leaves and erect umbels.* Sium aromaticum, sison officinarum. Tourn. Inst. R. H. 308. *Bastard Stone Parsley, or spurious Amomum.*
2. Sison (*Segetum*) foliis pinnatis, umbellis cernuis. Prod. Leyd. 105. *Sison with winged leaves and nodding umbels.* Sium arvense, sive segetum. Tourn. Inst. 308. *Honewort or Corn Parsley.*
3. Sison (*Canadense*) foliis ternatis. Hort. Cliff. 99. *Sison with trifoliate leaves.* Myrrhis Canadensis trilobata. Mor. Hist. 3. p. 301. *Canada Myrrh with trilobate leaves.*
4. Sison (*Verticillatum*) foliolis verticillatis capillaribus. Lin. Sp. Plant. 253. *Sison with hair-like small leaves in whorls.* Carui foliis tenuissimis asphodeli radice. Tourn. Inst. 306. *Narrow-leaved Carraway with an Asphodel root.*

The first sort grows on the side of ditches and moist shady banks in many parts of England; it is a biennial plant, which perishes soon after the seeds are ripe. The root is taper, running deep into the ground; the lower leaves are winged; they are composed of four pair of lobes terminated by an odd one; these are an inch and a half long, and half an inch broad, regularly indented on both sides, and the indentures are sawed; they are of a lucid green, and have an aromatic odour. The stalks rise three feet high, and branch out on every side; these are garnished with leaves of the same form with those below, but smaller; at the end of the branches the flowers are produced in small umbels. The flowers are white; they appear in June, and are succeeded by striated seeds, of a hot, pleasant, aromatic smell and taste, which ripen in August.

This plant is found growing so plentifully wild, as that it is rarely kept in gardens; but whoever is willing to propagate it, should sow the seeds in autumn, in a moist shady spot of ground, where the plants will come up, and require no farther care than to keep them clean from weeds; and if the seeds are permitted to scatter, the plants will rise without care. The seeds of this plant is put into Venice treacle, for a succedanum to the true Amomum.

The second grows naturally among Corn on moist land, in several parts of England. This is also a biennial plant, which decays soon after the seeds are ripe; it rises with an upright stalk about a foot high, which rarely divides into branches; the leaves stand upon pretty long foot-stalks; they are winged, but the lobes are smaller and finer cut than those of the former; the umbels of flowers are more compact, and nod on one side. It flowers and seeds about the same time as the former, and the plant may be cultivated in the same way.

The third sort grows naturally in North America, but is preserved by those who are curious in botany in their gardens. This has a perennial root; the stalk rises a foot and a half high, and is garnished with trifoliate leaves, whose lobes are oval, spear-shaped, and sawed on their edges; they are about three inches long, and one and a half broad; their foot-stalks are set with bristly hairs, and their base inclosed by a membranaceous sheath, which half embraces the stalk. The flowers are in umbels which terminate the stalks, and there are small ones which come from the wings of the stalk; they are very irregular in their form. The flowers are white, appear in June, and are succeeded by oblong streaked seeds which ripen in August.

The fourth sort grows naturally on the Alps and Apennines; this rises with a swelling jointed stalk near two feet high, which is garnished with very fine slender leaves, standing in whorls like those of the Water Milfoil; it branches out toward the top, each branch being terminated by a pretty large umbel of flowers, which are purplish on their outside, but white within; these appear the latter end of May, and the seeds ripen

the end of July. The roots of this plant are compoſed of thick fleſhy knots ſomewhat like thoſe of the King's Spear.

Theſe two laſt mentioned ſorts may be cultivated by ſeeds, which ſhould be ſown in autumn, for thoſe which are ſown in the ſpring ſeldom grow the firſt year. The plants require no other culture than to thin them where they are too cloſe, and keep them clean from weeds; they both delight in a moiſt ſoil and a ſhady ſituation, where the roots will continue ſeveral years.

SISYMBRIUM. Tourn. Inſt. R. H. 225. tab. 109. Lin. Gen. Plant. 728. Water Creſſes.

The CHARACTERS are,

*The flower has a ſpreading empalement compoſed of four linear, ſpear-ſhaped, coloured leaves, which fall off; it has four oblong ſpreading petals placed in form of a croſs, and ſix ſtamina, four of which are longer than the empalement, the other two, which are oppoſite, are ſhorter, and terminated by ſingle ſummits; it has an oblong ſlender germen with ſcarce any ſtyle, crowned by an obtuſe ſtigma. The germen afterward becomes a taper, oblong, incurved pod having two cells, opening with two valves which are ſhorter than the intermediate partition, and filled with ſmall ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifteenth claſs, which contains thoſe plants whoſe flowers have four long and two ſhorter ſtamina, and the ſeeds are included in pods.

The SPECIES are,

1. SISYMBRIUM (*Naſturtium aquaticum*) ſiliquis declinatis, foliis pinnatis, foliolis ſubcordatis. Hort. Cliff. 336. *Siſymbrium with declining pods, and winged leaves whoſe lobes are almoſt heart-ſhaped.* Naſturtium aquaticum ſupinum. C. B. P. 104. *Water Creſs.*
2. SISYMBRIUM (*Sylveſtre*) ſiliquis declinatis, foliis pinnatis, foliolis lanceolatis ſerratis. Hort. Cliff. 336. *Siſymbrium with declining pods, and winged leaves having ſpear-ſhaped ſawed lobes.* Eruca paluſtris, naſturtii folio, ſiliqua oblonga. C. B. P. 95. *Marſh Rocket with a Creſs leaf, and a long pod.*
3. SISYMBRIUM (*Amphibium*) ſiliquis declinatis, oblongo-ovatis, foliis pinnatifidis ſerratis. Lin. Sp. Plant. 657. *Siſymbrium with oblong, oval, declining pods, and wing-pointed ſawed leaves.* Raphanus aquaticus, foliis in profundas lacinias diviſis. C. B. P. 97. *Water Radiſh with leaves deeply cut.*
4. SISYMBRIUM (*Aquaticum*) foliis ſimplicibus dentatis ſerratis. Hort. Cliff. 336. *Siſymbrium with ſingle, indented, ſawed leaves.* Raphanus aquaticus alter. C. B. P. 97. *Another Water Radiſh.*
5. SISYMBRIUM (*Polyceratium*) ſiliquis axillaribus ſeſſilibus ſubulatis aggregatis, foliis repando-dentatis. Hort. Upſal. 193. *Siſymbrium with awl-ſhaped pods in cluſters ſitting cloſe to the ſtalks, and indented leaves which turn backward.* Eryſimum polyceration vel corniculatum. C. B. P. 101. *Many-podded or horned Hedge Muſtard.*
6. SISYMBRIUM (*Sophia*) petalis calyce minoribus, foliis decompoſito-pinnatis. Flor. Suec. *Siſymbrium with petals ſmaller than the empalement, and decompounded winged leaves.* Eryſimum ſophiæ dictum. Raii Syn. Ed. 3. p. 298. *Hedge Muſtard, called Sophia or Flixweed.*
7. SISYMBRIUM (*Altiſſimum*) foliis runcinatis flaccidis, foliolis ſublinearibus integerrimis, pedunculis laxis. Hort. Upſal. 193. *Siſymbrium with ſpear, wing-pointed, flaccid leaves, having linear entire lobes with looſe footſtalks.* Rapiſtrum Italicum ſiliquis longiſſimis. C. B. P. 95. *Italian Charlock with very long pods.*
8. SISYMBRIUM (*Irio*) foliis runcinatis dentatis, nudis caule lævi erectis. Lin. Sp. Plant. 659. *Siſymbrium with ſpear-ſhaped, winged, indented leaves, and erect pods.* Eryſimum latifolium, majus glabrum. C. B. P. 131. *Smooth, greater, broad-leaved Hedge Muſtard.*
9. SISYMBRIUM (*Strictiſſimum*) foliis lanceolatis dentato-ſerratis caulinis. Hort. Cliff. 337. *Siſymbrium with ſpear-ſhaped, winged, indented leaves on the ſtalks.* Heſperis lutea, ſiliquis ſtrictiſſimis. Tourn. Inſt. 222. *Yellow Rocket with cloſed pods.*

The firſt ſort is the common Water Creſs, which grows naturally in ditches and rills of water in many parts of England. The roots of this plant are compoſed of a great number of long fibres, which faſten themſelves to the mud at the bottom of the ditches, from which ariſe ſeveral ſtalks garniſhed with winged leaves, compoſed of five or ſix pair of lobes, which are roundiſh and almoſt heart-ſhaped, terminated by an odd one; theſe ſtand almoſt alternate along the midrib. The ſtalks riſe a foot and a half high; they are hollow, channelled, and divide at the top into two or three branches, which are terminated by looſe ſpikes of ſmall white flowers, compoſed of four petals placed in form of a croſs; theſe appear the beginning of June, and are ſucceeded by taper pods filled with ſmall brown ſeeds which ripen in July.

This plant has of late years been generally uſed as a ſallad herb in the ſpring of the year, and is by many preferred to all other ſorts of ſallads for the agreeable warm bitter taſte, and, being accounted an excellent remedy for the ſcurvy, and to cleanſe the blood, as alſo a good diuretic, it has greatly obtained a preference to moſt other herbs for winter and ſpring uſe with moſt people. This is generally gathered in the ditches, and in other ſtanding waters near London, to ſupply the markets; but whoever has a mind to cultivate it may eaſily do it, by taking ſome of the plants from the places of their natural growth early in the ſpring, being careful to preſerve their roots as entire as poſſible, and plant them into mud, and then let the water in upon them by degrees. When they have taken root, they will ſoon flouriſh and ſpread over a large compaſs of water; they ſhould not be cut the firſt ſeaſon, but ſuffered to run to ſeed, which will fall into the water, and furniſh a ſufficient ſupply of plants afterwards.

But where the water is ſo deep that it will not be eaſy to plant them, the beſt method will be to get a quantity of the plants juſt as their ſeeds are ripening, and throw them on the ſurface of the water where they are deſigned to grow, and their ſeeds will ripen, and fall to the bottom, where they will take root, and produce a ſupply of theſe plants. Theſe plants produce ſeed in July, which is the proper time for this work.

Some of thoſe people who gather this herb for uſe, either through ignorance, or ſome worſe deſign, have frequently taken the creeping Water Parſnep and ſold it for Water Creſs, whereby many perſons have ſuffered who have eaten it; therefore thoſe who make uſe of Water Creſs, ſhould be careful to have the right plant; they may be eaſily diſtinguiſhed by the ſhape of their leaves, thoſe of the Water Creſs having roundiſh, almoſt heart-ſhaped ſmall leaves or lobes, with a few indentures on their edges, and are of a dark green colour, but thoſe of the Water Parſnep have oblong lobes ending in points; they are of a light green, and ſawed on their edges.

The ſecond ſort grows naturally on the borders of the river Thames, and in ſome other parts of England. The leaves of this ſort are longer than thoſe of the firſt; the lobes are much narrower, and are ſawed on their edges; the flowers ſtand upon longer foot-ſtalks, and are much ſmaller. This ſpreads and multiplies in the ſame manner as the firſt.

The third and fourth ſorts grow naturally on the banks of the Thames, and in ditches in many parts of England, ſo are not admitted into gardens.

The fifth ſort grows naturally in the ſouth of France and Italy; it is an annual plant, whoſe ſtalks ſpread and decline toward the ground; they grow a foot long, and divide into many branches, which are garniſhed with ſmooth leaves ſhaped like the point of a halbert, deeply ſinuated on their borders, and indented, whoſe indentures turn backward. The flowers come out in cluſters at the wings of the ſtalk; they are ſmall, yellow, and are ſucceeded by ſlender crooked pods ſtanding in cluſters; they appear in June and July, and the ſeeds ripen in Auguſt and September.

The

The sixth sort grows naturally in uncultivated places, and also by the side of foot-ways in many parts of England. The leaves of this are divided into many very narrow segments; the stalks rise a foot and a half high; they are garnished with winged leaves, whose lobes are finely cut, resembling those of the true Roman Wormwood. The flowers are produced in loose spikes at the top of the stalk; they are small, yellow, and composed of four petals set in form of a cross; these appear in June, and are succeeded by slender pods filled with small roundish seeds which ripen in August, and then the plant dies. The seeds of this plant are used in medicine, and are by some greatly recommended for the gravel and stoppages of urine.

The seventh sort grows naturally in France and Italy. The lower leaves of this are flaccid, and cut in form of winged leaves ending in arrow-pointed lobes. The stalks rise three or four feet high, garnished with linear wing-pointed leaves; it branches out greatly on every side; the flowers grow sparsedly toward the end of the branches, which are succeeded by very long slender pods which are smooth, filled with small yellowish seeds. It flowers in June, the seeds ripen in August, and the plant dies soon after.

The two last are preserved in botanic gardens for the sake of variety. If their seeds are permitted to scatter the plants will come up in plenty, and require no other care but to thin them and keep them clean from weeds; or if their seeds are sown in autumn, they will succeed better than in the spring.

The eighth sort grows naturally in many parts of England, so is seldom admitted into gardens; this is an annual plant which sows itself, and comes up without care. It was remarked, after the great fire of London, that this plant came up in great plenty on the ruins.

The ninth sort grows naturally on the Helvetian mountains; this hath a perennial root, from which arise several branching stalks near three feet high, garnished with spear-shaped leaves, about three inches long and one broad, sawed on their edges, and of a deep green, standing alternately on the stalks. The flowers grow in loose spikes at the top of the stalks; they are small, yellow, and composed of four petals placed in form of a cross; these appear in June, and are succeeded by taper pods filled with small seeds which ripen in August.

This is preserved in some gardens for the sake of variety, but it has no great beauty; it is propagated by seeds, which succeed best when sown in autumn, for those which are sown in the spring seldom come up the same year. The plants require no farther care but to keep them clean from weeds, and love a cool shady situation.

SISYRINCHIUM. Lin. Gen. Plant. 908. Bermudiana. Tourn. Inst. R. H. 387. tab. 208.

The Characters are,

*The sheath which incloses the flowers faces both ways, and is composed of two compressed keel-shaped leaves. The flower has six oblong petals which spread open, and have an acute point, and three very short stamina terminated by bifid summits which are fixed to the base of the style, with an oval germen situated under the flower, supporting an awl-shaped style, crowned by a trifid reflexed stigma. The germen afterward turns to an oval three-cornered capsule with three cells, filled with roundish seeds.*

This genus of plants is ranged in the second section of Linnæus's twentieth class, which includes those plants whose flowers have their male and female organs joined, and have three stamina.

The Species are,

1. Sisyrinchium (*Bermudiana*) foliis gladiolatis amplexicaulibus, pedunculis brevioribus. *Sisyrinchium with sword-shaped leaves embracing the stalks, and shorter foot-stalks to the flower.* Bermudiana iridis folio fibrosâ radice. Tourn. Inst. R. H. 338. *Bermudiana with an Iris leaf and a fibrous root.*
2. Sisyrinchium (*Angustifolia*) foliis lineari-gladiolatis pedunculis longioribus. *Sisyrinchium with linear sword-shaped leaves, and longer foot-stalks to the flower.* Bermudiana graminea, flore minore cæruleo. Hort. Elth. 49. *Grass-leaved Bermudiana with a smaller blue flower.*
3. Sisyrinchium (*Bulbosa*) foliis plicatis, spathâ biflorâ. *Sisyrinchium with a plaited leaf, and two flowers in a sheath.* Bermudiana palmæ folio, radice bulbosa. Lign. Tourn. Inst. 381. *Bermudiana with a Palm leaf and a bulbous root.*

The first sort grows naturally in Bermuda, from whence it had the title of Bermudiana given to it by Tournefort; this hath a fibrous root, from which arise some stiff sword-shaped leaves, four or five inches long and half an inch broad, of a dark green colour and entire; between these come out the stalk which rises six inches high; it is compressed, and has two borders or wings running the whole length, and has three or four spear-shaped leaves which embrace it; these grow erect, and are hollowed like the keel of a boat. The stalk is terminated by a cluster of six or seven flowers, standing upon short foot-stalks, which are inclosed by a two-leaved keel-shaped sheath before they open; the flowers are of a deep blue colour with yellow bottoms; they are composed of six oval petals ending in acute points; they spread open, and the flowers, when fully expanded, are an inch over. In the center is situated an upright style, at the bottom of which are three stamina whose summits sit close to it, and the top has a stigma cut into three parts which are reflexed back to the style; these are of a gold colour. The flowers appear in June, and when they fall away, the germen, which was situated under, turns to an oval obtuse capsule with three cells, filled with roundish seeds.

The second sort grows naturally in Virginia; this hath a perennial fibrous root, from which arise many very narrow spear-shaped leaves about three inches long, and scarce an eighth part of an inch broad, of a light green colour, and entire. The stalks rise about three inches high; they are very slender, compressed and bordered like those of the first, and have short, narrow, sword-shaped leaves, whose base embrace them; they are terminated by two small pale blue flowers, inclosed in a two leaved sheath, standing upon longer foot-stalks than those of the other, which flower about the same time, and their seeds ripen in August.

These two species have been blended together by many botanists, who, it is very probable, have not seen them both, or at least have not had an opportunity of cultivating them, for those who have, can be under no doubt of their being distinct species. I have cultivated both in the same soil and situation upward of twenty years, during which time I frequently raised both sorts from seed, and have never observed either of them alter. The leaves, stalks, and flowers of the first are three times as large as those of the second, and the sheath incloses six or seven flowers; whereas those of the second have rarely more than two, and these do not expand but for a short time in the morning, whereas those of the first sort continue open the whole day.

These plants are propagated by seeds, and also by parting of their roots; if they are raised from seeds, these should be sown in autumn soon after they are ripe, upon an east aspected border, where they may have only the morning sun: the best way will be to sow them in drills at three or four inches distance, covering them about half an inch with light earth. In the spring the plants will appear, when their leaves will have much resemblance to Grass, therefore care should be taken that they are not pulled up as weeds by those who clean the ground. During the first summer they will require no other care but to keep them clean from weeds, unless the plants should come up so close as not to have room to grow, in which case, part of them should be drawn out to give room to the others, and these may be planted in a

ſhady border at three inches diſtance, where they may remain till autumn, when they ſhould be tranſplanted to the places where they are to remain, and the following ſummer they will flower. Theſe plants love a ſhady ſituation and a ſoft, loamy, undunged ſoil.

The time for tranſplanting and ſlipping off the old roots is early in autumn, that they may get good roots before winter. They are both ſo hardy as to thrive in the open air in England, and are very rarely injured by cold.

The third ſort grows naturally in the Weſt-Indies; this hath a ſmall, oval, bulbous root covered with a bright red ſkin, from which come out the leaves very like the firſt leaves of Palm-trees, but of a thinner ſubſtance; they are nine or ten inches long and one broad, having five or ſix longitudinal plaits; they are of a light green, ending with points, and two leaves embrace each other at their baſe; between theſe ariſes the foot-ſtalk of the flower, which is four inches long, and ſuſtains at the top two or three ſmall blue flowers incloſed in a ſpatha or ſheath; theſe are compoſed of ſix petals which expand like thoſe of the other ſorts, but do not continue open longer than three or four hours in the morning, and are cloſed up the remainder of the day, and when they are expanded, their petals are ſo ſmall as to make but little appearance. This ſort flowers commonly in the middle of ſummer, but does not keep any particular month; they are never ſucceeded by ſeeds in England.

This is propagated by offsets from the roots, which are ſent out in plenty; theſe ſhould be taken off when the roots are tranſplanted: the time for doing of this is ſoon after the leaves decay, or before the roots begin to ſhoot again. They muſt be planted in ſmall pots filled with light, loamy, undunged earth, and plunged into the tan-bed in the ſtove, where they ſhould conſtantly remain, for they are too tender to thrive in this country unleſs they are thus treated. Their after management is the ſame as for other bulbous-rooted plants from the ſame countries.

Siſyrinchium. Tourn. or Spaniſh Earth-nut, is by Dr. Linnæus referred to the genus Iris or Fleur-de-lis; but, as that is a plant which will not live long in a garden, I have omitted the mentioning of it in this work.

SIUM. Tourn. Inſt. R. H. 308. tab 162. Lin. Gen. Plant. 310. Siſarum. Tourn. Inſt. R. H. 308. tab. 163. Water Parſneps, and Skirrets; in French, *Chervi*.

The CHARACTERS are,

*It hath an umbellated flower; the general umbel is various in different ſpecies, the ſmall ones are plain and ſpreading. The general involucrum is compoſed of ſeveral ſhort, ſpear-ſhaped, reflexed leaves; thoſe of the ſmaller are of very ſmall narrow leaves. The general umbel is uniform; the flowers have five inflexed petals which are equal; they have five ſtamina terminated by ſingle ſummits, and a ſmall germen ſituated under the flower, ſupporting two reflexed ſtyles, crowned by obtuſe ſtigmas. The germen afterward becomes a roundiſh, oval, ſtreaked fruit ſplitting in two, each part containing one ſtreaked ſeed, plain on one ſide, and convex on the other.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and two ſtyles. To this genus he adds the Siſarum of Tournefort.

The SPECIES are,

1. SIUM (*Latifolium*) foliis pinnatis, umbellis terminalibus. Hort. Cliff. 98. *Sium with winged leaves, and the ſtalk terminated by an umbel.* Sium latifolium. C. B. P. 154. *The great Water Parſnep.*
2. SIUM (*Anguſtifolium*) foliis pinnatis ſerratis, umbella terminali. *Sium with winged ſawed leaves, and umbels terminating the ſtalks.* Sium ſive apium paluſtre, foliis oblongis. C. B. P. 154. *Common, upright, Water Parſnep.*
3. SIUM (*Nodiflorum*) foliis pinnatis, umbellis axillaribus ſeſſilibus. Hort. Cliff. 98. *Sium with winged leaves, and umbels of flowers ſitting cloſe to the wings of the ſtalks.* Sium umbellatum repens. Ger. Emac. 256, 255. *Creeping Water Parſnep.*
4. SIUM (*Siſarum*) foliis pinnatis, floribus ternatis. Hort. Cliff. 98. *Sium with winged lower leaves, but thoſe under the flowers trifoliate.* Siſarum Germanorum. C. B. P. 155. *German Skirrets.*
5. SIUM (*Falcaria*) foliolis linearibus decurrentibus connatis. Hort. Cliff. 98. *Sium with linear ſmall leaves, having running membranes which join at their baſe round the ſtalk.* Ammi perenne. Mor. Umb. *Perennial Biſhops-weed.*
6. SIUM (*Siculum*) foliis radicalibus ternatis, caulinis bipinnatis. Prod. Leyd. 105. *Sium with trifoliate bottom leaves, and thoſe on the ſtalks doubly winged.* Myrrhis foliis paſtinacæ læte virentibus. Tourn. Cor. 33. *Myrrh with light green Parſnep leaves.*

The firſt ſort is the great Water Parſnep, which grows naturally in deep waters in ſeveral parts of England; it riſes with upright ſtalks five or ſix feet high, garniſhed with large winged leaves ſhaped like thoſe of the common Parſnep, and the ſtalk is terminated by large umbels of pale yellow flowers. This plant flowers in June and July, and the ſeeds ripen the end of Auguſt; it is never cultivated in gardens.

The ſecond ſort is the common upright Parſnep, which grows naturally in ditches in moſt parts of England; this riſes with an upright branching ſtalk near three feet high, garniſhed with winged leaves compoſed of three or four pair of oblong ſawed lobes terminated by an odd one. The ſtalk is terminated by an umbel of white flowers which appear in June, and are ſucceeded by ſeeds which ripen in autumn; this is rarely cultivated, as it is a common weed in ditches and ſtanding waters. Both theſe plants have been recommended by ancient phyſicians for their virtues in medicine, but at preſent they are ſeldom uſed.

The third ſort is very common in ſtanding waters in moſt parts of England. The ſtalks ſpread over the ſurface, and produce umbels of white flowers at their joints. This is the plant which is frequently gathered and ſold for Water Creſs, as is before mentioned under the article SISYMBRIUM.

The fourth ſort is the common Skirret, which was formerly more cultivated in the Engliſh gardens than at preſent. The roots are the only part uſed, and although it is mentioned in moſt Diſpenſaries as a medicinal plant, yet it is rarely uſed as ſuch, being better adapted for the kitchen. It is eſteemed a wholeſome root, affording good nouriſhment, but has a flatulency, and its very ſweet taſte is diſagreeable to many palates.

The root of this plant is compoſed of ſeveral fleſhy fibres as large as a man's little finger, which join together in one head. The lower leaves are winged, having two or three pair of oblong lobes terminated by an odd one; the ſtalk riſes a foot high, and is terminated by an umbel of white flowers which appear in July, and are ſucceeded by ſtriated ſeeds like thoſe of Parſley, which ripen in autumn.

This plant is cultivated two ways, firſt by ſeeds, and afterward by ſlips from the root: the former method I think the more eligible, becauſe the roots which are raiſed from ſeeds, generally grow larger than thoſe raiſed by ſlips, and are leſs ſubject to be ſticky. The ſeeds ſhould be ſown the latter end of March or the beginning of April, either in broad caſt or in drills; the ground ſhould be light and moiſt, for in dry land the roots are generally ſmall, unleſs the ſeaſon proves very moiſt. If the ſeeds are good, the plants will appear in five or ſix weeks after they are ſown, and, when they have put out their leaves ſo as to be well diſtinguiſhed from the weeds, the ground ſhould be hoed over to deſtroy the weeds in the ſame manner as is practiſed for Carrots; and where the ſeeds are ſown in broad caſt, the plants ſhould be cut up, leaving them at the ſame diſtance as Carrots. Thoſe ſown in the drills ſhould be alſo thinned to the diſtance of four inches,

inches, and the ground hoed over to deſtroy the weeds. This ſhould be repeated three times, as is uſually done for Carrots, which, if well performed in dry weather, will keep the ground clean all the firſt part of the ſummer, ſo that unleſs there ſhould be much rain about Midſummer, there will be ſcarce any neceſſity for farther cleaning of the plants, for their leaves will ſpread, and prevent the growth of weeds afterward. In autumn, when the leaves begin to decay, the roots will be fit for uſe, and may be continued all the winter till they begin to ſhoot in the ſpring, when they will become ſticky, as will alſo any of thoſe which run up to ſeed the firſt ſummer, ſo that all ſuch ſhould be pulled up and thrown away.

The time for propagating this plant by offsets is in the ſpring, before they begin to ſhoot, at which time the old roots ſhould be dug up, and the ſide roots ſhould be ſlipped off, preſerving an eye or bud to each; theſe ſhould be planted in rows one foot aſunder, and four inches diſtant in the rows. If the ground is light, this may be performed with a dibble, but for ſtiff land it will be beſt to make a trench with a ſpade, in the ſame manner as for Aſparagus, laying the roots therein at a proper diſtance. The ground muſt be kept clean by hoeing it in the ſame manner as before directed, and at the ſeaſon the roots will be fit for uſe.

The fifth ſort is a perennial plant, which grows naturally in Germany. The roots of this plant creep and ſpread very far under ground; the leaſt part of them will grow, ſo that when it is once brought into a garden, it will ſoon multiply; they are thick, fleſhy, and taſte like thoſe of Eryngo. The leaves are divided into linear ſegments, and their baſe embrace the ſtalks, which riſe two feet high, and are terminated by large flat umbels of white flowers, which appear in July, but their ſeeds do not often ripen here.

The ſixth ſort grows naturally in Sicily, and is preſerved in botanic gardens for the ſake of variety. The lower leaves are pretty broad, trifoliate, and of a lucid green; the ſtalk riſes two feet high, and is terminated by an umbel of yellow flowers in July; the leaves on the ſtalks are doubly winged, and the ſeeds ripen in autumn, which ſhould be ſown ſoon after they are ripe.

SMALLAGE. See Apium.

SMILAX. Tourn. Inſt. R. H. 654. tab. 421. Lin. Gen. Plant. 992. Rough Bindweed.

The Characters are,

*It is male and female in different plants. The male flowers have a ſix-leaved, open, bell-ſhaped empalement; they have no petals, but have ſix ſtamina terminated by oblong ſummits. The female flowers have the like empalement, but they fall off; they have no petals or ſtamina, but have an oval germen, ſupporting three very ſmall ſtyles, crowned by oblong reflexed ſtigmas. The germen afterward turns to a globular berry with two cells, containing two globular ſeeds.*

This genus of plants is ranged in the ſixth ſection of Linnæus's twenty-ſecond claſs, which includes thoſe plants which have male and female flowers ſituated upon different plants, whoſe male flowers have ſix ſtamina.

The Species are,

1. Smilax (*Aſpera*) caule aculeato angulato, foliis dentato-aculeatis cordatis. Lin. Sp. Plant. 1028. *Smilax with an angular prickly ſtalk, and heart-ſhaped, prickly, indented leaves.* Smilax aſpera, fructu rubente. C. B. P. 296. *Rough Bindweed with a red fruit.*
2. Smilax (*Excelſa*) caule aculeato angulato, foliis cordatis inermibus. *Smilax with an angular prickly ſtalk, and ſmooth heart-ſhaped leaves.* Smilax orientalis, ſarmentis aculeatis, excelſas arbores ſcandentibus, foliis non ſpinoſis. Tourn. Cor. 45. *Eaſtern rough Bindweed, with prickly runners climbing the talleſt trees, and leaves not prickly.*
3. Smilax (*Sarſaparilla*) caule aculeato angulato, foliis inermibus retuſo-cordatis. *Smilax with an angular prickly ſtalk, and retuſe, heart-ſhaped, unarmed leaves.* Smilax viticulis aſperis Virginiana, folio hederaceo leni Zarza nobiliſſima. Pluk. Alm. 348. *Virginia rough Bindweed with prickly Vines, and a ſmooth Ivy leaf, called Zarza.*
4. Smilax (*Tamnoides*) caule aculeato tereti, foliis inermibus cordatis oblongis ſeptemnerviis. Lin. Sp. Plant. 1030. *Smilax with a taper prickly ſtalk, and oblong, heart-ſhaped, unarmed leaves with ſeven veins.* Smilax bryoniæ nigræ foliis, caule ſpinoſo, baccis nigris. Cateſb. Carol. 1. p. 52. *Rough Bindweed with black Briony leaves, a prickly ſtalk, and black berries.*
5. Smilax (*China*) caule aculeato teretiuſculo, foliis inermibus ovato-cordatis quinquenerviis. Lin. Sp. Plant. 1029. *Smilax with a taper prickly ſtalk, and oval, heart-ſhaped, unarmed leaves, having five veins.* Radix China. C. B. P. 496. *China-root.*
6. Smilax (*Caduca*) caule ſubaculeato tereti, foliis inermibus cordatis trinerviis. *Smilax with a taper ſtalk having a few ſmall thorns, and unarmed heart-ſhaped leaves with three veins.*
7. Smilax (*Ariſtolochiæfolia*) caule aculeato tereti, foliis inermibus ſagittatis obtuſiuſculis trinerviis. *Smilax with a prickly taper ſtalk, and very blunt, halbert-pointed, unarmed leaves.* Smilax aſpera ariſtolochiæ, foliis longioribus, ad baſin auriculatis. Houſt. MSS. *Rough Bindweed with longer Birthwort leaves, eared at their baſe.*
8. Smilax (*Spinoſa*) caule aculeato tereti, foliis ovato-lanceolatis nervis foliorum infernè aculeatis. *Smilax with a taper prickly ſtalk, and oval ſpear-ſhaped leaves whoſe veins on the under ſide are prickly.* Smilax viticulis aſperis, foliis oblongis, nervis foliorum ſpinoſis. Houſt. MSS. *Rough Bindweed with a prickly ſtalk, and oblong leaves with prickly veins.*
9. Smilax (*Virginiana*) caule aculeato angulato, foliis lanceolatis inermibus, acuminatis. *Smilax with an angular prickly ſtalk, and ſpear-ſhaped, acute-pointed, unarmed leaves.* Smilax viticulis aſperis Virginiana, foliis anguſtis lævibus nullis auriculis prædita. Pluk. Phyt. tab. 110. fig. 4. *Virginian rough Bindweed with prickly veins, and narrow ſmooth leaves without ears.*
10. Smilax (*Canellefolia*) caule inermi tereti, foliis inermibus ovatis trinerviis. *Smilax with an unarmed taper ſtalk, and oval unarmed leaves with three veins.* Smilax Virginiana, ſpinis innocuis armata latis canellæ foliis, radice arundinacea craſſa & carnoſa. Pluk. Phyt. 110. fig. 5. *Rough Bindweed of Virginia armed with innocent ſpines, a broad Cinnamon leaf, and a thick, fleſhy, Reed-like root.*
11. Smilax (*Humilus*) caule inermi tereti, foliis inermibus ovato-cordatis trinerviis, floribus corymboſis. *Smilax with a taper unarmed ſtalk, oval, heart-ſhaped, unarmed leaves, and flowers in a corymbus.* Smilax humilis, non ſpinoſa, foliis ariſtolochiæ, baccis rubris. Cateſb. Car. 1. p. 47. *Dwarf rough Bindweed without ſpines, Birthwort leaves, and red berries.*
12. Smilax (*Hederæfolia*) caule inermi tereti, foliis inermibus, caulinis cordatis, racemis ovato-oblongis. Lin. Sp. Plant. 1031. *Smilax with an unarmed taper ſtalk, unarmed, heart-ſhaped leaves on the ſtalks, and oval oblong bunches of flowers.* Smilax claviculata, hederæ folia tota lævis è terrâ Mariana. Pluk. Phyt. tab. 225. fig. 3. *Rough Bindweed with claſpers, and an Ivy leaf totally ſmooth, from Maryland.*
13. Smilax (*Laurifolia*) caule inermi tereti, foliis inermibus lanceolatis. *Smilax with a taper unarmed ſtalk, and ſpear-ſhaped unarmed leaves.* Smilax lævis, lauri folio, baccis nigris. Cateſb. Car. 1. p. 15. *Smooth Bindweed, with a Bay leaf and black berries.*

The firſt ſort grows naturally under hedges and in woods in Italy and Spain. The roots are compoſed of many thick fleſhy fibres, which ſpread wide on every ſide, and ſtrike deep in the ground, from which come out ſeveral ſtalks which are ſlender, angular, armed with ſhort crooked ſpines, and have claſpers on their ſides, by which they faſten themſelves to any neighbouring plant for ſupport, and riſe five or ſix feet high. The leaves are ſtiff, heart-ſhaped, and

acute-pointed, about three quarters of an inch broad at their base, where they are eared, drawing narrower to a point, and about two inches long; they are of a dark green, and have five longitudinal veins; their edges are set with a few short reddish spines. The flowers come out from the wings of the stalk in short bunches; they are small and whitish, having no petals. Those on the female plants are succeeded by red berries which ripen in autumn.

The second sort grows naturally in Syria. The roots of this are like those of the former; the stalks are four-cornered and prickly; these fasten themselves to the trees near them by their claspers, and mount to their tops. The leaves are heart-shaped, two inches long, and an inch and three quarters broad at their base; they have no spines on their edges, but have five veins running lengthways. The flowers and fruit are like those of the first sort.

The third sort grows naturally in Virginia. The roots of this are like those of the former; the stalks are angular and prickly; the leaves are heart-shaped, turning backward, and unarmed; the flowers are small, and come out in long loose bunches from the wings of the stalks; the berries are small and red.

The fourth sort grows naturally in Carolina. The roots are like the former; the stalks are taper and prickly; the leaves are oblong, heart-shaped, four inches long, and two inches and a half broad at their base, having no spines, but seven longitudinal veins; the flowers come out in long loose bunches from the side of the stalks, and the berries are black.

The fifth sort grows naturally at Carthagena in New Spain. The roots of this are like the former; the stalks are taper, very strong, and armed with short stiff spines; they fasten themselves by their claspers to the neighbouring trees, and rise twenty feet high. The leaves are of a thick substance, and have no spines; they are oval, heart-shaped, four inches long, and three and a half broad at their base, ending in an obtuse point, and have five longitudinal veins. The flowers are like those of the other species, but grow in close bunches, and the berries are red. This is the same with a plant which I received from China by the title of China-root.

The sixth sort grows naturally at Carthagena in New Spain; this hath very strong taper stalks, which are armed with a very few short spines. The leaves are thick, unarmed, and heart-shaped; they are five inches long, and three inches and a half broad at their base, ending with an acute point. This sort climbs on the neighbouring trees, and rises thirty feet high. The flowers of this I have not seen.

The seventh sort grows naturally at La Vera Cruz in New Spain; this hath a thick, taper, prickly stalk, which climbs up the neighbouring trees to the height of thirty or forty feet. The leaves are thick, stiff, and unarmed; they are seven inches long, and have two round ears at their base, where they are three inches and a half broad, but the other part of the leaves are two inches broad at their top, where they are rounded; they have three longitudinal veins, and stand on short foot-stalks.

The eighth sort grows naturally at La Vera Cruz; this hath slender, taper, prickly stalks, which fasten themselves to any neighbouring support by their claspers, and rise eight or ten feet high. The leaves are oval, spear-shaped, four inches and a half long, and two and a half broad in the middle; they have no spines on their edges, but their midrib and veins on their under side are armed with short reddish spines.

The ninth sort grows naturally in Jamaica. The stalks of this are slender, angular, and prickly; the leaves are spear-shaped, ending in acute points; they are three inches long, and half an inch broad, having no spines; their base is a little rounded, but have no ears.

The tenth sort grows naturally in Jamaica; this hath thick, fleshy, creeping roots. The stalks are taper and unarmed; these climb up the neighbouring trees and bushes to the height of ten or twelve feet. The leaves are oval, and end in acute points; they are five inches long and three broad, and have three longitudinal veins, but have no spines.

The eleventh sort grows naturally in Carolina; this hath taper unarmed stalks which rise three or four feet high. The leaves are oval, heart-shaped, about three inches long, and almost two broad, rounded at their points, and have three longitudinal veins. The flowers come out from the wings of the stalk at every joint, standing upon short foot-stalks, formed in a round bunch; these are succeeded by roundish red berries.

The twelfth sort grows naturally in Jamaica, and also in Maryland. The stalks of this are ligneous, taper, and unarmed; these have very long claspers, by which they fasten to any neighbouring support, and rise twenty feet high. The leaves are some oval, and others are heart-shaped; they are about three inches and a half long, and two and a half broad. The flowers come out from the wings of the stalk in oblong bunches; these are succeeded by red berries.

The thirteenth sort grows naturally in Carolina; this hath a thick, taper, unarmed stalk, which rises by the help of neighbouring bushes and trees ten or twelve feet high. The leaves are thick, spear-shaped, and unarmed, about three inches and a half long, and one inch and a half broad. The flowers come out from the wings of the stalk in round bunches, which are succeeded by black berries.

These plants are many of them preserved in the gardens of the curious for the sake of variety, but some of them may so be disposed as to make them ornamental, because those sorts which grow naturally in North America, and the two first sorts, are so hardy as to thrive in the open air in England; and as they retain their verdure all the year, if the plants are placed on the borders of woods or groves in gardens, and their branches properly supported, they will screen the nakedness of the ground under the trees from sight, and in winter, when their leaves are in beauty, they will make a pleasing variety, when the plants are properly intermixed with other evergreens; and as some of the sorts will rise five or six feet high, they will shut out from view any disagreeable objects.

Those sorts which require a stove to protect them in winter are little esteemed, because they require much room; and as their flowers have no beauty to recommend them, few persons care to be at the trouble of preserving them for that of their leaves, because there are many other plants whose leaves make a better appearance, and the plants do not require so much room, so these plants are rather the proper furniture of botanic gardens than those of pleasure.

They are all propagated by seeds, which must be procured from the countries where they naturally grow, for there are none of these plants which produce ripe seeds here. Those sorts which have been brought from the north of America, sometimes produce flowers in England, but the summers here are neither warm enough, nor of a proper duration to ripen their seeds, so that these are propagated by parting of their roots; for when the roots have obtained strength, they spread very far in the ground, and send up stalks at a distance from the old roots, whereby they may be greatly increased when the sorts are once obtained. The best time for transplanting and parting of their roots is early in autumn, that the offsets or young plants may have time to get good roots before the frost comes on; and if after they are planted, the cold should come on earlier, or be more severe than ordinary, if the surface of the ground about their roots is covered with some old tanners bark or mulch to keep the frost out of the ground, it will preserve them; but these roots should not be parted oftener than every third or fourth year, for unless the roots are large, there will be few stalks to each, and therefore will make but little appearance.

The tender sorts must be kept in pots, and plunged into the tan-bed of the bark-stove, in order to have them

them ſtrong; for although they will live in a moderate warmth in winter, they will make but little progreſs, and their ſtalks will be ſhort, their leaves ſmall, and the plants weak, ſo will make but a poor appearance; therefore, unleſs they can be allowed room in the warm ſtove, and conſtantly kept in the tan-bed, they will not be worth preſerving.

All the ſorts grow naturally under hedges and in woods, therefore they ſhould be diſpoſed in a ſuch a manner, as to imitate their places of growth, and not place them in the open ſun, where they will not thrive; therefore the hardy kinds ſhould be placed under the ſhade of trees, and the tender ones may be placed between the pots which contain tall plants, whoſe branches may ſcreen them from the ſun. Such of theſe plants as are tender muſt be frequently watered in hot weather, and ſhould then have a large ſhare of air admitted to them, but in winter they muſt be watered ſparingly, for their roots are apt to rot with too much wet.

When the ſeeds of theſe plants are obtained from abroad, they ſhould be ſown in pots filled with freſh light earth, and plunged into a moderate hot-bed, obſerving to water the earth frequently to keep it moiſt, becauſe the ſeeds, being hard, will not vegetate without a conſiderable ſhare of moiſture; theſe generally remain in the ground a whole year before they grow, ſo that if the plants do not come up the firſt ſeaſon, the pots ſhould be kept clean from weeds all the ſummer, and in winter the hardy ſorts ſhould be ſheltered from froſt under a common frame, and the tender ones plunged into the bark-bed in the ſtove: the following ſpring they muſt be again plunged into the hot-bed, which will bring the plants up very ſoon. When the plants are come up, they muſt be conſtantly kept clear from weeds, and frequently watered in warm weather, and toward the end of May the hardy ſorts ſhould be inured to the open air by degrees, and in June they may be removed out of the bed, and placed abroad in a ſheltered ſituation, where they ſhould remain till the froſt comes on in autumn, when they muſt be removed into ſhelter. If the pots are plunged into an old tan-bed under a frame, where they may be protected from the froſt, and in mild weather be expoſed to the open air, they will thrive much better than with more tender treatment.

The tender ſorts ſhould be plunged between the other pots in the bark-bed of the ſtove, where they ſhould remain all the winter. Theſe plants ſhould remain untranſplanted in the ſeed-pots till the following ſpring, when they ſhould be turned out of the pots, carefully ſeparated, and planted into pots filled with freſh earth; and if the hardy ſorts are plunged into a very temperate hot-bed, it will cauſe them to take new root very ſoon, and greatly ſtrengthen the plants; but the tender ſorts ſhould be plunged into a good hot-bed of tanners bark to bring the plants forward, that they may get ſtrength before winter, when they muſt be treated in the manner before directed.

The hardy ſorts ſhould be kept in pots for two or three years that they may be ſheltered in winter, by which time they will have ſtrength enough to bear the cold in the open air; ſo in the ſpring they may be turned out of the pots, and planted where they are deſigned to remain, obſerving, if the ſpring ſhould prove dry, to refreſh them now and then with water, as alſo to lay ſome mulch about them to prevent the earth from drying; and while the plants are young, if ſome mulch is laid about their roots in winter, it will be a ſure method to preſerve them.

SMYRNIUM. Tourn. Inſt. R. H. 315. tab. 168. Lin. Gen. Plant. 363. Alexanders, or Aliſanders; in French, *Maceron.*

The Characters are,

*It has an umbellated flower; the principal umbel is unequal, the ſmall ones are erect; they have no involucrum, and the empalement of the flowers are ſcarce diſcernible. The flowers have five ſpear-ſhaped petals which are a little inflexed, and five ſtamina the length of the petals, terminated by ſingle ſummits. The germen is ſituated under the flower, ſupporting two ſtyles crowned by headed ſtigmas. The germen afterward turns to an almoſt globular fruit which is ſtreaked and ſplits in two, each containing one moon-ſhaped ſeed, convex on one ſide, marked with three ſtreaks, and plain on the other.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifth claſs, which contains thoſe plants whoſe flowers have five ſtamina and two ſtyles.

The Species are,

1. Smyrnium (*Oluſatrum*) foliis caulinis ternatis petiolatis ſerratis, Hort. Cliff. 105. *Smyrnium with trifoliate leaves on the ſtalks, which are ſawed and have footſtalks.* Hippoſelinum Theophraſti ſive ſmyrnium Dioſcoridis. C. B. P. 154. *Common Alexanders, or Aliſanders.*
2. Smyrnium (*Rotundifolium*) foliis caulinis orbiculatis integerrimis amplexicaulibus. *Smyrnium with orbicular leaves on the ſtalks which embrace them.* Smyrnium peregrinum rotundo folio. C. B. P. 152. *Foreign Alexanders with a round entire leaf.*
3. Smyrnium (*Perfoliatum*) foliis caulinis ſimplicibus amplexicaulibus. Lin. Sp. 376. *Alexanders with ſimple leaves which embrace the ſtalks.* Smyrnium peregrinum folio oblongo. C. B. P. 154. *Foreign Alexanders with an oblong leaf.*
4. Smyrnium (*Creticum*) foliis caulinis ternatis ſerratis, ſummis oppoſitis ſeſſilibus, *Alexanders with lower leaves by threes which are ſawed, and thoſe at the top by pairs ſitting cloſe to the ſtalks.* Smyrnium Creticum paludapi folio. Tourn. Cor. 22. *Cretan Alexanders with a Smallage leaf.*
5. Smyrnium (*Integerrimum*) foliis caulinis duplicato ternatis integerrimis. Lin. Sp. Plant. 263. *Alexanders with double trifoliate leaves on the ſtalks, which are entire.*

The firſt ſort grows naturally on the rocks by the ſea-ſhore in Wales, the North of England, and in Scotland. It is alſo found growing wild in many places near London, but here it may be ſuppoſed to have been thrown out of gardens; for as it was formerly cultivated in gardens for the table, ſo the ſeeds may have been ſcattered, which will grow wherever they alight.

The lower leaves of this plant reſemble thoſe of Smallage, but they are much larger; the lobes are rounder, and are ſawed on their edges. The ſtalks riſe from three to four feet high, which are furrowed, and branch into many diviſions; theſe are garniſhed with trifoliate leaves of the ſame ſhape and form with the lower, but are ſmaller. The branches are terminated by large umbels of white flowers, which appear in June, and are ſucceeded by large roundiſh fruit, containing two moon-ſhaped ſeeds which ripen in Auguſt, and then the plant decays. The whole plant has a ſtrong warm taſte.

The ſecond ſort grows naturally in Sicily and Crete; the lower leaves of this ſort are decompounded of ſmall leaves, which divide by threes; their lobes are oval and indented on their edges; the ſtalk is ſmooth, hollow, and riſes three feet high, dividing toward the top into two or three branches; at each joint is placed one large orbicular leaf, whoſe baſe embraces the ſtalk; theſe are of a yellow green colour, and their edges are entire; the branches are terminated by ſmall umbels of yellowiſh flowers, whoſe ſmaller umbels or rays are of unequal lengths. The ſeeds are black and ſhaped like thoſe of the former, but are ſmaller.

The third ſort grows naturally in Crete; the lower leaves of this are larger than thoſe of the former, but are compoſed of ſeveral winged diviſions. The ſtalk does not riſe ſo high as that of the laſt mentioned, but is angular and not ſo hollow; the leaves upon the ſtalks are much larger; they are of the heart-ſhaped oval kind, and are indented on their edges, and embrace the ſtalks with their baſe; their colour is nearly the ſame with the former, but they are of a thinner texture. The umbels of flowers are ſmaller, as are alſo the ſeeds.

Theſe two ſorts have been frequently blended together by botaniſts, who have ſuppoſed they were but one ſpecies; but I have cultivated both many years, and have not found either of them alter.

The

The fourth sort grows naturally in Crete; the lower leaves of this are smaller than those of the first sort, and are more like those of Smallage; the stalk rises higher, and grows more erect than those of the first; the leaves on the lower part of the stalk are large, and sawed on their edges; they stand by threes round the stalk at the joints; their base set close, having no foot-stalks; the upper part of the stalk and branches are garnished with leaves of the same form, which stand by pairs. The umbels of flowers are much smaller, and the seeds are less.

These sorts are most of them biennial, perishing after their seeds are ripe; they flower in June, and their seeds ripen in August.

The first of these sorts is that ordered by the college for medicinal use, but is seldom now prescribed; and at present is seldom cultivated in gardens, though formerly it was greatly used in the kitchen, before Celery was so much cultivated, which hath taken place of Alexanders, and entirely supplanted it. The other sorts are preserved in botanic gardens for variety, but may either of them be cultivated for the use of the kitchen. The second sort is much preferable to the first for blanching, as I have tried, and will be tenderer, and not quite so strong.

All these plants may be propagated by sowing their seeds upon an open spot of ground in August, as soon as they are ripe; for if they are preserved till spring, they often miscarry, or at least do not come up until the second year; whereas those sown in autumn rarely fail of coming up in the spring, and will make much stronger plants than the other.

The common sort, when cultivated for the table, should be treated in the following manner:

In the spring the plants should be hoed out, so as to leave them ten inches or a foot apart each way; and, during the following summer, they must be constantly cleared from weeds, which, if permitted to grow amongst them, will draw them up slender, and render them good for little. In February following the plants will shoot up again vigorously, at which time the earth must be drawn up to each plant, to blanch them, and in three weeks after they will be fit for use, when they may be dug up, and the white part preserved, which may be stewed and eaten as Celery.

SNAP-DRAGON. See ANTIRRHINUM.

SNEEZWORT. See ACHILLEA.

SNOW is defined to be a meteor formed in the middle region of the air, of vapour raised by the action of the sun, or subterraneous fire there congealed, its parts constipated, its specific gravity increased, and thus returned to the earth in the form of little villi or flakes.

The Snow we receive may properly enough be ascribed to the coldness of the atmosphere through which it falls; when the atmosphere is warm enough to dissolve the Snow before it arrives at us, we call it rain; if it preserves itself undissolved, we call it Snow.

Snow is very useful; it fructifies the ground; it guards Corn, or other vegetables from the intenser cold of the air, especially the cold piercing winds.

It is supposed to abound with salific and fertile particles, as much or more than rain; however, it is accounted more ponderous, and by that means sinks deeper into the ground than rain does, and therefore is in some cases of more benefit to planting; for which reason, some lay heaps of Snow round the feet of their forest-trees, especially in hot burning lands.

Monf. le Clerc says, that some parts of a cloud which should turn to rain, are sometimes prevented by the cold, and formed into a consistence which we call Snow, which appears to be formed from watery particles, from hence, that when it dissolves, it turns into water; so that we may easily conceive Snow to be made of watery particles, hardened by cold and gathered into flakes, in such a manner as to leave large interstices between one another; which Snow is not transparent, as the water, because the more rigid particles, being huddled together by chance, do not leave strait pores between one another, and so keep out the matter of light.

But when it happens, that the region of the air under the cloud is very cold, the drops of rain are congealed as they fall, and come down in lumps, which are called hail; and these lumps are greater or less, according to the bigness of the rain drops of which they are formed, and these lumps of hail are also variously figured.

Dr. Grew, in a discourse of the nature of Snow, observes, that many parts thereof are of a regular figure, for the most part, being, as it were, so many little rowels or stars, of perfect transparent ice; upon each of which points are set other collateral points, at the same angles as the main points themselves; amongst these are divers other irregular, which are chiefly broken points and fragments of the regular ones; others also, by various winds, seem to have been thawed, and frozen again into irregular clusters, so that it seems as if the whole body of Snow were one entire mass of icicles irregularly figured; that is, a cloud of vapours being gathered into drops, the said drops do forthwith descend, and in their descent meeting with a freezing air as they pass through a colder region, each drop is immediately frozen into an icicle, shooting itself forth into several points; but still continuing to descend, and meeting with some intermitting gales of warmer air, or by their being continually wafted to and fro, touching upon one another, some are a little thawed, blunted, and again frozen into clusters, or entangled, so as to fall again into what we call flakes; although Snow is firm ice, and the lightness of it is owing to the excess of its surface, in comparison to the matter contained in it; as gold itself may be extended in surface, till it will ride upon the least breath of air.

SNOWDROP. See GALANTHUS.

SOIL. See EARTH.

SOLANOIDES. See PIERCEA.

SOLANUM. Tourn. Inst. R. H. 148. tab. 62. Lin. Gen. Plant. 224. [so called of solari, *Lat.* to comfort, because this plant sweetens the humours.] Nightshade; in French, *Morelle*.

The CHARACTERS are,

*The empalement of the flower is permanent, of one leaf, cut half through into five acute segments. The flower has one wheel-shaped petal, having a very short tube; the brim is large, spreading, and five-pointed. It has five small awl-shaped stamina, terminated by oblong summits which stand together, and a roundish germen supporting a slender style longer than the stamina, crowned by an obtuse stigma. The germen afterward turns to a roundish berry with two cells, having a convex fleshy receptacle, and filled with roundish compressed seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and one style.

The SPECIES are,

1. SOLANUM (*Nigrum*) caule inermi herbaceo, foliis ovatis decemangularibus umbellis nutantibus. Lin. Sp. 266. *Nightshade with an herbaceous unarmed stalk, having ten angles and nodding umbels.* Solanum officinarum, acinis nigricantibus. C. B. P. 166. *Common Nightshade of the shops with a black fruit.*

2. SOLANUM (*Villosum*) caule inermi herbaceo ramis teretibus foliis angulatis, umbellis nutantibus. *Nightshade with a woolly, herbaceous, unarmed stalk, oval indented leaves which are taper, and nodding umbels.* Solanum officinarum, acinis puniceis. C. B. P. 166. *Nightshade with red fruit.*

3. SOLANUM (*Luteum*) caule inermi herbaceo, foliis ovato-lanceolatis acuminatis tomentosis, umbellis nutantibus. *Nightshade with an herbaceous unarmed stalk, oval, spear-shaped, acute-pointed, indented, woolly leaves, and nodding umbels.* Solanum officinarum, acinis luteis. C. B. P. 166. *Nightshade with yellow berries.*

4. SOLANUM (*Rubrum*) caule inermi herbaceo glabro, foliis oblongo-ovatis acuminatis dentatis glabris, umbellis nutantibus. *Nightshade with an herbaceous, unarmed,*

*armed, smooth stalk, oblong, oval, acute-pointed, indented leaves, and nodding umbels.* Solanum Americanum, vulgari simile, acinis rubris. Rand. *American Nightshade like the common sort, with red berries.*

5. Solanum (*Americanum*) caule inermi herbaceo, foliis ovatis acuminatis glabris, umbellis erectis. *Nightshade with an herbaceous unarmed stalk, oval, acute-pointed, smooth leaves, and erect umbels.* Solanum Americanum vulgari simile, flore parvo purpurascente, acinis nigricantibus minioribus. Rand. *American Nightshade like the common sort, with a small purplish flower, and smaller black berries.*

6. Solanum (*Scabrum*) caule herbaceo subaculeato, foliis ovatis obtusis integerrimis, petiolis longissimis, umbellis nutantibus. *Nightshade with an herbaceous stalk a little prickly, oval, obtuse, entire leaves on very long foot-stalks, and nodding umbels.* Solanum nigrum vulgari simile, caulibus exasperatis. Hort. Elth. 368. *Black Nightshade like the common sort, with rough stalks.*

7. Solanum (*Guineense*) caule inermi herbaceo, foliis oblongo-ovatis acuminatis glabris subdentatis, umbellis nutantibus. *Nightshade with an herbaceous, angular, unarmed stalk, oblong, oval, acute-pointed, smooth leaves a little indented, and nodding umbels.* Solanum Guineense, fructu magno instar cerasi nigerrimo umbellato. Boerh. Ind. alt. 2. p. 68. *Nightshade from Guinea, with a large fruit like black Cherries, in umbels.*

8. Solanum (*Dulcamara*) caule inermi frutescente flexuoso, foliis superioribus hastatis, racemis cymosis. Hort. Cliff. 60. *Nightshade with a shrubby, bended, unarmed stalk, the upper leaves spear-shaped, and bunches of flowers at the top of the stalk.* Solanum scandens, seu dulcamara. C. B. P. 166. *Perennial climbing Nightshade, commonly called Bitter-sweet.*

9. Solanum (*Pseudocapsicum*) caule inermi fruticoso, foliis lanceolatis repandis, umbellis sessilibus. Lin. Sp. Plant. 184. *Nightshade with a shrubby unarmed stalk, spear-shaped leaves turning inward, and the umbels sitting close to the stalks.* Solanum fruticosum bacciferum. C. B. P. 167. *Shrubby berry-bearing Nightshade, commonly called Amomum Plinii.*

10. Solanum (*Igneum*) caule aculeato fruticoso, foliis lanceolatis anguloso-dentatis. Hort. Cliff. 61. *Nightshade with a shrubby prickly stalk, and spear-shaped leaves which are angularly indented.* Solanum spiniferum frutescens, spinis igneis, Americanum. Pluk. Phyt. tab. 225. fig. 5. *Shrubby and thorny American Nightshade, with fire-coloured thorns.*

11. Solanum (*Tomentosum*) caule aculeato fruticoso, foliis ovatis dentato-angulatis utrinque tomentosis, pedunculis spinosis. *Nightshade with a shrubby prickly stalk, oval, angular, indented leaves, woolly on every side, and prickly foot-stalks to the flowers.* Solanum spinosum, maxime tomentosum. Bocc. Rar. Plant. *Thorny Nightshade, very much covered with a wool or down.*

12. Solanum (*Sodomæum*) caule aculeato fruticoso, foliis pinnato-laciniatis obtusis utrinque aculeatis. *Nightshade with a shrubby prickly stalk, wing-pointed leaves which are obtuse, and have spines on both sides.* Solanum pomiferum frutescens Africanum spinosum nigricans, flore boraginis, foliis profunde laciniatis. H. L. *Shrubby African Apple-bearing Nightshade with black thorns, a flower like Borage, and deeply jagged leaves, commonly called Pomum Amoris.*

13. Solanum (*Indicum*) caule aculeato fruticoso, foliis cuneiformibus angulatis subvillosis. *Nightshade with a shrubby prickly stalk, angular, indented, woolly leaves, and the flowers in long bunches at the wings of the stalk.* Solanum Indicum spinosum boraginis flore. Icon. Robert. H. R. Par. *Prickly Indian Nightshade with a flower like Borage.*

14. Solanum (*Acanthifolium*) caule aculeato herbaceo, foliis sinuatis utrinque aculeatis, umbellis erectis, calycibus echinatis. *Nightshade with a prickly herbaceous stalk, sinuated leaves armed with spines on both sides, upright umbels, and very prickly empalements.* Solanum Americanum spinosum herbaceum, acanthi folio, flore amplo cæruleo. Houst. MSS. *Prickly, herbaceous, American Nightshade, with a Bear's-breech leaf and a large blue flower.*

15. Solanum (*Angustifolium*) caule aculeato fruticoso, foliis pinnato-laciniatis tomentosis, utrinque aculeatis, pedunculis axillaribus bifloris. *Nightshade with a prickly shrubby stalk, wing-cut leaves which are woolly, and prickly on both sides, and foot-stalks with two flowers at the wings of the stalks.* Solanum Americanum spinosissimum herbaceum, anguriæ folio, flore luteo. Houst. *The most prickly American Nightshade, with a Water Melon leaf and a yellow flower.*

16. Solanum (*Quercifolium*) caule aculeato fruticoso, foliis oblongis sinuato-pinnatis, aculeatis, umbellis sessilibus. *Nightshade with a prickly shrubby stalk, oblong, wing-sinuated, prickly leaves, and umbels sitting close to the stalks.* Solanum Americanum frutescens, & spinosum, quercus folio, baccis rubris. Houst. MSS. *Shrubby, prickly, American Nightshade, with an Oak leaf and red berries.*

17. Solanum (*Jamaicense*) caule aculeato fruticoso, foliis ovatis tomentosis, angulosa-sinuatis subaculatis, umbellis sessilibus. *Nightshade with a prickly shrubby stalk, oval, woolly, angular, sinuated leaves a little prickly, and umbels sitting close to the stalks.* Solanum Americanum bacciferum, caule & foliis tomentosis incanis spinosis, flore luteo fructu croceo. Sloan. Cat. 108. *Berry-bearing American Nightshade with hoary stalks and leaves, a yellow flower, and Saffron-coloured fruit.*

18. Solanum (*Fruticosum*) caule aculeato fruticoso, foliis laneeolatis subdentatis glabris, racemis longioribus axillaribus. *Nightshade with a prickly shrubby stalk, smooth spear-shaped leaves a little indented, and longer bunches of flowers from the wings of the stalk.* Solanum Americanum fruticosum bacciferum spinosum, flore cæruleo. Sloan.Cat. 108. *Shrubby, berry-bearing, American Nightshade with a blue flower.*

19. Solanum (*Scandens*) caule inermi frutescente flexuoso, foliis ovatis subtus tomentosis, floribus solitaris alaribus. *Nightshade with a shrubby, bending, unarmed stalk, oval leaves which are woolly on their under side, and flowers growing singly from the wings of the stalk.* Solanum Americanum, scandens & frutescens, flore magno cæruleo, fructu rubro. Houst. MSS. *Shrubby, climbing, American Nightshade, with a large blue flower and a red fruit.*

20. Solanum (*Laurifolium*) caule inermi fruticoso, foliis ovato-acuminatis integerrimis, subtus tomentosis, umbellis erectis alaribus & terminalibus. *Nightshade with a shrubby unarmed stalk, oval, acute-pointed, entire leaves, which are woolly on their under side, and erect umbels from the wings and the top of the branches.* Solanum Americanum frutescens, non spinosum, lauri folio, flore racemoso cæruleo. Houst. MSS. *Smooth, shrubby, American Nightshade with a Bay leaf, and blue flowers growing in clusters.*

21. Solanum (*Caroliniense*) caule aculeato fruticoso, foliis ovatis sinuato-dentatis subtus tomentosis, aculeis utrinque rectis, umbellis sessilibus terminalibus. *Nightshade with a prickly shrubby stalk, oval, sinuated, indented leaves which are woolly on their under side, the spines every way strait, and umbels sitting close at the end of the branches.* Solanum Americanum frutescens & spinosum, foliis infra tomentosis, flore magno cæruleo. Houst. MSS. *Shrubby and prickly American Nightshade, with leaves which are hoary underneath, and a large blue flower.*

22. Solanum (*Verbascifolium*) caule inermi fruticoso, foliis ovato-lanceolatis integerrimis subtus tomentosis, umbellis erectis pedunculis longissimis. *Nightshade with a shrubby unarmed stalk, oval, spear-shaped, entire leaves which are woolly on their under side, and erect umbels having very long foot-stalks.* Solanum Americanum arborescens, verbasci folio, fructu flavascente majori. Plum. Cat. 4. *Tree-like American Nightshade with a Mullein leaf, and a larger yellow fruit.*

23. Solanum (*Bonariense*) caule frutescente subinermi, foliis cuneiformibus sinuato repandis. Lin. Sp. Plant. 185. *Nightshade with a shrubby almost unarmed stalk, and wedge-shaped leaves which are sinuated and turn backward.* Solanum Bonariense arborescens, papas floribus.

floribus. Hort. Elth. 364. *Tree-like Nightshade of Buenos Ayres, with flowers like the Potatoe.*

24. Solanum (*Bahamense*) caule frutescente inermi, foliis lanceolatis sinuato-dentatis glabris, umbellis erectis. *Nightshade with a shrubby unarmed stalk, spear-shaped, sinuated, indented, smooth leaves, and erect umbels.* Solanum Bahamense arborescens, folio sinuato. Hort. Elth. 363. *Tree-like Nightshade from the Bahama Islands, with a sinuated leaf.*

25. Solanum (*Sempervirens*) caule inermi fruticoso, foliis integerrimis, pedunculis lateralibus filiformibus. Lin. Sp. Plant. 185. *Nightshade with a shrubby unarmed stalk, oval entire leaves, and thread-like foot-stalks to the flowers, proceeding from the side of the branches.* Solanum lignosum Africanum sempervirens, laurinis foliis. H. Amst. 2. p. 191. *Woody, evergreen, African Nightshade, with Bay leaves.*

26. Solanum (*Africanum*) caule inermi frutescente flexuoso, foliis ovatis subdentatis crassis. *Nightshade with a shrubby, flexible, unarmed stalk, and oval thick leaves somewhat indented.* Solanum dulcamarum Africanum, foliis crassis hirsutis. Hort. Elth. 365. *Climbing African Nightshade with hairy thick leaves.*

27. Solanum (*Umbellatum*) caule frutescente inermi, foliis lanceolatis integerrimis subtus pilosis, umbellis erectis terminalibus. *Nightshade with a shrubby unarmed stalk, spear-shaped entire leaves which are hairy on their under side, and erect umbels terminating the branches.* Solanum Americanum frutescens non spinosum, foliis oblongis subtus incanis, floribus umbellatis. Houst. *American shrubby Nightshade without thorns, oblong leaves hoary on their under sides, and flowers in umbels.*

28. Solanum (*Racemosum*) caule inermi fruticoso, foliis ovato integerrimis, subtus tomentosis, umbellis erectis terminalibus, calycibus obtusis lanuginosis. *Nightshade with a shrubby unarmed stalk, oval entire leaves which are woolly on their under side, erect umbels terminating the branches, and downy obtuse empalements.* Solanum Americanum fruticosum glabrum, foliis subrotundis subtus incanis, floribus racemosis. Houst. MSS. *Smooth, shrubby, American Nightshade with roundish leaves which are hoary on their under side, and branching flowers.*

29. Solanum (*Trilobatum*) caule aculeato fruticoso, foliis cuneiformibus subtrilobis glabris obtusis inermibus. Lin. Sp. Plant. 270. *Nightshade with a prickly shrubby stalk, leaves with sinuated indentures, bunches of flowers on the side of the branches, and the spines every where recurved.* Solanum spinosum, Jamaicense glabrum, foliis parvis minus profunde laciniatis. Pluk. Phyt. 316. fig. 5. *Prickly Jamaica Nightshade, whose small leaves are less deeply cut.*

30. Solanum (*Virginianum*) caule aculeato herbaceo, foliis pinnatifidis utrinque aculeatis, laciniis sinuatis obtusis, calycibus aculeatis. Lin. Sp. Plant. 267. *Nightshade with a prickly herbaceous stalk, wing-pointed leaves which are armed with spines on both sides, and prickly empalements.* Solanum annuum nigricans Virginianum spinosissimum latè se spargens, flore cæruleo glabrum. Pluk. Phyt. 62. fig. 3. *Black, annual, Virginia Nightshade which is the most prickly, having a blue smooth flower.*

31. Solanum (*Mammosum*) caule aculeato herbaceo, foliis cordatis quinquelobis, utrinque villosis aculeatis. Vir. Cliff. 15. *Nightshade with a prickly herbaceous stalk, and heart-shaped leaves with five lobes, which are hairy and prickly on both sides.* Solanum Barbadense spinosum annuum, fructu aureo rotundiore pyri parvi inverso forma & magnitudine. Pluk. Phyt. tab. 225. fig. 1. *Annual, prickly, Barbadoes Nightshade, with a rounder golden fruit of the form and size of a small Pear inverted, commonly called Bachelor's Pear.*

32. Solanum (*Schiru-schuna*) caule aculeato, foliis pinnato-sinuatis, fructu racemoso. *Nightshade with a prickly stalk, sinuated wing-like leaves, and fruit growing in a long bunch.*

The first sort is now very common upon dunghills, and on rich cultivated soils in many parts of England, where it often becomes a very troublesome weed. This is the sort which the College of Physicians have directed to be used in medicine, under the title of Solanum hortense: and although it is now become a very troublesome weed in many gardens near London, yet it is not a native of this country, but is supposed to have been brought originally from America, from whence the greater part of the species of this genus have been introduced into Europe.

There are two varieties of this which are found growing naturally in England. The most common sort is an upright branching plant with oval, acute-pointed, smooth leaves, and black berries. The other is a low branching plant with indented leaves, and greenish yellow berries; but whether these are only varieties, or distinct species I cannot say, though I have sown their seeds separately, and have found them keep their difference one year, but do not know if they will continue it always.

The second sort rises with an erect branching stalk three feet high; the leaves are oval, angular, indented, and smooth; the flowers are produced in roundish bunches in form of umbels; they are white, having five star-pointed petals which spread open and are reflexed; in the center are five stamina, which are terminated by oblong yellow summits standing close together; after the flowers are past, the germen swell to round pulpy berries of a yellow colour, having nodding umbels on the side of the branches; the flowers appear in July, and the seeds ripen in autumn. I have several times received the seeds of this sort from Barbadoes, where it is supposed to grow naturally.

The third sort rises with hairy branching stalks two feet and a half high; the leaves are woolly, oval, spear-shaped, acute-pointed, and indented on their edges; the flowers are like those of the former sort, and the berries are of the same size and shape, but are of a red colour; this flowers and ripens its berries at the same time with the former. The seeds of this came from America. The seeds of the fourth sort came from the West-Indies; this hath taller and smoother stalks than either of the former; the leaves are of a dark green and are smooth; they are oval, acute-pointed, and indented on their edges in angular indentures; the flowers are produced in nodding umbels on the side of the branches, which are succeeded by smooth red berries; this flowers at the same time with the former sorts.

The fifth sort grows naturally in Virginia; the stalks of this are angular, and rise upward of three feet high, dividing into a few slender branches, which spread from each other, and are garnished with oval, acute-pointed, smooth leaves, of a deep green colour; they have a few indentures on their edges; the flowers are very small, and there are but few in each umbel; they have narrow acute-pointed petals, white on the inside, and purplish without; they appear in August, and are succeeded by small black berries which ripen late in autumn.

The sixth sort grows naturally in North America. The stalks of this sort rise three feet high, and divide into spreading branches; they are angular, furrowed, and have a few short spines; the leaves are oval and entire; they are six inches long, and five broad, of a dark green colour, and have long foot-stalks; the flowers come out from the side of the branches in small umbels, which nod on one side; they are small, white, and star-pointed, and are succeeded by small black berries which ripen late in autumn.

The seventh sort grows naturally in Guinea. This rises with a strong, thick, herbaceous, angular stalk two feet and a half high, dividing into short thick branches, which are garnished with oblong, oval, smooth leaves, near five inches long, and three and a half broad, which have a few indentures, and stand upon pretty long foot-stalks. The flowers are produced in nodding umbels from the side of the stalk; they are like those of the first sort, but are larger. These are succeeded by large black berries the size of

of the common black Cherry, which ripens in autumn.

These seven sorts are annual, so their seeds should be sown in the spring, on a bed of rich earth where the plants are designed to remain, and when they come up they must be thinned, leaving them at least two feet distance, that they may have room to grow, after this they will require no farther care but to keep them clean from weeds; in July and August they will flower, and the seeds will ripen in autumn. Some people plant one or two plants of each sort in pots, whose stalks they train up to sticks to make them strait; and in autumn they remove the pots into the green-house, where they may be preserved till the spring, and during the winter, their fruit being ripe, will make a pretty appearance.

The eighth sort is a climbing woody plant, which grows in the hedges in divers parts of England, and is by some planted in gardens, to cover arbours, or shady walls, in London, and other close places, where few other plants will thrive. The cuttings or stalks of this are put into glasses of water, and placed in rooms, where they will put out branches and leaves, and continue a long time green. This plant is also used in medicine for some particular preparations; but the herbfolks in the markets often sell this instead of the Garden Nightshade, which is a cooling plant, and this a hot acrid one, which renders it contrary to the intention of the ointment, wherein Nightshade is one of the ingredients.

There is a sort of this with white flowers, which is supposed to be a variety of the former, but the leaves are woolly, in which it differs from the other, and this is constant. There is also one with variegated leaves, which is preserved by those who are very curious in collecting the various kinds of striped-leaved plants.

These may be easily propagated by laying down their branches, or by planting their cuttings in the spring upon a moist soil, where they will soon take root, and may afterward be transplanted where they are to remain.

The ninth sort grows naturally at the Madeiras; this rises with a strong woody stalk four or five feet high, and divides into many slender stiff branches, which are garnished with spear-shaped leaves turning backward. The flowers grow in small umbels, or singly on the side of the branches, to which they sit close; these are white, with yellow summits, and appear in June, July, and August, and are succeeded by berries as large as small Cherries which ripen in winter, when they make a good appearance in the green-house. There are two varieties of this, one with red, and the other has a yellowish fruit.

This plant may be propagated by sowing its seeds in a pot of rich earth in the spring, placing it upon a moderate hot-bed, which will greatly facilitate their growth; the earth in the pot should be frequently watered, for if it is kept too dry the seeds will not grow. When the plants are come up, you should make a gentle hot-bed, which must be covered with rich earth about six inches thick; in this they should be planted about six inches distance each way, and the bed arched over with hoops, &c. and covered with mats, to shade them from the sun and cold, observing frequently to water them.

When the plants have acquired strength, and the season becomes favourable, you must inure them to bear the open air by degrees, to which they should be fully exposed in June, when they should be taken up, with a ball of earth to the root of each plant, and placed separately in pots filled with rich earth, which must be set in a shady situation, and frequently watered until they have taken new root; after which they may be removed into a more open exposure, and placed among other exotic plants, but they require a great plenty of water in dry weather, without which they seldom produce much fruit.

In winter they must be removed into the green-house, and placed in the coldest part of the house, where they may have as much free air as possible in mild weather; being so hardy as many times to endure the cold of our ordinary winters abroad, when planted in a warm situation, so that they only require to be sheltered from severe frost.

These plants should be annually shifted about the latter end of April, when their roots should be pared round, cutting off all the mouldy fibres which were next the pot, and the pots filled up with fresh rich earth, which will strengthen their flowers, and cause them to produce plenty of fruit; which (as I said before) ripens in winter, and being of the shape and size of Cherries, are commonly called Winter Cherries by the gardeners.

The tenth sort grows naturally in the West-Indies; this rises with a shrubby stalk three feet high, dividing at the top into several branches, which are closely armed with strait gold-coloured spines on every side. The leaves are from two to three inches long, and three quarters of an inch broad, having a few angular indentures, and their midrib is armed with a row of the like spines as those upon the stalks, which stand erect. The flowers are produced in long bunches from the side of the stalks; they are white, and of the same size as those of the ninth, which are succeeded by red berries almost as large as the small black Cherry.

The tenth sort is much tenderer than either of the former, being brought from the warm parts of America. This is propagated by sowing the seeds in the spring, upon a good hot-bed; and when the plants are come up, they should be each transplanted into a separate small pot filled with rich earth, and plunged into a fresh hot-bed again, observing to water and shade them until they have taken root; after which, they should have air and water in proportion to the heat of the season, and the bed in which they are placed; and when their roots have filled the pots in which they were planted (which they will do in two months time, if they thrive) they must be shaken out, and after having gently pared off the fibres which grew next the pot, they should be planted into pots of a size larger, which must be filled with fresh rich earth, and plunged into a fresh hot-bed to bring the plants forward, observing to water them frequently, for they will not thrive without plenty of moisture in warm weather.

In July these plants may be inured to bear the open air by degrees, into which they may be removed if the season be warm; but otherwise they must always be preserved either under glasses, or in the stove; and if they are placed in the open air, they should not remain there longer than the middle or latter end of August, lest the nights growing cold, should hurt them. During the winter season they must be preserved in the stove, observing to refresh them frequently with water, but they must not have too much each time, especially in cold weather. The second year they will produce flowers and fruit.

The eleventh sort has a shrubby stalk which rises two feet high, and divides into several woody branches which are armed with sharp thorns, and garnished with oval woolly leaves which have angular indentures on their edges; they are an inch and a half long, and more than an inch broad. The flowers are produced in loose small bunches from the wings of the stalks; they are blue, and larger than those of the former sorts; these appear in June and July, and are succeeded by round berries as large as common Cherries, of a gold colour, which turn black when ripe.

The twelfth sort grows naturally at the Cape of Good Hope; this hath a strong, thick, shrubby stalk, which rises from two to three feet high, sending out many short thick branches, which are closely armed with short, strong, yellow spines on every side; the leaves are about four inches long, and two broad; they are cut almost to their midrib in obtuse segments which are opposite, regular, and formed like winged leaves; these segments have several obtuse indentures on their edges;

edges; they are of a dark green colour, and are armed with the same sort of spines as those on the stalks, on both sides. The flowers come out in small bunches on the side of the branches; they are blue, and larger than those of the former sort; these appear in June and July, and are succeeded by round yellow berries as large as Walnuts, which ripen in winter.

The eleventh and twelfth sorts are not so tender as the tenth, but require an open airy glass-case, or a warm green-house in winter, but in summer may be exposed in the open air with other exotic plants. These may be propagated by sowing their seeds on a hot-bed as the former, and should be managed as hath been directed for them; with this difference, that they may be much sooner exposed to the air, and should not be bred so tenderly. These are preserved for their odd appearance, by such as are curious in cultivating exotic plants; their fruits being ripe in winter, afford a variety in the green-house, and their leaves and flowers being very remarkable in their colour, shape, &c. render them worthy of a place in every good collection of plants.

The thirteenth sort hath a shrubby stalk which rises two or three feet high, sending out several ligneous branches, which are armed with short, strong, yellowish spines; the leaves are an inch and a half long, and an inch broad, woolly on both sides, and are angularly indented. These are armed with spines on both sides, in a row on the midrib. The flowers come out in longish bunches from the side of the stalks; they are blue, and like those of the twelfth; they appear in June and July, and are succeeded by round berries of a gold colour as large as Cherries, which ripen in winter.

The fourteenth sort was discovered by the late Dr. Houstoun at La Vera Cruz in New Spain, growing naturally there, from whence he sent the seeds to England, which succeeded in the Chelsea Garden. This rises with a prickly herbaceous stalk near two feet high, dividing into two or three branches, which are closely armed with slender yellow spines of unequal lengths. The leaves are six inches long, and three inches and a half broad, of a bright green colour, and deeply sinuated; the veins of the leaves are armed with yellow erect spines on both sides. The umbels of flowers stand erect at the end of the branches; the flowers are very large, and of a fine blue colour; these are succeeded by round berries as large as common Cherries, which are marbled with white and green. The empalement of the flower is armed with spines like a hedge-hog. It flowers in July and August, but the fruit ripens late in the autumn, so that unless the plants are brought forward in the spring, they will not produce ripe seeds in England.

The fifteenth sort grows naturally at La Vera Cruz in New Spain, where the late Dr. Houstoun discovered it. This hath shrubby trailing stalks two feet long, which are armed with long yellow spines, and covered with a gray bark; the leaves are near four inches long, and almost two broad, very finely cut in form of winged leaves almost to their midrib; they are woolly, and armed with long, slender, yellowish spines on their veins on both sides. The foot-stalks of the flowers arise from the wings of the stalks; they are two or three inches long, each for the most part sustaining two large yellow flowers, having very prickly empalements; these are succeeded by small round berries the size of gray Peas, which are marbled with green and white.

The sixteenth sort was discovered by the late Dr. Houstoun, growing at La Vera Cruz; this rises with a shrubby stalk five or six feet high, armed with short recurved spines, and covered with a smooth brownish bark, garnished with oblong leaves six inches long, and two and a half broad, which are regularly sinuated on both edges in form of winged leaves; these rise by two or three from the same point, and stand erect; they are armed with a few short spines along the midrib on both sides. The flowers come out in small loose bunches from the side of the branches, to which they sit close; these are but small; they have five white star-pointed petals, and are succeeded by small berries about the size of those of Juniper, which, when ripe, are red.

The seventeenth sort grows naturally in Jamaica; this rises with a shrubby woolly stalk five or six feet high, armed with short recurved thorns, and garnished with oval woolly leaves six inches long, and four broad, which are angularly sinuated, and have a very few short crooked spines upon the midrib on the under side. The flowers are in small umbels sitting close to the side of the branches; they are small and yellow; these are succeeded by small round berries of a Saffron colour when ripe.

The eighteenth sort grows naturally in Jamaica; this rises with shrubby stalks three or four feet high, dividing into several irregular branches which have a gray bark, and are armed on every side with slender erect spines of a gray colour. The leaves are spear-shaped, an inch and a half long, and half an inch broad; they are smooth, and a little indented or waved on their edges. The flowers come out in long bunches from the side of the stalk, standing upon long foot-stalks; they are of a fine blue colour, and are succeeded by Saffron-coloured berries the size of Peas.

The nineteenth sort was discovered by the late Dr. William Houstoun, growing naturally at La Vera Cruz; this hath a shrubby climbing stalk which rises ten or twelve feet high, covered with a smooth brown bark, and divides into several branches. The leaves are oval, woolly on their under side, but of a dark green on their upper; they are two inches long, and one and a half broad. The flowers come out singly from the wings of the stalk; they are large, of a fine blue colour, and the petal is not divided into segments like those of the other species, but it hath five angles, each ending in a point; these are succeeded by round berries about the size of gray Peas, which are red when ripe.

The twentieth sort was discovered by the late Dr. Houstoun at Campeachy; this rises with a smooth shrubby stalk six or seven feet high, sending out ligneous branches on every side, which have a smooth brown bark, and are garnished with oval acute-pointed leaves which are entire, and woolly on their under side; they are four inches long, and two and a half broad. The flowers are collected into umbels which stand erect; these come out from the side and at the end of the branches; they are of a light blue colour, and are succeeded by round berries the size of small black Cherries, which are yellow when ripe.

The twenty-first sort was discovered by the late Dr. Houstoun at La Vera Cruz; this hath a shrubby stalk which rises four feet high, having a white downy bark, and armed on every side with strait brown spines. The leaves stand three inches asunder; they are oval, and have sinuated indentures; they are two inches long, and one and a quarter broad, woolly on their under side, and have prickly foot-stalks. Their midrib is armed with two or three small spines, sometimes on both sides, and at others but on one. The spines are all erect; the flowers are disposed in an umbel sitting close at the end of the branches; they are large, of a fine blue colour, and have woolly empalements; these are succeeded by round berries the size of large Peas, which are red when ripe.

The twenty-second sort grows naturally at Campeachy; this rises with a woody stalk eight or ten feet high, sending out several ligneous branches which are covered with a gray down, and are furrowed. The leaves are sometimes placed alternately on the branches, and at others are opposite, standing upon pretty long thick foot-stalks; they are seven inches long, and three and a half broad; their edges are entire, and end in acute points, and are woolly on their under side. The flowers terminate the branches in large erect umbels, standing upon long foot-stalks; they

are

are large, white, and have woolly empalements; these are succeeded by berries the size of Cherries, which turn yellow.

The ten last mentioned sorts are propagated by seeds in the same manner as the former, but these being natives of warm countries, must be raised on a hot-bed early in the spring; and when the plants are fit to remove, they must be each planted in a separate small pot filled with fresh rich earth, and plunged into a moderate hot-bed of tanners bark, observing to shade them from the sun until they have taken new root; after which time they should have a large share of fresh air admitted to them in warm weather, and must be frequently watered. Toward the latter end of June it will be proper to harden the plants gradually, and soon after they should be removed into the stove, where they must have as much free air as possible in warm weather, but as the cold approaches in autumn, they must be carefully protected therefrom, and in winter they should be kept in a moderate temperature of warmth, otherwise they will not live in this country.

Some of these sorts will bear to be exposed in the open air in the heat of summer, provided they are placed in a warm situation; but if the season should prove cold, they will not thrive abroad, wherefore it will be better to let them remain in the stove, and open the glasses in front, and at the top of the stove, every day, to admit as much air as possible in hot weather, with which management they will thrive much better than in the open air.

The twenty-third sort grows naturally at Buenos Ayres in the Spanish West-Indies; this rises with a woody stalk ten or twelve feet high, covered with a purplish bark almost smooth. At the top it divides into several branches which grow erect, and are garnished with wedge-shaped leaves which are sinuated. The flowers are produced in large umbels at the end of the branches; they are large, white, and the petal is angular, but not divided at the brim; these appear in July, and are succeeded by small berries which change yellow when they are ripe.

The seeds of the twenty-fourth sort were sent from the Bahama Islands by Mr. Catesby; this rises with a smooth shrubby stalk six or eight feet high, covered with a brown bark, and divides into many branches, which are garnished with spear-shaped leaves three inches and a half long, and one and a half broad; they have a few sinuated indentures on their edges, and end in acute points; they are smooth, and of a light green colour. The flowers are produced in small umbels from the side of the stalks, standing erect; they are pretty large, white, and have their petals cut into five star-pointed segments; these are very rarely succeeded by seeds in England.

The two last mentioned sorts are not so tender as the ten former sorts, so may be treated in the same way as the eleventh and twelfth, by housing them in winter with Oranges and other green-house plants, and in summer place them abroad in a sheltered situation; they may be propagated by cuttings, which, if planted in a shady border during any of the summer months, will take root pretty freely, and may then be taken up and potted, placing them in the shade till they have taken new root, and then they may be treated in the same way as the old plants.

The twenty-fifth sort grows naturally on the coast of Guinea; this has a shrubby stalk which rises seven or eight feet high, dividing into many branches which have a smooth bark. The lower leaves are oblong, oval, about three inches long, and one and a half broad, smooth, of a dark green colour, and stand upon short foot-stalks; the flowers come out from the side of the branches in small bunches, standing upon very slender foot-stalks; they are of the same shape and colour with those of the Amomum Plinii, but are smaller; these are sometimes succeeded by berries about the size of small black Cherries, which are yellow when ripe.

This sort requires a stove in winter, and must not be exposed abroad longer than ten or twelve weeks in the warmest part of summer; it may be propagated by cuttings, which, when planted, must be closely covered with a bell or hand-glass, and shaded from the sun, treating them in the same manner as other cuttings of exotic plants.

The twenty-sixth sort grows naturally at the Cape of Good Hope; this has shrubby flexible stalks, requiring support like our common woody Nightshade, to which the plant has great resemblance, but the leaves are shorter, thicker, and are more indented on their edges: this sort very rarely flowers in England. There are some who have supposed this and our common woody Nightshade to be the same, which is certainly a great mistake, for this sort will not live abroad through the winter in England in any situation, nor does it produce flowers here with any treatment, for there are plants in the Chelsea Garden of several years old, which have been differently managed, and yet have never flowered.

It may be easily propagated by cuttings during any of the summer months, and may be preserved in a green-house in winter, treating it in the same way as the Amomum Plinii.

The twenty-seventh sort was discovered by the late Dr. Houstoun at Campeachy; this rises with a woody stalk ten or twelve feet high, sending out many branches which have a light gray bark, and are smooth. The leaves are spear-shaped, five inches long, and one and a half broad in the middle, drawing to a point at both ends; they are of a deep green on their upper side, but are hoary on their under. The flowers are produced in large umbels at the end of the branches; they are small, star-pointed, and white; their summits, which fill up the mouth of the tube, are purple; these are succeeded by small berries the size of middling Peas, which are yellow when ripe.

The twenty-eighth sort was discovered at Carthagena in New Spain, by the gentleman before-mentioned; this rises with a shrubby stalk, having a light brown bark, which divides into several irregular ligneous branches; these are garnished with oval leaves four inches long, and two and a half broad, smooth, of a dark green on their upper side, but woolly on their under. The flowers are produced in large erect umbels at the end of the branches, which are pretty large, and white, shaped like those of the other sorts; these are suceeded by round berries the size of small Cherries, sitting in the blunt woolly empalement of the flower, which turn yellow when ripe.

The twenty-ninth sort grows naturally in Jamaica, and also at the Capeof Good Hope: this rises with a shrubby prickly stalk five or six feet high, sending out a few branches toward the top, garnished with obtuse leaves which are smooth, and divided into three lobes; the flowers are small, which are succeeded by small berries which rarely ripen in England.

The thirtieth sort grows naturally in Virginia; this is an annual plant, rising with a shrubby prickly stalk about three feet high, sending out a few slender branches, garnished with wing-pointed leaves; the flowers are large, blue, and have prickly empalements; they are succeeded by berries almost the size of black Cherries. If the plants of this sort are brought forward on a hot-bed early in the spring, they will ripen their seeds, otherwise they never produce good seeds in England,

The thirty-first sort grows common in all the West-India islands, where it is called Batchelor's Pear. This rises with a prickly herbaceous stalk three or four feet high; the spines are strong and crooked; the leaves are large, angular, and woolly, and are armed with the like spines; the flowers are produced in bunches from the side of the stalks; they are of a pale blue colour, and are succeeded by yellow fruit the shape and size of a Catharine Pear, but they are inverted. The plant is annual here.

The thirty-second sort grows naturally on the coast of Malabar; this is an annual plant, rising with a prickly stalk

ſtalk near two feet high, ſending out a few branches without order, garniſhed with oblong leaves which are indented like winged leaves; the flowers are produced in long bunches from the ſide of the ſtalks; they are ſmall, white, and are ſucceeded by red berries the ſize of ſmall Cherries, which ripen in the autumn.

The ſeeds of theſe ſhould be ſown the beginning of March upon a hot-bed, and when the plants are fit to remove, they ſhould be planted in ſeparate ſmall pots filled with rich earth, and plunged into a new hot-bed to bring them forward, otherwiſe they will not ripen their ſeeds in England.

SOLDANELLA. Tourn. Inſt. R. H. 82. tab. 16. Lin. Gen. Plant. 182. Soldanel.

The CHARACTERS are,

*The flower has an erect permanent empalement cut into five parts; it has one bell-ſhaped petal ſpreading open gradually. The brim is cut into acute ſegments; it has five awl-ſhaped ſtamina terminated by ſingle ſummits, and a roundiſh germen ſupporting a ſlender ſtyle the length of the petal, which is permanent, and crowned by an obtuſe ſtigma. The germen afterward turns to an oblong taper capſule of one cell, obliquely ſtreaked, and opening at the top with ten indentures, filled with ſmall acute-pointed ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which contains thoſe plants whoſe flowers have five ſtamina and one ſtyle.

We have but one SPECIES of this genus, viz.

SOLDANELLA (*Alpina.*) Hort. Cliff. 49. *Soldanel.* Soldanella Alpina rotundifolia. C. B. P. 295. *Round-leaved Soldanel of the Alps.*

This plant grows naturally on the Alps, and other mountains in Germany. The root is fibrous and perennial; the leaves are almoſt kidney-ſhaped; they are about three quarters of an inch over each way, of a dark green colour, and ſtand upon long foot-ſtalks. Between theſe ariſe the foot-ſtalk of the flower which is naked, about four inches long, ſuſtaining at the top two ſmall open bell-ſhaped flowers, whoſe brim is cut into many fine ſegments like a fringe; the moſt frequent colour of the flower is blue, but it is ſometimes found with a ſnow-white flower. After the flower is paſt, the germen becomes an oval capſule, with the ſtyle coming out at the top, filled with very ſmall acute-pointed ſeeds. It flowers in April, and the ſeeds ripen in July.

There is another variety of this whoſe leaves are leſs round.

The beſt method to propagate theſe plants is by parting their roots, becauſe their ſeeds ſeldom ripen well in England; nor do the ſeeds, which are brought from abroad ſucceed, for they ſeldom grow unleſs they are ſown ſoon after they are ripe.

The ſeaſon for tranſplanting and parting theſe roots is in September, that they may have time to make good roots before winter; for if they are removed in the ſpring, they never flower very ſtrong: and if the ſeaſon ſhould prove dry, the plants will decay, unleſs they are conſtantly ſupplied with water.

The ſoil in which theſe plants thrive beſt, is a ſtrong cool loam, and they muſt have a ſhady ſituation; for if they are expoſed to the ſun they will not live, nor will they thrive in a warm light ſoil. In dry weather theſe plants ſhould be frequently watered, which will cauſe them to flower ſtrongly and make a good increaſe.

If the ſeeds ripen in England, and any perſon is deſirous to propagate the plants that way, they ſhould be ſown in boxes or pots filled with freſh loamy earth ſoon after they are ripe, and the boxes muſt be placed in a ſhady ſituation, and frequently watered in dry weather. The plants will ſometimes appear the ſame autumn the ſeeds are ſown, but more frequently they do not come up till the following ſpring, ſo that the earth muſt not be diſturbed, nor weeds permitted to grow in the boxes. When the plants come up, they muſt be duly watered in dry weather, and conſtantly placed in a ſhady ſituation. The following autumn the plants ſhould be taken out of the boxes, and planted in a ſhady border about ſix or eight inches aſunder, where they may remain to flower; or they may be intermixed with other low Alpine plants in north borders, where they will make an agreeable variety.

SOLIDAGO. Lin. Gen. Plant. 859. Virga aurea. Tourn. Inſt. R. H. 483. tab. 735. Golden Rod, or Saracens Woundwort; in French, *Verge dorée.*

The CHARACTERS are,

*It has a compound flower, made up of hermaphrodite florets and female half florets, incloſed in one oblong imbricated empalement, whoſe ſpikes are narrow, and join together. The hermaphrodite flowers which compoſe the diſk, are funnel-ſhaped, and cut into five points at the brim, which ſpread open; they have five very ſhort hair-like ſtamina terminated by cylindrical ſummits, and a crowned germen ſupporting a ſlender ſtyle as long as the ſtamina, crowned by a bifid open ſtigma. The germen afterward turns to a ſingle ſeed crowned with hairy down. The female half florets are tongue-ſhaped, and indented in three parts; theſe have a crowned germen, with a ſlender ſtyle crowned by two revolving ſtigmas, and are ſucceeded by a ſingle ſeed like the hermaphrodite florets.*

This genus of plants is ranged in the ſecond ſection of Linnæus's nineteenth claſs, which includes thoſe plants whoſe flowers are compoſed of hermaphrodite and female florets which are all fruitful, and the ſtamina and ſtyle are connected.

The SPECIES are,

1. SOLIDAGO (*Latifolia*) caule erecto foliis lanceolatis ſerratis, paniculis corymboſis, lateralibus terminalibuſque. *Woundwort with an erect ſtalk, ſpear-ſhaped ſawed leaves, and flowers in a corymbus on the ſide and at the top of the ſtalk.* Virga aurea latifolia ſerrata. C. B. P. 268. *Broad-leaved ſawed Golden Rod.*
2. SOLIDAGO (*Vulgaris*) caule ſubflexuoſo angulato, racemis paniculatis erectis confertis. Lin. Sp. Plant. 880. *Woundwort with an angular almoſt flexible ſtalk, and erect bunches of flowers in panicles cloſe together.* Virga aurea vulgaris. Park. Theat. 542. *Our common Golden Rod.*
3. SOLIDAGO (*Anguſtifolia*) foliis lineari-lanceolatis ſubintegerrimis, floribus confertis alaribus ſeſſilibus. *Woundwort with linear ſpear-ſhaped leaves almoſt entire, and flowers in cluſters ſitting cloſe at the wings of the ſtalk.* Virga aurea anguſtifolia minus ſerrata. C. B. P. 268. *Narrow-leaved Golden Rod leſs ſawed.*
4. SOLIDAGO (*Minor*) caule paniculato, foliis radicalibus ovatis dentatis, caulinis lanceolatis integerrimis. *Woundwort with a panicled ſtalk, the bottom leaves oval and indented, thoſe on the ſtalks ſpear-ſhaped and entire.* Virga aurea minor, foliis ſerratis utrinque acuminatis. Rand. *Smaller Golden Rod, with ſawed leaves pointed at both ends.*
5. SOLIDAGO (*Minuta*) foliis lineari-lanceolatis ſubſerratis ſubtus incanis floribus paniculatis confertis. *Woundwort with linear ſpear-ſhaped leaves ſlightly ſawed, hoary on their under ſide, and panicled flowers in cluſters.* Virga aurea montana, folio anguſto ſubincano, floſculis conglobatis. Raii Syn. 177. *Mountain Golden Rod with narrow leaves hoary on their under ſide, and flowers in round cluſters.*
6. SOLIDAGO (*Montana*) foliis lanceolatis ſerratis decurrentibus, caule angulato. Le Monier. Sauv. Monſp. 84. *Woundwort with ſpear-ſhaped, ſawed, running leaves, and an angular ſtalk.* Virga aurea montana, latiore folio hirſuto. H. R. Par. *Mountain Golden Rod with a broader hairy leaf.*
7. SOLIDAGO (*Canadenſis*) paniculato-corymboſa, racemis recurvatis, floribus adſcendentibus, foliis trinerviis ſubſerratis ſcabris. Hort. Upſal. 259 *Woundwort with corymbus panicles, recurved ſpikes of flowers riſing above each other, and rough leaves having three veins which are ſlightly ſawed.* Virga aurea anguſtifolia, paniculâ ſpecioſâ Canadenſis. H. R. Par. *Narrow-leaved Canada Golden Rod, with a fine panicle of flowers.*
8. SOLIDAGO (*Altiſſima*) paniculata-corymboſa, racemis recurvatis, floribus adſcendentibus, foliis enerviis ſubintegerrimis. Hort. Upſal. 259. *Woundwort with a corymbus panicle, recurved ſpikes of flowers riſing above each*

*each other, and leaves without veins almost entire.* Virga aurea altissima serotinâ, paniculâ, speciosâ patulâ. Martyn. Cent. 1. 14. *Tallest late Golden Rod, with a spreading panicle.*

9. Solidago (*Pilosa*) caule piloso, foliis lanceolatis serratis scabris sessilibus, racemis recurvatis alaribus, floribus pedunculatis. *Woundwort with a hairy stalk, spear-shaped, sawed, rough leaves sitting close to the stalks, recurved spikes, and flowers upon foot-stalks.* Virga aurea Canadensis hirsuta, paniculâ minus speciosa. Hort. R. Par. *Hairy Canada Golden Rod, with a less beautiful panicle.*

10. Solidago (*Marylandica*) paniculato-corymboso, racemis obtusis patulis, foliis nervosis scabris subintegerrimis. *Woundwort with a corymbus panicle, obtuse spreading spikes, and rough veined leaves almost entire.* Virga aurea Marylandica, spicis florum racemosis, foliis integris scabris. Mart. Dec. 2. *Maryland Golden Rod, with flowers in long bunches and rough entire leaves.*

11. Solidago (*Virginiana*) paniculato-corymbosa, racemis longissimis recurvatis, pedunculis foliosis, foliis lanceolatis serratis scabris. *Woundwort with a corymbus panicle, very long recurved spikes whose foot-stalks are leafy, rough, sawed, spear-shaped leaves.* Virga aurea rugosis foliis Virginiana, paniculâ florum amplissimâ. Pluk. Alm. 390. *Virginia Golden Rod with rough leaves, and an ample panicle of flowers.*

12. Solidago (*Scrophularifolia*) caule flexuoso, foliis ovatis acuminatis serratis, racemis lateralibus simplicibus. Flor. Leyd. Prod. 161. *Woundwort with a flexible stalk, oval, acute-pointed, sawed leaves, and single spikes of flowers at the wings of the stalk.* Virga aurea Canadensis, scrophulariæ folio. Pluk. Phyt. 235. *Canada Golden Rod with a Figwort leaf.*

13. Solidago (*Flexicaulis*) caule flexuoso glabro, foliis ovato-lanceolatis glabris dentatis, racemis brevioribus lateralibus simplicibus. *Woundwort with a smooth flexible stalk, oval, spear-shaped, smooth leaves which are indented, and shorter single spikes of flowers at the wings of the stalk.* Virga aurea Canadensis asterisci folio. Par. Bat. *Canada Golden Rod with a leaf of Asteriscus.*

14. Solidago (*Latissimifolia*) caule erecto glabro, racemis breviaribus lateralibus, foliis nervosis serratis glabris. *Woundwort with a smooth erect stalk, shorter erect spikes of flowers at the wings of the stalk, and smooth, veined, sawed leaves.* Virga aurea Canadensis, latissimo folio glabro. Tourn. Inst. 485. *Canada Golden Rod with the broadest smooth leaf.*

15. Solidago (*Hirsutissimis*) paniculato-corymbosa, racemis recurvatis, caulibus erectis hirsutissimis, foliis lanceolatis serratis acuminatis trinerviis subtus tomentosis. *Woundwort with a corymbus panicle, recurved spikes, very hairy erect stalks, and spear-shaped, sawed, acute-pointed leaves with three veins, woolly on their under side.* Virga aurea Canadensis, altissima, folio subtus incano. Tourn. Inst. 485. *Tallest Canada Golden Rod, with a leaf which is hoary on the under side.*

16. Solidago (*Humilius*) paniculato-corymbosa, racemis compositis recurvatis, foliis linearii-lanceolatis subdentatis sessilibus. *Woundwort with a corymbus panicle, compound recurved spikes, and linear spear-shaped leaves slightly indented, sitting close to the stalks.* Virga aurea humilis, foliis rigidis utrinque acuminatis paniculâ specicosâ. Rand. *Low Golden Rod with stiff leaves pointed at both ends, and a specious panicle of flowers.*

17. Solidago (*Rigida*) caule paniculato, foliis inferioribus ovatis dentatis, petiolis longissimis, superioribus lanceolatis semiamplexicaulibus. *Woundwort with a paniculated stalk, the lower leaves oval and indented, the upper spear-shaped, half embracing the stalk.* Virga aurea Novæ Angliæ, lato rigidoque folio. Par. Bat. *New-England Golden Rod with a broad and stiff leaf.*

18. Solidago (*Mexicana*) caule obliquo, pedunculis erectis foliatis ramosis, foliis lanceolatis integerrimis. Hort. Cliff. 409. *Woundwort with an oblique stalk, branching, erect, leafy foot-stalks, and spear-shaped entire leaves.* Virga aurea Limonii folio, panicula uno versu disposita. Tourn. Inst. 484. *Golden Rod with a Sea Lavender leaf, and a panicle of flowers disposed on one side of the stalk.*

19. Solidago (*Fistulosa*) caule piloso ramoso, racemis paniculatis erectis confertis, foliis hirsutis sessilibus integerrimis. *Woundwort with a hairy branching stalk, erect spikes of flowers in a panicle, and hairy entire leaves sitting close to the stalk.* Virga aurea, floribus fistulosis senecionis instar, foliis angustioribus non serratis. Hist. Oxon. 3. p. 125. *Golden Rod with fistular flowers like Groundsel, and narrow leaves not sawed.*

20. Solidago (*Carnoso*) foliis lanceolatis subcarnosis glaberrimis, margine scabriusculis, panicula corymbosa. Lin. Sp. Plant. 878. *Woundwort with spear-shaped leaves almost fleshy, and very smooth, with rough edges, and a corymbus panicle.* Virga aurea Canadensis, foliis carnosis latioribus. Hist. Oxon. 3. p. 124. *Canada Golden Rod with broad fleshy leaves.*

21. Solidago (*Cæsia*) panicula corymbosa, racemis suprà densioribus, caule glabro lævi. Lin. Sp. Plant. 879. *Woundwort with a corymbus panicle, the spikes growing closer toward the top, and a smooth stalk.* Virga aurea Marylandica cæsia glabra. Hort. Elth. 414. *Smooth Maryland Golden Rod.*

22. Solidago (*Glabra*) foliis lanceolato-linearibus subcarnosis glaberrimis, panicula corymbosa. *Woundwort with narrow, fleshy, very smooth leaves, and a corymbus panicle.* Virga aurea Canadensis, foliis carnosis angustioribus non serratis. Hist. Oxon. 3. p. 125. *Canada Golden Rod with fleshy leaves not sawed.*

23. Solidago (*Noveboracensis*) panicula corymbosa, foliis linearibus glaberrimis sessilibus. *Woundwort with a corymbus panicle, and linear very smooth leaves sitting close to the stalks.* Virga aurea Novaboracensis glabra, caulibus rubentibus foliis angustis glabris. Herm. Flor. 26. *Smooth Golden Rod of New-York, with reddish stalks and narrow smooth leaves.*

24. Solidago (*Integerrima*) caule paniculato racemis brevioribus confertis, foliis linearibus glabris integerrimis. *Woundwort with a paniculated stalk, shorter spikes of flowers in clusters, and narrow, smooth, entire leaves.* Virga aurea Canadensis, angustifolia non serrata. Houst. *Narrow-leaved Canada Golden Rod, with leaves not sawed.*

25. Solidago (*Rugosa*) caule paniculato racemis lateralibus simplicibus pedunculis foliatis foliis lanceolatis scabris integerrimis. *Woundwort with a paniculated stalk, single spikes of flowers from the wings of the stalk, having leafy foot-stalks, and rough, spear-shaped, entire leaves.*

26. Solidago (*Alba*) caule paniculato racemis erectis pedunculis foliatis, inferioribus ovatis serratis nervosis, caulinis lanceolatis integerrimis. *Woundwort with a paniculated stalk, erect spikes of flowers with leafy foot-stalks, the lower leaves oval, sawed, and veined, but those on the stalks spear-shaped and entire.* An? Virga aurea foliis latioribus, floribus in summis virgis albis, spicatim dense dispositis. Clayt. Flor. Virg. 97. *Broad-leaved Golden Rod, with white flowers at the top of the branches disposed in close spikes.*

27. Solidago (*Conferta*) caule paniculato racemis inferioribus simplicibus, summis confertissimis, foliis glabris integerrimis. *Woundwort with a paniculated stalk, the lower spikes simple, those at the top in very close clusters, and entire smooth leaves.*

28. Solidago (*Recurvata*) paniculata corymbosa, racemis inferioribus recurvatis, summis erectis confertis, foliis lanceolatis serratis scabris. *Woundwort with a corymbus panicle, the lower spikes recurved, the upper erect in clusters, and spear-shaped, sawed, rough leaves.*

29. Solidago (*Petiolata*) caule paniculato, racemis confertis, foliis inferioribus lineari-lanceolatis petiolatis, caulinis sessilibus glabris. *Woundwort with a paniculated stalk, clustered spikes of flowers, the lower leaves linear, spear-shaped on foot-stalks, and those on the stalks smooth, sitting close.*

30. Solidago (*Urticifolia*) caule rotundo piloso, foliis ovato lanceolatis crenatis oppositis scabris, racemis brevissimis lateralibus. *Woundwort with a round hairy stalk, oval, spear-shaped, crenated, rough leaves, standing opposite, and very short spikes of flowers at the wings of the stalk.* Virga aurea Americana, urticæ foliis conjugatis rugosis & hirsutis, florum spicis foliosis.

Houst.

Houst. MSS. *American Golden Rod with Nettle leaves by pairs which are rough and hairy, and spikes of flowers between the leaves.*

31. Solidago (*Fruticosa*) caule fruticoso, foliis lanceolatis glabris integerrimis, floribus corymbosis terminalibus. *Woundwort with a shrubby stalk, spear-shaped, smooth, entire leaves, and flowers in a corymbus terminating the stalks.* Virga aurea Americana, fruticosa, Salicis folio, floribus quasi umbellatis. Houst. MSS. *Shrubby American Golden Rod with a Sallow leaf, and flowers as it were in umbels.*

The first sort is not common in England, though that which grows naturally about London is generally taken for it. This grows plentifully about Brabant, and is the most common in Germany. The stalks of this are stiff, of a purplish brown colour, and rise about two feet high. The panicles of flowers come out from the wings, and at the top of the stalks, each flower standing upon a long slender foot-stalk; they are of a pale yellow colour, and appear the beginning of August. The leaves are spear-shaped almost four inches long, and a quarter broad, deeply sawed on their edges, and are of a pale green on their under side.

The second sort is our common Golden Rod about London; the lower leaves of this are oval, spear-shaped, about two inches long, and one broad; they are slightly sawed on their edges, and have pretty long foot-stalks; the stalks are slender, about a foot and a half high, garnished with small, narrow, entire leaves, having no foot-stalks. The flowers are produced in panicled bunches, which are clustered together, forming a thick erect spike; they are yellow, and appear in August and September.

The third sort is frequently found growing naturally in several parts of England; I have often gathered it in the woods near Dulwich in Surry; the stalk is round, smooth, rises a foot and a half high, garnished with narrow spear-shaped leaves about an inch and a quarter long, and an eighth of an inch broad; they are almost entire, and sit close to the stalk. The flowers come out in small clustered bunches at the wings of the stalk, to which they sit very close, and the stalk is terminated by a roundish bunch: as the flowers of this are produced at every joint, the upper half of the stalk, the spikes being short, they do not make so good an appearance as those of the second. It flowers about the same time.

The fourth sort grows naturally in the woods at Hampstead, from whence I have several times taken the roots, and planted them in the garden, where they have continued many years, and have never varied; the lower leaves of this are indented; the stalk seldom rises more than a foot high, branching out almost from the bottom. The branches are terminated by short clustered spikes of yellow flowers which are erect; the leaves on the stalk and branches are very narrow, acute-pointed, and entire.

The fifth sort grows naturally on the mountains in Wales; the lower leaves of this are narrow, spear-shaped, an inch and a half long, and a quarter broad; they are smooth, slightly sawed on their edges, and a little hoary on their under side; the stalk rises about six inches high, it is garnished with the same sort of leaves with those below, but smaller. The flowers grow in roundish clustered spikes at the top of the stalk, which are much larger than those of the common sort, and appear five or six weeks earlier in the season.

The sixth sort grows naturally upon the mountains in the south of France and Italy; the stalk is angular, and has narrow leafy borders; it rises about two feet high; the leaves are spear-shaped, acute-pointed, and sawed; they are three inches long, and one broad, of a pale green on their under side, and hairy; the flowers come out in close thick spikes from the wings of the stalks more than half the length, terminating the stalk in a thick spike; they are yellow, and appear in July.

The seventh sort grows naturally in North America; the stalks are round, smooth, and rise two feet high; they are garnished with narrow rough leaves, having three longitudinal veins; they are two inches and a half long, and a quarter of an inch broad in the middle, ending in acute points sitting close to the stalks, and have sometimes a few slight serratures on their edges. The flowers are gathered in a roundish panicle at the top of the stalk; the lower spikes of flowers are reflexed, but those at the top stand erect, and are joined very close; these are yellow, and appear in July.

The eighth sort grows naturally in North America; the stalks of this are round and smooth; they rise upward of four feet high; the leaves are rough, acute-pointed, and have no veins; they stand closer together on the stalks, and are shorter and broader than those of the seventh; the panicles of flowers are much larger, the spikes much longer, they spread out wider, and are more reflexed. This flowers late in August and September.

The ninth sort grows naturally in North America; the stalks of this are round and hairy; they rise near three feet high, and are closely garnished with rough spear-shaped leaves two inches long, and half an inch broad, slightly sawed on their edges, and sit close to the stalks. The flowers come out from the wings, at the upper part of the stalk, in long recurved spikes; they are small, of a sulphur colour, and stand upon short foot-stalks. This sort flowers the end of July.

The tenth sort grows naturally in North America; the stalks are round, smooth, and rise four or five feet high; they are garnished with rough spear-shaped leaves two inches and a half long, and half an inch broad; they are entire, and sit close to the stalks; the flowers are produced in roundish panicles at the top of the stalks, which are composed of obtuse spreading spikes in close clusters. The flowers are yellow, and appear in August.

The eleventh sort grows naturally in Virginia; the stalks are round, channelled, and rise two feet high; the leaves are rough, acute-pointed, and sawed; they are two inches and a half long, and one broad. The flowers are produced in a panicle at the top of the stalk; the spikes are very long, recurved, and spread out on every side; the lower parts of the foot-stalks are closely furnished with small leaves, and the flowers are in close clusters at the end of the spike; they are of a bright yellow colour, and appear late in September.

The twelfth sort grows naturally in North America; the stalks are slender, smooth, and rise two feet high; they are garnished with oval, acute-pointed, sawed leaves three inches long, and two broad, and stand alternately at two inches distance. The flowers come out in long bunches from the wings of the stalks; they are disposed loosely on the foot-stalk, and are of a pale yellow colour; these appear in August, and continue part of September.

The thirteenth sort grows naturally in North America; the lower leaves are four inches long, and almost two broad; their foot-stalks are two inches long, and have a membrane or wing on each side. The stalks rise two feet high; they are slender, smooth, and of a light purple colour, and garnished with oval, spear-shaped, indented leaves, near two inches long, and three quarters of an inch broad, of a pale green on their under side. The flowers are produced in short bunches from the wings of the stalk, almost the whole length; the lower spikes are an inch long, but those on the upper part of the stalks are almost round; the flowers are of a brimstone colour, and appear late in August.

The fourteenth sort grows naturally in Canada; the stalks of this are stiff, round, smooth, and have a white bark; they rise upward of three feet high, and are garnished with smooth spear-shaped leaves, having several veins; they are three inches and a half long, and one inch broad, standing alternately. The flowers come out toward the top of the stalk, from the wings, in short spikes, which stand erect and are obtuse; they are of a pale yellow colour, and appear in August.

The fifteenth sort grows naturally in Canada; this rises with a strong hairy stalk five or six feet high, which

which is garnifhed clofely with rough fpear-fhaped leaves ending in acute points; they are four inches long, and one broad, very hairy on their under fide, and fharply fawed on their edges, having three ftrong longitudinal veins; the flowers are difpofed in a roundifh panicle at the top of the ftalk; the fpikes of flowers are recurved; the flowers are fmall, and of a brimftone colour; this flowers in September, and frequently continues till the end of October.

The fixteenth fort grows naturally in North America; the ftalks of this are very ftrong; they rife near two feet high, are very clofely garnifhed with narrow, fpear-fhaped, ftiff leaves, four inches long, and half an inch broad, a little indented on their edges, fitting clofe to the ftalks. The flowers are difpofed in large panicles at the top of the ftalks; the fpikes are long, recurved, and are compofed of fmaller fpikes in clufters; the flowers are yellow, and appear in September.

The feventeenth fort grows naturally in New England. The ftalks rife two feet high; the lower leaves are oval, ftiff, fmooth, and entire; they are four inches long, and two inches and a half broad, ftanding upon foot-ftalks which are four inches long; thofe on the upper part of the ftalk are fpear-fhaped, entire, and embrace the ftalk half round with their bafe. The flowers are difpofed in loofe fpreading panicles at the top of the ftalks; the fpikes are fhort, clustered, and roundifh; the flowers are of a bright yellow colour, and appear in Auguft.

The eighteenth fort grows naturally at Mexico, but is hardy enough to thrive in the open air in England; the ftalks of this are oblique; they rife a foot and a half high, are fmooth, and have a brown bark, garnifhed with fmooth, fpear-fhaped, entire leaves, three inches long and three quarters of an inch broad. The flowers come out upon branching foot-ftalks on the fide of the ftalks, which are ranged on one fide of the ftalks, and have a few fmall leaves under the flowers. The flowers are yellow and appear the end of Auguft.

The nineteenth fort grows naturally in North America. The ftalks of this are very hairy, and rife four feet high, branching out toward the bottom; the lower part of the ftalk is garnifhed with rough leaves three inches long and one broad; the branches grow erect, and are garnifhed with fmall leaves fcarce one inch long, and an eighth broad, which are entire, and fit clofe to the ftalk; the flowers are difpofed in a clofe panicle at the top of the ftalk, growing erect; they are yellow, and appear in September.

The twentieth fort grows naturally in North America. The lower leaves are thick, flefhy, and fpear-fhaped; they are ten inches long, and one inch and a half broad, and have three longitudinal veins; the middle furface of the leaves is fmooth, but their edges are rough; they are of a deep green colour: the ftalks rife four feet high, and are clofely garnifhed with fmooth entire leaves, of the fame fhape and texture as the lower, but greatly diminifh in their fize to the top of the ftalk. The flowers are difpofed in a compact panicle at the top of the ftalk; the fpikes grow erect, and the flowers are of a bright yellow colour; they appear in October, and in mild feafons continue great part of November.

The twenty-firft fort grows naturally in Maryland; this hath a flender fmooth ftalk which rifes a foot and a half high, garnifhed with narrow fpear-fhaped leaves two inches long, and half an inch broad, indented on their edges, and ending in acute points; the flowers are difpofed in a loofe panicle at the top of the ftalk; the fpikes of flowers are clofer and thicker toward the top. The flowers are yellow, and appear in September.

The twenty-fecond fort grows naturally in North America; the lower leaves are flefhy, narrow, fpear-fhaped, and entire. The ftalks are fmooth, of a purplifh colour, and rife near three feet high; they are garnifhed with long, narrow, fmooth, keel-fhaped leaves, which are entire. The flowers are difpofed in a loofe panicle at the top of the ftalk; the fpikes are flender and erect. The flowers are of a bright yellow colour, and appear late in October, and fometimes continue till December.

The twenty-third fort grows naturally in New England. The lower leaves of this fort are long, narrow, and very fmooth; they are keel-fhaped and entire. The ftalks are red, flefhy, and fmooth; they rife two feet high, and are thinly garnifhed with narrow fmooth leaves. The flowers are produced in loofe panicles at the top of the ftalks, and there are fome fingle fpikes of flowers which come out from the wings of the ftalks below. The flowers are of a bright yellow colour, and appear in Auguft.

The twenty-fourth fort grows naturally in North America; the ftalks of this fort are fmooth, erect, and rife a foot and a half high, garnifhed with narrow, fmooth, entire leaves of a dark green colour. The flowers are difpofed in clofe compact panicles at the top of the ftalk; the fpikes of flowers are fhort, and clustered together. The flowers are large, of a bright yellow, and appear in September.

The twenty-fifth fort grows naturally in New England; the ftalks are round, hairy, and rife two feet and a half high; the upper branches come out in a loofe panicle; the leaves ftand clofe to the ftalks; they are rough, fpear-fhaped, and entire; thofe on the lower part are two inches long, and half an inch broad, but are gradually fmaller to the top. The fpikes of flowers come out from the wings of the ftalk; the lower are long, thofe above diminifh to the top; the foot-ftalks of the fpikes have many fmall leaves growing along them, fome of which are intermixed with the flowers. This fort flowers the middle of November.

The twenty-fixth fort grows naturally in North America; the lower leaves are oval, fix inches long, and three broad, and end in acute points; they are fawed on their edges, and have feveral ftrong longitudinal veins; their foot-ftalks are long, and have leafy borders or wings. The ftalks grow a foot and a half high, branching out almoft from the bottom; they are garnifhed with fmall, fpear-fhaped, entire leaves. The branches grow erect; they are clofely furnifhed with fmall leaves below, and are terminated by fhort clofe fpikes of white flowers, which appear the end of Auguft.

The twenty-feventh fort grows naturally at Philadelphia; the lower leaves are fpear-fhaped, oblique, fmooth, and entire, ftanding upon long foot-ftalks. The ftalks rife from three to four feet high; the fpikes of flowers which come out from the wings of the ftalks are long, blunt, and a little recurved at the end; thofe on the upper part of the ftalk are erect, and clustered together in a clofe fpike; they are yellow, and appear in September.

The twenty-eighth fort grows naturally at Philadelphia. The ftalks of this fort are hairy, and branch out toward the top; they are garnifhed with rough fpear-fhaped leaves fitting clofe to the ftalks. The lower leaves are four inches long, and an inch and a half broad; thofe on the ftalks, gradually diminifh in their fize to the top; they are rough, veined, and fawed on their edges. The flowers are difpofed in a panicled corymbus at the end of the branches; the fpikes on the lower part are recurved, but thofe at the top are clustered and erect. This fort flowers in September and October.

The twenty-ninth fort grows naturally at Philadelphia; the lower leaves are fmooth, entire, narrow, and fpear-fhaped; they are three inches and a half long, and half an inch broad, ftanding upon long foot-ftalks. The ftalks are round, fmooth, and rife three feet high; they are garnifhed with very fmall fmooth leaves which are entire, and fit clofe to the ftalks. The flowers grow in a clofe panicle at the top of the ftalk; they are of a bright yellow colour, and appear in September.

The thirtieth fort grows naturally at La Vera Cruz in New Spain, where it was difcovered by the late Dr. Houftoun. The ftalks of this are round, hairy,

 and

and rise near three feet high; they are garnished with oval spear-shaped leaves, placed opposite upon short foot-stalks; they are three inches long, and an inch and a quarter broad, their surface very rough, and their edges are crenated, of a dark green on their upper side, but pale on their under. The flowers are produced in short bunches from the wings of the leaves, at the upper part of the stalk; they are of a deep yellow colour, and pretty large.

The thirty-first sort grows naturally at La Vera Cruz, where it was discovered by the before-mentioned gentleman. This rises with a shrubby stalk seven or eight feet high, dividing into many spreading branches which are slender, ligneous, and covered with a smooth gray bark. The leaves are spear-shaped, smooth, and entire; they are two inches and a half long, and one broad, of a light green, and stand upon short foot-stalks. The flowers are produced at the end of the branches in a loose corymbus; they are large, of a pale yellow colour, and stand upon pretty long foot-stalks. The common empalement of the flowers is cut almost to the bottom. I believe Petiver has this plant in his Musæum, under the following title, Pulmonaria Jamaicensis, salicis folio, calycibus paleaceis.

These plants are all of them hardy, (except the two sorts last mentioned) so will thrive in the open air in England. Many of them have specious panicles of flowers, so are great ornaments to the English gardens at the end of the summer, when there is a scarcity of other flowers, which renders them more valuable. The five first sorts are seldom admitted into gardens, as they do not make any great appearance, but the sorts from North America are better esteemed; these have been greatly increased in their number of late years, and if we can judge from the sorts which have been introduced from North America within a few years past, we must suppose that country abounds with many more sorts than are yet known.

These plants when they are once obtained, may be propagated in plenty by parting of their roots; the best time for doing it is in autumn, as soon as their flowers are past; but those sorts which do not flower till very late in the year, should be transplanted early in the spring before they begin to shoot, and the roots may be then parted; but if the spring should prove dry, they will require water to establish them well in the ground, otherwise they will not flower strong the succeeding autumn. Some of the sorts spread their roots, and propagate much faster than others, so these may be transplanted and parted every other year; or if the plants are wanted, they may be every year divided, but then they will not flower so strong as those which are suffered to remain longer unremoved; and those sorts whose roots do not multiply so fast, should be parted once in three years, if they are expected to flower strong.

The sorts which grow tall, are not very proper furniture for small gardens, because they require much room, for these should be allowed four or five feet, otherwise their roots will intermix with those of the neighbouring plants, and draw away their nourishment; therefore these plants are proper ornaments for large extended walks round fields, or for the borders of wood-walks, where they will make a fine appearance during their season of flowering; and as they require little culture, so they are adapted to those places. They will thrive in almost any soil, but when they are planted in good ground they will grow much larger, and make a better appearance.

These plants may also be propagated by seeds, but it is only the early flowering kinds which perfect their seeds in England. These seeds should be sown in autumn soon after they are ripe, for those which are kept out of the ground till spring seldom succeed, or at best do not come up the same year; they may be sown in drills upon a bed of fresh earth, at about a foot asunder, but the seeds should be scattered pretty thick in the drills, and covered lightly over with fine earth. When the plants come up, they must be kept clean from weeds, and where they are too close, part of them may be drawn out, and planted in a shady border, to allow room for the others to grow till autumn, when the should be transplanted where they are designed to remain. The following year they will flower, and their roots will abide many years.

The two last mentioned sorts are natives of a warm country, so they will not thrive here, unless they have artificial heat in winter, especially the last sort, which requires a warmer situation than the other. These plants should be planted in pots, and the last should be plunged into the tan-bed in the stove, and treated in the same way as other tender plants from the same country. This may be propagated by cuttings, which, if planted in pots filled with loamy earth, and plunged into a moderate hot-bed, will take root. The other sort is propagated by parting of the roots, in the same manner as the sort before mentioned; these should be kept in a moderate stove in winter, and in summer may be placed abroad in a sheltered situation.

SOLSTICE is the time when the sun is in one of the solstitial points; that is, when he is at his greatest distance from the equator, which is twenty-three degrees and a half; thus called, because he then appears to stand still, and not to change his place in the degrees of the zodiac any way; an appearance owing to the obliquity of our sphere, and which those who live under the equator are strangers to.

The Solstices are two in each year; the æstival, or summer Solstice; and the hyemal, or winter Solstice. The summer Solstice is, when the sun is in the tropic of Cancer, which is on the 21st of June, when he makes our longest day.

The winter Solstice is, when the sun enters the first degree of Capricorn, which is on the 21st of December; when he begins to turn toward us, and makes our shortest day.

This is to be understood, as in our northern hemisphere; for in the southern, the sun's entrance into Capricorn makes the summer Solstice, and that into Cancer the winter Solstice.

SONCHUS, Sowthistle.

These are many of them weeds in England, so are not planted in gardens; for if their seeds are once permitted to scatter upon the ground, they will soon stock it with plants; for which reason they should always be extirpated, not only those in the garden, but also those in the parts near it; because their seeds being furnished with down, are wafted in the air to a considerable distance, where, falling on the ground, they soon come up and prove troublesome weeds.

SOPHORA. Lin. Gen. Plant. 456.

The CHARACTERS are,

*The flower hath a short bell-shaped empalement of one leaf, cut at the brim into five obtuse segments. The flower is of the butterfly kind; the standard is oblong, broad, and reflexed on the sides. It has two oblong wings with appendages to their base; the keel is of two leaves like those of the wings, whose lower borders join like the keel of a boat. It hath ten distinct stamina which are awl-shaped, parallel, and the length of the petals, hid in the keel, and terminated by small summits, and a taper oblong germen, supporting a style the length of the stamina, crowned by an obtuse stigma. The germen afterward turns to a long slender pod, with swellings where each seed is posited, which are roundish.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and one style. This agrees in every character with the other butterfly flowers, except that the ten stamina in these flowers stand distinct, and those of the other butterfly flowers have their stamina joined in two bodies.

The SPECIES are,

1. SOPHORA (*Alopecuroides*) foliis pinnatis, foliolis numerosis villosis oblongis, caule herbaceo. Lin. Sp. Plant. 373. *Sophora with winged leaves, having a great number of oblong hairy lobes.* Ervum Orientale alopecuroides

curoides perenne, fructu longiſſimo. Tourn. Cor. 27. *Eaſtern, perennial, Foxtail Ervum, with a long fruit.*

2. SOPHORA (*Tomentoſa*) foliis pinnatis, foliolis numeroſis ſubrotundis. Lin. Sp. 373. *Sophora with winged leaves, compoſed of many roundiſh lobes.* Coronilla Zeylanica, tota argentea. Burm. Zeyl. *Jointed podded Colutea of Ceylon, all over ſilvery.*

3. SOPHORA (*Tinctoria*) foliis ternatis ſubſeſſilibus, foliolis ſubrotundis glabris. Lin. Sp. Plant. 373. *Sophora with trifoliate leaves ſitting almoſt cloſe to the ſtalks, whoſe lobes are roundiſh and ſmooth.* Cytiſus Americanus procumbens, flore luteo, ramoſiſſimus, qui anil ſuppeditat. *Trailing American Cytiſus with a yellow flower and very branching, of which Indigo is made.*

The firſt ſort grows naturally in the Levant; this hath a perennial creeping root, from which ariſe ſeveral erect ſtalks from three to four feet high, garniſhed with winged leaves, compoſed of a great number of oblong hairy lobes ranged by pairs along the midrib, terminated by an odd one. The flowers come out from the wings of the ſtalk in long ſpikes, which ſtand erect cloſe to the ſtalk; they are of a pale blue colour, and ſmall. Theſe appear in July, but are rarely ſucceeded by pods in England.

It propagates faſt enough by its creeping root, in the ſame manner as Liquorice, when the plant is once obtained, and is very hardy, ſo ſhould be planted in ſome corner of the garden, at a diſtance from other plants, becauſe the roots of this plant will ſpread, mix with thoſe of the neighbouring plants, and ſoon overbear them. It will thrive in almoſt any ſoil or ſituation, for I have frequently ſeen the roots ſpread into the middle of gravel walks, and ſend up ſtalks.

The ſecond ſort grows naturally in the iſland of Ceylon, at Senegal in Africa, and alſo in the Weſt-Indies, but particularly in Jamaica, where the inhabitants call it Sea-ſide Pigeon Pea: this riſes with a downy ſtalk to the height of ſix or ſeven feet, garniſhed with winged leaves compoſed of five or ſix pair of roundiſh woolly lobes, terminated by an odd one. The flowers come out in ſhort looſe ſpikes from the wings of the ſtalks; they are large and yellow, not much unlike thoſe of Spaniſh Broom, but have no ſcent; theſe are ſucceeded by taper woolly pods five or ſix inches long, having four or five large ſwellings, in each of which is contained one roundiſh brown ſeed as large as Peas.

This plant is tender, ſo will not thrive in England out of a ſtove; it is propagated by ſeeds which may be eaſily procured from the Weſt-Indies, for the plants do not perfect them in England; theſe ſhould be ſown in pots, and plunged into a good hot-bed, where, if the ſeeds are good, the plants will appear in a month or ſix weeks. When theſe are fit to remove, they ſhould be each tranſplanted into a ſeparate pot filled with ſoft loamy earth, and plunged again into a hot-bed of tanners bark, obſerving to ſhade them from the ſun till they have taken new root; after which they muſt be treated in the ſame way as other tender plants from the ſame countries, always keeping them in the bark-bed in the ſtove, and in the winter they ſhould have but little water.

The third ſort grows naturally in Virginia and Philadelphia, from both theſe places I have received the ſeeds; from this plant there was formerly a coarſe ſort of Indigo made in America, as there was from ſome other plants, before the true Indigo plants were introduced there: this hath a perennial root, from which ariſe ſeveral ſtalks about a foot and a half high, ſending out from the bottom a great number of ſmall branches, garniſhed with leaves compoſed of three oval ſmooth lobes joined together at the foot-ſtalk like other trifoliate leaves; they ſit cloſe to the branches. The flowers come out toward the end of the branches in ſhort ſpikes; they are of the butterfly kind, yellow, and appear in July; they are often ſucceeded by ſhort ſwelling pods, which in very warm ſeaſons come to maturity in England. The ſtalks of this decay to the root in autumn.

This is propagated by ſeeds, which ſhould be ſown on a warm border in the beginning of April. The beſt way is to ſow them in ſhallow drills for the more conveniently keeping the plants clean, for they muſt not be removed till their ſtalks decay in autumn, when they ſhould be carefully taken up, and planted in a warm border where they are deſigned to remain, for they do not bear tranſplanting well.

SORBUS. Tourn. Inſt. R. H. 633. Lin. Gen. Plant. 548. [ſo called of ſorbere, *Lat.* to ſup, becauſe the fruit, being ripe, is ſo ſoft, that it may be ſupped.] The Service-tree; in French, *Sorbier.*

The CHARACTERS are,

*The flower has a ſpreading, concave, permanent empalement of one leaf, indented in five parts; it has five roundiſh concave petals which are inſerted in the empalement, and about twenty awl-ſhaped ſtamina, which are alſo inſerted in the empalement, terminated by roundiſh ſummits. The germen is ſituated under the flower, ſupporting three ſlender ſtyles crowned by erect headed ſtigmas; it afterward becomes a ſoft umbilicated fruit, incloſing three or four oblong cartilaginous ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's twelfth claſs, which includes thoſe plants whoſe flowers have from eleven to twenty ſtamina inſerted in the empalement, and three ſtyles.

The SPECIES are,

1. SORBUS (*Aucuparia*) foliis pinnatis, utrinque glabris. Hall. Helv. 250. *Service-tree with winged leaves which are ſmooth on both ſides.* Sorbus ſylveſtris, foliis domeſticæ ſimilis. C. B. P. 415. *Wild Service with leaves like the cultivated, commonly called Quicken, Quickbeam, Mountain Aſh, and in the north, Roan-tree.*

2. SORBUS (*Domeſtica*) foliis pinnatis, ſubtus tomentoſis. Hall. Helv. 351. *Service-tree with winged leaves which are woolly on their under ſide.* Sorbus ſativa. C. B. P. 451. *The cultivated Service.*

The firſt ſort grows naturally in many parts of England, but in the ſouthern counties they are ſeldom ſeen of any great magnitude, for the trees are commonly cut down, and reduced to underwood; but in the North of England and Wales, where they are permitted to grow, there are trees of very large ſize. The ſtems of this are covered with a ſmooth gray bark, the branches while young have a purpliſh brown bark, the leaves are winged; they are compoſed af eight or nine pair of long narrow lobes, terminated by an odd one; the lobes are about two inches long, and half an inch broad toward their baſe, ending in acute points, and are ſharply ſawed on their edges; the leaves on the young trees in the ſpring are hoary on their under ſide, which about Midſummer goes off, and thoſe upon the older branches have very little at any ſeaſon. The flowers are produced in large bunches almoſt in form of umbels, at the end of the branches; they are compoſed of five ſpreading concave petals ſhaped like thoſe of the Pear-tree, but ſmaller; theſe appear in May, and are ſucceeded by roundiſh berries, growing in large bunches, which have a depreſſed navel on the top, and turn red in autumn when they ripen.

This tree is cultivated in the nurſery-gardens, and ſold as a flowering ſhrub; but, if they were permitted to grow, they would riſe to a great height, and have large ſtems. The leaves of this tree make a pretty variety when they are mixed with others during the time of their flowering, and alſo in autumn. When their fruit is ripe they make a pretty appearance, but the blackbirds and thruſhes are ſo fond of this fruit, as to devour it as ſoon as it ripens; ſo that in thoſe places where there is a plenty of theſe birds, there will not be any of the fruit left to be perfectly ripe; however, as it is good for theſe ſongſters, where people have a deſire of drawing a number of theſe birds about their habitations, they ſhould plant a quantity of theſe trees for that purpoſe.

The ſecond ſort grows naturally in the warmer parts of Europe, where it riſes to a great height, and becomes a large tree, but in England there are few of any large ſize. In the ſouth of France and in Italy,

the fruit is served up to the table in their deserts, but in England they have not been much esteemed, which has occasioned their being so little cultivated here. There are several varieties of this fruit, which differ from each other in size and shape, as Apples and Pears do; some of these are shaped like Catherine Pears, and are nearly as large; others are depressed at both ends, and shaped like Apples, but both these sorts will arise from seeds of the same tree, so that those who are desirous of having the largest and best kinds, should propagate them by grafting or budding from those trees whose fruit are the fairest and best flavoured, as is practised for other fruits; these may be grafted upon Pear-stocks, which agree better with this tree than any other except their own, for they will not take upon Apple-stocks, nor do they thrive upon the Hawthorn or Medlar near so well, though the fruit of this tree approaches nearer to those than any other, and are not fit for the table till they are in a state of decay.

The several varieties of this tree differ in the number of their seeds, in the same manner as Pears, Apples, Quinces, and Medlars, some of them having but three seeds in each fruit, and others have four or five; so that although one of the characters of this genus is, that the fruit has but three seeds, yet that must be understood to be of the wild sort, in which there are seldom more, but those of the cultivated kind are as uncertain as the fruit of Apples and Pears.

In Italy these trees are very common, where they have a great variety of sorts which have been obtained from seeds, but I have not observed in the English gardens more than three sorts, and those are yet very scarce, for there are at present but few large trees of the true Service in England, one of which was lately growing in the gardens formerly belonging to John Tradescant at South Lambeth, near Vauxhall in Surry, who was a very curious collector of rare plants in King Charles the Second's time, which tree was near forty feet high, and produced a great quantity of fruit annually which were shaped like Pears; and there are indeed some trees of middling growth in the gardens of Henry Marsh, Esq; at Hammersmith, which produce fruit of the Apple shape (from whence several young plants have been raised of late in the nurseries near London;) but these are small, compared to that in John Tradescant's garden.

There are great numbers of large trees of this Service growing wild about Aubigny in France, from whence his Grace the late Duke of Richmond brought a great quantity of the fruit, and from the seeds raised a great number of young plants in his garden at Goodwood in Sussex.

The leaves of this tree differ from those of the first, in their lobes being broader, and not so much sawed; they are also much more downy on their under side, and the young shoots of the tree in the spring are covered with a white down. The flowers are produced in larger and more diffused bunches, and are a little larger, but there are seldom more than two or three fruit produced upon each bunch. The stamina of the flowers are also longer than those of the wild sort, which are the only differences I can observe between them.

Both these sorts may be propagated by sowing their seeds in pots soon after the fruit is ripe, sheltering them under a common frame in winter, and plunging the pots into a moderate hot-bed in the spring, which will soon bring up the plants; and when they are come up, they should be carefully kept clear from weeds, and in dry weather watered; but they should be exposed to the open air, for the only reason of putting them in a hot-bed is to forward the growth of the seeds; but if, when the plants are come up, the bed is kept covered, it will draw the plants and spoil them. In this bed the plants should remain until the middle of October, at which time their leaves will decay; when there should be a warm light spot of ground prepared to receive them, into which they should be planted in rows two feet asunder, and a foot distant in the rows, observing to take them up carefully, and to plant them as soon as possible, that their roots may not dry.

During the summer, the ground should be kept constantly clear from weeds, and in winter there should be a little mulch laid upon the surface of the ground about their roots, to protect them from being injured by frost; but in the spring the ground between them should be dug, burying the mulch therein, in doing of which you must be careful not to cut or injure the roots of the plants.

In this nursery they may continue three or four years according to their growth, when it will be proper to transplant them out where they are to remain; the best season for which is in October, or in the spring, just before they begin to shoot. The soil should be warm in which they are planted, and the situation defended from cold winds, in which place they will thrive, and produce fruit in a few years.

Those who raise many of these trees from seeds, will procure some varieties of the fruit, from which the best may be selected, and propagated for the table, and the others may be planted for variety in wildernesses or wood-walks, or may be used for stocks to graft the better kinds upon.

The wood of the wild Service-tree is much commended by the wheelwright for being all heart, and it is of great use for husbandmens tools, goads, &c. It is very white and smooth, so will polish pretty well.

There is a sort of this with variegated leaves, which is preserved by such as are curious in collecting the several sorts of striped plants, but there is no great beauty in it; it may be propagated by layers, or by being budded on the plain sort, but they become plain on a very rich soil.

The wild sort should have a moist strong soil, but will grow in the most exposed places, being extremely hardy, which renders them worthy of care, since they will thrive where few other trees will succeed.

SORREL. See ACETOSA.

SOUTHERNWOOD. See ABROTANUM.

SOWBREAD. See CYCLAMEN.

SPARTIUM. Lin. Gen. Plant. 765. Genista. Tourn. Inst. R. H. 643. tab. 311. [so called of sparum, a dart, because the rushes of this plant represent a dart; or else of the Greek σπάρ]ον, of σπείρεσθαι, [to sow, because it sows itself.] Broom; in French, *Genêt*.

The CHARACTERS are,

*The empalement of the flower is tubulous, heart-shaped, with a very short margin at the top, and has five small indentures, but below the flower the under side is extended. The flower is of the butterfly kind; the standard is almost heart-shaped, large, and wholly reflexed; the wings are oblong, oval, shorter than the standard, and annexed to the stamina; the keel is oblong, and longer than the wings, and the borders are hairy and connected together, to which the stamina are inserted. It has ten unequal stamina which are joined together, and are gradually longer, the upper being the shortest, and the under stands apart, terminated by oblong summits, and an oblong hairy germen, supporting a rising awl-shaped style, to which is fastened an oblong, hairy, inflexed stigma. The germen afterward becomes a long, cylindrical, obtuse pod of one cell, opening with two valves, including several globular kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes those plants whose flowers have ten stamina joined in two bodies.

The SPECIES are,

1. SPARTIUM (*Junceum*) ramis oppositis teretibus apice floriferis, foliis lanceolatis. Hort. Cliff. 956. *Broom with taper opposite branches whose tops have flowers, and spear-shaped leaves.* Genista juncea. J. B. 1. p. 395. *Rushy Broom, commonly called Spanish Broom.*

2. SPARTIUM

2. Spartium (*Radiatum*) sessilibus petiolis persistentibus ramis oppositis angulans, foliis ternatis linearibus. Lin. Sp. Plant. 998. *Broom with trifoliate leaves sitting close to the stalk, angular opposite branches, and awl-shaped opposite leaves.* Genista radiata sive stellaris. J. B. 1. 399. *Radiated starry Broom.*

3. Spartium (*Monospermum*) ramis angulatis, racemis lateralibus, foliis lanceolatis. Lin. Sp. Plant. 995. *Broom with angular branches, short bunches of flowers on the sides of the stalk, and spear-shaped leaves.* Spartium tertium flore albo. C. B. P. 396. *A third Broom with a white flower, commonly called white Spanish Broom.*

4. Spartium (*Scoparium*) foliis ternatis solitariisque, ramis inermibus angulosis. Hort. Cliff. 356. *Broom with trifoliate and single leaves, and angular unarmed branches.* Cytiso genista scoparia, vulgaris, flore luteo. Tourn. 649 *Common green Broom with a yellow flower.*

5. Spartium (*Lusitanicum*) foliis ternatis, foliolis cuneiformibus, ramis inermibus angulatis. *Broom with trifoliate leaves, whose lobes are wedge-shaped, angular, and unarmed branches.* An? Cytiso-genista Lusitanica, magno flore. Tourn. Inst. 649. *Portugal Broom with a large flower.*

6. Spartium (*Hirsutum*) foliis ternatis petiolatis, foliolis lineari-lanceolatis hirsutis, ramis inermibus angulatis. *Broom with trifoliate leaves upon foot-stalks, linear spear-shaped lobes which are hairy, and angular unarmed branches.*

7. Spartium (*Glabrum*) foliis ternatis glabris sessilibus, ramis inermibus angulatis, leguminibus glabris. *Broom with trifoliate smooth leaves sitting close to the branches, which are angular and unarmed, and smooth pods.*

8. Spartium (*Angulatum*) foliis solitariis ternatisque, ramis sexangularibus apice floriferis. Lin. Sp. Plant. 709. *Spartium with single and trifoliate leaves, and branches with six angles with flowers at their tops.* Spartium Orientale, siliqua compressa glabra & annulata. Tourn. Cor. 44. *Eastern Broom with round, smooth, compressed pods.*

9. Spartium (*Spinosum*) foliis ternatis, ramis angulatis spinosis. Hort. Cliff. 356. *Broom with trifoliate leaves, and angular prickly branches.* Cytisus spinosus. H. L. *Prickly Cytisus.*

10. Spartium (*Arborescens*) caule arborescente ramoso aculeato, foliis cuneiformibus confertis, floribus solitariis alaribus. *Broom with a tree-like, branching, prickly stalk, wedge-shaped leaves in clusters, and flowers standing singly on the side of the branches.* Spartium portulacæ foliis aculeatum, ebeni materie. Plum. Cat. 19. *Prickly Broom with Purslain leaves, or Ebony of the West-Indies.*

The first sort is the common Spanish Broom, which has been long cultivated in the English gardens for the sweetness of its flowers: of this there are two varieties, if not distinct species, which grow naturally in Spain and Portugal. The first, which is the common sort in England, has larger branches and broader leaves than the other. The flowers are also larger, of a deeper yellow colour, and appear earlier than those of the other, which has been of late years introduced from Portugal.

Both these sorts have smooth flexible branches, which rise eight or ten feet high. The lower branches are garnished with small, spear-shaped, smooth leaves, at the end of the shoots of the same year; the flowers are disposed in a loose spike; they are large, yellow, of the butterfly kind, have a strong agreeable odour, appear in July, and in cool seasons there is frequently a succession of flowers till September, which are succeeded by compressed pods about three inches long, containing one row of kidney-shaped seeds which ripen in autumn.

These plants are easily propagated by seeds, which should be sown in the spring upon a bed of common earth in a shady situation, where the plants will rise very freely; these must be kept clean from weeds the following summer, and in autumn they may be taken up and transplanted in a nursery, which should be chosen in a warm sheltered situation. In the taking up of the plants, there should be care taken not to tear the roots, for these send their roots deep into the ground, and are very apt to be torn if they are not raised out of the ground with a spade; these should be planted in rows three feet asunder, and at one foot distance in the rows. In this nursery they may remain a year or two to get strength, and then may be planted where they are to remain, for they do not succeed if they are removed large.

If the seeds of these sorts are permitted to scatter in autumn, the plants will come up in plenty in the spring without care, and these may be transplanted the following autumn, and treated in the same way as those before mentioned. These shrubs are very ornamental to large wood-walks in gardens, but hares and rabbits are very fond of them; so that, unless they are screened from these animals, they will devour them in winter when they have a scarcity of other food.

The second sort grows naturally in Italy; this is a shrub of low growth, seldom rising two feet high, but divides into many spreading branches, so as to form a large bush. The branches are small, angular, and come out by pairs opposite; the leaves are very narrow, awl-shaped, and are placed round the stalk, spreading out like the points of a star; the flowers are disposed in small clusters at the end of the branches; they are yellow, but not more than half the size of those of the former, and have no scent; they are succeeded by short hairy pods, containing two or three small kidney-shaped seeds in each; it flowers in June, and the seeds ripen in August. This shrub makes a pretty appearance during the time of its continuing in flower, and as it is hardy, deserves a place in gardens.

It is propagated by seeds, which should be sown in autumn, for those which are sown in the spring seldom grow the same year; these may be sown in a bed of common earth in rows, for the more conveniently keeping the plants clean from weeds. The plants should remain in the seed-bed till the following autumn, when they may be either transplanted to the places where they are to remain, or in a nursery to grow a year or two to get strength, before they are planted out for good; but these plants will not bear transplanting when they are large, so should be removed while they are young.

The third sort hath a thick stalk, covered with a rugged bark when old; it rises eight or nine feet high, sending out many slender Rush-like branches of a silvery colour, almost taper, which terminate in very slender bending ends; these have a few narrow spear-shaped leaves on the lower branches. The flowers are produced in very short spikes or clusters on the side of the branches; they are small, white, and are succeeded by large oval pods containing one kidney-shaped seed. It flowers about the same time as the former.

This sort grows plentifully in Spain and Portugal, from both which countries the seeds may be easily procured. These seeds should be sown in the middle of April upon a bed of fresh light earth, but the best way will be to sow them in drills about half an inch deep. The drills should not be less than one foot asunder, and the seeds may be laid in the drills at about three inches distance, which will allow room for the plants to grow till Michaelmas following, before which time it will not be safe to remove them; nor should they be suffered to stand longer, because they shoot downright roots very deep into the ground, and if these are cut or broken, when they are grown large, the plants frequently miscarry. Although I have here directed the sowing of these seeds in April, yet it must be understood, if the season proves favourable, otherwise it will be better to defer it longer, for these seeds are as subject to perish in the ground by cold or wet, as are the Kidney-beans; therefore when the season is favourable for sowing them, the seeds of the Broom may be safely sown.

At Michaelmas ſome of the plants may be taken up and potted, to be ſheltered in winter, and others may be planted in a warm ſituation and on a dry ſoil, where, if the winter ſhould not prove ſevere, they will ſtand very well. It will alſo be proper to leave ſome of the plants in the ſeed-bed, where, if the winter ſhould prove ſevere, they may be ſheltered with mats, and ſome mulch laid about their roots to prevent the froſt penetrating the ground, for theſe plants are ſo tender as not to live abroad in hard froſt, tho' in moderate winters they will do very well; but it is always neceſſary to have a plant or two of each ſort in pots, that they may be ſheltered in winter to preſerve the ſorts.

The fourth ſort is the common Broom which grows naturally in England, ſo is not often admitted into gardens, though, when it is in flower, it makes a much better appearance than many others which are coſtly; this riſes with a flexible ſtalk four or five feet high, ſending out many Ruſh-like angular branches which ſpread out on every ſide. The lower part of the branches are garniſhed with trifoliate leaves, and upward they are ſingle. The flowers come out upon ſhort foot-ſtalks ſingly on the ſide of the branches, for a conſiderable length toward the top; theſe are large, of the butterfly kind, and of a bright yellow colour; they appear in May, and are ſucceeded by compreſſed hairy pods containing kidney-ſhaped ſeeds which ripen in Auguſt. The flowers and branches of this ſort are uſed in medicine.

The fifth ſort grows naturally in Portugal and Spain; this has ſtronger ſtalks than our common Broom. The branches grow more erect, and have deeper angles; the leaves are all trifoliate, and much larger than thoſe of the fifth; the lobes are wedge-ſhaped; the flowers are larger, of a deeper yellow colour, and have longer foot-ſtalks. This flowers a little later in the year than that, and is not ſo hardy.

The ſixth ſort grows naturally in Portugal; this riſes with a ſtrong ſtalk like the former. The branches are angular and grow erect; they are better furniſhed with leaves than either of the other ſorts, which ſtand upon pretty long foot-ſtalks; the lobes are ſmall, very narrow, and hairy; the flowers grow cloſer together, are larger, and of a deep yellow colour.

The ſeventh ſort was brought from Portugal. The ſtalks and branches of this are ſlender, angular, and ſmooth, and are fully garniſhed with very narrow, trifoliate, ſmooth leaves ſitting cloſe to the ſtalks. The flowers come out in long looſe ſpikes at the end of the branches; they are large, of a bright yellow colour, and are ſucceeded by ſhort compreſſed pods, which are ſmooth, containing ſmall kidney-ſhaped ſeeds.

The eighth ſort grows naturally in the Levant; this hath ſlender ſtalks and branches, which are garniſhed with a few trifoliate and ſingle leaves toward the bottom. The branches have ſix angles or furrows; the flowers are ſmall, of a pale yellow colour, and are produced in looſe ſpikes at the end of the branches; theſe are rarely ſucceeded by ſeeds in England.

The ninth ſort grows naturally in Italy and Spain near the ſea-coaſt. The ſtalks riſe five or ſix feet high, and ſend out many angular flexible branches, armed with long ſpines, upon which grow trifoliate leaves; the flowers are produced at the end of the branches in cluſters, each ſtanding upon a long foot-ſtalk; they are of a bright yellow colour, and appear in June; they are ſucceeded by ſhort ligneous pods, with a thick border on their upper edges, containing three or four kidney-ſhaped ſeeds. This plant will not live abroad in England, unleſs it has a very warm ſituation.

Theſe plants are raiſed from ſeeds in the ſame way as the firſt ſort, and may be treated in the ſame manner.

The tenth ſort is very common in Jamaica, and ſeveral other places in the Weſt-Indies, where the wood is cut, and ſent to England under the title of Ebony, though it is not the true Ebony, which is a native of the eaſtern country, and is a plant of a very different genus. The wood of this American Ebony is of a fine greeniſh brown colour, and poliſhes very well, ſo is much coveted by the inſtrument-makers; and is uſed for ſeveral purpoſes, being of a very hard durable nature.

This tree has a pretty thick ſtem which riſes twelve or fourteen feet high, covered with a rugged brown bark, and divides into many ſpreading branches, which grow almoſt horizontal, and are armed with ſhort brown crooked ſpines. The leaves are ſmall, ſtiff, and wedge-ſhaped, coming out in cluſters, and ſit cloſe to the branches. The flowers come out upon ſlender foot-ſtalks from the ſide of the branches ſingly; they are of the butterfly kind, of a bright yellow colour, and are ſucceeded by compreſſed moon-ſhaped pods, which incloſe one kidney-ſhaped ſeed.

This plant is propagated by ſeeds, which muſt be procured from the countries of its natural growth, for the plants do not produce ſeeds in this climate. Theſe ſeeds ſhould be ſown in pots filled with light freſh earth early in the ſpring, and plunged into a good hot-bed of tanners bark, or placed in tan under pots, as their covers are very hard. In about ſix weeks after the ſeeds are ſown, the plants will appear, when they muſt be carefully treated (being very tender while young;) they muſt have freſh air admitted to to them every day when the weather is warm, and ſhould be frequently refreſhed with water, when the earth in the pots appears dry. In about five or ſix weeks after the plants appear they will be fit to tranſplant, when they ſhould be carefully ſhaken out of the pots and ſeparated, planting each into a ſmall pot filled with light rich earth, and then plunged into the hot-bed again, being careful to ſhade them from the ſun every day until they have taken root; after which time they muſt be treated in the ſame manner as other very tender exotic plants, by giving them air every day in warm weather, and watering them once in two or three days gently, and when the nights are cold, to cover the glaſſes. In this hot-bed the plants may remain till autumn, when they muſt be removed into the ſtove, and plunged into the bark-bed. Thoſe of them whoſe roots have filled the pots, ſhould be carefully ſhifted into pots one ſize larger before they are plunged; but as theſe plants are not of quick growth while young, they do not require to be often ſhifted out of the pots. During the winter ſeaſon theſe plants muſt be kept warm (eſpecially the firſt year,) and muſt have but little water, and in cold weather it muſt be given to them in ſmall quantities; and if their leaves ſhould contract filth, they muſt be waſhed with a ſponge to clean them, otherwiſe the plants will not thrive. As theſe plants are very tender when young, ſo they will not live in the open air in this country, even in the warmeſt part of the year; therefore they muſt be conſtantly kept in the ſtove, and ſhould be kept plunged in the bark-bed, obſerving in the ſummer ſeaſon, when the weather is warm, to admit a large ſhare of freſh air to the plants; but when they have obtained ſtrength, they may be expoſed for three months in a warm ſituation in the ſummer.

SPERGULA. Dillen. Gen. Nov. 7. Lin. Gen. Plant. 519. Spurrey.

The CHARACTERS are,

*The flower hath a ſpreading permanent empalement, compoſed of five oval concave leaves. It has five oval, concave, ſpreading petals which are larger than the empalement, and ten awl-ſhaped ſtamina ſhorter than the petals, terminated by roundiſh ſummits. It hath an oval germen, ſupporting five ſlender, erect, reflexed ſtyles, crowned by thick ſtigmas. The germen afterward turns to an oval cloſe capſule with one cell, opening with five valves, incloſing many depreſſed, globular, bordered ſeeds.*

This genus of plants is ranged in the fourth ſection of Linnæus's tenth claſs, which includes thoſe plants whoſe flowers have ten ſtamina and five ſtyles.

The SPECIES are,

1. SPERGULA (*Arvenſis*) foliis verticillatis, floribus decandris. Hort. Cliff. 173. *Spurrey with leaves in whorls, and*

*and flowers with ten ſtamina.* Alſine Spergula dicta major. C. B. P. 251. *Greater Chickweed, called Spurrey.*

2. Spergula (*Pentandria*) foliis verticillatis, floribus pentandris. Lin. Sp. Plant. 440. *Spurrey with whorled leaves, and flowers with five ſtamina.* Alſine ſpergulæ facie minima, ſeminibus emarginatis. Tourn. Inſt. 244. *The leaſt Chickweed with the appearance of Spurrey, having bordered ſeeds.*

3 Spergula (*Nodoſa*) foliis oppoſitis ſubulatis lævibus, caulibus ſimplicibus. Lin. Sp. Plant. 440. *Spurrey with awl-ſhaped ſmooth leaves placed oppoſite, and ſingle ſtalks.* Alſine nodoſa Germanica. C. B. P. 251. *Knotted German Chickweed.*

There are ſome other ſpecies of this genus, which grow naturally as weeds in England, ſo are not worthy notice here; nor ſhould I have mentioned theſe, were they not ſometimes cultivated.

The firſt and ſecond ſorts are cultivated in Holland and Flanders, for feeding their cattle; the uſual time of ſowing the ſeed is in July or Auguſt, that the plants may acquire ſtrength before the winter's cold. The uſe that is made of this, is to feed ſheep, and other cattle in winter, when the common Graſs is eaten bare. This plant ſeldom riſes above ſix inches high, ſo will not afford a very great quantity of food; but as it will grow on the pooreſt ſand, it may be cultivated in many places to good advantage, where no other Graſs will thrive ſo well; and by feeding it off the ground, the dung of the cattle will improve the land. This paſture, it is affirmed, will make excellent butter; and the mutton fed on it, is ſaid to be well taſted, ſo is by many preferred to that fed on Turneps. Hens will greedily eat this herb, and it makes them lay more eggs.

This plant being annual, muſt be ſown every year; and whoever is willing to ſave the ſeeds, ſhould ſow it in April, that the plants may flower the beginning of July, and the ſeeds will ripen in Auguſt; when it muſt be cut before the heads are quite brown, otherwiſe the ſeeds will ſoon ſcatter.

The ſeeds being very ſmall, about twelve pounds will be ſufficient to ſow an acre of land. The ground ſhould be well harrowed before the ſeeds are ſown, for if the larger clods are not broken, there will be an uneven crop of Graſs. People in the low country, ſow this ſeed after a crop of Corn is taken off the land. The ſecond ſort is now much cultivated in Flanders, though it is a much lower plant than the common ſort, but they eſteem it a much better Graſs. The ſeeds of this kind are ſmaller and flatter than thoſe of the common ſort, and have a white border round each.

SPERMACOCE. Dill. Hort. Elth. 277. Lin. Gen. Plant. 111. Button Weed.

The Characters are,

*The flower hath a ſmall permanent empalement indented in four parts, ſitting on the germen. It has one cylindrical petal, whoſe tube is longer than the empalement, and the brim indented in four parts, which ſpread open and are reflexed. It has four awl-ſhaped ſtamina ſhorter than the petal, terminated by ſingle ſummits, and a roundiſh compreſſed germen ſituated under the flower, ſupporting a ſingle ſtyle divided in two parts at the top, crowned by obtuſe ſtigmas. The germen afterward turns to two oblong ſeeds which are joined, having two horns, and are convex on one ſide, and plain on the other.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourth claſs, which includes thoſe plants whoſe flowers have four ſtamina and one ſtyle.

The Species are,

1. Spermacoce (*Tenuior*) glabra foliis linearibus, ſtaminibus incluſis. Lin. Sp. Plant. 102. *Smooth Spermacoce with ſtamina included in the flower.* Spermacoce verticillis tenuioribus. Hort. Elth. 370. *Spermacoce with narrow whorls.*

2. Spermacoce (*Verticillata*) glabra foliis lanceolatis verticillis globoſis. Lin. Sp. Plant. 102. *Smooth Spermacoce with ſpear-ſhaped leaves, and flowers in globular whorls round the ſtalks.* Spermacoce verticillis globoſis. Hort. Elth. 369. *Spermacoce with globular whorls.*

The firſt ſort grows to the height of two feet and a half; the ſtalks are ſtiff, a little angular, and covered with a brown bark; the branches come out by pairs. There are two leaves at each joint placed oppoſite, which are two inches long, and almoſt a quarter of an inch broad, and between theſe come out three or four ſmaller, which ſtand in whorls round the ſtalks; they are ſmooth, and have one ſtrong vein or midrib in the middle. The flowers grow in ſlender whorls toward the top of the ſtalks; they are ſmall, white, and ſit cloſe to the ſtalks, having a whorl of leaves cloſe under them; theſe are ſucceeded by two oblong ſeeds, having ſmall horns which ripen in the empalement.

The ſecond ſort riſes with a ſhrubby ſtalk three or four feet high, ſending out a few ſlender branches, which are garniſhed with narrow leaves not ſo long as thoſe of the former ſort; they are ſmooth, of a light green, and ſtand in a kind of whorls round the ſtalk, two of them being larger than the others in each whorl. The flowers grow in thick globular whorls toward the top of the ſtalk, and one of the whorls terminates the ſtalk; they are ſmall, very white, and funnel-ſhaped. The brim is cut into four obtuſe ſegments which ſpread open, and the ſtamina ſtand out above the tube of the flower. After the flowers are paſt, the germen turn to two ſeeds, ſhaped like thoſe of the former ſort.

Theſe plants grow naturally in moiſt places in Jamaica. The inhabitants call the ſecond ſort Button Weed. They are both propagated by ſeeds, which muſt be ſown on a hot-bed, and when the plants come up they muſt be tranſplanted on a freſh hot-bed to bring them forward, and afterward treated in the ſame way as other tender plants; and if they are placed in a ſtove, they will live through the winter, and produce good ſeeds the following year.

SPHÆRANTHUS. Vaill. Act. Par. 1719. Lin. Gen. Plant. 893. Globe Flower.

The Characters are,

*The flowers are compoſed of hermaphrodite florets, and female half florets, which are included in one globular ſcaly empalement, which is garniſhed with them on every ſide the receptacle. There are ſeveral of theſe florets included in each partial empalement. The hermaphrodite florets are placed in the center; they are funnel-ſhaped, and cut into five parts at the brim; they have five very ſhort hair-like ſtamina, terminated by cylindrical ſummits, and a germen which decays, ſupporting a thick longer ſtyle, having a ſingle ſtigma; theſe are barren. The female half florets are ſituated round the border, and have ſcarce any petals, but an oblong germen, ſupporting a briſtly ſtyle crowned by a double ſtigma; theſe have one oblong naked ſeed.*

This genus of plants is ranged in the ſecond ſection of Linnæus's nineteenth claſs, which includes thoſe plants whoſe flowers are compoſed of hermaphrodite barren florets, and female fruitful half florets.

The Species are,

1. Sphæranthus (*Indicus*) pedunculis criſpatis. Lin. Sp. Plant. 1314. *Globe-flower with curled foot-ſtalks.* Sphæranthus purpurea alata ſerrata. Burm. Zeyl. 220. *Purple, winged, ſawed Globe-flower.*

2. Sphæranthus (*Africanus*) pedunculis lævibus. *Globe-flower with ſmooth foot-ſtalks.* Scabioſæ capitulo, chryſanthemi Myconi foliis, alato caule Maderaſpatanus. Pluk. Phyt. tab. 108. 7. *A plant from Madras with a head like Scabious, leaves like the Corn Marygold of Myconus, and a winged ſtalk.*

The firſt ſort grows naturally in India; this riſes with an herbaceous ſtalk about a foot high, which rarely branches out; it is garniſhed with ſpear-ſhaped leaves about three inches long, and one broad in the middle, whoſe baſe ſits cloſe to the ſtalk, and from them is extended a leafy border or wing along the ſtalk; they are ſawed on their edges and are of a deep green, ſtanding alternate. The foot-ſtalks of the flowers come out from the ſide of the ſtalk, oppoſite to the leaf;

leaf; they are about two inches long, and sustain one globular head of flowers at the top, of a purplish red colour; these are succeeded by oblong seeds situated on the margin, which are naked.

The second sort grows naturally at Madras, and also at La Vera Cruz in New Spain, where it was discovered by the late Dr. Houstoun; this rises with an herbaceous winged stalk about ten inches high, garnished with oval, spear-shaped, sawed leaves placed alternately. The upper part of the stalk branches out into small divisions, which are terminated by foot-stalks sustaining three or four globular flowers of a pale yellow colour.

These are both annual plants, which require a hot-bed to bring them forward in the spring, and if the summer proves cold, they must be kept in a glass-case, otherwise they will not ripen seeds here.

SPHONDYLIUM. See Heracleum.

SPIGELIA. Lin. Gen. Plant. 192. Arapabaca. Plum. Nov. Gen. 10. tab. 31. Worm Grass.

The Characters are,

*The empalement of the flower is permanent, of one leaf, which is cut into five acute points; it has one funnel-shaped petal, whose tube is longer than the empalement, cut into five points at the brim which spread open. It has five stamina terminated by single summits, and a germen composed of two globular lobes, supporting one awl-shaped style the length of the tube, crowned by a single stigma. The germen afterward becomes two globular seed-vessels which are joined, sitting in the empalement, filled with small seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and one style.

The Species are,

1. Spigelia (*Anthelmia*) caule erecto, foliis quaternis sessilibus, spicis terminalibus. *Worm-seed with an erect stalk, and leaves growing by fours sitting close to the stalks, which are terminated by spikes of flowers.* Arapabaca quadrifolia, fructu testiculato. Plum. Nov. Gen. 11. *Four-leaved Arapabaca with a testiculated fruit.*
2. Spigelia (*Lonicera*) foliis oppositis ovato-oblongis acuminatis sessilibus, spicis terminalibus. *Worm Grass with oblong acute-pointed leaves growing opposite, and sitting close to the stalks, which are terminated by spikes of flowers.* Lonicera spinis terminalibus, foliis ovato-oblongis acuminatis distinctis sessilibus. Flor. Virg. 142. *Lonicera with spikes of flowers terminating the stalks, and oval, oblong, acute-pointed leaves sitting close to the stalks.*

The first sort grows naturally in moist places in most of the islands in the West-Indies; this is an annual plant with a fibrous root, from which arise a strong, erect, herbaceous stalk a foot and a half high, which is channelled, sending out two side branches opposite near the bottom, and a little above the middle is garnished with four oblong, oval, acute-pointed leaves, placed in form of a cross round the stalk; these, and also the principal stalk, have four smaller leaves near the top, sitting round in the same manner as the other, and from these arise short spikes of herbaceous flowers, ranged one one side the foot-stalk, which are succeeded by roundish twin capsules containing small seeds.

This plant is esteemed the most efficacious medicine for the worms yet known, and has been long used by the inhabitants of the Brasils as such; and also by the negroes, who taught the inhabitants of the British islands in America the use of it, where it has had great success, and from thence had the appellation of Worm Grass given to it.

It is too tender to thrive in the open air in England, so the seeds should be sown in pots filled with soft loamy earth in the autumn, and plunged into the bark-bed in the stove, where they should remain till the spring, when they should be plunged into a fresh hot-bed, which will bring up the plants; these must be afterward planted into separate pots, and plunged into another hot-bed, and shaded till they have taken new root, after which they must be treated in the same way as other tender annual plants from the same countries, keeping them constantly in the hot-bed under cover, otherwise they will not perfect their seeds in England. This plant flowers in July, and the seeds ripen in September, which should be sown soon after, for if they are kept out of the ground till spring, they frequently fail.

This plant produces plenty of flowers, and the seeds seem to be well formed, but those which are saved in England seldom grow: this may perhaps be occasioned by the plants being kept under cover, so that the farina does not properly impregnate the germen; whether it is from this cause, or what other I know not, but I have not been able to raise any plants from English seeds.

The second sort grows naturally in North America, where the inhabitants call it Indian Pink. This hath a perennial fibrous root, from which arise two or three erect herbaceous stalks about seven or eight inches high, garnished with three or four pair of oval, oblong, acute-pointed leaves, placed opposite, sitting pretty close to the stalk; they are smooth, entire, and have several veins which diverge from the mid-rib. The stalk is terminated by a short spike of flowers, which are ranged on one side the foot-stalk; they have short empalements which are cut into five acute segments. The tube of the flower is long, narrow at the bottom, swelling upward much larger, and is cut at the brim into five acute segments, which spread open flat; the outside of the flower is of a bright red, and the inside of a deep Orange colour. These appear in July, but the seeds never ripen here.

This plant is used in North America, for the same purposes as the other is in the West-Indies, and is esteemed as the best medicine there yet known for the worms. A particular account of the virtues of this plant is mentioned in the first volume of the Philosophical Essays, printed at Edinburgh, communicated by Dr. Garden of Carolina.

This is not easily propagated in England, for the seeds do not ripen here, and the roots make but slow increase, so that the plant is very uncommon in the English gardens at present; for although it is so hardy as to endure the cold of our ordinary winters in the open air, yet, as it does not ripen seeds, the only way of propagating it is by parting of the roots; and as these do not make much increase by offsets, so the plants are scarce. It delights in a moist soil, and must not be often transplanted.

SPINA ALBA. See Mespilus and Cratægus.

SPINACIA. Lin. Gen. Plant. 986. Spinach, or Spinage; in French, *Epinars.*

The Characters are,

*The flowers are male and female in different plants; the male flowers have an empalement cut into five oblong, obtuse, concave segments; they have no petals, but have five hair-like stamina longer than the empalement, terminated by oblong twin summits; these plants are barren. The female flowers have permanent empalements of one leaf, cut into four segments, two of which are very small; they have no petals, but a compressed roundish germen supporting four hair-like styles, crowned by single stigmas. The germen afterward turns to a roundish seed, which is shut up in the empalement, and in some species are almost smooth, but in others they have two or three sharp thorns.*

This genus of plants is ranged in the fifth section of Linnæus's twenty-second class, which contains those plants which have male flowers on different plants from the fruit, and the male flowers have five stamina.

The Species are,

1. Spinacia (*Oleracea*) foliis sagittatis seminibus aculeatis. *Spinach with arrow-pointed leaves and prickly seeds.* Spinacia vulgaris capsulâ seminis aculeatâ. Tourn. Inst. 533. *Common Spinach with prickly capsules.*
2. Spinacia (*Glabra*) foliis oblongo-ovatis, seminibus glabris. *Spinach with oblong oval leaves, and smooth seeds.*

*seeds.* Spinacia vulgaris, capsulâ seminis non echinatâ. Tourn. Inst. 533. *Common Spinach with seed-vessels which are not prickly, but smooth.*

The first sort was formerly more cultivated in the English gardens than at present, because it is much hardier, so not in much danger from cold, therefore was generally cultivated for use in winter. The leaves of this are triangular, and shaped like the point of an arrow; the stalks are hollow, branching, and herbaceous; they rise about two feet high. The male flowers are produced in long spikes; they are herbaceous having no petals, but each has five slender stamina, terminated by oblong twin summits filled with a yellowish farina, which, when ripe, flies out on the plants being shaken, and spreads all round; these plants after their farina is shed soon decay. The female flowers which are upon separate plants, sit in clusters close to the stalks at every joint; they are small, herbaceous, and have neither stamina or petals, but have roundish compressed germen, which afterward turn to roundish seeds, armed with short acute spines. The plant flowers in June, and the seeds ripen the beginning of August.

There are two or three varieties of this now cultivated in the kitchen-gardens, which differ in the size and shape of their leaves, and their seeds being more or less prickly.

The seeds of this kind should be sown upon an open spot of ground the beginning of August, observing, if possible, to do it when there is an appearance of rain; for if the season should prove dry for a long time after the seed is sown, the plants will not come up regularly; part of them may come up soon, and a great part of them may remain till rain falls before they come up, which if that should not happen in a little time after, many times there will not be half a crop. When the Spinach is come up, and the plants have four leaves, the ground should be hoed to destroy the weeds, and also to cut up the plants where they are too close, leaving the remaining plants about three or four inches asunder; but this should always be done in dry weather, that the weeds may be destroyed soon after they are cut.

About a month or five weeks after the first hoeing, the weeds will begin to grow again; therefore the ground should be then hoed again the second time, observing, as before, to do it in dry weather. But if the season should prove moist, it will be proper to gather the weeds up after they are cut, and carry them off the ground; for if the Spinach is not cleaned from weeds before winter, they will grow up and stifle it so much, that in wet weather the Spinach will rot away.

In October the Spinach will be fit for use, when you should only crop off the largest outer leaves, leaving those in the center of the plants to grow bigger; and thus you may continue cropping it all the winter and spring, until the young Spinach sowed in the spring is large enough for use, which is commonly in April; at which time the spring advancing, the Winter Spinach will run up to seed; so that it should be all cut up, leaving only a small parcel to produce seeds if wanted.

But if the ground in which this Winter Spinach is sown, being commonly planted with early Cabbages, it is not proper to let any of the Spinach remain there for seed; therefore it should be cleared off as soon as ever the Spring Spinach is fit for use, that the Cabbages may be earthed up and laid clear, which is of great service to them; wherefore you should sow a small spot of ground with this sort of Spinach, on purpose to stand for seed, where there should be no other plants among it.

The second sort differs from the first in having oval thick leaves, which are not angular at their base; the seeds are smooth having no spines, and the stalks and leaves are much more fleshy and succulent: of this there are two or three varieties, which differ in the thickness and size of their leaves, which in one are much rounder and thicker than the other.

These are sown in the spring upon an open spot of ground by themselves, or else mixed with Radish-seed, as is the common practice of the London gardeners, who always endeavour to have as many crops from their land in a season as possible; but where land is cheap in the country, it will be the better method to sow it alone without any other sort of seed mixed with it; and when the plants are come up, the ground should be hoed to destroy the weeds, and cut out the plants where they are too close, leaving the remaining about three inches asunder; and when they are grown so large as to meet, you may then cut out a part of it for use, thinning the plants that they may have room to spread; and this thinning may be twice performed, as there is occasion for the herb, at the last of which the roots should be left eight or ten inches asunder; and if then you hoe the ground over again to destroy the weeds, it will be of great service to the Spinach; for if the land is good upon which it is sown, the sort with broad thick leaves, commonly called Plantain Spinach, will with this management many times produce leaves as large as the broad-leaved Dock, and be extremely fine.

But in order to have a succession of Spinach through the season, it will be proper to sow the seed at three or four different times in the spring; the first in January, which must be on a dry soil; the second the beginning of February, upon a moister soil; the third the beginning of March, which should be on a moist soil; and the fourth the beginning of April; but these late sowings should be hoed out thinner at the first time than either of the former, for there will be no necessity to leave it for cutting out thin for use, because the former sowings will be sufficient to supply the table till these are full grown; besides, by leaving it thin at first, it will not be apt to run up to seed so soon as it would if the plants were close.

These sowings here mentioned are such as are practised by the kitchen-gardeners near London; but as this herb is much used in soups, &c. for great tables, there should be some seeds sown every three weeks, during the summer season, to supply the kitchen; but these late sowings should be on moist strong ground, otherwise, if the season proves hot and dry, the Spinach will run to seed before the plants obtain strength, especially if the plants do not stand thin.

In order to save seeds of either of these kinds, you should sow an open rich spot of ground, with the sort you intend in February, after the danger of being injured by frost is over; and when the plants are come up, they should be hoed out to six or eight inches distance, observing to cut down the weeds at the same time; and when the plants have grown about three weeks or a month longer, they should be hoed a second time, when they should be left twelve or fourteen inches asunder at least, for when they have shot out their side branches they will sufficiently spread over the ground.

You must also observe to keep them clear from weeds, which, if suffered to grow amongst the Spinach, will cause it to run up weak, and greatly injure it. When the plants have run up to flower, you will easily perceive two sorts amongst them, viz. male and female. The male will produce spikes of stamineous flowers, which contain the farina, and are absolutely necessary to impregnate the embryos of the female plants, in order to render the seeds prolific. These male plants are, by the gardeners, commonly called She Spinach, and are often by the ignorant pulled up as soon as they can be distinguished from the female, in order, as they pretend, to give room for the seed-bearing to spread; but, from several experiments which I have made on these plants, I find wherever the male plants are entirely removed before the farina is shed over the female plants, the seed will not grow which they produce, so that it is absolutely necessary to leave a few of them in every part of the spot, though there may be a great many drawn out where they are too thick, for a small quantity of male plants (if rightly situated) will be sufficient to impreg-

nate a great number of female, which, when ripe, will ſpread to a conſiderable diſtance, when the plants are ſhaken by the wind.

When the ſeeds are ripe (which may be known by their changing their colour, and beginning to ſhatter) the plants ſhould be drawn up, and ſpread abroad for a few days to dry, obſerving to turn them every other day, that the ſeeds on both ſides may dry equally; you muſt alſo guard the ſeeds from birds, otherwiſe they will devour them. When it is dry, the ſeeds ſhould be threſhed out, cleaned from the dirt, and laid up for uſe where mice cannot come to them, for they are extremely fond of this ſeed.

SPIRÆA. Tourn. Inſt. R. H. 618. tab. 389. Lin. Gen. Plant. 554. [ſo called of Σπεῖρα, a rope, becauſe this ſhrub is flexible like a rope.] Spiræa Frutex, vulgò.

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, plain at the baſe, and cut into five acute ſegments at the top; it has five roundiſh oblong petals inſerted in the empalement, and twenty or more ſlender ſtamina which are ſhorter than the petals, and are inſerted in the empalement, terminated by roundiſh ſummits, and five or more germen ſupporting as many ſlender ſtyles, which are longer than the ſtamina, crowned by headed ſtigmas. The germen afterward turns to an oblong, acute-pointed, compreſſed capſule, opening with two valves, containing a few ſmall acute-pointed ſeeds.*

This genus of plants is ranged in the fourth ſection of Linnæus's twelfth claſs, which contains thoſe plants whoſe flowers have about twenty ſtamina inſerted in the empalement, and five ſtyles.

The SPECIES are,

1. SPIRÆA (*Salicifolia*) foliis lanceolatis obtuſis ſerratis nudis, floribus duplicato-racemoſis. Hort. Cliff. 191. *Spiræa with ſpear-ſhaped, obtuſe, naked, ſawed leaves, and flowers in double branching ſpikes.* Spiræa ſalicis folio. Tourn. Inſt. 618. *Spiræa Frutex, vulgò.*
2. SPIRÆA (*Opulifolia*) foliis lobatis ſerratis, corymbis terminalibus. Lin. Sp. Plant. 489. *Spiræa with lobated ſawed leaves, and flowers growing in a corymbus terminating the ſtalks.* Spiræa opuli folio. Tourn. Inſt. 618. *Spiræa with a Marſh Elder leaf, commonly called Virginia Gelder Roſe, with a Currant leaf.*
3. SPIRÆA (*Hypericifolia*) foliis obovatis integerrimis, umbellis ſeſſilibus. Hort. Upſal. 131. *Spiræa with oval entire leaves, and umbels of flowers ſitting cloſe to the branches.* Spiræa hyperici folio non crenato. Tourn. Inſt. 618. *Hypericum Frutex, vulgò.*
4. SPIRÆA (*Crenata*) foliis oblongiuſculis apice ſerratis, corymbis lateralibus. Lin. Sp. Plant. 489. *Spiræa with oblong leaves whoſe points are ſawed, and flowers growing in a corymbus on the ſides of the branches.* Spiræa Hiſpanica, hyperici folio crenato. Tourn. Inſt. 618. *Spaniſh Spiræa with a notched leaf.*
5. SPIRÆA (*Tomentoſa*) foliis lanceolatis inæqualiter ſerratis ſubtus tomentoſis, floribus duplicato-racemoſis. Lin. Sp. Plant. 480. *Spiræa with ſpear-ſhaped leaves which are unequally ſawed, woolly on their under ſide, and flowers growing in double branching bunches.* Ulmaria pentacarpos, integris ſerratis foliis parvis ſubtus incanis Virginiana. Pluk. Alm. 393. *Meadow-ſweet of Virginia, with ſmall, entire, ſawed leaves, which are hoary on their under ſide, and a fruit having five cells.*
6. SPIRÆA (*Sorbifolia*) foliis pinnatis, foliolis uniformibus ſerratis, caule fruticoſo, floribus paniculatis. Lin. Sp. Plant. 490. *Spiræa with winged leaves whoſe lobes are uniformly ſawed, a ſhrubby ſtalk, and flowers growing in panicles.* Spiræa ſorbi folio, tenuiter crenato, floribus in thyrſo albidis. Amman. Ruth. 186. *Spiræa with a Service-tree leaf which is ſlightly crenated, and white flowers growing in a thyrſe.*
7. SPIRÆA (*Trifoliata*) foliis ternatis ſerratis ſubæqualibus, floribus ſubpaniculatis. Lin. Sp. Plant. 490. *Spiræa with trifoliate ſawed leaves which are almoſt equal, and flowers growing in a kind of panicle.* Ulmaria major trifolia, flore amplo pentapetalo, Virginiana. Pluk. Alm. 393. *Greater three-leaved Virginia Meadow-ſweet, with a large flower having five petals.*
8. SPIRÆA (*Filipendula*) foliis pinnatis, foliolis uniformibus ſerratis, caule herbaceo, floribus cymoſis. Lin. Sp. Plant. 490. *Spiræa with winged leaves having uniform ſawed lobes, an herbaceous ſtalk, and flowers growing on ſlender foot-ſtalks at the top.* Filipendula vulgaris, an molon Plinii. C. B. P. 163. *The common Dropwort.*
9. SPIRÆA (*Anguſtifolia*) foliis pinnatis, foliolis difformibus pinnato-ſerratis, floribus cymoſis. *Spiræa with winged leaves whoſe lobes are difformed and ſawed like wings, and flowers growing at the top of the ſtalks on ſlender foot-ſtalks.* Filipendula omni parte major, folio anguſtiori. Boerh. Ind. alt. 1. p. 43. *Dropwort greater in every part, and having a narrower leaf.*
10. SPIRÆA (*Ulmaria*) foliis pinnatis, impari majore lobato, floribus cymoſis. Flor. Lapp. 201. *Spiræa with winged leaves, whoſe outer lobe is greater and divided into lobes, and flowers growing in bunches on weak foot-ſtalks.* Ulmaria. Cluſ. Hiſt. 198. *Meadow-ſweet, or Queen of the Meadows.*
11. SPIRÆA (*Aruncus*) foliis ſupra decompoſitis, ſpicis paniculatis, floribus diviſis. Lin. Sp. Plant. 490. *Spiræa with more than decompounded leaves, paniculated ſpikes, and male and female flowers.* Barba capræ floribus oblongis. C. B. P. 163. *Goats Beard with oblong flowers.*

The firſt ſort has been long cultivated in the Engliſh gardens, but from what country it originally came, is not very certain; it is generally ſold by the nurſery-gardeners with other flowering ſhrubs, for planting wilderneſs work; it riſes with ſeveral ſhrubby ſtalks, which are very taper and rough toward the top, and are covered with a reddiſh bark. The leaves are ſpear-ſhaped, about three inches long, and one broad in the middle; they are bluntly ſawed on their edges, and of a bright green colour. In rich moiſt ground the ſtalks will riſe five or ſix feet high, but in moderate land from three to four, for their whole height is one year's growth from the root. Theſe are terminated by ſpikes of pale red flowers; the lower part of the ſpikes are branched out into ſmaller, but the upper parts are cloſe and obtuſe. Each flower is compoſed of five petals which ſpread open; they are of a pale red or fleſh colour, and have a great number of ſtamina, ſome of which ſtand out much beyond the petals, but others are not ſo long; they are terminated by brown headed ſummits, and in the center are ſituated five ſtyles, which are terminated by headed ſtigmas. After the flowers are paſt, the germen turn to pointed capſules, but they rarely come to perfection here. This ſhrub flowers in June and July, and in moiſt ſeaſons there is frequently young ſhoots from the root, which flower in autumn.

This plant may be propagated from ſuckers which are ſent forth in plenty from the ſtems of the old plants, or by laying down the tender branches, which when rooted, ſhould be tranſplanted out in rows at three feet diſtance, and the plants a foot aſunder in the rows. In this nurſery they may remain two years, obſerving to keep the ground clear from weeds, and in the ſpring to dig up the ground between the rows, ſo that the roots may the more eaſily extend themſelves; but if they put out ſuckers from their roots, thoſe ſhould be taken off to keep the ſhrubs within bounds, and afterwards they may be tranſplanted where they are to remain, either in ſmall wilderneſs quarters, or in clumps of flowering ſhrubs, obſerving to place them amongſt other ſorts of equal growth. The young ſhoots of this ſhrub being very tough and pliable, are often uſed for the tops of fiſhing-rods.

The ſecond ſort grows naturally in North America, but it is now as common in the Engliſh gardens as the firſt; this riſes with many ſhrubby branching ſtalks, ſometimes eight or ten feet high in good ground, but generally five or ſix; they are covered with a looſe brown bark which falls off, and are garniſhed with lobed leaves about the ſize and ſhape of thoſe of the common Currant Buſh, ending in acute points, and are ſawed on their edges. The flowers are produced in

in roundiſh bunches at the end of the branches; they are white, with ſome ſpots of a pale red. It flowers in June. This is commonly known in the nurſeries by the title of Virginia Gelder Roſe, with a Currant leaf; it may be propagated and managed in the ſame manner as the former, and is equally hardy.

The third came originally from Canada, but is now as common in the nurſery-gardens as either of the former, where it is known by the title of Hypericum Frutex, but has no affinity to St. Johnſwort, and is only ſo called from the reſemblance of their leaves; this riſes with ſeveral ſlender ſhrubby ſtalks five or ſix feet high, covered with a dark brown bark, ſending out ſmall ſide branches the whole length, garniſhed with ſmall wedge-ſhaped entire leaves, which have many punctures on their ſurface like St. Johnſwort. The flowers are diſpoſed in ſmall umbels which ſit cloſe to the ſtalks, each flower ſtanding upon a long ſlender foot-ſtalk; they are white, compoſed of five roundiſh petals which ſpread open, and in the center have a great number of ſtamina almoſt equal in length with the petals. This ſort flowers in May and June, and as the flowers are produced almoſt the length of the branches, the ſhrubs make a good appearance during the time of their flowering.

This may be propagated by laying down the under branches, which will take root in the compaſs of one year, when they may be taken off, and planted in a nurſery for two or three years (as hath been directed for the former;) after which they may be tranſplanted out where they are deſigned to remain, placing them with the two former, being nearly of the ſame growth, where they will add to the variety.

The fourth ſort grows naturally in Spain; this is not very common at preſent in the Engliſh gardens. The whole appearance of this ſhrub is ſo like the third, as not to be diſtinguiſhed at a ſmall diſtance; the only difference being, that the leaves of this are broader at the point, where they have two or three indentures. The flowers are like thoſe of the former, and appear at the ſame time. This may be propagated in the ſame way as the former.

The fifth ſort grows naturally in Philadelphia; this is a ſhrub of lower ſtature than the former. The ſtalks are ſlender, and branch out near the ground; they have a purple bark covered with a gray meally down. The leaves are ſpear-ſhaped, but ſmaller than thoſe of the firſt ſort, and are unequally ſawed; they are downy and veined on their under ſide, but are of a bright-green above. The branches are terminated by a thick racemus of flowers, which are branched toward the bottom into ſmall ſpikes; the flowers are very ſmall, of a beautiful red colour, and appear in July; the ſpikes of this are longer than thoſe of the firſt.

The ſixth ſort grows naturally in North America; this riſes with ſhrubby ſtalks like the firſt, but ſends out horizontal branches which are ſlender, and covered with a brown bark. The leaves are ſpear-ſhaped, of a thin texture, and a bright green colour on both ſides; they are ſlighty ſawed on their edges, but the ſaws are acute. The flowers are diſpoſed in panicles at the end of the branches; they are ſmall, white, and of the ſame conſtruction of the former, having many ſtamina which are a little longer than the petals, terminated by large, roundiſh, brown ſummits. This ſort flowers the beginning of Auguſt.

Theſe ſorts are propagated in the ſame way as the firſt, but, as ſome of them do not put out ſuckers from their roots here in any plenty, their branches ſhould be laid down in autumn, which in one year will take root, and may then be planted where they are deſigned to remain, or into a nurſery, where they may ſtand one or two years to get ſtrength before they are planted out for good.

The ſeventh ſort grows naturally in North America; this hath a perennial root, but the ſtalks are annual, and riſe about a foot high, ſending out branches from the ſide their whole length; theſe are garniſhed with leaves, which for the moſt part are trifoliate, but are ſometimes ſingle, and at others by pairs; they are about an inch and a half long, and half an inch broad, ending in acute points; they are ſharply ſawed on their edges, of a bright green on their upper ſide, and pale on their under. The flowers are diſpoſed in looſe panicles at the top of the ſtalks, ſtanding upon ſlender foot-ſtalks; they have five long ſpear-ſhaped petals which ſpread open, and a great many ſtamina which are no longer than the tube of the flower. This ſort flowers in July, and the ſeeds ripen in September.

It is propagated by ſeeds, which ſhould be ſown on a ſhady border ſoon after they are ripe, for if they are ſown in the ſpring, the plants will not come up till the year after, and many times fail. When the plants appear, they muſt be conſtantly kept clean from weeds, but they ſhould not be removed till autumn, when their leaves begin to decay; then they may be either tranſplanted where they are deſigned to remain, or into a nurſery-bed, where they may grow a year or two to get ſtrength before they are planted out for good. This plant loves a ſhady ſituation and a moiſt light ſoil.

The eighth ſort is the common Dropwort, which grows plentifully upon chalky grounds in many parts of England. The roots of this conſiſt of a great number of oval knobs or glandules, which are faſtened together by ſlender fibres, from whence it had the title of Dropwort; the leaves ſpread near the ſurface of the ground, are winged, ſeven or eight inches long, and compoſed of many ſawed lobes, which are almoſt placed alternately along the midrib; thoſe near the baſe are the ſmalleſt, the others increaſe in ſize to the middle, afterward decreaſe again to the point, and ſit cloſe to the midrib. The flower-ſtalk riſes a foot or more in height, and has ſeldom more than one leaf upon it; the top is garniſhed with looſe bunches of ſmall white flowers, ſtanding upon ſlender foot-ſtalks which are conſtructed like thoſe of the other ſorts, but are ſucceeded by ſeveral capſules, which are ranged circularly: it flowers in June. The roots of theſe plants are uſed in medicine, and are accounted diuretic. It is rarely kept in gardens, but there is a variety of this with double flowers, which was found growing naturally in the north of England, that is kept in gardens for the ſake of variety.

The ninth ſort was given me many years ſince by the late Dr. Boerhaave of Leyden, but from whence he received it I do not know. The leaves of this are much longer and narrower than thoſe of the common ſort; the lobes of the leaves are unequal in length, ſome being two inches and a half long, and others not more than one inch; they are ſawed on their edges; the ſegments are oppoſite, and ranged like the lobes of winged leaves. The flower-ſtalk riſes much higher, and ſuſtains a much larger bunch of flowers. This flowers at the ſame time with the other.

The tenth ſort grows naturally on the ſides of waters, and in low moiſt meadows in moſt parts of England. The ſtalks are angular, red, and riſe three or four feet high, garniſhed with winged leaves, compoſed of two or three pair of large indented lobes, terminated by an odd one, which is much larger than the other, and divided into three parts or lobes; they are of a dark green on their upper ſide, but hoary on their under. The ſtalks are terminated by large looſe bunches of white flowers, which have an agreeable ſcent; theſe appear in June, and are ſucceeded by roundiſh capſules, twiſted like a ſcrew, filled with ſmall ſeeds.

The leaves and tops of this plant are uſed in medicine, but the plants are rarely kept in gardens. There is a variety of this with double flowers which is kept in ſome gardens, and one with variegated leaves.

The eleventh ſort grows naturally upon the mountains in Auſtria; this hath a perennial root, and an annual ſtalk which riſes from three to four feet high, garniſhed with decompounded winged leaves, which are compoſed of ſeveral doubly-winged leaves, each having

having three or four pair of oblong lobes terminated by an odd one; these are two inches long, and almost one broad, sawed on their edges, and ending in acute points. The flowers are disposed in long slender spikes, which are formed into loose panicles at the top of the stalks; they are small, white, and of two sexes in the same spike; they appear in July, but the seeds rarely ripen here.

This plant is kept in gardens for the sake of variety; it may be propagated by parting of the root in autumn; it loves a moist soil and a shady situation.

The shrubby sorts require no other pruning, but to cut out all the dead branches and such as grow irregular, and take off all their suckers every year, for if these are permitted to grow, they will starve the old plants by drawing away their nourishment. The ground between them should also be dug every spring to encourage their roots, and every third year a little rotten dung buried therein, which will cause them to flower very strong.

SPIRÆA of AFRICA. See Diosma.

SPONDIAS. Lin. Gen. Plant. 577. Plum. Nov. Gen. 22. Black American Plum.

The Characters are,

*It hath a small coloured empalement of one leaf, cut into five segments which fall off; and five oblong, plain, spreading petals to the flower, and ten awl-shaped erect stamina alternately longer, terminated by oblong summits, with an oval germen supporting five short styles, crowned by obtuse stigmas. The empalement afterward becomes a Plum, having five large punctures, inclosing an oval, ligneous, fibrous nut.*

This genus of plants is ranged in the fourth section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and five styles.

The Species are,

1. Spondias (*Purpurea*) petiolis communibus compressis. Lin. Sp. Plant. 613. *Spondias whose common foot-stalks are compressed.* Myrobalanus minor, folio fraxini alato, fructu purpureo officulo magno fibroso. Sloan. Cat. Jam. 182. *Myrabolon with an Ash leaf, and purple fruit with a large fibrous stone.*
2. Spondias (*Lutea*) foliolis nitidis. Lin. Sp. Plant. 613. *Spondias with neat leaves.* Monbin arbor folio fraxini, flore luteo racemoso. Plum. Gen. *Tree Monbin with an Ash leaf and yellow fruit.*

The first sort grows naturally in many places in the West Indies; its usual height is about ten or twelve feet, and their stems as large as a man's leg, sending out branches toward the top, which have a gray bark; these are destitute of leaves for some months, but in the spring before the leaves appear, there are many small purple flowers which come out from the side of the branches; these are succeeded by a fruit like Plums, having a luscious thin pulp, covering a large fibrous stone. The leaves which come out afterward are unequally winged, having four or five pair of lobes about an inch long, and half an inch broad, terminated by an odd one.

The second sort grows also in the warmest parts of America, where it rises to the height of thirty feet or more, sending out many crooked irregular branches, which are also destitute of leaves for some months; the branches have a light coloured bark, and are garnished with unequal winged leaves, which have four or six pair of lobes near two inches long, and one broad, having deep longitudinal veins. The flowers come out before the leaves appear, which are succeeded by yellow Plums an inch or more in length, growing in a sort of racemus. These have large fibrous stones with a thin covering of flesh.

These plants grow easily from cuttings when they are once obtained, which if planted in pots filled with light rich earth, and plunged into a moderate hot-bed, covering them down either with bell or hand-glasses to exclude the external air, and shaded from the sun, will take root freely. The best time for this is in the spring, before the plants put out their leaves.

They may also be propagated by their stones, if they are brought over fresh, which should be put into small pots filled with the same rich earth, and plunged into a hot-bed of tanners bark, observing duly to water the earth, and in about six or seven weeks the plants will appear. These should afterward be treated in the same way as the Annona, keeping them constantly in the tan-bed in the stove, and when they are destitute of leaves, give them but little water.

SQUASHES. See Pepo.

SQUILLS. See Scilla.

STACHYS. Tourn. Inst. R. H. 186. tab. 86. Lin. Gen. Plant. 638. [of Στάχυς, an ear of Corn, because the flowers of this plant resemble an ear of Corn.] Base Horehound.

The Characters are,

*The flower hath a tubulous, angular, permanent empalement, cut into five acute parts at the top; it has one lip-shaped petal, with a short tube having oblong chaps. The upper lip is erect, hooked, and a little indented at the point; it is large, reflexed, and cut into three parts, the middle segment being large and indented at the point. It has four awl-shaped stamina, two of which are longer, and inclined to the upper lip; the other two are shorter, terminated by single summits, and a four-pointed germen, supporting a slender style the length of the stamina, crowned by a bifid acute stigma. The germen afterward turns to four oval angular seeds which ripen in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes those plants whose flowers have two short and two longer stamina, and the seeds are naked in the empalement.

The Species are,

1. Stachys (*Germanica*) verticillis multifloris, foliorum serraturus imbricatis, caule lanato. Lin. Sp. Plant. 812. *Base Horehound with a woolly stalk, woolly leaves which are sawed, and whorls of flowers.* Stachys major Germanica. C. B. P. 236. *Greater German Base Horehound.*
2. Stachys (*Cretica*) verticillis multifloris, calycibus pungentibus caule hirto. Hort. Upsal. 170. *Base Horehound with many flowers in the whorls, and prickly empalements.* Stachys Cretica. C. B. P. 236. *Base Horehound of Candia.*
3. Stachys (*Italica*) foliis lineari-lanceolatis tomentosis subcrenatis, petiolis longissimis, caule fruticoso tomentoso. *Base Horehound with narrow, spear-shaped, woolly leaves which are somewhat crenated, grow on very long foot-stalks, and have a shrubby woolly stalk.* Stachys minor Italica. C. B. P. 236. *Lesser Italian Base Horehound.*
4. Stachys (*Alba*) foliis oblongo-ovatis crenatis pilosis calycibus pungentibus, labii superiore piloso. *Base Horehound with oblong, oval, crenated, hairy leaves, prickly empalements to the flowers, and the upper lip hairy.* Stachys alba, latifolia major. Barrel. Icon. 297. *Greater, broad-leaved, white Base Horehound.*
5. Stachys (*Alpina*) verticillis multifloris, foliorum serratum apice cartilagineis, corollis labio plano. Flor. Suec. 527. *Base Horehound with sawed leaves, having cartilaginous tops, and many flowers in whorls.* Stachys hormini folio obscurè virenti, flore ferrugineo. Mor. Hort. Reg. Blæs. 198. *Base Horehound with an obscure green Clary leaf, and an iron-coloured flower.*
6. Stachys (*Hispanica*) foliis inferioribus ovato-oblongis subcrenatis subtus tomentosis, caulinis cordatis acutis sessilibus, calycibus spinosis. *Base Horehound with oval, oblong, lower leaves, which are slightly crenated, woolly on their under side, those on the stalks being heart-shaped, acute-pointed, and sitting close to the stalks, and prickly empalements to the flowers.* Stachys elatior, flore flavescente punctato. Act. Phil. Lond. N° 383. *Taller Base Horehound with a yellowish spotted flower.*
7. Stachys (*Glutinosa*) ramis ramosissimis, foliis lanceolatis glabris. Hort. Cliff. 310. *Base Horehound with very spreading branches, and smooth spear-shaped leaves.* Galeopsis angustifolia Cretica viscosa. *Narrow-leaved viscous Hedge Nettle of Crete.*

8. Stachys

8. Stachys (*Paluſtre*) verticillis ſexfloris, foliis lineari-lanceolatis ſemiamplexicaulibus. Flor. Suec. 490. *Baſe Horehound with whorls of ſix flowers, and narrow ſpear-ſhaped leaves which half embrace the ſtalk.* Stachys paluſtris fœtida. C. B. P. 236. *Stinking marſh Baſe Horehound, or Gerard's Clound's Woundwort.*

9. Stachys (*Spinoſa*) ramulis ſpina terminalis. Hort. Cliff. 310. *Baſe Horehound with ſpines terminating the branches.* Stachys ſpinoſa Cretica. C. B. P. 236. *Prickly Baſe Horehound of Crete.*

10. Stachys (*Orientalis*) foliis tomentoſis ovato-lanceolatis, floralibus verticillo brevioribus. Prod. Leyd. 318. *Eaſtern Baſe Horehound, with oval, ſpear-ſhaped, woolly leaves, and flowers ſhorter than the whorls.* Stachys Orientalis altiſſima fœtidiſſima. Tourn. Cor. 12. *The talleſt Eaſtern Baſe Horehound, which is very fœtid.*

There are ſome other ſpecies of this genus which grow naturally in England, and others are common in different parts of Europe; but as they are rarely admitted into gardens, it would be beſide my purpoſe to enumerate them here.

The firſt and the eighth ſorts here mentioned, grow naturally in England; the firſt only in a few particular places, but the latter is common by the ſide of ditches and waters every where, and is here only mentioned, becauſe it is a diſpenſary plant, and has been ſuppoſed a good vulnerary herb. Of this there is another ſpecies, which was found by Mr. Stoneſtreet growing wild, with narrow leaves, ſhorter ſtalks, longer cloſer ſpikes of flowers, and the leaves ſtand diſtinct upon ſhort foot-ſtalks, and this has conſtantly retained its difference in the garden. Both theſe ſorts have creeping roots, ſo will ſoon ſpread over a large ſpot of ground where they have liberty.

The ſeventh ſort grows naturally in Crete; this is a low plant, with an herbaceous ſtalk which is very branchy from the bottom. The ſtalks are ſlender, four-cornered, and ſmooth; they are garniſhed with a few ſmall ſpear-ſhaped leaves: the whole plant is very clammy, and ſmells like bitumen. The flowers are ſmall, of a dirty white colour, and ſtand in ſmall whorls round the ſtalks. Theſe appear in July, and are ſucceeded by roundiſh ſeeds which ripen in autumn.

This is propagated by ſeeds, and requires to be ſheltered under a frame in winter, being too tender to live in the open air here.

The other ſorts are kept in botanic gardens for the ſake of variety, but are not cultivated in other places, ſo it will be needleſs to give a particular deſcription of them here.

They are propagated by ſeeds, which ſhould be ſown in March upon a bed of light freſh earth, and when the plants are come up, they may be planted out into other beds about ſix inches aſunder, obſerving to water them until they have taken root, after which they will require no farther care but to keep them clear from weeds till Michaelmas, when they ſhould be tranſplanted where they are to remain, which muſt be in an open ſituation, and upon a dry light ſoil, not rich, in which they will endure the winter much better than in good ground. The ſummer following theſe plants will flower, and in Auguſt their ſeeds will ripen, when they may be gathered and preſerved till ſpring for ſowing; many of them die ſoon after.

## STÆHELINA. Lin. Gen. Plant. 844.

The Characters are,

*The common empalement of the flower is oblong, cylindrical, and imbricated; the ſcales are coloured and reflexed; the flower is compoſed of ſeveral uniform florets, which are the length of the empalement; they are funnel-ſhaped, and of one petal. The brim is cut into five equal acute ſegments, is bell-ſhaped, and have each five hair-like ſtamina terminated by cylindrical ſummits, with a ſhort germen ſupporting a ſlender ſtyle, crowned by a double oblong ſtigma. The germen afterward becomes a ſhort four-cornered ſeed, crowned with a feathery down, which ripens in the empalement.*

This genus of plants is ranged in the firſt ſection of Linnæus's nineteenth claſs, which includes thoſe plants whoſe flowers are compoſed of only hermaphrodite florets which are fruitful, and have their ſummits connected together in a tube.

The Species are,

1. Stæhelina (*Gnaphalodes*) foliis tomentoſis, ſquamis calycinis lanceolatis, apice membranaceis reflexis. Lin. Sp. Plant. 840. *Stæhelina with woolly leaves, and ſpear-ſhaped ſcales to the empalements, with reflexed membranaceous tops.* Jacea Æthiopica, ſtæchados citrinæ majoribus tomentoſis foliis, capitulorum ſpinis & ſquamulis ex aureo colore nitentibus. Pluk. Alm. 193. tab. 302. *Æthiopian Knapweed with woolly leaves like the greater Goldylocks, and the ſpines and ſcales of the head of a ſhining gold colour.*

2. Stæhelina (*Dubia*) foliis linearibus denticulatis, ſquamis calycinis lanceolatis, pappo calycibus duplo longioribus. Lin. Sp. Plant. 1176. *Stæhelina with leaves which are linear and indented, ſcales to the empalement which are ſpear-ſhaped, and down longer than the empalement.* Santolina foliis linearibus, flore ſolitario terminali, ſquamis calycinis crenatis. Hort. Cliff. 398. *Stæhelina with linear indented leaves, and ſpear-ſhaped ſcales to the empalement.* Elichryſium ſylveſtre, flore oblongo. C. B. P. 265. *Wild Immortal Flower, with an oblong flower.*

The firſt ſort grows naturally at the Cape of Good Hope, from whence it was introduced into the Dutch gardens; this riſes with a ſhrubby ſtalk about three feet high, and divides into ſeveral branches, which are garniſhed with long, taper, woolly leaves ſet thinly upon the branches. The flowers are produced at the end of the branches in ſingle heads, which are pretty large, and have ſcaly empalements; theſe terminate in ſpines which are recurved; they are compoſed of ſeveral florets which are tubulous, hermaphrodite, and of a yellow colour, each of which is ſucceeded by a ſingle four-cornered ſeed crowned with a feathery down, and ripens in the empalement, each being ſeparated by a chaffy ſcale.

The ſecond ſort is a native of Spain and Italy; this is a low ſhrub, ſeldom riſing more than two feet high, ſending out many ſlender branches which are garniſhed with leaves placed alternate; there is a ſmall knob or angle, juſt under that part where the leaf is inſerted to the branch; the leaves are narrow, and have three blunt angles or corners. The branches are terminated by a ſingle flower, whoſe empalement is oval, and like thoſe of the flowers of Knapweed, being imbricated. The ſcales are oblong, oval, and their points are rounded; ſome of them have a large membranaceous border whoſe edge is crenated, and ſpread open; the florets are yellow and equal, of the ſame length as the empalement; they are all hermaphrodite and have a bifid ſtigma, and the ſeeds have a little hairy down on their top.

As theſe plants do not always ripen their ſeeds in England, ſo they are generally propagated by cuttings, which if planted in any of the ſummer months, and covered cloſe with a bell or hand-glaſs, will take root pretty freely. When theſe have made good roots, they ſhould be taken up carefully and planted in pots filled with freſh light earth, not too rich, and placed in the ſhade until they have taken new root; then they ſhould be removed to a ſheltered ſituation, where they may be intermixed with other exotic plants till the autumn, when they muſt be removed into ſhelter, and treated in the ſame way as other plants from the ſame country. Theſe plants do not require any artificial heat in winter, but ſhould have a dry air, for their tender ſhoots are very ſubject to rot with damp; therefore they will thrive better in a glaſs-caſe, than a green-houſe in winter.

STAMINA, CHIVES, or FILAMENTS, are the ſmall threads which encompaſs the ſtyle in the center of flowers; upon the tops of which the apices or ſummits, which contain the male duſt, hang, ſo are generally termed the male organs of generation.

STAMINEOUS FLOWERS are ſuch as have a number of ſtamina, or chives; but are deſtitute of

five coloured leaves, which are called petala, the stamina being only encompassed by the flower-cup; of this sort are the male plants of Nettles, Spinach, Hemp, &c.

STAPELIA. Lin. Gen. Plant. 271. Asclepias. Tourn. Inst. R. H. 94. Swallow-wort, or Fritillaria crassa.

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, cut into five acute segments; it has one large plain petal, cut into five acute segments above the middle, and a plain five-pointed starry nectarium with linear segments, whose torn points surround the parts of generation; it has five plain, broad, erect stamina, with linear summits fastened on each side the stamina, and two oval plain germen having no style, crowned by a blunt stigma. The germen afterward turn to two oblong taper pods filled with compressed seeds, crowned with a feathery down, lying over each other like the scales of fish.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which includes those plants whose flowers have five stamina, and two styles or germen.

The SPECIES are,

1. STAPELIA (*Variegata*) denticulis ramorum patentibus. Vir. Cliff. 20. *Stapelia with spreading indentures to the branches.* Asclepias Africana aizoides. Tourn. Inst. 94. *African Swallow-wort like Houseleek, commonly called Fritillaria crassa.*
2. STAPELIA (*Hirsuta*) denticulis ramorum erectis. Hort. Cliff. 77. *Stapelia with erect indentures to the branches.* Asclepias Africana aizoides, flore pulchrè fimbriato. Com. Rar. Plant. 19. *African Swallow-wort like Houseleek, with a fine fringed flower.*

There are some other species of this genus, which grow naturally at the Cape of Good Hope; the figures and descriptions of some sorts, having been exhibited by the learned Dr. Burman, professor of botany at Amsterdam, though we have not more than three species in England, one of which has not yet flowered here. There is a variety of the first sort mentioned in books, with flat crested branches, and is by some gardeners titled Coxcomb Fritillary; but this is no other than three, four, or more branches, joined together and becoming flat, so will return back to its original again, therefore is not worthy notice.

The first sort rises with many succulent branches about the size of a man's finger, which are four or five inches long, having several protuberant indentures on their sides, which spread open horizontally, ending in acute points; these branches spread on the ground and emit roots from their joints, so where they have room will extend very wide; they are angular, and of a deep green colour in summer, when they are free in growth, but in winter they change to a purplish colour; they abound with a viscous juice of a nauseous taste. From the side of the branches toward their bottom comes out the foot-stalk of the flower at one of the sinuses, which is short, and sustains one flower, having a large thick petal which is cut half way into five points like a star, which spreads open flat; these are greenish on the outside, but yellow within, having a circle of purple round the nectarii, and the whole petal is finely spotted with purple, resembling the belly of a frog. In the center are the five compressed nectarii which are prominent, of a livid colour, which include the genital parts. The flower, when blown, has a very fœtid odour like that of carrion, so like as that the common flesh fly deposit their eggs on it, which frequently are hatched, but wanting proper food die soon after; for I have many years watched the progress of these, to see if the maggots produced from these eggs ever eat any part of the flower, or lived any time, but could never observe either; nor have ever heard that any other person of credit has, though it has been asserted, that they have devoured great part of the petal, and come to maturity, changing afterward into their last state of flies. After the flowers are past, the double germen changes into four taper pods joined at their base, which are near a span long, and almost as thick as a man's finger, which are filled with flat seeds crowned with a feathery down, lying over each other like the scales of fish, but these pods are seldom formed in England; for in upward of forty years which I have cultivated these plants, I never saw them produce their pods but three times, and those plants were plunged into the tan-bed in the stove, into which the branches had put out long roots, and thereby became very luxuriant.

The branches of the second sort are much larger than those of the first, and stand more erect, but spread and emit roots in the same way; they have four longitudinal furrows, which divide them into four angles, which have protuberant indentures on their edges, whose points are erect; they are nearly of the same colour as those of the first, being of a dark green in summer, but inclining to purple in autumn. The flowers come out upon short foot-stalks from the side of the branches; these are of the form with those of the former, but are much larger; the petal is of a thicker substance, and on the inside covered with fine purplish soft hairs; the ground of the flower is an herbaceous yellow, streaked and chequered with purplish lines. This sort produces its flowers in much greater plenty than the first sort, so that in summer and autumn these plants are seldom long destitute of flowers, but I have never seen any of the pods of this sort produced in England.

Both these plants grow naturally upon the rocks near the Cape of Good Hope, where they strike their roots into the crevices of the rocks and spread themselves greatly. They are propagated here very easily, by taking off any of the side branches during any of the summer months, which, when planted, put out roots very freely. The branches should be slipped off from the plants to the bottom, where they are joined by a small ligature, so will not occasion a great wound, the joints at the place where they are connected being almost closed round; for if they are cut through the branch, the wound will be so great as to occasion their rotting when planted: these should be laid in a dry place under cover for eight or ten days, that the wounded part may dry and heal over before they are planted, otherwise they will rot; then they should be planted in pots filled with earth, composed of fresh sandy earth, mixed with lime rubbish and sea sand; and if the pots are plunged into a very moderate hot-bed, it will promote their taking root; they should be now and then sprinkled with water, but it must be given them sparingly; and as soon as they have taken root, they must be inured to the open air. If these plants are kept in a very moderate stove in winter, and in summer placed in an airy glass-case, where they may enjoy much free air, but be screened from wet and cold, they will thrive and flower very well; for although they will live in the open air in summer, and may be kept through the winter in a good green-house, yet those plants will not flower so well as those managed in the other way. These plants must have little water given them, especially in winter.

STAPHYLÆA. Lin. Gen. Plant. 336. Staphylodendron. Tourn. Inst. R. H. 616. tab. 386. so called of σταφυλὴ, a Grape, and δένδρον, a tree, because its fruit grows upon trees in clusters.] Bladder-nut; in French, *Nez-Coupez.*

The CHARACTERS are,

*The empalement is roundish, concave, and coloured, so large as to inclose the flower, which has five oblong erect petals like the empalement, and a pitcher-shaped concave nectarium at the bottom of the flower, with five oblong erect styles terminated by single summits, and a thick germen divided in three parts supporting three styles, to which there are obtuse stigmas contiguous. The germen afterward become two hard almost globular seeds, included in three-cornered bladders, joined by a longitudinal seam, with an acute point opening within.*

This genus of plants is ranged in the third ſection of Linnæus's fifth claſs, which contains thoſe plants whoſe flowers have five ſtamina and three ſtyles.

The Species are,

1. Staphylæa (*Pinnata*) foliis pinnatis. Hort. Cliff. 112. *Bladder-nut with winged leaves.* Staphylodendron ſylveſtre & vulgare. H. L. *The common wild Bladder-nut.*
2. Staphylæa (*Trifoliata*) foliis ternatis. Hort. Cliff. 112. *Bladder-nut with trifoliate leaves.* Staphylodendron Virginianum trifoliatum. H. L. *Three-leaved Virginian Bladder-nut.*

The firſt ſort grows naturally in woods in ſeveral parts of England, but is cultivated as a flowering ſhrub in the nurſery-gardens. This hath ſeveral ſhrubby ſtalks ariſing from the ſame root, which grow ten or twelve feet high, covered with a ſmooth bark, and divide into ſeveral branches which are ſoft and pithy; they are garniſhed with winged leaves, compoſed of two pair of oval lobes terminated by an odd one; theſe differ greatly in ſize according to the ſtrength and vigour of the ſhrubs; ſome are more than two inches long, and an inch and a half broad, but on old weak ſhrubs they are much ſmaller. They are ſmooth, entire, and of a light green colour, ſtanding upon pretty long foot-ſtalks. The flowers come out upon long ſlender foot-ſtalks which hang downward; theſe ſpring from the wings of the ſtalks near their extremity. The flowers are diſpoſed in oblong bunches; they have each five oblong white petals, which expand in form of a Roſe; theſe appear in May, and are ſucceeded by inflated capſules or bladders compoſed of three cells, one or two of which have a roundiſh, ſmooth, hard ſeed, and the other are barren.

This ſhrub makes a variety when intermixed with others which flower at the ſame ſeaſon, though their flowers are not very beautiful. The nuts of this tree being hard and ſmooth, are ſtrung for beads by the Roman catholics in ſome countries; and the children of the poor inhabitants eat the nuts, though they have a diſagreeable taſte.

The ſecond ſort grows naturally in North America, from whence it was brought into Europe, where it is now become as common in the nurſery-gardens about London, as the other ſort. This hath a more ſubſtantial ſtalk than the firſt; the bark of the old branches and ſtalks is ſmooth and of a gray colour, that of the young is of a light green and very ſmooth; the leaves are by threes on each foot-ſtalk; the lobes are oval ending in a point, and their edges are ſawed; they are of different ſizes, according to the age and ſtrength of the plants. The largeſt are three inches long and two broad, but in old plants the leaves are not much more than half the ſize; they are ſmooth, and of a light green colour. The flowers are produced from the ſide of the branches in longer bunches than thoſe of the former ſort, but their foot-ſtalks are much ſhorter; the flowers are of a cleaner white, and their petals are ſomewhat larger than thoſe of the firſt, as are alſo the bladder capſules; the ſeeds are larger, and ripen better than thoſe of the common ſort. The time of flowering and the ripening of the ſeeds, is the ſame with that.

Both theſe ſorts are uſually propagated by ſuckers from the root, which the firſt ſort ſends out in plenty; theſe ſhould be taken from the old plants in autumn, and their roots trimmed, then planted in a nurſery, in rows at three feet diſtance, and one foot aſunder in the rows; in this nurſery the plants ſhould ſtand one or two years according to their ſtrength, and then be tranſplanted to the places where they are to remain.

The plants which are propagated in this manner from ſuckers, are very ſubject to put out ſuckers in greater plenty from their roots, than thoſe which are raiſed from ſeeds, or propagated by layers or cuttings, ſo are not to be choſen when the other can be had; therefore thoſe who propagate them for their own uſe, ſhould prefer the other methods. If they are propagated by layers, the young branches ſhould be laid down in autumn, in the ſame manner as is practiſed for other trees and ſhrubs; theſe will have put out roots the following autumn, when they may be taken from the old plants and planted in a nurſery, where they may grow one or two years to get ſtrength, and then may be removed to the places where they are to ſtand.

When theſe are propagated by cuttings, it ſhould be the ſhoots of the former year, and if they have a ſmall piece of the two years wood at the bottom, they will more certainly ſucceed; for as the young ſhoots are ſoft and pithy, ſo they are very ſubject to rot, when they have no part of the old wood to them. They ſhould be planted in autumn on a ſhady border, but muſt not have too much wet.

They may alſo be propagated by ſowing their ſeeds early in autumn, in beds of light freſh earth, and when the plants are come up, they muſt be carefully kept clear from weeds, and in very dry weather, if they are now and then refreſhed with water, it will greatly promote their growth; in theſe beds they may remain until October following, at which time they ſhould be carefully taken up and planted in a nurſery, placing them in rows three feet aſunder, and the plants one foot diſtance in the rows; and, if the the following ſpring ſhould prove very dry, it will be convenient to give them a little water to encourage their taking root; after which they will require no farther care but to keep the ground clean from weeds in ſummer, and every ſpring to prune off irregular branches, and dig the ground between the rows to looſen the earth, that their roots may the more eaſily extend. In this nurſery they may remain two years, by which time it will be proper to tranſplant them out where they are to remain, either in wilderneſs quarters, or in clumps of various trees, where they will add to the diverſity. The beſt ſeaſon for tranſplanting theſe trees is in autumn, with other deciduous trees. When theſe ſeeds are ſown in the ſpring, the plants ſeldom come up till the following year.

African Bladder-nut. See Royena.

Laurel-leaved American Bladder-nut. See Ptelea.

STAR-FLOWER. See Ornithogalum.

STARWORT. See Aster.

STATICE. Tourn. Inſt. R. H. 341. tab. 177. Lin. Gen. Plant. 348. Thrift, or Sea Pink.

The Characters are,

*The flowers are collected in a roundiſh head, having a common ſcaly empalement; each flower has a funnel-ſhaped empalement of one leaf. The flowers have five petals, they are funnel-ſhaped, the baſe of the petals are narrow, their points broad, obtuſe, and ſpread open; they have five ſtamina which are ſhorter than the petals, terminated by proſtrate ſummits; and a ſmall germen ſupporting five ſtyles which ſtand apart, crowned by acute ſtigmas. The germen afterward turns to one ſmall roundiſh ſeed incloſed in the empalement.*

This genus of plants is ranged in the fifth ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and five ſtyles. To this genus he has joined the Limonium of Tournefort.

The Species are,

1. Statice (*Armeria*) ſcapo ſimplici capitulo, foliis linearibus. Lin. Sp. Plant. 394. *Thrift with ſingle ſtalks, linear leaves, and flowers in heads.* Caryophyllus montanus major, flore globoſo. C. B. P. 211. *Greater Mountain Pink with a globular flower.*
2. Statice (*Montana*) foliis linearibus ſubulatis, ſquamis calycinis obtuſis. *Thrift with linear awl-ſhaped leaves, and obtuſe ſcales to the empalement.* Statice montana minor. Tourn. Inſt. R. H. 341. *Smaller Mountain Thrift.*
3. Statice (*Maritima*) foliis linearibus planis, ſquamis calycinis obtuſis. *Thrift with plain linear leaves, and obtuſe ſcales to the empalement.* Caryophyllus marinus minimus, flore globoſo. H. P. Blæſ. *The leaſt Sea Pink with a globular flower.*

The first sort grows naturally on the Alps, and other cold mountains in several parts of Europe. This has a perennial fibrous root, from which come out many narrow spear-shaped leaves about four inches long, and half an inch broad in the widest part; they are smooth, of a dark green colour, and sit close over each other at their base. The foot-stalks of the flowers rise about a foot high; they are naked, and terminated by one globular head, containing several small, pale, red flowers, which are included in one common scaly empalement; the lower scales are acute-pointed, and immediately under the flower is placed five narrow leaves which afterward fall off. This plant flowers in June, and the flowers are succeeded by oblong seeds which are closely wrapped up in the particular empalement of the flower, and ripen in August. There is a variety of this with white flowers.

The second sort is also a native of the Alps, and other cold mountains, where it seldom rises more than two inches high, but when it is planted in gardens, it becomes much larger. The roots of this are fibrous and perennial; they divide into heads, which have a great number of narrow Grass-like leaves, which have three corners at their base, sitting close round the heads, whose base embrace the stems and lie over each other. The stalks are naked, and rise about six inches high, sustaining on their tops heads of pale purplish flowers, inclosed in one common scaly empalement, whose scales are broad and rounded at their points. The flowers appear the latter end of May, and if the season is not very hot, they will continue good part of June.

There is a variety of this with bright red flowers, which is commonly called Scarlet Thrift; the flowers of this make a much better appearance than those of the other, so has been much more cultivated in gardens; but neither of the kinds are greatly esteemed at present, and therefore seldom seen in any modern gardens.

The third sort grows naturally in salt marshes, where the sea flows over them frequently, in many parts of England, so is very rarely admitted into gardens. The leaves of this sort are very narrow, short, and plain; the stalks seldom rise more than three or four inches high; the heads of flowers are small, and the flowers are of a pale flesh colour, so make but little appearance; it flowers later in the season than either of the former.

There was some years past another species of this genus in the English gardens, which came from Portugal. This had a thick perennial stalk which by age became shrubby, and rose to be a foot and a half in height; the leaves were like those of the first sort, but much larger; the foot-stalks of the flowers were a foot and a half long, naked, and terminated by one large globular head of flowers, of a pale red colour; but all the plants of this kind which were in England, the severe frost in the beginning of the year 1740 destroyed, since which time I have not seen one of them.

The second sort has been planted in gardens, to make edging on the sides of borders in the flower-gardens; for which purpose they were formerly in great esteem, but of late they have been very justly rejected for that use; because there was a necessity of transplanting these edgings every year, otherwise they could not be kept within due bounds; besides, wherever a plant failed, which was no extraordinary thing, there always appeared a large unsightly gap; however, tho' they are not in use at present for that purpose, yet a few plants of the first and second should have a place in some part of the flower-garden, for variety; especially the variety with red flowers will grow in almost any soil or situation, and their flowers will continue a long time in beauty.

All these sorts may be propagated by parting their roots; the best time for which is in autumn, that they may take root before the frost, which will cause them to flower much stronger than those transplanted in the spring; and the plants will not be in so much danger of miscarrying as those are, especially when the spring happens to prove dry. After these plants have taken root, they will require no farther care but to keep them clean from weeds, and to transplant and part their roots annually, for if they are permitted to stand longer unremoved, they are very subject to rot and decay, especially when they are planted in good ground.

STATUES and VASES contribute very much to the embellishment and magnificence of a garden, and extremely advance the natural beauties of it.

They are made of several forms, and different materials. The richest are those of cast brass, lead gilt, and marble; the ordinary sort are of a common stone or stucco.

Among figures are distinguished groups, which consist at least of two figures together in the same block; figures insulate or detached, that is, those that you can go quite round, and figures that are set in niches, which are finished on the fore part only.

There are likewise busts, termes, half-length figures, figures half as big as the life, and those bigger than the life, that are called colossal, either on regular pedestals, or such as are more slender, tapering, and hollowed, not to mention the figures which sometimes adorn cascades, as also bas-relievos, &c.

These figures represent all the several deities, and illustrious persons of antiquity, which should be placed properly in gardens.

The river gods, as Naiads, Rivers, and Tritons, should be placed in the middle of fountains and basons.

The gods of the woods, as Sylvans, Fauns, and Dryades, in the groves; sacrifices, bacchanals, and children sports, are likewise represented in bas-relievo upon the vases and pedestals, which may be adorned with festoons, foliage, mouldings, and other ornaments.

In woods and groves, Sylvanus, god, and Ferona, goddess, of the woods; Acteon the hunter, who chancing to espy Diana bathing, she transformed him into a hart, and he was devoured by his own dogs. Also,

Echo, a virgin rejected of her lover, who pined away in the woods for grief, where her voice still remains, answering the outcries of every complaint. Also,

Philomela, transformed into a nightingale, and Itys, into a pheasant.

Jupiter, Mars, and Bellona, should possess the largest open centers and lawns of a grand design, elevated upon pedestals, columnal, and other architectonical works, with their immediate servants and vassals underneath; Jupiter with his Mercury, Mars with Fame, and the rest of their attendants.

Also Minerva or Pallas, goddess of wisdom: with the several liberal sciences; the three destinies, Clotho, Lachesis, and Atropos; Tellus, the goddess of earth; Priapus, the god of gardens; Pytho, the goddess of eloquence; Vesta, the goddess of chastity.

Neptune, in his chariot, should possess the center of the greatest body of water, whether it be fountain, bason, or whatsoever there is of that kind, and attended with the Naiades, Tritons, and his other sea attendants.

For canals, basons, and fish-ponds, Palæmon, Paniscus, and Oceanus, gods; Dione, Melicerta, Thetis, and Marica, sea goddesses; Salacia, goddess of the water; Naiades, fairies of the water; and the sirens, Parthenope, Ligia, and Leucosia.

Flora and Chloris, goddesses of flowers, and also Venus, Daphne, and Rucina, the goddess of weeding, in the flower-garden.

The Dii minores ought also to possess the niches.

Ceres, Pomona, and the Hesperides, Ægle, Arethusa, and Hesperethusa, who were three sisters, feigned to have an orchard of golden Apples, kept by a dragon, which Hercules slew when he took them away, should be placed in the orchard. the fauns and sylvans should be placed in the more remote and rural centers and parts of the wood work.

Bacchus, the god of wine, and Silenus, in vineyards.
Daphne and Diana, Flora and Venus, ſhould have their places in the flower-garden.
Æolus, god of the winds, and the Oreades, fairies of the mountains, ſhould be placed on high mounts, terrace walks, &c.
The goddeſs Vallenta in vallies.
Harpocrates and Angerona, the former the god, and the latter the goddeſs, of ſilence, and Mercury, the god of eloquence, in private cabinets in a wilderneſs or grove.
Ariſtæus, the patron of bees, near an apiary.
Morpheus and Pan, gods of ſheep, Pales, the goddeſs of ſhepherds, and Bubona, the goddeſs of oxen, in ſmall paddocks of ſheep in open lawns. But unleſs theſe ſtatues are good, or copies from thoſe which are ſo, there had better be none in gardens, for perſons of good taſte cannot bear to ſee ordinary ones.

STELLATE plants are ſuch as have their leaves placed at certain knots or intervals of the ſtalks in form of a ſtar: of this tribe are Madder, Gooſegraſs, Ladies Bedſtraw, &c.

STERILITY ſignifies barrenneſs.

STEWARTIA. Lin. Gen. Plant. 758.

The Characters are,

*The flower has a permanent empalement of one leaf, cut into five oval concave ſegments; it has five large oval petals which ſpread open, and a great number of ſlender ſtamina which are joined in a cylinder at bottom, which are ſhorter than the petals, to which they are connected at their baſe, and are terminated by roundiſh proſtrate ſummits, with a roundiſh hairy germen, ſupporting five ſtyles the length of the ſtamina, crowned by obtuſe ſtigmas. The germen afterward turns to a five-cornered capſule with five cells, opening with five valves whoſe cells are cloſed, each containing one oval compreſſed ſeed.*

This genus of plants is ranged in the third ſection of Linnæus's ſixteenth claſs, which includes thoſe plants whoſe flowers have many ſtamina connected together in a column.

We know but one Species of this genus, viz.

Stewartia (*Malacodendron.*) Act. Upſal. 1741. Lin. Sp. Plant. 698. *Stewartia.* Malacodendron. Mitch.

The title of this genus was given it in honour of the Right Honourable the Earl of Bute, whoſe great knowledge of the ſcience of botany is well known to all who have have the honour of his lordſhip's acquaintance.

This ſhrub grows naturally in Virginia, where it riſes with ſtrong ligneous ſtalks to the height of ten or twelve feet, ſending out branches on every ſide, covered with a brown bark, garniſhed with oval ſpear-ſhaped leaves like thoſe of the Cherry-tree, about two inches and a half long, and one inch and a half broad; they are ſawed on their edges, and are pretty much veined, ſtanding alternately. The flowers are produced from the wings of the ſtalk; their empalements are of one leaf, cut into five obtuſe ſegments almoſt to the bottom. The flower is of one petal (according to Ray and Tournefort,) which is cut into five parts almoſt to the bottom, but their baſe are connected together, and fall off united; the ſegments are narrow at their baſe, but ſpread open, are broad and obtuſe at their points, and hollowed like a ſpoon in the middle; they are white, but one of the ſegments in each flower is ſtained with an herbaceous yellow colour. In the center of the flower ariſe five ſtyles, which are ſurrounded by a circle of purple ſtamina, terminated by roundiſh blue ſummits. The ſtamina are inſerted to the baſe of the petals, ſo form at their baſe one body, being there connected together. It flowers the latter end of May. The fruit of this is a conical, dry, ligneous capſule, having five ſharp angles and five cells, which open at the top with five valves, each cell containing one oblong ſmooth ſeed.

This ſhrub is at preſent very rare in the Engliſh gardens. The ſeeds are ſeldom brought to England, and thoſe frequently fail, either by their not having been properly impregnated, or duly ripened, for I have examined ſeveral which have been hollow, having only a ſhell; and when the plants come up, they are very difficult to maintain while young; for if they are expoſed to too much ſun, they will ſoon be deſtroyed, nor do they thrive when expoſed to the open air. The only way in which I have ſeen the young plants ſucceed was, when they were ſown under glaſſes, and the ſurface of the ground between the plants covered with Moſs to keep the ground moiſt, and the glaſſes were conſtantly ſhaded every day when the ſun was bright. With this management the plants ſeemed in good health, but made little progreſs in their growth.

STOCK GILIFLOWER. See Cheiranthus.

STŒBE. Lin. Gen. Plant. 839.

The Characters are,

*The flower is compoſed of many hermaphrodite florets, which are included in one common empalement, whoſe ſcales are awl-ſhaped and permanent; between each ſcale is ſituated one floret, whoſe empalement is compoſed of five narrow acute leaves which are equal and erect. The florets are funnel-ſhaped, of one petal, cut into five points at the brim, ſpread open; they have five ſhort hair-like ſtamina, terminated by cylindrical ſummits with five indentures, and an oblong germen, ſupporting a ſlender ſtyle, crowned by a bifid acute ſtigma. The germen afterward becomes a ſingle ſeed, crowned with a long feathery down, ſitting in the common empalement.*

This genus of plants is ranged in the fifth ſection of Linnæus's nineteenth claſs, which includes thoſe plants whoſe flowers have many partial empalements included in the common one.

We have but one Species of this genus, viz.

Stoebe (*Æthiopica.*) Hort. Cliff. 360. *Stœbe.* Helichryſoides juniperi creberrimis aduncis foliis, floribus in ramulorum cymis Vaill. Act. Par. 1719. *Baſtard Elichryſum with crooked Juniper leaves, and flowers growing at the tops of the branches.*

This plant grows naturally at the Cape of Good Hope; it is a perennial plant, with a ligneous ſtalk which riſes two or three feet high, ſending out ſlender branches from the ſides, which are garniſhed with ſhort linear leaves that are for the moſt part hooked; they are of a grayiſh colour, and placed irregularly round the branches; the flowers are produced in ſingle heads at the end of the branches; they are of a pale yellow colour, and are compoſed of ſeveral hermaphrodite florets, each having a ſeparate cup, included in one common empalement, whoſe ſcales lie over each other like thoſe of fiſh. The florets are ſingle, and peep out between the ſcales of the empalement. This plant flowers in Auguſt, but ſeldom produces good ſeeds in England.

It is propagated by cuttings or ſlips, which ſhould be planted in July upon a bed of ſoft loam, and covered cloſe down either with a bell or hand-glaſs, ſhading them every day from the ſun till they have taken root; then they muſt be gradually inured to the open air, and afterward taken up, and planted in pots, placing them in the ſhade till they have taken new root; then they may be placed in a ſheltered ſituation with other tender exotic plants, and in autumn they muſt be removed into ſhelter, for they are too tender to live through the winter in the open air in England.

STŒCHAS. Tourn. Inſt. R. H. 201. tab. 95. Lavendula. Lin. Gen. Plant. 630 [ſo called from certain iſles in the Mediterranean Sea, belonging to the French, where this plant was firſt found. In the ſhops it is called Stœchas Arabica, not becauſe it grows there, but becauſe the Arabian phyſicians highly commend this herb.] Caſſidony, French Lavender, or Stickadore.

The Characters are,

*The flower has an oval permanent empalement of one leaf, whoſe brim has ſome obſcure indentures; it is of the lip kind with one petal, having a cylindrical tube longer than the empalement, whoſe brim ſpreads open. The upper lip is large, bifid, and open; the under lip is cut into three roundiſh almoſt equal ſegments. It has four*

*ſtamina within the tube, which are turned aſide, two of which are ſhorter than the other, terminated by ſmall ſummits, and a quadrifid germen ſupporting a ſlender ſtyle the length of the tube, crowned by an obtuſe indented ſtigma. The germen afterward turn to four almoſt oval ſeeds which ripen in the empalement, to which the following notes muſt be added: the flowers are ranged in ſeveral ſeries, and the ſpikes are terminated by tufts of leaves.*

This genus of plants is ranged in the firſt ſection of Linnæus's fourteenth claſs, joining it to Lavendula, which contains thoſe plants whoſe flowers have two long and two ſhorter ſtamina, and the ſeeds are naked.

The Species are,

1. Stoechas (*Officinarum*) foliis lanceolato-linearibus, pedunculis brevioribus. *Stœchas with ſpear-ſhaped linear leaves, and ſhorter foot-ſtalks to the flowers.* Stœchas purpurea. C. B. P. 216. *Purple Stœchas, or common French Lavender.*
2. Stoechas (*Pedunculatus*) foliis lanceolato-linearibus, pedunculis longiſſimis. *Stœchas with ſpear-ſhaped linear leaves, and the longeſt foot-ſtalks to the flowers.* Stœchas cauliculis non folioſis. C. B. P. 216. *Stœchas without foot-ſtalks and leaves.*
3. Stoechas (*Dentatus*) foliis pinnato-dentatis. *Stœchas with winged indented leaves.* Stœchas folio ſerrato. C. B. P. 216. *Stœchas with a ſawed leaf.*

The firſt ſort grows naturally in the ſouth of France and Spain, from whence the tops or heads of flowers are imported to England for medicinal uſe: this has a low, thick, ſhrubby ſtalk, which riſes about two feet high, ſending out ligneous branches the whole length, which are garniſhed with ſpear-ſhaped linear leaves about an inch long, which are hoary and pointed, of a ſtrong aromatic ſcent, and ſtand oppoſite on the branches at each joint, with ſmaller leaves of the ſame ſhape coming out at the ſame places. The branches are terminated with ſcaly ſpikes of purple flowers about an inch in length; the ſpikes are four-cornered; the ſcales lie over each other like thoſe of fiſh; out of each ſcale peeps one lip flower, whoſe tube is the length of the ſcale, ſo the two lips only appear; the under is ſpread open, and the upper ſtands erect. The ſpike of flowers is terminated by a ſmall tuft of purple leaves like the Clary of Matthiolus; the flowers appear in May and June, which are ſucceeded by oval ſeeds which ripen in Auguſt. The whole plant has a very ſtrong, aromatic, agreeable odour.

The heads of flowers of this kind are uſed in ſome of the capital medicines directed by the College of Phyſicians, which are commonly brought from the ſouth of France, where the plants are in great plenty; but, as theſe are ſeldom imported, and very little care taken in the drying and packing them, they are very apt to take a mouldineſs in their paſſage, and are not near ſo good for uſe as thoſe which are gathered freſh in England, where the plants may be cultivated to great advantage.

The ſecond ſort grows naturally in Spain. The difference between this and the firſt conſiſts in the foot-ſtalks, which ſuſtain the ſpikes of flowers, being three times the length of thoſe of the firſt, and naked, having no leaves. The ſpikes of flowers are longer and not ſo thick, and they have more coloured leaves on their tops, which are longer, and of a brighter purple colour. Theſe differences are not accidental, for I have many years propagated this plant by ſeeds, and have always found them the ſame. The flowers, ſeeds, and other parts are the ſame. Of both theſe there are ſome plants which vary in the colour of their flowers, ſome producing white, and others purpliſh flowers, but the moſt common colour is blue.

Theſe plants may be cultivated by ſowing their ſeeds upon a bed of light dry ſoil in March, and when they come up, they ſhould be carefully cleared from weeds until they are two inches high, at which time they ſhould be removed; therefore there muſt be a ſpot of light dry ground prepared, and laid level, which muſt be trodden out in beds, into which the plants ſhould be planted at about five or ſix inches diſtance each way, obſerving to water and ſhade them until they have taken root, after which they will require no further care but to keep them clear from weeds the following ſummer; but, if the winter ſhould prove ſevere, it will be proper to cover them with mats, Peas-haulm, or ſome other light covering, to guard them againſt the froſt, which otherwiſe would be apt to injure them while they are ſo young; but in March, or the beginning of April, the following ſpring, they muſt be removed into the places where they are to remain, obſerving if poſſible, to tranſplant them in a warm moiſt ſeaſon, and not let them remain long above ground, for if their roots are dried they ſeldom grow well after. The ſoil in which theſe are planted ſhould be a dry warm ſand or gravel, and the poorer the ſoil is in which they are planted, the better they will endure the cold of the winter, provided the ground be dry; though indeed the plants will thrive better in ſummer upon a rich moiſt ground, but then they will not produce ſo many flowers, nor will the heads or ſpikes have near ſo ſtrong an aromatic ſcent, as is the caſe with moſt ſorts of aromatic plants.

Theſe plants may alſo be propagated by planting ſlips or cuttings of any of the kinds in the ſpring, obſerving to refreſh them with water until they have taken root, after which they may be managed as hath been directed for the ſeedling plants; but, as thoſe plants raiſed from ſeeds are much better than theſe, it is hardly worth while to propagate them this way, eſpecially ſince their ſeeds ripen ſo well in this country. The heads of the firſt ſorts may be gathered for uſe, when the flowers are in full perfection, and ſpread to dry in a ſhady place, after which they may be put up for uſe.

The third ſort grows naturally in Andaluſia in Spain, and alſo about Murcia; this has a ligneous ſtalk which riſes two or three feet high, furniſhed with branches on every ſide the whole length, which are four-cornered, and garniſhed with leaves placed oppoſite by pairs, which are about an inch long, and an eighth of an inch broad, indented regularly on both ſides almoſt to the midrib, in form of winged leaves; they are of a grayiſh colour, have a pleaſant aromatic odour, and biting warm taſte. The flowers are produced in ſcaly ſpikes at the end of the branches, ſtanding upon long naked foot-ſtalks; the ſpikes are four-cornered, hairy, and about an inch long, terminated by a few purpliſh leaves in the like manner as the other ſorts, which inclined me to keep it joined to them. It flowers great part of ſummer, but the ſeeds very rarely ripen in England.

As this plant ſeldom produces ſeeds in England, it is propagated by ſlips or cuttings, which, if planted in April, and treated in the ſame way as thoſe of the two other ſorts, will take root very freely; but theſe plants, when rooted, muſt be planted in pots, that they may be ſheltered from ſevere froſt in winter, becauſe they are too tender to live in the open air through the winter in England, eſpecially while they are young; but when they have obtained ſtrength, ſome of them may be turned out of the pots, and planted in a warm ſituation, upon a dry rubbiſhy ſoil, where they will be ſtinted from growing too vigorouſly, ſo will endure the cold much better than if they were growing in better ground.

STONECROP. See Sedum.

STONECROP-TREE. See Chenopodium.

STOVES are contrivances for the preſerving ſuch tender exotic plants, which will not live in theſe northern countries without artificial warmth in winter. Theſe are built in different methods, according to the ingenuity of the artiſt, or the different purpoſes for which they are intended, but in England they are at preſent reducible to two or three.

The firſt is called a dry Stove, being ſo contrived, that the flues, through which the ſmoke paſſes, are either carried under the pavement of the floor, or elſe are erected in the back part of the houſe, over each other, and are returned ſix or eight times the whole length of the Stove, according to the height. In

Pl. I.
Plan of the Large Tan Stove
F
F
F
F
I
H
A.A. Two Tan Beds.
B. The Walks round.
C. The Flues against the back Wall.
D. The Shed behind the Stove.
E.E. The two Fire places.
F. The Section of the four Flues.
G. The upright Section of the Stove.
H. The upright View of the Glasses.
I An Iron Bar for supporting of the Roof.
D
E
E
C
C
B
B
A
A
B
B
8 G.
60
50
40
30
20
10
5
Feet

these Stoves the plants are placed on shelves of boards laid on a scaffold, rising above each other like the seats in a theatre, for the greater advantage of their standing in sight, and enjoying an equal share of light and air. In these Stoves are commonly placed the tender sorts of Aloes, Cereuses, Euphorbiums, Tithymals, and other succulent plants, which are impatient of moisture in winter, and therefore require for the most part to be kept in a separate Stove, and not placed among trees or herbaceous plants, which perspire freely, and thereby often cause a damp air in the house, which is imbibed by the succulent plants to their no small prejudice. These Stoves may be regulated by a thermometer so as not to over-heat them, nor let the plants suffer by cold; in order to which, all such plants as require nearly the same degree of heat, should be placed by themselves in a separate house, for if in the same Stove there are plants placed of many different countries, which require as many different heats, by making the house warm enough for some plants, others, by having too much heat, are drawn and spoiled.

The other sort of Stoves are commonly called bark Stoves, to distinguish them from the dry Stoves already mentioned. These have a large pit, nearly the length of the house, three feet deep, and six or seven feet wide, according to the breadth of the house, which pit is filled with fresh tanners bark to make a hot-bed, and in this bed the pots of the most tender exotic trees and herbaceous plants are plunged. The heat of this bed being moderate, the roots of the plants are always kept in action, and the moisture detained by the bark, keeps the fibres of their roots in a ductile state, which in the dry Stove, where they are placed on shelves, are subject to dry too fast, to the great injury of the plants. In these Stoves, if they are rightly contrived, may be preserved the most tender exotic trees and plants, which, before the use of the bark was introduced, were thought impossible to be kept in England; but, as there is some skill required in the structure of both these Stoves, I shall not only describe them as intelligibly as possible, but also annex plans of both Stoves hereto, by which it is hoped every curious person will be capable of directing his workmen in their structure.

The dimension of these Stoves should be proportioned to the number of plants intended to be preserved, or the particular fancy of the owner, but their length should not exceed forty feet for one fire-place; but where there are two fires it will be proper to make a partition of glass in the middle, and to have two tan-pits, that there may be two different degrees of heat for plants from different countries (for the reasons before given in the account of dry Stoves;) and were I to erect a range of Stoves, they should be all built in one, and only divided with glass partitions, at least the half way toward the front, which will be of great advantage to the plants, because they may have the air in each division shifted by sliding the glasses of the partitions, or by opening the glass door which should be made between each division, for the more easy passage from one to the other. These Stoves should be raised above the level of the ground, in proportion to the dryness of the place, for if they are built on a moist situation, the whole should be placed upon the top of the ground, so that the brick-work in front must be raised three feet above the surface, which is the depth of the bark-bed, whereby none of the bark will be in danger of lying in water; but if the soil be dry, the brick-work in front need not be more than one foot above ground, and the pit may be sunk two feet below the surface. Upon the top of this brick-work in front must be laid the plate of timber, into which the wood-work of the frame is to be mortised; this should be of sound Oak felled in winter, without sap, the dimension one foot wide, and six inches deep, and the upright timbers in front must be placed four feet asunder, or somewhat more, which is the proportion of the width of the glass doors or sashes; these should be about six feet and a half, or seven feet long, and placed upright; their dimension should be nine inches by six, of yellow Fir; but from the top of these should be sloping glasses, which should reach within three feet of the back of the stove, where there should be a strong crown-piece of timber placed, in which there should be a groove made for the glasses to slide into; the dimension of the sloping timbers should be ten inches by nine of yellow Fir, and the crown-plate one foot by nine or ten inches of the same timber. The wall in the back part of the Stove should be at least thirteen inches thick, but eighteen or twenty-two inches, which is two bricks and a half, will be better, for the greater thickness there is in the back wall, the more heat will be thrown to the front, whereby the air of the Stove will be better warmed, and the building will be so much stronger; for to this back wall the flues, through which the smoke is to pass, must be joined. This back wall should be carried up about sixteen or twenty feet high, or more for tall Stoves, that they may be of a proper height to support the timbers of the back roof, which covers the shed behind the Stove. The roof is fastened into the crown-piece before-mentioned, which in tall Stoves should be about thirty feet above the surface of the tan-bed, which will give a sufficient declivity to the sloping glasses to carry off the wet, and be of a reasonable height for containing many tall plants. The back roof may be slated, covered with lead, or tiled, according to the fancy of the owner; but the manner of the outside building is better expressed by the annexed plan, than is possible to be described in words.

In the front of the house, before the tan-bed, there should be a walk, about two feet wide, for the conveniency of walking; next to which the bark-pit must be placed, which should be in width proportionable to the breadth of the house. If the house is fourteen feet wide, which is a due proportion, the pit may be eight feet wide, and behind the pit should be a walk two feet wide, to pass, in order to water the plants, &c. then there will be two feet left next the back wall to erect the flues, which must be all raised above the level of the bark-bed. These flues ought to be one foot wide in the clear, that they may not be too soon stopped with the soot, as also for the more conveniently cleaning them; the lower flue, into which the smoke first enters from the fire, should be two feet deep in the clear; this should be covered with broad tiles, which should be a foot and a half square, or one foot by a foot and a half long, that they may be wide enough to extend over the wall in front of the flues, and to take sufficient hold of the back wall; over this the second flue must be returned back again, which may be twenty inches deep, and covered on the top as before; and so in like manner the flues may be returned over each other six or eight times, that the heat may be spent before the smoke passes off. The thickness of the wall in front of these flues need not be more than four inches, or three will do very well if they are carefully carried up, but it must be well jointed with mortar, and pargitered within side to prevent the smoke from getting into the house: the outside should be faced with mortar, and covered with a coarse cloth, to keep the mortar from cracking, as is practised in setting up coppers. If this be carefully done, there will be no danger of the smoke entering the house, which cannot be too carefully guarded against, for there is nothing more injurious to plants than smoke, which will cause them to drop their leaves, and, if it continue long in the house, will entirely destroy them. The fire-place must be made at one end, where there is but one; but, if the Stove is so long as to require two, they should be placed at each end of the shed, which must be made the length of the Stove, that the fires and the back of the flues may not suffer from the outer air; for it will be impossible to make the fires burn equally, where the wind has full ingress to it, and it will be troublesome to attend the fire in wet weather, where it is exposed to the rain.

The contrivance of the furnace muſt be according to the fuel which is deſigned to burn, but as turf is the beſt firing for Stoves, where it can be had cheap, many prefer it, becauſe it laſts longer than any other ſort of fuel, and ſo requires leſs attendance, I ſhall deſcribe a proper ſort of furnace for that purpoſe.

The whole of this furnace ſhould be erected within the houſe, which will be a great addition to the heat, and the front-wall on the outſide of the fire-place, next the ſhed, ſhould be three bricks thick, the better to prevent the heat from coming out that way. The door of the furnace, at which the fuel is put in, muſt be as ſmall as conveniently may be to admit of the fuel; and this door ſhould be placed near the upper part of the furnace, and made to ſhut as cloſe as poſſible, ſo that there may be but little of the heat paſs off through it. This furnace ſhould be about twenty inches deep, and ſixteen inches ſquare at bottom, but may be ſloped off on every ſide, ſo as to be two feet ſquare at the top, and under this furnace ſhould be a place for the aſhes to fall into, which ſhould be about a foot deep, and as wide at the bottom of the furnace; this ſhould alſo have an iron door to ſhut as cloſe as poſſible, but juſt over the aſh hole, above the bars which ſupport the fuel, ſhould be a ſquare hole about four or ſix inches wide to let in air to make the fire burn: this muſt alſo have an iron frame, and a door to ſhut cloſe when the fire is perfectly lighted, which will make the fuel laſt longer, and the heat will be more moderate.

The top of this furnace ſhould be nearly equal to the top of the bark-bed, that the loweſt flue may be above the fire, ſo that there may be a greater draught for the ſmoke, and the furnace ſhould be arched over with bricks. The beſt materials for this purpoſe are what the bricklayers call Windſor bricks, which ſhould be laid in loam of the ſame kind as the bricks are made with, which, when burnt by the fire, will cement the whole together, and become like one brick; but you ſhould be very careful, wherever the fire is placed, that it be not too near the bark-bed, for the heat of the fire will, by its long continuance, dry the bark, ſo that it will loſe its virtue, and be in danger of taking fire; to prevent which, it will be the beſt method to continue a hollow, between the brick-work of the fire and that of the pit, about four or five inches wide, which will effectually prevent any damage ariſing from the heat of the fire; nor ſhould there be any wood-work placed near the flues, or the fire-place, becauſe the continual heat of the Stove may in time dry it ſo much as to cauſe it to take fire, which ſhould be very carefully guarded againſt.

The entrance into this Stove ſhould be either from a green-houſe, the dry Stove, or elſe through the ſhed where the fire is made, becauſe in cold weather the front-glaſſes mnſt not be opened. The inſide of the houſe ſhould be clean and white-waſhed, becauſe the whiter the back part of the houſe is, the better it will reflect the light, which is of great conſequence to plants, eſpecially in winter, when the Stove is obliged to be ſhut up cloſe.

Over the top ſliding-glaſſes there ſhould be either wooden ſhutters, or tarpaulins fixed in frames to cover them in bad weather, to prevent the wet from getting through the glaſſes, and to ſecure them from being broken by ſtorms of hail, and theſe outer coverings will be very ſerviceable to keep out the froſt; and if in very ſevere cold there is a tarpaulin hung before the upright glaſſes in the front, it will be of great ſervice to the Stove, for then much leſs fire will preſerve a heat in the houſe.

In the warmeſt of theſe houſes or diviſions ſhould be placed the moſt tender exotic trees and plants, a liſt of which followeth:

Acajou, or Caſhew,
Ahouai,
Allegator Pear,
Allſpice, or Pimento,
Arrow-root,
Bananas,
Baſtard Cedar of Barbadoes,
Baſtard Locuſt of Barbadoes,
Bully-tree,
Button-wood of Barbadoes,
Cabbage-tree,
Cocoa-tree,
Calabaſh-tree,
Caſſada,
Cherry-tree of Barbadoes,
Cocoa-nut-tree,
Cortex Winteranus,
Cuſtard-apple,
Date-tree,
Dumb Cane,
Fiddle-wood,
Fig-tree, the arched Indian,
Flower-fence of Barbadoes,
Fuſtic-tree,
Ginger,
Guaiacum,
Logwood,
Macaw-tree,
Mamee-tree,
Manchineel-tree,
Mimoſa, or Senſitive Plants,
Nickar-tree, or Bonduc,
Palm-trees, of ſeveral ſorts,
Papaw-tree,
Plantain-tree,
Plum-tree of Jamaica,
Hog-plum,
Sapotilla-tree,
Santa Maria,
Sour Sop,
Sugar-Apple,
Sweet Sop,
Tamarind-tree,
Tulip-flower, or White-wood.

Theſe with moſt other ſorts of trees, ſhrubs, and herbaceous plants, which are natives of very warm countries, ſhould be plunged in the bark-bed for the reaſons already aſſigned, and over the flues may be a conveniency made to ſet the Melon Thiſtle, the tender ſorts of Cereuſes, and Euphorbiums, with other very tender ſucculent plants, which require to be kept dry in winter.

As in this Stove are placed the plants of the hotteſt parts of the Eaſt and Weſt-Indies, the heat ſhould be kept up equal to that marked Anana upon the botanical thermometers, and ſhould never be ſuffered to be above eight or ten degrees cooler at moſt; nor ſhould the ſpirit be raiſed above ten degrees higher in the thermometer during the winter ſeaſon, both which extremes will be equally injurious to the plants.

But in order to judge more exactly of the temper of the air in the Stove, the thermometer ſhould be hung at a good diſtance from the fire; nor ſhould the tube be expoſed to the ſun, but, on the contrary, as much in ſhade as poſſible; becauſe, whenever the ſun ſhines upon the ball of the thermometer but one ſingle hour, it will raiſe the liquor in the tube conſiderably, when perhaps the air of the houſe is not near ſo warm, which many times deceives thoſe who are not aware of this.

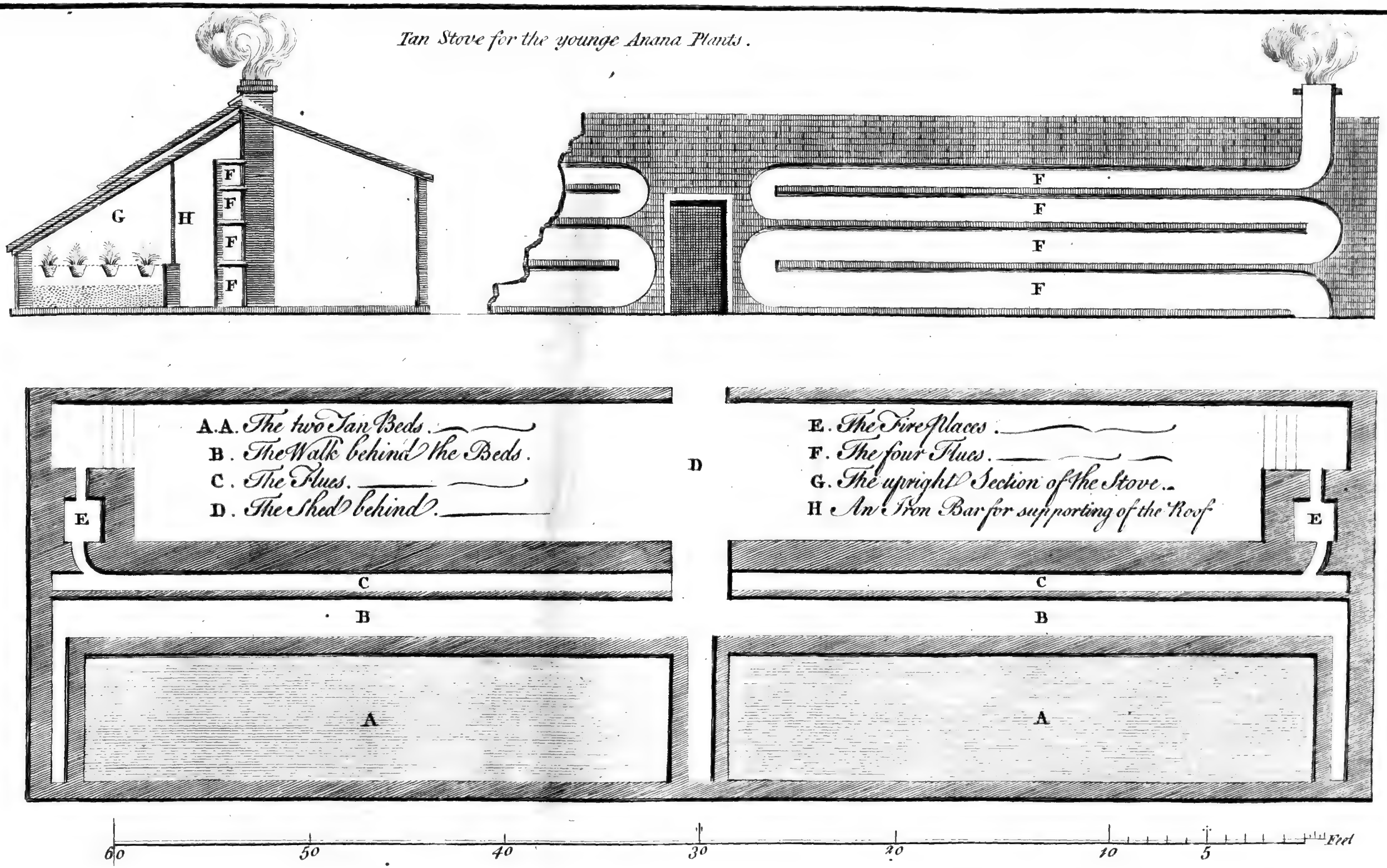
In the management of the plants placed in the bark-bed, there muſt be a particular regard had to the temper of the bark, and the air of the houſe, that neither be too violent; as alſo to water them frequently, but ſparingly in cold weather, becauſe when they are in continual warmth, which will cauſe them to perſpire freely, if they have not a proper ſupply to anſwer their diſcharge, their leaves will decay, and ſoon fall off. As to the farther directions concerning the culture of the particular plants, the reader is deſired to turn to their ſeveral articles, where they are diſtinctly treated of.

The other ſort of Stove, which is commonly called the dry Stove, as was before ſaid, may be either built with upright and ſloping glaſſes at the top, in the ſame manner, and after the ſame model of the bark Stove, which is the moſt convenient; or elſe the front glaſſes, which ſhould run from the floor of the cieling, may be laid ſloping, to an angle of 45 degrees, the better to admit the rays of the ſun in ſpring and autumn, when the ſun declines. The latter method has been chiefly followed by moſt perſons who have built theſe ſorts of Stoves, but where I have had the contrivance of Stoves of this kind, I have always built them after the model of the bark Stove, with upright glaſſes in front, and ſloping glaſſes over them, becauſe this will more eaſily admit the ſun at all the different ſeaſons; for in ſummer, when the ſun is high, the top glaſſes will admit the rays to ſhine almoſt all over the houſe, and in winter, when the ſun is low, the front glaſſes will admit its rays; whereas, when the glaſſes are laid to any declivity in one direction, the rays of the ſun will not fall directly

thereon

Pl. II.

*Tan Stove for the younge Anana Plants.*




S. G.

thereon above a fortnight in autumn, and about the ſame time in ſpring, and during the other parts of the year they will fall obliquely thereon; and in ſummer, when the ſun is high, the rays will not reach above five or ſix feet from the glaſſes, for the proof of this ſee the article Sun. Beſides, the plants placed toward the back part of the houſe, will not thrive in the ſummer ſeaſon for want of air; whereas when there are ſloping glaſſes at the top, which run within four feet of the back of the houſe, theſe, by being drawn down in hot weather, will let in perpendicular air to all the plants; and of how much ſervice this is to all ſorts of plants, every one who has had opportunity of obſerving the growth of plants in a Stove, will eaſily judge; for when plants are placed under cover of a cieling, they always turn themſelves toward the air and light, and thereby grow crooked; and if in order to preſerve them ſtrait, they are turned every week, they will nevertheleſs grow weak, and look pale and ſickly; for which reaſons, I am ſure, whoever has made trial of both ſorts of Stoves, will readily join with me to recommend the model of the bark Stove for every purpoſe.

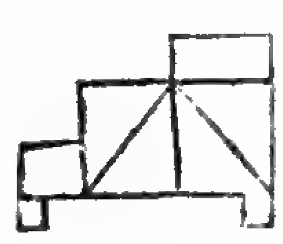
As to the farther contrivance of this Stove, it will be neceſſary to obſerve the temper of the place, whether the ſituation be dry or wet; if it be dry, then the floor need not be raiſed above two feet above the level of the ground; but if it be wet, it will be proper to raiſe it three feet, eſpecially if theſe flues are to be carried under the floor; for when they are erected cloſe upon the ſurface of the ground, theſe will raiſe a damp, which will prevent the flues drawing ſo well as when they are more elevated. The furnace of this Stove muſt be placed at one end of the houſe, according to the directions before given. This muſt be made according to the fuel intended to burn, which, if for coals or wood, may be made according to the common method for coppers, but only much larger; becauſe, as the fire is to be continued in the night chiefly, if there is not room to contain a proper quantity of fuel, it will occaſion a great deal of trouble in attending upon the fire in the night, which ſhould be avoided as much as poſſible; becauſe, whenever the trouble is made very great or difficult, and the perſon who is intruſted with the care of it, has not a very great affection for the thing, and is withal not very careful, there will be great hazard of the fire being neglected, which in a little time may be of dangerous conſequence to the plants; but, if the fuel intended be turf, then the contrivance of the furnace may be the ſame as for the bark Stove already mentioned. The flues of this Stove, if they are carried under the pavement, may be turned after the following manner,

which will cauſe them to draw better than if ſtrait, and by this method of diſpoſing them, they may be ſo much turned as to reach almoſt from the back to the front of the houſe.

The depth of them ſhould not be leſs than eighteen inches, and the width nearly equal, which will prevent their being choaked up with ſoot, as is often the caſe when the flues are made too ſmall. The ſpaces between the flues ſhould be filled up either with dry brick rubbiſh, lime, or ſand, from which there will little moiſture ariſe; and the flues ſhould be cloſely plaiſtered with loam both within and without, and the upper part of them covered with a coarſe cloth under the floor, to prevent the ſmoke from getting into the houſe.

When the flue is carried from the furnace to the end of the houſe, it may be returned in the back above the floor twice in ſtrait lines, which may be contrived to appear like a ſtep or two, by which means the ſmoke will be continued in the houſe until all its heat is ſpent, which will conſequently warm the air of the houſe the better; and the chimneys, through which the ſmoke is to paſs off, may be either at both ends, or in the middle, carried up in the thickneſs of the brick work of the flues, ſo as not to appear in ſight in the houſe. The flues ſhould be firſt covered with broad tiles ſixteen inches long, and then a bed of ſand laid over them about two inches thick, upon which the other tiles ſhould be laid to correſpond with the reſt of the floor. This thickneſs of cover will be full enough to prevent the too ſudden riſe of the heat from the flues.

But if the furnace is placed under the floor, the thickneſs of ſand between the brick arch which covers it and the floor, ſhould not be leſs than four or ſix inches, ſo that the bottom of the furnace ſhould be ſunk the lower; and if from the fire-place to the end of the houſe, the flues are laid a little riſing, it will cauſe them to draw the better; but this riſe muſt be allowed in the placing them lower under the floor next the fire, becauſe the floor muſt be laid perfectly level, otherwiſe it will appear unſightly.



In this Stove there ſhould be a ſtand or ſcaffold erected for placing ſhelves above each other, in the manner annexed, that the plants may be diſpoſed above each other, ſo as to make a handſome appearance in the houſe; but theſe ſhelves ſhould be made moveable, ſo as to be raiſed or ſunk, according to the various heights of the plants, otherwiſe it will be very trouble ſome to raiſe or ſink every particular plant according to their heights, or every year as they advance in their growth.

In placing the feet of this ſtand you muſt be careful not to ſet them too near the fire, nor directly upon the top of the flue, eſpecially that end next the fire, leſt by the conſtant heat of the tiles the wood ſhould take fire, which cannot be too much guarded againſt; ſince ſuch an accident would go near to deſtroy all the plants, if the houſe eſcaped being burnt. This ſtand or ſcaffold ſhould be placed in the middle of the houſe, leaving a paſſage about two feet and a half in the front, and another of the ſame width in the back, for the more conveniently paſſing round the plants to water them, and that the air may freely circulate about them. In diſpoſing the plants, the talleſt ſhould be placed backward, and the ſmalleſt in front, ſo that there will not be occaſion for more than five or ſix ſhelves in height at moſt; but the ſcaffold ſhould be ſo contrived, that there may be two ſhelves in breadth laid upon every riſe whenever there may be occaſion for it, which will ſave a deal of trouble in diſpoſing of the plants.

In the erection of theſe Stoves, it will be of great ſervice to join them all together with only glaſs partitions between them, as was before obſerved: and where ſeveral of theſe Stoves and green-houſes are required in one garden, then it will be very proper to have the green-houſe in the middle, and the Stoves at each end, either in the manner directed in the plan of the green-houſe exhibited in that article, or carried on in one ſtrait front.

By this contrivance in the ſtructure of theſe houſes, a perſon may paſs from one to the other of them, without going into the open air; which, beſides the pleaſure to the owner, is alſo of great uſe, becauſe there will be no occaſion of making a back-way into each of them, which otherwiſe muſt be, ſince the front glaſſes of the Stove ſhould not be opened in cold weather, if it can poſſibly be avoided on any account, otherwiſe the cold air ruſhing in, will greatly prejudice the very tender plants.

But beſides the Stoves here deſcribed, and the green-houſe, it will be very neceſſary to have a glaſs-caſe or two, wherever there are great collection of plants. Theſe may be built exactly in the manner already deſcribed for the Stoves, with upright glaſſes in front, and ſloping glaſſes over the top of them, which ſhould run within four feet of the back of the houſe. The height, depth, and other dimenſions, ſhould be conformable to that of the Stoves, which will make a regularity in the building. Theſe may be placed at

the end of the range on each hand beyond the Stoves; and if there be a flue carried along round each of these, with an oven to make a fire in very cold weather, it will save a great deal of labour, and prevent the frost from ever entering the house, be the winter ever so severe; but the upper glasses of these houses should have either shutters of wood, or tarpaulins in frames to cover them in frosty weather; and if there is a contrivance to cover the upright glasses in frost, either with mats, shutters, or tarpaulins, it will be of great use in winter, otherwise the flue must be used when the frost comes on, which should only be done upon extraordinary occasions; because the design of these houses is, to keep such plants as require only to be preserved from frost, and need no additional warmth; but at the same time, require more air than can conveniently be given them in a green-house. In one of these houses may be placed all the sorts of Ficoides, African Sedums, Cotyledons, and other succulent plants from the Cape of Good Hope. In the other may be placed the several kinds of Arctotis, Osteospermum, Royena, Lotus, and other woody or herbaceous plants from the same country, or any other in the same latitude.

Thus by contriving the green-house in the middle, and one Stove and a glass-case at each end, there will be a conveniency to keep plants from all the different parts of the world, which can be no otherwise maintained but by placing them in different degrees of heat, according to the places of their native growth.

The Stoves before described are such as are usually built to maintain exotic plant, which will not live in England, unless they enjoy a temperature of air, approaching to that of the several countries from whence they are brought; therefore, whoever is inclinable to preserve a large collection of plants from different countries, must contrive to have two or three of these Stoves, each of which should be kept in a different temperature of warmth; and the plants should be also adapted to the several degrees of heat, as they shall require to preserve them; but for the better information of those persons who are not conversant in this business, there is a list of plants added by way of appendix to this; in which the plants are ranged according to the different degrees of heat which they require to be preserved in this country, to which the reader is desired to turn for his further information: and as the far greatest number of Stoves which have been erected in England, are designed for the culture of the Ananas only, so I shall add a description and plans of two sorts of Stoves, of the least expence in building for this purpose; so that whoever is inclinable to erect a Stove for ripening of the Ananas, may, by attending to the plans and descriptions, direct the building and contriving such Stoves as they are desirous to have, or according to the number of fruit proposed to be ripened annually.

The first sort of Stove is that which is designed for the plants, which produce the fruit the same year; for as the plants do not generally fruit until the second year from their being taken from the old plants, whether they are suckers from the side of the plants or crowns taken from the fruit, if they fruit the succeeding year, the fruit will be small; therefore when they are properly managed, they will not produce their fruit until the second year, by which time they will have obtained strength to produce large fruit, in which their greatest value consists; for although there are several varieties of this fruit, which differ in degrees of goodness, as in most other fruits, yet they may all of them be improved in their size, without diminishing of their excellence in taste; tho' I know there are some persons of a contrary opinion, and who believe that the small fruit are always better flavoured than the large; but from long experience I can assert, that the larger and better nourished this fruit is, the higher will be its flavour, supposing the sorts are the same; therefore every person who cultivates this fruit, should endeavour to have it improved to the greatest perfection; in order to which it will be proper to have a small Stove, in which the young plants may be placed to bring them forward for fruiting, and the following autumn they should be removed into the larger Stove for ripening: but I shall return to the description of the larger Stove. The length of this must be proportionable to the quantity of fruit desired in one season, for as to their width, that should not be much varied; the tan-bed should never be narrower than six, nor should it be more than seven feet wide; for when it is more, there will be difficuly in reaching those plants which are in the middle of the bed, to water or clean them; and if there is room enough on each side of the bed for a walk a foot and a half broad, it will be sufficient for persons to water and do every thing which is necessary to the plants; and as these places are not designed for walking in, so it is to no purpose to have broad walks, which will take up too much space; and the fires must be larger, in proportion to the space of the house, otherwise the air cannot be kept in a proper temperature of warmth. If the Stove is made thirty-six feet long in the clear, then the tan-bed may be thirty-three feet long, and a walk left at each end a foot and a half wide, which will be sufficient to walk round the bed to water and attend the plants; and such a tan-bed will contain eighty fruiting plants very well if the bed is seven feet wide, and this stove may be very well warmed with one fire; but if the Stove is built much larger, there must be two fire-places contrived, one at each end, otherwise the air of the house cannot be kept in a proper temperature of heat. The quantity of fuel which will be wanting for a Stove of thirty-six feet long in the clear, is about three chaldron and a half of coals, or in such proportion for any other sort of fuel; when coals can be had reasonable, it is the best kind of fuel; and the pit or Scotch coal is preferable to the Newcastle coal, because the latter is very subject to melt or run into clinkers when the oven is very hot, which the pit coal never does, but always burns away with a white ash, making but little soot; so that the flues will not require to be so often cleaned, as when the other coal is used. The next best fuel for Stoves is peat, where it can be procured good, but the scent of this fuel is disagreeable to many people. There are some persons who burn wood in their Stoves, but this fuel requires much greater attendance than any other, therefore is not very proper for this purpose; but in the building of the Stoves, the ovens must be contrived for the sort of fuel which is to be used in them; but these will be afterward described, and the places where they should be situated, are delineated in the plan.

The Stoves designed for ripening the fruit of the Ananas should have upright glasses in their front, which should be high enough to admit a person to walk upright under them on the walk in the front of the house; or where this cannot be admitted, the front walk may be sunk one foot lower than that on the back of the tan-bed, so that the surface of the bed will be a foot above the walk, which will be rather an advantage, as the plants will be so much nearer the glass; and a person may with great ease water and attend the plants when they are thus raised above the walk; therefore, when a Stove is so situated, as that the raising of it high above ground might be attended with inconvenience, the walks quite round the tan-bed may be sunk a foot or eighteen inches below the top of the bed, which will admit of the Stove being built so much lower; for if there is height for a person to walk under the glasses, it will be as much as is required; but as the flues, when returned four times against the back wall will rise near seven feet, so the bottom of the lower flue should be on the same level with the walk, to admit room enough for the whole under the roof. Over the upright glasses there must be a range of sloping glasses, which must run to join the roof, which should come so far from the back wall as to cover the flues, and the walk behind the tan-pit; for if the sloping glasses are of length sufficient to reach nearly over the bed, the plants will require

*Two Sorts of Frames with oyled Paper for Covering Melons.*

quire no more light; therefore these glasses should not be longer than is absolutely necessary, which will render them more manageable; but the annexed plan will render this more intelligible, than any written description can do.

The other sort of Stove, which is designed for raising of young plants until they are of a proper size to produce fruit, need not be built so high as the former, therefore there will not be wanting any upright glasses in the front; but the frames may be made in one slope, as in the annexed plan: indeed of late years, many persons have made tan-beds with two flues running through the back wall to warm the air in winter; and these beds have been covered with glasses, made in the same manner as those for common hot-beds, but larger; these were contrived to save expence, and have in many places answered the intention, but to these there are several objections. 1. That of having no passage into them, so that the glasses must be taken off when the plants want water, &c. 2. The damps very often rise in the winter season, when the glasses are closely shut, which often prove very injurious to the plants. 3. There is danger of the tan taking fire, where there is not great care taken that it doth not lie near the flues; so that although the small Stoves here proposed require more expence in their building, yet, being greatly preferable to those pits, and the after expence being the same, they will be found so much more convenient as to render them more general where this fruit is cultivated.

Where there is no danger of the wet settling about the tan in winter, the bark-pit may be sunk two feet deep in the ground, and raised one foot above the surface; the only walk which is necessary in these Stoves, is that on the back of the tan-bed, which may be on the level with the surface of the ground, so that the tan-bed will be more than one foot above the walk; and the flues beginning from the level of the walk, there will be room to return them three times, which will warm the air much more with the same fire than when they are carried but twice the length of the Stove.

But in wet land the tan-bed should be wholly raised above the level of the ground, in order to preserve the tan from being chilled by moisture; and in such places the walk on the back should be raised near two feet above the level of the ground, because the tan-bed should not rise much more than one foot above the walk; for if it is higher, it will be more difficult to reach the plants when they require water; the brick wall of the pit, on the side next the walk, need not be more than four inches thick, so far as rises above the walk, but below that it should be nine inches thick; the reason for reducing the wall above, is to gain room for the walk, which would otherwise be too much contracted; and if there is a kirb of Oak laid on the top of the four inch wall, it will secure the bricks from being displaced, and sufficiently strengthen the wall, which being but one foot above the walk, will not be in any danger of falling; and on this kirb there may be two or three upright iron bars fixed with claws, to support the crown-piece of timber, which will secure it from hanging in the middle, which in a great length is very often the case, where there are no supports placed under it: there may be more or less of these bars, according to the length of the Stove; but if they are about ten feet asunder, it will be near enough. If these iron bars are one inch square, they will be strong enough to answer the design.

But as it is hoped that the annexed plan of this small Stove will convey a clear idea of the whole contrivance, this will render it unnecessary to add any farther description here.

*An Explanation of the Plate which represents the two sorts of frames with oiled paper for covering of Melons.*

The first of these frames is contrived like the covers of waggons; it has a frame of wood at the base, to which are fastened broad hoops which are bent over circularly, as is represented at fig. 1. The width of this frame should be from five to six feet, for less than five feet will not be sufficient to cover the bed, and if they are more than six feet broad, they will be too heavy and troublesome to move. *a* shews the section of the width, *b* the frame of wood at the base, *c* the arch of hoops, and *d* a small slip of wood which is fastened to the under side of the hoops to keep them in their proper position.

The distance between each hoop should not be more than one foot, and there should be two rows of strong packthread or rope-yarn on each side of the arch running from hoop to hoop at the places marked *e. e. e. e.* to keep the oiled paper from sinking down with wet. The length of each frame should not be much more than ten feet, which will be sufficient length for covering three plants, that being about the size of a three light frame, for if they are longer they will be heavy and troublesome to move; therefore there should be as many of these frames made, as may be necessary for covering the quantity of plants desired. Fig. 2. represents two lengths of these frames joined; *G.* shews the profile of the frame, and *H.* represents the paper turned back, that it may be seen how it is laid over the frame.

Fig. 3. represents the other sort of frame which is contrived like the roof of a house, *a* shews a section of the base; *b b* the two slopes, *c* one of the sides which is contrived to be raised at any time to admit air to the plants; *d* shews the place where this shuts down, and *e* the prop which supports it. If in the making of these frames every other light is made with hinges so as to be raised, and on the opposite side they are contrived to rise alternately, it will be a very good method, for then air may be given at the side contrary to the wind; and in very warm weather, when the plants require a large share of air, they may all be raised on both sides, which will make a thorough air to the whole bed. Fig. 4. shews the plan of these frames, and fig. 5. the same erected; *g* represents the profile of it, and *f* the covering of paper. This sort of frame may be made of pantile laths, or of slips of deal of like dimensions, because they should not be too heavy; but the base of the frame to which these are fastened, should be more substantial. Some persons who have made trial of both, recommend the latter for the convenience of giving air to the plants, for there is no other contrivance in the first sort for admitting the air, but by raising the whole frame on one side in proportion to the quantity of air intended to be admitted; and when the season is warm they generally raise those frames on both sides, and permit the plants to run out from under them.

When these frames are made, if they are well painted over with the following composition, it will greatly preserve them, viz. to every six pounds of melted pitch, add half a pint of Lintseed-oil, and a pound of brick-dust; these should be well mixed together, and used warm; when this dries it becomes a hard cement, so that no moisture can penetrate through it, and is the best sort of pigment for all timber exposed to the weather, I have ever seen used; so that where the colour is not offensive to the sight, it should be preferred to every other.

When the frames are thoroughly dry, the paper should be pasted on to the frames. The best sort of paper for this purpose is what they call Dutch wrapper; this is strong, and when oiled over becomes pellucid, so admits the rays of light through it extremely well. After the paste is well dried, the paper should be oiled over on the outside, which if well done with Lintseed-oil will be sufficient, for the oil will soak quite through the paper, so there will be no necessity for oiling both sides, nor for doing it over more than once. The oil should be dry before the frames are exposed to the wet, otherwise the paper will tear. In the pasting of the paper on the frames, there should be care taken to stretch it very smooth, and also to paste it to all the ribs of the frames, and also to the pack-

packthreads, to prevent the wind from raiſing the paper, which would ſoon tear it when it became looſe.

The above deſcription, together with the annexed plan, it is hoped will be ſufficient inſtructions for any one who is deſirous of making theſe covers; and what has been before mentioned under the article MELON, will be directions enough for the uſe of them; ſo that I ſhall only add one caution which may be neceſſary to repeat here, which is, not to keep theſe covers too cloſe down over the plants, leſt it draw them too weak, ſo that air ſhould always be admitted to the plants at all times in proportion to the warmth of the ſeaſon.

Theſe covers of oiled paper are not only uſeful for covering of Melons, but are the beſt things to cover cuttings of exotic plants, when planted, that can be contrived, and are alſo capable of being uſed for many other purpoſes.

The paper will ſeldom laſt longer than one ſeaſon, ſo it will require a new covering every ſpring; but if the frames are well made, and when they are out of uſe, laid up in ſhelter from the wet, they will laſt ſeveral years, eſpecially if there is a band of ſtraw laid round the Melons, upon which the frames may ſtand; ſo they will not reſt upon the ground, and the ſtraw-bands will prevent the damp from riſing ſo as to rot them. Theſe ſtraw-bands are ſuch as are recommended for the hot-beds of Aſparagus in winter.

STRAMONIUM. See DATURA.

STRATIOTES. Lin. Gen. Plant. 607. Aloides. Boerh. Ind. alt. Plant. 2. p. 172. Water Soldier.

The CHARACTERS are,

*It has one flower incloſed in a compreſſed obtuſe ſheath, compoſed of two leaves which are keel-ſhaped and permanent. The empalement of the flower is of one leaf, trifid and erect. It has three almoſt heart-ſhaped petals, which are twice the ſize of the empalement, erect and ſpreading, and about twenty ſtamina inſerted in the receptacle of the flower, terminated by ſingle ſummits. The germen is ſituated under the empalement, ſupporting ſix ſtyles divided in two parts, crowned by ſingle ſtigmas. The germen afterward becomes an oval capſule, narrowed on every ſide, having ſix angles, and as many cells filled with oblong incurved ſeeds.*

This genus of plants is ranged in the ſixth ſection of Linnæus's thirteenth claſs, which includes thoſe plants whoſe flowers have many ſtamina and ſix ſtyles.

We know but one SPECIES of this genus, viz.

STRATIOTES (*Aloides.*) Lin. Flor. Lap. 222. *Water Soldier, Water Aloe, or Freſh Water Soldier.* Aloe paluſtris. C. B. P. 280. *Marſh Aloe.*

This plant is in ſhape like the Aloe, but the leaves are thinner, and ſerrated on the edges very ſharply; they are of a grayiſh colour, and about a foot long; between the leaves, from the center of the plant, ariſe one, two, and ſometimes three ſtalks, almoſt the length of the leaves, each being terminated by a three-forked ſheath, out of which burſts one white flower compoſed of three roundiſh heart-ſhaped petals, with many yellow ſtamina in the middle. Below the flower is ſituated a conical germen which is reverſed, the broad end ſtanding upward and the narrow downward. This becomes a ſix-angled capſule, having ſix cells filled with ſeeds. It flowers in July, and the ſeeds ripen in September. It grows plentifully in ſtanding waters in the Iſle of Ely, and many places in the North of England, from whence young plants may be procured in ſpring, when they firſt riſe on the ſurface of the water; and theſe being placed in large ponds or canals, will ſtrike down their roots, and propagate without any farther care. In autumn the plants ſink down to the bottom of the water, and riſe again in the ſpring.

STRAWBERRY. See FRAGARIA.

STRAWBERRY-TREE. See ARBUTUS.

STYLE. The Style of a flower is a body accompanying the germen, either ariſing from the top of it, or ſtanding as an axis in the middle of the germen, and ſupports the ſtigma, which is ſuppoſed the female organ by which the farina is received and conveyed to the germen.

STYRAX. Tourn. Inſt. R. H. 598. tab. 369. Lin. Gen. Plant. 527. Storax-tree.

The CHARACTERS are,

*The flower has a ſhort cylindrical empalement of one leaf, indented in five parts; it has one funnel-ſhaped petal, with a ſhort cylindrical tube the length of the empalement, whoſe brim is cut into five large obtuſe ſegments which ſpread open; it has ten or twelve awl-ſhaped ſtamina diſpoſed circularly, which are inſerted in the petals, and terminated by oblong ſummits, and a roundiſh germen, ſupporting a ſingle ſtyle the length of the ſtamina, crowned by a ragged ſtigma. The germen afterward turns to a roundiſh fruit with one cell including two nuts, which are plain on one ſide and convex on the other.*

This genus of plants is ranged in the firſt ſection of Linnæus's eleventh claſs, which contains the plants whoſe flowers have twelve ſtamina and one ſtyle.

We know but one SPECIES of this genus, viz.

STYRAX (*Officinale.*) Hort. Cliff. 187. *The Storax-tree.* Styrax folio mali cotonei. C. B. P. 452. *The Quince-leaved Storax-tree.*

This plant grows plentifully in the neighbourhood of Rome, and alſo in Paleſtine, and ſeveral of the iſlands in the Archipelago, from whence the fruit has been brought to England, where there have been many plants raiſed of late years in ſome curious gardens.

It has a woody ſtalk which riſes twelve or fourteen feet high, covered with a ſmooth grayiſh bark, and ſends out many ſlender ligneous branches on every ſide, which are garniſhed with oval leaves about two inches long, and one inch and a half broad, of a bright green on their upper ſide, but hoary on their under; they are entire, and are placed alternately on ſhort foot-ſtalks. The flowers come out from the ſide of the branches, upon foot-ſtalks which ſuſtain five or ſix flowers in a bunch; theſe have one very white petal which is funnel-ſhaped, the lower part being tubulous and cylindrical; the upper part is divided into five obtuſe ſegments which ſpread open, but not flat, rather inclining to an angle. Theſe appear in June, and are ſometimes ſucceeded by berries in England, which ripen in autumn.

It may be propagated by ſowing the ſeeds in pots filled with freſh light earth, and plunged into a moderate hot-bed. This ſhould be done as ſoon as poſſible when the ſeeds are procured, for if they are ſown the latter end of ſummer, and the pots kept in a moderate hot-bed of tanners bark all the winter, the plants will come up the ſucceeding ſpring; whereas thoſe ſown in the ſpring, often remain in the ground a whole year before the plants come up.

When the plants are come up, they ſhould be hardened gradually to the open air, into which they ſhould be removed in June, placing them in a ſheltered ſituation, obſerving to keep them clean from weeds, as alſo to ſupply them with water duly in dry weather. In this place they may remain till autumn, when they ſhould be placed under a common hot-bed frame, where they may be ſcreened from hard froſt in winter, but in mild weather enjoy the free air as much as poſſible, for if they are kept too cloſe their tops are very ſubject to grow mouldy. The leaves of theſe plants fall off in autumn, and in the ſpring, before they begin to ſhoot, they ſhould be ſhaken out of the pots, and their roots carefully parted, and each tranſplanted into a ſeparate ſmall pot filled with light freſh earth, and plunged into a very moderate hot-bed, obſerving to water and ſhade them until they have taken root; after which they ſhould be inured to the open by degrees, into which they muſt be removed in June, placing them in a warm ſituation; in which place they may remain till the end of October, at which time they ſhould be removed into ſhelter for the winter ſeaſon. Theſe plants are tolerably hardy, and only require to be ſheltered from ſevere froſt while they are young; for in Italy they grow

extremely well in the open air, and produce fruit in great plenty. When the plants have grown three or four years in pots, and are become ſtrong, ſome of them may be turned out of the pots, and planted in the full ground, againſt a wall to the ſouth aſpect, to which their branches ſhould be trained in the ſame manner as is practiſed with fruit-trees, in which ſituation they will bear the cold of our ordinary winters very well; but in very ſevere froſt, it will be proper to cover the branches either with mats, Straw, or other light covering to protect them.

The gum of this tree is uſed in medicine, which is obtained by making inciſions in the tree. It is brought from Turkey, but is ſo adulterated by mixing ſawduſt or other ſtuff with it, that it is very difficult to meet with any that is pure. It has a moſt pleaſant fragrant odour; it is called Styrax calamita, becauſe it was tranſported in hollow canes.

There is another ſort of Storax, which is called Styrax liquida, which is a thick tenacious ſubſtance like turpentine, of a reddiſh brown colour. It has been much diſputed among the writers on the Materia Medica, what this is, ſome believing it to be the gum or reſin of a tree, and others thought it to be a fictitious thing; but Mr. Petiver ſays, in the Philoſophical Tranſactions, N° 313, it is a kind of bird-lime made of the bark of a tree, by boiling it in ſalt water. The tree grows on the iſland of Cobroſs, at the upper end of the Red Sea, near Cadeſh, which is within three days journey of Sues. It is called Roſa mallas, and by the Turks Cotta mija.

Of late years there has been another ſpecies of Storax imported from North America, which is collected from the liquid Amber-tree; this has been titled liquid Storax by ſome, but is very different from that which is brought from Turkey, and is clear, inclining to yellow; it is brought ſometimes liquid, and at others it is dried in the ſun to a concrete reſin before it is tranſported.

SUBER. See Quercus.

SUBTERRANEOUS is that which is under or within the ſurface, bowels, or caverns of the earth, or the hollow places of the earth, that are under ground.

SUCCORY. See Cichorium.

SUCCULENT PLANTS are ſuch whoſe leaves are thick, and abound with juice.

SULPHUREOUS is of a brimſtone colour.

SUMACH. See Rhus.

SUMMITS, or apices, are thoſe bodies which contain the prolific powder, analagous to the male ſperm in animals; theſe generally hang upon the ſtamina or threads, which ſurround the ovary in flowers.

The SUN has uſually been reckoned among the number of planets, but he ought rather to be numbered among the fixed ſtars.

According to the Copernican hypotheſis, which is now generally received, and which has even demonſtration on its ſide, the ſun is the center of the planetary and cometary ſyſtem, round which all the planets and comets, and our earth among the reſt, revolve in different periods, according to their different diſtances from the Sun.

But the Sun, though thus eaſed of that prodigious motion whereby the antients imagined him to revolve daily round our earth, yet he is not a perfectly quieſcent body.

From the phænomena of his maculæ or ſpots, it evidently appears, that he has a rotation round his axis, like that of the earth, whereby the natural day is meaſured, only ſlower.

Some of theſe ſpots have made their firſt appearance near the edge or margin of the Sun, and have been ſeen ſome time after on the oppoſite edge; whence, after a ſtay of about fourteen days, they have re-appeared in their firſt place, and taken the ſame courſe over again, finiſhing their entire circuit in twenty-ſeven days time, which is hence deduced to be the period of the Sun's rotation round his axis.

This motion of the ſpots is from weſt to eaſt, whence it is concluded, that of the Sun, to which the other is owing, is from eaſt to weſt.

Dr. Hook thinks it reaſonable to conclude, That the ſuperficies of the Sun is covered with air, or atmoſphere, or ſome other fluid body, and that its atmoſphere, though poſſibly eighty times thicker than that about our earth; yet, in compariſon of the vaſt diameter of the Sun's body, becomes wholly inviſible to us, though aſſiſted by the beſt teleſcopes.

He ſuppoſes it alſo to look as bright as the body of the Sun itſelf, and that it is really the ſhell of this atmoſphere, and not the very body of the Sun that ſhines; and from hence he ſays, That all the phænomena of the maculæ and fæculæ of the Sun will be ſolved, and that they are only clouds or ſmokes in this atmoſphere.

He concludes, That the Sun itſelf within this atmoſphere is a ſolid and opacous body, from theſe reaſons:

1. The conſtancy of its rotation.
2. The fixedneſs of its axis.
3. The power of its gravitation or attraction towards its center.

He concludes, That theſe prove its ſolidity and opacity from the diſappearing of the ſolar ſpots in the limb, and their not returning backwards, as they would ſeem to do, if the body were tranſparent, as the atmoſphere is, or the flame of a candle, or the radiation of hazy light about the nucleus of a comet, through which, as well as through its beard, the ſmall fixed ſtars may be ſeen.

He thinks the ſuperficial parts of the Sun to conſiſt of bodies ſimilar to our nitre and ſulphur, and that theſe are ſet on fire, and conſequently, that the phyſical cauſe of its light is the actual burning or fire of its ſuperficial ſalts.

Nor can there be any objection of moment brought againſt this hypotheſis, from the danger of the Sun's fire being burnt quite out in ſo many thouſand years it hath been in being, for (ſays he) ſuppoſing it to have grown ſome minutes leſs, ſince it began to give light, none can contradict it by any obſervations we have upon record.

For, ſuppoſing we had aſtronomical obſervations of 4000 years ſtanding, as we have none of above 2000 of that kind, and allowing that the Sun's diameter had then been obſerved to be as many minutes as it is now, yet it could not thence be concluded, that the Sun did not loſe a mile in diameter every year, and conſequently be now 4000 miles leſs in diameter than it then was.

For ſince his diameter is near 87 times greater than that of the earth, which latter he ſuppoſes 8000 miles, then the Sun's muſt be 696,000 miles. Now 4000 is but the 174th part of the diameter, and conſequently would have diminiſhed it but one eighth of a minute, which is a much leſs quantity than the antients pretended to obſerve to.

But ſuppoſing they could have obſerved even to ſeconds, yet that could not have contradicted it, becauſe it is poſſible the Sun may have approached as much nearer us as that diminution amounts to, and for which, he ſaith, he could ſhew a reaſon.

Sir Iſaac Newton alſo, in his optics, gives good reaſon to ſuppoſe the Sun and fixed ſtars to be great earths, vehemently hot, whoſe heat is conſerved by the greatneſs of their bodies, and the mutual action and re-action between them and the light which they emit; and whoſe parts are kept from fuming away, not only by their fixity, but alſo by the vaſt weight and denſity of the atmoſpheres incumbent on them, and every way ſtrongly compreſſing them, and condenſing the vapours and exhalations which ariſe from them.

The light ſeems to be emitted from the Sun and fixed ſtars (which probably are Suns to other ſyſtems,) much after the manner as iron, when heated to ſuch a degree, as to be juſt going into fuſion by the vibrating motion of its parts, emits with force and violence copious ſtreams of liquid fire all around. Great bodies muſt preſerve their heat longeſt, and that, perhaps, in the proportion of their diameters.

Sir Isaac Newton hath made it probable, that the great comet in the year 1680, in its perihelion, went so near the Sun, as that it acquired a heat, which would not entirely go off in 50,000 years; whence we may guess, that if the Sun and fixed stars be only collections of dense and solid matter, like the planets, but heated to a very intense degree, they may be many millions of years without losing any considerable part of their heat.

According to Cassini, the Sun's distance from the earth is 172,800,000 English miles.

As for the annual motion of the Sun round the earth, it is easily shewn by astronomers, that the annual motion of the earth will occasion such an appearance. A spectator in the Sun would see the earth move from west to east, for the same reason that we see the Sun move from east to west, and all the phænomena resulting from this annual motion, in which soever of the bodies it be, will appear the same from either.

As to the nature, properties, and figure of the Sun, &c.

1. As the solar spots are found sometimes to stay three days longer behind the Sun than they spend in passing over the hemisphere visible to us, we easily deduce that they do not adhere to the surface of the Sun, but are at some distance therefrom.

2. As the spots frequently rise and vanish even in the midst of the Sun's disk, and undergo several changes, both with regard to bulk, figure, and density, it follows, that they frequently rise, de novo, about the Sun, and are again dissipated.

3. Hence it should follow, that they are formed out of the exhalations of the Sun, and are no other than solar clouds.

4. Since then exhalations proceeding from the Sun rise above him, and stop at a certain altitude, it is evident there is some fluid encompassing the Sun to urge the exhalations to rise, and this fluid must be denser at bottom, and rarer at top, like our atmosphere.

5. Since the spots frequently dissolve and disappear in the middle of the Sun's disk, the matter of the spots, that is, the solar exhalations, fall back again to the Sun; whence it follows, that there must arise various alterations in the Sun's atmosphere, and the Sun himself.

6. Since the revolution of the spots round the Sun is found very regular, and likewise very near the Sun, it follows, that they do not revolve round the Sun, but that the Sun, together with his atmosphere, wherein the maculæ are, move round their common axis in an interval of about twenty-seven days; and hence it is, that the spots near the limb, being viewed obliquely, appear narrow and long.

7. Since the Sun, in every situation, appears like a circular disk, its figure, as to sense, must be spherical, though it is really spheroidical.

8. That the substance of the Sun is fire, is thus proved: the Sun shines, and his rays, collected by concave mirrors, or convex lenses, burn, consume, and melt the most solid bodies, or else convert them into ashes or glass.

Wherefore, as the solar rays are diminished by their divergency in a duplicate ratio of the distances reciprocally taken, it is evident that their force and effect is the same when collected by a burning lens or mirror, as if we were at such a distance from the Sun where they were equally dense. The Sun's rays therefore, in the neighbourhood of the Sun, produce the same effects as might be expected from the most vehement fire; consequently, the Sun is of a fiery substance.

Hence it follows, that its surface is every where fluid, that being the condition of flame.

Indeed it is not absolutely determined, whether the whole body of the Sun be fluid, as some think, or solid, as others; but as there are no other marks, whereby to distinguish fire from other bodies, but light, heat, a power of burning, consuming, melting, calcining, and vitrifying, we do not see what should hinder, but that the Sun may be a globe of fire like ours, invested with flame.

9. Since the maculæ are formed out of the solar exhalations, it appears, that the Sun is not pure fire, but that there are heterogeneous particles mixed along with it.

Some make the mean distance of the Sun from the earth 7490 diameters of the earth, others 10,000, others 12,000.

The Sun, according to that excellent chemist, the younger Lemery, seems to be no other than a huge mass, or collection of the matter of fire or light, though so placed as to disable it to act on bodies here on earth, otherwise than by one of these two ways: first, by emanations or emissions of his own substance transmitted hither; but this hypothesis being subject to great difficulties, and not sufficiently answering to certain phænomena, recourse is had to another, which supposes trains of fire or light, disposed in all the interstices of the grand expanse of air and æther between the Sun and us; and that these trains are made to act on terrestrial bodies, by their being vigorously driven or impelled toward such bodies, by the immediate action of the Sun thereon.

These trains, in effect, may be esteemed as a sort of little Suns prolonged, but always depending on the great Sun, as the source of their motion and action on bodies; it is those that form the rays of light; they do not, in point of matter, differ from the substance of the Sun himself, but only in this, that the same thing is more copious in one case than the other. In the Sun we may suppose the matter of light more abundant than in the focus of our largest burning-glasses. Thus from the vehement action of the rays of the Sun collected in such glass, we learn what use the air, interposed between the rays of light, is of in tempering their action, and rendering it more supportable, since, without such medium, instead of warming and illuminating, it would blind and burn us. So that the air may be considered as having somewhat of the same effect, with respect to the rays of light upon us, that the water in a balnæum mariæ has. Mem. de l'Acad. ann. 1713.

Omitting to enter into a particular discussion about the matter of the Sun, and whether it be fire, to us it appears very extraordinary, that the Sun, after a continual emission of the corpuscles of fire upwards of 5000 years, should not be yet exhausted.

Whilst the Sun is above the horizon, he impels all the rays, before vague and fluctuating, toward a focus, and such impulsion or determination is always in right lines; so that all our light, heat, and colour, is the effect of a rectilinear motion.

Suppose, for instance, a fire in a dark place, and a thermometer placed at a certain distance therefrom, with an iron plate between them; in this case, the thermometer will not be affected by fire, by reason that the rectilinear passage of the heat is stopped. Nor need it be added, that under the like circumstances no light, colour, &c. are perceivable, so that none of these act but in right lines.

If there were no Sun, nor any body to supply its place, there would be no heat, i. e. the fire would not be determined in right lines, so that the Sun is the father of all heat, or some other body that acts in the same manner as the Sun, for the Sun does not make heat, but only the difference between the heat of the day and the night.

Dr. Halley observes, That the Sun, radiating on the earth in the morning, has but little effect, but that, when raised to the meridian, he acts with all his force. Now this is owing to the atmosphere, which, being replete with an infinite number of corpuscles, reflects more of the Sun's rays to the earth, when they fall perpendicularly, than would otherwise arrive there; for whereas falling obliquely, they would be reflected, and thus be thrown off, and dispersed into other parts, now that their incidence is perpendicular, they will pass directly through.

And hence arises what is frequently observed by sailors, viz. That when the Sun radiates obliquely upon the sea, as in the evening, there is no enduring his rays, by reason they are all reflected from the water, and scarce any lost therein; so that the rectitude or obliquity of the rays contributes very considerably to the collecting of fire.

And this obliquity, &c. is to be considered in a twofold respect, both with respect to the matter in the atmosphere, and to the surface of the earth.

Now heat may be varied two ways:

1. By means of the atmosphere, for this does not always remain the same. Thus, e. g. Water is naturally transparent, and if you warm it, it still retains its transparency; but if you make it boil, the vapour issuing from it, though perhaps a million of times rarer than the primitive water, will not be transparent, but opaque, by reason its parts now are under a different arrangement.

And hence those legions of corpuscles every where floating in the vast receptacle of the atmosphere, whenever they acquire a different disposition, which they frequently do, alter the collection of the rays on the earth. Add, that those white clouds, which appear in summer time, are as it were so many mirrors, and occasion excessive heat.

These cloudy mirrors are sometimes round, sometimes concave, polygonous, &c. When the face of the heaven is covered with such white clouds, the Sun shining among them must of necessity create a great heat, since many of his rays, which would otherwise perhaps never touch our earth, are hereby reflected to us. Thus, if the Sun be on one side, and the clouds on the opposite one, they will be perfect burning-glasses. And hence the phænomena of thunder, &c.

I have, says Dr. Boerhaave, observed, a kind of hollow clouds full of hail and snow, during the continuance of which the heat was extreme, since, by such condensation, they were enabled to reflect much more strongly; after this came a sharp cold, and then the clouds discharged their hail in great quantity, to which succeeded a moderate warmth. Frozen, concave clouds therefore, by their great reflexions, produce a vigorous heat, and the same, when resolved, excessive cold.

Hence it is probable, that thunder is only produced when such concave clouds, before convolved into spherical figures, are driven with opposite motions against each other, and the rays transmitted through those spheres from burning foci.

All clouds, it is probable, contain snow andice, but these in their fall through the warmer regions of the atmosphere near the earth, liquefy and distil in drops.

The meteors in the atmosphere have likewise their share in reflecting of fire. These, in effect, are a sort of wandering fire visible by night, and which determine the fire over and upon the earth.

2. It is varied by means of the earth; for, as the surface of the earth varies, so must the heat. Thus sandy places, reflecting more rays than others, must excite a greater degree of heat.

On the highest mountains we always find the most cold, snow, and hail.

In the sultry regions of Peru the mountains are all summer long covered with snow, by reason they only receive direct, and but little refracted fire; and the effect of fire, arising merely from being determined by the Sun into a parallelism, is found by computation to be very inconsiderable. For this effect, as already observed, is greater in winter than in summer.

Though the Sun be in his apogee in the summer, and in his perigee in winter, yet will a night's ice bear it shining upon it five or six hours ere it be thawed.

And if, as the Sun rises nearer toward the zenith, the ice and snow at length begin to run, this is not owing to the greater force of the Sun, but to the greater reflexion and collection of his rays from the circumstances and position of the atmosphere and earth.

But the highest tops of hills are always free from snow; the reason whereof is, that water, i. e. the vapours and exhalations, emitted therefrom, never rise by the Sun's action above a mile high. But there are mountains a mile and a half high; to the tops of these therefore, vapours, and consequently clouds, can never mount.

And hence it is, that in very high mountains, as the Pico de Theide in Bohemia, though the middle part be eternally invested with ice and snow, and the bottom scorched with intolerable heat, yet on the top you find yourself in a pure, thin, serene air, and view the clouds hovering at a considerable distance below you. Hence also it is, that all thunder is confined within less than a mile's height.

Add, that in caverns, and the hollow parts under ground, the heat is found very great, so that the air is coldest in the highest places, and hottest in the lowest, but in the intermediate atmosphere very unequal. Heat therefore depends on clouds, mountains, &c. which reflect the light variously, and on the direction of the Sun's rays, or the position of his body with respect to us.

Hence again we gather that fire is the universal cause of all the motions about our earth, for all fluidity depends on fire, and accordingly, in the large burning-glasses, the firmest bodies become fluid, and evaporate in fume; and the more fluid any body is, the more it contains, whence it is, that water, deprived of all its fire, fixes into ice, and when exposed afresh to the fire resolves into water; and all fluids whatever, if destitute of fire, would do the same.

The Sun may be accounted the parens naturæ, or the primum mobile of all vegetative motion.

The Sun's attractive virtue is very conspicuous in the exhalation of those crude and unwholesome vapours, with which the earth is often infested, which, if they were suffered to continue long upon the face of the earth, would render it a miserable desart.

The Sun, by sublimating those crude and hurtful vapours, and their being rarefied before their descension and distribution, forms them into rain, which is of great consequence in vegetation.

To this may be added the attraction of plants themselves, which creates a kind of emulation in them, which shall grow the tallest.

But that which the ancients used to attribute to attraction, may now be very well solved by pulsion.

To apply which to the matter in hand: when the surface of the sea, &c. is divided by the heat of the Sun, and the power of the air, their ascension thro' the atmosphere, either by the rarefaction of the air by the Sun, or otherwise by the respiration of the terraqueous globe, which in this case may be supposed to act like the body natural; or else, that the air, being rarefied by the Sun beams, does, by the gravitation of his own body in general, force those humid vapours by pulsion upward, through those beams or rays of light, which are, as it were, so many pipes or tubes for their ready passage, ascension, and conveyance.

Or if those vapours are conveyed by the undulation of the air in a perpendicular manner, rather than a radiant one, through the rays and beams of light, whichsoever of these ways it is, the Sun is the principal agent in this business, and the whole process is either attraction, pulsion, or respiration, forwarded by the virtual power of it.

That the rarefaction of the air by heat is a great help to attraction or pulsion may be discovered by the fire engine made by Mr. Savary. We cannot say that the water is either forced or attracted by the heat, but that the air that is in the pipe is lengthened by its rarefying quality to such a degree, that the equilibrium is lost, and the impulse and pressure of the air which is without, forces the water to that great height that is seen in the operation.

And so, if a little scrip of paper burning and fuming be put into a common drinking glass, and it be turned

ed up immediately, and put upon a plate of water, it ſeems as though it would ſuck it up into the glaſs; when indeed the truth of the experiment is, that it is only the outward preſſure, and the inward weakneſs of the air to reſiſt, being purified by heat; for if the ſame glaſs ſhould be plunged into a baſon of water up to the foot of it, yet the water that is in the baſon would not enter into the glaſs, till the air, either having loſt its own ſtrength, or rather inſinuated or incorporated itſelf in the water, loſes its own ſtrength; ſuch is the force of air.

But this may ſuffice concerning what the ancients call attraction, which in many caſes is ſolved by pulſion, or the preſſure and elaſtic power of the air, rather than by the attractive power of the Sun.

It is ſufficiently proved by ocular demonſtration that the vapours of the ſea, rivers, lakes, and all the humidities of the ground, are drawn up after this manner.

And that heat is an agent in this operation has been clearly proved by the experiments of that learned naturaliſt Dr. Halley, by taking a veſſel of water four inches deep, and ſeven and nine tenths in diameter, which being warmed to ſuch a degree, as might be ſuppoſed the air might do it, in ſome of the hotteſt months, and letting it ſtand about two hours time, and weighing it, found it had evaporated near half an ounce, although there did not appear any reek or ſmoke, nor did the water ſeem warm, by putting his finger into it; from which it may be concluded, that out of that ſmall ſuperficies of the water, ſix ounces would be evaporated in the ſpace of twenty-four hours.

Upon this ſuppoſition every ten ſquare inches of the ſurface of water yield in vapour, per day, a cube inch of water; and each ſquare foot, half a wine pint; and every ſpace of four feet ſquare, a gallon; a mile ſquare, 6914 tuns; a ſquare degree, ſuppoſe of 69 Engliſh miles, will evaporate 33 millions of tuns.

This will account for the Caſpian ſea being always at a ſtand, and neither waſting nor overflowing; and alſo for the current ſaid to ſet always in at the Streights of Gibraltar, notwithſtanding that thoſe Mediterranean ſeas receive ſo many, and ſo conſiderable rivers.

This experiment has been carried yet farther by the Oxford Society, who, ſuppoſing a cubical foot of water to weigh 76 pounds, and this foot containing 1728 cubic inches, and divided in the 76 pounds, gives half an ounce and $13\frac{1}{3}$ grains, which is the weight of a cubical inch of water; therefore the weight of the 233 grains $\frac{233}{253}$, or 35 parts of a cubic inch divided by thirty-eight.

Then the area of a circle, the diameter of which is 7 inches and upwards, is more than 49 ſquare inches, which if it be divided by $\frac{35}{38}$ parts of an inch, the quantity of water carried off in vapours, the product will be $\frac{35}{1862}$ or $\frac{1}{53}$ parts of an inch, waſted in that experiment. This is a plain proof of what a great quantity of water may be thus carried off, in great dimenſions of water, even enough to ſupply all rains, dews, &c.

But the Sun, beſides this, has a diffuſive power (not to dwell on the light it conveys to theſe ſublunary regions) without which the whole race of mankind muſt wander and grovel in the dark, for by its genial and chearful rays it exhilarates the vegetable part of the creation, and makes natures herſelf to ſmile.

It has an influence upon deep grounds by warming and chearing the pores of the earth, when diluted and ſodden by too much wet, and puts the emulgent fibres of plants upon ſeeking their food.

It helps the ſurface of the ground by attracting or diſpelling the vapours, which would otherwiſe make it noxious; but more particularly it warms and heats the ground, and by its powerful influence contributes to diſſolve the latent ſalt, and prepares them for being ſucked in by the fibres of the plants, which, by the ſame genial force, are put in action to ſeek out for their food.

The Sun alſo exhales all ſuperfluous moiſture, and by its vital heat, comforts the dilated pores.

The Sun diffuſes the early dews, which, if they lay too long on plants, would rot rather than refreſh them; it alſo preſſes them into the nerves, and other analogous parts. This influential power operates on the boughs, branches, leaves, and fruit.

The Sun alſo qualifies the air, which otherwiſe, by its frigidity, would ſtop the very courſe of nature, and indeed it would be difficult to inſtance any thing in the whole circle of botanology, that does not participate of a ſhare of this virtual and diffuſive good.

From what has been ſaid we may eaſily account for the difference of heat in ſummer and winter, viz. from the obliquity of the Sun's rays. This therefore ſhould be well conſidered in the contrivance of ſtoves, to preſerve the moſt tender exotic plants, which ought to have their glaſſes ſo ſituated, as to receive the Sun's rays in direct lines as great a part of the year as poſſible; for which reaſon the ſtoves, which have upright glaſſes in front, and ſloping glaſſes over them, are juſtly preferred to any at preſent contrived.

And from hence we ſee the advantage of making the back part and cieling of all green-houſes and ſtoves as white as poſſible, ſince it is evident, that the rays of light are hereby reflected with much greater force, and ſo conſequently the heat is greatly increaſed, which ſhould always be obſerved in buildings of this kind.

From hence alſo we may learn, that countries in the ſame latitude may be very different in their heat, according to their ſituation, in reſpect to the Sun's rays, or according to the nature of the ſoil in reflecting the rays with a greater or leſs force; ſo that in preſerving exotic plants, the heat which they require cannot be exactly determined from the latitude of the places of their growth; but the ſituation of the places muſt alſo be conſidered, as, whether they grow on hills, mountains, or valleys; and if on the ſide of hills, which ſide in reſpect to the Sun, with ſeveral other obſervations, which ought to be made by ſuch as collect plants in foreign countries.

I ſhall here add a table of the ſhadow of the Sun at the ſeveral ſeaſons of the year, which was communicated to me by Mr. Timothy Sheldrach of Norwich, by which a perſon may more readily ſee what effect walls, buildings, trees, &c. have, in ſhading the ground to ſeveral diſtances, according as the Sun is more or leſs elevated above the horizon; as alſo how great the ſhade will be in the green-houſes, as the piers are in breadth, or the wall in front is in height below the ſaſhes.

| ☉ in ♋ | | | | ☉ in ♎ ♈ | | | | ☉ in ♑ | | | | Lat. 51° 30′ The length of the ſhadow of a column of five feet high at the time the ſun enters every ſign. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Degr. of Lat. | ° | ′ | ″ | Degr. of Lat. | ° | ′ | ″ | Degr. of Lat. | ° | ′ | ″ | ☉ in 5 feet | | Feet | Inch |
| 30 | — | 8 | — | 10 | — | 10 | — | 0 | — | 17 | 30 | | | | |
| 40 | — | 17 | 30 | 20 | — | 22 | 30 | 10 | — | 37 | 30 | | ♋ | 2 | |
| 50 | — | 32 | 30 | 30 | — | 35 | — | 20 | — | 57 | 30 | ♌ | ♊ | 3 | 1 |
| 60 | — | 47 | 30 | 40 | — | 47 | 30 | 30 | 1 | 17 | — | ♍ | ♉ | 3 | 11½ |
| 70 | 1 | 7 | 30 | 50 | 1 | 10 | — | 40 | 2 | 2 | 30 | ♎ | ♈ | 6 | 6 |
| 80 | 1 | 40 | — | 60 | 1 | 50 | — | 50 | 3 | 40 | — | ♏ | ♓ | 2 | 7 |
| 90 | 2 | 37 | 30 | 70 | 2 | 40 | — | — | — | — | — | ♐ | ♒ | 15 | 5 |
| | | | | 80 | 10 | — | — | — | — | — | — | | ♑ | 20 | — |

The firſt three tables ſhew the length of ſhadows in the ſummer and winter ſolſtice, and in the vernal and autumnal equinoxes. Suppoſe a mountain, column, or other body, whoſe perpendicular height is one degree. The length of the ſhadow from any thing of that altitude is here ſhewn in every degree of latitude; at the above-mentioned times, in degrees and minutes, and where a ſhorter meaſure than a mile is required, it is ſhewn in ſeconds. The fourth table is calculated for the latitude of 51° 30′, which is pretty near that of London. This fourth table ſhews the length of the ſhadow made by any perpendicu-

lar

lar body of five feet altitude on a plane, at which time the Sun enters every ſign of the zodiac, which, at a ſouth Sun, will be found very exact on a true level.

SUPERFICIES of the ground, &c. is the out-part or ſurface of it.

SURFACE is the bare outſide of a body or ſuperficies.

SURIANA. Plum. Nov. Gen. 37. tab. 40. Lin. Gen. Plant. 353.

The CHARACTERS are,

*The empalement of the flower is permanent, and compoſed of five ſpear-ſhaped ſmall leaves. The flower has five oval petals the length of the empalement, which ſpread open; it has ten ſlender ſtamina which are ſhorter than the petals, terminated by ſingle ſummits, and five roundiſh germen ſupporting a ſlender ſtyle the length of the ſtamina, which is inſerted in the middle to the ſide of the germen, crowned with an obtuſe ſtigma. The germen afterward become five roundiſh ſeeds joined together.*

This genus of plants is ranged in the fifth ſection of Linnæus's tenth claſs, which includes thoſe plants whoſe flowers have ten ſtamina and five germen.

We know but one SPECIES of this genus, viz.

SURIANA (*Maritima.*) Hort. Cliff. 492. *Suriana.* Suriana foliis protulacæ anguſtis. Plum. Nov. Gen. 37. *Suriana with narrow Purſlain leaves.*

This plant was ſo named by Father Plumier, who diſcovered it in the French ſettlements in America, in honour of Joſeph Surian of Marſeilles, who was a very curious botaniſt.

This grows naturally by the ſea ſide in moſt of the iſlands in the Weſt-Indies, where it riſes with a thick ſhrubby ſtalk eight or nine feet high, covered with a dark brown bark, and divides into branches, the upper part of which are cloſely garniſhed with leaves on every ſide ſtanding without order; they are about an inch long, and one eighth of an inch broad at the point, growing narrower to their baſe; they are rounded at their points, and ſit cloſe to the branches, having no foot-ſtalks; they are of a dirty green colour. From between the leaves come out the foot-ſtalks of the flowers, which are about an inch long; theſe do each ſuſtain two, three, or four yellow flowers, which have ſome four, and others five petals, which are rounded at their points, and almoſt heart-ſhaped; theſe are ſucceeded by roundiſh ſeeds, which are joined together, ſitting in the empalement. Some flowers have two, others three, four, or five ſeeds to each.

The ſeeds of this plant were brought from the Havanna by the late Dr. William Houſtoun, who found the plants growing there in great plenty on the ſhore, in moiſt places, where the ſalt water uſually flows. It alſo grows plentifully in ſome parts of the iſland of Jamaica.

It is propagated by ſeeds, which muſt be ſown on a hot-bed early in the ſpring, and when the plants are come up they muſt be carefully cleared from weeds, and frequently refreſhed with water. In warm weather the glaſſes of the hot-bed ſhould be raiſed every day to admit freſh air to the plants, to prevent their drawing up too weak. When the plants are fit to remove, they ſhould be taken up carefully, and each planted in a ſeparate ſmall pot filled with freſh light earth, and plunged into a hot-bed of tanners bark, obſerving to ſhade them until they have taken new root; after which time they muſt be duly watered every evening in hot weather, and they muſt have freſh air admitted to them every day in proportion to the warmth of the ſeaſon. In this hot-bed the plants may remain till autumn, when the nights begin to be cold, at which time they ſhould be removed into the ſtove, and plunged into the bark-bed. During the winter ſeaſon theſe plants muſt be kept very warm, eſpecially while they are young, otherwiſe they will not live through the winter in this country. They muſt alſo be frequently refreſhed with water, but it muſt not be given to them in large quantities in cold weather, for too much moiſture in winter will ſoon deſtroy them. Theſe plants make but ſlow progreſs the firſt year, afterwards they will grow pretty freely if they are not ſtinted. In winter they muſt conſtantly be kept in the ſtove in this country, and if they are plunged into the bark-bed, they will make the greater progreſs. In ſummer they muſt have a large ſhare of air, by opening the glaſſes of the ſtoves; and if their leaves are covered with filth (which the plants in ſtoves often contract,) they ſhould be carefully waſhed with a ſponge, otherwiſe the plants will not only appear unſightly, but it will retard their growth.

SWERTIA. Lin. Gen. Pl. 321. Gentiana. C. B. P.

The CHARACTERS are,

*The empalement is permanent, and cut into five ſpear-ſhaped ſegments; the flower is of one petal, divided at the top into five ſpear-ſhaped ſegments, and is larger than the empalement; it has ten nectarii which are ſmall, erect, ſituated on the internal part of the petal at the diviſion of the ſegments, and five awl-ſhaped ſtamina ſhorter than the corolla, terminated by incumbent ſummits; and an oblong oval germen having no ſtyle, but two ſimple ſtigmas. The empalement afterward becomes a taper acute-pointed capſule with one cell, filled with ſmall ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifth claſs, which contains thoſe plants whoſe flowers have five ſtamina, and two ſtyles or ſtigmas.

The SPECIES are,

1. SWERTIA (*Perennis*) corollis quinquefidis, foliis radicalibus ovalibus. Lin. Sp. Plant. 328. *Perennial Swertia with a five-pointed corolla, and the radical leaves oval.* Gentiana paluſtris latifolia. C. B. P. 188. *Broad-leaved Marſh Gentian.*
2. SWERTIA (*Difformis*) corollis quinquefidis, terminali ſexfida, pedunculis longiſſimis, foliis linearibus. Lin. Sp. Plant. 328. *Swertia with a five pointed corolla which terminates with ſix points, very long foot-ſtalks to the flower, and linear leaves.*

There are two or three other ſpecies of this genus, which grow naturally in Siberia and Canada, but as they are annual plants, and have not been introduced here, ſo I have not inſerted them.

The firſt ſort grows naturally upon the Alps in Helvetia and Bavaria. This is a perennial plant, ſending out tufts of leaves from the root which are four inches long, and near two broad, of a deep green colour, and very ſmooth: from between theſe ariſe the foot-ſtalks of the flowers, which are eight or nine inches long, naked, and ſuſtains a pretty large bunch of blue flowers on the top, whoſe petals are connected at the top. Theſe appear in June, but are rarely ſucceeded by ſeeds in England.

The ſecond ſort grows naturally in Virginia. This hath narrow linear leaves which come from the root, about three inches long, and half a quarter of an inch broad; the foot-ſtalks of the flowers ariſe immediately from the root; they are about ſix or ſeven inches high, and ſupport one blue flower.

Theſe plants grow naturally in ſwamps, ſo are with difficulty preſerved in gardens; and as they do not produce ſeeds, ſo are only propagated by parting of their roots; the beſt time for which is in September, that they may have time to be eſtabliſhed before the froſt comes on; they ſhould be planted in the ſhade, and have a looſe moiſt ſoil, and in ſummer muſt be frequently watered, otherwiſe they will not live, but the winters cold will never injure them.

SWIETENIA. See CEDRUS.

SYCAMORE. See ACER MAJUS.

SYMPHYTUM. Tourn. Inſt. R. H. 138. tab. 56. Lin. Gen. Plant. 170. [Some derive it from συμφύειν to conglutinate, becauſe if the leaves or root of this plant are boiled with fleſh, the fleſh returns again into one maſs; hence it is called the Conſolida major officinarum.] Comfrey; in French, *Conſound.*

The CHARACTERS are,

*The flower hath a five-cornered, erect, permanent empalement, cut into five acute ſegments; it has one petal with a ſhort tube, about which the limb has a ſwelling belly, and thicker tube; the brim is indented in five obtuſe parts which*

*which are reflexed; the chaps are armed with five awl-shaped rays which are connected in a cone; it has five awl-shaped stamina which are alternate with the rays of the chaps, terminated by erect acute summits, and four germen supporting a slender style the length of the petal, crowned by a single stigma. The germen afterward turn to four gibbous acute-pointed seeds which ripen in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and one style.

The Species are,

1. Symphytum (*Officinale*) foliis ovato-lanceolatis decurrentibus. Hort. Cliff. 47. *Comfrey with oval, spear-shaped, running leaves.* Symphytum Consolida major, flore purpureo quæ mas. C. B. P. 259. *Comfrey, or greater Consound, with a purple flower.*
2. Symphytum (*Tuberosum*) foliis summis oppositis. Lin. Sp. Plant. 136. *Comfrey with the upper leaves placed opposite.* Symphytum majus tuberosâ radice. C. B. P. 259. *Greater Comfrey with a tuberous root.*
3. Symphytum (*Orientale*) foliis ovatis subpetiolatis. Lin. Sp. Plant. 136. *Comfrey with oval leaves and short foot-stalks.* Symphytum Orientales, folio subrotundo aspero, flore cæruleo. Tourn. Cor. 7. *Eastern Comfrey with a roundish leaf, and a blue flower.*

There are a few other species of this genus, but those which are here enumerated, are all the sorts at present to be found in the English gardens.

The first sort grows naturally in England, but the most common here is that with a whitish yellow flower, which is found growing by the side of ditches and other moist places in great plenty, but that with purple flowers is the most common in Holland and Germany; these are supposed to be only accidental varieties, which differ in the colour of their flowers; however, this difference is permanent in the plants raised from seeds, as I have many times found; nor are the two kinds ever found mixed where they grow wild, for in those places where the blue is found, the white is never seen, and vice versa; but as there are no specific differences between them, I shall not separate them.

The common Comfrey has thick roots composed of many fleshy fibres or fangs, which run deep in the ground; they are black on the outside, but white within, full of a slimy tenacious juice. The lower leaves are large, long, sharp-pointed, hairy and rough. The stalks rise two feet high, which are garnished with oval spear-shaped leaves about five inches long, and two broad near their base, ending in acute points; they are hairy, rough, and from their base runs a leafy border along the stalk. From the upper part of the stalk are sent out some side branches, which are commonly garnished with two smaller leaves, and are terminated by loose bunches of flowers which are reflexed; each flower has one tubulous petal, whose upper part is bellied and thicker than the lower, and the chaps are closed by the stamina and rays which cross it, and shuts up the tube. These in the common English sort are of a yellowish white, and the foreign one is of a purple colour. It flowers in June, and the seeds ripen in August.

The second sort grows naturally in Germany; the roots of this are composed of many thick fleshy knobs or tubers, which are joined by fleshy fibres; the stalks incline on one side; they rise a foot and a half high; the leaves on the lower part are six inches long, and two and a half broad in the middle, ending in acute points, and are not so rough and hairy as those of the other species; they are placed alternate, and sit close to the stalks. The two upper leaves on every branch stand opposite, and just above them are loose spikes or bunches of pale yellow flowers, whose petals are stretched out farther beyond the empalement than those of the other. This flowers at the same time with the other.

The third sort grows naturally on the side of rivers near Constantinople; this hath a perennial root like the first; the stalks grow two feet high; the leaves are rounder, and are armed with rough prickly hairs. The flowers are blue, and grow in bunches like those of the first sort; they appear in March, but are seldom succeeded by seeds in England.

These plants may be cultivated, either by sowing their seeds in the spring, or by parting of their roots: the latter way being the more expeditious, is chiefly practised where they are planted for use. The best season for parting the roots is in autumn, at which time almost every piece of a root will grow. They should be planted about two feet and a half asunder, that they may have room to spread, and will require no farther care but to keep them clear from weeds, for they are extremely hardy, and will grow upon almost any soil, or in any situation.

SYRINGA. Lin. Gen. Plant. 22. Lilac. Tourn. Inst. R. H. 601. tab. 372. Lilac.

The Characters are,

*The flower has a small, tubulous, permanent empalement of one leaf, which is indented in four parts at the brim; it has one petal, with a long cylindrical tube cut into four obtuse segments at the brim which spread open, and two very short stamina terminated by small summits, standing within the tube; it has an oblong germen supporting a short slender style, crowned by a thick bifid stigma. The germen afterward turns to an oblong, compressed, acute pointed capsule with two cells, opening with two valves contrary to the partition, including in each cell one oblong acute-pointed seed with a membranaceous border.*

This genus of plants is ranged in the first section of Linnæus's second class, which contains those plants whose flowers have two stamina and one style.

The Species are,

1. Syringa (*Vulgaris*) foliis ovato-cordatis. Hort. Cliff. 6. *Syringa with oval heart-shaped leaves.* Syringa cærulea. C. B. P. 391. *Blue Syringa, and the Lilac.* Matth. 1237. *The blue Lilac.*
2. Syringa (*Persica*) foliis lanceolatis. Lin. Sp. Plant. 9. *Syringa with spear-shaped leaves.* Lilac folio ligustri. Tourn. Inst. 602. *Lilac with a Privet leaf, commonly called Persian Jasmine.*
3. Syringa (*Laciniata*) foliis lanceolatis integris dissectisque laciniata. Hort. Cliff. 6. *Syringa with entire spear-shaped leaves, and others which are cut and jagged.* Lilac laciniato folio. Tourn. Inst. 602. *Lilac with a cut leaf, commonly called cut-leaved Persian Jasmine.*

The first sort is very common in the English gardens, where it has been long cultivated as a flowering shrub. It is supposed to grow naturally in some parts of Persia, but is so hardy as to resist the greatest cold of this country. There are three varieties of this shrub, which are commonly cultivated in the English gardens, and do not only differ in the colour of their flowers, but also in that of their shoots and leaves; one of these has white flowers, one blue, and the third has purple flowers; the latter is commonly known by the title of Scotch Lilac, to distinguish it from the other. This is the most beautiful of the three, and is probably called the Scotch Lilac, because it was first mentioned in the catalogue of the Edinburgh Garden. Whether this was raised from seeds, or which other way it was obtained I could never learn; but I take it to be a distinct species from the others, though there is not marks enough upon them to distinguish their specific differences; because I have raised many of the plants from seeds, which have always retained their difference, as have also the white, when they were propagated by seeds; so that they may be rather esteemed as distinct sorts, although by the rules now admitted for determining specific differences, they may not have sufficient marks whereby to distinguish them; and as they have been by many of the modern botanists joined together, I shall not separate them again, but shall mention the particulars in which they differ.

This shrub grows to the height of eighteen or twenty feet in good ground, and divides into many branches; those of the white sort grow more erect than the other, and the purple or Scotch Lilac has its branches yet

more diffused. The branches of the white are covered with a smooth bark of a gray colour, those of the other two are darker. The leaves of the white are of a bright green; their shape and size are so near as not to be distinguished thereby. They are heart-shaped, almost five inches long, and three and a half broad near their base; their foot-stalks are an inch and a half long, and are placed opposite. The buds of the future shoots, which are very turgid before the leaves fall, are of a very bright green in the white sort, but those of the other two are of a dark green. The flowers are always produced at the ends of the shoots of the former year, and below the flowers come out shoots to succeed them; for that part upon which the flowers stand, decays down to the shoots below every winter. There are generally two bunches or panicles of flowers joined at the end of each shoot; those of the blue are the smallest, and the flowers are smaller, their brims expanded, and are placed thinner than either of the other. The bunches on the white are larger; the flowers are closer placed, and larger than the blue; but those of the Scotch are larger, and the flowers are fairer than those of either of the other, so make a much finer appearance. The panicles of flowers grow erect, and being intermixed with the fine green leaves, have a fine effect: and if we add to this the fragrancy of their flowers, it may be ranged among the most beautiful shrubs which now decorate the English gardens. They flower in May, and when the season is cool, these shrubs will continue three weeks in beauty, but in hot seasons the flowers soon fade. Their seeds are ripe in September, which if sown soon after, the plants will come up the following spring; but as their roots send out great plenty of suckers annually, so few persons ever take the trouble to propagate these plants by seeds. I have raised several plants of the three sorts from seeds, and constantly found them prove the same as the shrubs from which the seeds were taken. These plants do generally flower the third year from seed, and I have always found these plants not so apt to send out suckers, as those which were produced by suckers, so are much more valuable; for the others put out such plenty of suckers, as that if they are not annually taken from the plants they will starve them, so that in this way the plants may be propagated in great plenty.

These plants thrive best upon a light rich soil, such as the gardens near London are for the most part composed of; and there they grow to a much larger size, where they are permitted to stand unremoved, than in any other part of England, for in strong loam, or upon chalky land, they make no progress. If the suckers are small when they are taken from the old plants, they should be planted in a nursery, in rows three feet asunder, and one foot distance in the rows, where they may stand a year or two to get strength, and then they should be removed to the places where they are to remain. The best time to transplant these shrubs is in autumn.

There is a variety or two of these shrubs with blotched leaves, which some persons are fond of; but as these variegations are the effect of weakness, so whenever the shrubs become healthy their verdure returns again.

The second sort grows naturally in Persia, but has been long cultivated in the English gardens, where it is best known among the gardeners by the title of Persian Jasmine. This is a shrub of much lower growth than the former, seldom rising more than five or six feet high. The stalks of this shrub are woody, covered with a smooth brown bark; the branches are slender, pliable, and extend wide on every side; these frequently bend downward where they are not supported; they are garnished with narrow spear-shaped leaves placed opposite, which are about two inches and a half long, and three fourths of an inch broad, of a deep green colour, ending in acute points. The flowers are produced in large panicles at the end of the former year's shoots, in like manner as the former; they are of a pale purple colour, and have a very agreeable odour. These appear the latter end of May, soon after those of the common sort, and continue longer in beauty, but these do not perfect their seeds in England.

There is a variety of this with almost white flowers, which has of late years been obtained, but whether it came from seeds, or was accidentally produced from suckers from the purple kind, I cannot say.

The third sort differs from the second in having two sorts of leaves, those on the lower part of the branches are for the most part entire; these are broader and shorter than those of the second, and do not end in such sharp points. The leaves on the younger branches are cut into three or five segments like winged leaves, almost to the midrib. The branches of this sort are slenderer and weaker than those of the second; their bark is of a darker brown, and the flowers of a brighter purple colour.

This was brought into Europe before the other, and came by the Persian title Agem. Both these sorts are usually propagated by suckers, which their roots send out in great plenty; these should be carefully taken off from the old plant in the autumn, and planted in a nursery in the same manner as is before directed for the first, where they may grow two years to get strength, and may then be transplanted to the places where they are designed to remain. The plants which are so propagated, are always very prolific in suckers, for which reason it will be a better way to raise them by laying down their young branches, which in one year will be sufficiently rooted to transplant, and may then be treated in the same way as the suckers.

# T.



TABERNÆMONTANA. Plum. Gen. Nov. 18. tab. 30. Lin. Gen. Plant. 265.

The CHARACTERS are,

*The flower has a small empalement cut into five acute parts; it hath one funnel-shaped petal, with a long cylindrical tube, which is bellied at both ends, and the brim is cut into five oblique segments; it has five small stamina in the middle of the tube, terminated by summits which join together, and one germen supporting an awl-shaped style, crowned by decayed stigmas. The germen afterward turn to two bellied capsules which are horizontally reflexed, opening with one valve, having one cell, filled with oblong oval seeds lying imbricatim, and surrounded with pulp.*

This

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

The Species are,

1. Tabernæmontana (*Citrifolia*) foliis glomerato-umbellatis oppositis ovatis lateralibus. Lin. Sp. Plant. 308. *Tabernæmontana with oval leaves which are placed opposite, and flowers growing in glomerated umbels on the side of the branches.* Tabernæmontana lactescens, citri foliis undulatis. Plum. Nov. Gen. 18. *Milky Tabernæmontana, with waved Citron leaves.*
2. Tabernæmontana (*Alba*) foliis oblongo-ovatis acuminatis oppositis, floribus corymbosis terminalibus. *Tabernæmontana with oblong, oval, acute-pointed leaves, which are placed opposite, and flowers growing in a corymbus terminating the branches.* Tabernæmontana lactescens, lauri folio, flore albo, siliquis rotundioribus. Houst. MSS. *Milky Tabernæmontana with a Bay leaf, a white flower, and rounder pods.*
3. Tabernæmontana (*Laurifolia*) foliis oppositis ovalibus obtusiusculis. Lin. Sp. Plant. 308. *Tabernæmontana with oval obtuse leaves placed opposite.* Nerium arboreum, folio latiore obtuso, flore luteo minore. Sloan. Cat. Jam. 154. *Tree Oleander with obtuse leaves, and small yellow flowers.*
4. Tabernæmontana (*Amsonia*) foliis alternis, caulibus subherbaceis. Lin. Sp. Plant. 308. *Tabernæmontana with herbaceous stalks, and alternate leaves.* Anonymus suffrutex. Gron. Virg. 26.

Father Plumier, who constituted this genus, gave it this title in honour of Dr. James Theodore, who was called Tabernæmontanus, from a little village in Germany, where he was born. He was one of the most knowing botanists of his age, and published at Francfort a folio, in a long form, in the year 1590, in which are the figures of two thousand two hundred and fifty plants.

The first sort grows naturally in Jamaica, and some of the other islands in the West-Indies. This rises with an upright woody stalk to the height of fifteen or sixteen feet, covered with a smooth gray bark, which abounds with a milky juice, and sends out several branches from the side, which grow erect, and have many joints; these are garnished with thick leaves which have a milky juice; they are from five to six inches long, and two broad in the middle, drawing to a point at each end; they are of a lucid green, and have many transverse veins from the midrib to the border, standing opposite on foot-stalks an inch long. The flowers come out in roundish bunches from the wings of the stalk; they are small, of a bright yellow colour, and have an agreeable odour. The tube of the flower is half an inch long; the brim is cut into five acute points, which spread open like those of the common Jasmine. These flowers in their native soil, are succeeded by two swelling capsules joined at their base, but spread from each other horizontally, and are filled with oblong seeds, lying over each other like the scales of fish, included in a soft pulp.

The second sort was discovered by the late Dr. William Houstoun in the year 1730, growing naturally at La Vera Cruz. This rises with a woody stalk ten or twelve feet high, covered with a wrinkled gray bark, sending out many branches toward the top, which are garnished with oblong oval leaves of a lucid green, and of a thick consistence; they are five inches long, and two and a half broad, rounded at both ends, but terminate with an acute point. These are placed opposite, and have short foot-stalks. The flowers come out in pretty large roundish bunches at the end of the branches; they are smaller than those of the first sort, and are white, having an agreeable scent. These are succeeded by shorter and rounder pods, which spread from each other horizontally like the former.

The third sort grows naturally in Jamaica, and the other warm islands in America. This rises with a shrubby stalk twelve or fourteen feet high, sending out a few branches toward the top which grow erect, and are garnished with oval obtuse leaves four inches long and two broad, placed opposite, and are of a lucid green colour. The flowers are produced in a sort of umbel from the side of the branches; they are small, yellow, and have an agreeable odour, but are not succeeded by seeds in England.

These three sorts are very impatient of cold, so will not live in this country, unless they are placed in a warm stove; they may be propagated by seeds, which must be procured from the countries where the plants grow naturally; these should be sown early in the spring on a hot-bed, and when the plants are come up, and are fit to remove, they must be carefully transplanted into small pots filled with light rich earth, and then plunged into a hot-bed of tanners bark, being careful to shade them in the heat of the day until they have taken new root; after which time, they must have free air admitted to them every day when the weather is warm; but if the nights should prove cold, the glasses of the hot-bed should be covered with mats every evening, soon after the sun goes off from the bed. These plants must be often refreshed with water, but it must not be given to them in large quantities, especially while they are young, for as they are full of a milky juice, they are very subject to rot with much moisture.

The plants may remain during the summer season in the hot-bed, provided the tan is stirred up to renew the heat when it wants, and a little new tan added; but at Michaelmas, when the nights begin to be cold, the plants should be removed, and plunged into the bark-bed in the stove; where, during the winter season, they must be kept in a moderate degree of warmth, and in cold weather they should have but little water given them, lest it should rot them. The plants should constantly remain in the stove, where, in warm weather, they may have free air admitted to them by opening the glasses, but in cold weather they must be kept warm. With this management the plants will thrive and produce their flowers, and as their leaves are always green, they will make a pleasant diversity amongst the tender exotic plants in the stove.

These plants may also be propagated by cuttings during the summer season, which should be cut off from the old plants, and laid to dry in the stove five or six days before they are planted, that the wounded parts may heal, otherwise they will rot. These cuttings should be planted in pots filled with fresh light earth, and plunged into the hot-bed of tanners bark, and closely covered with a hand-glass, observing to shade them from the sun in the middle of the day in hot weather, as also to refresh them now and then with a little water. When the cuttings have taken root, they may be transplanted into separate pots, and treated in the same manner as those which are raised from seeds.

The fourth sort is a perennial plant, which grows naturally in Virginia. This sends up in the spring two or three herbaceous stalks near a foot high, garnished with oblong leaves which are placed alternately; the flowers are produced in small bunches, terminating the stalks; they are white and have no scent, nor are they succeeded by seeds in England.

This plant had the title of Amsonia given to it by Mr. Clayton, who first discovered it in Virginia.

As it does not produce seeds in England, so the plants are at present very rare in the gardens, for the roots do not send out many offsets. This plant will thrive in the open air here, provided it is planted in a warm situation; it loves a light soil, rather moist than otherwise; but if it is planted in dry ground, it should be frequently watered in dry weather.

TACAMAHACA. See Populus.

TAGETES. Tourn. Inst. R. H. 478. tab. 278. Lin. Gen. Plant. 865. African or French Marigold; in French, *Oeillet d'Inde.*

The Characters are,

*The common empalement of the flower is single, of one leaf, oblong, erect, and five-cornered; the flower is compound and radiated; the rays or border is composed of female half florets which are tongue-shaped. The disk or middle is made up of hermaphrodite florets which are tubulous, and cut into five obtuse segments; these have five short hair-like stamina, terminated by cylindrical summits, and an oblong germen supporting a short slender style, crowned by a thin, bifid, reflexed stigma. The germen afterward becomes a single, linear, compressed seed, almost the length of the empalement, crowned by five acute-pointed unequal scales. The female half florets have an oblong germen, with a style and stigma like the hermaphrodite, and are succeeded by seeds of the same form, but have no stamina.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, which contains those plants whose flowers are composed of hermaphrodite and female florets which are fruitful, and have their summits connected.

The Species are,

1. Tagetes (*Erecta*) caule simplici erecto, pedunculis nudis unifloris. Hort. Cliff. 418. *Tagetes with a single erect stalk, and naked foot-stalks bearing single flowers.* Tagetes maximus rectus, flore simplici ex luteo pallido. I. B. 3. p. 100. *Greatest upright African Marigold, with a pale, single, yellow flower.*
2. Tagetes (*Patula*) caule subdiviso patulo. Hort. Cliff. 418. *Tagetes with a spreading subdivided stalk.* Tagetes Indicus minor, multiplicato flore. Tourn. Inst. 488. *Smaller Indian Tagetes with double flowers, commonly called French Marigold.*
3. Tagetes (*Minuta*) caule simplici recto, pedunculis squamosis multifloris. Hort. Cliff. 419. *Tagetes with a single erect stalk, and scaly foot-stalks bearing many flowers.* Tagetes multiflora minuto flore albicante. Hort. Elth. 374. *Many-flowering Tagetes with a small white flower.*
4. Tagetes (*Rotundifolia*) caule simplici erecto, foliis cordatis simplicibus, pedunculis nudis unifloris. *Tagetes with a single stalk, simple heart-shaped leaves, and naked foot-stalks having one flower.* Tagetes Americana, folio singulari subrotundo. Houst. MSS. *American Tagetes with a single roundish leaf.*

The first sort grows naturally in Mexico, but has been long cultivated in the English gardens, where it is commonly titled African, or African Marigold; of this there are the following varieties:

1. Pale yellow, or brimstone colour, with single, double, and fistulous flowers.
2. Deep yellow, with single, double, and fistulous flowers.
3. Orange-coloured, with single, double, and fistulous flowers.
4. Middling African, with Orange-coloured flowers.
5. Sweet-scented African.

These are all very subject to vary, so that unless the seeds are very carefully saved from the finest flowers, they are very apt to degenerate; nor should their seeds be too long sown in the same garden without changing it, for the same reason; therefore, those who are desirous to have these flowers in perfection, should exchange their seeds with some person of integrity at a distance, where the soil is of a different nature, at least every other year. If this is done, the varieties may be continued in perfection.

This plant is so well known as to need no description. It flowers from the beginning of July till the frost puts a stop to it. The second sort grows naturally in Mexico, but has been long in the English gardens, where it is distinguished from the first by the title of French Marigold.

Of this there are several varieties, some of which have much larger flowers than others, and their colour varies greatly; there are some which are beautifully variegated, and others quite plain; but as these are accidents arising from culture, so they do not merit farther distinction, for I have always found that seeds saved from the most beautiful flowers will degenerate, especially if they are sown in the same garden for two or three years together, without changing the seed.

These plants are annual, so must be propagated from seeds every spring, which may be sown upon a moderate hot-bed the beginning of April; and when the plants are come up, they should have plenty of fresh air, for if they are drawn too much, they will not afterward become handsome, notwithstanding they have all possible care taken of them. When they are about three inches high, they should be transplanted on a very moderate hot-bed, which may be arched over with hoops, and covered with mats, for these plants are hardy enough to be brought up without glasses; in this bed they should be planted about six inches asunder each way, observing to water and shade them until they have taken root; but as the plants acquire strength, they should be inured to bear the open air by degrees, and about the beginning of May they should be taken up, with a ball of earth to the root of each plant, and planted into the borders of the parterre-garden, or into pots, for furnishing the courts, &c. shading them carefully from the sun till they have taken new root, and also supplying them duly with water. When their flowers appear, if any should prove single, the plants should be destroyed, and then those in pots may be removed to the court where the several varieties, being intermixed with other annual plants, afford an agreeable variety.

These plants have a strong disagreeable scent, especially when handled, for which reason they are not so greatly esteemed for planting near habitations; but the flowers of the sweet-scented sort, being more agreeable, are generally preferred, especially for planting in small gardens.

The third sort grows naturally in Chili in the Spanish West-Indies. This is a plant of taller growth than either of the former. The stalk is single, erect, and branches a little toward the top; it rises about ten feet high; the branches grow erect. The leaves are narrower than either of the other. The foot-stalks of the flowers are scaly and stand erect, close to the stalk; these sustain three or four small white flowers, which appear very late in autumn, so that unless it is kept in a glass-case the seeds will not ripen here. This plant has very little beauty, so is only preserved for the sake of variety.

The fourth sort rises with an upright stalk about two feet high, sending out a few branches toward the top, garnished with heart-shaped leaves standing upon long slender foot-stalks; those on the lower part of the stalk are two inches and a half long, and one and a half broad toward their base, ending in very acute points, being in shape like those of the black Poplar, rough to the touch, and are slightly crenated on their edges; the branches and stalks are each terminated by one large yellow flower standing upon a long naked foot-stalk. The empalement of the flower is short; the leaves of which it is composed are oblong and oval, drawing to a point. The female florets, which compose the rays or border, are much longer than the empalement. The hermaphrodite florets in the disk or middle are equal; they are of a deep yellow colour, and make a good appearance, for the flowers are double. This plant was discovered by the late Dr. Houstoun growing naturally at La Vera Cruz in New Spain, from whence he sent the seeds to England.

The two last sorts are not so hardy as the former, so the seeds of these should be sown earlier in the spring upon a good hot-bed, and when the plants are fit to remove, they should be transplanted on a fresh hot-bed, at about three inches distance each way, observing to shade them from the sun till they have taken new root, then they should be treated in the same way as the Amaranthus, and other tender annual plants, being careful not to draw them up weak; when they have spread so as to meet each other, they should be taken up with balls of earth to their roots, and planted in pots with light rich earth, and plunged into a hot-bed under a deep frame, where the plants may

may have room to grow, being careful to shade them from the sun till they have taken new root, after which they must have air and water in proportion to the warmth of the season; and when the plants are grown too tall to remain longer in the frame, they should be removed to an airy glass-case, where they may stand to flower and ripen their seeds.

TAMARINDUS. Tourn. Inst. R. H. 660. tab. 445. Lin. Gen. Plant. 46. *The Tamarind-tree.*

The CHARACTERS are,

*The empalement of the flower is composed of four oval plain leaves which are equal; the flower has five petals which are almost like those of the butterfly kind, one of them standing erect, two are placed like wings on each side, and two reflect downward; it has three awl-shaped stamina situated in the sinuses of the empalement, and are arched toward the upper petal, terminated by single summits, and an oblong oval germen supporting an awl-shaped ascending style, crowned by a single stigma. The germen afterward becomes a long, swelling, compressed pod, having a double cover, and one cell containing three, four, or five angular compressed seeds, surrounded with pulp.*

This genus of plants is ranged in the first section of Linnæus's third class, which includes those plants whose flowers have three stamina and one style.

We know but one SPECIES of this genus, viz.

TAMARINDUS (*Indica.*) Hort. Cliff. 18. *The Tamarind-tree.* Siliqua Arabica, quæ Tamarindus. C. B. P. 403. *The Arabian Pod or Tamarind.*

This tree grows naturally in both Indies, and also in Egypt; but it has been supposed by some eminent botanists, that the Tamarind which grew in the East-Indies, was different from that of the West, because the pods of the first are almost double the length of those of the latter. The pods which have been brought me from the East-Indies, have generally been so long as to contain five, six, and sometimes seven seeds, whereas those of the West-Indies have very rarely more than three or four; but the plants which I have raised from the seeds of both sorts, are so like as not to be distinguished; therefore I suppose it may be owing to the soil, or culture, that one is so much larger than the other.

This grows to a very large size in those countries where it is a native, but in England it will not thrive out of a stove, especially in winter. The stem is very large, covered with a brown bark, and divides into many branches at the top, which spread wide every way, and are closely garnished with winged leaves, composed of sixteen or eighteen pair of lobes, without a single one at the end. The lobes are about half an inch long, and a sixth part of an inch broad, of a bright green, a little hairy, and sit close to the midrib. The flowers come out from the side of the branches, five, six, or more together upon the same foot-stalk, in loose bunches; these are composed of five reddish petals, one of which is reflexed upward like the standard in some of the butterfly flowers, two others stand on each side like the wings, and the other two are turned downwards; these, in the countries where the plants grow naturally, are succeeded by thick compressed pods, two, three, four, or five inches long, having a double skin or cover, and swell in every place where the seeds are lodged, full of an acid stringy pulp, which surrounds smooth, compressed, angular seeds.

The Tamarinds which are brought from the East-Indies are darker and drier, but contain more pulp, being preserved without sugar, and are fitter to be put into medicines than those from the West-Indies, which are much redder, have less pulp, and are preserved with sugar, so are pleasanter to the palate.

The plants are preserved in the gardens of those who have conveniency to maintain rare exotic trees and shrubs.

They are easily propagated by sowing their seeds on a hot-bed in the spring; and when the plants are come up, they should be planted each into a separate small pot filled with light rich earth, and plunged into a hot-bed of tanners bark to bring them forward, observing to water and shade them until they have taken root; and as the earth in the pots appears dry, they must be watered from time to time, and should have air given to them in proportion to the warmth of the season, and the bed in which they are placed; when the pots in which they are planted are filled with their roots, the plants should be shifted into pots of a larger size, which must be filled up with rich light earth, and again plunged into the hot-bed, giving them air, as before, according to the warmth of the season; but in very hot weather the glasses should be shaded with mats in the heat of the day, otherwise the sun will be too violent for them through the glasses; nor will the plants thrive, if they are exposed to the open air, even in the warmest season; so that they must be constantly kept in the bark-stove both summer and winter, treating them as hath been directed for the Coffee-tree, with whose culture they will thrive exceeding well.

These plants, if rightly managed, will grow very fast; for I have had them upwards of three feet high in one summer from seed, and have had two plants which produced flowers the same season they were sown; but this was accidental, for none of the older plants have produced any flowers, although I have several plants of different ages, some of which are above twenty years old, and about fifteen feet high, with large spreading heads.

TAMARIX. Lin. Gen. Plant. 75. Tamariscus. Tourn. Inst. R. H. 661. The Tamarisk.

The CHARACTERS are,

*The empalement of the flower is obtuse, erect, and permanent; it is cut into five parts; the flower has five oval concave petals which spread open, and five hair-like stamina terminated by roundish summits; it has an acute-pointed germen without a style, crowned by three oblong, feathery, twisted stigmas. The germen afterward turns to an oblong acute-pointed capsule with three corners, having one cell, opening with three valves, containing many small downy seeds.*

This genus of plants is ranged in the third section of Linnæus's fifth class, which includes those plants whose flowers have five stamina, and three styles or stigmas.

The SPECIES are,

1. TAMARIX (*Gallica*) floribus pentandris. Hort. Cliff. 111. *Tamarisk with flowers having five stamina.* Tamariscus Narbonensis. Lob. Icon. 218. *French Tamarisk.*
2. TAMARIX (*Germanica*) floribus decandris. Hort. Cliff. 111. *Tamarisk whose flowers have ten stamina.* Tamariscus Germanica. Lob. Icon. 218. *German Tamarisk.*

The first sort grows naturally in the south of France, in Spain and Italy, where it grows to a tree of middling size, but in England is seldom more than fourteen or sixteen feet high. The bark is rough, and of a dark brown colour; it sends out many slender branches, most of which spread out flat and hang downward at their ends; these are covered with a Chestnut-coloured bark, and garnished with very narrow finely divided leaves, which are smooth, of a bright green colour, and have small leaves or indentures which lie over each other like scales of fish. The flowers are produced in taper spikes at the end of the branches, several of them growing on the same branch. The spikes are about an inch long, and as thick as a large earth-worm. The flowers are set very close all round the spike; they are very small, and have five concave petals of a pale flesh colour, with five slender stamina terminated by roundish red summits. The flowers appear in July, and are succeeded by oblong, acute-pointed, three-cornered capsules, filled with small downy seeds, which seldom ripen in England.

The wood, bark, and leaves of this tree are used in medicine, and are accounted specific for all disorders of the spleen, as being believed to lessen it much. The bark is sometimes used for rickets in children.

The second sort grows naturally in Germany, in moist land; this is rather a shrub than tree, having several ligneous stalks arising from the same root, which grow

grow erect, sending out many side-branches which are also erect; they have a pale green bark when young, which afterward changes to a yellowish colour. The leaves are shorter, and set closer together than those of the other sort, and are of a lighter green, approaching to a gray colour; the flowers are produced in long loose spikes at the end of the branches, standing erect; they are larger than those of the former, and have ten stamina standing alternately. It flowers about the same time as the former.

These both cast their leaves in autumn, and it is pretty late in the spring before the young ones push out, which renders them less valuable; they are now frequently planted in gardens for ornament, and, when they are mixed with other shrubs, make a pretty variety.

They may be easily propagated by laying down their tender shoots in autumn, or by planting cuttings in an east border, which, if supplied with water in the spring before they begin to shoot in dry weather, will take root in a short time; but they should not be removed until the following autumn, at which time they may be either placed in a nursery to be trained up two or three years, or else into the quarters where they are designed to remain, observing to mulch their roots, and water them according as the season may require, until they have taken root; after which, the only culture they will require is to prune off the straggling shoots, and keep the ground clean about them.

TAMUS. Lin. Gen. Plant. 991. Tamnus. Tourn. Inst. R. H. 102. tab. 28. The black Briony.

The Characters are,

*It has male and female flowers on different plants. The male plants have empalements, composed of six oval spear-shaped leaves, which spread wide at the top; they have no petals, but have six short stamina, terminated by erect summits; the female flowers have bell-shaped empalements of one leaf, cut into six spear-shaped segments, which sit upon the germen; these have no petals, but have oblong punctured nectarii sitting on the inside of each segment of the empalement, and a large, oblong, oval, smooth germen under the empalement, with a cylindrical style, crowned by three reflexed indented stigmas. The germen afterward becomes an oval berry with three cells, including two globular seeds.*

This genus of plants is ranged in the sixth section of Linnæus's twenty-second class, which includes those plants whose male flowers are upon distinct plants from the fruit, and the male flowers have six stamina.

The Species are,

1. Tamus (*Communis*) foliis cordatis indivisis. Hort. Cliff. 458. *Tamus with heart-shaped undivided leaves.* Bryonia lævis sive nigra racemosa. C. B. P. 297. *Common black Briony.*
2. Tamus (*Cretica*) foliis trilobis. Lin. Sp. Plant. 1028. *Tamus with leaves which are divided into three lobes.* Tamus Cretica, trifido folio. Tourn. Cor. 3. *Black Briony of Crete with a trifid leaf.*

The first sort is rarely cultivated in gardens, but grows wild under hedges in divers parts of England, and is there gathered for medicinal use. The root is very large, fleshy, and has a dark brown skin or cover; the stalks are smooth, and twine round any neighbouring support, whereby they rise to the height of ten or twelve feet; they are garnished with smooth heart-shaped leaves of a lucid green, which are produced alternately. The flowers are produced in long bunches from the side of the stalks; those of the male plants fall off soon after their farina is cast abroad, but the female flowers are succeeded by oval smooth berries which are red when ripe. It flowers in July, and the fruit ripens in autumn.

It may be easily propagated by sowing their seeds soon after they are ripe, under the shelter of bushes, where, in the spring, the plants will come up, and spread their branches over the bushes, and support themselves, requiring no farther care, and their roots will abide many years in the ground without decaying.

The second sort was discovered in the island of Crete by Dr. Tournefort, who sent the seeds to the Royal Garden at Paris; this has a rounder root than the other. The stalks twine round any neighbouring support in like manner; the leaves of this are divided into three lobes, in which the principal difference consists. This is an abiding plant, which is hardy enough to live in the full ground in England, and may be propagated as the other.

TANACETUM. Tourn. Inst. R. H. 461. tab. 261. Lin. Gen. Plant. 848. Tansey; in French, *Tanesie.*

The Characters are,

*It has a flower composed of hermaphrodite and female florets, contained in one common hemispherical imbricated empalement, whose scales are compact and acute-pointed. The hermaphrodite florets, which compose the disk of the flower, are funnel-shaped, and cut at the top into five segments which are reflexed; these have five short hair-like stamina, terminated by cylindrical tubulous summits, and a small oblong germen, supporting a slender style, crowned by a bifid revolved stigma. The germen afterward becomes an oblong naked seed. The female florets are trifid, which compose the rays or border, and are deeply divided within; these have an oblong germen, with a slender style, crowned with two reflexed stigmas, but no stamina.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, which contains the plants whose flowers are composed of hermaphrodite and female florets which are fruitful, and their summits are connected.

The Species are,

1. Tanacetum (*Vulgare*) foliis bipinnatis incisis serratis. Hort. Cliff. 398. *Tansey with doubly-winged cut leaves which are sawed.* Tanacetum vulgare luteum. C. B. P. 132. *Common yellow Tansey.*
2. Tanacetum (*Sibericum*) foliis pinnatis, laciniis lineарii-filiformibus, corymbus glabris, caule herbaceo. Lin. Sp. Plant. 844. *Tansey with winged leaves which are cut into linear thread-like segments, a smooth corymbus, and an herbaceous stalk.* Tanacetum foliis pinnatis multifidis, laciniis linearibus trifidis. Flor. Sibir. 2. p. 134. *Tansey with many-pointed winged leaves, having trifid linear segments.*
3. Tanacetum (*Balsamita*) foliis ovatis integris serratis. Hort. Cliff. 398. *Tansey with oval, entire, sawed leaves.* Balsamita major. Dod. Pempt. 296. *Costmary, or Alecoast.*
4. Tanacetum (*Frutescens*) foliis pinnatifidis, laciniis lanceolatis obtusiusculis integerrimis. Lin. Sp. Plant. 844. *Tansey with wing-pointed leaves, having spear-shaped, entire, obtuse segments.* Tanacetum Africanum arborescens, foliis lavendulæ multifido folio. H. Amst. 2. 210. *African-tree Tansey, with a leaf like the cut-leaved Lavender.*
5. Tanacetum (*Suffruticosum*) foliis pinnato-multifidis, laciniis linearibus subdivisis, acutis caule suffruticoso. Hort. Cliff. 398. *Tansey with many-pointed winged leaves, having linear segments which are acutely divided, and an under shrub stalk.* Tanacetum Africanum, frutescens, foliis lavendulæ multifidæ, longè minoribus, graveolens. Boerh. Ind. Plant. 1. p. 124. *Shrubby African Tansey, with leaves like the cut-leaved Lavender, but much smaller and stronger scented.*
6. Tanacetum (*Crithmifolium*) foliis pinnatis, pinnis linearibus remotis integerrimis. Lin. Sp. Plant. 843. *Tansey with winged leaves, whose lobes are linear, grow at a distance from each other, and are entire.* Elichrysum Africanum frutescens, foliis crithmi marini. Hort. Amst. 2. p. 113. *Shrubby African Goldy-locks with leaves like Samphire.*

The first sort is the common Tansey which is used in medicine and the kitchen; this grows naturally by the sides of roads, and the borders of fields in many parts of England. It has a fibrous creeping root, which will spread to a great distance where they are not confined, from which rise many channelled stalks, from two to almost four feet high, according to the goodness of the soil, which are garnished with doubly-winged leaves, whose lobes are cut and sharply

ſharply ſawed; they are of a deep green colour, and have a pleaſant grateful odour. The ſtalks divide near the top into three or four branches which ſtand erect, and are terminated by umbels of naked yellow flowers, compoſed of many florets, which are included in hemiſpherical ſcaly empalements. Theſe appear in July, and are ſucceeded by ſeeds which ripen in September.

There are three varieties of this, one with a curled leaf, which is titled Double Tanſey by gardeners; another with variegated leaves, and a third with larger leaves which have little ſcent; but, as theſe have accidentally been produced from ſeeds of the common Tanſey, they are not enumerated as diſtinct ſpecies.

This ſort is eaſily propagated by the creeping roots, which, if permitted to remain undiſturbed, will in a ſhort time overſpread the ground where they are permitted to grow; ſo that wherever this is planted in a garden, the ſlips ſhould be placed at leaſt a foot aſunder, and in particular beds, where the paths round them may be often dug, to keep their roots within bounds. They may be tranſplanted either in ſpring or autumn, and will thrive in almoſt any ſoil or ſituation.

The common Tanſey is greatly uſed in the kitchen early in the ſpring; at which ſeaſon, that which is in the open ground, or eſpecially in a cold ſituation, is hardly forward enough to cut, ſo that where this is much wanted at that ſeaſon, it is the beſt way to make a gentle hot-bed in December, and plant the old roots thereon without parting them, and arch the bed over with hoops, to cover it with mats in cold weather, by which method the Tanſey will came up in January, and be fit to cut in a ſhort time after.

The ſecond ſort grows naturally in Siberia; this has a perennial fibrous root; the ſtalks riſe more than two feet high; the leaves are narrow and winged; the lobes are very narrow, and end in two or three points which are entire; the flowers are produced in ſmall thin umbels from the ſide, and at the top of the ſtalk; they are yellow and but ſmall, the umbels having few flowers in each. This flowers in June and July, and the ſeeds ripen in autumn: it may be propagated in the ſame way as the firſt.

The third ſort grows naturally in the ſouth of France and Italy, but is here planted in gardens, and was formerly pretty much uſed in the kitchen, and alſo in medicine. The roots of this are hardy, fleſhy, and creep in the ground; the lower leaves are oval and entire; they are near three inches long, and one inch and a half broad, ſawed on their edges, of a grayiſh colour, and have long foot-ſtalks. The ſtalks riſe from two to three feet high, and ſend out branches from the ſide; they are garniſhed with oval ſawed leaves like thoſe at the bottom, but ſmaller, and ſit cloſe to the ſtalk. The flowers are produced at the the top of the ſtalks in a looſe corymbus; they are naked, and of a deep yellow colour; theſe appear in Auguſt, but are not ſucceeded by ſeeds in England. The whole plant has a ſoft pleaſant odour.

It is propagated eaſily by parting of their roots: the beſt time for this is in autumn, that they may be well eſtabliſhed in the ground before ſpring. Where this plant is cultivated for uſe, the plants ſhould be planted in beds at two feet diſtance every way, that they may have room to grow; for in two years the roots will meet, ſo every other year they ſhould be tranſplanted and parted to keep them within compaſs; they will thrive in almoſt any ſoil or ſituation, but will continue longeſt in dry land.

The fourth ſort grows naturally at the Cape of Good Hope; this riſes with a ſhrubby ſtalk eight or ten feet high, ſending out branches on every ſide the whole length, which are garniſhed with wing-pointed leaves, whoſe ſegments are ſpear-ſhaped, entire, and blunt-pointed. The flowers are produced in ſmall roundiſh bunches at the end of the branches; they are of a ſulphur colour, and appear in May, but there is a ſucceſſion of flowers on the ſame plant great part of ſummer. The ſeeds rarely ripen in England.

The fifth ſort was brought from the Cape of Good Hope, where it grows naturally; this riſes with a branching ſhrubby ſtalk three or four feet high, garniſhed with wing-pointed leaves whoſe lobes are very narrow, and frequently cut into acute ſegments. The flowers are produced in ſmall roundiſh bunches at the end of the branches; they are larger than thoſe of the former ſort, and are of a bright yellow colour. It flowers about the ſame time with the former.

The ſixth ſort grows naturally at the Cape of Good Hope; this has a thick ſhrubby ſtalk, covered with a gray bark, which riſes ſeven or eight feet high, ſending out many branches on every ſide, which are cloſely garniſhed with linear-winged leaves, whoſe lobes or pinnæ are very narrow, and ſpread from each other. The leaves ſit cloſe to the ſtalks on every ſide; the branches are terminated by cloſe, large, roundiſh bunches of bright yellow flowers. Some of the foot-ſtalks ſuſtain but one, others two, three, or four flowers upon each, which begin to appear the beginning of July, and there is a ſucceſſion of them on the ſame plants till late in autumn; and thoſe which come early in the ſeaſon, will be ſucceeded by ſeeds which ripen in winter.

The three laſt-mentioned ſorts are too tender to live through winter in the open air, ſo muſt be kept in pots, and removed into ſhelter before hard froſts come on; they are all of them eaſily propagated by cuttings, which may be planted in a bed of loamy earth, during any of the ſummer months; theſe ſhould be ſhaded from the ſun until they have taken root, and muſt be frequently refreſhed with water. When they have good roots, they ſhould be taken up with balls of earth about their roots, and planted in pots, placing them in a ſhady ſituation till they have taken new root; then they may be removed to a ſheltered ſituation, placing them among other hardy exotic plants, where they may remain till late in October, when they muſt be put into ſhelter. Theſe plants are ſo hardy as only to require protection from hard froſt, ſo muſt not be tenderly treated, and in mild weather ſhould always be as much expoſed to the air as poſſible, to prevent their drawing weak.

TAN, or TANNERS BARK is the Bark of the Oak-tree, chopped or ground into coarſe powder, to be uſed in tanning or dreſſing of ſkins, after which it is of great uſe in gardening: firſt, by its fermentation (when laid in a proper quantity,) the heat of which is always moderate, and of a long duration, which renders it of great ſervice for hot-beds; and ſecondly, after it is well rotted, it becomes excellent manure for all ſorts of cold ſtiff land, upon which one load of Tan is better than two of rotten dung, and will continue longer in the ground.

The uſe of Tan for hot-beds has not been many years known in England. The firſt hot-beds of this ſort, which were made in England, were at Blackheath in Kent, above fourſcore years ago; theſe were deſigned for the raiſing of Orange-trees, but the uſe of theſe hot-beds being but little known at that time, they were made but by two or three perſons, who had learned the uſe of them in Holland and Flanders, where the gardeners ſeldom make any other hot-beds; but in England there were very few hot-beds made of Tanners Bark before the Ananas plants were introduced into this country, which was in 1719, ſince which time the uſe of theſe hot-beds has been more general, and are now made in all thoſe gardens where the Ananas plants are cultivated, or where there are collections of tender exotic plants preſerved; and the gardeners here are now better ſkilled in the making and managing of theſe hot-beds than in moſt other countries, which might render it leſs neceſſary to give a full deſcription of them here; but yet, as there may be ſome perſons in the remote parts of England, who have not had an opportunity of informing themſelves of the uſe of Tanners Bark for this purpoſe, I ſhall inſert

ſert the ſhorteſt and plaineſt method of making and managing theſe hot-beds, as they are practiſed by the moſt knowing perſons, who have long made uſe of theſe hot-beds; and firſt, I ſhall begin with the choice of the Tan.

The tanners in ſome parts of England do not grind the Bark to reduce it into ſmall pieces, as is commonly practiſed by the tanners near London, where there is great difference in the ſize of the bark, ſome being ground much ſmaller than the other, according to the different purpoſes for which it is intended; but in many places the Bark is only chopped into large pieces, which renders it very different for the uſe of hot-beds; for if the Tan is very coarſe, it will require a longer time to ferment than the ſmall Tan; but when it begins to heat, it will acquire a much greater degree, and will retain the heat a much longer time than the ſmall; therefore where there is choice, the middling-ſized Tan ſhould be preferred, for it is very difficult to manage a hot-bed when made of the largeſt Tan; the heat of which is often ſo great, as to ſcald the roots of plants, if the pots are fully plunged into the bed; and I have known this violent heat continue upward of two months, ſo that it has been unſafe to plunge the pots more than half their depth into the Tan, till near three months after the beds have been made; therefore where the perſons, who have the care of theſe beds, do not diligently obſerve their working, they may in a ſhort time deſtroy the plants which are placed in the beds: on the other hand, if the Tan is very ſmall, it will not retain the heat above a month or ſix weeks, and will be rotten and unfit for a hot-bed in a ſhort time; ſo that where the middle-ſized Tan can be procured, it ſhould always be preferred to any other.

The Tan ſhould be always ſuch as been newly taken out of the pits, for if it lies long in the tanners yard before it is uſed, the beds ſeldom acquire a proper degree of heat, nor do they continue their heat long; ſo that when it has been more than a fortnight or three weeks out of the pit, it is not ſo good for uſe as that which is new. If the Tan is very wet, it will be proper to ſpread it abroad for two or three days, to drain out the moiſture, eſpecially if it is in autumn or winter ſeaſon, becauſe then, as there will be little ſun to draw a warmth into the Tan, the moiſture will prevent the fermentation, and the beds will remain cold; but in the ſummer ſeaſon, there is no great danger from the moiſture of the Tan. The heat of the ſun through the glaſſes will be then ſo great, as ſoon to cauſe a fermentation in the Tan.

Theſe Tan-beds ſhould be always made in pits having brick-walls round them, and a brick pavement at the bottom, to prevent the earth from mixing with the Tan, which will prevent the Tan from heating. Theſe pits muſt not be leſs than three feet deep, and ſix feet in width, but ſeven is better; the length muſt be in proportion to the number of plants they are to contain, but if they are not ten feet in length, they will not retain their heat long; for where there is not a good body of Tan, the outſide of the bed will ſoon loſe its heat, ſo that the plants which are there plunged, will have no benefit of the warmth, nor will the middle of theſe beds retain their heat long, ſo that they will not anſwer the purpoſe for which they are intended.

When the Tan is put into the bed, it muſt not be beaten or trodden down too cloſe, for that will cauſe it to adhere, and form one ſolid lump, ſo that it will not acquire a proper heat; nor ſhould it be trodden down at the time when the pots are plunged into the beds, to avoid which there ſhould be a board laid croſs the bed, which ſhould be ſupported at each end, to prevent its reſting upon the Tan, upon which the perſon ſhould ſtand who plunges the pots, ſo that the Tan will not be preſſed down too cloſe. When the Tan is quite freſh, and has not been out of the pits long enough to acquire a heat, the beds will require a fortnight, or ſometimes three weeks, before they will be of a proper temperature of warmth to receive the plants; but in order to judge of this, there ſhould be three or four ſticks thruſt down into the Tan, about eighteen inches deep, in different parts of the bed, ſo that by drawing out the ſticks, and feeling them at different depths, it will be eaſy to judge of the temper of the bed; and it will be proper to let a few of theſe ſticks remain in the bed after the plants are plunged, in order to know the warmth of the Tan, which may be better judged of by feeling theſe ſticks, than by drawing out the pots, or plunging the hand into the Tan.

When the Tan is good, one of theſe beds will retain a proper degree of heat for near three months; and when the heat declines, if the Tan is forked up and turned over, and ſome new Tan added to it, the heat will renew again, and will continue two months longer; ſo that by turning over the Tan, and adding ſome new Tan every three months or thereabouts, as the bed is found to decline of its heat, they may be continued one year, but every autumn it will be proper to take out a good quantity of the old Tan, and to add as much new to the bed, that the heat of the bed may be kept up in winter; for if the heat is ſuffered to decline too much during the cold ſeaſon, the plants will ſuffer greatly; to prevent this, there ſhould always be ſome new Tan added to the bed in winter, when the heat is found to decline; but the Tan ſhould be laid in a dry place a week or ten days to dry, before it is put into the bed, otherwiſe the moiſture will chill the old Tan in the bed, and prevent the fermentation; ſo that unleſs the Tan is turned over again, there will be little or no heat in the beds, which often proves fatal to the plants which are plunged in them; therefore whoever has the management of theſe beds, ſhould be very careful to obſerve conſtantly the warmth of the Tan, ſince, upon keeping the beds in a due temperature of warmth, their whole ſucceſs depends; and where this caution is not taken, it frequently happens that the Ananas plants run into fruit very ſmall, or the plants are infected by inſects, both which are occaſioned by the growth of the plants being ſtopped by the decline of the heat of the Tan; therefore great regard muſt be had to that, eſpecially in winter.

The great advantages which theſe tan-beds have of thoſe which are made of horſe-dung, are the moderate degree of heat which they acquire, for their heat is never ſo violent as that of horſe-dung, and they continue this heat much longer; and when the heat declines, it may be renewed, by turning the beds over, and mixing ſome new Tan with the old, which cannot be ſo well done with horſe-dung; and likewiſe the beds will not produce ſo great ſteams, which are often injurious to tender plants, ſo that theſe Tan-beds are much preferable to thoſe of horſe-dung for moſt purpoſes.

Tan, when it is well rotted, is alſo an excellent manure for all cold and ſtiff lands; and if it is laid upon Graſs ground in autumn, that the rains in winter may waſh it into the ground, it will greatly improve the Graſs; but when it is uſed new, or in the ſpring of the year, when dry weather comes ſoon after, it is apt to cauſe the Graſs to burn, which has occaſioned the diſuſe of Tan in many places; but if properly uſed, it will be found an excellent dreſſing for all ſtiff lands.

TAPIA. See Crateva.

TARCHONANTHUS. Lin. Gen. Plant. 846.

The Characters are,

*It has a flower compoſed of ſeveral hermaphrodite florets, included in one common top-ſhaped empalement, which is ſhort, permanent, and hairy. The florets are uniform, funnel-ſhaped, and of one petal, indented in five parts at the top; they have each five very ſhort hair-like ſtamina, terminated by cylindrical tubulous ſummits longer than the petal, and an oblong germen, ſupporting a ſtyle the length of the ſtamina, crowned by two awl-ſhaped ſtigmas which open lengthways. The germen afterward turns to a ſingle oblong ſeed, crowned with down, which ripens in the empalement.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which includes those plants whose flowers are made up of all fruitful florets, and their summits are connected together.

We have but one Species of this genus, viz.

Tarchonanthus (*Camphoratus.*) Hort. Cliff. 398. Conyza Africana, frutescens, foliis salviæ odore camphoræ. Tourn. Inst. 455. *Shrubby African Fleabane, with Sage leaves smelling like Camphire.*

This plant grows naturally at the Cape of Good Hope, and also in China; it has a strong woody stalk, which in England rises to the height of twelve or fourteen feet, sending out many ligneous branches at the top, which may be trained up to have a regular head. The branches are garnished with leaves, which are in shape like those of the broad-leaved Sallow, having a downy surface like those of Sage, and their under sides are white; they resemble in smell the Rosemary leaves when bruised. The flowers are produced in spikes at the extremity of the shoots, which are of a dull purple colour, so do not make any great appearance. The usual time of its flowering is in autumn, but continue great part of winter, and are not succeeded by seeds here. These plants are preserved to make a variety in the green-house during the winter season, by those who are curious in collecting of foreign plants; they retain their leaves all the year.

It is too tender to live through the winter in the open air in England, but requires no artificial heat, therefore may be placed in a common green-house with Myrtles, Oleander, and other hardy exotic plants in winter, and in summer may be exposed with them in the open air, and treated in the same manner as they are.

It may be propagated by cuttings, which should be planted in May, in pots filled with light earth, and if they are plunged into a moderate hot-bed, it will promote their putting out roots. These should be shaded with mats, or covered with oiled paper, to screen them from the sun until they are rooted. By the middle of July these cuttings will have taken root, when they should be each transplanted into a separate pot, and placed in the shade until they have taken new root; after which time they may be placed with other hardy exotic plants in a sheltered situation, where they may remain till the middle or end of October, when they should be removed into the green-house, placing them where they may have a large share of air in mild weather. This plant is very thirsty, so must be often watered, and every year the plants must be shifted; and as they increase in size, should be put into larger pots.

TARRAGON. See Abrotanum.

TAXUS. Tourn. Inst. R. H. 589. tab. 362. Lin. Gen. Plant. 1006. [so called of τόξα, poisons; because this tree, in old time, was used in compounding poisons in warm climates.] The Yew-tree; in French, *If.*

The Characters are,

*The male flowers are produced on separate trees from the fruit for the most part; they have neither empalement or petals, but the gem is like a four-leaved cover; they have a great number of stamina which are joined at the bottom in a column longer than the gem, terminated by depressed summits, having obtuse borders and eight points, opening on each side their base, casting their farina. The female flowers are like the male, having no empalement or petals, but have an oval acute-pointed germen, but no style, crowned by an obtuse stigma. The germen afterward becomes a berry lengthened from the receptacle, globular at the top, and covered by a proper coat at bottom, open at the top, full of juice, and of a red colour; but as it dries, wastes away, including one oblong oval seed, whose top without the berry is prominent.*

This genus of plants is ranged in the eleventh section of Linnæus's twenty-second class, which includes those plants whose male flowers are upon separate plants from the fruit, and their stamina are joined in one body or column.

We have but one Species of this plant in England, viz.

Taxus (*Baccas*) foliis approximatis. Lin. Sp. Plant. 1040. *Yew-tree with leaves growing near each other, or the common Yew.*

This tree grows naturally in England, and also in most of the northern countries of Europe, and in North America; and where, if it is suffered to grow, will rise to a good height, and have very large stems; it naturally sends out branches on every side, which spread out, and are almost horizontal; they are closely garnished with narrow, stiff, blunt-pointed leaves, of a very dark green. The flowers come out from the side of the branches in clusters; the male flowers having many stamina, are more conspicuous than the female; these for the most part are upon different trees, but sometimes are upon the same tree; they appear the latter end of May, and the berries ripen in autumn.

There is hardly any sort of evergreen tree which has been so generally cultivated in the English gardens as the Yew, upon the account of its being so tonsile, as to be with ease reduced into any shape the owner pleased; and it may be too often seen, especially in old gardens, what a wretched taste of gardening prevailed formerly in England, from the monstrous figures of beasts, &c. we find these trees reduced into; but of late this taste has been justly exploded by persons of superior judgment, for what could be more absurd than the former methods of planting gardens? where, those parts next the habitation, were crouded with a large quantity of these and other sorts of evergreen trees, all of which were clipped into some trite figure or other, which, besides the obstructing the prospect from the house, and filling up the ground, so that little room was left for other shrubs and flowers. Beside, it occasioned an annual expence to render the trees disagreeable; for there never was a person, who had considered the beauty of a tree in its natural growth, with all its branches diffused on every side, but must acknowledge such a tree infinitely more beautiful than any of those shorn figures, so much studied by persons of a groveling imagination.

The only use this tree is fit for in gardens, is to form hedges for the defence of exotic plants; for which purpose, when it is necessary to have hedges, it is the most proper of any tree in being; the leaves being small, the branches are produced very close together; and if carefully shorn, they may be rendered so close as to break the winds better than any other sort of fence whatever, because they will not be reverberated, as against walls, pales, or other close fences, therefore consequently are much to be preferred for such purposes.

These trees may be easily propagated by sowing their berries in autumn, as soon as they are ripe (without clearing them from the pulp which surrounds them, as hath been frequently directed,) upon a shady bed of fresh undunged soil, covering them over about half an inch thick with the same earth.

In the spring the bed must be carefully cleared from weeds, and if the season proves dry, it will be proper to refresh the bed with water now and then, which will promote the growth of the seeds, many of which will come up the same spring, but others will remain in the ground until autumn or spring following; but where the seeds are preserved above ground till spring before they are sown, the plants never come up till the year after; so that by sowing the seeds as soon as they are ripe, there is often a whole year saved.

These plants, when they come up, should be constantly cleared from weeds, which, if permitted to grow amongst them, will cause their bottoms to be naked, and frequently destroy the plants when they continue long undisturbed.

In this bed the plants may remain two years, after which, in autumn, there should be a spot of fresh undunged soil prepared, into which they should be removed the beginning of October, planting them in beds about four or five feet wide, in rows about a

foot asunder, and six inches distance from each other in the rows, observing to lay a little mulch upon the surface of the ground about their roots, as also to water them in dry weather until they have taken root; after which they will require no farther care, but to keep them clear from weeds in summer, and to trim them according to the purpose for which they are designed.

In these beds they may remain two or three years, according as they have grown, when they should again be removed into a nursery, placing them in rows at three feet distance, and the plants eighteen inches asunder in the rows; observing to do it in autumn, as was before directed, and continue to trim them in the summer season, according to the design for which they were intended; and after they have continued three or four years in this nursery, they may be transplanted where they are to remain; always observing to remove them in autumn where the ground is very dry, but on cold moist land it is better in the spring.

These trees are very slow in growing, but yet there are many very large trees upon some barren cold soils in divers parts of England. The timber of these trees is greatly esteemed for many uses.

TELEPHIOIDES. See ANDRACHNE.

TELEPHIUM. Tourn. Inst. R. H. 248. tab. 128. Lin. Gen. Plant. 339. Orpine.

The CHARACTERS are,

*The empalement of the flower is permanent, composed of five oblong oval leaves which are obtuse, and the length of the petals. The flower has five oblong obtuse petals, and five awl-shaped stamina which are shorter than the petals, terminated by prostrate summits, with a three-cornered acute germen having no style, crowned by three acute spreading stigmas. The germen afterward turns to a short three-cornered capsule with one cell, opening with three valves, containing many round seeds.*

This genus of plants is ranged in the third section of Linnæus's fifth class, which contains those plants whose flowers have five stamina, and three styles or stigmas.

We have but one SPECIES of this genus in the English gardens, viz.

TELEPHIUM (*Imperati.*) Hort. Upsal. 70. *Orpine, or Live long.* Telephium legitimum Imperati. Clus. Hist. 77. *The true Orpine of Imperatus.*

This plant grows naturally in the south of France and Italy. The root is composed of ligneous fibres of a yellowish colour, which spread out wide. The branches or stalks are slender, and trail upon the ground; they are eight or nine inches long, and are garnished with small oval leaves of a grayish colour, smooth and pretty stiff, which are ranged alternately along the stalk, having one longitudinal nerve running through the middle. The flowers are produced at the end of the branches in short thick bunches, which are reflexed like those of the Heliotropium. They are composed of five white petals which spread open and are the length of the empalement, having five very slender stamina terminated by yellow summits. This plant flowers in June and July, and the seeds ripen in autumn.

This may be propagated by seeds, which should be sown in autumn on a bed of fresh light earth, in an open situation; for if they are sown in the spring, the plants will not come up till the following spring. When the plants are come up, they should be thinned so as to leave them six or eight inches asunder; and they must be constantly kept clear from weeds, for if these are permitted to grow, they will soon overbear the plants and destroy them. These plants do not transplant well, so should stand in the place where they were sown. In the summer they will flower, and the seeds will ripen in autumn, which will scatter soon if it is not gathered when ripe; and, if the ground is not disturbed, the plants will come up in plenty, and require no other care than to keep them clear from weeds.

TEREBINTHUS. See PISTACHIA.

TERGIFŒTOUS PLANTS, are such as bear their seeds on the backsides of their leaves.

TERNATEA. See CLITORIA.

TERRACES. A Terrace is a bank of earth, raised on a proper elevation, so that any person who walks round a garden, may have a better prospect of all that lies round him; and these elevations are so necessary, that those gardens that have them not are deficient.

When the Terraces are rightly situated, they are great ornaments for their regularity and opening, especially when they are well made, and their ascent not too steep.

There are several kinds of Terrace-walks:

1. The great Terrace, which generally lies next to the house.

2. The side or middle Terrace, which is commonly raised above the level of the parterre, lawn, &c.

3. Those Terraces which encompass a garden.

As to the breadth of side Terraces, this is usually decided by its correspondence with some pavilion, or some little jettee or building; but most of all by the quantity of stuff that is to spare for those purposes.

The side Terrace of a garden ought not to be less than twenty feet, and but very seldom wider than thirty.

As for the height of a Terrace, some allow it to be but five feet high; but others more or less, according to their fancies; but more exact persons never allow above five or six feet; and in a small garden, and a narrow Terrace-walk, three feet; and sometimes three feet and a half high, are sufficient for a Terrace eighteen feet wide, and four feet are sufficient for a Terrace of twenty feet wide; but when the garden is proportionably large, and the Terrace is thirty feet wide, then it must be at least five or six feet high.

The noblest Terrace is very deficient without shade, for which Elm-trees are very proper; for no seat can be said to be complete, where there is not an immediate shade almost as soon as out of the house, and therefore these shady trees should be detached from the body and wings of the edifice.

TERENE, earthy, or composed of earth.

TERRESTRIAL, earthy, or that belongs to earth.

TETRACERA. Lin. Gen. Plant. 604.

The CHARACTERS are,

*The flower has a permanent empalement of six roundish spreading leaves, the three outer are alternate and smaller than the other: it has six small petals which soon fall off, and a great number of stamina which are permanent, and the length of the empalement, terminated by single summits; it has four oval germen supporting a short awl-shaped style, crowned by an obtuse stigma. The germen afterward become four oval reflexed capsules, each having one cell, opening at the seam on the upper side, inclosing one roundish seed.*

This genus of plants is ranged in the fourth section of Linnæus's thirteenth class, which includes those plants whose flowers have many stamina and four styles.

We have but one SPECIES of this genus, viz.

TETRACERA (*Volubilis.*) Hort. Cliff. 214. Petræa floribus spicatis, foliis lauri scabris. Amman. Herb. 518. *Petræa with spiked flowers, and rough leaves resembling those of the Bay-tree.*

This plant grows naturally at La Vera Cruz, where it was discovered by the late Dr. Houstoun, who sent it to England. It has a woody stalk which rises to the height of twelve or fourteen feet, covered with a gray bark, sending out several slender ligneous branches which twine about any neighbouring support; they are garnished with oblong oval leaves, whose surface are very rough, near six inches long, and two inches and a half broad, slightly indented on their edges toward their points, and have many transverse veins running from the midrib to the edges; they are placed alternate on their branches, standing upon short foot-stalks, of a grayish colour on their upper surface, and brown on their under. The

flowers are produced in panicles at the end of the branches; these panicles are composed of three or four short thick spikes which branch out from the lower part of the principal spike, which is much longer and thicker than the other. The flowers have six thin purple petals of the same length as the empalement, which are very fugacious, so that they soon fall off; these sit upon the germen. After the flowers are past, the four germen become so many oval capsules which are reflexed backward; these open lengthways on the upper side, and have each one oblong seed inclosed.

This shrub is very different from that which Dr. Plukenet titles Fagus Americanus ulmi amplissimis foliis, capsulis bigemellis. Amalth. 87. though Dr. Linnæus has added this Synonime to it.

This is propagated by seeds, which must be procured from the countries where the plant naturally grows, which may probably be found in some of the British islands in the West-Indies. I have received it from the island of Barmuda, where it was found by the late Dr. Cressy, who sent me specimens and seeds. These seeds are frequently abortive, for, upon examining them, there was scarce more than a twentieth part which had any kernels, and others appeared fair but were hollow. The seeds should be sown in pots filled with light earth, and plunged into a moderate hot-bed of tanners bark, where they must be treated in the same way as other exotic seeds from the same countries; and as the plants seldom come up the same year, the pots should be removed into the stove before winter, and plunged into the tan-bed between the other pots of plants, where they should remain till spring, when they should be taken out and plunged into a fresh hot-bed of tanners bark, which will bring up the plants if the seeds were good. When the plants are fit to remove, they should be each planted in a separate small pot filled with light earth, and plunged into a good bed of tan, shading them from the sun till they have taken new root; after which their treatment must be the same as for the Annona, and the like tender exotic plants, which require to be kept always in the tan-bed.

TETRAGONIA. Lin. Gen. Plant. 551. Tetragonocarpos. Boerh. Ind. alt. 262.

The Characters are,

*The flower has a permanent coloured empalement, composed of four oval, plain, deflexed leaves sitting upon the germen. It has no petals, but about twenty hair-like stamina which are shorter than the empalement, terminated by oblong prostrate summits, and a roundish four-cornered germen under the flower, supporting four awl-shaped styles which are recurved and as long as the stamina, with hairy stigmas the length of the styles. The germen afterward becomes a thick capsule with four cells, having four angles which have narrow wings or borders, containing one hard oblong seed in each.*

This genus of plants is ranged in the fourth section of Linnæus's twelfth class, which includes those plants whose flowers have about twenty stamina and five styles.

The Species are,

1. Tetragonia (*Fruticosa*) foliis linearibus. Flor. Leyd. Prod. 250. *Tetragonia with linear leaves.* Tetragonocarpos Africana fruticans, foliis longis & angustis. H. Amst. 2. p. 205. *African shrubby Tetragonocarpos, with long narrow leaves.*
2. Tetragonia (*Decumbens*) foliis ovatis integerrimis, caule fruticoso decumbente. *Tetragonia with oval entire leaves, and a shrubby trailing stalk.*
3. Tetragonia (*Herbacea*) foliis ovatis. Flor. Leyd. Prod. 250. *Tetragonia with oval leaves.* Tetragonocarpos Africana, radice magna crassa & carnosa. Hort. Amst. 2. p. 203. *Tetragonocarpos with a large fleshy root, and oval leaves.*

These plants grow naturally at the Cape of Good Hope, from whence they were first brought to the gardens in Holland. The first sort has slender ligneous stalks which rise three or four feet high, if they are supported, otherwise they trail upon the ground; they are covered with a light gray bark, and divide into a great number of trailing branches, which when young are succulent, of an herbaceous colour, and covered with small pellucid drops, somewhat like the Diamond Ficoides, which reflect the light. As the branches are older, they become more ligneous, and are garnished with thick, succulent, narrow leaves, about half an inch long, and a tenth of an inch broad, concave, and blunt-pointed; these are placed alternate, and at their base come out a cluster of smaller leaves, which have the like pellucid drops as the stalks. The flowers are produced from the wings of the stalks, at every joint toward the end of the branches; sometimes they come up singly, at others there are two, and sometimes three flowers at each joint; these have empalements of five leaves, which spread open and are a little reflexed; they are green without, and yellow within, each having about forty stamina, which are terminated by oblong prostrate summits which fill up the middle of the flower. They appear in July and August, and are succeeded by large four-cornered capsules having four wings or borders, and four cells, each containing one oblong seed, which ripens in winter.

The second sort has larger stalks than the former, which branch out in like manner; the branches trail upon the ground where they are not supported; the young branches are very succulent, and almost as thick as a man's little finger; the leaves are two inches long, and one broad; their surface are covered with very small pellucid drops, as are the stalks. The flowers are larger, and stand upon pretty long foot-stalks, three or four arising from the same points; the empalement, and also the summits, are of a pale sulphur colour. It flowers at the same time with the first.

These may be propagated by cuttings, which should be cut off from the plants a few days before they are planted, that the part where they are cut may be healed, otherwise they will rot, for the leaves and stalks of this plant are very full of moisture. The best time to plant these cuttings is in July, that they may have time to make good roots before winter. These cuttings may be planted on a bed of fresh earth, and if they are shaded from the sun in the heat of the day, it will be of service to them. They should be frequently refreshed with water, but they must not have it in too great plenty, for that will rot them. In about six weeks after planting, the cuttings will be sufficiently rooted to transplant, therefore they should be taken up, and planted into pots filled with light fresh undunged earth, and placed in a shady situation until they have taken new root, after which time they may be placed with other hardy exotic plants in a sheltered situation, where they may remain till the middle or latter end of October; at which time they should be removed into the green-house, and placed where they may enjoy as much free air as possible in mild weather; for they only require to be protected from the frost, being pretty hardy with respect to cold, but they should not have too much moisture in winter. If these plants are planted in the full ground in the summer season, they will grow prodigiously rank and large; as they also will, if they are permitted to root into the ground through the holes at the bottom of the pots; therefore the pots should be frequently removed to prevent it, for when they grow too freely, their leaves will be very full of moisture; which, together with the weight of the fruit, which are always produced at the extremity of the branches, will weigh the branches upon the ground, and render the plants very unsightly. The plants of this kind commonly grow very straggling; therefore the more their roots are confined in the pots, the more close and stinted will be the heads of the plants; which is what they should always be kept to, in order to render them sightly. The flowers of this plant have no great beauty, but as the whole face of the

the plant is peculiar, it may be allowed a place in every collection of plants for the sake of variety, since it requires no great trouble to cultivate it.

These plants may also be propagated by seeds, which should be sown on a warm border of light fresh earth, where sometimes they will remain a whole year before the plants come up; therefore when they do not come up the first season, the borders should not be disturbed, but kept constantly clear from weeds; and the following spring, when the plants are come up about four inches high, they should be taken up and planted in pots, (and treated in the same manner as hath been directed for the cuttings;) for if they are suffered to grow in the border till they are large, they will not transplant so well, nor will they make so handsome plants.

The third sort hath large fleshy roots; the branches are weak, and trail upon the ground; these generally decay about Midsummer, and new shoots are produced late in autumn. The leaves of this come out in bunches; they are oval, plain, and not so thick and succulent as those of the other sorts; they are little more than an inch long, and half an inch broad. The flowers are produced from the wings of the leaves in February; these are like those of the second sort, and have long slender foot-stalks. This never produces any seeds in England; however the cuttings will grow, if they are planted early in the spring, so that the sort may be propagated with the same facility as either of the other kinds.

All these sorts require protection in winter; but if they are placed in an airy glass-case with Ficoides, and other hardy plants, where they may have a large share of free air in mild weather, and protected from the frost, they will thrive much better than when they are more tenderly treated.

TETRAGONOTHECA. Hort. Elth. 283. Lin. Gen. Plant. 875. Sun-flower, vulgò.

The Characters are,

*The flower is composed of hermaphrodite and female florets, which are included in one large common empalement, cut into four plain, triangular, heart-shaped segments which spread open. The disk or middle of the flower is made up of hermaphrodite florets, which are funnel-shaped, and cut into five segments at the brim, which are reflexed; they have five short hair-like stamina, terminated by cylindrical summits, and a naked germen supporting a slender style, crowned by two reflexed stigmas. The germen afterward becomes one naked roundish seed. The female half florets which compose the ray or border of the flower, have their petals stretched out like a tongue on one side, and are cut at their points into three equal acute parts. These have no stamina, but a naked germen supporting a slender style with two twisted stigmas, and are succeeded by single naked seeds.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, which includes the plants whose flowers are composed of hermaphrodite and female florets which are fruitful, and their summits are connected.

We have but one Species of this genus, viz.

Tetragonotheca (*Helianthoides.*) Lin. Sp. Plant. 903. Tetragonotheca doronici maximi folio. Hort. Elth. 378. *Dwarf Sun-flower, with a leaf like the greater Leopard's Bane.*

This plant is a native of Carolina, from whence the seeds were brought to Europe. The roots of this plant are perennial, but the stalks are annual, and perish in autumn on the approach of cold. The roots will abide through the winter in the full ground, if they are planted in a warm situation, so do not require any shelter, except in very severe winters; when, if they are covered over with rotten tan or Peas haulm, to keep out the frost, there will be no danger of their being killed.

About the latter end of April or the beginning of May, the roots will send forth new shoots, which are garnished with large, oblong, rough leaves, placed by pairs, closely embracing the stalks; these are a little sinuated on their edges, and are covered with small hairs. The stalks usually grow about two feet and a half high in England, and branch out toward the top into several smaller stalks, each having one large yellow flower at their top, shaped like a Sun-flower; which, before it expands, is covered with the inflated empalement, which is four-cornered. The seeds of this plant rarely ripen in England, but when they are obtained from abroad, they should be sown in the full ground in the spring of the year; where sometimes they will remain a year before the plants come up, so that if they do not come up the same year, the ground should not be disturbed, but kept clean from weeds, and wait till the second year to see what plants will come up. When the plants appear they must be kept clean from weeds, and if the season should prove dry, they will require to be frequently watered. In autumn the plants should be transplanted into the places where they are to remain.

These plants will live three years in a proper soil and situation, but as it does not increase here, the best method is to procure good seeds from abroad annually.

TETRAPETALOUS FLOWER is one which is composed of only four single flower leaves, called petala.

TEUCRIUM. Lin. Gen. Plant. 625. Tourn. Inst. R. H. 207. tab. 93. [takes its name from king Teucer, who was the first amongst the ancients who brought this plant into use.] Tree Germander.

The Characters are,

*The empalement of the flower is of one leaf, cut into five acute equal segments at the top, and is permanent. The flower is of the lip kind with one petal, having a short cylindrical tube a little incurved at the chaps. The upper lip is erect, and deeply cut into two acute segments. The lower lip spreads and is cut into three segments; the middle one is large and roundish, the two side ones are acute and erect. It has four awl-shaped stamina which are longer than the upper lip, and are prominent between the segments, terminated by small summits. It has a germen divided in four parts, supporting a slender style, crowned by two slender stigmas. The germen afterward turn to four roundish naked seeds which ripen in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and the seeds have no capsule.

The Species are,

1. Teucrium (*Flavum*) foliis cordatis obtuse serratis, floralibus integerrimis concavis, caule fruticoso. Lin. Sp. Plant. 565. *Tree Germander with heart-shaped leaves which are bluntly sawed, those between the flowers concave and entire, and a shrubby stalk.* Teucrium multis. J. B. *Common Tree Germander.*
2. Teucrium (*Lucidum*) foliis ovatis acute inciso-serratis glabris, floribus axillaribus geminis, caule erecto. Lin. Sp. Plant. 790. *Germander with oval smooth leaves which are acutely sawed, and two flowers proceeding from the side of the stalks, which are erect.* Chamædrys Alpina frutescens, folio splendente. Magnol. Hort. 52. *Shrubby Alpine Germander with a lucid leaf.*
3. Teucirum (*Fruticans*) foliis integerrimis oblongo-ovatis petiolatis, suprà glabris, subtus tomentosis pedunculis unifloris. Lin. Sp. Plant. 563. *Tree Germander with entire, oblong, oval leaves having foot-stalks, smooth and hoary underneath, and one flower on a foot-stalk.* Teucrium fruticans Bæticum. Clus. Hist. 1. p. 348. *Spanish Tree Germander.*
4. Teucrium (*Latifolium*) foliis integerrimis, rhombeis acutis, villosis, subtus tomentosis. Hort. Upsal. 195. *Tree Germander with entire leaves which are hairy, shaped like an acute rhombus, and woolly on their under side.* Teucrium Hispanicum latiore folio. Tourn. Inst. R. H. 208. *Spanish Tree Germander with a broader leaf.*
5. Teucrium (*Campanulatum*) foliis multifidis, floribus solitariis. Lin. Sp. 562. *Germander with many-pointed leaves, and flowers growing singly.* Teucrium Hispanicum supinum humilius, verbenæ tenuifoliæ foliis. Jussieu. *Low, trailing, Spanish Germander, with leaves like those of the narrow-leaved Vervain.*

6. Teucrium (*Botrys*) foliis multifidis, pedunculis axillaribus ternis. Lin. Sp. Plant. 562. *Germander with many-pointed leaves, and flowers growing on foot-ſtalks by threes.* Chamædrys foliis laciniatis. Lob. Obſerv. 209. *Germander with jagged leaves.*

7. Teucrium (*Chamædrys*) foliis ovatis inciſo-crenatis petiolatis, floribus ſubverticillatis. Hort. Cliff. 302. *Germander with oval leaves with crenated cuts, having foot-ſtalks, and flowers growing almoſt in whorls.* Chamædrys minor repens. C. B. P. 248. *Smaller creeping Germander.*

8. Teucrium (*Niſſolianum*) foliis trifidis quinquefidiſque filiformibus floribus pedunculatis ſolitariis oppoſitis caule decumbente. Lin. Sp. 782. *Germander with trifid and quinquefid leaves, and flowers growing on ſolitary foot-ſtalks.* Chamædrys multiflora, tenuifolia Hiſpanica. Tourn. Inſt. 205. *Spaniſh narrow-leaved Germander bearing many flowers.*

9. Teucrium (*Maſſilienſe*) foliis ovatis rugoſis inciſo-crenatis, incanis, caulibus erectis, racemis rectis. Lin. Sp. 789. *Teucrium with oval rough leaves, which are hoary, crenated, and erect ſtalks, and ſpikes of flowers.* Teucrium Creticum odoratum flore purpureo. H. R. Par. *Sweet-ſmelling Germander of Crete, with a purple flower.*

10. Teucrium (*Scorodonia*) foliis cordatis ſerratis petiolatis, racemis lateralibus ſecundis, caule erecto. Lin. Sp. Plant. 564. *Germander with heart-ſhaped ſawed leaves having foot-ſtalks, many long bunches of flowers growing from the wings, and an upright ſtalk.* Scordium alterum ſive ſalvia agreſtis. C. B. P. 247. *Another Scordium, or Wild Sage.*

11. Teucrium (*Scordium*) foliis oblongis ſeſſilibus dentato ſerratis, floribus geminis lateralibus pedunculatis, caule diffuſo. Lin. Sp. 790. *Teucrium with oblong, indented, ſawed leaves ſitting cloſe to the ſtalks, flowers ſet by pairs on foot-ſtalks, proceeding from the ſides of the ſtalks, which are diffuſed.* Scordium. C. B. P. 247.

12. Teucrium (*Marum*) foliis integerrimis ovatis ſubtus tomentoſis, utrinque acutis, racemis ſecundis villoſis. Lin. Sp. Plant. 564. *Germander with oval entire leaves, which are hoary on their under ſide, pointed at both ends, and hairy bunches of flowers.* Marum Syriacum vulgò. Flor. Bat. 2. 84. *Syrian Maſtick, or common Marum.*

13. Teucrium (*Chamæpitys*) foliis trifidis linearibus integerrimis, floribus ſeſſilibus lateralibus ſolitariis caule diffuſo. Mater. Med. 287. *Germander with linear, trifid, entire leaves, and flowers ſitting cloſe, growing ſingly from the wings of the branches.* Chamæpitys lutea vulgaris, ſive folio trifido. C. B. P. 249. *Common yellow Ground Pine having a trifid leaf.*

14. Teucrium (*Iva*) foliis tricuſpidatis linearibus, floribus ſeſſilibus. Lin. Sp. 787. *Germander with tricuſpid linear leaves, and flowers ſitting cloſe to the wings of the ſtalk.* Chamæpitys moſchata, foliis ſerratis, an prima Dioſcoridis? C. B. P. 249. *Muſk Ground Pine with ſawed leaves, and probably the firſt of Dioſcorides.*

15. Teucrium (*Moſchatum*) foliis linearibus tomentoſis integerrimis, floribus ſeſſilibus. *Germander with linear, woolly, entire leaves, and flowers ſitting cloſe to the branches.* Chamæpitys moſchata, foliis non ſerratis. Allion. *Muſk Ground Pine with leaves not ſawed.*

16. Teucrium (*Chamædrifolium*) foliis oblongo-ovatis obtusè dentatis, floribus ſolitariis alaribus pedunculatis, calycibus acutis. *Germander with oblong oval leaves, which are bluntly indented, and flowers placed ſingly at the wings of the ſtalks, having acute empalements.* Teucrium Americanum Chamædryos folio, flore albo. Houſt. MSS. *American Teucrium, with a Germander leaf and white flower.*

17. Teucrium (*Veſicarium*) foliis ovato-lanceolatis inæqualiter ſerratis, racemis alaribus terminalibuſque calycibus inflatis. *Germander with oval ſpear-ſhaped leaves which are unequally ſawed, and long bunches of flowers ſpringing from the wings, and terminating the ſtalks, and inflated empalements.* Chamædrys Americana, maxima, catariæ folio, calice veſicario. Houſt. MSS. *Greateſt American Germander, with a Catmint leaf and a bladdered empalement.*

18. Teucrium (*Canadenſe*) foliis ovato-lanceolatis ſerratis, caule erecto, racemo terminali, verticillis hexaphyllis. Lin. Sp. 789. *Germander with oval ſpear-ſhaped leaves, and an erect ſtalk terminated by a racemus of flowers.* Chæmedrys Canadenſis urticæ folio ſubtus incano. Tourn. Inſt. 205. *Germander of Canada with a Nettle leaf, hoary on their under ſide.*

19. Teucrium (*Virginicum*) foliis ovatis inæqualiter ſerratis, racemis terminalibus. Flor. Virg. 64. *Germander with oval leaves unequally ſawed, and a racemus of flowers terminating the ſtalks.*

The firſt ſort grows naturally in the ſouth of France, in Spain, and Italy; it riſes with a ſhrubby ſtalk two feet high, ſending out many ligneous branches, garniſhed with heart-ſhaped leaves, which are a little waved, bluntly ſawed on their edges, a little more than an inch long, and three quarters broad near their baſe, of a lucid green on their upper ſide, but a little hoary on their under ſide, ſtanding upon ſhort foot-ſtalks. The upper part of the branches for ſix or eight inches in length are adorned with flowers, which come out from the wings of the ſtalk, two or three ſtanding on each ſide at every joint; they are of a dirty white colour, and ſtand upon ſlender foot-ſtalks; under each of theſe whorls ſtand two ſmaller leaves, which are entire and concave. The flowers appear in July, and the ſeeds ripen in autumn.

This ſort was formerly preſerved in green-houſes with great care, but of late years it has been planted out into the full ground, and is found hardy enough to endure the cold of our ſevereſt winters without ſhelter, provided it be planted on a dry ſoil.

This may be propagated by planting cuttings in the ſpring, on a bed of freſh light earth, obſerving to ſhade and water them until they have taken root; after which they will require no farther care, but to keep them clear from weeds until the following autumn, when they may be tranſplanted out into the places where they are to remain, being careful in removing them not to ſhake off all the earth from their roots, as alſo to water them if the ſeaſon ſhould prove dry, until they have taken freſh root; after which, the only care they require is to keep the ground clean about them, and to prune off ſuch ſhoots as are ill ſituated, and the flowering branches when they decay, whereby their heads will appear more regular.

It may alſo be propagated by ſeeds, which generally are produced in plenty. If theſe are ſown upon a bed of light earth in April, the plants will come up in ſix weeks after, and theſe may be tranſplanted in autumn, where they are deſigned to remain.

The ſecond ſort grows naturally on the Alps, but in the lower parts, where the cold is not very ſevere, and generally on moiſt ground; this hath a ſhrubby ſtalk like the former; it does not riſe ſo high, but branches out more than that. The ſtalks are covered with ſhort hairy down; the lower leaves are oval, crenated, and of a lucid green on their upper ſide, but a little hoary on their under; the leaves between the flowers are ſpear-ſhaped and entire; the ſpikes of flowers are much longer; the flowers are larger, and their colour more inclining to a yellow than thoſe of the former. This flowers at the ſame time with the other, and may be propagated in the ſame way.

The third ſort grows naturally in Spain and Sicily, near the borders of the ſea; this has a ſhrubby branching ſtalk which riſes ſix or eight feet high, covered with a hoary bark. The branches are garniſhed with ſmall oval leaves placed oppoſite, ſitting cloſe to the branches; they are near one inch long, and half an inch broad, ſmooth on their upper ſide, of a lucid green, and their under ſides are hoary. The flowers come out from the wings of the ſtalk at the upper part of the branches; they are ſingle, one on each ſide at a joint ſtanding upon ſhort foot-ſtalks; their empalements are ſhort and hoary. The middle ſegment of the lower lip is large, and indented at the point; the ſtamina are long-hooked, and ſupply the place of the upper lip; the flowers are blue, and come in ſucceſſion great part of ſummer, and the plants frequently produce good ſeeds in England.

 There

There is a variety of this with variegated leaves, which is preserved in some gardens.

The fourth sort is much like the third, but the leaves are broader, of a rhomboid form, and are more hairy and whiter on their under side; this will endure the cold of our ordinary winters, if planted on a dry soil and in a warm situation, but in severe hard frost it is sometimes destroyed; for which reason the plants are often preserved in pots, and removed into the green-house in winter. This is propagated by cuttings in the same manner as the former, and the plants require the same treatment.

The fifth sort grows naturally in Spain and Italy upon moist ground. The stalks of this are herbaceous, and trail upon the ground; they grow about a foot in length, are garnished with deep green leaves, cut into many points almost to the midrib; they are smooth, and stand opposite. The flowers come out on each side the stalks singly; they are white, and appear in July; these are each succeeded by four seeds, which ripen in September.

This plant is preserved in botanic gardens for variety; it is propagated by seeds, which may be sown in the spring in the place where the plants are to remain; and when they come up, will require no other culture but to thin them where they are too close, and keep them clean from weeds. These plants ripen their seeds the first year, but if they are in a warm situation they will live through the winter.

The sixth sort grows naturally in the south of France, in Italy and Germany, in the Corn fields; this is an annual plant, which perishes soon after the seeds are ripe. The stalks are four-cornered and hairy; they grow about a foot long, and are garnished at every joint by leaves placed opposite, which are hairy and cut almost to the midrib, and the segments are cut into three points. The flowers come out at the wings of the stalk in whorls, three standing together on each side upon short foot-stalks; they are white, and shaped like those of the other species; they appear in June and July, and the seeds ripen in August and September.

This is propagated by seeds in the same way as the last; but if the seeds of this are sown in autumn, or permitted to scatter when ripe, they will succeed better than if sown in the spring, and the plants will come earlier to flower.

The seventh sort grows naturally in the south of France, and in Germany; this has a creeping fibrous root, which spreads in the ground and multiplies greatly, sending out many four-cornered hairy stalks, which are eight or nine inches long; these send out a few short branches, which are garnished with oval leaves about an inch long, and three quarters broad, which are deeply crenated on their borders, and stand upon short foot-stalks; they are of a light green above, but hoary on their under side. The flowers grow from the wings of the stalks, toward the upper part, almost in whorls, standing chiefly to one side of the stalk; they are of a reddish colour, the lower lip turning upward. This plant flowers in June and July, and the seeds ripen in autumn.

It is a perennial plant, and propagates very fast by its creeping roots, and will thrive in almost any soil or situation: the best time to transplant it is in autumn. This was a few years since in great request as a specific for the gout, but is at present in little esteem.

The eighth sort grows naturally in Spain; this is a perennial plant, having some resemblance of the former, but the roots do not creep. The stalks are taller, and more erect; the leaves are narrower, pointed at both ends, and not so deeply indented; the indentures are sharper, and only toward their points; the stalks are garnished with flowers great part of their length, which come out in bunches at the wings of the leaves; they are longer than those of the former, and of a brighter red colour. This plant flowers about the same time with the former.

It may be propagated by parting of the roots in autumn, or by sowing of the seeds at the same season, which will more certainly succeed than those which are sown in the spring. It loves an open situation exposed to the sun, but will thrive in almost any soil which is not too moist.

The ninth sort grows naturally in the island of Crete, and also in Nice in Italy; this is a perennial plant with a low shrubby stalk, sending out many branches, which are four-cornered and woolly; these are garnished with oval leaves about an inch long, and three quarters broad; they are woolly on both sides, and are bluntly crenated on their borders. The upper parts of the branches are adorned with purple flowers in whorls, having two small, oval, entire leaves under each whorl; the flowers are as large as those of the first sort, but their cups are very woolly, and their indentures end in sharp points. This flowers in July, and when the season proves warm and dry, the plants will produce good seeds in England.

This may be propagated either by seeds or cuttings in the same way as the two first sorts, but the plants should have a dry soil and a warm situation, otherwise they will not live through the winter in the open air in England.

The tenth sort is the common wild or Wood Sage, which grows naturally in woods and thickets in many parts of England, so is rarely admitted into gardens; this has a creeping perennial root, from which arise stiff, ligneous, four-cornered stalks a foot and a half high, garnished at each joint by two heart-shaped leaves placed opposite, which are slightly sawed on their edges, and stand upon foot-stalks. The upper part of the stalks have three or four long spikes of flowers, which incline to one side of the stalk; they are of an herbaceous white colour, and the stamina are terminated by purple summits. It flowers in July, and the seeds ripen in autumn. This plant will grow in any soil or situation, and was formerly used in medicine.

The eleventh sort is the common Water Germander, which grows naturally in the isle of Ely, and some other fenny parts of England; this has a small, stringy, fibrous, creeping root, which is perennial, from which arise many four-cornered, trailing, diffused stalks, which are garnished with oblong, hairy, and indented leaves, sitting close to the stalks. The flowers are produced at the wings of the stalks, two arising on each side at every joint; they are of a purple colour, and sit very close to the bottom of the leaves; these appear in July, but are seldom succeeded by seeds. The whole plant has an odour like that of Garlick. The herb is used in medicine.

This plant may be propagated by its creeping roots, or planting the young shoots in the spring, in the same manner as Mint, Penny-royal, &c. and should have a moist soil, otherwise it will not thrive in gardens.

The twelfth sort is the common or Syrian Marum, which grows naturally in Syria, and also in the kingdom of Valencia; this has a low shrubby stalk, sending out many slender ligneous branches, which in warm countries will rise three or four feet high, but in England it is rarely seen half that height. The stalks are very hoary, and are garnished with small oval leaves placed opposite at each joint; these are about the size of those of Thyme, and are pointed at both ends; they are green above, and hoary underneath; they have a piercing grateful scent, so quick as to cause sneezing. The flowers grow in loose whorled spikes at the end of the branches; they are very downy, and the flowers are of a bright red colour; they appear in July and August, but are not succeeded by seeds in England.

This plant is easily propagated by slips or cuttings, which, if planted during the summer months on a bed of light loamy earth, covering them down close either with bell or hand-glasses, and shading them from the sun, will put out roots very freely. When these have made good roots, they may be transplanted either

either into separate small pots, or on a warm border, at about six inches distance every way, observing to shade them from the sun, and supply them with water till they have taken new root; after which they will require no other care but to keep them clean from weeds. These plants will live through the winter in the open air, if they are planted in a dry soil and a warm situation, when the frosts are not very severe; but in very hard winters they are frequently killed, if they are not protected by mats or some other covering. There was about forty years ago a great number of these plants growing in the warm borders of the Royal Gardens at Kensington, which were clipped into conical forms, and were near three feet high, but now there are few plants of a large size to be found in the English gardens, because their branches are annually cut to keep them short.

The cats are very fond of this plant, and where there are but few of these plants will destroy them, unless they are protected from them; but, where there is a great number of the plants together, the cats seldom touch them.

The thirteenth sort is the common Ground Pine which is used in medicine; it grows naturally on chalky arable land in several parts of England; it is an annual plant, with a single ligneous root, which strikes deep into the ground, sending out a few slender fibres from the side, from which arise many weak trailing stalks which are very hairy; these are garnished with narrow leaves ending with three points, which are set by pairs, and cross over each other at every joint; they are hairy, and, when bruised, emit a strong resinous odour. The flowers sit close to the stalks at the wings of the leaves; there are two or three of them at each joint, of a bright yellow colour, and shaped like the other species; these appear in July, and the seeds ripen in September. If these are permitted to scatter, the plants will come up better than if sown, and require no other care but to thin them, and keep them clean from weeds.

This plant is greatly recommended for its virtues; there is scarce a better herb than this for opening obstructions; it is a strong diuretic, and an excellent remedy for the rheumatism.

The fourteenth sort grows naturally in the south of France, in Italy, and Spain; it is an annual plant, with a single ligneous root, sending out a few fibres. The stalks are about six inches high, and are closely garnished with very hairy narrow leaves which are indented toward their points. The flowers come out from the wings of the stalks to which they sit very close; they are large, of a bright purple colour, and appear in July; but unless the season proves favourable, they are not succeeded by seeds in England.

The fifteenth sort grows naturally about Nice in Italy, from whence it was sent me; this is also an annual plant, much like the former, but the leaves are narrower and entire. The whole plant is covered with white woolly hairs, and the flowers are smaller than those of the former.

Both these plants succeed best, if, when they perfect their seeds, they are permitted to scatter in the same manner as the thirteenth sort; or if the seeds are sown, it should be in atuumn, for they rarely succeed when they are sown in the spring.

The sixteenth sort was discovered by the late Dr. Houstoun, growing naturally at La Vera Cruz; this is an annual plant, with an erect stalk a foot and a half high; it is four-cornered and smooth, garnished with smooth, oblong, oval leaves which are bluntly indented; they are about an inch and a half long, and three quarters of an inch broad, standing upon short foot-stalks. The flowers come out from the wings of the stalks, two of them arising at each joint, upon short slender foot-stalks; they are small and white, having short empalements, which are cut at the brim into five very acute points. The flowers appear in July, and are succeeded by seeds which ripen in autumn.

The seventeenth sort was discovered by the late Dr. Houstoun at the same place with the former; this is also an annual plant, with a slender, upright, four-cornered stalk which rises three feet high, and divides into several smooth branches, which are garnished with oval spear-shaped leaves, three inches long and one broad, of a bright green on their upper side, but pale on their under; they are unequally sawed on their edges, and stand upon long foot-stalks. The flowers come out in long bunches from the wings of the stalk, and also at the top; they are pretty large, white, and have bladdered empalements; these appear late in July, and unless the season proves favourable, they will have no good seeds succeed them.

The sixteenth and seventeenth sorts are tender, so will not thrive in the open air in England; and unless the season proves warm, they will not perfect their seeds here. The seeds of these should be sown in small pots in autumn, which should be plunged into the tan-bed in the stove between the other pots, where they should remain till spring, and then they may be taken out, and plunged into a hot-bed, which will bring up the plants. When these are fit to remove, they should be each planted in a separate pot, and plunged into a hot-bed, and afterward treated in the same way as other tender plants which require constant shelter.

The eighteenth sort grows naturally in North America; this is a perennial plant, very like our Scorodonia or Wood Sage, but does not creep at the root as that does; the stalks are erect, and garnished with oval spear-shaped leaves which are white on their under side, and deeply sawed on their edges; the stalks are terminated by racemi of yellow flowers, and the whorls have six leaves.

This is a very hardy plant, so will thrive in the open air; it may be propagated by parting of the roots, or by sowing of the seeds, which is best if done in autumn.

The nineteenth sort grows naturally in Virginia; this is also a perennial plant, having oval leaves which are unequally sawed; the stalk is annual, and rises near a foot high, which is terminated by a long spike of red flowers, which appear in July and August, when the plants make a pretty appearance.

This is easily propagated by seeds, which are produced in plenty; if these are sown in the autumn on a bed of a light earth, they will succeed better than if sown in the spring.

THALICTRUM. Tourn. Inst. R. H. 270. tab. 143. Lin. Gen. Plant. 617. [This name is ancient, and written in a two-fold manner. In the manuscripts it is found θάλιγθρον and θάλεχτρον, but has now obtained the name of Thalictrum among all the moderns, from θάλλω, to flourish, or look green. It was anciently used at weddings, and is called πήγανον, because some botanists have classed this plant with Rues.] Meadow Rue.

The Characters are,

*The flower has no empalement, but has four or five roundish concave petals which fall off soon, and a great number of stamina, which are broad and compressed toward their tops, terminated by twin summits, which are oblong, with several very short styles sitting singly upon roundish germen, and crowned by thick stigmas. The germen afterward turn to so many keel-shaped capsules, collected in a head, each containing one oblong seed.*

This genus of plants is ranged in the seventh section of Linnæus's thirteenth class, which contains those plants whose flowers have a great number of stamina and many styles.

The Species are,

1. Thalictrum (*Flavum*) caule folioso sulcato, paniculâ multiplici erectâ. Hort. Cliff. 226. *Meadow Rue with a furrowed leafy stalk, and many erect panicles of flowers.* Thalictrum majus, siliquâ angulosо aut striata. C. B. P. 336. *Greater Meadow Rue, with angular or channelled pods.*

2. Thalictrum (*Speciosum*) caule anguloso, foliis linearibus bifidis trifidisque, paniculâ multiplici erectâ. *Meadow Rue with an angular stalk, narrow leaves ending in two or three points, and many erect panicles of flowers.* Thalictrum majus, siliquâ seminis striatâ, fo-

liis rugosis trifidis. Mor. Umbel. 70. *Greater Meadow Rue with streaked seed-vessels, and rough trifid leaves.*

3. Thalictrum (*Aquilegifolium*) fructibus pendulis triangularibus rectis, caule tereti. Lin. Sp. Plant. 547. *Meadow Rue with a pendulous triangular fruit, and a taper stalk.* Thalictrum majus staminibus florum purpurascentibus. C. B. P. 337. *Greater Meadow Rue with purple stamina to the flowers, commonly called feathered Columbine.*

4. Thalictrum (*Lucidum*) caule folioso sulcato, foliis linearibus carnosis. Dalib. Paris. 162. *Meadow Rue with a furrowed leafy stalk, and linear fleshy leaves.* Thalictrum pratense minus alterum, Parisiensum, foliis crassioribus lucidis. H. R. Par. *Another smaller Meadow Rue of Paris, with thicker shining leaves.*

5. Thalictrum (*Canadense*) floribus pentapetalis, radice fibrosâ. Flor. Leyd. Prod. 486. *Meadow Rue with flowers having five petals, and a fibrous root.* Thalictrum Canadense. Cornut. Canad. 186. *Meadow Rue of Canada.*

6. Thalictrum (*Tuberosum*) floribus pentapetalis, radice tuberosâ. Hort. Cliff. 227. *Meadow Rue with flowers having five petals, and a tuberous root.* Thalictrum minus asphodeli radice, magno flore. Tourn. Inst. 271. *Smaller Meadow Rue with an Asphodel root, and a large flower.*

7. Thalictrum (*Minus*) foliis sexpartitis, floribus cernuis. Lin. Sp. Plant. 546. *Meadow Rue with leaves cut into six segments, and nodding flowers.* Thalictrum minus. C. B. P. 337. *Smaller Meadow Rue.*

8. Thalictrum (*Fœtidum*) caule paniculato ramosissimo folioso. Lin. Sp. Plant. 545. *Meadow Rue with a very branching, paniculated, leafy stalk.* Thalictrum minimum fœtidissimum. C. B. P. 337. *The least stinking Meadow Rue.*

9. Thalictrum (*Dioicum*) floribus diocis. Lin. Sp. Plant. 545. *Meadow Rue with male and female flowers on different plants.* Thalictrum pratense minus. Park. Theat. 265. *Small American Meadow Rue.*

10. Thalictrum (*Angustifolium*) foliolis lanceolato-linearibus integerrimis. Hort. Cliff. 226. *Meadow Rue with spear-shaped linear leaves which are entire.* Thalictrum pratense, angustissimo folio. C. B. P. 337. *The narrowest leaved Meadow Rue.*

11. Thalictrum (*Alpinum*) caule simplicissimo subnudo, racemo simplici terminali. Hort. Cliff. 227. *Meadow Rue with a single stalk which is almost naked, and terminated by a single bunch of flowers.* Thalictrum montanum minimum præcox, foliis splendentibus. Mor. Hist. p. 325. *The least Meadow Rue with shining leaves.*

The first sort grows naturally by the side of rivers and in moist meadows in many parts of England. This has a yellow creeping root, from which arise several furrowed stalks five or six feet high, garnished at each joint with leaves composed of many lobes, which differ in their form and size; some are spear-shaped and entire, others are obtuse, and cut into three points; they are of a deep green colour on their upper side, but pale on their under. The flowers are of an herbaceous white colour, and formed into many panicles, standing erect on the top of the stalks. These appear in July, and are succeeded by short triangular capsules containing one oblong seed.

The second sort grows naturally in the meadows about Montpelier. The root of this is like the former; the stalks are angular, and rise five feet high; they are better furnished with leaves, whose lobes are very narrow, some of them ending with two, and others with three points, of a bright green colour. The flowers are yellow, and are formed into many panicles which terminate the stalks. This sort flowers about the same time with the former.

The third sort grows naturally upon the Alps; of this there are two varieties, one with a green stalk and white stamina, the other has purple stalks and stamina. These two are propagated in gardens, by the title of feathered Columbine; this hath a thick fibrous root; the stalks are taper, and rise three feet high; the leaves are like those of the Columbine. The flowers grow in large panicles at the top of the stalk. It flowers in June, and the seeds, which are in triangular capsules, ripen in August.

The fourth sort grows naturally in the meadows about Paris; this hath upright channelled stalks which rise five or six feet high, garnished at each joint with winged leaves, composed of many linear fleshy lobes, which are for the most part entire, ending in acute points. The flowers are of a yellowish white colour; they appear in July, and are succeeded by small angular capsules with one small oblong seed in each, which ripens in August.

The fifth sort grows naturally in North America; this has a fibrous root of a dark colour. The stalks are smooth, of a purple colour, and rise three or four feet high, branching toward the top. The leaves are like those of Columbine, of a grayish colour, and smooth. The flowers are produced in large panicles at the top of the stalks; they are larger than those of the former sorts, and have five white petals which soon fall off, and a great number of white stamina with yellow summits. This flowers in June, and the seeds ripen in August.

The sixth sort grows naturally in Spain; this has knobbed roots; the leaves are small, obtuse, and indented in three parts at their points; they are of a grayish colour and smooth. The stalks rise a foot and a half high, naked almost to the top, where they divide into two or three small ones, under which is situated one leaf. Each division of the stalk is terminated by a small bunch of pretty large flowers, having five white petals. The flowers are almost disposed in form of an umbel. They appear in June, and are succeeded by small angular capsules, containing one oblong seed in each, which ripen in August.

The seventh sort grows naturally in some parts of Cambridgeshire; this has a creeping fibrous root. The stalks rise about a foot high, and are garnished with winged leaves composed of many obtuse short lobes, which are cut into six segments. The stalks branch out wide; the flowers grow in loose panicles; they are small and nodding. The stamina are of an herbaceous white, and the summits are yellowish. It flowers in June.

The eighth sort grows naturally in the south of France; this hath a very branching stalk which rises about six or seven inches high, garnished with winged leaves, which are downy, composed of a great number of small lobes which are bluntly indented, and have a fœtid scent. The flowers grow in loose panicles; they are small, of an herbaceous white colour, with yellowish stamina. This flowers in June.

The ninth sort grows naturally in North America. The root of this is fibrous; the stalks rise near a foot high, and are almost naked at the top, where they have one leaf, composed of many small lobes of a grayish colour, indented at their points. The flowers are produced in small bunches at the top of the stalks; they are male and female in different plants. These appear in June.

The tenth sort grows naturally in Italy and some parts of Germany; this hath a perennial root. The stalks rise from two to three feet high; the leaves are winged like those of the other sort, their lobes are narrow and entire. The flowers are small, and are collected in panicles at the top of the stalks, and are of an herbaceous white colour.

The eleventh sort grows naturally on the Alps; this hath a fibrous creeping root; the leaves are small, blunt, and of a grayish colour. The stalks rise about six inches high, and are almost naked; they are terminated by a single loose spike of flowers, each having four petals. This flowers the latter end of April or the beginning of May.

These plants are generally propagated by parting their roots. The best time for this work is in September, when their leaves begin to decay, that they may take fresh root before the frost comes on to prevent them; they should also be planted in a fresh light soil, and have a shady situation, in which they will thrive exceedingly, though they may be planted in al-

moſt any ſoil or ſituation, provided it be not too hot and dry; but moſt of them creep ſo much under ground, as to become very troubleſome in a garden, for which reaſon there are but few of the ſorts admitted into gardens. The third, fifth, and ſixth ſorts are frequently cultivated in the gardens. The roots of theſe do not creep like the others, and their flowers have ſome beauty to recommend them, but the others are only kept in botanic gardens for the ſake of variety; therefore when they are admitted, their roots ſhould be confined in pots, otherwiſe they cannot be kept within bounds.

THAPSIA. Tourn. Inſt. R. H. 321. tab. 171. Lin. Gen. Plant. 323. [ſo called of the iſland of Thapſus, where it grew in plenty.] The deadly Carrot, or ſcorching Fennel.

The CHARACTERS are,

*It has an umbellated flower; the general umbel is large, and compoſed of about twenty rays which are nearly equal; theſe have no involucri; the general umbel is uniform. The flowers have five ſpear-ſhaped incurved petals, and five hair-like ſtamina the length of the petals, terminated by ſingle ſummits. It has an oblong germen ſituated under the flower, ſupporting two ſhort ſtyles crowned by obtuſe ſtigmas. The germen afterward becomes an oblong fruit, girt with a longitudinal membrane dividing into two parts, each containing one oblong ſeed, pointed at both ends, having plain borders on both ſides.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fifth claſs, which contains thoſe plants whoſe flowers have five ſtamina and two ſtyles.

The SPECIES are,

1. THAPSIA (*Villoſa*) foliolis dentatis villoſis baſi coadunatis. Hort. Cliff. 105. *Scorching Carrot with indented hairy lobes, which are joined at their baſe.* Thapſia latifolia villoſa. C. B. P. 148. *Broad-leaved, hairy, ſcorching Fennel.*
2. THAPSIA (*Maxima*) foliis pinnatis, foliolis latiſſimis pinnatifidis ſubtus villoſis petiolis decurrentibus. *Scorching Carrot with winged leaves, having very broad wing-pointed lobes, which are hairy on their under ſide, and running foot-ſtalks.* Thapſia maxima, latiſſimo folio. C. B. P. 148. *The greateſt ſcorching Fennel with a very broad leaf.*
3. THAPSIA (*Fœtida*) foliolis multifidis baſi anguſtatis. Hort. Cliff. 105. *Scorching Carrot with many-pointed lobes, which are narrowed at their baſe.* Thapſia Carotæ folio. I. B. 3. p. 187. *Scorching Fennel with a Carrot leaf.*
4. THAPSIA (*Apulia*) foliis digitatis, foliolis bipinnatis multifidis ſetaceis. Hort. Cliff. 106. *Scorching Carrot with many-pointed, hand-ſhaped, briſtly lobes.* Thapſia tenuiore folio Apulia. Tourn. Inſt. 322. *Narrow-leaved ſcorching Fennel of Apulia.*
5. THAPSIA (*Trifoliata*) foliis ternatis ovatis. Lin. Sp. Plant. 262. *Scorching Carrot with oval trifoliate leaves.* Sium folio infimo cordato, caulinis ternatis, omnibus crenatis. Flor. Virg. 31. *Water Parſnep with heart-ſhaped leaves, thoſe on the ſtalks trifoliate, and all of them crenated.*
6. THAPSIA (*Altiſſima*) foliis decompoſitis, lobis maximis lucidis, umbella maxima. *The talleſt ſcorching Carrot with decompounded leaves, having very large lucid lobes, and great umbels.* Thapſia montana, omnium maxima, foliis lobatis. Hort. Piſ. 164. *The largeſt mountain ſcorching Carrot with broad lobes.*

The firſt ſort grows naturally in Spain, Portugal, and the ſouth of France; this hath a thick fleſhy root in ſhape of a Carrot, which has an outward blackiſh ſkin; the inſide is white, bitter, and very acrid, with a little aromatic taſte. The leaves are winged; the lobes are thick, hairy, and indented; they are regularly cut into oppoſite ſegments like other winged leaves. The ſtalk is ſpungy, and riſes about two feet high, dividing upward into two or three ſmall branches, each being terminated by a large umbel of yellow flowers. Theſe appear in June, and are ſucceeded by large, flat, bordered ſeeds which ripen in Auguſt.

The ſecond ſort grows naturally in Spain, and all over Old Caſtile, quite to the Pyrenean mountains. The root of this ſort is large, thick, and of a dark colour without. The leaves are very thick, and hairy on their under ſide; they ſpread circularly on the ground, and are divided into broad hairy lobes. The ſtalks riſe four or five feet high; they are large, jointed, and full of pith, having one leaf at each joint, ſhaped like thoſe at the bottom, but are ſmaller as they are nearer the top. The ſtalk is terminated by a large umbel of yellow flowers which appear the latter end of June, and the ſeeds ripen about two months after.

The third ſort grows naturally in Italy and Spain. The leaves of this ſort are cut into many narrow ſegments, almoſt as ſmall as thoſe of the garden Carrot, but are rough and hairy; their ſegments are always oppoſite, and are narrower at their baſe than their points. The ſtalks riſe about two feet high, and are terminated by umbels of ſmall yellow flowers which appear in July; theſe are ſucceeded by flat bordered ſeeds which ripen the beginning of September.

The fourth ſort grows naturally in Apulia. The root of this is about the thickneſs of a man's thumb; the bark is yellow and wrinkled, the inſide white, and abounds with an acrid milky juice; the leaves are finely divided like thoſe of Fennel, they are hairy, and ſit cloſe to the root. The ſtalk riſes from two to three feet high; it is naked, and branches into two or three ſtalks, each being terminated by a ſmall umbel of flowers, which are large, yellow, and appear in July: theſe are ſucceeded by flat ſeeds, having cartilaginous borders, which ripen in September.

The fifth ſort grows naturally in North America. The ſeeds were ſent me by Dr. Benſel from Philadelphia. This hath a ſlender tap root, which is ſhaped like thoſe of Parſley; the leaves at the bottom are heart-ſhaped. The ſtalk is ſingle and does not branch; it riſes near two feet high, is of a purple colour, and ſlender; this is garniſhed at each joint with one trifoliate leaf, whoſe lobes are oval and crenated. The ſtalk is terminated by a ſmall umbel of purple flowers which appear in July, and are ſucceeded by compreſſed channelled ſeeds which ripen in September. Dr. Gronovius thinks this plant very like that which is figured by Kempfer, by the title of Nindzi.

The ſixth ſort grows naturally in Apulia: this hath a large taper root; the leaves ſpread circularly near the ground; theſe are divided into ſeveral lobes, which are divided into many very large lucid lobes, ſtanding alternately on ſhort foot-ſtalks: the ſtalk riſes near eight feet high, and is terminated by an umbel of yellow flowers, which appear in July, and are ſucceeded by bordered compreſſed ſeeds which ripen in September.

Theſe plants are all of them propagated by ſeeds, which ſhould be ſown in autumn; for if they are kept out of the ground till ſpring, they often miſcarry, or if they grow, they commonly lie a whole year in the ground before the plants come up; whereas thoſe ſeeds which are ſown in autumn, generally grow the following ſpring. Theſe ſhould be ſown in drills, in the place where they are deſigned to remain. The drills ſhould be at leaſt three feet and a half aſunder, becauſe the plants ſpread their leaves very wide. When the plants come up in the ſpring, they muſt be carefully cleared from weeds; and where they are too cloſe together, ſome of them ſhould be drawn out to give room for the others to grow, but at this time they need not be left more than two or three inches apart; for the firſt year when the plants ariſe from ſeeds, they make but ſlow progreſs, except the ſixth ſort, which will require more room; ſo the autumn following the remaining part of the plants may be taken up, leaving thoſe which are deſigned to remain about eighteen inches aſunder; and thoſe plants which are taken up may be tranſplanted into another bed, if they are wanted. After the firſt year theſe plants will require no farther care, but to keep them clear from weeds; and every ſpring, juſt before the plants begin to puſh out new leaves, the ground ſhould be carefully dug between the plants to looſen it, but the roots muſt not be injured, leſt it ſhould

cause them to decay. The plants being thus managed, will continue several years, and produce flowers and seeds annually, from which new plants may be raised. They delight in a soft loamy soil, and if they are exposed only to the morning sun, they will thrive better than if they have a warmer situation, for they endure the cold of our winters very well. The roots of the third sort were formerly used in medicine, but are now never ordered, being supposed to have a poisonous quality. Boerhaave says it has much the same qualities as Euphorbium, it burns the bowels and produces a diarrhœa.

THELIGONUM. Lin. Gen. Plant. 947. Cynocrambe. Tourn. Cor. 52. tab. 485. Dogs Cabbage.

The CHARACTERS are,

*It has male and female flowers on the same plant. The male flowers have a turbinated empalement of one leaf, cut into two segments which turn backward. It has no petal, but several erect stamina the length of the empalement, terminated by single summits. The female flowers have a small bifid empalement of one leaf, which is permanent. It has no petals, but has a globular germen, supporting a short style crowned by an obtuse stigma. The germen afterward becomes a thick globular capsule with one cell, inclosing one globular seed.*

This genus of plants is ranged in the eighth section of Linnæus's twenty-first class, which includes the plants whose flowers have male and female flowers on the same plant, and the flowers have many stamina.

We have but one SPECIES of this genus, viz.

THELIGONUM (*Cynocrambe.*) Sauv. Monsp. 129. Cynocrambe Dioscoridis. C. B. P. 122. *Dogs Cabbage of Dioscorides.*

This plant grows naturally in the south of France, in Italy, and Tartary. It is an annual plant, which decays as soon as the seeds are ripe. The stalks trail on the ground like those of Chickweed; they grow about a foot long; their joints are pretty close; these are garnished with oval acute-pointed leaves, standing on pretty long foot-stalks which are bordered. At each joint is placed one of these leaves, and from the same point come out several smaller leaves of the same shape on shorter foot-stalks. The flowers are produced from the wings of the stalk in clusters, sitting very close; they are small, of an herbaceous white colour, so make no great appearance. The male and female flowers grow from the same joint. The female flowers are succeeded by a single roundish seed, which ripens in autumn.

It is preserved in botanic gardens for the sake of variety. The seeds of this must be sown in autumn, in the place where the plants are to remain; for when they are sown in the spring, the plants rarely come up the same year. They require no other culture but to keep them clean from weeds, and thin them where they are too close.

THEOBROMA. Lin. Gen. Plant. 806. Guazuma. Plum. Nov. Gen. 36. tab. 18. *Bastard Cedar.*

The CHARACTERS are,

*The empalement of the flower is composed of three oval concave leaves which are reflexed. The flower has five oval petals which spread open, and are hollowed like a spoon; from the top of each petal comes out a bifid bristly ligula, divided like two horns. It has a great number of short stamina joined in five bodies, and are the length of the petals, which are terminated by roundish summits, and a roundish germen supporting a single style the length of the petals, crowned by a single stigma. The germen afterward turns to a roundish fruit with five angles, opening in five cells, each containing several seeds.*

This genus of plants is ranged in the first section of Linnæus's eighteenth class, which includes those plants which have many stamina joined in five bodies.

We have but one SPECIES of this genus, viz.

THEOBROMA (*Guazuma*) foliis serratis. Hort. Cliff. 379. *Theobroma with sawed leaves.* Guazuma arbor ulmifolia, fructu ex purpura nigro. Plum. Nov. Gen. 36. *Tree Guazuma with an Elm leaf, and a black purple fruit.*

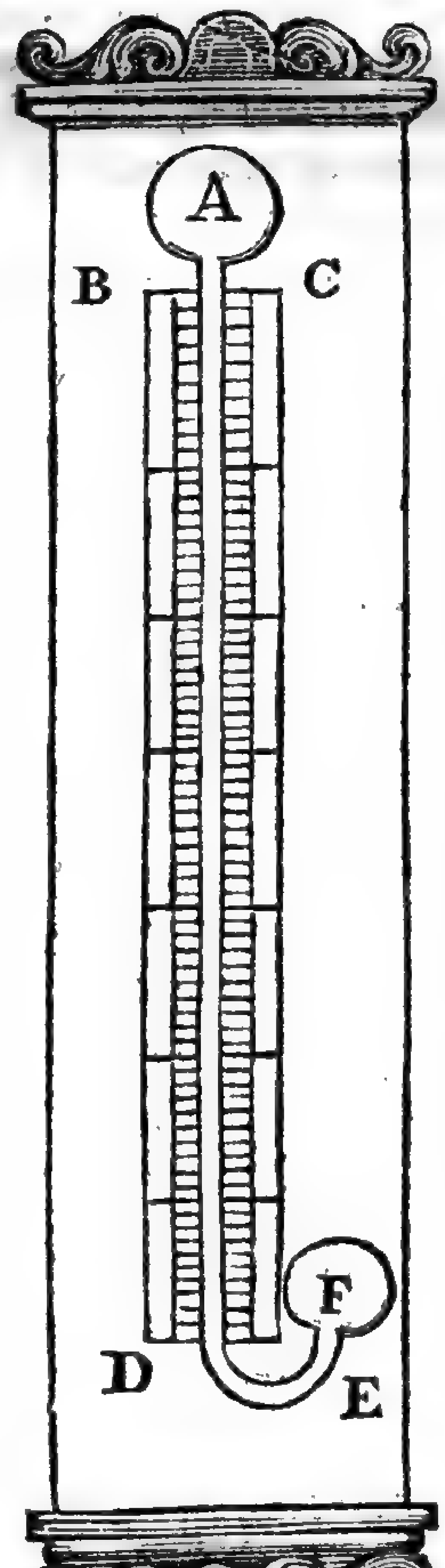
This grows naturally in most of the islands in the West-Indies, where it rises to the height of forty or fifty feet, having a trunk as large as a middle-sized man's body, covered with a dark brown furrowed bark, sending out many branches toward the top, which spread out wide on every hand, and are garnished with oblong heart-shaped leaves placed alternate, which are near four inches long, and two broad near their base, ending in acute points, of a bright green on their upper side, and pale on their under, sawed on their edges, with a strong midrib, and several transverse veins, and stand upon short foot-stalks. The flowers come out in bunches from the wings of the leaves; they are small and of a yellow colour, having five concave petals which spread open circularly, with a great number of stamina, which at their base are joined in five bodies, terminated by roundish summits. In the center is situated a roundish germen, supporting a slender style the length of the stamina, crowned by a single stigma. The germen afterward turns to a roundish warted fruit having five obtuse angles, and five cells which contain several irregular seeds.

The wood of this tree is white and ductile, so is frequently cut into staves for casks. The fruit and leaves are good fodder for cattle, therefore when the planters clear the land from wood, they leave the trees of this sort standing for food for their cattle, which is of great use in dry seasons, when the common fodder is scarce. There are some plants of this sort preserved in the gardens of some curious persons; it is propagated by seeds, which must be procured as fresh as possible from the countries where the plants grow naturally. These should be sown upon a good hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a separate small pot, and plunged into a hot-bed of tanners bark, observing to shade them from the sun till they have taken new root; then they should be treated in the same way as the Coffee-tree, keeping them always in the tan-bed in the stove.

THERMOMETER, [Θερμόμετρον, of θέρμη, heat, and μετρέω, to measure.] An instrument shewing, or rather measuring, the increase and decrease of the heat, and cold of the air.

Of which there are various kinds; the constructions, defects, theories, &c. whereof are as follow.

*The construction of a Thermometer, depending on the rarefaction of the air.*

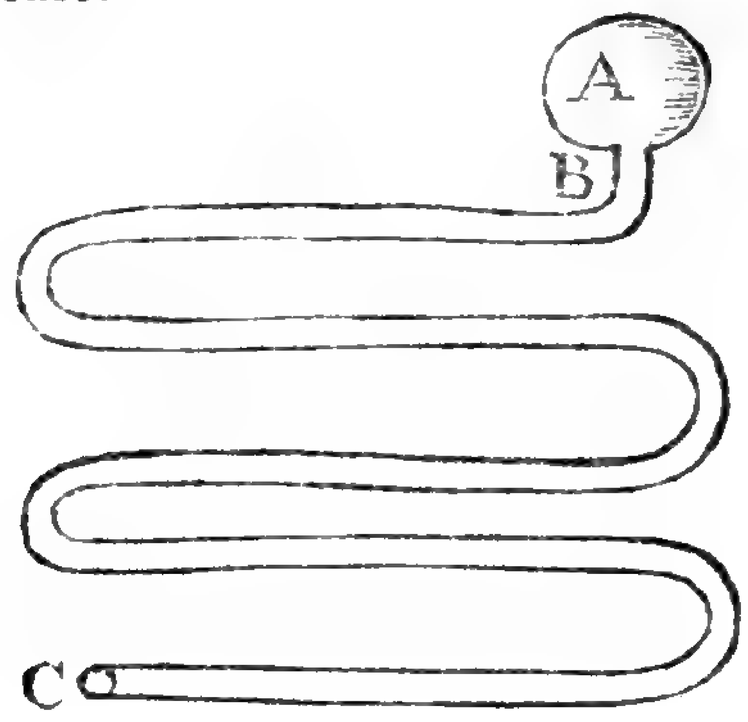



In the tube CF, to which is fastened a glass ball A, is put a quantity of common water, mixed with aqua regia, to prevent its freezing; and the mixture tinged with a solution of vitriol, to give it a greenness. In filling the tube, care is taken that there be so much air left in the ball and tube, as that when at its greatest condensation in the middle of winter, it may just fill the ball; and yet in its greatest rarefaction in summer, may not drive all the liquor out of the tube. To the other extreme of the tube is fastened another glass ball EF, open to the air at F. On each side the tube is applied the scale BD, divided into any number of equal parts.

Now as the ambient air becomes warmer, the air in the ball and the top of the tube expanding, would drive the liquor into the lower ball, and consequently its surface will descend; on the contrary, as the ambient air grows colder, that in the ball becoming condensed, the liquor will ascend.

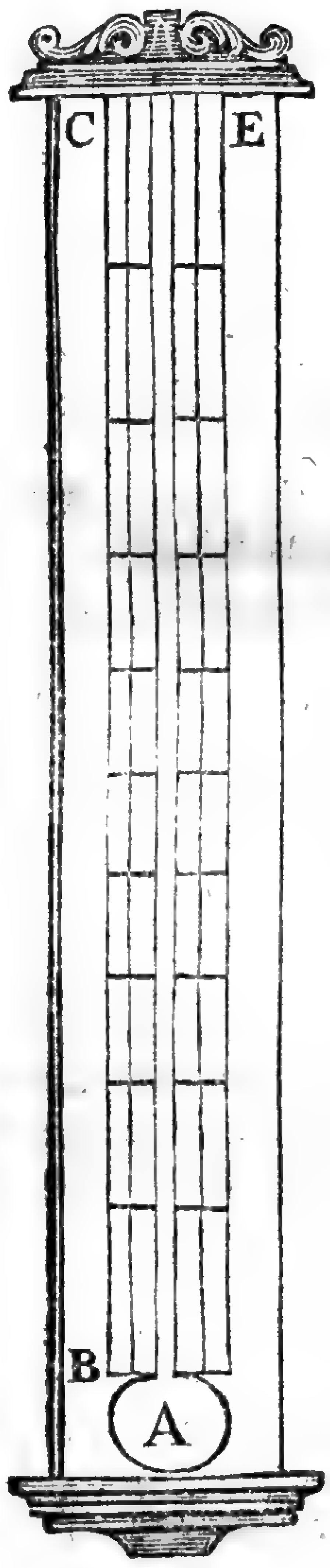
*The construction of the Mercurial Thermometer.*

In the manner, and with the same caution as before, put a little quantity of mercury, not exceeding the bigness of a Pea, into a tube B C, thus bent with wreaths; that taking up the less height, it may be the more manageable, and less liable to harm: divide this tube into any number of equal parts, to serve for a scale.




Here the approaches of the mercury towards the ball A, will shew the increases of the degree of heat. The reason is the same as in the former.

But both these instruments are defective in this, that they are liable to be acted on by a double cause; for not only a decrease of heat, but also an increase of weight of the atmosphere, will make the liquor rise in the one, and the mercury in the other; and on the contrary, either an increase of heat, or decrease of weight of the atmosphere, will make it descend.




There being some inconveniencies attending the Thermometers just described, another has been attempted, that should measure heat and cold by the rarefaction and condensation of spirits of wine; tho' that be vastly less than that of air, and consequently the alterations in the air likely to be much less sensible.

The structure of this Thermometer is this: on some little pieces of Turmerick is poured a quantity of spirit of wine, which hereby receives a red tincture; this being done, the spirit of wine is filtrated through a brown paper, that the coarser particles of the root may be separated therefrom: with the spirit thus tinged and prepared, they fill a glass ball with a tube, and that all the spirit may not descend in winter into the ball, it is convenient to put the ball into a lump of snow mixed with salt; or, if the instrument be to be made in summer, into spring water, impregnated with saltpetre, that the condensed spirit may shew how far it will retire in the extremest cold.

If it be still at too great a distance from the ball, part of it is to be taken out; and that the tube may not be much longer than needs, it is convenient to immerge the ball, filled with its spirit, in boiling water, and to mark the farthest point to which the spirit then rises.

At this point the tube is to be hermetically sealed by the flame of a lamp; and at the sides is to be added a scale, as in the former Thermometers.

Now the spirit of wine rarefying and condensing very considerably, as the heat of the ambient air increases, the spirit will dilate, and consequently will ascend in the tube; and as the heat decreases, the spirit will descend, and the degree or quantity of ascent and descent will be seen in the scale.

Yet, as the ratio of yesterday's heat to to-day's, is not hereby discovered, this instrument is not strictly a Thermometer, any more than the former.

Here it is to be observed;

1. That as the natural gravity of the liquor makes it tend downward, so it resists its ascent out of the ball into the tube, and that the more as it rises higher, for which reason it were best to have the tube horizontal.

2. Since there must of necessity be some air left in the void part of the tube over the liquor, that air, by its elasticity, will tend downward, and of consequence will resist the rise of the liquor, and be compressed by it as it does rise; its elasticity therefore is thus increased.

3. Since it is found by experience, that a less degree of heat is communicated more easily to the spirit of wine in the ball than a greater, the rarefactions of the spirit of wine are not proportionable to their producing causes; especially a greater degree of heat finds more liquor in the tube than a less does; to which, notwithstanding, the heat may be more easily communicated than to that stagnating in the ball.

On these accounts, this last Thermometer, called the Florentine Thermometer, because contrived by the Academists del Cimento, though it is that which is in common use, is far from being an accurate measure of heat, &c. To which may be added, what Dr. Halley observes in the Philosophical Transactions, that he has learned from those that have kept spirit of wine long, that it loses part of its expansive force in course of time.

Various authors have proposed various methods for finding a fixed point or degree of heat and cold, from which to account for the other degrees, and adjust the scale; so that observations made at the same or different times, in different places, may be compared together.

Some note the place the liquor is at in winter, when water begins to freeze; and again that in summer, when butter placed near the ball of the Thermometers, melts. The intermediate space they divide into two equal parts; the middle point whereof answers in their graduation to temperate heat; and each moiety they subdivide into ten degrees, adding four other equal degrees on each of the two extremes.

But this method supposes the same degree of heat and cold to answer to the freezing of all water, and the melting of all butter, as also that all Thermometers receive the same impressions from the same degree of heat; all which are contrary to experience.

Others advise, that the ball of the Thermometer be put into any quantity of snow and salt, and the point the liquor is at to be noted; and that thence the Thermometer be removed into a deep cave or cellar, whither no external air reaches; so that the liquor receiving the action of the temperate heat, may shew the degree of temperate heat; and lastly, they divide the intermediate space into fifteen or more equal parts which they continue beyond each extreme; but this method is liable to the like inconvenience with the former.

Dr. Halley assumes, that for a fixed degree of heat, where spirits of wine begin to boil; but there is reason to suspect this too of being precarious; though, after him, Mr. Amontons retains the degree of heat, answering to boiling water, for the graduating his mercurial Thermometer: but as the different specific gravities of water argue a different mass or texture, it is highly probable, that the heat of all boiling waters is not the same, so that the point is yet undetermined.

THERMOSCOPE, [of θέρμη, heat, and σκοπέω, I view.] An instrument designed to shew the changes happening in the air, with respect to heat and cold. The name of Thermoscope is indifferently used with that of thermometer; however, there is some difference in the literal import of the words; the first signifying an instrument that shews or exhibits the changes

changes of heat, &c. to the eye; and the latter an inſtrument that meaſures thoſe changes; on which foundation the thermometer ſhould be a more accurate Thermoſcope.

This difference the excellent Wolfius taking hold of, deſcribes all the thermometers in uſe as Thermoſcopes; ſhewing, that none of them do properly meaſure the changes of heat, &c. and that none of them do more than indicate the ſame.

Though their different heights, yeſterday and to-day, ſhew a difference of heat; yet ſince they do not diſcover the ratio of yeſterday's heat to to-day's, they are not ſtrictly thermometers.

The Acta Erud. Lipſ. propoſes a method of graduating the common thermometers ſo, as that the unequal diviſions thereof ſhall correſpond to equal degrees of heat, whereby the ratio of to-day's heat to yeſterday's will be meaſured, and conſequently the Thermoſcope improved into a thermometer.

The method is thus:

Take a ſlender tube about four palms long, with a ball faſtened to the ſame; pour into it ſpirit of wine, enough juſt to fill the ball when ſurrounded with ice, and not a drop over; in this ſtate ſeal the orifice of the tube hermetically, and provide ſix veſſels, each capable of containing a pound of water, and ſomewhat over; and in the firſt pour eleven ounces of warm water, into the ſecond ten ounces, into the third nine, &c.

This done, immerge the thermometer into the firſt veſſel, and pour into it one ounce of hot water, obſerving how high the ſpirit riſes in the tube, and noting the point with an unit, then remove the thermometer into the ſecond veſſel, into which are poured two ounces of hot water, and note the place the ſpirit riſes to with two; by thus proceeding till the whole pound of water is ſpent, the inſtrument will be found to be divided into twelve parts, denoting ſo many terms or degrees of heat; ſo that at two, the heat is double to that of one; at three triple, &c.

But Wolfius ſhews, that though this method is plauſible, yet it is deceitful, and built upon falſe ſuppoſitions; for it takes for granted, we have one degree of heat, by adding one ounce of hot to eleven of cold water, two degrees by adding two ounces to ten, &c. It ſuppoſes that a ſingle degree of heat acts on the ſpirit in the ball of a ſingle force, a double with a double force, &c.

Laſtly, it ſuppoſes, that if the effect be produced in the thermometer, by the heat of the ambient air, which is here produced by the hot water, the air has the ſame degree of heat with the water.

But none of theſe ſuppoſitions are true; for as to the firſt, allowing the heat of the hot water equally diſtributed through the cold, one degree of heat will be diſtributed through eleven parts, two through ten, three through nine, &c. taking therefore equal bulks of water, e. g. a twelfth part of each, the heat will not be double in the one, triple in another, &c.

The firſt ſuppoſition is therefore erroneous, and ſo is the ſecond; neither is the heat of the hot water equally diffuſed through the cold; nor does the heat of the hot water act uniformly on the ſpirit of wine; i. e. not with the ſame force all the time of its action. For the third ſuppoſition; the heat of the ambient air acts not only on the ſpirit of wine on the ball, but alſo on that in the tube; and therefore this, as well as that, ſhould be changed.

Dr. Hook, in order to adjuſt the gradations of a thermometer with the greater accuracy, hath contrived and deſcribed an inſtrument for that purpoſe, in his Micrographia, p. 38.

*The way of filling Thermoſcopes, or ſuch other ſmall glaſs tubes, with ſpirit of wine or water.*

Take the ball of the glaſs, and then warm it gently between your hands; then heat it very well (though gently) before a good fire, turning it round, that it may be equally warm; for, without this caution there will be danger of its breaking: then applying the ball to the flame of a lamp or candle, burning it about in it, heat it as hot as you can, without melting the glaſs; and then ſpeedily immerſing the open end of the pipe into the veſſel of liquor that you intend to fill it withal, the liquor will riſe into it, and fill it near full.

The reaſon of which aſcent of the liquor is, that the air within the ball and the tubes being expelled in great meaſure by the heat, or at leaſt rarefied there to a very great degree, the immerſed open end of the tube keeps off the preſſure of the circumambient atmoſphere on that part of the liquor that the end of the tube covers: but the atmoſphere preſſes on all other parts of the liquor in the open veſſel; and, conſequently, there being none, or a very ſmall quantity of air within the tube to hinder it, forces it by its weight up into the tube, till it gain an equilibrium with the preſſure or weight of the air without.

If the tube cannot be filled full enough by this method, the reſt may be ſupplied by a ſmall glaſs funnel; the ſhank of which muſt be drawn out exceeding ſlender, and inſerted into the orifice of the tube; and then, by blowing, you may force by your breath the ſpirit of wine into the tube, ſo as to fill it quite, or to what degree you pleaſe.

Dr. Hook, in his Micrographia, hath an engine for graduating his thermometers, to make them true ſtandards of heat and cold.

The thermometers or Thermoſcopes are inſtruments of very great uſe to gardeners in the management of ſtoves. They ſhew by inſpection the preſent condition of the air, and whether it be hot or cold; which day in ſummer is the hotteſt, and in the winter which is the coldeſt, or any part of the day; and from thence many uſeful experiments have and may be made; viz. how much one ſpring exceeds another in coldneſs; which baths are the hotteſt or coldeſt; and, if being held in the hand of a perſon in a fever, or otherwiſe applied, will nicely ſhew the abatement or increaſe of a fever.

The common thermometer which is uſed for hot-houſes, has a long tube of about two feet in length, and is about the eighth part of an inch diameter; and in this it is remarked, that the air is cold for the plants when the ſpirit riſes to fifteen inches; that it is temperate at ſixteen inches and a half; that it is warm when it riſes to eighteen inches; and this is the ſtandard for Pine-apple heat. It is marked for hot air at twenty inches, and ſultry hot at twenty-one and a half; but in the common thermometers, theſe degrees are differently marked; this temperate air is about our warm, this warm air our hot, and our hot air is about the ſame as the ſultry.

Theſe thermometers are marked with ſome of the names of the moſt remarkable plants which are preſerved in the hot-houſes; but as the number of theſe plants has been greatly increaſed in England of late years, I have directed ſome thermometers to be made with a ſcale divided into degrees, and with three different points of heat marked in claſſes, which correſpond with theſe thermometers; and under each claſs I have drawn up liſts of the ſeveral plants, ranged according to the degrees of heat in which they are found to ſucceed; whereby the culture of them is made eaſy to perſons of ſmall ſkill.

By this means every gardener may know when it is proper to apply his heat in its full force, and what degree of heat ought to be uſed for the welfare of any plant from any part of the world.

Mr. Patrick has fixed his thermometer to a ſcale of ninety degrees, which are numbered from the top downwards, and alſo a moveable index fitted to it.

The deſign of this is to ſhew how the heat or cold is changed, from the time it was laſt looked upon, according to the different degrees of heat and cold in all latitudes; as by the trial of two thermometers that have been regulated abroad, the one by Dr. Halley, in his late ſouthern voyage, and the other by Capt. Johnſon, in his voyage to Greenland. The



firſt

first has a degree of heat under the equinoctial line, and the other a degree of cold in 88 degrees north latitude.

These instruments, the barometer, hygrometer, and thermometer or Thermoscope, discover the alterations of the air, as to wet or dry, especially if it be accompanied with a hygrometer; and the thermometer shews the condition of the air, as to heat or cold.

The method prescribed to be used in keeping the accounts or observations made on the alterations of these instruments, is that which was used by the Hon. Samuel Molyneux, Esq;

There must be a book for the remarks in all the twelve months of the year, which are to be made six times every day. At these times you must observe,

1. How the quicksilver rises or falls in the barometer.
2. What is the alteration of the hygrometer.
3. How the spirits in the thermometer rise or fall.
4. From what point of the compass the wind blows; and also with what strength, according to the nearest guess that can be made.
5. Whether it rains, snows, hails, &c. and in what quantity.

Every leaf of the book is to be divided into several columns; the first for the day of the month and the week, the second for the number of inches and parts of an inch in the tube of the barometer, where the quicksilver stands at the time when the observation is made.

The second is to be for marking the degrees, which the index of the hygrometer points to at the same time.

The third is for shewing the number of inches and parts of an inch, where the spirits stand in the thermometer at the time when the observation is made.

The fourth is for marking from what point the winds blow, and their strength.

The fifth is for noting the quantity of rain, &c. that falls, and what disposition the clouds and air have.

Take, for example, the following account of the 2d of June, 1721, which table is inserted underneath.

According to this method, a weather book may be kept of the country a person resides in; and by comparing the motions of the quicksilver and spirit with the weather, at such times as the observations are made, a little practice will enable a person to give a good judgment beforehand what weather will happen.

The TABLE.

| *Friday, June 2, 1721.* | *Barometer.* Inch. | Par. | *Hygrometer, with its Divisions and Parts.* | *Thermom.* | *Wind.* | *Weather.* |
|---|---|---|---|---|---|---|
| Morning at 9. | 29 | 98 | 240 | 30 | East, brisk Gale. | Cloudy. |
| Noon. | 29 | 98 | 260 20 | 28 | East, brisk Gale, or *ditto.* | |
| Afternoon at 3. | 29 | 98 | 280 20 | 28 | *Ditto.* | *Ditto.* |
| Afternoon at 6. | 29 | 98 | 300 20 | 27 | *Ditto.* | *Ditto.* |
| Evening at 9. | 29 | 98 | 315 15 | 28 | *Ditto.* | *Ditto.* |
| Midnight. | 29 | 98 | 320 5 | 28 | *Ditto.* | *Ditto.* |

Mr. Boyle, by placing a thermometer in a cave, which was cut strait into the bottom of a cliff, fronting the sea, to the depth of 130 feet, found the spirit stood, both in winter and summer, at a small division above temperate; the cave had eighty feet depth of earth above it.

I, says Dr. Hales, marked six thermometers numerically, 1, 2, 3, 4, 5, 6. The thermometer, number 1, which was the shortest, I placed with a south aspect in the open air; the ball of number 2, I set two inches under ground; that of number 3, four inches; number 4, eight inches; number 5, sixteen inches; and number 6, twenty-four inches: and that the heat of the earth at those several depths may the more accurately be known, it is proper to place near each thermometer a glass tube, sealed at both ends, of the same length with the stems of the several thermometers, and with tinged spirit of wine in them to the same height as in each corresponding thermometer; the scale of degrees of each thermometer being marked on a sliding ruler, with an index at the back of it, pointing to the corresponding tube.

When at any time an observation is to be made, by moving the index to point to the top of the spirit in that tube, an accurate allowance is hereby made for very different degrees of heat and cold in the stems of the thermometers at all depths; by which means the scale of degrees will shew truly the degrees of heat in the balls of the thermometers, and consequently the respective heats of the earth at the several depths where they are placed.

The stems of these thermometers, which were above the ground, were fenced from weather and injuries, by square wooden tubes. The ground they were placed in, was a brick earth in the midddle of my garden.

July the 30th he began to keep a register of their rise and fall: during the following month of August he observed, that when the spirit in the thermometer, number 1, (which was exposed to the sun) was about noon risen to 48 degrees, then the second thermometer was 45, the fifth 33, and the sixth 31; the third and fourth at intermediate degrees: the fifth and sixth thermometers kept nearly the same degree of heat, both night and day, till towards the latter end of the month; when, as the days grew shorter and cooler, and the nights longer and cooler, they then fell to 25 and 27 degrees.

Now so considerable a heat of the sun, at two feet depth under the earth's surface, must needs have a strong influence in raising the moisture at that and greater depths, whereby a very great and continual reek must always be ascending during the warm summer season, by night as well as by day; for the heat at two feet deep is nearly the same night and day; the impulse of the sun-beams giving the moisture of the earth a brisk undulating motion; which watery particles, when separated and rarefied by heat, ascend in the form of a vapour; and the vigour of the warm and confined vapour (such as that which is one, two, or three feet deep in the earth) must be very considerable, so as to penetrate the roots with some vigour; as we may reasonably suppose from the vast force of confined vapour in æolipies, in the digester of bones, and the engine to raise water by fire.

If plants were not in this manner supplied with moisture, it were impossible for them to subsist under the scorching heat within the tropics, where they have no rain for many months together; for though the dews are much greater there than in these more northern climates, yet, doubtless, where the heat so much exceeds ours, the whole quantity evaporated in a day there, does as far exceed the quantity that falls by night in dew, as the quantity evaporated here in a summer's day is found to exceed the quantity of dew which falls in the night.

But the dew which falls in a hot summer season cannot possibly be of any benefit to the roots of trees; because it is remanded back from the earth by the following day's heat, before so small a quantity of moisture can have soaked to any considerable depth.

The great benefit therefore of dew in hot weather must be, by being plentifully imbibed into vegetables, thereby not only refreshing them for the present, but also furnishing them with a fresh supply of moisture, towards the great expences of the succeeding day.

It is therefore probable, that the roots of trees and plants are thus, by means of the sun's warmth, constantly irrigated with fresh supplies of moisture; which, by the same means, insinuates itself with some vigour into the roots; for if the moisture of the earth were not thus actuated, the roots must then

receive all their nouriſhment merely by imbibing the next adjoining moiſture with the earth; and conſequently the ſhell of the earth, next the ſurface of the roots, would always be conſiderably drier, the nearer it is to the root, which I have not obſerved to be ſo. And by experiments 18 and 19, the roots would be very hard put to it to imbibe ſufficient moiſture in dry ſummer weather, if it were not thus conveyed to them by the penetrating warmth of the ſun; whence by the ſame genial heat, in conjunction with the attraction of the capillary ſap-veſſels, it is carried up through the bodies and branches of vegetables; and thence paſſing into the leaves, it is there moſt vigorouſly acted upon in thoſe thin plates, and put into an undulating motion by the ſun's warmth, whereby it is moſt plentifully thrown off, and perſpired through their ſurface; whence, as ſoon as it is diſentangled, it mounts with great rapidity in the free air.

But when, towards the latter end of October, the vigour of the ſun's influence is ſo much abated, that the firſt thermometer was fallen to three degrees above the freezing point, the ſecond to ten degrees, the fifth to fourteen degrees, and the ſixth to ſixteen degrees; then the briſk undulations of the moiſture of the earth, and alſo of the aſcending ſap, much abating, the leaves faded and fell off.

The greateſt degree of cold in the following winter, was in the firſt twelve days of November, during which time, the ſpirit in the firſt thermometer was fallen four degrees below the freezing point, the deepeſt thermometer ten degrees; the ice on ponds was an inch thick; the ſun's greateſt warmth at the winter ſolſtice, in a very ſerene, calm, froſty day, was, againſt a ſouth aſpect of a wall, 19 degrees, and in a free open air, but 11 degrees above the freezing point.

From the 10th of January to the 29th of March was a very dry ſeaſon, when the green Wheat was generally the fineſt that was ever remembered: but from the 29th of March, 1725, to the 29th of September following, it rained more or leſs every day, except ten or twelve days about the beginning of July; and that whole ſeaſon continued ſo very cool, that the ſpirit in the firſt thermometer roſe but to 24 degrees, except now and then a ſhort interval of ſun-ſhine; the ſecond only to 20 degrees, the fifth and ſixth to 24 and 23 degrees, with very little variation; ſo that, during this whole ſummer, thoſe parts of roots which were two feet under ground, had three or four degrees more warmth than thoſe which were but two inches under ground; and at a medium, the general degree of heat through this whole ſummer, both above and under ground, was not greater than the middle of the preceding September.

THLASPI. Tourn. Inſt. R. H. 212. tab. 101. Lin. Gen. Plant. 719. [Θλάσπι, ſo called of θλάω, to compreſs or ſqueeze together, becauſe the ſeed-veſſels of it are very much compreſſed.] Mithridate, or Treacle Muſtard.

The Characters are,

*The empalement of the flower is compoſed of four oval concave petals which fall off. The flower has four oval petals double the ſize of the empalement, placed in form of a croſs; it has ſix ſtamina half the length of the petals, two of which are ſhorter than the others, terminated by acute ſummits, and a roundiſh compreſſed germen ſupporting a ſingle ſtyle the length of the ſtamina, crowned by an obtuſe ſtigma. The germen afterward becomes an oval, heart-ſhaped, compreſſed little pod, with an acute border divided into two cells by an intermediate partition, containing two or three ſeeds in each.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifteenth claſs, which contains thoſe plants whoſe flowers have four long and two ſhorter ſtamina, and the ſeeds are included in ſhort pods.

The Species are,

1. Thlaspi (*Campeſtre*) ſiliculis ſubrotundis, foliis ſagittatis dentatis incanis. Hort. Cliff. 330. *Treacle Muſtard with roundiſh pods, and arrow-pointed, hairy, and indented leaves.* Thlaſpi arvenſe, vaccariæ incano folio majus. C. B. P. 106. *Mithridate Muſtard, or Baſtard Creſs.*
2. Thlaspi (*Arvenſe*) ſiliculis orbiculatis, foliis oblongis dentatis glabris. Flor. Lapp. 251. *Treacle Muſtard with orbicular pods, and oblong, indented, ſmooth leaves.* Thlaſpi arvenſe ſiliquis latis. C. B. P. 105. *Treacle Muſtard, or Penny Creſs.*
3. Thlaspi (*Perfoliatum*) ſiliculis obcordatis, foliis caulinis cordatis glabris ſubdentatis, petalis longitudine calycis, caule ramoſo. Lin. Sp. Plant. 902. *Treacle Muſtard with heart-ſhaped, ſmooth, indented leaves, the petals of the flower as long as the empalement, and a branching ſtalk.* Thlaſpi arvenſe, perfoliatum majus. C. B. P. 106. *The greater, wild, perfoliate Treacle Muſtard.*
4. Thlaspi (*Alpeſtre*) ſiliculis obcordatis, foliis ſubdentatis, caulinis amplexicaulibus, petalis longitudine calycis, caule ſimplici. Lin. Sp. Plant. 903. *Treacle Muſtard with heart-ſhaped leaves embracing the ſtalks, the petals of the flower as long as the empalement, and a ſingle ſtalk.* Thlaſpi perfoliatum minus. C. B. P. 106. *The leaſt perfoliate Treacle Muſtard.*
5. Thlaspi (*Peregrinum*) ſiliculis ſuborbiculatis, foliis lanceolatis integerrimis. Lin. Sp. Plant. 903. *Treacle Muſtard with orbicular pods, and ſpear-ſhaped entire leaves.* Thlaſpi capſulis cordatis peregrinum. Bocc. Hiſt. 2. 927. *Foreign Treacle Muſtard with heart-ſhaped pods.*
6. Thlaspi (*Alliaceum*) ſiliculis ſubovatis ventricoſis, foliis oblongis obtuſis dentatis glabris. Prod. Leyd. 334. *Treacle Muſtard with almoſt oval ſwelling pods, and oblong, blunt, ſmooth, indented leaves.* Thlaſpi Allium redolens. Mor. Hiſt. 2. p. 297. *Treacle Muſtard with the ſmell of Garlick.*
7. Thlaspi (*Hirtum*) ſiliculis ſubrotundis piloſis, foliis caulinis ſagittatis hirſutis. Prod. Leyd. 333. *Treacle Muſtard with roundiſh hairy pods, and hairy arrow-pointed leaves on the ſtalks.* Thlaſpi villoſum capſulis hirſutis. C. B. P. 106. *Perennial Mithridate Muſtard.*
8. Thlaspi (*Montanum*) ſiliculis obcordatis, foliis glabris radicalibus carnoſis obovatis integerrimis, caulinis amplexicaulibus corollis calyce majoribus. Lin. Sp. Plant. 902. *Treacle Muſtard with heart-ſhaped pods, the lower leaves ſmooth and entire, and the upper embracing the ſtalks.* Thlaſpi foliis globulariæ. J. B. 2. p. 926. *Treacle Muſtard with a blue Daiſy leaf.*

The firſt ſort grows naturally amongſt the Corn in divers parts of England, as alſo on the ſide of dry banks; it is a biennial plant, which periſhes ſoon after it has ripened its ſeeds. The root is compoſed of ligneous fibres which ſpread in the ground; the leaves are near three inches long, narrow at their baſe, and broader toward their points, where they have ſeveral indentures; they are hoary on both ſides. The ſtalk riſes about a foot high, branching out toward the top, and is pretty cloſely garniſhed with leaves placed alternately, ſitting cloſe to the ſtalks, whoſe ears embrace the ſtalk. The flowers are produced in ſhort ſpikes at the end of the ſtalks; they are ſmall, white, and compoſed of four petals placed in form of a croſs; theſe appear in June, and are ſucceeded by roundiſh capſules having two cells, containing two or three ſeeds in each, which ripen in Auguſt. The whole plant has a warm biting taſte. The ſeeds of this are frequently uſed inſtead of thoſe of the next, which is the ſort directed to enter the compoſition of Venice treacle.

The ſecond ſort is an annual plant, which grows naturally in ſeveral parts of England: I have found it growing in plenty in the meadows on the right hand ſide of Godalming. The root of this is compoſed of ſlender fibres; the ſtalk riſes a foot high, is angular, channelled, and ſmooth; the leaves are about two inches long, are ſmooth and indented, of a deep green colour, and ſit cloſe to the ſtalks; the flowers are produced in looſe ſpikes toward the upper part of the ſtalks; they are ſmall, white, and compoſed of four petals placed croſſwiſe like the former; theſe are ſucceeded by broad, flat, roundiſh, compreſſed pods, having leafy borders which have two cells,

each

each containing two or three dark brown ſeeds taſting like Garlick. It flowers in June, and the ſeeds which are an ingredient in Theriaca, ripen in Auguſt.

The third ſort is an annual plant, which grows naturally in the northern counties of England. The ſtalks of this riſe about nine inches high, which are divided at the top into ſeveral branches, which are clothed with oblong heart-ſhaped leaves, whoſe baſe embrace the ſtalks; they are ſmooth and entire. The flowers are ſmall, white, and are produced in looſe ſhort ſpikes at the end of the branches: they appear the beginning of June, and the ſeeds ripen early in Auguſt.

The fourth ſort is an annual plant, which grows naturally in ſome parts of England; the ſtalk riſes about four inches high, is ſingle, and never branches out; the leaves embrace the ſtalks at their baſe; the flowers are produced at the top of the ſtalks; the petals are the ſize of the empalement, which are ſucceeded by roundiſh heart-ſhaped pods, containing round ſeeds.

The fifth ſort grows naturally in Sicily; this is a biennial plant, whoſe ſtalks riſe eight or nine inches high, branching out toward the top, and are garniſhed with blunt thick leaves, of a grayiſh colour, which are ſpear-ſhaped and entire; they are placed oppoſite, ſitting cloſe to the ſtalk; they have a bitter warm taſte. The flowers are produced in looſe ſpikes at the top of the ſtalks; they are ſmall and of a purple colour, having four heart-ſhaped petals placed in form of a croſs; theſe are ſucceeded by heart-ſhaped pods of a fine green colour, which are divided into two cells, each containing three or four ſmall, oblong, yellowiſh ſeeds, which have an acrid taſte. It flowers in June, and the ſeeds ripen in Auguſt.

The ſixth ſort is an annual plant, which grows naturally in the northern parts of Europe; this riſes about ſix or eight inches high. The ſtalk branches toward the top, and is garniſhed with oblong, ſmooth, blunt leaves which are a little indented; theſe ſit cloſe to the ſtalk, and, if bruiſed, have a ſtrong ſcent of Garlick. The branches are terminated by looſe ſpikes of ſmall white flowers, compoſed of four roundiſh petals, placed in form of a croſs; theſe appear in June, and are ſucceeded by ſwelling roundiſh pods, containing a few dark brown ſeeds which ripen in July.

The ſeventh ſort grows naturally in Wales, and in a few places in England; this has a perennial creeping root. The lower leaves are oblong and hoary; they are very ſlightly ſinuated, but not indented on the edges. The ſtalks are about five or ſix inches long, and are bent toward the ground; the flowers are rather larger than thoſe of the firſt ſort, but are of the ſame form; the pods are hoary, but not hairy. It flowers in May, and the ſeeds ripen in July. This grows naturally on the ſide of a bank beyond Wandſworth in the road to Putney.

The eighth ſort grows naturally upon the Alps, and in ſome parts of Yorkſhire in dry ſtony paſtures. The root of this is perennial and creeping; the ſtalks riſe four or five inches high; the lower leaves are wedge-ſhaped, being broad and rounded at their points, but narrow at their baſe, of a deep green colour, and entire; thoſe upon the ſtalks are rounder, and ſit very cloſe. The flowers are produced in looſe ſpikes at the end of the branches; they are ſmall and white, ſhaped like thoſe of the other ſorts, and appear in May; theſe are ſucceeded by roundiſh heart-ſhaped pods divided into two cells, each containing two or three brown ſeeds which ripen in July.

Theſe plants are propagated by ſeeds, which ſhould be ſown where the plants are to remain, which may be performed either in the ſpring or autumn, but the latter is to be preferred, becauſe the ſeeds at that ſeaſon never fail; and the plants which come up before winter will grow much ſtronger, and produce a greater quantity of ſeeds than thoſe which are ſown in the ſpring, eſpecially if the ſeaſon proves dry; and there is very little danger of the plants being injured by froſt in winter, if they are upon dry ground. When the plants come up, they will require no other care but to thin them where they are too cloſe, and keep them clean from weeds.

The two ſorts which are firſt mentioned, may be cultivated for their ſeeds to be uſed in medicine, ſo theſe may be ſown thin upon beds of light ground, in the ſame way as for other garden plants, and when they come up, the ground ſhould be hoed to deſtroy the weeds, and where the plants are too thick, they ſhould be cut up in the ſame manner as is practiſed for Onions, Carrots, &c. leaving them three or four inches apart, and by twice hoeing the ground, if it is well performed, and in dry weather, will keep the ground clean till the ſeeds are ripe.

The other ſorts are ſeldom cultivated but in botanic gardens for variety, ſo a few plants of each will be ſufficient; therefore theſe may be ſown in drills, and when the plants come up they muſt be thinned, and kept clean from weeds. If the ſeeds of theſe plants are permitted to ſcatter, the plants will come up without care.

THISTLE. See Carduus.

THORN APPLE. See Datura.

THORN, the Glaſtenbury. See Mespilus and Crategus.

THUNDER is defined by ſome to be a noiſe in the loweſt region of the air, excited by a ſudden kindling of ſulphureous exhalations.

Some alſo account for it, by ſuppoſing two clouds impending over one another, the upper and rarer whereof becoming condenſed by a freſh acceſſion of the air, raiſed thither by warmth from the lower parts of the atmoſphere, or driven upon it by the wind, immediately falls forcibly down upon the lower and denſer clouds, by which fall the air interpoſed between the two being compreſſed, that next the extremities of the two clouds is ſqueezed out, and leaves room for the extremity of the upper cloud to cloſe tight upon the under. Thus a great quantity of air is incloſed, which, eſcaping through ſome winding irregular vent or paſſage, occaſions the noiſe we call Thunder.

But this only reaches to the phænomena of Thunder heard without lightening, and in effect we have now a better ſolution: that Thunder is not occaſioned by the falling of the clouds, but by the kindling of ſulphureous exhalations in the ſame manner as the noiſe of aurum fulminans.

Sir Iſaac Newton ſays, there are ſulphureous exhalations always aſcending into the air, when the earth is dry; there they ferment with the nitrous acids, and ſometimes taking fire, generate into Thunder, lightning, &c.

That beſides the vapours raiſed from water, &c. there are alſo exhalations carried off from ſulphur, bitumen, volatile ſalts, &c. is paſt all doubt. The vaſt quantity of ſulphureous and bituminous matter all over the ſurface of the earth, and the volatile ſalts of plants and animals, afford ſuch an ample ſtock thereof, that it is no wonder the air ſhould be filled with ſuch particles, raiſed higher and lower, according to their greater or leſs degree of ſubtilty and activity, and more copiouſly ſpread in this or that quarter, according to the directions of the winds, &c.

The atmoſphere about the earth abounds with nitrous particles of a ſpirituous nature, which are every where carried along with it; beſides which ſort of particles, there are others raiſed up into the air which may be ſomewhat of the nature of ſulphureous, nitrous, and other combuſtible bodies, as we ſee ſpirit of wine, ſpirit of turpentine, camphire, and almoſt all other combuſtible bodies, will by heat be rarefied into the form of air or ſmoke, and be raiſed up into the air.

All which, if they have a ſufficient degree of heat, will catch fire, or be turned into flame by the nitrous parts of the air, as thouſands of experiments might be brought to prove.

Dr.

Dr. Wallis in Philos. Transact. N° 231, says, That Thunder and lightning are so very like the effects of fired gunpowder, that we may reasonably judge they proceed from the like cause.

Now the prinipal ingredients in gunpowder are nitre and sulphur (the admission of charcoal being chiefly to keep their parts separate, for the better kindling of it;) so that if we suppose in the air a convenient mixture of nitrous and sulphureous vapours, and those by accident to take fire, such explosion may well follow with noise and light, as in the firing of gunpowder; and being once kindled, it will run from place to place, as the vapour leads it, like as in a train of gunpowder, with the like effects.

This explosion, if high in the air, and far from us, will do no mischief, or not considerable, like a parcel of gunpowder fired in the open air, where nothing is near enough to be hurt by it; but if the explosion be near to us, or amongst us, it may kill men or cattle, tear trees, fire gunpowder, break houses, or the like, which gunpowder would do in the like circumstances. This nearness or farness may be estimated by the distance of the time between seeing the flash of lightning, and hearing the clap of Thunder; for though in their generation they be simultaneous, yet light moving faster than sound, they come to us successively.

I have observed, that commonly the noise is about seven or eight seconds after the flash, but sometimes it is much sooner, in a second or two, or less than that, just after the flash; and then the explosion must needs be very near us, and even amongst us, and in such cases, I have more than once presaged the expectation of mischief, and it hath proved accordingly.

The noise of Thunder is more diversified in cloudy weather, because the air is variously reverberated from the clouds to us; but if there are no clouds, the air flows through the open spaces to our ears, more freely and evenly, and it frequently lightens in such weather without Thunder, because the inflammation consists only of sulphureous particles, and on the contrary it often thunders in cloudy weather without any lightning appearing visibly, because it is intercepted by the clouds.

Rain generally attends Thunder and lightning, either at the same time, or soon after, and it frequently rains faster after a clap of Thunder, so that rain seems to be the effect of Thunder.

As for Thunderbolts; when it thunder and lightens, there sometimes falls a Thunderbolt. This Thunderbolt is a most rapid flame, that darts out of the clouds to the ground, and strikes every thing that is in its way, and it is observed to have the following peculiar phænomena:

1. That it oftener strikes upon high places than low, as upon mountains, towers, steeples, trees, &c.

2. That it sometimes burns peoples clothes without hurting their bodies.

3. That it sometimes breaks their bones, and at the same time does not hurt their flesh or their garments.

4. That it has melted or broken a sword in a scabbard without hurting the scabbard; and, on the contrary, has sometimes burnt the scabbard all over, and at the same time done no harm to the sword.

From these considerations we may conclude that a Thunderbolt is an exhalation kindled on a sudden, and is copious enough to be hurried down to us by winds.

Thunderbolts are most commonly darted aslope through the air, and this may be occasioned by the winds, which seldom or never blow downright. And it is probable, that the flame is beaten down by the wind, and reaches the ground before the matter of it is quite spent.

And this may be the reason that for the most part they strike upon high places; for, as they fall obliquely through the air, they often in their way meet with mountains, towers, &c. and the reason that the force of their flame is very different, is probably from the difference of the exhalations which form the Thunderbolts, the bodies from which they are collected being sulphureous, bituminous, or saline, and from thence it may be, that it sometimes burns garments, at the same time that it passes over the bodies without doing them any harm.

Sometimes it penetrates the soft flesh harmlessly, and yet breaks the hard bones, as gold and other metals are dissolved by aqua-regia and aqua-fortis, and in the mean time the paper shall not be hurt by them: and for the same reason it is, that a sword may be melted in a scabbard, and yet the scabbard remain entire; and so it would be if they were both laid together in aqua-fortis, because the acute parts of the aqua-fortis do not operate upon the soft matter, the particles of which are branched, as they do upon harder bodies, into the pores of which they insinuate themselves, and dissolve the contexture.

The effects of lightning upon vegetables are sometimes very great; it splits down trees, and there has been many instances where the bodies of large trees have been torn to pieces, and the chips scattered to a great distance, but instances of this are pretty rare. The killing of branches or parts of trees is very common and sudden; for when this happens, that part of the tree where the lightning strikes, will in a very few hours appear as dead as if it had been some days severed from the trees.

THURIFEROUS signifies bearing or producing frankincense.

THUYA. Tourn. Inst. R. H. 586. tab. 358. Lin. Gen. Plant. 957. [so called of θύω, to perfume with smoke, because this plant hath a penetrating smell.] The Arbor Vitæ, vulgò; in French, *Arbre de Vie*.

The CHARACTERS are,

*It has male and female flowers in the same plant; the male flowers are produced in an oval katkin. The flowers are placed opposite upon the common foot-stalk, each flower embracing it with its base; these come out of an oval concave scale; they have no petals, but have four stamina which are scarce discernible; their summits adhere to the base of the scale of the empalement. The female flowers are collected in a common almost oval cone, two flowers standing opposite in each scale; they have no petals, but have a small germen, supporting a slender style, crowned by a single stigma; these are succeeded by an oblong oval cone, opening longitudinally, whose scales are almost equal, convex on the outside, and obtuse, each containing an oblong seed with a membranaceous wing.*

This genus of plants is ranged in the ninth section of Linnæus's twenty-first class, which contains those plants which have male and female flowers on the same plant, and their stamina are collected in one body.

The SPECIES are,

1. THUYA (*Occidentalis*) strobilis lævibus, squamis obtusis. Hort. Cliff. 449. *Thuya with smooth cones and obtuse scales.* Thuya Theophrasti. C. B. P. 488. *The common Arbor Vitæ.*

2. THUYA (*Orientalis*) strobilis squarrosis, squamis acuminatis reflexis. Hort. Upsal. 289. *Thuya with rugged cones, and acute-pointed reflexed scales.* Thuya strobilis uncinatis, squamis reflexo-acuminatis. Flor. Leyd. Prod. 87. *The China Arbor Vitæ.*

The first sort grows naturally in Canada, Siberia, and other northern countries, but has been long an inhabitant in the English gardens. In some of these gardens, which have not been altered, there are some of these trees which are of a large size: it has a strong woody trunk, which rises to the height of forty feet or more. The bark, while young, is smooth, and of a dark brown colour, but, as the trees advance, the bark becomes cracked and less smooth. The branches are produced irregularly on every side, standing almost horizontal, and the young slender shoots frequently hang downward; these branches stand but thin, and the younger branches only are garnished with leaves, so that when the trees are grown large, they make but an indifferent appearance, being so thinly clothed with leaves. The young branches are flat, and the small leaves are placed imbricatim over each other like the scale of fish; the flowers are produced from the side of the young branches, pretty near to the foot-stalk; the

male flowers grow in oblong katkins, and between these the female flowers are collected in form of cones. When the former have shed their farina, they soon after drop off, but the female flowers are succeeded by oblong cones, having obtuse smooth scales, containing one or two oblong seeds. It flowers early in the spring, and the seeds ripen in September. The leaves of this tree have a rank oily scent when bruised.

The second sort grows naturally in the northern parts of China, where it rises to a considerable height, but this has not been long enough in Europe to have any trees of large size here. The seeds of this sort were first sent to Paris by some of the missionaries, and there are some of the trees growing in the gardens of some curious persons there, which are more than twenty feet high. The branches of this sort grow closer together, and are much better adorned with leaves, which are of a brighter green colour, so make a much better appearance than the other; and being very hardy, is esteemed much preferable to most of the evergreen trees with small leaves, for ornament in gardens. The branches of this tree cross each other at right angles; the leaves are flat, but the single divisions of the leaves are slender, and the scales are smaller, and lie closer over each other than those of the first sort. The cones are also much larger, and of a beautiful gray colour; their scales end in acute reflexed points.

Both these trees may be propagated by seeds, layers, or cuttings. The first sort is commonly propagated by cuttings; these should be planted in September, upon a shady border and in a loamy soil; the cuttings should be chosen from the shoots of the same year, with a small joint of the former year's wood at the bottom of each. These should be planted three or four inches deep, in proportion to their length, treading the ground close to them, to prevent the admission of air. If the following spring should prove dry, there should be a little mulch laid over the surface of the ground to prevent its drying; where this is performed in time, it will save the trouble of watering the cuttings, and it will be much better for them, because when these are putting out their young fibres, if they are much watered, it will rot them while they are tender. These cuttings will be rooted enough to transplant by the next autumn, when they may be either planted in beds, or in nursery rows to be trained up.

When they are propagated by layers, the young branches only should be laid down in autumn, which will also put out roots by the next autumn, when they may be taken up, and transplanted in the same manner as those raised from cuttings: but although these are very expeditious methods of propagating this tree, yet those who are desirous to have large trees, should always propagate them by seeds, for the plants so raised will be much preferable to the other.

There is a variety of the first sort with variegated leaves, which some people keep in their gardens for the sake of variety; but as this proceeds from a weakness in the plants, so whenever the plants become strong and vigorous, they always return to their plain colour again, to prevent which they generally plant them in very poor ground. This variety can only be preserved by propagating the plants either by cuttings or layers.

The China sort is generally propagated by layers in the same way as the former; but the cuttings of this, if rightly managed, will take root very freely; but most people have over-nursed them. If these are planted in September in a border of soft loam, exposed to the east, and before hard frost sets in, and the surface of the ground covered with old tanners bark about two inches thick, it will prevent the frost from penetrating the ground very deep; and if this remains in the spring, it will also keep the ground moist; for if these cuttings, or the layers of this sort are watered in the spring, when they are beginning to put out young fibres, it will certainly rot them, as I have frequently experienced; therefore I advise every one not to water these cuttings or layers, nor should the plants be much watered when they are transplanted, for the same reason: but as there are many plants now in England which ripen their seeds, so those who can be supplied with them should prefer this to both the other methods of propagating the plants; for, after the two first years, the seedling plants will greatly outstrip the other in growth, and the plants growing with their branches closer, will be much handsomer.

These seeds should be sown soon after they are ripe, which is in the spring. These should be sown in pots filled with soft loamy earth, and plunged into the ground in an east border, where they may have only the morning sun, observing always to keep the pots clean from weeds. Sometimes these seeds will come up the same year, but they often lie in the ground till the next spring; therefore the pots should be put in a common hot-bed frame in winter, and in the spring the plants will come up; these must not be too much exposed to the sun the first year, and if in the next winter they are sheltered under a frame, it will be a good way to preserve them, and the spring following they may be transplanted into beds, and treated in the same way as those propagated by cuttings.

THYMBRA. Lin. Gen. Plant. 627.

The CHARACTERS are,

*It has an empalement of one leaf whose brim is cut into into two lips; the upper lip is broad, and has three equal points; the under is narrow, and cut into two parts. The flower is of one petal, of the lip kind. The upper lip is concave, and cut into two obtuse segments. The lower lip ends with three almost equal points; it has four slender stamina, the two under being shorter than the other, terminated by twin summits under the upper lip, and a four-pointed germen supporting a slender half bifid style, crowned by acute stigmas. The germen afterward become four seeds which ripen in the empalement.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes those plants whose flowers have two long and two shorter stamina, and the seeds ripen in the empalement.

The SPECIES are,

1. THYMBRA (*Spicata*) floribus spicatis. Lin. Sp. Plant. 569. *Thymbra with spiked flowers.* Hyssopum montanum, Macedonicum, valerandi dourez. I. B. 3. 2. 276. *Mountain Macedonian Hyssop.*
2. THYMBRA (*Verticillata*) floribus verticillatis. Lin. Sp. Plant. 569. *Thymbra with whorled flowers.* Hyssopus angustifolia, montana, aspera. C. B. P. 218. *Rough, narrow-leaved, Mountain Hyssop.*

The first sort grows naturally on Mount Libanus, in Macedonia, and in Spain; it is a low shrubby plant like Heath, branching out into slender ligneous stalks which are six or eight inches long, covered with a brown bark, and garnished with narrow acute-pointed leaves about half an inch long, sitting close to the stalks opposite; they have an aromatic odour when bruised. The stalks are terminated by thick close spikes of purple flowers, near two inches long. The empalements are stiff and hairy; they are cut half their length into acute segments, out of these the flowers peep, with their two lips; the upper is concave and arched, the under is cut into three equal portions, and these are a little reflexed. These appear in June and July, and in warm seasons they are sometimes succeeded by seeds which ripen in autumn.

The second sort grows naturally in Spain and Italy; this has a shrubby stalk which seldom rises much more than a foot high, putting out many small ligneous branches, which are garnished with narrow spear-shaped leaves which have many punctures; they stand opposite, and are of an aromatic flavour. The flowers grow in whorled spikes at the end of the branches. The leaves which stand under each whorl are broader than those below, and are covered with fine hairs. The flowers are purple, and sit close to the stalks; the upper lip is concave and ends with two obtuse points, the lower ends with three equal points. These appear about the same time with the other, and in warm seasons the seeds ripen in England.



These

These plants are propagated by seeds, which should be sown in the spring on a bed of light earth, where, if the seeds are good, the plants will appear in about six or eight weeks. When they come up they must be kept clean from weeds, and in July they will be fit to remove, at which time part of them should be planted in small pots; and the other may be planted in a warm border of dry ground, being careful to shade them from the sun, and supply them with water till they have taken new root; after which, those in the full ground will require no other care but to keep them clean from weeds; and, if the winter should prove very severe, they should be covered with mats, or some other covering to protect them, for the young plants are in greater danger of being destroyed than those which are older. Those plants in the pots should be sheltered under a common frame in winter, where they may enjoy the free air in mild weather, and be protected from hard frost.

These plants will live in the open air in England unless the winters prove very severe, especially if they are planted in a poor, dry, stony soil.

THYMELÆA. See DAPHNE and PASSERINA.

THYMUS. Tourn. Inst. R. H. 196. tab. 93. Lin. Gen. Plant. 646. [so called of Θύος, odour, because a very odorous plant; or of Θυμός, animal spirit, because good in reviving the same.] Thyme.

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, divided into two lips, whose chaps are hairy and shut. The upper lip is broad, plain, erect, and indented in three parts; the under lip ends in two equal bristles. The flower is of the lip kind; it has one petal, with a tube the length of the empalement. The chaps are small; the upper lip is short, erect, obtuse, and indented at the point; the lower lip is long, broad, and divided into three parts, the middle segment being broadest. It has four incurved stamina, two being longer than the other, terminated by small stamina; and a four-pointed germen supporting a slender style, crowned by a bifid acute stigma. The germen afterward turn to four small roundish seeds ripening in the empalement, whose neck is narrowed.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which contains those plants whose flowers have four stamina, two of them being longer than the other, and the seeds ripen in the empalement.

The SPECIES are,

1. THYMUS (*Vulgaris*) erectus, foliis revolutis ovatis, floribus verticillato-spicatis. Hort. Cliff. 305. *Upright Thyme with oval leaves which turn backward, and flowers growing in whorled spikes.* Thymus vulgaris, folio latiore. C. B. P. 219. *Common broad-leaved Thyme.*
2. THYMUS (*Tenuifolius*) foliis lineari-lanceolatis incanis, floribus verticillato-spicatis. *Thyme with linear, spear-shaped, hoary leaves, and flowers growing in whorled spikes.* Thymus vulgaris, folio tenuiore. C. B. P. 219. *Common Thyme with narrow leaves.*
3. THYMUS (*Cephalotos*) capitulis imbricatis magnis, bracteis ovatis, foliis lanceolatis. Lin. Sp. Plant. 592. *Thyme with large imbricated heads, oval bracteæ, and spear-shaped leaves.* Thymus Lusitanicus cephalotos, squamis capitulorum amplioribus. Tourn. Inst. 126. *Portugal Thyme with large heads, having very large scales.*
4. THYMUS (*Villosus*) capitulis imbricatis magnis, bracteis dentatis, foliis setaceis pilosis. Lin. Sp. Plant. 592. *Thyme with large imbricated heads, indented bractæa, and bristly hairy leaves.* Thymus Lusitanicus, folio capillaceo villoso, capite magno purpurascente oblongo. Tourn. Inst. 196. *Portugal Thyme with a hairy narrow leaf, and a large, oblong, purplish head.*
5. THYMUS (*Serpyllum*) floribus capitatis, caulibus decumbentibus, foliis planis obtusis basi ciliatis. Flor. Suec. 477. *Thyme with flowers growing in heads, trailing stalks, and plain obtuse leaves.* Serpyllum latifolium hirsutum. C. B. P. 220. *Broad-leaved hairy Mother of Thyme.*
6. THYMUS (*Glabrus*) floribus capitatis, caulibus decumbentibus foliis lanceolatis glabris. *Thyme with flowers growing in heads, trailing stalks, and smooth spear-shaped leaves.* Serpyllum vulgare majus, flore purpureo. C. B. P. 220. *Common greater Mother of Thyme, with a purple flower.*
7. THYMUS (*Ovatus*) caulibus decumbentibus, foliis ovatis glabris, floribus verticillato-spicatis. *Thyme with strong trailing stalks, oval smooth leaves, and flowers growing in whorled spikes.* Serpyllum vulgare majus flore minore. Bot. Par. 183. *Common greater Mother of Thyme, with a smaller flower.*
8. THYMUS (*Lanuginosus*) caulibus decumbentibus, foliis ovato lanceolatis rigidis lanuginosis, floribus capitatis. *Thyme with creeping stalks, oval, spear-shaped, stiff leaves, which are downy, and flowers growing in heads.* Serpyllum saxatile, hirsutum, Thymi folium nanum, flore pupureo. Bot. Par. 183. *Hairy Rock Mother of Thyme, having a dwarf Thyme leaf and a purple flower.*
9. THYMUS (*Odoratissimus*) caulibus decumbentibus, foliis lineari-lanceolatis glabris, floribus alaribus terminalibusque. *Thyme with trailing stalks, linear, spear-shaped, smooth leaves, and flowers growing at the wings and tops of the stalks.* Serpyllum odoratissimum glabrum, longiore angustioreque folio. Amman. *Smooth sweet-scented Mother of Thyme, with a longer and narrower leaf.*

The first sort is the common Thyme, which is cultivated in the gardens for the kitchen, and also for medicine. This grows naturally on stony rocky places in the south of France, in Spain and Italy, and is so well known here as to need no description.

This plant may be propagated either by seeds or parting the roots; the season for either is in March or October. If it is propagated by seeds, they should be sown upon a bed of light earth, observing not to bury the seeds too deep, which will cause them to rot, nor to sow them too thick, for the seeds are very small. When the plants are come up, they should be carefully cleared from weeds; and if the spring should prove dry, and they are watered twice a week, it will greatly promote their growth. In June the plants should be thinned, leaving them about six inches asunder each way, that they may have room to spread; and those plants which are drawn out may be transplanted into fresh beds at the same distance, observing to water them until they have taken root; after which they will require no farther care but to keep them clear from weeds, and the winter following they may be drawn up for use.

But if the plants are propagated by parting their roots, the old plants should be taken up at the times before-mentioned, and slipped into as many parts as can be taken off the root; these should be transplanted into beds of fresh light earth, at six or eight inches distance, observing, if the season is dry, to water them until they have raken root, after which they must be duly weeded, and they will thrive, and soon be fit for use.

In order to save the seeds of these plants, some of the old roots should remain unremoved in the place where they were sown the preceding year; these will flower in June, and in July the seeds will ripen, which must be taken as soon as it is ripe, and beat out, otherwise the first rain will wash it all out of the husks. These plants root greatly in the ground, and thereby draw out the goodness of the soil sooner than most other plants; so that whatever is sown or planted upon a spot of ground whereon Thyme grew the preceding year, will seldom thrive, unless the ground be trenched deeper than the Thyme rooted, and well dunged.

If this plant grows upon walls, or on dry, poor, stony land, it will endure the greatest cold of this country; but in rich ground where the plants grow vigorously, they are sometimes destroyed by severe frost.

There is a variety of this with variegated leaves, which is by some preserved in their gardens.

The second sort has shorter stalks, the leaves are longer, narrower, and end in sharper points than the first, and the whole plant is hoary. The flowers grow in long whorled spikes, and are larger than those of the common Thyme. This may be propagated and treated in the same way as the first sort.

The

The third ſort grows naturally in Spain and Portugal; this has a low woody ſtalk, from which come out many ſtiff branches about five or ſix inches long, garniſhed with ſmall, narrow, ſpear-ſhaped leaves placed oppoſite, and are terminated by pretty large heads of flowers, which come out from oval ſcaly leaves, lying over each other like the ſcales of fiſh; they are white, and but ſmall, ſo make no great appearance. The whole plant is of a hoary colour, and has a weak aromatic ſcent. It flowers in July, but unleſs the ſeaſon proves warm, the ſeeds do not ripen in England.

The fourth ſort grows naturally in Portugal; this has ſlender, ligneous, hairy ſtalks, which grow erect, about ſix inches high, garniſhed with very narrow, briſtly, hairy leaves, which, at the lower part of the ſtalks, come out in cluſters, but upward they are placed by pairs. The ſtalks are terminated by ſingle ſcaly heads. The leafy ſcales are indented in acute points; theſe lie over each other in the ſame order as the other, and between them the flowers peep out, which are of a purple colour, and ſhaped like thoſe of the common Thyme. This plant flowers in July, but does not produce ſeeds in England.

Theſe two ſorts may be propagated by ſlips, if they are planted in April on an eaſt border, and cloſely covered with a bell or hand-glaſs, refreſhing them twice a week with water, which muſt not be given to them in too great quantity. When theſe have put out good roots, ſome of them may be tranſplanted into pots, to be ſheltered under a frame in winter; the others ſhould be planted on a warm border of dry ground, obſerving to ſhade and water them till they have taken new root. Theſe plants will live through the winter in the open air in a warm dry ſituation, but in ſevere froſt they are generally deſtroyed; they may be propagated by ſeeds when they can be procured. If theſe are ſown on a bed of light earth in the ſame way as common Marjoram, the plants will come up, and may be treated as thoſe raiſed from ſlips.

The fifth ſort is the common Mother of Thyme, which is frequently titled wild Thyme; it grows naturally upon dry commons and paſtures in moſt parts of England, ſo is very rarely admitted into gardens. This is ſo well known as to need no deſcription. There is a very common miſtake which has prevailed in regard to this plant, which is, that the ſheep and deer which feed upon them, have much finer flavoured fleſh than others, whereas no cattle will meddle with it; for in the places where it grows, when the Graſs is as cloſely eaten down as poſſible, the wild Thyme will be found in flower with all its ſtalks entire.

Of this there are the following varieties: the ſmall creeping Mother of Thyme without ſcent. Narrow-leaved Mother of Thyme ſmelling like the leaves of the Walnut-tree: ſhrubby Mother of Thyme with pale red flowers; and the Lemon Thyme. The laſt is frequently kept in gardens for the agreeable odour of its leaves; but when this is propagated by ſeeds, the plants have not the ſame ſcent; ſo it is an accidental variety, which is obtained by propagating it by ſlips and cuttings.

The ſixth ſort has broader and ſmoother leaves than the common ſort; the ſtalks grow much longer; the joints are farther diſtant; the heads of flowers are larger, and the flowers are of a brighter purple colour. There is a variety of this with variegated leaves, which is propagated in gardens, and was formerly planted for edgings to borders; but it is now frequently brought in pots to the markets, to ſupply the London gardens.

The ſeventh ſort has trailing ſtalks like the common kind, but they grow longer, and their joints are farther aſunder; the leaves are oval, ſmooth, and of a lucid green. The flowers grow in cloſe thick whorls which are diſtant from each other, forming a looſe ſpike five or ſix inches long. The flowers of this ſort are much ſmaller than thoſe of the common ſort, appearing but little beyond their emplements. This is pretty common in the neighbourhood of Paris, but is rarely found growing naturally in England.

The eighth ſort grows naturally in the foreſt of Fontainbleau in France; this has trailing ſlender ſtalks like the firſt, which are garniſhed with ſmall, oval, ſpear-ſhaped, hoary leaves; the young ſhoots of the ſame year are alſo very white and hoary. The leaves are ſtiffer than thoſe of the other ſorts. The flowers are produced in round heads at the end of the branches; they are of a bright purple colour, and appear at the ſame time as thoſe of the other ſorts.

The ninth ſort grows naturally in Tartary; the ſtalks of this are long, ſlender, and trail upon the ground, but do not emit roots from their joints as many of the others do; the ſtalks are ſmooth, of a light brown colour, and are garniſhed with narrow ſpear-ſhaped leaves which are ſmooth. The ſtalks have ſmall whorls of flowers at the wings of the leaves, and are terminated by oblong heads of flowers, whoſe empalements are hoary. The flowers are of a bright purple colour. The whole plant has an agreeable aromatic ſcent.

All theſe ſorts may eaſily be propagated by thoſe who are deſirous to have them in their gardens, either by ſlips, or parting of their roots in the ſame manner as Thyme, or their ſeeds may be ſown in the ſpring. They delight in dry undunged ground, where they will propagate themſelves by their trailing ſtalks, and require no other care but to keep them clean from weeds.

THYME THE MARUM. See Teucrium.

THYME THE MASTICH. See Satureja.

TIARELLA. Lin. Gen. Plant. 495. Cortuſa. Herm. Par. Bat. 129. Sanicle.

The Characters are,

*The flower has a permanent empalement divided into five oval acute parts; it has five oval petals the length of the empalement, and ten awl-ſhaped ſtamina which are much longer than the petals, terminated by roundiſh ſummits, and a bifid germen ending with two ſtyles, crowned by ſingle ſtigmas. The germen afterward becomes an oblong capſule with one cell, opening with two valves, containing ſeveral oval ſeeds.*

This genus of plants is ranged in the ſecond ſection of Linnæus's tenth claſs, which includes thoſe plants whoſe flowers have ten ſtamina and two ſtyles.

The Species are,

1. Tiarella (*Cordifolia*) foliis cordatis. Lin. Gen. Nov. 188. Sp. Plant. 580. *Tiarella with heart-ſhaped leaves.* Mitella Americana, florum petalis integris. Tourn. Inſt. 242. *American Mitella with entire petals to the flower.*
2. Tiarella (*Trifoliata*) foliis ternatis. Lin. Gen. Nov. 188. Sp. Plant. 405. *Tiarella with trifoliate leaves.* Mitella foliis ternatis. Amœn. Acad. 2. p. 351. *Mitella with ternate leaves.*

The firſt ſort grows naturally in North America; this has a perennial fibrous root which creeps and multiplies, from which come out many heart-ſhaped leaves upon ſlender foot-ſtalks, which are three inches long, ariſing immediately from the root. The leaves are unequally indented on their edges, and are of a light green colour. The flowers ſtand upon ſlender naked foot-ſtalks, which ariſe immediately from the root between the leaves, which is about four inches long, and is terminated by a looſe ſpike of ſmall, herbaceous, white flowers which appear in May, but are ſeldom ſucceeded by ſeeds in England.

This plant is propagated by its creeping roots, which ſpread in the ground and ſhoot up heads; theſe may be taken off and tranſplanted in the autumn. It loves a moiſt ſoil and a ſhady ſituation, and requires no other care but to keep it clean from weeds.

The ſecond ſort grows naturally in the northern parts of Aſia; this has a perennial fibrous root, from which ſpring up a few trifoliate leaves upon foot-ſtalks; theſe are like thoſe of the Bilberry, but are much ſmaller. The ſtalk is ſlender, and riſes five or ſix inches high; it is rough and hairy, garniſhed with two leaves at the bottom, and another toward the top, a little below the

the ſpike of flowers; they are angular and ſawed on their edges. The ſtalk is terminated by a looſe ſpike of flowers, which are compoſed of five ſmall white petals inſerted in the empalement, and ten awl-ſhaped ſtamina which are longer than the petals, terminated by roundiſh ſummits. Theſe flowers appear early in May, but the plants rarely produce any ſeeds in England.

This ſort is propagated by parting of the root, in the ſame manner as the former, and delights in a moiſt ſoil and a ſhady ſituation.

TILIA. Tourn. Inſt. R. H. 611. tab. 381. Lin. Gen. Plant. 587. [of telum, a dart, becauſe its wood is uſed in making darts.] The Lime, or Linden-tree; in French, *Tillau* or *Tilleul.*

The CHARACTERS are,

*The flower has a concave coloured empalement, which is cut into five parts; it has five oblong blunt petals which are crenated at their points, and many awl-ſhaped ſtamina terminated by ſingle ſummits, with a roundiſh germen ſupporting a ſlender ſtyle the length of the ſtamina, crowned by an obtuſe five-cornered ſtigma. The germen afterward becomes a thick globular capſule with five cells, opening at the baſe with five valves, each containing one roundiſh ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's thirteenth claſs, which contains thoſe plants whoſe flowers have many ſtamina and one ſtyle.

The SPECIES are,

1. TILIA (*Cordata*) foliis cordatis acuminatis, inæqualiter ſerratis, fructibus quinquæ locularibus tomentoſis. *Lime-tree with heart-ſhaped acute-pointed leaves, which are unequally ſawed, and a woolly fruit having five cells.* Tilia fœmina, folio minore. C. B. P. 426. *The female Lime-tree with a ſmaller leaf.*
2. TILIA (*Æuropæa*) foliis acuminatis, ſerratis, ſubhirſutis, fructibus quadrulangularibus ſubpiloſis. *Lime-tree with acute-pointed leaves which are ſawed, ſomewhat hairy, and a hairy fruit having four cells.* Tilia foliis molliter hirſutis, viminibus rubris, fructu tetragono. Raii Syn. 316. *The red twigged Lime-tree.*
3. TILIA (*Americana*) foliis cordatis acuminatis ſerratis, ſubtus piloſis floribus nectario inſtructis. *Lime-tree with heart-ſhaped, acute-pointed, ſawed leaves which are hairy on their under ſide, and flowers furniſhed with nectariums. American black Lime.*
4. TILIA (*Caroliniana*) foliis cordatis obliquis glabris ſubſerratis cum acumine, floribus nectario inſtructis. *Lime-tree with heart-ſhaped ſmooth leaves, which are oblique to the foot-ſtalk, ſomewhat ſawed on their edges, ending in acute points, and flowers having nectariums.* Tilia Caroliniana, foliis longiùs mucronato. Rand. Cat. Hort. Chelſ. *Carolina Lime-tree with a long-pointed leaf.*

The firſt ſort grows naturally in the woods in many parts of England; of this there are two or three varieties, which differ in the ſize and ſmoothneſs of their leaves, ſome of them having much larger and rougher leaves than the others. I have plants of three of theſe varieties from ſeeds, but have conſtantly found them vary from one to the other; and I much doubt if the ſecond is more than a ſeminal variety, but as I have not had an opportunity of raiſing any of the plants from ſeeds, I cannot poſſibly determine this.

The large-leaved Dutch Lime was generally preferred to our common ſort for the ſize of its leaves, but of late years all theſe trees are little eſteemed, becauſe it is late in the ſpring before their leaves come out, and they begin to decay the firſt in autumn; and when the trees are planted in a dry ſoil, their leaves frequently decay in July, and are continually falling off, making a litter all the remaining part of ſummer.

The third ſort was brought from New England by the title of Black Lime. The branches of this ſort are covered with a dark brown bark. The leaves are large, heart-ſhaped, and end in acute points; they are deeply ſawed on their edges, and are of a deep green on their upper ſide, but of a pale green and a little hairy on their under ſide, ſtanding upon long ſlender foot-ſtalks. The flowers are produced in bunches, in the ſame manner as thoſe of the common Lime-tree, but the petals of the flowers are narrower, and have nectariums growing to their baſe. The flowers of this ſort do not appear till late in July, ſo are a full month after the common ſort. The capſules are ſmaller, rounder, and leſs hairy than thoſe of the common ſort.

The ſeeds of the fourth ſort were brought from Carolina by the late Mr. Cateſby. This tree ſeems to be of much ſmaller growth than either of the other ſorts; the branches ſpread more horizontally. The leaves are ſmaller, and have a ſmoother ſurface than either of the other; they are heart-ſhaped, but the midrib runs oblique to the foot-ſtalk, ſo that one ſide of the leaves is much larger than the other. Their edges are ſlightly ſawed, and their tops run out into long acute points. The bunches of flowers ſtand upon long ſlender foot-ſtalks; the petals of the flowers are narrow, and end in acute points; theſe have each a narrow nectarium faſtened to their baſe on the inſide, which ſtand erect cloſe to the petals. The flowers emit a very fragrant odour, and are continually haunted by bees during their continuance. This tree flowers toward the end of July, and when the ſeaſon proves favourable, the ſeeds ripen in autumn.

All theſe trees are eaſily propagated by layers, which in one year will take good root, and may then be taken off, and planted in a nurſery, at four feet diſtance row from row, and two feet aſunder in the rows. The beſt time to lay them down and to remove them, is at Michaelmas, when their leaves begin to fall, that they may take root before the froſt comes on, though they may be tranſplanted any time from September to March, in open weather; but if the ſoil is dry, it is much the better way to remove them in autumn, becauſe it will ſave a great expence in watering them, eſpecially if the ſpring ſhould prove dry. In this nurſery they may remain four or five years, during which time the ground ſhould be dug every ſpring, and conſtantly kept clear from weeds, and the large ſide ſhoots pruned off, to cauſe them to advance in height; but the ſmall twigs muſt not be pruned off from the ſtems, becauſe theſe are abſolutely neceſſary to detain the ſap, for the augmentation of their trunks, which are apt to ſhoot up too ſlender, when they are entirely diveſted of all their lateral twigs. If the ſoil in which they are planted be a fat loam, they will make a prodigious progreſs in their growth, ſo that in three years time they will be fit to tranſplant out where they are to remain.

They may alſo be propagated by cuttings, but, as this method is not ſo certain as by layers, that method is generally practiſed. In order to obtain proper ſhoots for laying down, a Lime-tree is cut down cloſe to the ground, from the roots of which a great number of ſtrong ſhoots are produced the following year; theſe will be ſtrong enough to lay down the following autumn, eſpecially if the ſmalleſt of them are cut off cloſe early in the ſummer; for when too many ſhoots are ſuffered to grow all the ſummer, they will be much weaker, than if only a ſufficient quantity is left. The manner of laying down theſe ſhoots having been already directed under the article LAYERS, I need not repeat it here.

There are ſome perſons who raiſe theſe trees from ſeeds, which, although it is a ſlower way, yet when the trees are deſigned to grow large, is the beſt method; and if they are only once tranſplanted, and this performed while they are young, it will be ſtill the better way; for all trees that are tranſplanted when large, are ſhorter lived than thoſe which remain in the places where they aroſe from ſeeds, and their timber will be ſounder, and grow to a much larger ſize.

When this method is practiſed, the ſeeds ſhould be ſown in autumn ſoon after they are ripe, upon a ſhady border of moiſt light ſoil, where the plants will come up the following ſpring; but, when the ſeeds are

kept out of the ground till spring, the plants will not come up till the year after. When the plants appear, they should be constantly kept clean from weeds till the following autumn; then they should be carefully taken up and transplanted into a nursery, where they may grow two or three years to get strength, and then may be planted where they are designed to remain, for the younger they are planted out, the more they will thrive.

The timber of the Lime-tree is used by the carvers, it being a soft light wood, as also by architects for framing the models of their buildings; the turners likewise use it for making light bowls, dishes, &c. but it is too soft for any strong purposes.

These trees will continue growing, and remain sound a great number of years, and, if planted in a good loamy soil, will grow to a considerable bulk. I have measured one of these trees, which was near ten yards in girth two feet about the ground, and was then in a very thriving condition; and Sir Thomas Brown mentions one of these trees which grew in Norfolk, that was sixteen yards in circuit, a foot and a half above ground, in height thirty yards, and in the least part of the trunk it was eight yards and a half.

TINUS. See Viburnum.

TITHYMALUS. Tithymaloides. Tourn. Inst. App. 654. Euphorbia. Lin. Gen. Pl. 536. Spurge.

The Characters are,

*The flower has an empalement of one leaf, indented in three parts; it has one petal which is shaped like a slipper, of a thick fleshy consistence. Under the upper part of the flower are situated the ten stamina, which are inserted in the receptacle of the flower; they are slender, and terminated by globular summits; in the center is situated a roundish three-cornered germen, supporting three bifid styles, crowned by oblong stigmas. The germen afterward becomes a roundish capsule having three cells, each containing one oval seed.*

This genus of plants is by Dr. Linnæus joined to the Euphorbia, which is ranged in the third section of his eleventh class, which contains those plants whose flowers have ten or twelve stamina and three styles. But as the flowers of this genus differ greatly in their structure from those of Euphorbia, I have chosen to separate them, and have continued the old title of Tithymalus to the genus.

The Species are,

1. Tithymalus (*Mytifolius*) foliis ovatis acuminatis. *Spurge with oval acute-pointed leaves.* Tithymaloides frutescens folio myrti amplissimo. Tourn. Inst. 654. *Shrubby Bastard Spurge with a large Myrtle leaf.*

2. Tithymalus (*Lauro-cerasifolius*) foliis oblongo ovatis obtusis succulentis. *Spurge with oblong, oval, obtuse leaves, which are very succulent.* Tithymaloides lauro-cerasi folio non serrato. Hort. Elth. 383. *Bastard Spurge with a Laurel leaf which is not sawed.*

The first sort grows naturally near Carthagena in America, from whence Mr. Robert Millar, surgeon, sent the branches, which were planted here, and succeeded: this rises with shrubby succulent stalks to the height of twelve or fourteen feet, which are too weak to stand without support, though they are frequently as large as a man's little finger; but their leaves being succulent, are so heavy as to weigh down the branches if they are not supported. The leaves are oval, and terminate in acute points; they are two inches and a half long, and one inch and a half broad near their base; they are about the thickness of Bay leaves, and are ranged alternately on two sides of the branches, to which they sit close. The flowers are produced at the end of the branches three or four together; they are of a scarlet colour, of one petal in shape of a slipper; these are succeeded by roundish capsules with three furrows, dividing them into three cells, each containing one oblong seed. The whole plant abounds with an acrid milky juice.

The second sort grows naturally in Barbadoes, and most of the other islands in the West-Indies, where the English inhabitants know it by the title of Poison Bush; this hath thick, shrubby, succulent stalks, which will grow to the height of ten or twelve feet, these are larger than those of the first sort, and are garnished with oblong oval leaves ending with blunt points; they are above three inches long, and an inch and a half broad in the middle, of a very thick consistence, and of a dark green colour, ranged alternately on two sides of the stalk. The flowers grow at the end of the branches; they are shaped like those of the first sort, and are of a deep red colour; these are succeeded by roundish capsules divided into three cells, each containing one oblong seed.

This whole plant abounds with an acrid milky juice, which will draw blisters on the flesh wherever it is applied, and if it mixes with the blood, I have been credibly informed, it becomes a deadly poison; so that if the points of arrows, or the edges of swords are rubbed with this juice, it becomes deadly to any animal wounded with those weapons.

These plants are both propagated by cuttings, which may be taken from the plants during any of the summer months, and after having laid in a dry place for a fortnight or three weeks, until the wounded part be healed over, they should be planted into small pots filled with light sandy earth mixed with lime rubbish, and then plunged into a hot-bed of tanners bark, observing now and then to refresh them gently with moisture, but they should never receive much wet, which will rot them.

After they have taken root, they may have a greater share of air by raising the glasses, but they must never be wholly exposed to the open air. In this bed they may remain until the beginning of October, when they must be removed, and placed with the Melon and Torch Thistle in a warm dry stove, and during the winter season they should have very little water, which, if given in plenty, seldom fails to rot them.

These plants are too tender to thrive in the open air in England, therefore should constantly remain in the stove, observing in the summer season, when the weather is warm, to admit a large share of fresh air to them, and in the winter to place them in a warm part of the stove, otherwise they cannot be preserved.

They must be shifted every summer, and fresh earth given to them. If the earth is light and sandy, it will require no mixture, for rich or strong ground is very improper for them; therefore where the soil is inclinable to either of these, there should be a good mixture of sand and lime rubbish to prevent its binding, or detaining moisture.

These plants are preserved for their odd appearance amongst other succulent plants, their leaves being very large, thick, and full of a milky acrid juice.

TITHYMALUS. See Euphorbia.

TOAD FLAX. See Linaria.

TOBACCO. See Nicotiana.

TOLUIFERA. Lin. Gen. Plant. 470. Balsam of Tolu-tree.

The Characters are,

*The flower has a bell-shaped empalement of one leaf, which is slightly indented in five parts at the brim; it has five petals inserted in the receptacle of the flower, four of which are narrow and equal, being a little longer than the empalement, and the fifth is much larger, and almost heart-shaped, having a tail the length of the empalement; it has ten short stamina, terminated by oblong erect summits, and a roundish germen supporting a very short style, crowned by an acute stigma. The germen afterward turns to a roundish fruit with four cells, each containing one oval seed.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which contains those plants whose flowers have ten stamina and one style.

We have but one Species of this genus, viz.

Toluifera (*Balsamum.*) Lin. Mat. Med. *The Balsam-tree of Tolu.* Balsamum Tolutanum, foliis ceratiæ similibus. C. B. P. 401. *Balsam-tree of Tolu, with leaves like those of the Carob.*

This

This tree grows naturally near Carthagena in America, from whence the late Dr. Houstoun sent the seeds to England: in its native place this grows to a tree of large size. The bark is very thick, rough, and of a brown colour; the branches spread out wide on every side, and are garnished with winged leaves, composed of several oblong oval lobes placed alternately along the foot-stalk, terminated by an odd one; these are four inches long, and two broad in the middle; they are rounded at both ends, but run out to an acute point at the top; they are smooth, of a light green colour, and sit close to the foot-stalk. The flowers are produced in small bunches at the wings of the branches, each standing upon a slender foot-stalk almost an inch long; their empalements are of the round bell-shape, being of one leaf, which is slightly scallopped at the brim into five obtuse parts. The flower has four narrow petals of a yellow colour, which are a little longer than the empalement, and one more whose tail is of the same length of the other petals, and the top is of an oval heart-shape, stretched out beyond the other parts; it has ten short stamina within the tube of the flower, which are terminated by oblong erect summits of a sulphur colour, and at the bottom of the tube is situated a roundish germen, having a very short style, crowned by an acute-pointed stigma. After the flower is past, the germen turns to a roundish fruit the size of a large Pea, divided into four cells, each containing one oblong oval seed.

This tree is propagated by seeds, which must be procured from the country where it grows naturally, and should be fresh, otherwise they will not grow. When they are gathered from the tree, they should be put up in sand to preserve them, for when they are sent over in papers, the insects naturally devour them. These seeds must be sown in pots filled with light earth as soon as they arrive, and plunged into the tan. If it should happen in autumn or winter, they must be plunged in the stove, but in spring or summer, they may be plunged in the tan-bed under a frame; they should be taken out of their covers, otherwise they will be long in the ground before they vegetate. When the plants come up and are fit to remove, they should be carefully transplanted, each into a separate pot, and plunged into a good hot-bed of tanners bark, shading them from the sun till they have taken new root; after which they should be treated in the same way as the Coffee-tree, with which management the plants will succeed.

TOMENTUM is that soft downy substance which grows on the leaves of some plants.

TORDYLIUM. Tourn. Inst. R. H. 320. tab. 170. Lin. Gen. Plant. 293. Hartwort.

The Characters are,

*It hath an umbellated flower; the principal umbel is composed of many small ones, which are compounded of many rays; the involucrum of the greater umbel is composed of narrow leaves, and is frequently as long as the rays of the umbel; those of the rays are half the length; the umbels are difformed. The flowers have five heart-shaped inflexed petals which are equal; they have each five hair-like stamina terminated by single summits, and a roundish germen situated under the flower, supporting two small styles, crowned by obtuse stigmas. The germen afterward turn to a roundish compressed fruit longitudinally indented, dividing in two parts, each containing one roundish compressed seed with an indented border.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and two styles.

The Species are,

1. Tordylium (*Maximum*) umbellis confertis radiatis, foliolis lanceolatis inciso-serratis. Hort. Cliff. 90. *Hartwort with the rays of the umbel closed together, and the lobe of the leaves spear-shaped, and cut like saws.* Tordylium maximum. Tourn. Inst. R. H. 320. *The greatest Hartwort.*
2. Tordylium (*Officinale*) involucris partialibus longitudine florum, foliolis ovatis laciniatis. Hort. Cliff. 90. *Hartwort with the involucrums of the rays as long as the flowers, and oval jagged leaves.* Tordylium Narbonense minus. Tourn. Inst. 320. *Small Hartwort of Narbonne.*
3. Tordylium (*Syriacum*) involucris umbellâ longioribus. Hort. Cliff. 90. *Hartwort with longer involucrums to the umbels.* Tordylium minus, limbo granulato Syriacum. Mor. Umb. 37. *Smaller Syrian Hartwort, with the borders of the seeds granulated.*
4. Tordylium (*Apulum*) umbellulis remotis, foliis pinnatis, pinnis subrotundis laciniatis. Hort. Cliff. 90. *Hartwort with the umbels growing at a distance, and winged leaves having roundish lobes, which are cut on their edges.* Tordylium Apulum minimum. Col. Ecph. 122. *The least Hartwort of Apulia.*
5. Tordylium (*Secacul*) umbellulis remotis, foliis duplicato-pinnatis, pinnis incisis tomentosis. *Hartwort whose umbels are distant from each other, and doubly-winged leaves whose lobes are cut and downy.* Tordylium Orientale, Secacul Arabum dictum. Rawvolfio. Nissol. *Eastern Hartwort, by the Arabians called Secacul.*
6. Tordylium (*Nodosum*) umbellis simplicibus sessilibus, seminibus exterioribus hispidis. Lin. Gen. Plant. 240. *Hartwort with single umbels to the stalks, and the outer side of the seeds prickly.* Caucalis nodosio echinato semine. C. B. P. *Knotted Parsley.*
7. Tordylium (*Anthriscus*) umbellis confertis, foliolis ovato-lanceolatis pinnatifidis. Hort. Cliff. 90. *Hartwort with closed umbels, and oval, spear-shaped, wing-pointed lobes.* Caucalis semine aspero, flosculis rubentibus. C. B. P. *Hedge Parsley with a rough seed, and a reddish flower.*
8. Tordylium (*Latifolium*) umbellis confertis nudiusculis, foliis pinnatis, foliolis lanceolatis inciso-serratis. Lin. Sp. Plant. 345. *Hartwort with naked umbels of flowers, and winged leaves whose lobes are spear-shaped and sawed.* Caucalis arvensis echinata latifolia. C. B. P. 152. *Broad-leaved wild Parsley with rough seeds.*

The first sort grows in Italy and Spain; this is a biennial plant, which dies soon after it has perfected its seeds. The lower leaves of this sort are large and winged, each having three or four pair of lobes terminated by an odd one. The lobes are about three inches long, and one broad in the middle; they are rough and hairy, having many deep indentures on their edges like the teeth of a saw; the stalk rises three or four feet high, sending out two or three branches from the side, garnished at each joint by one winged leaf; those on the lower part of the stalk have two pair of small lobes terminated by an odd one, but those toward the top have one pair, and the middle lobe is long and narrow. The stalk and branches are terminated by umbels of white flowers, whose rays are closed together; these are succeeded by oval compressed seeds, having a thick white border. It flowers in June and July, and the seeds ripen in August or September.

The second sort grows plentifully about Rome, and also in the south of France; this is mentioned in the last edition of Ray's Synopsis as an English plant, growing naturally in Oxfordshire, where I have found it growing on the side of banks; but the seeds were sown there by Mr. Jacob Bobart, gardener at Oxford. The leaves of this sort are composed of three or four pair of oval lobes terminated by an odd one; they are soft and hairy, about one inch long, and three quarters broad, bluntly indented on their edges. The stalks rise a foot and a half high, and divide into three or four branches; these have one small leaf at each joint, and are terminated by umbels of white flowers, composed of several small umbels or rays, which stand upon long foot-stalks, spreading out wide from each other. The flowers are succeeded by smaller compressed seeds which are bordered.

The third sort grows naturally in Syria; this is a low plant, whose stalks seldom rise a foot high. The lower leaves are composed of two pair of oval lobes terminated by a large one; these are hairy, and slightly crenated on their edges; they branch out into two or

or three divisions, and are terminated by umbels of white flowers which have large involucrums, for the most part trifid. The points are spear-shaped, and at their base is situated a small umbel, composed of a few flowers sitting close to the tails of the involucrums. The flowers are succeeded by large, oval, compressed, bordered seeds.

The fourth sort grows naturally in Italy. The stalks of this branch out from the bottom, and seldom rise a foot high; they are hairy and rough. The lower leaves are composed of three pair of roundish lobes, terminated by an odd one, which are hairy and jagged. The general umbel is composed of eight small ones, which stand upon very long foot-stalks, and spread out wide from each other. The flowers are white, and the exterior petal of each is much larger than those of the two first sorts; these are succeeded by roundish, compressed, bordered seeds.

The fifth sort grows naturally about Aleppo, and in other parts of Syria. The bottom leaves are doubly winged, each leaf being composed of four pair of wings terminated by an odd one. The wings are composed of seven oval lobes standing alternately, which are deeply jagged; they are of a yellowish green colour, and a little hairy. The stalks are taper, and not channelled; they rise two feet and a half high, have a few small hairs scattered over them, and at each joint are garnished with one smaller winged leaf; they send out one or two short branches toward the top, and are terminated by large umbels of yellow flowers, composed of ten small umbels, whose foot-stalks are alternately longer; these spread open wide from each other. The flowers are succeeded by compressed oval seeds, shaped like those of Parsneps, of a yellowish colour.

The sixth sort grows naturally in arable land in several of the maritime counties in England, so is rarely admitted into gardens; this has trailing stalks which spread flat on the ground, and are a foot or more in length. The leaves are like those of Parsley, but are cut into finer segments; the umbels of flowers are small, and sit close to the joints of the stalks; the flowers are small and white; they are succeeded by short seeds a little compressed, and set with sharp burry prickles on their outside.

The seventh sort grows naturally on the side of banks and foot-paths in many parts of England; this rises with a slender stalk three feet high. The leaves are like those of Parsley; their lobes are spear-shaped, and have winged points; they are hairy, and stand thinly on the stalks. The flowers are produced in small umbels at the top of the stalks, which are composed of several small umbels or rays which close together; they are small, and of a pale red colour, and are succeeded by small prickly seeds.

The eighth sort grows naturally among the Corn in Cambridgeshire, and in some other parts of England. This rises with a channelled stalk three feet high, garnished with one winged leaf at each joint, composed of two pair of lobes terminated by a long one: they are broad, spear-shaped, and deeply sawed on their edges. The umbels of flowers which terminate the stalks are clustered together; the seeds are broad, rough, and have borders round them.

All these plants may be termed annual, because they do not live more than one year; but some of them are called biennial, from the young plants which come up in autumn living through the winter, and producing their flowers and fruit the following summer; but as the seeds which are sown or permitted to scatter, perfect their seeds in the compass of one year, they should be termed annual, for this is the property of many of the plants with umbellated flowers, whose seeds should be sown in autumn; otherwise, if they come up (which frequently does not happen the same year when they are sown in the spring,) the plants generally decay before their seeds ripen; but as their whole growth is performed within the year, they are esteemed as annual plants.

They are propagated by seeds, which should be sown in autumn soon after they are ripe, when the plants will soon appear, and are very hardy, so that they require no farther care but to keep them clear from weeds, and where they come up too close together, they should be thinned, so as to leave them six inches asunder. In June following the plants will flower, and their seeds will ripen in August, which, if permitted to scatter on the ground, will produce a supply of plants without any trouble. If the seeds of these plants are kept out of the ground till spring, they seldom succeed; for if any plants are produced from the seeds then sown, they commonly perish before they have perfected their seeds, whereas those which are sown in autumn rarely fail. These plants will grow on any soil or situation, so may be put into any obscure part of the garden.

TORMENTILLA. Tourn. Inst. R. H. 298. tab. 153. Lin. Gen. Plant. 153. Tormentil.

The Characters are,

*The flower has a plain empalement of one leaf, divided into eight segments at the top; it has four oval heart-shaped petals, whose tails are inserted in the empalement, and spread open, and many awl-shaped stamina which are inserted in the empalement, terminated by single summits; it has eight small germen collected in a head, which have slender styles the length of the germen inserted to their sides, crowned by obtuse stigmas. The germen afterward turns to a fruit, containing many small seeds included in the empalement.*

This genus of plants is ranged in the fifth section of Linnæus's twelfth class, which includes those plants whose flowers have from twelve to twenty stamina, which are inserted in the empalement.

The Species are,

1. Tormentilla (*Erecta*) caule erecto. Lin. Sp. Plant. 500. *Tormentil with an erect stalk.* Tormentilla vulgaris. Park. Theat. 394. *Common Tormentil.*
2. Tormentilla (*Reptans*) caule repente, foliis petiolatis. Lin. Sp. Plant. 500. *Tormentil with a creeping stalk, and leaves on foot-stalks.* Pentaphyllum reptans, alatum, foliis profundiùs serratis. D. Plot. Oxf. 6. 1. 7. tab. 9. *Creeping winged Cinquefoil, with leaves which are deeply sawed.*

The first sort grows wild on dry pastures and commons in most parts of England, so is never cultivated in gardens; this is so commonly known as to need no description. The roots of this plant have been frequently used for tanning of leather, in places where Oak bark is scarce. This root is also much used in medicine, and is accounted the best astringent in the whole vegetable kingdom.

The second sort is found in some particular places of England growing wild, but particularly in Oxfordshire. The stalks of this sort spread on the ground, and emit roots from their joints, whereby they propagate very fast: this is rarely preserved, unless in some botanic gardens for the sake of variety. It requires no care to propagate these plants, since, if their roots are once planted in almost any soil or situation, the plants will flourish without any other care, but to prevent their being over-run with great weeds.

TOURNEFORTIA. Lin. Gen. Plant. 176. Pittonia. Plum. Nov. Gen. 5. tab. 3.

The Characters are,

*The empalement of the flower is of one leaf, cut into five small segments at the top, and is permanent. The flower is of one petal, of the globular bell-shape, and cut at the brim into five acute points, which spread open horizontally; it has five awl-shaped stamina the length of the tube, terminated by single summits, and a globular germen supporting a single style the length of the stamina, crowned by a single stigma. The germen afterward becomes a spherical succulent berry, inclosing four oblong oval seeds resting upon the empalement.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

Father Plumier, who discovered several species of this genus in America, constituted this genus, and gave it the title of Pittonia, in honour of Dr. Joseph Pitton; but

but Dr. Linnæus has changed the title from Pittonia to Tournefortia.

The Species are,

1. Tournefortia (*Fœtidissima*) foliis ovato-lanceolatis, hirtis pedunculis ramosis spicis pendulis. Lin. Sp. 201. *Tournefortia with oval, spear-shaped, hairy leaves, and hanging spikes of flowers.* Pittonia racemoso nicotianæ foliis fœtidissimis. Plum. Gen. Nov. 5. *Branching Pittonia with fœtid Tobacco leaves.*
2. Tournefortia (*Hirsutissima*) foliis ovatis petiolatis, caule hirsuto, spicis ramosissimis terminalibus. Lin. Sp. Plant. 140. *Tournefortia with oval leaves growing upon foot-stalks, and a hairy stalk terminated by very branching spikes of flowers.* Pittonia hirsutissima & ramosissima, baccis albis. Plum. Gen. Nov. 5. *The most branching hairy Pittonia with white berries.*
3. Tournefortia (*Volubilis*) foliis ovatis acuminatis, glabris petiolis reflexis, caule volubili. Lin. Sp. Plant. 143. *Tournefortia with oval, acute-pointed, smooth leaves, having reflexed foot-stalks and a twining stalk.* Pittonia scandens, baccis niveis, nigris maculis notatis. Plum. Gen. 5. *Climbing Pittonia, with white berries marked with black spots.*
4. Tournefortia (*Scandens*) foliis cordatis hirsutis, spicis racemosis reflexis, caule volubili. *Tournefortia with hairy heart-shaped leaves, branching reflexed spikes of flowers, and a twining stalk.* Pittonia scandens racemosa, flore fusco. Houst. MSS. *Climbing branching Pittonia, with flowers of a brown colour.*
5. Tournefortia (*Tomentosa*) foliis cordatis subtus tomentosis, spicis racemosis brevibus, caule volubili. *Tournefortia with heart-shaped leaves which are woolly on their under side, very short branching spikes of flowers, and a twining stalk.* Pittonia scandens, racemosa, foliis subrotundis subtus incanis. Houst. MSS. *Climbing branching Pittonia, with roundish leaves which are hoary on their under side.*
6. Tournefortia (*Carnosa*) foliis ovatis rugosis petiolatis, spicis racemosis axillaribus, caule fruticoso. *Tournefortia with oval rough leaves growing upon foot-stalks, branching spikes of flowers proceeding from the wings of the stalks, and a shrubby stalk.* Pittonia frutescens, folio carnosa hirsuta & obtuso. Plum. Gen. 5. *Shrubby Pittonia with a fleshy, hairy, and blunt leaf.*
7. Tournefortia (*Suffruticosa*) foliis sub-lanceolatis incanis suffruticoso. Lin. Sp. 202. *Tournefortia with oval spear-shaped leaves having acute points, being woolly on their under side, branching incurved spikes of flowers, and a branching stalk.*
8. Tournefortia (*Humilis*) foliis lanceolatis sessilibus, spicis simplicibus recurvis lateralibus. Lin. Sp. Plant. 141. *Tournefortia with spear-shaped leaves sitting close to the stalks, and single recurved spikes of flowers growing at the wings of the same.* Pittonia humilis anchusæ folio. Plum. Gen. 5. *Low Pittonia with an Alkanet leaf.*

The first sort grows naturally in Jamaica, and in some of the other islands in the West-Indies, where it rises with shrubby stalks ten or twelve feet high, sending out many branches, which are closely garnished with oval spear-shaped leaves placed alternately round the stalks; they are five inches long, and two and a half broad in the middle, hairy on their under side, and stand upon short foot-stalks. The branches are terminated by long branching spikes of flowers, which are ranged on one side the foot-stalks in the same manner as those of the Heliotrope or Turnsol. Some of the foot-stalks sustain two, others three, and some four spikes of flowers, which are near five inches long, and are reflexed like a scorpion's tail at the top. The flowers are of a dirty white colour; they are small, and closely ranged on one side the spike; these are succeeded by small succulent fruit, inclosing four oblong seeds in each.

The second sort is also a native of the islands in the West-Indies. The stalks of this are shrubby, taper, and rough; they rise to the height of eight or ten feet, dividing into many branches, which are covered with a light brown, hairy, rough bark, and garnished with oval leaves placed alternately; these are about four inches long, and two and a half broad, having many transverse veins running from the midrib to the sides; they have short hairy foot-stalks, and are of a deep green on their upper side. The branches are terminated by very branchy spikes of flowers; these are succeeded by small, roundish, succulent fruit, each inclosing four oblong seeds.

The third sort grows naturally in Jamaica, and some of the islands in America; this has a twining ligneous stalk, which twists about the neighbouring trees for support, and rises to the height of ten or twelve feet, sending out several slender ligneous branches, which are garnished with oval acute-pointed leaves, whose foot-stalks are reflexed. The flowers are produced in branching spikes from the side and the top of the branches; they are small and white, and are succeeded by small, white, succulent berries, having one or two black spots on each.

The fourth sort was discovered by the late Dr. Houstoun, growing naturally in Jamaica, who sent the seeds to England; this hath shrubby branching stalks, which rise to the height of ten or twelve feet. The branches are garnished with heart-shaped hairy leaves, near three inches long, and one and a half broad near the base, ending in acute points; they are of a thinner texture than those of the former species, and stand upon short foot-stalks. The flowers come out at the end of the branches in very slender branching spikes; they are small, and of a dirty brown colour, ranged along on the upper side of the foot-stalk; these are succeeded by small pulpy berries, each containing four seeds.

The fifth sort was found growing naturally by Mr. Robert Millar near Carthagena, in New Spain; this has climbing stalks, which twine about any neighbouring support, and rise to the height of ten or twelve feet. The branches are garnished with heart-shaped leaves which are two inches long, and one and a quarter broad near their base; they are very downy on their under side, and stand upon very short foot-stalks. The flowers are produced in short branching spikes which come out from the wings of the branches; they are of a dirty white colour, small, and are succceeded by small succulent berries, inclosing two, three, and sometimes four seeds.

The sixth sort was discovered by the late Mr. Robert Millar, growing naturally near Carthagena in New Spain; this has a strong ligneous stalk, which rises near twenty feet high, sending out several strong ligneous branches, covered with a light brown bark which is rough, and garnished with thick oval leaves, four inches long and three broad; they are very rough on their upper surface, and of a dark green colour, but pale and smoother on their under side, standing upon pretty long foot-stalks. The flowers are produced in branching spikes from the wings of the branches; they are small, white, and shaped like those of the other species, and are succeeded by small succulent berries, each including two or three oblong seeds.

The seventh sort was discovered by the same gentleman in the same country; this has woody stalks which rise five or six feet high, from which spring out many slender ligneous branches, garnished with oval spear-shaped leaves about two inches long, and one broad in the middle, which are rounded at each end, but have acute points; they are of a dark green on their upper surface, but have a white down on their under side, and sit close to the branches. The flowers are produced from the wings of the stalks, and also at the top; they are formed in slender branching spikes, being ranged on one side of the spikes which are recurved; they are white, and are succeeded by small succulent berries, which contain two or three seeds.

The eighth sort was found growing naturally at Campeachy, by the late Dr. Houstoun; this plant has low shrubby stalks, which seldom rise more than three feet high, sending out a few slender ligneous branches, which are garnished with rough spear-shaped leaves sitting close to the branches; these are of a dark green on their upper side, but pale on their under. The flowers

flowers come out in single spikes from the wings of the stalk; they are white, and are succeeded by small succulent berries like the former sort.

These plants are propagated by seeds, which must be procured from the countries where they grow naturally; these should be sown in small pots filled with light earth, and plunged into a hot-bed of tanners bark. These seeds sometimes grow the first year, but they often remain in the ground a whole year; therefore, if the plants should not come up the same season, the pots should be plunged in autumn into the tan-bed in the stove, where they should remain all the winter, and in the spring they should be removed out, and plunged into a fresh tan-bed, which will soon bring up the plants if the seeds were good. When these are fit to remove, they should be each planted in a small pot, and plunged into a tan-bed, where they must be shaded from the sun till they have taken new root, and then they must be treated in the same way as other tender plants from the same countries, which require to be kept constantly in the bark-stove.

TOXICODENDRON. Tourn. Inst. R. H. 610. tab. 381. Rhus. Lin. Gen. Plant. 331. [τοξικὸν, poison, and δένδρον, a tree.] Poison-tree, vulgò.

The CHARACTERS are,

*The male flowers are upon different plants from the female; they have a small empalement cut into five points at the brim, and five small roundish petals which spread open; they have five short stamina, terminated by roundish summits. The female flowers have empalements and petals like the male; they have no stamina, but in the center is situated a roundish germen, supporting three small styles, crowned with globular stigmas. The germen afterward turns to a berry with one or two cells, inclosing one seed in each.*

This genus of plants is ranged in the third section of Linnæus's fifth class, which includes the plants whose flowers have five stamina and three styles, and has joined them to his genus of Rhus; but this genus should be ranged in the fifth section of his twenty-second class, which contains those plants whose flowers are male and female on different plants, and the male flowers have five stamina.

The SPECIES are,

1. TOXICODENDRON (*Vulgare*) foliis ternatis, foliolis obcordatis, glabris, integerrimis, caule radicante. *Poison-tree with roundish, heart-shaped, smooth, entire, trifoliate leaves, and a stalk putting out roots.* Toxicodendron triphyllum, folio sinuato pubescente. Tourn. Inst. 611. *Smooth three-leaved Poison-tree, or Poison Oak.*
2. TOXICODENDRON (*Pubescens*) foliis ternatis, foliolis ovatis inciso-angulatis pubescentibus. *Poison-tree with trifoliate leaves whose lobes are oval, angularly cut, and covered with short soft hairs.* Toxicodendron triphyllum, glabrum. Tourn. Inst. 611. *The three-leaved Poison-tree, with a soft, hairy, sinuated leaf.*
3. TOXICODENDRON (*Glabrum*) foliis ternatis, foliolis ovato-lanceolatis glabris caule erecto fruticoso. *Poison-tree with trifoliate leaves whose lobes are oval, spear-shaped, and smooth, and an erect shrubby stalk.* Toxicodendron rectum, foliis minioribus glabris. Hort. Elth. 389. *Upright Poison-tree with smaller smooth leaves.*
4. TOXICODENDRON (*Pinnatis*) foliis pinnatis, foliolis ovato-lanceolatis integerrimis. *Poison-tree with winged leaves whose lobes are oval, spear-shaped, and entire.* Toxicodendron foliis alatis, fructu rhomboide. Hort. Elth. 392. *Poison-tree with winged leaves and a rhomboidal fruit, called Poison Ash.* And the Rhus foliis pinnatis integerrimis, petiolo integro æquali. Lin. Mat. Med. 151. Also the Amyris foliis impari pinnatis of the same author. Sp. Plant. 496.
5. TOXICODENDRON (*Crenatum*) foliis ternatis, foliolis ovatis crenato-dentatis glabris. *Poison-tree with trifoliate leaves, whose lobes are oval, smooth, and bluntly indented.*
6. TOXICODENDRON (*Volubilis*) foliis ternatis, foliolis ovatis inciso-sinuatis glabris, caule volubili radicante. *Poison-tree with trifoliate leaves whose lobes are oval, smooth, and cut into sinuses, and a twining rooting stalk.* Toxicodendron amplexicaule, foliis minoribus glabris. Hort. Elth. 399. *Poison-tree with a twining stalk, and smaller smooth leaves.*
7. TOXICODENDRON (*Serratum*) foliis sæpius ternatis, foliolis oblongo-ovatis rugosis serratis, caule radicante. *Poison-tree with leaves which are generally trifoliate, oblong, oval, rough, sawed lobes, and a rooting stalk.*
8. TOXICODENDRON (*Arboreo*) foliis ternatis, foliolis lanceolatis supernè inæqualiter serratis, subtus tomentosis, caule arborescente. *Poison-tree with trifoliate leaves, spear-shaped lobes unequally sawed toward their points, downy on their under side, and a tree-like stalk.* Baccifera Indica trifoliata, fructu rotundo monopyreno, pedunculo longo. Sloan. Cat. 170. *Indian, trifoliate, berry-bearing-tree, with a roundish fruit having one seed, and a long foot-stalk.*
9. TOXICODENDRON (*Arborescens*) foliis ternatis, foliolis ovato-lanceolatis acuminatis glabris, caule fruticoso ramoso. *Poison-tree with trifoliate leaves, having oval, spear-shaped, acute-pointed, smooth lobes, and a shrubby branching stalk.* Toxicodendron arborescens pyri foliis glabris, floribus racemosis. Houst. MSS. *Tree-like Poison-tree, with smooth Pear leaves and branching flowers.*
10. TOXICODENDRON (*Altissimum*) foliis pinnatis sessilibus, lobis acuminatis. *The tallest Poison-tree with winged leaves, whose lobes are pointed, and sit close to the foot-stalks.* Fasi no Ki. Arbor Vernicifera spuria, sylvestris angustifolia. Kemp. Amœn. 794. *The spurious Vernice-tree with narrow leaves.*

The first sort grows naturally in many parts of North America; this has a low shrubby stalk, which seldom rises more than three feet high, sending out shoots near the bottom, which trail upon the ground, putting out roots from their joints, whereby it multiplies and spreads greatly; so that when it is not confined or trained up to a support, the stalks seldom rise upward. If the stalks happen to be close to a wall, they emit roots which fasten to the joints in the wall, and support themselves when they are severed from the root; and the stalks of such plants will become more ligneous, and rise much higher, than those which grow in the ground. The foot-stalks of the leaves are near a foot long; the leaves are composed of three oval heart-shaped lobes, which are smooth and entire, each lobe standing upon short foot-stalks; the lobes are five inches long, and three inches and a half broad; the two side lobes are oblique to the foot-stalk, but the middle one is equal; they have many transverse veins running from the midrib to the borders. The flowers come out from the side of the stalk in loose panicles; they are of an herbaceous colour and small, so make little appearance. Some plants have only male flowers, which have five stamina in each; these decay without producing fruit, but upon the other plants are only female flowers, which have a germen and three very short styles; these are succeeded by roundish, channelled, smooth berries of a gray colour, which inclose one or two seeds, but these seeds do not grow unless some male plants are near them. The plants flower in July, and the seeds ripen in autumn. This plant, whence once planted in a garden, will propagate fast enough by its trailing branches, which put out roots at every part. It will thrive in almost any soil or situation.

The second sort grows naturally in many parts of North America. The stalks of this sort rise higher than those of the former; the branches are slender but ligneous; they have a brown bark, and are garnished with downy leaves standing upon pretty long foot-stalks; these are composed of three oval lobes about two inches long, and one and a half broad, indented angularly, and are hoary on their under side. The male flowers, which are produced on separate plants from the fruit, come out from the side of the stalks in close short spikes; these are of an herbaceous colour, and have five short stamina in each. The female flowers are produced in loose panicles; these are in

in ſhape and colour like the male, but are larger, and have a roundiſh germen, ſupporting three very ſhort ſtyles; theſe are ſucceeded by roundiſh berries which ripen in autumn.

The third ſort grows naturally in North America; this has a ſhrubby branching ſtalk which riſes ſix or ſeven feet high, covered with a brown bark. The branches are ligneous, and grow erect; they are garniſhed with ſmooth trifoliate leaves, whoſe lobes are oval, ſpear-ſhaped, and have a few ſmall indentures on their borders; they are near three inches long, and one and a half broad, with ſeveral tranſverſe veins from the midrib to their borders. The male and female flowers grow upon ſeparate plants; their ſhape and colour is like thoſe of the former, and the fruit is alſo like that.

The fourth ſort grows naturally in Virginia, Penſylvania, New England, and Carolina; from all theſe countries I have received ſeeds and plants of it, and it alſo grows in Japan. This, in the countries where it grows naturally, riſes with a ſtrong woody ſtalk to the height of twenty feet or upward, but in England we ſeldom ſee any of them more than five or ſix feet high; the reaſon of this is from the plants being tender, ſo are deſtroyed in ſevere winters; but I have ſeen ſome plants which were kept in pots and ſheltered in winter, upward of ten feet high, in the garden of Samuel Reynardſon, Eſq; at Hillendon, which, after his death were purchaſed, with all his other exotic plants, by Sir Robert Walpole. This has a ſtrong woody ſtalk, covered with a light brown bark inclining to gray, branching out on every ſide. The branches are garniſhed with winged leaves, compoſed of two or three pair of lobes terminated by an odd one. The lobes vary greatly in their ſhape, but for the moſt part they are ſpear-ſhaped, about three or four inches long, and one and a half broad in the middle; they are ſometimes rounded at their baſe, but end in acute points; their upper ſurface is ſmooth, and of a lucid green, but their under ſide is pale and a little hairy. The foot-ſtalks of the leaves change to a bright purple colour, eſpecially toward the latter part of ſummer, and in autumn all the leaves are of a beautiful purple colour before they fall off. The male flowers are produced in looſe panicles from the wings of the branches; they are ſmall, of an herbaceous white colour, compoſed of five ſmall roundiſh petals, and have five ſhort ſtamina within, terminated by roundiſh ſummits. The female flowers are upon ſeparate plants from the male, and are diſpoſed on looſe panicles; theſe are ſhaped like the male, but are ſomewhat larger, and have in their center a roundiſh germen, ſupporting three very ſhort ſtyles, crowned with globular ſtigmas. The germen afterward turns to a berry variable in ſhape, ſometimes almoſt oval, at others ſhaped like a ſmall ſpear; but the moſt general form is roundiſh, with a protuberance almoſt like the Cicer; theſe include one ſeed. It flowers in July, and in warm ſeaſons the female plants produce fruit, but they do not ripen here.

This is undoubtedly the ſame plant which is mentioned by Dr. Kempfer in his Amœnitates Exoticarum, by the title of Sitz, vel Sits Adju, or Arbor vernicifera legitima, folio pinnato juglandis, fructu racemoſa Ciceris facie, p. 791, 792. The true Varniſh-tree with a Walnut-tree leaf, and a branching fruit like Cicers. But the figure he has exhibited of this plant, is the moſt inaccurate of any perhaps to be found in any of the modern books of botany; it is drawn from a ſide ſhoot of a branch which has been cut off, ſo has neither flower nor fruit to it, and being a vigorous ſhoot, the leaves are very different in ſize and ſhape from thoſe on plants which have not been headed; and his deſcription of the leaves ſeems to have been taken from this branch, otherwiſe he could not have compared them to thoſe of the Walnut-tree. He ſeems to have been conſcious of this fault, by his adding another figure of the plant in ſmall under his own, taken from a Japan Herbal, in which there is a much better repreſentation of it than his own conveys. How a perſon, who was employing himſelf in making drawings of plants, in a country where the natural hiſtory of it was ſo little known, ſhould make choice of ſuch an imperfect ſample for his figure, is amazing; for there can be no doubt of his meeting with perfect plants in flower or fruit, in a place where the ſhrubs are cultivated ſo plentifully as he mentions; and in his deſcription of it, he ſets out by comparing the height of the ſhrubs to thoſe of Willow, than which he could not have choſen any plant by way of compariſon, which would have conveyed a more indetermined idea; for it is well known there are different ſpecies of Willow, whoſe growth is from four to forty feet high; therefore there can be no other way of reconciling his deſcription with what he afterward mentions, when he is giving an account of the method uſed by the natives in collecting the varniſh, where he ſays the ſhrubs are cut down every third year, but by comparing their growth with that of the Willows, which are cut down for fuel, &c. every four or five years.

However, as the dried ſamples of this plant which he brought to Europe, agrees with the American Toxicodendron here mentioned, and the milky juice of both have the ſame qualities of ſtaining, ſo there can be no doubt of the plants being the ſame; therefore if it is thought that varniſh may be of public utility, it may be collected in plenty in moſt of the Engliſh ſettlements in North America.

Kempfer has alſo given a figure and deſcription of a ſpurious Varniſh-tree, which is called Faſi-no-Ki by the natives, and is by him titled Arbor vernicifera ſpuria, ſylveſtris anguſtifolia. Spurious wild Varniſh-tree with a narrow leaf, which he ſays agrees with the other in every part, excepting the lobes of the leaves, which are narrower. This led me into a miſtake in the former editions of the Gardeners Dictionary, by ſuppoſing their difference might ariſe from culture only; but having ſince raiſed from ſeeds a ſhrub which has all the appearance of his ſpurious Varniſh-tree, and is evidently a diſtinct ſpecies, if not a different genus from the true ſort, I am certain Kempfer has been guilty of a great miſtake in this particular. The ſeeds of this were ſent from China, for thoſe of the Varniſh-tree; but when I ſowed them, I remarked they were pretty much like thoſe of the Beech-tree, but ſmaller, being thick on one ſide and narrow on the other, in ſhape of a wedge, from whence I ſuppoſed there were three of the ſeeds included in one capſule. There is a ſhrub of this kind now growing in the Chelſea Garden, which is more than twenty feet high, but, as it has not yet produced flowers, I am at a loſs where to range it, therefore have placed it here till it has ſhewn its flowers. How Dr. Linnæus came to change the title of this plant, and remove it to another claſs, I am at a loſs to account; for had he ſeen the plants growing, or had ſpecimens of it, I am certain he would not have done: for though ſometimes, in very vigorous growing plants, the flowers have frequently ſix or ſeven ſtamina, yet their conſtant number is rarely more than five: and how ſome other perſons, from whom he had this intelligence, has ſuppoſed the true Varniſh-tree and the wild one were the ſame, I am at as great a loſs to gueſs; for the leaves of the true Varniſh-tree has ſeldom more than four pair of lobes, but the wild ſort has fourteen or ſixteen pair, and the lobes are differently formed.

The fifth ſort grows naturally in North America, from whence the ſeeds were a few years ſince brought to England; this has a ſhrubby ſtalk which ſends out many ligneous branches, covered with a ſmooth purple bark, and garniſhed with trifoliate leaves, ſtanding upon foot-ſtalks an inch long; the lobes are oval, about two inches long, and one and a half broad in the middle, of a deep lucid green on their upper ſide, but of a pale green on their under, and are deeply crenated or indented on their edges, their baſe

joining close to the foot-stalks. The leaves, when bruised, emit an odour like that of Orange-peel, from whence the gardeners have titled it the sweet-scented Toxicodendron. The male flowers are produced in short close panicles; they are small, and of an herbaceous white colour; they grow upon separate plants from the fruit, which grow in sparsed panicles, and are of an oval shape.

The sixth sort grows naturally in North America. The stalks of this sort emit roots their whole length, whereby they fasten to trees or any neighbouring support, and climb to the height of six or eight feet; these are garnished with trifoliate oval leaves, which are smooth, and cut into sinuses on their edges. The lobes are four inches long and two broad. The flowers are produced in short panicles from the side of the branches; they are male and female on different plants like the other species.

The seventh sort was sent me by Mr. John Bartram from Philadelphia, by the title of Great Toxicodendron; this hath trailing roots which run near the surface of the ground, sending up stalks in different places; the leaves stand upon long foot-stalks; they have chiefly three lobes, but some have four. The lobes are obtuse, rough, and sawed on their edges. They are four or five inches long, and three broad; this sort has not as yet flowered in England, so I can give no farther description of the plant at present: these sorts are all of them so hardy as to thrive in the open air in England, but the fourth sort is often destroyed by severe frost, so should be planted in a warm situation.

The first, sixth, and seventh sorts propagate in plenty by their creeping stalks and roots; the others are propagated by laying down their branches, which will put out roots in one year, and may then be taken off and transplanted, either in the places where they are to remain, or in a nursery, to grow two or three years to get strength before they are planted out for good; they are also propagated by seeds, which should be sown on a bed of light earth, and when the plants come up they must be kept clean from weeds the following summer; and before the frost comes on in autumn, the bed should be hooped over, that the plants may be covered with mats, for otherwise the early frosts will kill their tops, which frequently causes their stalks to decay to the ground; for as the plants are tender, and generally shoot late the first year, they are in much greater danger than when they get more strength. In spring the plants may be transplanted into nursery-beds to grow a year or two, and may then be transplanted for good.

These plants are preserved by the curious in botany for the sake of variety, but as there is little beauty in them, there are not many of the sorts cultivated in in England. The wood of these trees, when burnt, emits a noxious fume, which will suffocate animals when they are shut up in a room where it is burnt: an instance of this is mentioned in the Philosophical Transactions by Dr. William Sherard, which was communicated to him in a letter from New England by Mr. Moore, in which he mentions some people who had cut some of this wood for fuel, which they were burning, and in a short time they lost the use of their limbs, and became stupid; so that if a neighbour had not accidentally opened the door, and seen them in that condition, it is generally believed they would soon have perished. This should caution people from making use of this wood for such purpose.

When a person is poisoned by handling this wood, in a few hours he feels an itching pain, which provokes a scratching, which is followed by an inflammation and swelling. Sometimes a person has had his legs poisoned, which have run with water. Some of the inhabitants of America affirm, they can distinguish this wood by the touch in the dark, from its extreme coldness, which is like ice; but what is mentioned of this poisonous quality, is most applicable to the fourth sort here mentioned, which, by the description, agrees with this species.

The juice of the tree is milky when it first issues out of the wounded part, but soon after it is exposed to the air it turns black, and has a very strong fœtid scent, and is corroding; for I have observed, on cutting off a small branch from one of these shrubs, that the blade of the knife has been changed black in a moment's time, so far as the juice had spread over it, which I could not get off without grinding the knife.

The eighth sort grows naturally in Jamaica on the red hills, and Campeachy, in great plenty. It has a thick woody stem which rises near thirty feet high, with a smooth Ash-coloured bark, sending out ligneous branches on every side, which have a hairy rusty-coloured bark, and are garnished with trifoliate leaves which have hairy foot-stalks two inches long. The lobes are spear-shaped, about four inches long, and two broad in the middle, drawing to points at both ends; they are unequally sawed toward the top, and have many transverse veins running from the midrib to the borders; they are of a dark green on their upper side, but have a brown woolly down on their under side. The flowers are ranged in a single racemus, which springs from the wings of the branches; they are small, of a yellowish colour, and the female flowers are succeeded by small, oval, smooth berries, of an Orange colour when ripe.

The ninth sort grows naturally about Carthagena in New Spain; this rises with a shrubby stalk twelve or fourteen feet high, covered with a gray bark, sending out a great number of branches on every side, which are garnished with trifoliate smooth leaves, whose lobes are oval, spear-shaped, and oblique to their foot-stalks; they are near three inches long, and an inch and a half broad, running out in long acute points. The male and female flowers are upon different plants; they are formed in loose panicles, are small, and of a dirty white colour. The female flowers are succeeded by small, oval, smooth berries, each including one seed.

The two last sorts are tender plants, so will not thrive in this country without the assistance of artificial heat; they are propagated by seeds, when these can be procured from the countries where the plants grow naturally. These should be sown as soon as they arrive here, in pots filled with light earth, and plunged into a tan-bed. Sometimes the plants will come up the same year, but the seeds often lie long in the ground when they are sown in the spring; and when they do not grow the first year the pots should be plunged in the bark-bed in the stove in autumn, where they should be plunged into a fresh hot-bed under a frame, which will soon bring up the plants. When these are fit to remove, they should be each planted in a small pot filled with light earth, and plunged into a new tan-bed, observing to shade them from the sun till they have taken new root; then they should be treated in the same way as other tender exotic plants, which are constantly kept in the bark-stove.

The tenth sort came from China. This grows to a large size, sending out many branches on every side, which are garnished with very long winged leaves, each leaf having fourteen or sixteen pair of lobes, which sit close to the midrib; as this has not produced flowers in England, so we are at a loss where to place it, but it is hardy enough to live in the open air in winter. This propagates fast enough by the many suckers sent out from the roots.

TRACHELIUM. Tourn. Inst. R. H. 130. tab. 50. Lin. Gen. Plant. 204. Throatwort.

The Characters are,

*The flower has a small empalement cut at the top in five parts, sitting upon the germen. It has one petal, which is funnel-shaped, having a long, slender, cylindrical tube, cut at the top into five small oval segments, which spread open; it has five hair-like stamina the length of the petal, terminated by single summits; and a roundish three-cornered germen situated under the flower, supporting a long slender style, crowned by a globular stigma. The germen afterward turns to a roundish obtuse capsule with three lobes, having three cells, which are filled with small seeds.*

This

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and one ſtyle.

We know but one SPECIES of this genus in the Engliſh gardens, viz.

TRACHELIUM (*Cæruleum.*) Hort. Upſal. 41. *Throatwort.* Trachelium azureum umbelliferum. Pon. Bal. 44. *Blue Mountain Throatwort.*

This plant grows naturally in ſhady woods in many parts of Italy. It has a perennial root which is fleſhy and tuberous, ſending out many fibres which ſpread wide on every ſide. The leaves are oval, ſpear-ſhaped, about two inches long, and one broad in the middle, ſawed on their edges, and ending in acute points. The ſtalks riſe a foot and a half high, and are garniſhed with leaves ſhaped like thoſe at the bottom, but come out irregularly. Sometimes there are two pretty large leaves, and one or two ſmaller riſing from the ſame point; at others, one large and three ſmaller at the ſame joint; theſe come out alternate, and the upper part of the ſtalk, immediately under the umbel, is naked of leaves, except two or three narrow ones, which are cloſe to the foot-ſtalks of the flowers; theſe are diſpoſed in form of an umbel compoſed of many ſmall ones. The flowers are ſmall, funnel-ſhaped, and of an azure blue colour; theſe appear in June and July, and are ſucceeded by roundiſh capſules, with three cells filled with ſmall ſeeds, which ripen in September.

This plant is propagated by ſeeds, which ſhould be ſown in autumn when they are ripe, for when they are kept out of the ground till ſpring, they frequently fail, or if they do grow, it is not before the following ſpring. When the plants come up, they ſhould be kept clean from weeds, and as ſoon as they are big enough to remove, they ſhould be tranſplanted on an eaſt-aſpected border of light undunged earth, placing them in rows ſix inches apart, and four inches diſtant in the rows, ſhading them from the ſun till they have taken new root; after which they require no other care but to keep them clean from weeds till autumn, when they may be tranſplanted into the borders of the flower-garden, where they will flower the following ſummer.

But as theſe plants will thrive better on old walls, when by accident they have ariſen from ſeeds, ſo their ſeeds, when ripe, may be ſcattered on ſuch walls as are old, or where there is earth lodged ſufficient to receive the ſeeds; where the plants will come up and reſiſt the cold much better, and continue longer than when ſown in the full ground; and when a few of the plants are eſtabliſhed on the walls, they will ſhed their ſeeds, ſo that they will maintain themſelves without any farther care. I have obſerved ſome plants of this kind, which have grown from the joints of a wall, where there has not been the leaſt earth to ſupport them, which have reſiſted the cold, though they have been greatly expoſed to the winds, when moſt of thoſe in the full ground were killed; ſo that theſe plants are very proper to cover the walls of ruins, where they will have a very good effect.

TRADESCANTIA. Lin. Gen. Plant. 398. Ephemeron. Tourn. Inſt. 193. Flower of a Day, or Virginia Spiderwort.

The CHARACTERS are,

*The empalement is compoſed of three oval concave leaves which are permanent. The flower has three orbicular, large, ſpreading petals, which are equal, and ſix ſlender hairy ſtamina which ſtand erect, and are the length of the empalement, terminated by kidney-ſhaped ſummits, with an oval germen ſupporting a ſlender three-cornered ſtyle, crowned by a three-cornered obtuſe ſtigma. The empalement covers an oval capſule with three cells, filled with angular ſeeds.*

This genus of plants is placed in the firſt ſection of Linnæus's ſixth claſs, which contains thoſe plants whoſe flowers have ſix ſtamina and one ſtyle.

We have but one SPECIES of this plant in England, though there are two other ſpecies, one of which grows on the coaſt of Malabar, the other in the American iſlands.

TRADESCANTIA (*Virginiana*) erecta lævis, floribus congeſtis. Lin. Sp. 411. *Virginia Spiderwort with erect ſmooth ſtalks, and flowers cloſely connected at the top.*

This plant grows naturally in Virginia, and moſt other parts of North America; it hath roots compoſed of many fleſhy fibres; the ſtalks are ſmooth, riſing a foot and a half high, garniſhed by long, ſmooth, keel-ſhaped leaves, which embrace the ſtalks; the flowers are produced in cluſters at the top of the ſtalks; theſe are compoſed of three pretty large ſpreading petals of a purple colour; they appear early in June, and there is a ſucceſſion of flowers moſt part of ſummer, though each flower continues but one day, from whence it had the title of Ephemeron.

There are two other varieties of this ſpecies, one with a deep blue, and the other a white flower; but as theſe vary from one to another when raiſed from ſeeds, ſo they ſhould not be ſeparated.

Theſe plants multiply ſo faſt by their roots, and alſo from the ſeeds if permitted to fall, that they ſhould be yearly reduced to keep them within bounds. The beſt time to remove and part the roots is in the autumn.

TRAGACANTHA. Tourn. Inſt. R. H. 417. tab. 234. Aſtragalus. Lin. Gen. Plant. 799. [Τραγάκανθα, of Τράγος, a goat, and Ἀκάνθη, a thorn.] Goats-thorn.

The CHARACTERS are,

*The empalement of the flower is of one leaf, indented in five parts, the lower ſegments being the ſhorteſt. The flower is of the butterfly kind; the ſtandard is long, erect, indented at the point, and the borders are reflexed. The wings are ſhorter than the ſtandard. The keel is of the ſame length with the wings, and is indented; it has ten ſtamina, nine are joined and one is ſeparated, terminated by roundiſh ſummits, and a ſhort taper germen ſupporting an awl-ſhaped ſtyle, crowned by an obtuſe ſtigma. The germen afterward becomes a ſhort ſwelling pod, having two longitudinal cells, incloſing kidney-ſhaped ſeeds.*

This genus of plants Dr. Linnæus has joined to the Aſtragalus, which is placed in the third ſection of his ſeventeenth claſs, which contains thoſe plants whoſe flowers have ten ſtamina joined in two bodies.

The SPECIES are,

1. TRAGACANTHA (*Maſſilienſis*) petiolis longioribus ſpineſcentibus, foliolis ovatis obtuſis. *Goats-thorn with longer foot-ſtalks ending in ſpines, and having oval obtuſe lobes to the leaves.* Tragacantha. C. B. P. 388. *Goats-thorn.*
2. TRAGACANTHA (*Hiſpanica*) foliolis lanceolatis, floribus ſolitariis axillaribus, ſiliculis ovatis inflatis. *Goats-thorn with ſpear-ſhaped lobes, flowers proceeding ſingly from the ſides of the branches, and oval, inflated, bladder pods.* Tragacantha humilis Balearica, foliis parvis vix incanis, flore albo. Salvador. *Low Goats-thorn of the Balearick Iſlands, having ſmall leaves which are ſcarce hoary, and a white flower.*
3. TRAGACANTHA (*Argentea*) foliolis lanceolatis acuminatis tomentoſis, floribus alaribus terminalibuſque. *Goats-thorn with ſpear-ſhaped, acute-pointed, woolly leaves, and flowers growing on the ſides and at the ends of the branches.* Tragacantha orientalis humillima argentea barbæ Jovis folio. Tourn. Cor. 29. *The loweſt eaſtern Goats-thorn, with ſilvery leaves like thoſe of Jupiter's Beard.*
4. TRAGACANTHA (*Glabra*) foliolis linearibus glabris, floribus congeſtis axillaribus. *Goats-thorn with very narrow ſmooth leaves, and flowers growing in cluſters on the ſides of the branches.* Tragacantha foliis minimis viridibus. Boerh. Ind. alt. 2. p. 53. *Goats-thorn with the leaſt very green leaves.*

The firſt ſort grows naturally on the ſea-ſhore about Marſeilles, and in Italy; this hath a thick, ſhort, ligneous ſtalk, which branches out greatly on every ſide. The young branches are woolly; they are cloſely garniſhed with winged leaves, whoſe foot-ſtalks end in acute thorns. The lobes are ſmall, oval, obtuſe, and of a ſilvery colour. The flowers are large, white, and

and ſhaped like a butterfly; they are produced in cluſters at the end of the branches; theſe appear in June and July, and are ſucceeded by ſhort pods having two longitudinal cells, containing two or three kidney-ſhaped ſeeds, which ſeldom ripen in England.

The ſecond ſort grows naturally in the iſlands of Majorca and Minorca; this hath a thick woody ſtalk which riſes about two feet high, ſending out many ligneous branches, which are cloſely garniſhed with ſpear-ſhaped ſmall leaves; they are hoary, and are ranged by pairs along a very ſtrong foot-ſtalk, ending with a ſharp point. The flowers are produced ſingly from the ſides of the branches, they are large and white; theſe are ſucceeded by oval bladder pods, containing four kidney-ſhaped ſeeds; it flowers in July, but the ſeeds do not ripen in England.

The third ſort grows naturally in the iſlands of the Archipelago; this has a very low ſhrubby ſtalk, which divides into many downy branches, which are garniſhed with winged leaves, compoſed of nine or ten pair of ſpear-ſhaped woolly lobes, which end in acute points; theſe are extended to the end of the foot-ſtalk, ſo there is not any part of it bare at the end, as in the other ſpecies. The flowers are produced from the ſide and at the top of the branches; they are white, and ſhaped like thoſe of the other ſpecies, but ſmaller; they appear at the ſame time as the former ſorts, but are not ſucceeded by pods in England.

The fourth ſort grows naturally in Spain; this is a very low plant; the ſtalks are pretty thick and woody, but ſeldom riſe to more than five or ſix inches high, dividing into ſeveral branches, which are cloſely garniſhed with ſmall winged leaves, compoſed of ſeveral pair of ſmall linear lobes which are ſmooth, and of a bright green colour. The foot-ſtalks of theſe end in very ſharp thorns, which ſtand out beyond the lobes; the flowers grow in cluſters from the ſide of the ſtalks; they are ſmaller than thoſe of the other ſpecies, and are of a dirty white colour; theſe appear in July, but are not ſucceeded by ſeeds in England.

Theſe ſorts may be propagated by ſeeds, which muſt be procured from the countries where the plants grow naturally; theſe ſhould be ſown on a bed of freſh earth in April, and when the plants come up, they ſhould be carefully kept clean from weeds, which, if permitted to grow amongſt the plants, would ſoon overbear and deſtroy them while they are young. If the ſeaſon ſhould prove dry, it will be of great ſervice to water the plants now and then, and when they are large enough to tranſplant, they ſhould be carefully taken up, and ſome of them planted in ſmall pots filled with freſh earth, placing them in the ſhade until they have taken root; after which time they may be removed into an open ſituation, where they may remain till the latter end of October, when they ſhould be placed under a common frame, where they may be ſheltered from ſevere froſt, but may have free air in mild weather, when the glaſſes ſhould not be put over them.

The remainder of the plants may be planted on a warm dry border, where they muſt be ſhaded until they take root; and if the ſeaſon ſhould continue dry, they muſt be refreſhed with water, otherwiſe they will be in danger; becauſe, when they are ſo young, their roots will not have eſtabliſhed themſelves in the ground ſufficiently to nouriſh them in great droughts.

Thoſe plants which were planted in pots, may be preſerved for a year or two under frames in winter, until they have obtained ſtrength, when they may be ſhaken out of the pots, and planted in a lean dry ſoil and a warm ſituation, where they will endure the cold of our ordinary winters very well; but as they are ſometimes deſtroyed by hard winters, it will be proper to keep a plant of each kind in pots, which may be ſheltered in winter to preſerve the ſpecies.

Theſe plants may be propagated by ſlips, for as they rarely produce ſeeds in this country, the latter method is generally uſed here. The beſt time for this work is in April, juſt as the plants begin to ſhoot, at which time the tender branches of the plants ſhould be ſlipped off, and their lower parts diveſted of the decayed leaves; then they ſhould be planted on a very moderate hot bed, which ſhould be covered with mats, to ſcreen them from the great heat of the ſun by day, and the cold by night. Theſe cuttings ſhould be frequently, but gently watered, until they have taken root, after which they may be expoſed to the open air, obſerving always to keep them clear from weeds, and in very dry weather they muſt be refreſhed with water.

On this bed they may remain until the following ſpring, where, if the winter ſhould be very ſevere, they may be covered with mats as before, and in April they may be tranſplanted out, either into pots filled with ſandy light earth, or into warm borders, where, if the ſoil be dry, gravelly, and poor, they will endure the ſevereſt cold of our climate: but if they are planted in a very rich ſoil, they often decay in winter.

From one ſpecies of this genus, Monſieur Tournefort ſays, the gum adragant, or dragon, is produced in Crete, of which he gives the following relation in his voyage to the Levant: "We had the ſatisfaction of "fully obſerving the gum adragant on Mount Ida. "I cannot underſtand how Bellonius comes to aſſert "ſo poſitively, that there is no ſuch thing in Candia; ſure he had not read the firſt chapter of the "ninth book of Theophraſtus's Hiſtory of Plants! "The little bald hillocks about the ſheepfold produce "much of the Tragacantha, and that too a very good "ſort. Bellonius and Proſper Alpinus were doubtleſs "acquainted with it, though it is hardly poſſible, "from their deſcriptions, to diſtinguiſh it from the "other kinds they make mention of. This ſhrub "ſpontaneouſly yields the gum adragant towards the "end of June, and in the following months, at which "time, the nutritious juice of this plant, thickened "by the heat, burſts open moſt of the veſſels wherein "it is contained. It is not only gathered in the heart "of the trunk and branches, but alſo in the interſpaces of the fibres, which are ſpread in the figure "of a circle like rays of the ſun. This juice is coagulated into ſmall threads, which, paſſing through "the bark, iſſue out by little and little, according "as they are protruded by the freſh ſupplies of juice "ariſing from the roots. This ſubſtance, being expoſed to the air, grows hard, and is formed either "in lumps, or ſlender pieces, curled and winding in "the nature of worms, more or leſs long, according "as matter offers. It ſeems as if the contraction of "the fibres of this plant contributes to the expreſſing "of the gum. Theſe delicate fibres, as fine as Flax, "being uncovered, and trodden by the feet of the "ſhepherds and horſes, are by the heat ſhrivelled up, "and facilitate the emanation of the extravaſated "juices."

This gum ſhould be light, and of a tranſparent white colour; it ſhould have no taſte or ſmell, and in ſmall pieces of a different figure, and free from all kinds of dirt or filth. When this is diſſolved in water, it is uſed to give a body to ſeveral medicines; it is alſo much uſed by the painters.

But notwithſtanding what Tournefort has ſaid concerning the gum adragant being produced from one particular ſpecies, many authors are of opinion, that it is taken from ſeveral other ſpecies, but particularly that of Marſeilles, from whence that gum is often brought into England.

At preſent theſe plants are rarely preſerved, excepting by ſome perſons who are curious in botany; yet in large gardens many of them deſerve a place, where, if they are planted on hillocks, or the ſlopes of dry banks, they will have a very good effect, eſpecially thoſe which retain their leaves through the year.

**TRAGIA.** Plum. Gen. Nov. 14. tab. 12. Lin. Gen. Plant. 930.

The CHARACTERS are,

*It hath male and female flowers on the ſame plant. The empalement of the male flowers is cut into three oval acute-pointed ſegments which ſpread open; it has no petals, but there are three ſtamina in each, the length of the empalement,*

*ment, terminated by roundish summits; the empalement of the female flowers are permanent; they are cut into five oval concave segments. The flowers have no petals or stamina, but a roundish germen, having three furrows, supporting an erect style, crowned by a trifid spreading stigma. The germen afterward turns to roundish three-lobed capsules having three cells, each containing one globular seed.*

This genus of plants is ranged in the third section of Linnæus's twenty-first class, which includes those plants which have male and female flowers on the same plant, and the male flowers have three stamina.

The Species are,

1. Tragia (*Volubilis*) foliis cordato-oblongis, caule volubili. Lin. Sp. Plant. 980. *Tragia with oblong heart-shaped leaves, and a twining stalk.* Tragia scandens, longo betonicæ folio. Plum. Gen. Nov. 14. *Climbing Tragia with a long Betony leaf.*
2. Tragia (*Involucrum*) fæmineis pentaphyllis pinnatifidis. Lin. Sp. Plant. 980. *Tragia with five-leaved involucri to the female flowers, which are wing-pointed.* Ricinocarpos Zeylanica hirsuta, foliis lanceolatis serratis. Burm. Zeyl. 202. *Hairy Ricinocarpos of Ceylon, with spear-shaped sawed leaves.*

The title of this genus was applied to it by Father Plumier, who constituted the genus to the honour of Hieronymus Bock, an ancient botanist, who was commonly called Tragus.

The first sort grows plentifully in the savannahs in Jamaica, and the other warm parts of America, where it twines round whatever plants or trees it grows near, and rises seven or eight feet high, having tough woody stems. The leaves are oblong and heart-shaped; they are an inch and a half long, and three quarters of an inch broad toward their base, ending in acute points, and are deeply sawed on their edges, standing alternately upon pretty long foot-stalks. The male flowers come out from the wings of the stalk, in long bunches of about two inches in length; the female flowers are produced on separate foot-stalks, arising from the same point as the male; these are succeeded by roundish capsules with three cells, each inclosing one roundish seed. The whole plant is covered with burning spines like those of the Nettle, which renders it very unpleasant to handle.

The second sort grows naturally in India; this rises with an erect ligneous stalk about three feet high, which rarely sends out any side branches; it is garnished with oblong spear-shaped leaves, which run out in very long acute points, and are sharply sawed on their edges; these are ranged alternately on the stalk, and are closely covered with yellowish stinging hairs. The flowers are produced in small clusters from the wings of the stalk, standing several together upon the same foot-stalk; the upper are all male, and the under female, and the latter are succeeded by roundish capsules with three cells, each inclosing one seed.

As these are plants of no great beauty, they are seldom preserved in this country, except in some botanic gardens for the sake of variety; they are propagated by seeds, which must be sown on a hot-bed early in the spring, and must afterward be transplanted into pots, and plunged into a hot-bed of tanners bark, and treated in the same manner as other tender plants which require to be kept in the bark-stove.

TRAGOPOGON. Tourn. Inst. R. H. 477. tab. 270. Lin. Gen. Plant. 810. [Τραγοπώλων, of τράγος, a goat, and πώλων, a beard, because the pappous seed, while it is included in the calyx, resembles a goat's beard.] Goats-beard; in French, *Barbe de Bouc.*

The Characters are,

*The common empalement of the flower is single, and composed of eight acute-pointed leaves, which are alternately large, and joined at their base. The flower is composed of many hermaphrodite florets, which are uniform; they are of one petal, stretched out like a tongue, indented at their points in five parts, and lie over each other like the scales of fish; these have five short hair-like stamina terminated by cylindrical summits, and an oblong germen situated under the floret, supporting a slender style the length of the stamina, crowned by two revolving stigmas. The empalement of the flower afterward swells to a belly, inclosing many oblong, angular, rough seeds, slender at both ends, crowned by a feathery down.*

This genus of plants is ranged in the first section of Linnæus's nineteenth class, which contains those plants whose flowers are composed of only hermaphrodite florets, and their summits are connected with the style.

The Species are,

1. Tragopogon (*Pratense*) calycibus corollæ radium æquantibus, foliis integris strictis. Lin. Sp. Plant. 789. *Goats-beard with an empalement equal to the rays of the flower, and entire closed leaves.* Tragopogon pratense luteum majus. C. B. P. 274. *Greater yellow Meadow Goats-beard.*
2. Tragopogon (*Minus*) calycibus corollæ radiis longioribus, foliis linearibus strictis. *Goats-beard with the empalement longer than the rays of the flower, and linear closed leaves.* Tragopogon pratense luteum minus. Hort. R. Blæs. *Smaller yellow Meadow Goats-beard.*
3. Tragopogon (*Porrifolium*) calycibus corollæ radiis sesqui longioribus, foliis integris strictis, pedunculis supernè incrassatis. Hort. Upsal. 243. *Goats-beard with the empalement longer than the rays of the flower, entire closed leaves, and the foot-stalk thicker at the upper part.* Tragopogon purpureo-cæruleum porri folio, quod artifi vulgò. C. B. P. 274. *Goats-beard of a purple blue colour, and a Leek leaf, commonly called Salsafy.*
4. Tragopogon (*Picroides*) calycibus corollâ brevioribus aculeatis, foliis pinnato-hastatis. Hort. Cliff. 382. *Goats-beard with prickly empalements which are shorter than the petals, and arrow wing-pointed leaves.* Sonchus asper, laciniatus Creticus. C. B. P. 124. *Rough Sow-thistle of Crete with jagged leaves.*
5. Tragopogon (*Dalechampii*) calycibus monophyllis corollâ brevioribus inermibus, foliis runcinatis. Hort. Upsal. 224. *Goats-beard with an empalement of one leaf, shorter than the petals of the flower, and plain shaped leaves.* Hieracium magnum Dalechampii. Hist. 569. *Greatest Hawkweed of Dalechamp.*

The first sort grows naturally in the meadows of Austria and Germany; this is very different from the sorts which grow naturally in England, for I have sown the seeds of both sorts several years in the same bed of earth, and have always found the plants have retained their difference. The lower leaves are three quarters of an inch broad at their base, where they embrace the stalk; they are more than a foot long, and are closed together, ending in acute points. The stalk rises near three feet high, which is garnished at each joint with one leaf of the same shape with those below, but are smaller; it is terminated by one large yellow flower composed of hermaphrodite florets, which lie over each other like the scales of fish; these are included in one common simple empalement, which is equal in length to the rays of the flower. Each floret is succeeded by an oblong seed which is larger at the base than at the point, where it is crowned with a large feathery down. The seeds of the border or ray are crooked and rough, but those of the disk are strait and smooth. It flowers in June, and the seeds ripen about a month after.

The second sort grows naturally in moist pastures in many parts of England; it is by the common people titled Sleep-at-noon, or Go-to-bed-at-noon, because the flowers are generally closed up before that time every day. The lower leaves of this sort are almost as long as those of the first sort, but are not more than a third part so broad; they are of a deep green colour, and end in acute points. The stalks rise about a foot high, and sustain one yellow flower at the top, not more than half so large as those of the first; the empalement of these flowers are longer than the rays; the seeds of this are much smaller. It flowers about the same time with the former.

When this sort is shot up in stalk four inches high, the common people gather it out of the fields, and boil it in the same way as Asparagus, and some give it the preference.

The third sort is cultivated in gardens by the title of Salsafy. The roots of this are dressed in different ways,

and ſerved up to the table; and of late years there are ſome perſons who cultivate it for the ſtalks, which are cut in the ſpring when they are four or five inches high, which are dreſſed like Aſparagus, in the like manner as the ſecond ſort. The ſtalks of this are much longer and are tenderer than the other, ſo are better for this purpoſe than thoſe of the ſecond ſort; the leaves of this are broad; the flowers are large and blue; the foot-ſtalk immediately under the flower is much thicker than below, and the empalement is longer than the rays of the flower.

The fourth ſort grows naturally in Crete, and alſo in Italy; this is an annual plant very like the Sow-thiſtle in ſtalk and leaf, but the empalement of the flower is prickly. It is ſeldom admitted into gardens, becauſe the ſeeds are wafted by the winds to a great diſtance, and thereby fill the garden with weeds.

The fifth ſort grows naturally about Montpelier; this hath many large, plain, ſhaped leaves at the root, which are ſix or ſeven inches long, and two broad, indented on their ſides; the foot-ſtalks of the flower ariſe immediately from the root, and are a foot in length, ſupporting one large ſulphur-coloured flower, compoſed of many florets, included in an empalement of one leaf, which is ſhorter than the corolla; the florets are ſucceeded by oblong ſeeds, crowned by a feathery down.

Theſe plants are propagated from ſeeds, which ſhould be ſown in April upon an open ſpot of ground, in rows about nine or ten inches diſtance, and when the plants are come up, they ſhould be hoed out, leaving them about ſix inches aſunder in the rows. The weeds ſhould alſo be carefully hoed down as they are produced, otherwiſe they will ſoon overbear the plants and ſpoil them. This is all the culture required, and if the ſoil be light and not too dry, the plants will have large roots before winter, at which time the Salſafy, whoſe roots are eaten at that ſeaſon, will be fit for uſe, and may be taken up any time after their leaves begin to decay; but, when they begin to ſhoot again, they will be ſticky and not fit for uſe; but many perſons cultivate this ſort for the ſhoots, as was before mentioned.

The common yellow ſort, whoſe ſhoots are ſold in the market, will be fit for uſe in April or May, according to the forwardneſs of the ſeaſon. The beſt time to cut them is, when their ſtems are abour four inches long, for if they ſtand too long, they are never ſo tender as thoſe which are cut while young.

Some people, in cultivating theſe plants, ſow their ſeeds in beds pretty cloſe, and when they come up, they tranſplant them out in rows at the before mentioned diſtance; but, as they form a tap-root, which abounds with a milky juice, when the extreme part of their roots are broken by tranſplanting, they ſeldom thrive well afterward; therefore, it is by far the better way to make ſhallow drills in the ground, and ſcatter the ſeeds therein, as before directed, whereby the rows will be at a due diſtance; and there will be nothing more to do than to hoe out the plants when they are too thick in the rows, which will be much leſs trouble than the other method of tranſplanting, and the plants will be much larger and fairer.

TRAGOSELINUM. See PIMPINELLA.

TRANSPLANTING OF TREES. See PLANTING.

TRANSPORTATION OF PLANTS: In ſending plants from one country to another, great regard ſhould be had to the proper ſeaſon for doing it; for example, if a parcel of plants are to be ſent from a hot country to a cold one, they ſhould be ſent in the ſpring of the year, that, as they come toward the colder countries in the warmeſt ſeaſon, ſo if they have ſuffered a little in their paſſage, there will be time to recover them before winter; whereas thoſe which arrive in autumn, are often loſt in winter, becauſe they have not time to recover and get root before the cold comes on.

On the contrary, thoſe plants which are ſent from a cold country to a hot one, ſhould always be ſent in the beginning of winter, that the cold may prevent their ſhooting during the paſſage, and that they may arrive time enough to be rooted before the great heats come on, otherwiſe they will ſoon periſh.

The beſt way to pack up plants for a voyage (if they are ſuch as will not bear to be kept out of the ground) is to have ſome ſtrong boxes with handles to them, for the more eaſily removing them in bad weather; theſe ſhould have holes bored in their bottoms to let out the moiſture, otherwiſe it will rot the roots of the plants. Over each of theſe holes ſhould be laid a flat tile, or oyſter-ſhell, to prevent the earth from ſtopping them; then they ſhould be filled up with earth, into which the plants ſhould be ſet as cloſe as poſſible, in order to ſave room, which is abſolutely neceſſary, otherwiſe they will be very troubleſome in the ſhip; and as the only thing intended is to preſerve them alive, and not to make any progreſs while on their paſſage, a ſmall box will contain many plants, if rightly planted. The plants ſhould alſo be placed in the box a fortnight or three weeks before they are put on board the ſhip, that the earth may be a little ſettled about their roots; and during the time they are on board, they ſhould remain, if poſſible, on the deck, that they may have air; but in bad weather they ſhould be covered with a tarpaulin to guard them againſt the ſalt water and ſpray of the ſea, which will deſtroy them, if it comes at them in any quantity.

The water theſe plants ſhould have, while on board, muſt be proportioned to the climate whence they come, and to which they are going. If they come from a hot country to a cold one, then they ſhould have very little moiſture after they have paſſed the heats; but, if they are carried from a cold country to a hot one, they muſt have a great ſhare of moiſture when they come into a warmer climate, and ſhould be ſhaded in the day from the violent heat of the ſun, to which if they are too much expoſed, will dry them up and deſtroy them.

If the plants to be ſent from one country to another, are ſuch as will live out of the ground a conſiderable time, as all thoſe which are full of juice will do; as the Sedums, Ficoides, Euphorbiums, Cereuſes, &c. then they require no other care but to pack them up in a cloſe box, wrapping them up well with dry Moſs, obſerving to place them ſo cloſely that they may not be tumbled about, which will bruiſe them, and that thoſe plants which have ſpines may not wound any of the others. The box alſo ſhould be placed where they may receive no moiſture, and where rats cannot come to them, otherwiſe they are in danger of being eaten by thoſe vermin; if theſe plants are packed too cloſe, they are apt to ferment, and thereby either rot, or at leaſt grow ſickly; to prevent which, they ſhould have a good quantity of dry hay or ſtraw laid between them, and ſeveral ſmall holes ſhould be made in the boxes, to let out the noxious air.

If theſe plants are thus carefully packed up, they will grow though they ſhould be two, three, or four months on their paſſage; and will be leſs liable to ſuffer than if planted in earth, becauſe the ſailors generally kill theſe plants by over watering them.

There are alſo ſeveral ſorts of trees, which may be packed up in cheſts with Moſs about them, which will bear to be kept out of the ground two or three months, provided it be at a ſeaſon when they do not grow; as may be ſeen by the Orange-trees, Jaſmines, Capers, Olive, and Pomegranate-trees, which are annually brought from Italy; and if ſkilfully managed, very few of them miſcarry, notwithſtanding they are many times kept three or four months out of the ground.

In ſending ſeeds from one country to another, the great care to be taken is, to ſecure them from vermin, and preſerve them dry, otherwiſe they mould and decay. The method Mr. Cateſby always obſerved was, to put up his ſeeds dry into papers, and then put them into a dry Gourd-ſhell, and ſeal them up; in which

which way he sent several large parcels of seeds from Carolina to England, which never miscarried. There are some persons who have directed to put them into glasses, and to seal them closely down, to keep out the external air; but from several experiments of this kind which I have made, I find seeds thus closely put up will not grow, if they remain stopped up any considerable time, all seeds requiring some share of air to preserve their vegetating quality; so that where a person has no other conveniency, they may be put up in a bag, and hung up in a dry part of the ship, or put into a trunk, where they may be safe from vermin, in which places they will keep very well.

N. B. It is the safest way to bring all sorts of seeds in their pods or husks in which they grew, provided they are put up dry; because their own covering will afford them some nourishment, if the seeds are not separated from the placenta.

TRIANTHEMA. Lin. Gen. Plant. 537. Portulacastrum. Jussiæi 1.

The Characters are,

*It hath an empalement composed of two small awl-shaped leaves; the flower has five oval petals which spread open, and commonly five stamina which are shorter than the corolla, terminated by oval twin summits, and a cylindrical germen whose upper part is truncated, having two horns, supporting a slender stinging style, with a fissure which runs through the twin summits, crowned by a single stigma. The empalement afterward becomes a two-cornered cylindrical capsule with one cell, inclosing eight or ten seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

The Species are,

1. Trianthema (*Procumbens*) foliis obovatis petiolatis, floribus sessilibus caulibus procumbentibus. Act. Phil. 1763. *Trianthema with procumbent stalks, almost oval leaves on foot-stalks, and flowers sitting close to the stalks.* Portulaca Curassavica procumbens, capparidis folio, flore muscoso, capsula bifurca. Par. Bat. 213. *Purslain from Curassao, with trailing stalks, a Caper leaf, and a two-horned capsule.*
2. Trianthema (*Diffusa*) foliis ovatis petiolatis, floribus confertis axillaribus sessilibus, caule diffuso. Act. Phil. 1763. *Trianthema with diffused stalks, oval leaves, and the flowers in clusters sitting close at the wings of the stalks.*

The first sort grows naturally in most of the islands in the West-Indies, where it is often a troublesome weed; this sends out many trailing branches which lie flat on the ground, spreading two feet or more each way; these have much the appearance of Purslain, and have fleshy succulent leaves almost oval: the flowers come out from the joints of the stalks; they are somewhat of a purple colour, not much unlike those of Purslain, and are succeeded by capsules having two horns, with one cell inclosing eight or ten seeds.

The second sort grows in the East-Indies: this rises with succulent diffused stalks near two feet high, garnished with oval leaves less succulent than those of the first. The flowers are white, and are produced in clusters sitting close to the stalks, and are succeeded by capsules containing several seeds.

These plants are both annual in this country, and are seldom preserved except in botanic gardens for variety. Whoever has a mind to cultivate them, must sow their seeds on a good hot-bed in the spring, and when the plants are fit to remove, they should be planted on another hot-bed to bring them forward, otherwise they will not ripen their seeds. In June they may be transplanted into a warm border, where they will grow until the frost in autumn kills them.

TRIBULUS. Tourn. Inst. R. H. 265. tab. 141. Lin. Gen. Plant. 476. Caltrops.

The Characters are,

*The empalement of the flower is cut into five acute parts, which are a little shorter than the petals; there are five oblong blunt petals to the flower which spread open, and ten small awl-shaped stamina terminated by single summits, and an oblong germen the length of the stamina, having no style, but crowned by a headed stigma. The germen afterward turns to a roundish prickly fruit, divided into five capsules, armed with three or four thorns, angular on one side, joining together. The cells are transverse, and contain two or three Pear-shaped seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which includes those plants which have ten stamina and one style.

The Species are,

1. Tribulus (*Terrestris*) foliolis sexjugatis subæqualibus, seminibus quadricornibus. Hort. Cliff. 160. *Caltrops with six pair of lobes to each leaf, which are almost equal, and four horns to each seed.* Tribulus terrestis, folio ciceris, fructu aculeato. C.B.P. 250. *Land Caltrops with a Chich leaf, and a prickly fruit.*
2. Tribulus (*Maximus*) foliolis quadrijugis exterioribus majoribus. Lin. Sp. Plant. 386. *Caltrops with four pair of lobes to each leaf, of which the outer are the largest.* Tribulis terrestris major, flore maximo odorato. Sloan. Cat. Jam. 93. *Greater Caltrops with the largest sweet flower.*
3. Tribulus (*Cistoides*) foliolis octojugatis subæqualibus. Lin. Sp. Plant. 387. *Caltrops with eight pair of lobes to each leaf, which are almost equal.* Tribulus terrestris major Curassavicus. Par. Bat. 236. *Greater Land Caltrops of Curassao.*

The first sort is a very common weed in the south of France, in Spain, and Italy, where it grows among Corn, and on most of the arable land, and is very troublesome to the feet of cattle; for the fruit being armed with strong prickles, run into the feet of the cattle which walk over the land. This is certainly the plant which is mentioned in Virgil's Georgicks, under the title of Tribulus, though most of his commentators have applied it to other plants.

It is called in English Caltrops, from the form of the fruit, which resembles those instruments of war that were cast in the enemies way to annoy their horses.

This hath a slender fibrous root, from which spring out four or five slender stalks which spread flat on the ground; they are hairy, and extend two feet and a half in length; these are garnished at each joint with winged leaves, composed of six pair of narrow hairy lobes, almost of equal size; those on the lower part of the stalk stand alternately, but toward the top they are placed opposite. The flowers come out from the wings of the stalk, standing upon short foot-stalks; they are composed of five broad, obtuse, yellow petals, which spread open. In the center is situated an oblong germen, crowned by a headed stigma, attended by ten short stamina, terminated by single summits. The flowers appear in June and July, which are succeeded by roundish, five-cornered, prickly fruit, which, when ripe, divides into five parts, each having a transverse cell containing one or two seeds, which ripen in August and September.

This plant is preserved in several curious gardens in England, for the sake of variety. It is propagated by seeds, which should be sown in autumn, for those which are kept out of the ground till spring, commonly remain in the ground a whole year before the plants come up. These seeds should be sown on an open bed of fresh light earth, where they are designed to remain; for, as it is an annual plant, it doth not bear transplanting very well, unless it be done when the plants are very young. In the spring, when the plants come up, they should be carefully cleared from weeds, and where they come up too close, some of the plants should be pulled out to give room for the remaining plants to grow; after this they will require no other culture but to keep them clear from weeds. In June they will begin to flower, and their seeds will ripen in August and September, which, if permitted to scatter, the plants will come up the following spring, and maintain their place, if they are not overborne with weeds.

The second sort grows naturally in Jamaica, and some of the other islands in the West-Indies; this is an annual plant, with pretty thick, compressed, channeled stalks which trail upon the ground, and are near two feet long, garnished with winged leaves placed by pairs opposite; these are sometimes composed of three, but most commonly of four pair of lobes, the outer being the largest; they are smooth, and sit close to the foot-stalk. The flowers come out from the wings of the stalk; they are composed of five large yellow petals which spread open, and have an agreeable odour; these are succeeded by roundish prickly fruit ending in a long point, but seldom ripen in England.

The third sort grows naturally in the West-Indies; it was found by the late Dr. Houstoun at the Havannah; this has a ligneous root, from which spring out many stalks which are hairy, jointed, and trail upon the ground; these are garnished at each joint by winged leaves, which differ greatly in size, one of the leaves at each joint being composed of eight pair of oblong lobes which are nearly equal, and opposite to this comes out a small leaf composed of but four pair of lobes. The large leaves stand alternately upon the stalks, and the small ones on the opposite side; the stalks are near two feet long, and at the wings of the stalks come out the foot-stalks of the flowers, which are hairy, and near two inches long, each sustaining one pale yellow flower, composed of five large petals, which have narrow tails, but are very broad and rounded at their points. The flowers are succeeded by roundish fruit armed with very acute spines, but these rarely ripen in England.

The two last sorts being natives of hot countries, are very tender, so must be sown on a hot-bed early in the spring; and when the plants are come up, they must be each transplanted into a separate pot filled with rich light earth, and then plunged into a hot-bed of tanners bark, where they must be treated in the same manner as other tender exotic plants, being careful to bring them forward as early as possible in the summer, otherwise they will not perfect their seeds in this country.

The third sort will live through the winter, if it is plunged in the bark-stove, and treated in the same way as other tender plants, and the following summer they will flower earlier, so there will be more time for the seeds to ripen.

TRICOMANES, Maiden-hair.

There are three or four varieties of this plant, which grow naturally in Europe, but in America there is a great number of species, which are remarkably different from each other, as also from the European kinds.

These being of the tribe of Ferns or capillary plants, are seldom preserved in gardens. Their roots should be planted in moist shady places, especially the European sorts, which commonly grow from between the joints of old walls, and in other very moist shady situations; but those sorts which are brought from hot countries, must be planted in pots filled with rubbish, and strong earth mixed, and in winter they must be screened from hard frosts, to which, if they are exposed, it will destroy them.

The common sort in England is generally sold in the markets for the true Maiden-hair, which is a very different plant, and not to be found in England, it being a native of the south of France, and other warm countries, so is rarely brought to England.

TRICHOSANTHES. Lin. Gen. Plant. 966. Anguina. Michel. 9.

The Characters are,

*It has male and female flowers at separate distances on the same plant. The male flowers have a long smooth empalement of one leaf, cut into five small segments at the top, which are reflexed; the petal is plain, spreading, and cut into five parts, ending in long branching hairs; they have three short stamina arising from the point of the empalement, terminated by cylindrical erect summits joined in a body, and three small styles fastened to the empalement. The female flowers sit upon the germen, and have empalements and petals like the male flowers, but have no stamina; they have a long slender germen situated under the flower, supporting a style the length of the empalement, crowned by three oblong stigmas. The germen afterward turns to a succulent fruit having three cells, inclosing many compressed seeds.*

This genus of plants is ranged in the tenth section of Linnæus's twenty-first class, which includes the plants whose flowers have male and female florets on the same plant, and the summits are connected together.

We have but one Species of this genus in the English gardens, viz.

Tricosanthes (*Anguina*) pomis teretibus oblongis incurvis. Hort. Cliff. 450. *Tricosanthes with a taper, oblong, incurved fruit.* Anguina Sinensis, flore albo elegantissimo, fructu oblongo intorto. Michel. Gen. 12. tab. 9. *China Serpent Cucumber with a most elegant white flower, and an oblong intorted fruit.*

This plant grows naturally in China, it is an annual, and of the Cucumber tribe. The stalks run to a great length, and if they are not supported, trail upon the ground, in the same manner as Cucumbers and Melons. The leaves are angular and rough; the flowers come out from the side of the stalks; they are white, and cut into many small filaments or threads. The fruit is taper, near a foot long, incurved, and divided into three cells, which include many compressed seeds like those of Cucumber.

It is propagated by seeds, which must be sown on a hot-bed early in the spring, and afterwards treated in the same way as Cucumbers and Melons, keeping them covered with glasses, otherwise they will not ripen their fruit here.

TRICHOSTEMA. Gron. Flor. Virg. 64. Lin. Gen. Plant. 652.

The Characters are,

*It has a lipped empalement to the flower of one leaf; the upper lip is twice as large as the under, and is cut into three equal acute segments, the under lip into two. The flower is of the lip kind, it has a very short tube; the upper lip is compressed and hooked, and the under lip is cut into three segments, the middle one being the least; it has four hair-like stamina which are long and incurved, two of them being a little shorter than the other, terminated by single summits, and a four-pointed germen supporting a long slender style, crowned by a bifid stigma. The germen afterward turn to four roundish seeds, inclosed in the swollen empalement of the flower.*

This genus of plants is ranged in the first section of Linnæus's fourteenth class, which includes those plants whose flowers have two longer and two shorter stamina, and the seeds are naked in the flower-cup.

The Species are,

1. Trichostema (*Dichotomum*) staminibus longissimis exsertis. Lin. Sp. Plant. 598. *Trichostema with the longest stretched out stamina.* Cassida Mariana, majoranæ folio. Pet. Suc. 243. *Maryland Scull Cap with a Marjoram leaf.*
2. Trichostema (*Brachiatum*) staminibus brevibus inclusis. Lin. Sp. Plant. 598. *Trichostema with shorter stamina included in the petal.* Teucrium Virginianum origani folio. Hort. Elth. 380. *Virginia Germander with a wild Marjoram leaf.*

The first sort grows naturally in many parts of North America; it is an annual plant, which rises about six or eight inches high, dividing into small branches, which are garnished with small roundish leaves, not unlike those of Sweet Marjoram; these are placed opposite, and are covered with fine, small, downy hairs. The flowers are produced at the wings of the branches; they are small, and of a purple colour, gaping with two lips; the upper lip is arched, and is much larger than the lower; it is cut into three acute points; the lower lip is small, and cut into two points. These appear late in August, so that unless the season proves warm, the seeds will not ripen in England.

The second sort grows naturally in Virginia; this hath an herbaceous branching stalk, which rises from nine inches to a foot high; it has four angles, and the leaves stand by pairs on the branches; they are shaped like those of the wild Marjoram, and are a little hairy, sitting close to the branches. The flowers are produced at the top of the branches; they are small, and of a purple colour. The four stamina stand within the tube of the flower; these flowers do not appear till the end of summer, so the seeds seldom ripen here.

They are propagated by seeds, which should be sown in pots filled with light earth in autumn; and in winter the pots should be placed under a frame to shelter them from severe frost, but should be exposed to the open air at all times when the weather is mild. In the spring the plants will appear, and when they are fit to remove, they should be planted on a bed of light earth, shading them from the sun till they have taken fresh root, then they will require no other culture but to keep them clean from weeds.

TRIDAX. Lin. Gen. Plant. 872. After. Houst. MSS. American Starwort.

The CHARACTERS are,

*The flower has a common cylindrical imbricated empalement. The scales are acute-pointed, and erect. The flowers are composed of hermaphrodite florets in the disk, and the rays are of female half florets. The hermaphrodite florets are funnel-shaped, of one petal, and cut at the brim into five points; these have five short hair-like stamina, terminated by cylindrical summits joined together, and an oblong crowned germen supporting a bristly style, crowned by an obtuse stigma. The germen afterward becomes an oblong single seed, crowned with a simple down. The female half florets are plain, of one petal, and cut into three segments at the top; these have an oval germen like the hermaphrodite florets, but no stamina, and are succeeded by single seeds of the same shape.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, which contains the plants whose flowers are composed of hermaphrodite and female florets, which are both fruitful.

We know but one SPECIES of this genus, viz.

TRIDAX (*Procumbens.*) Hort. Cliff. 418. After procumbens, flore ochroleuco, foliis laciniatis & hirsutis. Houst. MSS. *Trailing Starwort with a whitish copper-coloured flower, and hairy jagged leaves.*

This plant was discovered by the late Dr. Houstoun, growing naturally by the road side leading to old La Vera Cruz, in America. The stalks of this trail upon the ground and emit roots at their joints, whereby it spreads and propagates; they are herbaceous and hairy, and garnished with rough hairy leaves placed by pairs, about an inch and a half long, and three quarters of an inch broad, ending in acute points, and are acutely jagged on their edges. The flowers are produced upon long naked foot-stalks, which terminate their branches. They have one common empalement composed of oval scales, ending in acute points, which lie over each other like the scales of fish; within which are ranged many female half florets, which compose the border or rays, and a good number of hermaphrodite florets which form the disk or middle; these are of a pale copper colour, inclining to white, and are each succeeded by a single oblong seed crowned with down.

This plant is propagated by seeds, which should be sown in pots and plunged into a hot-bed, and when the plants come up and are fit to remove, they should be each planted in a small pot filled with light earth, and plunged into a hot-bed of tanners bark, observing to shade them from the sun till they have taken new root; then they must afterward be treated in the same way as other tender plants from the West-Indies, placing them in the bark-stove in autumn, where they should constantly remain.

It may also be propagated by its trailing stalks, which frequently put out roots at their joints; if these are cut off and planted, they will make new plants. This plant does not produce flowers in plenty here, and but rarely perfects its seeds in England.

TRIFOLIUM. Tourn. Inst. R. H. 404. tab. 228. Lin. Gen. Plant. 896. [of tres, three, and folium, *Lat.* a leaf.] Trefoil; in French, *Trefle.*

The CHARACTERS are,

*The flower has a tubulous permanent empalement of one leaf. The flower is of the buttefly kind, and is frequently permanent, drying in the empalement. The standard is reflexed, the wings are shorter than the standard, and the keel is shorter than the wings; it has ten stamina, nine are joined, and one is separate, terminated by single summits, and an almost oval germen supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes a short pod with one valve, containing a few roundish seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which contains those plants whose flowers have ten stamina joined in two bodies; and to this genus he has added the Trifoliastrum of Micheli, some of the species of Melilot of Tournefort, and the Lupinaster of Bux-baum.

There are great numbers of species of this genus, several of which grow naturally in England, and others in several parts of Europe; but as many of them are plants of small estimation, they are rarely cultivated either in the field or garden; therefore it would be swelling this work too much to enumerate them here, so I shall select only such of them as are cultivated either for use or beauty.

The SPECIES are,

1. TRIFOLIUM (*Pratense*) spicis subvillosis, cinctis stipulis oppositis membranaceis, corollis monopetalis. Lin. Sp. Plant. 1082. *Trefoil with hairy spikes, membranaceous stipulæ placed opposite, and flowers of one petal.* Trifolium purpureum, majus, pratensi simile. Raii Syn. 328. *The Red or Dutch Clover.*
2. TRIFOLIUM (*Repens*) capitulis umbellaribus leguminibus tetraspermis, caule repente. Lin. Sp. Plant. 767. *Trefoil with umbellated heads, pods having four seeds, and a creeping stalk.* Trifolium pratense album. C. B. P. 327. *White Meadow Trefoil, Honeysuckle Grass, or white Dutch Clover.*
3. TRIFOLIUM (*Agrarium*) spicis ovalibus imbricatis, vexillis deflexis persistentibus, calycibus nudis, caule erecto. Flor. Suec. 617. *Trefoil with oval imbricated spikes of flowers, having deflexed permanent standards, naked empalements, and an erect stalk.* Trifolium pratense luteum, capitulo lupuli vel agrarium. C. B. P. *Yellow Meadow Trefoil, or Hop Clover.*
4. TRIFOLIUM (*Filiforme*) spicis imbricatis, vexillis deflexis persistentibus, calycibus pedicillatis, caulibus procumbentibus. Lin. Sp. Plant. 773. *Trefoil with imbricated spikes of flowers, having deflexed permanent standards, empalements standing upon foot-stalks, and trailing stalks.* Trifolium luteum, lupulinum, minimum. Hist. Ox. 2. 142. *The least yellow Hop Trefoil, called None-such, or Black Seed.*
5. TRIFOLIUM (*Ochroleucrum*) spicis ovatis, calycibus foliatis, caule erecto villoso, foliolis lanceolatis. *Trefoil with oval spikes of flowers, having leafy empalements, an erect hairy stalk, and spear-shaped leaves.* Trifolium pratense hirsutum majus, flore albo sulphurea, seu ochroleucrum. Raii Cat. Cant. *Greater, hairy, Meadow Trefoil, with a whitish sulphur or copper-coloured flower, commonly called Trefoil.*
6. TRIFOLIUM (*Rubens*) spicis villosis longis corollis monopetalis, caule erecto, foliis serrulatis. Hort. Cliff. 375. *Trefoil with oblong, blunt, hairy spikes of flowers, of one petal, erect stalks, and sawed leaves.* Trifolium spicâ oblongâ rubrâ. C. B. P. 328. *Trefoil with an oblong red spike.*
7. TRIFOLIUM (*Squarrosum*) spicis subpilosis, calycum infimo dente longissimo reflexo, caule herbaceo. Lin. Sp. Plant. 1082. *Trefoil with hairy spikes of flowers, whose empalements have long reflexed indentures, and an herbaceous stalk.* Trifolium Hispanicum angustifolium, spica dilute rubente. C. B. P. 328. *Narrow-leaved Spanish Trefoil, with pale red flowers.*

8. Trifolium (*Angustifolium*) spicis villosis conico-oblongis, dentibus calycinis setaceis, subæqualibus, foliolis linearibus. Hort. Cliff. 375. *Trefoil with oblong, conical, hairy spikes, having bristly indentures to the empalements which are almost equal, and linear lobes to the leaves.* Trifolium montanum, angustissimum, spicatum. C. B. P. 238. *Spiked Mountain Trefoil with the narrowest leaves.*

9. Trifolium (*Arvense*) spicis villosis ovalibus, dentatis calycinis setaceis æqualibus. Hort. Cliff. 375. *Trefoil with oval hairy spikes, and bristly indentures to the empalements which are equal.* Trifolium arvense humilie spicatum sive lagopus. C. B. P. 328. *Hare's-foot Trefoil.*

10. Trifolium (*Fragiferum*) capitulis subrotundis, calycibus inflatis bidentatis reflexis, caulibus repentibus. Hort. Cliff. 373. *Trefoil with roundish heads, reflexed bladder empalements with two teeth, and a creeping stalk.* Trifolium fragiferum friscum. C. B. P. 329. *Strawberry Trefoil.*

11. Trifolium (*M. Officinalis*) leguminibus racemosis nudis dispermis, caule erecto. Hort. Cliff. 376. *Trefoil with long naked bunches of pods containing two seeds, and an erect stalk.* Melilotus officinarum Germanicæ. C. B. P. 331. *Common Melilot.*

12. Trifolium (*M. Cærulea*) spicis oblongis, leguminibus seminudis mucronatis, caule erecto. Hort. Cliff. 375. *Trefoil with oblong spikes, half naked acute-pointed pods, and an upright stalk.* Lotus hortensis odora. C. B. P. 330. *Sweet Trefoil.*

The first sort, which is well known in England by the title of red Clover, needs no description; this has been frequently confounded with the red Meadow Trefoil by the botanists, who have supposed they were the same species; but I have often sown the seeds of both in the same bed, which have constantly produced the two species without varying. The stalks of the Meadow Trefoil are weak and hairy; the stipulæ, which embrace the foot-stalks of the leaves are narrow and very hairy; the heads of flowers are rounder and not so hairy as those of the Clover, whose stalks are strong, almost smooth, furrowed, and rise twice the height of the other; the heads of flowers are large, oval, and hairy; the petal of the flowers open much wider, and their tubes are shorter than those of the other; but the Clover has been so much cultivated in England for near a hundred years past, that the seeds have been scattered over most of the English pastures, so that there are few of them who have not Clover mixed with the other Grasses; and this has often deceived the botanists, who have supposed that the Meadow Trefoil has been improved to this by dressing of the land.

Since the red Clover has been cultivated in England, there has been great improvement made of the clay lands, which before produced little but Rye-grass, and other coarse bents; which, by being sown with red Clover, have produced more than six times the quantity of fodder they had formerly on the same land, whereby the farmers have been enabled to feed a much greater stock of cattle than they could before, which has enriched the ground, and prepared it for Corn; and where the land is kept in tillage, it is the usual method now among the farmers, to lay down their ground with Clover, after having had two crops of Corn, whereby there is a constant rotation of Wheat, Barley, Clover, or Turneps on the same land.

The Clover-seed is always sown with Barley in the spring, and when the Barley is taken off, the Clover spreads and covers the ground, and this remains two years, after which the land is ploughed again for Corn. The Clover is a biennial plant, whose roots decay after they have produced seeds; but by eating it down, or mowing it when it begins to flower, it causes the roots to send out new shoots, whereby some of the plants are continued longer than they would naturally remain. The common allowance of seed for an acre of ground is ten pounds. In the choice of the seeds, that which is of a bright yellow colour, inclining to brown should be preferred, and the pale-coloured thin seed should be rejected. The Clover-seed should be sown after the Barley is harrowed in, otherwise it will be buried too deep; and after the seeds are sown, the ground should be rolled, which will press the seeds into the ground; but this should be done in dry weather, for moisture will often cause the seeds to burst, and when the ground is wet, the seeds will stick to the roll. This is the method which is generally practised by most people in the sowing of this seed with Corn, but it will be much better if sown alone; for the Corn prevents the growth of the plants until it is reaped and taken off the ground, so that one whole season is lost; and many times, if there be a great crop of Corn upon the ground, it spoils the Clover, so that it is hardly worth standing; whereas, when it is sown without any other seed, the plants will come up more equal, and come on much faster than that which was sown the spring before under Corn.

Therefore from many years trial I would advise the seeds to be sown in August, when there is a prospect of rain soon after; for as the ground is at that season warm, so the first shower of rain will bring up the plants, and these will have time enough to get strength before the winter: and if, some time in October, when the ground is dry, the Clover is well rolled, it will press the ground close to the roots, and cause the plants to send out more shoots; the same should be repeated in March, which will be found very serviceable to the Clover. The reason of my preferring this season for the sowing of the seeds rather than the spring is, because the ground is cold and wet in spring, and if much rain fall after the seeds are sown, they will rot in the ground; and many times when the seed is sown late in the spring, if the season should prove dry, the seeds will not grow, so that I have always found the other season has been the best.

About the latter end of May this Grass will be fit to cut, when there should be great care taken in making it; for it will require a great deal more labour and time to dry than common Grass, and will shrink into less compass; but if it be not too rank, it will make extraordinary rich food for cattle. The time for cutting it is, when it begins to flower; for if it stands much longer, the lower part of the stems and the under leaves will begin to dry, whereby it will make a less quantity of hay, and that not so well flavoured.

Some people cut three crops in one year of this Grass, but the best way is to cut but one in the spring, and feed it the remaining part of the year, whereby the land will be enriched, and the plants will grow much stronger.

One acre of this plant will feed as many cattle as four or five acres of common Grass; but great care should be taken of the cattle when they are first put into it, lest it burst them: to prevent which, some turn them in for a few hours only at first, and so stint them as to quantity; and this by degrees, letting them at first be only one hour in the middle of the day, when there is no moisture upon the Grass, and so every day suffer them to remain a longer time, until they are fully seasoned to it; but great care should be had never to turn them into this food in wet weather; or if they have been for some time accustomed to this food, it will be proper to turn them out at night in wet weather, and let them have hay, which will prevent the ill consequences of this food; but there are some who give straw to their cattle while they are feeding upon this Grass, to prevent the ill effects of it; which must not be given them in the field, because they will not eat it where there is plenty of better food. There are others who sow Rye-grass amongst their Clover, which they let grow together, in order to prevent the ill consequences of the cattle feeding wholly on Clover; but this is not a commendable way, because the Rye-grass will greatly injure the Clover in its growth, and the seeds will scatter and fill the ground with bents.

Where the seeds are designed to be saved, the first crop in the spring should be permitted to stand until the seeds are ripe, which may be known by the stalks and heads changing to a brown colour; then it should be

be cut in a dry time, and when it is well dried, it may be housed until winter, if the seeds are not wanted before, when the seeds should be threshed out; but if the seeds are wanted for immediate sowing, it may be threshed out before it be housed or stacked; but then it must be well dried, otherwise the seeds will not quit their husks.

It has been a great complaint amongst the farmers, that they could not thresh out these seeds without great labour and difficulty; which I take to be chiefly owing to their cutting the spring crop when it begins to flower, and so leave the second crop for seed, which ripens so late in autumn, that there is not heat enough to dry the husks sufficiently, whereby they are tough, and the seeds rendered difficult to get out; which may be entirely remedied by leaving the first crop for seed, as hath been directed, and then the ground will be ready to plough, and prepare for Wheat the same year, which is another advantage.

When cattle are fed with this hay, the best way is to put it in racks, otherwise they will tread a great quantity of it down with their feet. This feed is much better for most other cattle than milch cows, so that these should rarely have any of it, lest it prove hurtful to them; though when it is dry, it is not near so injurious to any sort of cattle as when green.

The second sort grows naturally in most of the pastures in England, and is generally known among the country people by the title of white Honeysuckle.

This is an abiding plant, whose branches trail upon the ground, and send out roots from every joint, so that it thickens and makes the closest sward of any of the sown Grasses; and it is the sweetest feed for all sorts of cattle yet known; therefore when land is designed to be laid down for pasture, with intent to continue so, there should always be a quantity of the seeds of this plant sown with the Grass seeds. The usual allowance of this seed is eight pounds to one acre of land, but this should never be sown with Corn; for if there is a crop of Corn, the Grass will be so weak under it, as to be scarce worth standing: but such is the covetousness of most farmers, that they will not be prevailed on to alter their old custom of laying down their grounds with a crop of Corn, though they lose twice the value of their Corn by the poorness of the Grass, which never will come to a good sward, and one whole season is also lost; for if this seed is sown in the spring without Corn, there will be a crop of hay to mow by the middle or latter end of July, and a much better after-feed for cattle the following autumn or winter, than the Grass which is sown with Corn will produce the second year. The seed of this sort may also be sown with Grass seeds in autumn, in the manner before directed for the common red Clover; and this autumnal sowing, if the seeds grow kindly, will afford a good early crop of hay the following spring; and if, after the hay is taken off the land, the ground is well rolled, it will cause the Clover to mat close upon the ground, and become a thick sward.

The seeds of this white Dutch Clover is annually imported from Flanders, by the way of Holland, from whence it received the name of Dutch Clover; not that it is more a native of that country than of this, for it is very common in moist pastures in every county in England, but the seeds were never collected for sowing here till of late years: nor are there many persons at present here who save this seed, although it may be done, if the same care as is practised for the red Clover, is taken with this sort; therefore it should be recommended to every farmer, who is desirous to improve his land, carefully to sow an acre or two of this white Clover by itself for seeds, which will save him the expence of buying the seeds, which are often sold at a great price, and there will be no want of sale for any quantity they may have to spare.

The farther account of this Grass, may be seen under the article PASTURE.

The third sort grows naturally among the Grass in most of the upland pastures in this country, but the seeds are frequently sold in the shops by the title of Hop Clover, and are by many people mixed with the other sorts of Clover and Grass seeds, for laying down ground to pasture: this grows with upright branching stalks about a foot high, which are garnished with trifoliate leaves whose lobes are oblong and heart-shaped, but reversed at the narrow point, joining the foot-stalks. The flowers grow from the wings of the stalk upon long foot-stalks, and are collected into oval imbricated heads; they are yellow, and have naked empalements lying over each other like scales, somewhat like the flowers of Hops, from whence this plant had the title of Hop Clover. But there are two sorts of this which grow naturally in England. The other, which is the fourth sort, is a much smaller plant than this, and has trailing stalks. The heads of flowers are smaller, and the flowers are of a deeper yellow colour; these are not abiding plants, so are by no means proper to be sown where the ground is designed to continue in pasture; but in such places where one or two crops only are taken, and the land is ploughed again for Corn, it may do well enough when it is mixed with other seeds, though the cattle are not very fond of it green, unless when it is very young. The large sort is the most profitable, but this is rarely to be had without a mixture of the small kind, and also of the smaller Melilot, which is commonly called None-such, or sometimes Black Seeds, for those who save the seeds for sale, are seldom curious enough to distinguish the sorts; but where the beauty of the verdure is considered, there must not be any of these seeds sown, because their yellow heads of flowers are very unsightly among the Grass; and if it is in gardens where the Grass is constantly mowed, the flowers of these plants will come out near the root in such clusters, as to occasion large, unsightly, yellow patches; and as the heads decay they turn brown, and have a very disagreeable appearance.

The fifth sort grows naturally on chalky lands in many parts of England, and in some counties the seed is sown after the same manner as the common red Clover, especially on chalky ground, where it will thrive, and produce a better crop than Clover. The stalks of this are hairy, and grow erect to the height of two feet or more, and are garnished with trifoliate leaves, standing upon long foot-stalks, whose lobes are longer than those of the red Clover, and have no marks of white; they are of a yellowish green colour, and are covered with soft hairs. The flowers grow in oval spikes at the end of the branches, they are of a pale copper colour; their petals are long and tubulous, but the brim is divided into two lips as the other sorts. It flowers and ripens its seeds about the same time as the common Clover.

This is known by the title of Trefoil in the places where it is cultivated, but the seedsmen sell the Hop Clover by that name; so they make no distinction between this, the Hop Clover, and Nonesuch; therefore, by which of these three titles the seeds are bought, they prove the same. This sort of Trefoil is much cultivated in that part of Essex which borders on Cambridgeshire.

The sixth sort grows naturally in Spain and Italy; this has upright stalks near two feet high, which are hairy, and garnished with trifoliate leaves, having roundish lobes which are sawed at their points. The flowers are produced at the top of the stalk, in long, obtuse, hairy spikes; they are of a bright red colour, so make a pretty appearance during their continuance. It is an annual plant, so is not proper for sowing with Grass, otherwise it makes good fodder.

The seventh sort is an annual plant, which grows naturally in the south of France and Italy; it rises with a strong herbaceous stalk near three feet high, which is smooth, and garnished with trifoliate leaves, whose lobes are two inches and a half long, and near a quarter broad, standing upon long foot-stalks, which are embraced by stipulæ or sheaths their whole length. The flowers are produced at the top of the stalks in very long spikes; they are of a beautiful red colour, so make a fine appearance. It flowers in July, and the seeds ripen in autumn.

The eighth ſort grows naturally in Spain and Italy; this riſes with a ſlender ſtiff ſtalk near two feet high, garniſhed with trifoliate leaves, whoſe lobes are very narrow like Graſs, and are hairy. The flowers are produced at the top of the ſtalks in oblong conical ſpikes; the indentures of their empalements end in long briſtly hairs, which are almoſt equal in length; the ſpikes are hairy, and the flowers of a pale red colour. It flowers and ripens its ſeeds about the ſame time as the former.

The ninth ſort is the common Hare's-foot Trefoil, which grows naturally upon dry gravelly land in moſt parts of England, and is a ſure indication of the ſterility of the ſoil, for it is rarely ſeen upon good ground. This plant is ſeldom eaten by cattle, ſo is unfit for paſture, and is only mentioned here becauſe it is ſometimes uſed in medicine; it is an annual plant, whoſe root decays ſoon after it has perfected ſeeds.

The tenth ſort grows naturally on arable land in many parts of England; this has trailing ſtalks which put out roots at their joints. The leaves ſtand upon long ſlender foot-ſtalks; the lobes are roundiſh, and are ſawed on their edges; the flowers are collected in roundiſh heads, ſtanding upon ſlender foot-ſtalks, which riſe from the wings of the ſtalks; theſe have bladder empalements which terminate in two teeth. When theſe lie on the ground, their globular heads, having a little bluſh of red on their upper ſide toward the ſun, and the other part being white, have a great reſemblance of Strawberries, and from thence it was titled Strawberry Trefoil.

Theſe ſorts are frequently preſerved in gardens for the ſake of variety; they are eaſily propagated by ſeeds, which may be ſown in an open bed of ground, either in autumn or ſpring. The plants which come up in autumn, will grow much larger, and flower earlier in the ſummer than thoſe which are ſown in the ſpring; ſo from thoſe good ſeeds may be always obtained, whereas the other ſometimes miſcarry. When the plants come up, they require no other care than to keep them clean from weeds, and thin them where they are too cloſe.

The eleventh ſort is the common Melilot which is uſed in medicine; it grows naturally among the Corn in many parts of England, particularly in Cambridgeſhire in great plenty, where it is a moſt troubleſome weed; for in reaping, it is ſcarce poſſible to ſeparate it from the Melilot, ſo that it is carried in with the Corn; and the ſeeds of the Melilot being ripe about the ſame time with the Corn, they are threſhed out with it, and being heavy are difficult to ſeparate from it; and when a few of the ſeeds are ground with the Corn, it ſpoils the flour; for the bread, or whatever elſe is made with it, will have a ſtrong taſte like Melilot plaſter.

The roots of this plant are ſtrong and ligneous, from which ſpring out ſeveral ſtalks which riſe from two to four feet high, according to the goodneſs of the land. The ſtalks branch out, and are garniſhed with trifoliate leaves, having oval ſawed lobes of a deep green colour. The flowers are produced in long ſlender ſpikes which ſpring from the wings of the ſtalks; they are of a bright yellow, and ſhaped like the other butterfly flowers; theſe are ſucceeded by naked ſeeds which ripen in Auguſt.

The twelfth ſort grows naturally in Bohemia and Auſtria, but has been long cultivated in England as a medicinal plant, though at preſent it is rarely uſed; it is annual. The ſtalks are large, hollow, and channelled; they riſe about a foot high, and ſend out many branches, which are garniſhed with trifoliate leaves, whoſe lobes are oval and ſlightly ſawed on their edges, ſtanding upon pretty long foot-ſtalks. The flowers are collected in oblong ſpikes, which ſtand upon very long foot-ſtalks, ſpringing from the wings of the ſtalks at every joint the whole length of the ſtalk; they are of a pale blue colour, and ſhaped like thoſe of the common Melilot; theſe appear in June and July, and are ſucceeded by ſmall yellow ſeeds of a kidney ſhape, two or three being included in each ſhort pod; theſe ripen the beginning of September. The whole plant has a very ſtrong ſcent like that of Fenugreek, and periſhes ſoon after the ſeeds are ripe.

If the ſeeds of theſe ſorts are permitted to ſcatter, the plants will riſe without care, and require no other culture but to keep them clean from weeds, and thin them where they grow too cloſe.

TRIGONELLA. Lin. Gen. Plant. 804. Fœnum Græcum. Tourn. Inſt. R. H. 409. tab. 230. Fenugreek.

The Characters are,

*The empalement of the flower is bell-ſhaped, of one leaf, cut at the top into five almoſt equal ſegments. The flower is of the butterfly kind; the ſtandard is oval, obtuſe, and reflexed; the two wings are oblong, reflexed, and ſpreading flat like the ſtandard, ſo as outwardly to appear like a regular flower of three petals; the keel is very ſhort, obtuſe, and occupies the navel of the flower. It has ten ſhort riſing ſtamina, nine of which are joined, and one ſtands ſeparate, terminated by ſingle ſummits, and an oval oblong germen, ſupporting a ſingle ſtyle, crowned by a riſing ſtigma. The germen afterward turns to an oblong oval pod compreſſed, and cloſe filled with kidney-ſhaped ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's ſeventeenth claſs, which includes thoſe plants whoſe flowers have ten ſtamina joined in two bodies.

The Species are,

1. Trigonella (*Fœnum Græcum*) leguminibus ſeſſilibus ſtrictis erectiuſculis ſubfalcatis acuminatis caule erecto. Hort. Cliff. 229. *Trigonella with ſcythe-ſhaped acute pods which are cloſe, erect, and ſit cloſe to the ſtalks, which are erect.* Fœnum Græcum ſativum. C. B. P. 348. *Common or cultivated Fenugreek.*
2. Trigonella (*Spinoſa*) leguminibus ſubpedunculatis congeſtis declinatus ſubfalcatis compreſſis pedunculis communibus ſpinoſis breviſſimis. Lin. Sp. 1094. *Fenugreek with foot-ſtalks to the pods, which are ſickle-ſhaped and compreſſed, and the common foot-ſtalks with ſhort ſpines.* Fœnum Græcum ſylveſtre polyceration Creticum majus. Breyn. Cent. 79. *Greater Cretan Fenugreek with many pods.*
3. Trigonella (*Polycerates*) leguminibus ſeſſilibus arcuatis confertis, caulibus procumbentibus. *Trigonella with arched pods growing in cluſters, which ſit cloſe to the ſtalks and trail on the ground.* Fœnum Græcum ſylveſtre alterum polyceration. C. B. P. 348. *Another wild Fenugreek with many pods.*
4. Trigonella (*Platycarpos*) leguminibus pedunculatis congeſtis pendulis ovalibus compreſſis, caule diffuſo, foliolis ſubrotundis. Hort. Upſal. 229. *Trigonella with cluſtered, oval, compreſſed, hanging pods, having foot-ſtalks, diffuſed ſtalks, and roundiſh lobes.* Melilotus ſupina latifolia ſiliquâ latâ membranaceâ compreſsâ. Amman. Ruth. 151. *Low broad-leaved Melilot, with broad, compreſſed, membranaceous pods.*
5. Trigonella (*Ruthenica*) leguminibus pedunculatis congeſtis pendulis linearibus rectis, foliolis ſublanceolatis. Lin. Sp. Plant. 776. *Trigonella with linear ſtrait pods which hang down, and grow in cluſters upon foot-ſtalks, and ſpear-ſhaped lobes to the leaves.* Melilotus ſupina anguſtifolia, medicæ folio, ſiliquâ compreſsâ. Amman. Ruth. 119. *Low narrow-leaved Melilot with the appearance of Medick, and a compreſſed pod.*

The firſt ſort is the common Fenugreek, whoſe ſeeds are uſed in medicine. Where this plant grows naturally is uncertain, but it is cultivated in the fields in the ſouth of France, and in Germany, from whence great quantities of the ſeeds are annually imported here for uſe.

It is an annual plant, which riſes with a hollow, branching, herbaceous ſtalk, a foot and a half high, garniſhed with trifoliate leaves placed alternately, whoſe lobes are oblong, oval, indented on their edges, and have broad furrowed foot-ſtalks. The flowers come out ſingly at each joint from the wings of the ſtalk; they are white, of the butterfly kind, and ſit very cloſe to the ſtalk; theſe are ſucceeded by long compreſſed pods ſhaped ſomewhat like a broad ſword, ending

ending in long points, having a broad membrane on one edge; these are filled with square yellow seeds, indented on one side like a kidney. The whole plant has a very strong odour.

This plant has not as yet been cultivated in any quantity for use in England, as it has generally proved a very uncertain crop, occasioned by the inconstancy of the weather here, for in cold wet seasons the plants are frequently killed before the seeds ripen; and if any of them live long enough to perfect their seeds, the pods change of a dirty colour, and the seeds turn black and unsightly, when much rain falls about the time of their ripening; therefore the seeds which are imported from the continent, are always preferred to those of our own growth.

But as the consumption of these seeds is very great in England, there are some persons who are inclinable to make fresh trials to cultivate the plants here, and, as I have many years cultivated this in small quantities, and have made trials by sowing the seeds at different seasons, and after various manners, by which I have acquired a knowledge of its culture, I shall here give such directions for the management of this plant, as from experience has been found to succeed best.

The ground in which this plant thrives best, is a light hazel loam, not enriched with dung; this should be made clean from the roots of weeds, and well ploughed twice, and harrowed fine before the seeds are sown. The best time to sow the seeds is the latter end of September or beginning of August; these should be sown in shallow drills like Peas. The rows should be two feet asunder, and the seeds must be scattered one inch distant from each other in the drills; for if the plants are too close together in the spring, they may be easily thinned with the hoe when the ground is cleaned. If the seeds are sown at the before-mentioned time, the plants will appear in three weeks or a month after; and if the weeds appear at the same time, the ground should be hoed over as soon as possible in dry weather, to destroy the weeds; and when the plants are grown an inch high, the earth should be drawn up to their stems in the same manner as is practised for Peas. This will secure their stems from being injured by sharp cutting winds; and if a ridge of earth is drawn up on the north or east side of each row, it will protect the plants from the pinching winds which blow from both those quarters; for although this plant will not be in any danger from the frost in the ordinary winters, yet in very severe frosts they are sometimes killed; but as this plant will live in any situation, where Peas stand through the winter, there will be no greater hazard of the one crop than the other.

In the spring of the year the ground must be hoed again in dry weather to kill the weeds, and the plants should be again earthed up in the like manner as Peas, with whose culture this plant will thrive; but there must be great care taken to keep the ground as clean from weeds as possible, for if they are permitted to grow, they will soon advance above the plants, and greatly weaken them; and when their pods begin to form, they cannot be too much exposed to the sun and air, whereby they will be less liable to suffer from moisture.

When the seeds are sown in autumn, the plants will grow much stronger, and have many more side branches than those which come up in the spring, so will produce a much greater crop of seeds, and these will produce their flowers five or six weeks earlier, so will have a better season to ripen; but in order to have them better ripened, the top of the plants should be cut off with garden shears about the middle of June, by which time the pods will be formed on the lower part of the stalks, which will be greatly forwarded by topping of the stalks in the same way as is commonly practised for garden Beans; for where the plants are suffered to extend in length, the lower pods often miscarry, or are less nourished, and those on the top of the stalks are late before they ripen; so where the topping of the plants is omitted, the pods at bottom will open and cast out their seeds, before those above will be ripe; therefore to preserve the first and cut off the other, will be found the best method; for by so doing, the pods will ripen equally, and much earlier in the season.

If the summer proves warm, the seeds will ripen in August, and the plants should then be cut off, and laid to dry for five or six days, in which time they should be turned two or three times, that the pods may dry equally; then the seeds may be either threshed out in the field, or the haulm may be housed in a barn, to be threshed at a more convenient time.

The second sort grows naturally in Crete. The stalks of this are slender, and rise a foot high, sending out several slender branches, which are garnished with trifoliate leaves whose lobes are wedge-shaped, and sawed at their ends, where they are indented; these stand upon slender foot-stalks. The flowers are produced in clusters from the sides of the branches upon short foot-stalks, which stand erect, being armed with short spines; the flowers are small, of a pale colour, and are succeeded by narrow pods standing parallel and erect. This is an annual plant which flowers in July; the seeds ripen the end of August, and the plants decay soon after.

The third sort grows naturally in Spain and Italy; this is also an annual plant, whose roots decay soon after the seeds are ripe. The stalks trail upon the ground, and extend a foot and a half in length, sending out several side branches; these are garnished with small trifoliate leaves, whose lobes are wedge-shaped and sawed at their points. The flowers are produced in clusters at the wings of the stalk; they are small, of a pale yellow colour, and sit very close to the stalks; these are succeeded by short hooked pods, which sit close to the stalks in clusters, spreading out every way. It flowers in July, and the seeds ripen in autumn.

The fourth sort grows naturally in Siberia. The root of this is biennial; the stalks trail upon the ground, and extend a foot in length, sending out many side branches; these are garnished with trifoliate leaves, having roundish lobes, which are sawed on their edges. The flowers come out from the wings of the stalks upon foot-stalks, growing in clusters; they are small, of a yellowish white colour, and are succeeded by oval compressed pods, containing two seeds in each. It flowers in June, and the seeds ripen in September.

The fifth sort also grows naturally in Siberia; this is also a biennial plant, whose roots decay soon after the seeds are ripe. The stalks of this are very slender, and trail upon the ground; they extend a foot and a half in length, and divide into several branches. The leaves are trifoliate; the lobes are wedge-shaped, indented at the point, and sawed; they are narrower than either of the former. The flowers are produced in clusters upon slender foot-stalks, which spring from the wings of the stalk; they are small, and of a bright yellow colour; these are succeeded by narrow erect pods, which contain three or four small seeds. This flowers and perfects its seeds about the same time as the former. The seeds of both these plants were sent me by the late Dr. Amman, Professor of Botany at Petersburgh.

These plants are frequently cultivated in gardens for the sake of variety, but I do not know any use is made of either of the sorts except the first. The seeds of these should be sown in the places where the plants are designed to stand, for they will not bear transplanting. If they are sown in autumn, in the same way as is before directed for the first sort, the plants will come earlier to flower, and good seeds may be obtained with more certainty than from the spring plants. All the culture these require is to thin them where they stand too close, and keep them clean from weeds. A few plants of each sort in a garden will be sufficient, as they have no great beauty.

The seeds of the first sort are very rarely used for internal medicines, but are much used in fomentations, bathings, and cataplasms, and also in emollient glysters, being ripening, dissolving, and anodyne, and

good for all kinds of tumours and ſwellings, to which purpoſe the farina or powder is very effectual. Farriers and grooms make much uſe of it in drinks for horſes; but theſe ſeeds are too hard to be pounded in a mortar, ſo they ſhould be ground in a mill.

TRILLIUM. Lin. Gen. Plant. 412. Solanum. C. B. P. American Herb Paris.

The CHARACTERS are,

*The flower has a three-leaved ſpreading empalement which is permanent, and three oval petals which are very little larger than the empalement; it has ſix awl-ſhaped ſtamina which are ſhorter than the petals, erect, and terminated by oblong ſummits which are the length of the ſtamina, and a roundiſh germen with three ſlender ſtyles which are recurved, crowned by ſingle ſtigmas. The germen afterward becomes a roundiſh berry with three cells, filled with roundiſh ſeeds.*

This genus of plants is ranged in the third ſection of Linnæus's ſixth claſs, which includes thoſe plants whoſe flowers have ſix ſtamina and three ſtyles.

The SPECIES are,

1. TRILLIUM (*Cernuum*) flore pedunculato cernuo. Lin. Sp. Plant. 339. *Trillium with a nodding flower growing upon a foot-ſtalk.* Solanum Triphyllum, flore hexapetalo carneo. Cateſb. Car. vol. 1. p. 45. *Three-leaved Nightſhade, with a fleſh-coloured flower having ſix petals.*
2. TRILLIUM (*Erectum*) flore pedunculato erecto. Lin. Sp. Plant. 340. *Trillium with a flower growing erect upon a foot-ſtalk.* Solanum triphyllum Canadenſe. Cornut. 166. *Three-leaved Canada Nightſhade.*
3. TRILLIUM (*Seſſile*) flore ſeſſili erecto. Lin. Sp. Plant. 340. *Trillium with an erect flower having no foot-ſtalk.* Solanum triphyllum flore hexapetalo tribus petalis purpureis, cæteris viridibus reflexis. Cateſb. Car. 1. p. 50. *Three-leaved American Nightſhade with a flower of ſix petals, three of which are purple-coloured, and the other green and reflexed.*

Theſe plants grow naturally in the woods in many parts of North America; the firſt was ſent me from Philadelphia by Dr. Benſel, who found it growing in plenty there. The root of this plant is tuberous, ſending out many fibres; the ſtalk is ſingle, naked, and riſes five or ſix inches high, with three oval leaves placed at the top upon ſhort foot-ſtalks, which ſpread out in a triangle; theſe are two inches long, and an inch and a half broad, ſmooth, and of a deep green colour. From the center of the foot-ſtalks of the three leaves comes out one flower upon a ſhort foot-ſtalk, which nods downward; this has a three-leaved green empalement which ſpreads open, and within are three petals about the ſize of the empalement; they are of a whitiſh green on their outſide, and purple within, having ſix ſtamina in the center, ſurrounding the ſtyle, which have oblong ſummits. The flowers of this appear in April, and are ſucceeded by roundiſh ſucculent berries, having three cells filled with roundiſh ſeeds, which ripen in June.

The ſecond ſort has a taller ſtalk than the firſt. The three leaves are placed at a diſtance from the flower, which ſtands upon a long foot-ſtalk, and is erect; the petals of the flower are larger, and end with ſharper points.

The third ſort grows in ſhady thickets in Carolina. The ſtalk of this is purple; the three leaves grow at the top like the firſt, but they are much longer, and end in acute points; the petals of the flowers are long, narrow, and ſtand erect.

Theſe plants are propagated by ſeeds, which ſhould be ſown upon a ſhady border ſoon after they are ripe, and then the young plants will come up the next ſpring; but if the ſeeds are ſown in the ſpring, they will remain in the ground a year. When the plants come up they muſt be kept clean from weeds, and in autumn, after their leaves decay, the roots may be tranſplanted to a moiſt ſhady place, where they are to remain.

TRIOSTEUM. Lin. Gen. Plant. 211. Trioſteoſpermum. Dillen. Hort. Elth. Dr. Tinkar's Weed, or falſe Ipecacuana.

The CHARACTERS are,

*The flower has a permanent empalement of one leaf, cut into five ſegment which are the length of the petal; and a tubulous flower of one petal, with a ſhort brim cut into five parts which ſtand erect; and five ſlender ſtamina the length of the tube, terminated by oblong ſummits, with a roundiſh germen ſupporting a cylindrical ſtyle, crowned by a thick ſtigma. The germen afterward becomes an oval berry with three cells, each including one hard, three-cornered, obtuſe ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and one ſtyle.

The SPECIES are,

1. TRIOSTEUM (*Perfoliatum*) floribus verticillatis ſeſſilibus. Lin. Sp. Plant. 176. *Trioſteum with flowers growing in whorls, and ſitting cloſe to the ſtalks.* Trioſteoſpermum latiore folio, flore rutilo. Hort. Elth. *Broad-leaved Trioſteoſpermum with a reddiſh flower, commonly called Dr. Tinkar's Weed, or falſe Ipecacuana.*
2. TRIOSTEUM (*Anguſtifolium*) floribus oppoſitis pedunculatis. Lin. Sp. Plant. 175. *Trioſteum with flowers growing oppoſite, having foot-ſtalks.* Periclymenum herbaceum rectum Virginianum. Pluk. Alm. 287. *Upright, herbaceous, Virginian Honeyſuckle.*

The firſt ſort grows naturally in the woods in moſt parts of North America; this has a root compoſed of thick fleſhy fibres, which are contored and rough, from which ſpring ſeveral ſtrong herbaceous ſtalks, riſing a foot and a half high, garniſhed at each joint by two oblong broad leaves embracing the ſtalk. From the boſoms of theſe come out the flowers in whorls, ſitting very cloſe to the ſtalks; theſe have empalements which are cut into five ſegments. The flowers are ſmall, tubulous, and cut ſlightly at the brim into five obtuſe ſegments; they are of a dark red colour, inclining to purple; theſe appear the beginning of June, and are ſucceeded by roundiſh berries, which turn yellow when ripe; they have three cells, in each of which is contained one hard ſeed. The root is perennial, but the ſtalks decay every autumn.

The ſecond ſort differs from the firſt in its leaves being longer and narrower. The flowers ſtand ſingle upon ſhort foot-ſtalks, and there are but two at each joint, whereas the other has many growing in whorls round the ſtalks; but the roots of both are indifferently uſed in America by the title of Dr. Tinkar's Weed.

Both theſe plants are natives of New England, Virginia, and ſome other northern parts of America, where their roots have been frequently uſed as an emetic, and are commonly called Ipecacuana. One of the firſt perſons who brought their roots into uſe was Dr. Tinkar, from whence many of the inhabitants have called them by the name of Dr. Tinkar's Weed. The leaves of the firſt ſort greatly reſemble thoſe of the true Ipecacuana, but the roots are of a different form; but ſo far as I can judge by the imperfect fruit of a ſpecimen in my collection of the true Ipecacuana, as alſo by the figure and deſcription given by Piſo in his Hiſtory of Braſil, it ſeems to belong to this genus.

The firſt ſort grows on low marſhy grounds, near Boſton in New England, very plentifully, where the roots are taken up every year, and are continued in uſe amongſt the inhabitants of Boſton.

This plant is preſerved in ſeveral curious gardens in England, and is hardy enough to thrive in the open air, but it ſhould be planted on a moiſt light ſoil; for if it is on dry ground, there muſt be care taken to water the plants conſtantly in dry weather, otherwiſe they will not thrive. It may be propagated by ſeeds, which ſhould be ſown on a border of light earth, where the morning ſun only comes on it; but if the ſeeds are ſown in the ſpring, they will remain in the ground a whole year before the plants will come up, ſo that during this time the border muſt be conſtantly kept clear from weeds; and the following ſpring, when

the plants appear, they should be duly watered in dry weather, which will greatly promote their growth; but if the seeds are sown in autumn, the plants will come up the following spring. They must be constantly kept clean from weeds, which, if permitted to grow amongst them, will soon overbear the plants while they are young, and either quite destroy them, or so much weaken them, that they will not recover in a long time.

The plants may remain in this seed-border until the Michaelmas following, when they should be carefully taken up, and transplanted where they are designed to remain. Some of them should be planted in pots, that they may be sheltered in winter while young, lest those which are in the full ground should be destroyed by severe frost.

This plant may be also propagated by parting of the roots. The best season for this work is in the spring, just before the plants begin to shoot, which is commonly about the middle or latter end of March; but in doing of this, the roots must not be parted too small, for that will prevent their flowering strong.

These plants perfect their seeds in this country every year, which, if sown in autumn as soon as they are ripe, the plants will come up the following spring, by which means a whole year will be saved. The seedling plants will not flower until the third year, and then they are seldom so strong as the older plants.

TRIPETALOUS FLOWERS are such as consist of three leaves, which are called petals, to distinguish them from the leaves of plants.

TRIPOLIUM. See Aster.

TRITICUM. Tourn. Inst. R. H. 512. tab. 292, 293. Lin. Gen. Pl. 99. Wheat; in French, *Froment.*

The Characters are,

*It has an oval chaffy empalement with two valves, which inclose two or three flowers. The petals have a double valve as large as the empalement; the outer valve is bellied and acute-pointed, the inner is plain. The flowers have three hair-like stamina terminated by oblong forked summits, and a top-shaped germen supporting two hairy reflexed styles, crowned by feathery stigmas. The germen afterward becomes an oval oblong seed, obtuse at both ends, convex on one side, and channelled on the other, wrapped up in the petal of the flower.*

This genus of plants is ranged in the second section of Linnæus's third class, which contains those plants whose flowers have three stamina and two styles.

The Species are,

1. Triticum (*Hybernum*) calycibus quadrifloris ventricosis lævibus, imbricatis submutisis. Hort. Upsal. 21. *Wheat with beards, having smooth, bellied, imbricated husks, with four flowers.* Triticum hybernum aristis carens. C. B. P. 21. *Winter Wheat without awns, or common Wheat.*

2. Triticum (*Æstivum*) calycibus quadrifloris ventricosis glabris imbricatis aristatis. Hort. Upsal. 21. *Bearded Wheat with smooth imbricated bellies, and four flowers in each chaff.* Triticum æstivum. C. B. P. 21. *Summer or Spring Wheat.*

3. Triticum (*Turgidum*) calycibus quadrifloris ventricosis villosis imbricatis subaristatis. Hort. Upsal. 21. *Wheat with hairy, bellied, imbricated, obtuse husks, containing four flowers.* Triticum spicâ villosâ quadratâ, breviore & turgidiore. Mor. Hist. 3. p. 176. *Wheat with four-cornered, short, hairy, turgid spikes, commonly called gray Pollard, or Duckbill Wheat.*

4. Triticum (*Quadratum*) glumis ventricosis villosis imbricatis spicis oblongis pyramidatis. *Wheat with hairy, bellied, imbricated husks, and oblong pyramidal spikes.* Triticum spicâ villosâ quadrata longiore, aristis munitum. Mor. Hist. 3. p. 176. *Wheat with longer, four-rowed, hairy spikes armed with beards, commonly called Cone Wheat.*

5. Triticum (*Polonicum*) calycibus bifloris nudis, flosculis longissime aristatis, racheos dentibus barbatis. Lin. Sp. Plant. 127. *Wheat with two flowers in each cup, which are long, naked, and bearded.* Triticum Polonicum. Pluk. Phyt. 231. f. 6. *Polonian Wheat.*

There are some other varieties of Wheat, which the farmers in different parts of England distinguish by different titles, but they are only seminal variations, which have risen from culture. Some of these differ in the colour of their chaff, and others in the form of their spikes; but as they are subject to vary, we shall not enumerate them as different species. These are, The red Wheat without awns, the red-eared bearded Wheat, many-eared Wheat, and naked Barley. The five sorts above enumerated I have sown several years, and have always found them constant without variation.

Where Wheat grows naturally is very hard to determine at present; but it is generally supposed that Africa is the country, because in the earliest accounts we have of it, there is mention of its being transported from thence to other countries, and Sicily was the first country in Europe where this grain was cultivated; but although the country of its natural growth is in a very warm climate, it is found to bear the inclemency of our rough climate very well; and in more northern countries, where the summers are long enough to ripen the grain, it is found to succeed.

The first sort is the common Wheat which is sown in most parts of England, and is so well known as to need no description. The spikes or ears of this are long; the grains are ranged in four rows, and lie over each other like the scales of fish; the chaff is smooth, bellied, and is not terminated by awns or beards.

The second sort is called Summer or Spring Wheat; this will ripen much earlier than the other, so has often been sown in the spring of the year, at the same time with Oats; but if the season proves wet, it is very subject to grow tall, and have very thin grains, which has discouraged people from sowing it at that season; so that, unless from the severity of the winter, or some other accident, the winter Corn is injured, the practice of sowing Wheat in the spring is rarely used.

The third sort is called in some places Gray Wheat, in others Duckbill Wheat and gray Pollard, but in Sussex it is generally known by the title of Fullers Wheat; this sort grows very tall, and if it is sown too thick, is very apt to lodge with rain and wind, for the ears are large and heavy; they nod on one side as the grain increases in weight. The awns are long, the chaff hairy, which detains the moisture, all which help to lodge it, for which reason many people do not chuse to cultivate this sort; but where the roots are at a proper distance from each other, they will put out many stalks from each, and the stalks will be stronger, and support themselves better, and the grain produces more flour in proportion than any of the other sorts. The awns of this sort always drop off when the grain is full grown.

The fourth sort is more cultivated in Oxfordshire and Berkshire than in any other part of England. The ears of this sort are formed like a cone, ending with a slender point, from whence it had the title of Cone Wheat. Of this there are the white and red, which I believe are only varieties, for I have generally seen them mixed in the field. The awns of this are long and rough, so the farmers say it guards the grain from birds, which has been a recommendation to sow it, especially near inclosures, where there is a shelter for birds. Mr. Tull prefers this sort for sowing in drills, but I have seen the third sort answer much better in the horse-hoeing husbandry.

The Polonian Wheat grows tall, the ears are long and heavy, so that where it is sown too thick, it is very subject to be lodged; therefore the farmers little regard it; but it produces much flour, and therefore worthy of cultivation.

The season for sowing of Wheat is autumn, and always when the ground is moist. In the downs of Hampshire, Wiltshire, and Dorsetshire, the farmers begin sowing of their Wheat in August, if there happens rain; so that when they are in their harvest, if the weather stops them, they employ their people in sowing, for if the Corn is not forward in autumn, so as to cover the ground before winter, it seldom succeeds well on those dry lands, especially if the spring should prove dry; but in the low strong lands, if they get

get their Wheat into the ground by the middle of November, the farmers think they are in good ſeaſon; but ſometimes it ſo happens, from the badneſs of the ſeaſon, that in many places the Wheat is not ſown till Chriſtmas or after, but this late-ſown Wheat is ſubject to run too much to ſtraw, eſpecially if the ſpring ſhould prove moiſt.

The uſual allowance of ſeed Wheat to one acre of land is three buſhels, but from repeated experiments, it has been found, that leſs than half that quantity is more than ſufficient; therefore, if the farmers have regard to their own intereſt, they ſhould ſave this expence of ſeed, which amounts to a conſiderable article in large farms, eſpecially when it is to be purchaſed, which moſt of the ſkilful farmers do, at leaſt every other year, by way of change; for they find that the ſeeds continued long upon the ſame land will not ſucceed ſo well, as when they procure a change of ſeeds from a diſtant country. And the ſame is practiſed by the huſbandmen of the Low-Countries, who commonly procure freſh ſeeds from Sicily every ſecond or third year; which they find ſucceed better with them, than the ſeeds of their own country. In the choice of the ſeeds, particular regard ſhould be had to the land upon which it grew, for if it is light land, the Wheat which grew upon ſtrong land is the beſt, and ſo vice verſa.

There have been ſome perſons in England curious enough to procure their ſeed Wheat from Sicily, which has ſucceeded very well, but the grain of this has proved too hard for our Engliſh mills to grind, which has occaſioned their neglecting to procure their ſeeds from thence; nor do I think there can be much advantage in procuring the ſeeds from abroad, ſince the lands of England are ſo various, as to afford as much change of ſeeds as will be neceſſary. And the leſs we purchaſe from abroad, the greater will be the ſaving to the public; ſo that it ſhould be the buſineſs of ſkilful farmers to want as few ſeeds as poſſible, ſince, by exchange with each other, they may ſo contrive, as not to part with ready money for any ſeeds.

The land which is uſually allotted for Wheat, is laid fallow the ſummer before the Corn is ſown; during which time it is ploughed two or three times, to bring it into a tilth; and the oftener and better the ground is ploughed, and the more it is laboured with harrows between each ploughing to break and divide the clods, the better will be the crop, and the fewer weeds will be produced. But in this article moſt of the farmers are deficient, for after they have given their lands one ploughing, they frequently leave it to produce weeds, which ſometimes are permitted to ſtand until they ſhed their ſeeds, whereby the ground will be plentifully ſtocked with weeds; and as an excuſe for this, they ſay that theſe weeds will ſupply their ſheep with ſome feed, and the dung of the ſheep will mend their land; but this is a very bad piece of huſbandry, for the weeds will draw from the land more than the dung of the ſheep will ſupply; ſo that it is undoubtedly the beſt method to keep the ground as clean from weeds as poſſible, and to ſtir it often to ſeparate and break the clods, and render the land fine; and where the land can enjoy a winter's fallow, it will be of much greater ſervice to it than the ſummer; and by thus labouring of the land, it will be of equal ſervice to it as a dreſſing of dung. Therefore if the farmers could be prevailed on to alter their method of huſbandry, they would find their advantage in it; for the expence of dreſſing in ſome counties is ſo great, as to take away the whole profit of the crop.

There is alſo a very abſurd method in common practice with the farmers, which is the carrying out of their dreſſing, and ſpreading it on the land in the ſummer, where it lies expoſed till the ſun has dried out all the goodneſs of it, before it is ploughed into the ground, ſo that the dreſſing is of little value; therefore the dung ſhould never be laid on the land faſter than it can be ploughed in, for one load of dung ſo managed, is better than three in their uſual method.

As Wheat remains a longer time upon the ground than moſt other ſorts of Corn, it requires a greater ſtock of nouriſhment to lengthen and fill the ears: therefore, if the dreſſing is exhauſted in winter, the Corn will have but ſhort ears, and thoſe but lean, nor will the grain afford much flour; ſo that it frequently happens, that a light dreſſing of ſoot in the ſpring, at the time the Wheat is beginning to ſtalk, proves of greater ſervice to the crop, than a dreſſing of dung laid on the land before it is ploughed, eſpecially if the dung is not very good. Deep ploughing (where the ſtaple of the ground is deep enough to admit of it) will alſo be of great ſervice to the Corn, for the ſmall fibres of the roots, which are the mouths that ſupply the nouriſhment, extend themſelves very deep into the ground. I have traced many of them upward of three feet, and believe they ſpread much farther where the ground is light; therefore it is of great advantage to the crop to have the ground ſtirred and looſened to a proper depth, for by ſo doing the roots will find a ſupply of paſture for the nouriſhment and augmentation of the ears, at the time they are forming, when it is moſt required; for if the ground is ploughed ſhallow, the roots will have extended themſelves to that depth by the ſpring, ſo that when the nouriſhment is wanted to ſupply the ſtalks, the roots are ſtinted by the hardneſs of the ſoil, which they cannot penetrate; when this is the caſe, the colour of the blade is frequently ſeen to change in April, and ſeldom recovers its verdure again; and when this happens, the ſtalks are always weakened in proportion to the decay of the blade; for it is well known from long experience, that the leaves or blade of Corn, are neceſſary to draw in nouriſhment from the air and dews, for the increaſe of the ſtalk and ear; but in order to aſcertain this, I have made trial of it, by cutting off the leaves of ſome roots of Wheat alternately, early in the ſpring, and have conſtantly found the ſtalks upon thoſe roots much ſmaller, the ears ſhorter, and the grain thinner than thoſe of the intermediate roots, whoſe blades were not cut. This ſhews the abſurdity of that practice of feeding ſheep upon Corn in the winter and ſpring. I have frequently ſeen in ſome gardens, plants diveſted of their lower leaves, which ignorant perſons have ſuppoſed to draw away the nouriſhment from the head; but whereever this has been practiſed, I have always ſeen the plants have been greatly weakened by it; ſo that until thoſe leaves decay naturally, they ſhould never be taken off.

Of late years, many compoſts have been advertiſed for the ſteeping of the ſeeds of Corn, in order to improve their growth, ſome of which have been ſold at a dear rate; but as ſo great ſucceſs was aſſured by the inventors to thoſe who ſhould make uſe of them, there were numbers of perſons who made the trial; but ſo far as I have been able to get information of their experiments, they did not ſucceed ſo well as to encourage the uſe of theſe compoſitions; and from ſeveral trials which I made myſelf with great care, I always found, that the Wheat which had been ſteeped in theſe compoſitions came up ſooner, and grew much ranker in the winter, than that which had not been ſteeped; but in the ſpring the unſteeped Wheat had a greater number of ſtalks to each plant, and the ears were better fed than thoſe which had been ſteeped; therefore theſe ſorts of compoſts have been found of no real uſe to the crop.

My experiments were made in the following manner. The Wheat was ſown in drills, on the ſame ſpot of ground; the ſeeds which had been ſteeped were ſown in alternate rows, and the intermediate rows were ſown with unſteeped Corn. The rows were a foot and a half aſunder, and the grains were all taken out of one meaſure, and ſown as equally as poſſible: the ſteeped Corn appeared above ground three days before the other, and continued to grow faſter than the unſteeped Corn during the winter, but in the ſpring the blade of the ſteeped Corn changed its colour, and their points became of a brown colour, when I gave a light

light dressing to one of the rows, which soon recovered its verdure, and caused it to be the strongest row of the whole; but the others which had not this dressing, produced weaker stalks and ears than that which was not steeped.

I have before observed, that in general the farmers sow more than double the quantity of Corn on their lands than is necessary; therefore there is a great waste of grain, which in scarce years amounts to a considerable sum in large farms, and to a whole country, it is an object worthy the attention of the public: but I fear whatever may be said to prevent this, will have but little weight with the practitioners of agriculture, who are so fond of old customs, as rarely to be prevailed upon to alter them, though they are extremely absurd. But if these people could be prevailed on to make the trial with care, they must be soon convinced of their error; for if they would but examine a field of Corn sown in the common way, they will find but few roots which have more than two or three stalks, unless by chance, where there may be some few roots which have room to spread, upon which there may be six, eight, or ten stalks, and frequently many more; but in a field of Wheat which had not a greater allowance than one bushel of Corn to an acre, so that the roots had room to spread, I have observed the roots produced from six to twelve, or fourteen stalks, which were strong, and had long well nourished ears, and the produce was much greater than in any of those fields in the neighbourhood, which were sown with the common allowance. And if the land is good, and the roots stand at a proper distance from each other, there will be few roots which will not produce as many stalks as I have here mentioned, and the ears will be better nourished.

But if the land is not covered with the blades of Corn by the spring, the farmers think they shall have no crop; whereas, if they would have patience to wait till the roots put out their stems, they would soon be convinced of the contrary; especially if they could be prevailed on to draw a weighty roller over the Wheat in March, which will cause it to spread; and by settling of the loose ground to the roots, the drying winds in the spring would be prevented from penetrating to their fibres, so that the roots will produce the more stalks; but before this operation, it will be proper to have the Corn cleaned from weeds, if these are permitted to grow, they will draw away much nourishment from the Corn; and if, at this season, the land is made clean from weeds, the Corn will soon after spread and cover the ground, whereby the growth of weeds will be greatly lessened.

There is not any part of husbandry which requires the farmer's attention more, than that of keeping his land clean from weeds; and yet there are few who trouble themselves about it, or who understand the proper method of doing it; few of them know those weeds which are annual, so as to distinguish them from those which are perennial; and without this knowledge, it will be much more difficult for a person to clean his land, let his industry be ever so great, for annual weeds may be soon destroyed if taken in time; whereas, if they are neglected, their seeds will soon ripen and scatter; after which it will require three times the labour and expence to get rid of them, as would have been sufficient at the beginning, and then the crop would have had no bad neighbours to rob it of its nourishment. The common method now practised is a very absurd one, for the weeds are left to grow till the Wheat is beginning to ear, and the weeds are in flower; so the ground being covered by the Corn, all the low weeds are hid, and these are left to ripen and scatter their seeds; the tall weeds only are taken out, and if the people employed are not careful, many of these will escape them, as they will be so intermixed with the stalks of Wheat as not to appear, unless diligently sought after. By this method the weeds of tall growth are permitted to stand, and rob the Corn of its nourishment, during the principal time of its growth, and the humble weeds are never destroyed; and by going amongst the stalks when they are tall, great numbers of them are broken and trod under the work-people's feet; yet however obvious this is to every farmer, none of them have thought of altering this practice. I would therefore recommend a method which is now in common practice amongst the kitchen gardeners, which has been found of great benefit to their crops, and has also been a great saving to them in the expence of weeding; and this is making use of hoes for cleaning the Wheat early in the spring, before the ground is covered with blades of Corn. With this instrument, all the low as well as the tall weeds will be cut up, and if it is performed in dry weather, the weeds being then small will soon die. Where the ground happens to be very full of weeds, it may be necessary to go over it a second time, at about a fortnight after the first, to cut up any weeds which may have before escaped. By laying the ground clean at this time, the Corn will not be robbed of its nourishment; and there will not be time for the weeds to grow so as to prejudice it much after, for the ground will be so much shaded by the Corn, as to keep down the weeds, so that they cannot have time to ripen their seeds before harvest.

If, at the time of this operation, the roots of Corn are cut up where they are too close, it will be found of great service to the other; but this, I fear, few of the old farmers will ever agree with me in; tho' what I mention is not from theory but experiments, which have been repeated with great care; and where it was practised the produce of twenty rods of ground, was much greater both in weight and measure, than the same quantity of ground in the best part of the field where this was not practised, and the stalks stood upright, when a great part of the Corn in the same field was lodged.

I have often observed in those fields where foot-paths are made through Corn-fields, that by the side of those paths where the Corn is thin, and has been trodden down in the winter and spring, that the stalks have stood erect, when most of the Corn in the same field has been laid flat on the ground; which was owing to the stalks being so much stronger from their having more room, the other having been drawn up tall and slender by being so close together. There is also another great advantage in keeping Corn clean from weeds, and giving it room to spread, which is, that the Corn is not so liable to take the smut as when it is full of weeds, and the roots too much crowded, as I have frequently observed; so that cleanness and free air, is as essential to the well doing and growth of vegetables as animals; and the changing of the seed annually is also as necessary, as the change of air is to all sorts of animals; for where this has been carefully practised, there has rarely happened any smutty Corn in the field.

Brining of the seed Wheat is what the farmers generally practise to prevent the smut, which in most years answers very well; but there is nothing which contributes more to this, than keeping the plants in good health, which is better effected by the method before proposed; for by stirring of the ground with the hoe between the roots of Corn in the spring, they will be better supplied with nourishment; for in strong lands, where the water may have lain in the winter, the surface of the ground will bind so hard on the first dry weather as to stint the Corn, and frequently cause it to change colour. When this happens, the roots seldom put out many stalks, and those which are put out, are weak; but where the surface of the ground can be stirred to loosen the parts, the Corn will soon recover its colour and strength, and cover the land with shoots.

What has been here directed, must be understood to relate to Wheat sown in broad-cast, which is the usual method practised by farmers in every part of England; for the horse-hoeing husbandry which was practised by Mr. Tull, has been almost universally rejected

by the farmers in every county, it being so opposite to their accustomed practice, that they cannot be prevailed upon to make trial of it; and indeed, by the absurdity of the author in a few particulars, he has discouraged many from engaging in it, who would have practised it; but upon finding Mr. Tull positively asserting, that the same land would nourish the same species of plants without changing the crops for ever, and this without manure, which being contrary to all experience, led them to believe his other principles had no better foundation. And he practised this method of sowing the same species upon the same ground, till his crops failed, and were much worse than those of his neighbours who continued their old method of husbandry, and hereby his horse-hoeing husbandry was ridiculed by them, and laid aside by gentlemen who were engaging in it. But notwithstanding these and some other particulars which have been advanced by Mr. Tull, yet it is much to be wished that this new husbandry might be universally practised; for some few persons who have made sufficient trial of it, have found their crops answer much better than in the common or old method of husbandry; and the French, who have learned it from Mr. Tull's book, are engaging in the practice of it with greater ardour than those of our own country: and although they had not the proper instruments of agriculture for the performance, and met with as strong opposition from the persons employed to execute the business as in England, yet the gentlemen seem determined to persist in the practice of it, though as yet few of their experiments have had the success they hoped for; partly from the aukwardness of their labourers, and partly from their averseness to practise this husbandry, and also from their being made in land not well conditioned, but yet their produce has been equal to that of the old husbandry; and they say, that if the produce of the land in the new method of husbandry does not exceed that in the old way, yet by saving seven parts from eight of the seed Corn, it is a great affair to a whole country, especially in times of scarcity.

As Mr. Tull has given a full directions for the practice of this husbandry, I shall refer the reader to his book for instruction, and shall only mention two or three late experiments which have been made in his method, whereby the utility of it will more fully appear.

The first was in a field of Wheat, which was sown partly in broad-cast in the common method, and partly according to Tull's method; the spots thus sown were not regular in lands, but interspersed indifferently in many directions. Those parts of the field in Tull's method, were in rows at two feet distance, and stood thin in the rows. The roots of the Wheat in these spots had from ten to thirty stalks on a root, and continued upright till it was reaped; whereas few of the roots in the common method had more than two or three stalks, and these were most of them lodged before harvest; so that upon trial of the grain when threshed, there was near a third part more in weight and measure, than from the same extent of ground, taken in the best part of the field sown in the common way.

Another trial was made in sowing of the Corn in rows at different distances, with some sown in two parts of the ground broad-cast. The event was, that all which was sown broad-cast in the usual way was lodged, as was also most of that where the rows were six or nine inches asunder; those which stood a foot distance escaped better, but the rows two feet asunder were the best, and the produce much greater than any of the other; which plainly shews the absurdity of that practice, in sowing a great quantity of seeds to have a better produce, which is the opinion of most of the old farmers; and it was formerly the prevailing opinion among gardeners, who allowed near eight times the quantity of seeds for the same space of ground as is now usually sown, and these crops are greatly superior to any of those.

The produce of an acre of Wheat is various, according to the goodness of the soil. In some of the shallow, chalky, down lands, where there have been near four bushels of Corn sown, I have known the produce not more than double of the seed; but when this is the case, the farmer had much better let his land lie waste, since the produce will not defray the expence, so that more than the rent of the land is lost: and although these sorts of crops are frequently seen on such land, yet such is the passion for ploughing among the husbandmen at present, that if they were not restrained by their landlords, they would introduce the plough into every field, notwithstanding they are sure to lose by it.

But although the produce of these poor downs is so small, as before related, yet upon good land, where the Corn has stood thin upon the ground, I have known eight or ten quarters reaped from an acre, over the whole field, and sometimes much more. And I have been informed by persons of great credit, that on good land, which was drilled and managed with the horse-hoe, they have had twelve quarters from an acre of land, which is a great produce; and this is with greater certainty, if the seasons prove bad, than can be expected by the common husbandry.

The finest field of Wheat I ever yet saw, was sown in rows at a foot and a half distance; the allowance of seed to this field was three gallons, and by the common practice of the farmers, there is seldom less than three bushels, which is eight times the quantity: this Wheat was hoed by the hand twice in the spring, which cost five shillings and six-pence per acre. When the Corn was in ear, it was not less than six feet high; there were from twelve to twenty stalks on each root, which were so strong as to all stand upright; the ears were very long, the ground perfectly clean from weeds, and the produce was more than eleven quarters to an acre of land. These experiments, one should imagine, would excite an industry among farmers to the practice; but on the contrary, not one of those in the neighbourhood would follow it.

The price of Corn varies continually, and this variation is often very great in the space of one or two years; so that from being so cheap, as that the farmers could not pay their rents, in the compass of a year or two the price has been doubled; for one or two plentiful harvests have lowered the price of Wheat so much, as to make it difficulty for the needy farmer to go on with his business who wants ready money for his crops, as soon as he can prepare them for the market. This has established a set of people called dealers in Corn, who have taken the advantage of the farmer's necessity, and engrossed their Corn to keep it for better markets; and these dealers have of late years increased so greatly in their numbers, to the great prejudice of the raisers and consumers of Corn, as may in time prove fatal to the country, by monopolizing the greatest part of the produce, and then set their own price upon it; so that between these Corn-factors as they are called, and the distillers, the price of bread may be too great for the labouring poor; which is an affair which requires more public attention than has yet been given to it.

The French are building public granaries for the conservation of their Corn, in most of their provinces; for as in some years they have great plenty of Corn, and at other time as great scarcity, they are contriving to prevent any great want of it.

When the Wheat is sold much under four shillings the bushel, the farmer cannot pay his rent and live; nor can the poorer sort of people afford to purchase good bread, when the Wheat is sold at a price much higher than six shillings the bushel; therefore when it it is at a medium between these, there can be no great cause of complaint on either side.

**TRIUMFETTA.** Plum. Nov. Gen. 40. tab. 8. Lin. Gen. Plant. 529.

The CHARACTERS are,

*The flower has no empalement; it has five linear, erect, obtuse petals, which are concave, and turn inward; it has*

*has fifteen or sixteen rising stamina which are awl-shaped, erect, and the length of the petals, terminated by single summits; and a roundish germen supporting a style the length of the stamina, crowned by an acute bifid stigma. The germen afterward becomes a globular capsule, set with long prickles on every side, having four cells, each containing one seed, which is convex on one side and angular on the other.*

This genus of plants is ranged in the first section of Linnæus's eleventh class, which contains those plants whose flowers have from eleven to nineteen stamina inclusive, and one style.

There is but one SPECIES of this genus at present known, viz.

TRIUMFETTA (*Lappula.*) Hort. Cliff. 210. Triumfetta fructu echinato racemoso. Gen. Plant. 40. *Triumfetta with prickly branching fruit.*

The title of this genus was given to it by Father Plumier, in honour of John Baptist Triumfetti, doctor of physic and philosophy at Bononia, who has published some curious tracts in botany.

This plant grows naturally in Jamaica, and most of the other islands of the West-Indies; it rises with an upright stem to the height of six or seven feet, which becomes ligneous toward the bottom, and divides upward into four or five branches, which are garnished with leaves placed alternately their whole length; these are about two inches and a half long, and almost two inches broad toward their base, divided almost into three lobes toward the top, and the middle division ending in an acute point; they are veined on their under side, are covered with a soft brown down, and have several veins running from the midrib to the sides; their upper side is of a yellowish green, and a little hairy; their borders are acutely, but unequally sawed, and stand upon foot-stalks an inch long. The branches are terminated by long spikes of flowers, which come out in clusters from the side of the principal foot-stalk, at distances of about an inch. The flowers are small, the petals narrow, and of a yellow colour; these are succeeded by burry capsules, something like those of the Agrimony, but are round; the prickles are longer than those, and are placed on every side. This plant generally flowers here in July and August, and in warm seasons the seeds do sometimes ripen in England.

It is propagated by seeds, which must be sown on a hot-bed early in the spring; and when the plants are come up, they should be each transplanted into a separate pot filled with light, fresh, kitchen-garden earth, and plunged into a moderate hot-bed of tanners bark; they must be shaded from the sun until they have taken new root, after which time they must be treated in the same manner as hath been directed for other tender exotic plants. During the summer season the plants may remain in this hot-bed, but in autumn they must be removed into the stove, and plunged into the bark-bed, observing to refresh them with water frequently; but in very cold weather it must not be given them in too great plenty. If the plants live through the winter, they will flower the following summer, so will ripen their seeds in autumn; but they may be continued two or three years, provided they are carefully managed.

TROLLIUS. Lin. Gen. Plant. 620. Helleborus. Tourn. Inst. R. H. 272. Globe Ranunculus, or Locker Gowlans.

The CHARACTERS are,

*The flower has no empalement; it has about fourteen almost oval petals, whose points meet together; it has nine nectariums, which are narrow, plain, incurved, and umbilicated, which are perforated at their base, and a great number of bristly stamina, terminated by erect summits, with numerous germina sitting close like a column, having no styles, but are crowned by pointed stigmas. The germen afterward become so many capsules collected into an oval head, each containing one seed.*

This genus of plants is ranged in the seventh section of Linnæus's thirteenth class, which includes those plants whose flowers have many male and female parts.

The SPECIES are,

1. TROLLIUS (*Europæus*) corollis conniventibus, nectariis longitudine staminum. Lin. Sp. Plant. 556. *Trollius with the petals of the flower meeting, and nectariums the length of the stamina.* Helleborus niger, ranunculi folio, flore globoso majore. Tourn. Inst. R. H. 272. *Black Hellebore with a Crow-foot-leaf, and a large globular flower, commonly called Globe-flower, or Locker Gowlans.*
2. TROLLIUS (*Asiaticus*) corollis patentibus, nectariis longitudine petalorum. Lin. Sp. Plant. 557. *Trollius with an open spreading flower, and nectariums the length of the petals.* Helleborus aconiti folio, flore globoso croceo. Amman. Ruth. 101. *Hellebore with a Wolf's-bane leaf, and a globular Saffron-coloured flower.*

The first sort grows naturally in the northern counties in England, and in many parts of Wales. I found it in great plenty growing in the park of Burrow-hall, in Lancashire; it has a perennial, fibrous, black root, from which spring up many leaves which resemble those of Wolf's-bane, cut into five segments almost to the bottom; the stalk rises near two feet high; it is smooth, hollow, and branches toward the top; each branch is terminated by one large yellow flower, shaped like those of Crow-foot, which has no empalement. These are composed of several concave petals, whose points turn inward toward each other, covering the parts of generation, so are of a globular form, whence it had the title of Globe Ranunculus. It flowers the latter end of May and the beginning of June, and the seeds ripen in August. This plant is frequently kept in gardens about London, and is easily propagated by parting of the roots; the best time for doing this is the latter end of September, when the leaves are beginning to decay. The roots should not be divided into small parts, if they are expected to flower strong the following year; these should be planted at a foot distance from each other, and require a shady situation and a moist soil. The roots need not be removed or parted oftener than once in three years, unless there is a desire of increasing them.

The second sort grows naturally in Siberia, from whence it was brought to the Imperial Garden at Petersburgh, and has been communicated since to several parts of Europe; this differs from the first in having larger leaves, which are of a lighter green colour; their segments are fewer and larger, resembling those of the yellow Monk's-hood. The petals of the flower spread open, and do not converge at their points like those of the first sort. The flowers, stamina, and nectariums are of an elegant Saffron colour. It flowers in May.

This sort may be propagated and treated in the same way as the first, but it requires a moister soil, and should have a shady situation, but not under the drip of trees; it thrives best on a north border, where the soil is loamy, but not too stiff. In such situations the plants will produce seeds in England, for if they are in a dry soil, or much exposed to the sun, they frequently die in summer. I have seen this sort in the most flourishing state, where the surface of the ground was covered with Moss to keep it moist.

As the flowers of both these plants make a pretty appearance during their continuance, they deserve a place in every good garden for the sake of variety, especially as they will thrive in moist shady places where few better plants will live; and by thus suiting the plants to the different soils and situations of a garden, every part may be furnished with beauties, and a greater variety may be preserved.

TROPÆOLUM. Lin. Gen. Plant. 421. Cardamindum. Tourn. Inst. R. H. 430. tab. 244. Indian Cress.

The CHARACTERS are,

*The empalement of the flower is of one leaf, ending in five points; it is erect, spreading, coloured, and falls off.*

*The two under segments are narrow, their tail ends in a nectarious horn, which is longer than the empalement. The flower has five roundish petals inserted in the segments of the empalement; the two upper sit close to the foot-stalk, but the lower have oblong hairy tails. It has eight short awl-shaped stamina, which decline and are unequal, terminated by oblong rising summits having four cells, and a roundish germen, with three lobes which are streaked, supporting a single erect style, crowned by an acute trifid stigma. The germen afterward becomes a solid fruit dividing in three parts, convex on the outside, angular within, having many furrows, each part or cell including one furrowed seed, convex on one side, and angular on the other.*

This genus of plants is ranged in the first section of Linnæus's eighth class, which includes those plants whose flowers have eight stamina and one style.

The Species are,

1. Tropæolum (*Minus*) foliis subquinquelobis, petalis obtusis. Hort. Upsal. 93. *Tropæolum with leaves which are almost divided into five lobes, and obtuse petals to the flower.* Cardamindum minus & vulgare. Tourn. Inst. R. H. 433. *The common or smaller Indian Nasturtium.*
2. Tropæolum (*Majus*) foliis subquinquelobis petalis obtusis. Hort. Upsal. 93. *Tropæolum with five lobes to the leaves, and obtuse petals to the flower.* Cardamindum ampliore folio & majore flore. Tourn. Inst. R. H. 430. *Indian Nasturtium with a larger leaf and flower, commonly called Indian Cress.*

The first sort grows naturally in Peru; this was first brought to Europe in 1684, and was rised in the gardens of Count Beverning in Holland.

It has a trailing herbaceous stalk, garnished with leaves almost circular. The foot-stalk is inserted in the center of the leaf, like a buckler, as is the Navelwort; the leaves are smooth, and of a grayish colour; the flowers come out from the wings of the stalks, standing upon very long slender foot-stalks; they are of an admirable structure, and are composed of five acute-pointed petals; the two upper are large and rounded, the three under are narrow, and their tails join together, and are lengthened into a tail two inches long. After the flower is passed, the germen turns to a roundish fruit which is furrowed, and divided into three lobes, each including one streaked seed. It flowers from Midsummer till the frost stops it in autumn.

There are two varieties of this, one with a deep Orange-coloured flower inclining to red, and the other with a pale yellow flower.

The second sort grows naturally about Lima; this has larger stalks than the former. The leaves are also larger, and their borders are indented almost into lobes; the flowers are larger, and their petals are rounded at their points. There are two colours of this sort as in the former, and one with double flowers, which is propagated by cuttings, for it does not produce seeds.

The first sort is less common at present in the English gardens than the second, the flowers of the latter being larger make a finer appearance, for which it is preferred; they are both esteemed annual plants, tho' they may be continued through the winter if they are kept in pots, and sheltered in a good green-house, in like manner as that with double flowers is preserved, and they may be propagated by cuttings as that is; but, as these ripen their seeds constantly every year, the plants are generally raised from seeds, which may be sown in April in the places where they are to remain, which should be where their stalks may have support, for they will climb six or eight feet high when they are trained up, and then their flowers will make a good appearance; but when they trail upon the ground, they will spread over the neighbouring plants and become unsightly.

The flowers of these plants are frequently eaten in sallads; they have a warm taste like the Garden Cress, and are esteemed very wholesome; they are likewise used for garnishing dishes. The seeds are pickled, and by some are preferred to most kinds of pickles for sauce.

TUBEROSE. See Polyanthes.

TUBEROSE ROOTS are such as consist of an uniform fleshy substance, and are of a roundish figure, as Turneps, &c.

TUBULOUS PLANTS are such whose stems or flowers are hollow like a pipe.

TULIPA. Tourn. Inst. R. H. 373. tab. 199, 200. Lin. Gen. Plant. 376. Tulip.

The Characters are,

*The flower has no empalement; it is of the bell-shape, and composed of six oblong, oval, concave, erect petals; it has six awl-shaped stamina which are shorter than the petals, terminated by oblong four-cornered summits, and a large, oblong, taper, three-cornered germen, having no style, crowned by a triangular, three-lobed, permanent stigma. The germen afterward turns to a three-cornered capsule having three cells, which are filled with compressed seeds, lying over each other in a double order.*

This genus is ranged in the first section of Linnæus's sixth class, which contains those plants whose flowers have six stamina and one style.

The Species are,

1. Tulipa (*Sylvestris*) flore subnutante, foliis lanceolatis. Lin. Sp. Plant. 305. *Tulip with a nodding flower, and spear-shaped leaves.* Tulipa minor lutea Italica. C. B. P. 63. *The smaller yellow Italian Tulip.*
2. Tulipa (*Gesneriana*) flore erecto, foliis ovato-lanceolatis. Lin. Sp. Plant. 306. *Tulip with an erect flower, and oval spear-shaped leaves. Common Tulip with all its varieties.*

The first sort was formerly preserved in the English gardens, but since there has been so many varieties of the second sort propagated in England, the first has been rejected, and is now only to be found in old neglected gardens. The petals of this flower end in acute points; the flower is yellow, and nods on one side, and the leaves are narrower than those of the common sort.

The common Tulip is so well known as to need no description, and it would be to little purpose to enumerate the several varieties of these flowers, which may be seen in one good garden, since there is no end of their numbers, and what some people may value at a considerable rate, others reject; and as there are annually a great variety of new flowers obtained from breeders, those which are old, if they have not very good properties to recommend them, are thrown out and despised, I shall therefore point out the properties of a good Tulip, according to the characteristics of the best florists of the present age. 1. It should have a tall strong stem. 2. The flower should consist of six leaves, three within, and three without; the former ought to be larger than the latter. 3. Their bottom should be proportioned to their top, and their upper part should be rounded off, and not terminate in a point. 4. These leaves, when opened, should neither turn inward nor bend outward, but rather stand erect, and the flower should be of a middling size, neither over large, nor too small. 5. The stripes should be small and regular, arising from the bottom of the flower; for if there are any remains of the former self-coloured bottom, the flower is in danger of losing its stripes again. The chives should not be yellow, but of a brown colour. When a flower has all these properties, it is esteemed a good one.

Tulips are generally divided into three classes, according to their seasons of flowering; as Præcoces, or early blowers; Medias, or middling blowers; and Serotines, or late blowers; but there is no occasion for making any more distinctions than two, viz. early and late blowers.

The early blowing Tulips are not near so fair, nor do they rise half so high as the late ones, but are chiefly valued for appearing so early in the spring, some of which will flower the middle of March in mild seasons, if planted in a warm border near a wall, pale, hedge, or other shelter, and the others will succeed them; so that they keep flowering until the general season for these flowers is come, which is toward the end of April. As these early blowing Tulips are but few,

few, I shall insert the name of the principal of them, which are as follow :

| | |
|---|---|
| 1. Duke Van Toll, or Winter Duke. | 21. Vice-roy. |
| 2. General Duke. | 22. Maria. |
| 3. General Brancion. | 23. Aurora Van Bart. |
| 4. Pretty Betty. | 24. Paragon Grebberi. |
| 5. Duchess of Brancion. | 25. Galatea. |
| 6. Lac Verine. | 26. Marquis. |
| 7. Violet Ragans. | 27. Gilden Bloemen. |
| 8. Violet Remow, or Pourpre Lisse. | 28. Alcetus. |
| 9. Palto Van Leyden. | 29. Jewel Van Haerlem. |
| 10. Florisante. | 30. Jacht Van Delst. |
| 11. Brandenburgh. | 31. Goude Son. |
| 12. Nonsuch. | 32. Flamboyant. |
| 13. Admiral Crinki. | 33. Bruyd Renard. |
| 14. General Molswick. | 34. Palamedes. |
| 15. Paragon Cleremont. | 35. Apollo. |
| 16. Admiral Encusen. | 36. Juno. |
| 17. Morillion. | 37. Silver-boot. |
| 18. Noblest. | 38. Florida Voorhelm. |
| 19. Early Perfect. | 39. Roy d'Espagne. |
| 20. Superintendent. | 40. Metropolit. |
| | 41. Konins-kroon. |

These are the names which have been imposed on these flowers by the florists of the several countries where they were raised, and by which the roots may be obtained from Flanders and Holland, where the florists are very exact in keeping up their lists of these flowers complete.

The roots of these early blowing Tulips should be planted the beginning of September in a warm border, near a wall, pale, or hedge; because if they are put into an open spot of ground, their buds are in danger of suffering by morning frosts in the spring. The soil for these should be renewed every year, where people intend to have them fair. The best soil for this purpose is that which is taken from a light sandy pasture, with the turf rotted amongst it, and to this should be added a fourth part of sea sand. This mixture may be laid about ten inches deep, which will be sufficient for these roots, which need not be planted more than four or five inches deep at most. The offsets should not be planted amongst the blowing roots, but in a border by themselves, where they may be planted pretty close together, especially if they are small; but these should be taken up when their leaves decay, in the same manner as the blowing roots, otherwise they would rot if the season should prove very wet; for these are not so hardy as the late blowers, nor do they increase half so fast as those, so that a greater care is required to preserve the offsets of them.

When these Tulips come up in the spring, the earth upon the surface of the borders should be gently stirred and cleared from weeds; and as the buds appear, if the season should prove very severe, it will be of great service to cover them with mats, for want of which many times they are blighted, and their flowers decay before they blow, which is often injurious to the roots, as is also the cropping of the flowers so soon as they are blown; because their roots, which are formed new every year, are not at that time arrived to their full magnitude, and are hereby deprived of proper nourishment.

If, when these flowers are blown, the season should prove very warm, it will be proper to shade them with mats, &c. in the heat of the day; as also if the nights are frosty, they should be in like manner covered, whereby they may be preserved a long time in beauty; but, when their flowers are decayed, and their seed-vessels begin to swell, they should be broken off just at the top of the stalks, because if they are permitted to seed, it will injure the roots.

When the leaves of these flowers are decayed (which will be before the late blowers are out of flower) their roots should be taken up, and spread upon mats in a shady place to dry; after which they should be cleared from their filth, and put in a dry place where the vermin cannot come to them, until the season for planting them again, being very careful to preserve every sort separate, that you may know how to dispose of them at the time for planting them again; because it is the better way to plant all the roots of each sort together (and not to intermix them, as is commonly practised in most other kinds of flowers;) for as there are few of them which blow at the same time, so when the several roots of one sort are scattered through a whole border, they make but an indifferent appearance; whereas, when twenty or thirty roots of the same sort are placed together, they will all flower at the same time, and afford a more agreeable prospect.

There are many curious persons, who, in order to preserve their several kinds of Tulips, and other bulbous-rooted flowers separate, have large flat boxes made, which are divided into several parts by small partitions, each of which is numbered in the same manner as the divisions of their beds; so that when a catalogue of their roots is made, and the numbers fixed to each sort in the beds, there is nothing more to do when they take up their roots, but to put every kind into the division marked with the same number which was placed to each sort in the bed, which saves a great deal of trouble in making fresh marks every time the roots are taken up, and effectually answers the purpose of preserving the kinds separate.

The several sorts of these early blowing Tulips rise to different heights in their stems, so that scarcely any two of them grow to an equal height. The Duke Van Toll being one of the first that appears in the spring, is generally very short-stalked, and so the other sorts, in proportion to their earliness, are shorter than those which succeed them, and the late blowing kinds are all of them considerably longer in their stems than any of the Præcoces, or early blowers; so that when they are confusedly mixed together, they make a very indifferent appearance.

The late blowing Tulips are so numerous, that, as I before observed, it would be to no purpose to attempt to give a catalogue of them. These are generally obtained from breeders, which is a term applied to all such flowers as are produced from seeds, which are of one self-colour, and have good bottoms and chives; these in time break into various beautiful stripes, according to the ground of their former self-colour, but this must be entirely thrown off, otherwise they do not esteem a flower well broken.

Of these breeders there hath been a great variety brought into England from Flanders of late years, which is the grand nursery for most sorts of bulbous-rooted flowers; but there are some curious persons, who have lately obtained many valuable breeders from seed sown in England; and doubtless, were we as industrious to sow the seeds of these flowers as the people of France and Flanders, we might in a few years have as great a variety as is to be found in any part of Europe; for, although it is six or seven years from the sowing before the flowers blow, yet, if after the first sowing there is every year a fresh parcel sown, when the seven years are expired, there will be constantly a succession of roots to flower every year, which will reward the expectation, and keep up the spirit of raising; but it is the length of time at first, which deters most people from this work.

The manner of propagating these flowers from seeds is as follows: you should be careful in the choice of the seed, without which there can be little success expected. The best seed is that which is saved from breeders which have all the good properties before related, for the seeds of striped flowers seldom produce any thing that is valuable.

The best method to obtain good seeds is to make choice of a parcel of such breeding Tulip roots as you would save seeds from, and place them in a separate bed from the breeders, in a part of the garden where they may be fully exposed to the sun, observing to plant them at least nine inches deep; for if they are planted too shallow, their stems are apt to decay before their seed is perfected.

These flowers should always be exposed to the weather, for if they are shaded with mats, or any other covering, it will prevent their perfecting the seed. About the middle of July, (a little sooner or later, as the summer is hotter or colder) the seeds will be fit to gather, which may be known by the dryness of their stalks, and the opening of the seed-vessels, at which time it may be cut off, and preserved in the pods till the season for sowing it, being careful to put it up in a dry place, otherwise it will be subject to mould, which will render it good for little.

Having saved a parcel of good seed, about the beginning of September is the best season for sowing it, when there should be provided a parcel of shallow seed-pans, or boxes, which should have holes in their bottoms to let the moisture pass off; these must be filled with fresh sandy earth, laying the surface very even, upon which the seeds should be sown as regularly as possible, that they may not lie upon each other; then there should be some of the same light sandy earth sifted over them, about half an inch thick. These boxes or pans should be placed where they may have the morning sun till eleven of the clock, in which situation they may remain until October, at which time they should be removed into a more open situation, where they may enjoy the benefit of the sun all the day, and be sheltered from the north winds, where they should remain during the winter season; but in the spring, when the plants are up, they should be again removed to their first situation; and if the season should be dry, they must be refreshed with water while the plants remain green; but as soon as their tops begin to decay, there must be no more given them, lest it rot their tender bulbs; therefore the boxes should be placed in a shady situation during the summer season, but not under the drip of trees.

These plants, at their first appearance, have very narrow grassy leaves like those of Onions, and come up with bending heads, in the same manner as they do; so that persons who are unacquainted with them, may pull them up instead of Grass whilst they are very young, before their leaves are a little more expanded, which is rarely performed the first year; for they seldom appear before the middle of March, and they commonly decay about the latter end of May, or the beginning of June, according as the season is hotter or colder.

The weeds and Moss should also be cleared off from the surface of the earth in the boxes, and a little fresh earth sifted over them soon after their leaves decay, which will be of great service to their roots. These boxes should be constantly kept clear from weeds, which, if permitted to grow therein, when they are pulled up, the roots will be apt to draw the bulbs out of the ground. At Michaelmas they should be fresh earthed again, and as the winter comes on, they must be again removed into the sun as before, and treated in the same manner, until the leaves decay in the spring, when the bulbs should be carefully taken up, and planted in beds of fresh sandy earth, which should have tiles laid under them, to prevent their roots from shooting downward, which they often do when there is nothing to stop them, and thereby are destroyed. The earth of these beds should be about five inches thick upon the tiles, which will be sufficient for nourishing these roots while they are young.

The distance which these young bulbs should be allowed, need not be more than two inches, nor should they be planted above two inches deep; but toward the end of October, it will be proper to cover the beds over with a little fresh earth about an inch deep, which will preserve the roots from the frost, and prevent Moss or weeds from growing over them; but, if the winter should be very severe, it will be proper to cover the bed either with mats or Peashaulm, to prevent the frost from entering the ground, because these roots are much tenderer while young, than they are after they have acquired strength.

In the spring the surface of the ground should be gently stirred to make it clean, before the plants come up; and if the spring should prove dry, they must be frequently refreshed with water during the time of their growth; but this must not be given to them in great quantities, lest it rot their tender bulbs; and when the leaves are decayed, the weeds should be taken off, and the beds covered with fresh earth, which should also be repeated again in autumn.

In these beds the bulbs may remain two years, during which time they must be constantly kept clear from weeds, and in spring and autumn fresh earthed, in the manner already directed; after which the bulbs must be taken up, and planted into fresh beds, at four inches asunder, and as many deep, where they may remain two years more, during which time they should have the same culture as before; and after that, the bulbs being large enough to blow, they should be taken up, and planted in fresh beds at the usual distance, and in the same manner as old roots; where, when they flower, such of them as are worthy to be preserved, should be marked with sticks; and at the season for taking up the bulbs, they must be separated from the others, in order to be planted as breeders in different beds; but you should by no means throw out the rest until they have flowered two or three years, because it is impossible to judge exactly of their value in less time; for many, which at first flowering appear beautiful, will afterwards degenerate so as to be of little value; and others, which did not please at first, will many times improve, so that they should be preserved until their worth can be well judged of.

In this method many sorts of new breeders will be annually raised, from which there will always be fine flowers broken, which, being the produce of a person's own sowing, will be greatly valued, because they are not in other hands, which is what enhances the price of all flowers: and it has been entirely owing to this method of raising new flowers, that the Dutch have been so famous, amongst whom the passion for fine Tulips did some time reign so violently, that many of the florists near Haerlem have often given a hundred ducats for one single root; which extravagance was the occasion of an order being made by the States, to limit the utmost price that should be afterward given for any Tulip root, were it ever so fine.

Having thus given an account of the method of raising these flowers from seeds, I shall now proceed to the management of those roots which are termed breeders, so as to have some of them every year break out into fine stripes.

There are some who pretend to have a secret how to make any sort of breeders break into stripes whenever they please, but this, I dare say, is without foundation; for from many experiments which I and others have made of this kind, I never could find any certainty of this matter. All that can be done by art, is to shift the roots every year into fresh earth of different mixtures and a different situation, by which method I have had very good success.

The earth of these beds should be every year different, for although it is generally agreed that lean, hungry, fresh earth doth hasten their breaking, and cause their stripes to be the finer and more beautiful, yet, if they are every year planted in the same sort of soil, it will not have so much effect on them, as if they were one year planted in one sort of earth, and the next year in a very indifferent one, as I have several times experienced; and if some fine striped Tulips are planted in the same beds with the breeders, intermixing them together, it will also cause the breeders to break the sooner.

The best compost for these roots is a third part of fresh earth from a good pasture, which should have the sward rotted with it, a third part of sea sand, and the other part sifted lime rubbish; these should be all mixed together six or eight months at least before it is used, and should be frequently turned, in order to mix the parts well together. With this mixture the beds should be made about two feet deep, after the following manner: after the old earth is taken from out of the bed to the depth intended, then some of the fresh earth

earth should be put in about eighteen inches thick; this should be levelled exactly, and then lines drawn each way of the bed, chequerwise; at six inches distance, upon the center of each cross, should be placed the Tulip roots, in an upright position, and after having finished the bed in this manner, the earth must be filled in, so as to raise the bed six or eight inches higher, observing, in doing this, not to displace any of the roots, and also to lay the top of the beds a little rounding to throw off the water.

There are many persons who are so careless in planting their Tulip roots, as only to dig and level the beds well, and then with a blunt dibble to make holes, into which they put the roots, and then fill up the holes with a rake, but this is by no means a good method; for the dibble, in making the holes, presses the earth closely on each side, and at the bottom, whereby the moisture is often detained so long about the roots as to rot them, especially if the soil is inclinable to bind; besides the earth being hard at the bottom of the bulbs, they cannot so easily emit their fibres, which must certainly prejudice the roots.

These beds should be sunk, more or less, below the surface, according to the moisture or dryness of the ground, for the roots should be so elevated as never to have the water stand near the reach of their fibres in winter, for moisture is very apt to rot them; so that where the soil is very wet, it will be proper to lay some lime rubbish under the earth, in order to drain off the wet, and the beds should be entirely raised above the level of the ground; but to prevent their falling down into the walks, after frost or hard rains, it will be proper to raise the paths between them, either with sea coal ashes or rubbish, eight or ten inches, which will support the earth of the beds; and these paths may slope at each end from the middle, which will make passage for the water to run off as it falls. But where the soil is dry, the bottom of the beds may be sunk eighteen or twenty inches below the surface, for in such places the beds need not be more than four or six inches above the surface, which will be allowance enough for their settling.

During the winter season there will be no farther care required. The roots being planted thus deep, will be in no danger of suffering by ordinary frosts, but if the winter should prove very severe, some rotten tan or Peas-haulm may be laid over the beds to keep out the frost during the continuance, but this must be removed when the frost is over; and in the spring, when their leaves begin to appear above ground, the earth upon the surface of the beds should be stirred to clear it from weeds, Moss, &c. and when the flower-buds begin to come up, they should be guarded from frost, otherwise they are very subject to blight and decay soon after they appear, if the frost pinches their tops; but they need only be covered in such nights when there is a prospect of frost, for at all other times they should have as much air as possible, without which they will draw up weak, and produce small flowers.

When the breeding Tulips are in flower, you should carefully examine them, to see if any of them have broken into beautiful stripes, which, if you observe, there should be a stick put into the ground by every such root, to mark them, that they may be separated from the breeders, to plant amongst the striped flowers the following year; but you should carefully observe, whether they have thrown off their former colour entirely, as also when they decay, to see if they continue beautiful to the last, and not appeared smeared over with the original colour, in both which cases they are very subject to go back to their old colour the next year: but if their stripes are distinct and clear to the bottom, and continue so to the last, (which is what the florists call dyeing well,) there is no great danger of their returning back again, as hath been by some confidently reported; for if one of these flowers is quite broken (as it is termed,) it will never lose its stripes, though sometimes they will blow much fairer than at others, and the flowers of the offsets will be often more beautiful than those of the old roots.

This alteration in the colour of these flowers may be seen long before they are blown, for all the green leaves of the plant will appear of a fainter colour, and seem to be striped with white, or of a brownish colour, which is a plain proof, that the juices of the whole plant are altered, or, at least, the vessels thro' which the juice is strained; so that hereby particles of a different figure are capable of passing through them, which, when entered into the petals of the flower, reflect the rays of light in a different manner, which occasions the variety we see in the colours of flowers (but this is more fully explained in the article Vegetation, which see.) This breaking of the colours in flowers proceeds from weakness, or at least is the cause of weakness in plants; for it is observeable, that after Tulips are broken into fine stripes, they never grow so tall as before, nor are the stems, leaves, or flowers, so large as before; and it is the same in all other variegated plants and flowers whatever, which are also much tenderer than they were before they were striped; so that many sorts of exotic plants which by accident became variegated in their leaves, are often rendered so tender, as not to be preserved without much more care, though indeed the striping of Tulips doth never occasion so great weakness in them as to render them very tender. The greatest effect it hath on them, is in lessening their growth, causing some (which, while they continued in their original plain colours, did rise near three feet in height) to advance little more than two after their colours were altered; and the more beautifully their stripes appear, the shorter will be their stems, and the weaker their flowers.

There is nothing more to be observed in the culture of striped flowers than what has been directed for breeders, excepting that these should be arched over with tall hoops and rails, that they may be shaded from the sun in the day time, and protected from strong winds, hard rains, and frosty mornings, otherwise the flowers will continue but a short time in beauty; but where the instructions here given are duly followed, they may be preserved in flower a full month, which is as long as most other flowers continue.

There are some persons who are so extremely fond of these flowers, as to be at a great expence in erecting large frames of iron work to cover their beds of Tulips, in such a manner, that they may walk between two beds under the frames, over which are spread tarpaulins, so as to keep off sun, rain, and frost, whereby they can view the flowers without being at the trouble of taking off or turning up the tarpaulins, or being incommoded by the sun or rain, which cannot be avoided where the covering is low; besides, by thus raising the covers, the flowers have a greater share of air, so that they are not drawn so weak, as they are when the covering is low and close to them; but these frames being expensive, can only be made by persons of fortune; however, there may be some of wood contrived at a smaller expence, which being arched over with hoops, may answer the purpose as well as the iron frames, though they are not so sightly or lasting.

But after the flowers are faded, the heads of all the fine sorts should be broken off to prevent their seeding; for if this is not observed, they will not flower near so well the following year, nor will their stripes continue so perfect; and this will also cause their stems to decay sooner than otherwise they would do, so that their roots may be taken up early in June, for they should not remain in the ground after their leaves are decayed. In taking the roots out of the ground, you must be very careful not to bruise or cut them, which will endanger their rotting, and, if possible, it should be done a day or two after rain. When these roots are taken out of the ground, they must be cleared from their old covers, and all sorts of filth, and spread upon mats in a shady place to dry, after which they should be put up in a dry place, where vermin


cannot

cannot get to them, obſerving to keep every ſort ſeparate, but they ſhould not be kept too cloſe from the air, nor ſuffered to lie in heaps together, leſt they ſhould grow mouldy, for if any of the roots once take the mould, they commonly rot when they are planted again, if not before.

The offsets of theſe roots, which are not large enough to produce flowers the ſucceeding year, ſhould be alſo put by themſelves, keeping each ſort diſtinct; theſe ſhould be planted a month earlier in autumn than the blowing roots, in particular beds by themſelves in the flower-nurſery, where they may not be expoſed to public view; but the earth of the beds ſhould be prepared for them in the ſame manner as for larger roots, though theſe ſhould not be planted above five inches deep, becauſe they are not ſtrong enough to puſh through ſo great covering of the earth as the old roots; they may be placed much nearer together than thoſe which are to flower, and in one year moſt of them will become ſtrong enough to flower, when they may be removed into the flower-garden, and placed in the beds amongſt thoſe of the ſame kinds.

TULIPIFERA. Herm. Hort. Leyd. Boerh. Ind. Plant. II. p. 262. Liriodendrum. Lin. Gen. Plant. 609. [of Tulipa, a Tulip, and fero, *Lat.* to bear.] The Tulip-tree.

The CHARACTERS are,

*The proper involucrum of the flower is compoſed of two angular leaves, which fall off; the empalement is compoſed of three oblong plain leaves like petals, which fall away. The flower is nearly of the bell-ſhape, and has ſix petals, which are obtuſe and channelled at their baſe; the three outer fall off; it has a great number of narrow ſtamina, which are inſerted to the receptacle of the flower, having long narrow ſummits faſtened to their ſide, and many germen diſpoſed in a cone, having no ſtyle, crowned by a ſingle globular ſtigma. The germen afterward become ſcaly ſeeds, lying over each other like the ſcales of fiſh, and form the reſemblance of a cone.*

This genus of plants is ranged in the ſeventh ſection of Linnæus's thirteenth claſs, which includes thoſe plants whoſe flowers have many male and female parts. He has altered the title of it to Liriodendrum, but as the flowers of this tree have as little reſemblance of a Lily, as they have of a Tulip, the firſt title may be as well continued, eſpecially as it has been long known in Europe by the title Tulipifera.

We have but one SPECIES of this genus, viz.

TULIPIFERA (*Liriodendron.*) *The Tulip-tree.* Tulipifera arbor Virginiana. H. L. *The Virginia Tulip-tree*; *and by Linnæus* Liriodendron foliis lobatis. Lin. Sp. Plant. 755.

This is a native of North America, where it grows ſo large as to be a tree of the firſt magnitude, and is generally known thro' all the Engliſh ſettlements by the title of Poplar. Of late years there has been great numbers of theſe trees raiſed from ſeeds in the Engliſh gardens, ſo that now they are become common in the nurſeries about London, and there are many of the trees in ſeveral parts of England which do annually produce flowers. The firſt tree of this kind which flowered here, was in the gardens of the late Earl of Peterborough, at Parſons Green near Fulham, which was planted in a wilderneſs among other trees; before this was planted in the open air, the few plants which were then in the Engliſh gardens, were planted in pots and houſed in winter, ſuppoſing they were too tender to live in the open air; but this tree ſoon after it was placed in the full ground, convincing the gardeners of their miſtake, by the great progreſs it made, while thoſe which were kept in pots and tubs increaſed ſlowly in their growth; ſo that afterward there were many others planted in the full ground, which are now arrived to a large ſize, eſpecially thoſe which were planted in a moiſt ſoil. One of the handſomeſt trees of this kind near London, is in the garden of Waltham Abbey; and at Wilton, the ſeat of the Earl of Pembroke, there are ſome trees of great bulk; but the old tree at Parſons Green is quite deſtroyed, by the other trees which were ſuffered to over-hang it, and rob it of its nouriſhment, from a fear of taking down the neighbouring trees, leſt by admitting the cold air to the Tulip-tree it would injure it.

The young ſhoots of this tree are covered with a ſmooth purpliſh bark; they are garniſhed with large leaves, whoſe foot-ſtalks are four inches long; they are ranged alternate; the leaves are of a ſingular form, being divided into three lobes; the middle lobe is blunt and hollowed at the point, appearing as if it had been cut with ſciſſars. The two ſide lobes are rounded, and end in blunt points. The leaves are from four to five inches broad near their baſe, and about four inches long from the foot-ſtalk to the point, having a ſtrong midrib, which is formed by the prolongation of the foot-ſtalk. From the midrib run many tranſverſe veins to the borders, which ramify into ſeveral ſmaller. The upper ſurface of the leaves is ſmooth, and of a lucid green, the under is of a pale green. The flowers are produced at the end of the branches; they are compoſed of ſix petals, three without, and three within, which form a ſort of bell-ſhaped flower, from whence the inhabitants of North America gave it the title of Tulip. Theſe petals are marked with green, yellow, and red ſpots, ſo make a fine appearance when the trees are well charged with flowers. The time of this tree's flowering is in July, and when the flowers drop, the germen ſwells and forms a kind of cone, but theſe do not ripen in England.

Mr. Cateſby, in his Natural Hiſtory of Carolina, &c. ſays, There are ſome of theſe trees in America, which are thirty feet in circumference; that the boughs are unequal and irregular, making ſeveral bends or elbows, which render the trees diſtinguiſhable at a great diſtance, even when they have no leaves upon them. They are found in moſt parts of the northern continent of America, from the Cape of Florida to New England, where the timber is of great uſe, particularly for making of periaugues, the trunks of theſe being large enough to be hollowed into the ſhape of thoſe boats, ſo they are of one piece.

This tree is propagated by ſeeds, which are now annually imported in great plenty from America. Theſe may be either ſown in pots or tubs filled with light earth from the kitchen-garden, or in a bed in the full ground. Thoſe which are ſown in the firſt way, may be placed on a gentle hot-bed, which will forward their growth, ſo that the plants will acquire more ſtrength before winter. If they are thus treated, the glaſſes of the hot-bed ſhould be ſhaded from the ſun every day, and the earth in the pots ſhould be frequently refreſhed with water, for unleſs it is kept moiſt, the ſeeds will not grow; but this muſt be done with care, ſo as not to make it too wet, which will rot the ſeeds. When the plants appear, they muſt be ſtill ſhaded in the heat of the day from the ſun, but freſh air muſt be admitted daily to prevent their drawing up weak, and as the ſeaſon advances, they muſt be gradually hardened to bear the open air. While the plants are young, they do not care for much ſun, ſo they ſhould be either ſhaded or placed where the morning ſun only ſhines upon them; they muſt alſo be conſtantly ſupplied with water, but not have it in too great plenty. As the young plants commonly continue growing late in the ſummer, ſo when there happens early froſts in autumn, it often kills their tender tops, which occaſions their dying down a conſiderable length in winter; therefore they ſhould be carefully guarded againſt theſe firſt froſts, which are always more hurtful to them than harder froſts afterward, when their ſhoots are better hardened; however, the firſt winter after the plants come up, it will be the better way to ſhelter them in a common hot-bed frame, or to arch them over with hoops, and cover them with mats, expoſing them always to the open air in mild weather.

The following ſpring, juſt before the plants begin to ſhoot, they ſhould be tranſplanted into nurſery-beds, in a ſheltered ſituation, where they are not too much expoſed to the ſun. The ſoil of theſe beds ſhould be

a soft gentle loam, not too stiff, nor over light; this should be well wrought, and the clods well broken, and made fine. There must be great care taken not to break the roots of the plants in taking them up, for they are very tender; they should be planted again as soon as possible, for if their roots are long out of the ground, they will be much injured thereby. These may be planted in rows at abont a foot distance, and at six inches distance in the rows, for as they should not remain long in these nursery-beds, so this will be room enough for them to grow; and by having them so close, they may be shaded in the summer, or sheltered in the winter, with more ease than when they are farther apart.

When the plants are thus planted, if the surface of the beds is covered with rotten tanners bark, or with Moss, it will prevent the earth from drying too fast, so that the plants will not require to be so often watered, as they must be where the ground is exposed to the sun and air; after this, the farther care will be to keep them clean from weeds, and if the latter part of summer should prove moist, it will occasion the plants growing late in autumn, so the tops will be tender and liable to be killed by the first frosts. In this case, they should be covered with mats to protect them.

If the plants make great progress the first summer, they may be transplanted again the following spring; part of them may be planted in the places where they are to remain, and the other should be planted in a nursery where they may grow two or three years to acquire strength before they are planted out for good; though the younger they are planted in the places where they are to stand, the larger they will grow, for the roots run out into length, and when they are cut it greatly retards their growth, so that these trees should never be removed large, for they rarely succeed when they are grown to a large size before they are transplanted. Some trees I have seen removed pretty large, which have survived their removal, but young plants of two or three years old which were planted near them, were much larger in fifteen years than the old ones.

When the seeds are sown upon a bed in the full ground, the bed should be arched over with hoops, and shaded in the heat of the day from the sun, and frequently refreshed with water; as also should the plants when they appear, for when they are exposed much to the sun they make but small progress. The care of these in summer must be to keep them clean from weeds, supplying them duly with water, and shading them from the sun in hot weather; but as these seeds will not come up so soon as those which were placed on a hot-bed, they generally continue growing later in autumn, therefore will require shelter from the early frosts in autumn; for as the shoots of these will be much softer than those of the plants which had longer time to grow, so if the autumnal frosts should prove severe, they will be in danger of being killed down to the surface of the ground, by which the whole summer's growth will be lost, and sometimes the plants are entirely killed by the frost the first winter, if they are not protected.

As these plants will not have advanced so much in their growth as the other, they should remain in the seed-bed to have another year's growth before they are removed, therefore all that will be necessary to observe the second year is to keep them clean from weeds; and now they will not be in so much danger of suffering from the warmth of the sun as before, therefore will not require such constant care to shade them; nor should the watering of them be continued longer than the spring, for if the autumn should prove dry, it will prevent the plants from shooting late, and harden those shoots which were made early in the year, whereby the plants will be in less danger from the early frosts.

After the plants have grown two years in the seed-bed, they will be strong enough to remove, therefore, in the spring, just at the time when their buds begin to swell, they should be carefully taken up, and transplanted into nursery-beds, and treated in the same way as has been before directed for the plants which were raised on a hot-bed.

There are some people who propagate this tree by layers, but the layers are commonly two or three years before they take root, and the plants so raised, seldom make such strait trees as those raised from seeds; tho' indeed they will produce flowers sooner, as is always the case with stinted plants.

This tree should be planted on a light loamy soil, not too dry, on which it will thrive much better than upon a strong clay, or a dry gravelly ground; for in America they are chiefly found upon a moist light soil, where they will grow to a prodigious size, though it will not be proper to plant these trees in a soil which is too moist in England, because it might endanger the rotting of the fibres of the roots, by the moisture continuing too long about them, especially if the bottom be clay, or a strong loam, which will detain the wet.

TURKS CAP. See Lilium.

TURKY WHEAT. See Zea.

TURNEP. See Rapa.

TURNERA. Plum. Nov. Gen. 15. tab. 12. Lin. Gen. Plant. 338.

The Characters are,

*The empalement of the flower is funnel-shaped, of one leaf, having an oblong, cylindrical, angular tube, and is cut into five segments. The flower has five heart-shaped, pointed, plain petals, with narrow tails which are inserted in the tube of the empalement; it has five awl-shaped stamina which are shorter than the petals, inserted in the empalement, and are terminated by acute-pointed erect summits, and a conical germen supporting three slender styles, crowned by hairy many-pointed stigmas. The germen afterward turns to an oval capsule with one cell, which opens at the top with three valves, and contains several oblong obtuse seeds.*

This genus of plants is ranged in the third section of Linnæus's fifth class, which includes those plants whose flowers have five male and three female parts.

The Species are,

1. Turnera (*Ulmifolia*) floribus sessilibus petiolaribus, foliis basi biglandulosis. Lin. Sp. Plant. 33. *Turnera with flowers growing close to the foot-stalks of the leaves, whose base has two glands.* Turnera ulmifolia. Plum. Nov. Gen. 15. *Shrubby Turnera with an Elm leaf.*
2. Turnera (*Angustifolia*) floribus sessilibus petiolaribus foliis lanceolatis rugosis acuminatis. *Turnera with flowers sitting close to the foot-stalks of the leaves, and spear-shaped rough-pointed leaves.* Cistus urticæ folio, flore luteo, vasculis trigonis. Sloan. Cat. Jam. 86. *Cistus with a Nettle leaf, a yellow flower, and a three-cornered capsule.*

These plants are both of them natives of the warm parts of America. The first species was found by Father Plumier in Martinico, who gave it the name of Turnera, in honour of Dr. Turner, a famous English physician, who lived in Queen Elizabeth's reign, and wrote an herbal, in which he has chiefly described the useful plants.

The second sort was discovered by Sir Hans Sloane, who has figured it in his Natural History of Jamaica, under the following title, Cistus urticæ folio, flore luteo, vasculis trigonis, vol. i. p. 202; but both these sorts were observed by my late friend Dr. William Houstoun, in several parts of America.

This sort rises with a shrubby stalk to the height of eight or ten feet, sending out branches on every side the whole length; these are garnished with narrow spear-shaped leaves, which are hairy; they are near three inches long, and about three quarters of an inch broad, terminating in acute points; they are obtusely sawed on their edges, and stand upon very short foot-stalks; these, when rubbed, emit a disagreeable odour. The flowers grow from the foot-stalks of the leaves, to which they sit very close, having two pretty large leafy appendages to their empalements. The flowers are of a pale yellow colour, and are

com-

composed of five large oval petals, whose tails are twisted and join; these are succeeded by short tubular capsules having one cell, which opens at the top with three valves which turn back, and let out the seeds.

The first sort has a shrubby stalk like the second, and rises to the same height. The branches of this are slender, and stiffer than those of the former. The leaves are oval, spear-shaped, two inches and a half long, and an inch and a half broad, rough on their upper side, and of a lucid green; their under side has many strong veins, and is of a lighter green; they are sawed on their edges, and have longer foot-stalks than those of the second species, and stand much farther asunder on the branches. The flowers sit close upon the foot-stalks of the leaves, in like manner as the former, but the flowers are larger and of a brighter yellow than those of the former. These differences remain constant, and never alter when raised from seeds; so that from near thirty years experience in sowing the seeds, I may pronounce them different species.

These plants are easily propagated by sowing their seeds on a hot-bed early in the spring, and when the plants are come up two inches high, they should be transplanted into small pots, and plunged into a hot-bed of tanners bark, observing to water and shade them until they have taken root; after which they must be treated as hath been directed for the Guavas, and other tender plants from the same countries, to which the reader is desired to turn to avoid repetition. The seeds of these plants will often fall into the pots which are placed near them in the stove, which will grow, and soon furnish plants enough, after a person is once possessed of them. As they are too tender to live in the open air in England, they must be placed in the bark-bed in the stove, where, during the winter season, they must be kept warm and frequently watered; but in the summer season, they must have a great share of air, otherwise they will draw up tender, and not produce many flowers.

When the plants are grown pretty large, they may be treated more hardily, by placing them in the dry stove; where, if they are kept in a moderate degree of heat, they will thrive and flower very well. Those who would save the seeds of these plants, must watch them carefully, because, when they are ripe, they soon scatter if they are not gathered.

These plants produce their flowers great part of the year, if they are kept in a proper degree of warmth, so that there are some of the flowers in beauty for at least nine or ten months, which renders the plants more valuable.

TURNSOLE. See HELIOTROPIUM.

TURRITIS. Tourn. Inst. R. H. 223. Dillen. Gen. Nov. 6. Lin. Gen. Plant. 733. Tower Mustard.

The CHARACTERS are,

*The empalement of the flower is composed of four oblong oval leaves, which are erect, and close together. The flower has four oblong, oval, entire petals, placed in form of a cross, and six erect awl-shaped stamina the length of the tube, two of which are shorter than the other, terminated by single summits, and a taper germen a little compressed, having no style, but is crowned by an obtuse stigma. The germen afterward becomes a long four-cornered pod with two cells, which are divided by an intermediate partition opening with two valves, and filled with small, roundish indented seed.*

This genus of plants is ranged in the second section of Linnæus's fifteenth class, which contains the plants whose flowers have four long and two shorter stamina, and the seeds are included in long pods.

The SPECIES are,

1. TURRITIS (*Glabra*) foliis radicalibus dentatis hispidis, caulinis integerrimis amplexicaulibus glabris. Hort. Cliff. 339. *Tower Mustard with hispid lower leaves which are indented, and the upper ones smooth, entire, and embracing the stalk.* Turritis foliis inferioribus cichoraceis cæteris perfoliatæ. Tourn. Inst. 224. *Tower Mustard with under leaves like Cicory, and the upper like Thoroughwax.*

2. TURRITIS (*Hirsuta*) foliis omnibus hispidis, caulinis amplexicaulibus. Hort. Cliff. 339. *Tower Mustard with all the leaves prickly, and the upper ones embracing the stalk.* Erysimo similis hirsuta, non laciniata alba. C. B. P. 101. *A hairy plant resembling Hedge Mustard, but the leaves not jagged.*

The first sort grows naturally in several parts of England, upon walls and dry banks; this hath its lower leaves much jagged on their edges, and are rough to the touch. The stalks rise a foot and a half high, and are garnished with smooth grayish leaves, two inches long, and three quarters of an inch broad at their base, ending in points; these embrace the stalks with their base. The upper part of the stalk has slender branches proceeding from the wings of the leaves, which sustain tufts of small white flowers, having four petals placed in form of a cross. These appear in June, and are succeeded by long, slender, compressed, four-cornered pods, which grow erect close to the stalk, and are filled with small seeds which ripen in August.

The second sort grows naturally upon old walls and buildings in the northern parts of England; the lower leaves are shaped like those of the Daisy, but are rough. The stalks rise eight or ten inches high, which are garnished with oval leaves, whose bases embrace the stalks; they are as rough as the lower leaves. The upper part of the stalks branch into slender stalks, which sustain short spikes of white flowers like those of the former sort, which are succeeded by slender pods having four corners, which are shorter than those of the first sort. This plant flowers earlier than the first, and the seeds are ripe in July.

These plants are sometimes kept in gardens for the sake of variety; but if their seeds are scattered upon an old wall or building, in autumn, soon after they are ripe, the plants will come up and thrive without farther care, and their seeds will scatter on the walls and spread, so there will be no danger of the plants maintaining the situation, if they are not purposely destroyed.

The other species are referred to Arabis, Brassica, and Hesperis, under which articles they will be found.

TUSSILAGO. Tourn. Inst. R. H. 487. tab. 276. Lin. Gen. Plant. 856. Colt's-foot.

The CHARACTERS are,

*The flower has one common cylindrical empalement, whose scales are linear, spear-shaped, and equal. The flower is made up of hermaphrodite florets, which compose the disk, and female half florets which form the rays or border. The hermaphrodite florets are funnel-shaped, and cut at the brim into five segments; these have five short hair-like stamina, terminated by cylindrical summits; and a short crowned germen supporting a slender style, crowned by a thick stigma. The germen afterward becomes an oblong compressed seed, crowned with a hairy down. The female half florets are stretched out on one side with a narrow tongue-shaped segment; these have no stamina, but have a short crowned germen, which turns to a seed like those of the hermaphrodite florets, which ripen in the empalement.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, which includes those plants whose flowers are composed of hermaphrodite and female florets, which are all fruitful.

The SPECIES are,

1. TUSSILAGO (*Farfara*) scapo imbricato unifloro, foliis subcordatis, angulatis denticulatis. Lin. Hort. Cliff. 411. *Colt's-foot with an imbricated stalk bearing one flower, and angular indented leaves which are nearly heart-shaped.* Tussilago vulgaris. C. B. P. 197. *Common Colt's-foot.*

2. TUSSILAGO (*Anandria*) scapo unifloro, subsquamoso erecto, foliis lyrato ovatis. Lin. Sp. 865. *Colt's-foot with one flower on each stalk, and oval lyre-shaped leaves.* Tussilago scapo unifloro, calyce clauso. Hort. Upsal. 259. *Colt's-foot with one flower on each stalk, and a closed empalement.*

3. Tussilago (*Alpina*) scapo subnudo unifloro, foliis cordato-orbiculatis crenatis. Hort. Cliff. 411. *Colt's-foot with an almost naked stalk bearing one flower, and orbicular, heart-shaped, crenated leaves.* Tussilago Alpina rotundifolia glabra. C. B. P. 197. *Round-leaved smooth Colt's-foot of the Alps.*

The first of these sorts is very common in watery places in almost every part of England, and is rarely kept in gardens; for the roots creep under ground, and increase so fast, that in a short time they will spread over a large spot of ground. This plant is so well known as to need no description.

The second sort grows naturally in Siberia; this is a very low plant, whose leaves grow close to the ground; they are of an oval form, and indented on the sides like a lute. The flowers stand upon short foot-stalks which rise between the leaves, and are three or four inches long, each sustaining one flower at the top, of a dirty purplish colour. These appear early in the spring, and are succeeded by downy seeds which ripen in June.

The third sort grows naturally on the Alps; this is a low perennial plant, whose leaves are round, and indented at the foot-stalk in form of a heart, and their edges are crenated; their upper surface is smooth, and of a bright green colour; their under sides are a little downy and whitish; their foot-stalks arise from the ground, and are three inches long. The foot-stalks of the flowers which arise from the root are four inches long, woolly, and sustain one purplish flower at the top, which is made up of hermaphrodite and female florets, like those of the other sorts.

The two last are frequently kept in gardens for the sake of variety; they are easily propagated by parting their roots in autumn, and must be planted in a moist shady border, where they will thrive, and require no farther care but to keep them clean from weeds.

TYPHA. Cat's-tail, or Reed-mace.

Of this there are two species, which grow naturally in standing waters in many parts of England, one with broad, the other with narrow leaves; but as these plants will not live in dry ground, so it will be to no purpose to trouble the reader farther about them.

# V.



VACCARIA. See Saponaria.

VACCINIUM. Lin. Gen. Plant. 434. Vitis. Idæa. Tourn. Inst. R. H. 607. tab. 377. The Bill-berry, Whortle-berry, or Cran-berry; in French, *Airelle*, or *Myrtille*.

The Characters are,

*The flower has a small permanent empalement sitting upon the germen; it is bell-shaped, of one petal, which is slightly cut into four segments at the brim, which turn backward; it has eight stamina, which are terminated by horned summits having two awns on their backside which spread asunder; the points open. The germen is situated below the flower, supporting a single style longer than the stamina, crowned by an obtuse stigma; it afterward turns to an umbilicated globular berry with four cells, containing a few small seeds.*

This genus is placed in the first section of Linnæus's eighth class, which includes those plants whose flowers have eight stamina and one style.

1. Vaccinium (*Myrtillus*) pedunculis unifloris, foliis ovatis serratis deciduis, caule angulato. Flor. Lapp. 143. *Whortle-berry with one flower upon each foot-stalk, oval sawed leaves which fall off in winter, and an angular stalk.* Vitis Idæa foliis oblongis crenatis, fructu nigricante. C. B. P. 470. *Black Whorts, Whortle-berries, or Bill-berries.*
2. Vaccinium (*Vitis Idæa*) racemis terminalibus, nutantibus, foliis obovatis revolutis integerrimis subtus punctatis. Lin. Sp. Plant. 351. *Whortle-berry with nodding branches of flowers terminating the branches, and oval leaves which are entire, turned back, and punctured on their under side.* Vitis Idæa foliis subrotundis non crenatis, baccis rubris. C. B. P. 470. *Red Whorts, or Whortle-berries.*
3. Vaccinium (*Pensylvanica*) foliis ovatis mucronatis, floribus alaribus nutantibus. *Whortle-berries with oval-pointed leaves, and nodding flowers proceeding from the wings of the stalks.* Vitis Idæa myrtinis foliis, flosculis dependentibus. Pluk. Phyt. tab. 321. fig. 4. *Whortle-berries with Myrtle leaves, and small depending flowers.*
4. Vaccinium (*Hispidulum*) foliis integerrimis revolutis ovatis, caulibus repentibus, filiformibus, hispidis. Lin. Sp. Plant. 352. *Whortle-berries with oval entire leaves turning back, and a slender, creeping, bristly stalk.* Vitis Idæa palustris Virginiana, fructu majore. Raii Hist. 685. *Marsh Virginia Whorts with a larger fruit.*
5. Vaccinium (*Oxycoccos*) foliis integerrimis revolutis ovatis, caulibus repentibus filiformis nudis. Lin. Sp. Plant. 351. *Whortle-berries with oval, entire, reflexed leaves, and naked, slender, creeping stalks.* Oxycoccus seu vaccinia palustris. J. B. 1. p. 525. *Whortle-berries, Moss-berries, or Moor-berries; by some called Cran-berries.*

The first sort grows very common upon large wild heaths in many parts of England, but is never cultivated in gardens, it being with great difficulty transplanted; nor will it thrive long when it is removed thither, for from many trials which I have made, by taking up the plants at different seasons with balls of earth to their roots and planting them in gardens, I could never succeed so as to preserve the plants above two years, and those never produced any fruit, so that it is not worth the trouble of cultivating.

The fruit of this sort is gathered by the poor inhabitants of those villages which are situated in the neighbourhood of their growth, and carried to the market-towns. These are by some eaten with cream or milk; they are also put into tarts, and much esteemed by the people in the north, but they are seldom brought to London. The shrub on which these grow rises about two feet high, having many stems, which are garnished with oblong leaves, shaped like those of the Box-tree, but somewhat longer, and are a little sawed on their edges. The flowers are shaped like those of the Arbutus, or Strawberry-tree, of a greenish white colour, changing to a dark red toward the top. The fruit are about the size of large Juniper-berries, and

of a deep purple colour, having a flue upon them when they are untouched, like the blue Plums, which rub off with handling.

The second sort is of much humbler growth, seldom rising above six or eight inches high. The leaves of this sort are so like that of the Dwarf Box, as that, at a distance, the plants are often taken for it, even by persons of skill. This is an evergreen shrub, which grows upon moory ground in several parts of the North, but it is full as difficult to transplant into gardens as the other sort; though I have been assured by persons of credit, that they have seen this sort planted to make edgings to the borders of the gardens in Norway and Sweden, where the plants may grow much better, from the cold of those climes, than they will do in England, for this is a native of very cold countries. I have several times received plants of this sort from Greenland, by the whale ships. The berries of this sort are red, and have a more agreeable acid flavour than those of the first sort. This fruit is frequently used for tarts in several of the northern countries, where the plants grow wild upon the moors.

The third sort grows naturally in Virginia and other parts of North America; this has a low shrubby stalk like the second; the leaves are small, oval, pointed, and not unlike some sorts of Myrtle; they continue green all the year; the flowers come out from the wings of the leaves at every joint; their foot-stalks are pretty long, and nod downward; they sustain but one flower; they are small, white, and are succeeded by small red berries which seldom ripen here.

The fourth sort grows naturally in marshy grounds in most parts of North America. The stalks of this are slender, imbricated, and trail upon the ground; the scales are bristly; the leaves are oval, entire, and their edges turn backward; the flowers come out from the wings of the stalk; they are of an herbaceous white colour, and in their native soil are succeeded by large red berries, but in England the fruit never comes to perfection.

The plants of this sort are difficult to preserve in England, for they require a moorish boggy soil, which should be covered with Moss, and constantly kept wet, otherwise they will not thrive.

The fifth sort produces long slender branches not bigger than thread, which trail upon the mossy bogs, so are often hid by the Moss. The branches are thinly garnished with small leaves, about the size and shape of those of Thyme, having their upper surface of a shining green colour, but are white underneath.

The flowers are generally produced toward the extremity of the shoots, which are in shape like those of the former sorts, but are smaller, and of a red colour; these grow upon long slender foot-stalks, and are succeeded by round, red, spotted berries, of a sharp acid flavour, which are much esteemed by the inhabitants of the places near the bogs where they grow. Some use them for tarts, and others eat them with milk or cream.

This sort is a native of bogs, therefore cannot by any art be propagated upon dry land; but where there are natural bogs, the plants may be taken up carefully, preserving some of the soil to their roots, and transplanted into the bogs in the autumn; and if they are once fixed in the place, they will spread and propagate themselves in great plenty, and require no farther care.

The two sorts first mentioned also propagate very fast by their creeping roots, so that when they are fixed in a proper soil, they will soon overspread the ground, for the heaths, upon which they naturally grow, are generally covered with the plants. The first sort grows with the Heath, their roots intermixing together, and frequently is found upon sandy heaths in divers parts of England; but the second sort grows only upon moorish land, where, by its creeping roots, the ground is soon covered with the plants.

There are several other species of this genus, some of which are natives of Spain and Portugal, others of Germany and Hungary, and several of the northern parts of America, from whence those large fruit are brought to England, which are used by the pastry-cooks of London, during the winter season for tarts; but, as all these sorts naturally grow upon swamps and bogs, they are not easy to transplant into gardens, so as to thrive or produce fruit, therefore there can be little hopes of cultivating them to advantage.

VALANTIA. Lin. Gen. Plant. 1151. Cruciata. Tourn. Inst. 115. *Crosswort.*

The Characters are,

*It hath hermaphrodite solitary flowers in the place of the germen, of one leaf, cut into four oval acute segments, and four stamina as long as the petals, terminated by small summits, with a large germen supporting a slender style the length of the stamina, crowned by headed stigmas; the empalement afterward becomes a thick compressed capsule, containing one globular seed.*

This genus of plants is ranged in the first section of Linnæus's twenty-third class, intitled Polygamia Monœcia, which includes those plants which have male, female, and hermaphrodite flowers on the same plant.

The Species are,

1. Valantia (*Hispida*) floribus masculis trifidis hermaphroditici germini hispido insidentibus. Lin. Sp. 1490. *Valantia with three male flowers sitting on the hispid germen of the hermaphrodite flowers.* Aparine semine Coriandri saccharati. Park. Theat. 576. *Goose-grass like a Coriander comfit.*
2. Valantia (*Muralis*) floribus masculis trifidis hermaphroditici germini glabro insidentibus. Sauv. Monsp. 162. *Valantia with three male flowers sitting on the smooth germen of the hermaphrodite.* Cruciata muralis minima Romana. Col. Ecphr. 1. p. 298.
3. Valantia (*Aparina*) floribus masculis trifidis pedicillatis hermaphroditici pedunculo insidentibus. Hort. Upsal. 302. *Valantia with trifid male flowers sitting on the foot-stalks of the hermaphrodite flowers.* Aparine semine lævi. Vaill. Parif. 18. *Goose-grass with a smooth seed.*
4. Valantia (*Articulata*) floribus masculis quadrifidis, pedunculis dichotomis nudis foliis cordatis. Hort. Upsal. 303. *Valantia with male flowers which are quadrifid, the knots of the forked stalks naked, and heart-shaped leaves.*
5. Valantia (*Cruciata*) floribus masculis quadrifidis, pedunculis diphyllis. Hort. Upsal. 303. *Valantia with quadrifid male flowers, whose foot-stalks have two leaves.* Cruciata hirsuta. C. B. P. 335. *Hairy Crosswort.*

These plants are seldom cultivated except in botanic gardens for variety. The four sorts first mentioned are trailing annual plants; if these are permitted to scatter their seeds in autumn, the plants will come up, and require no farther care but to thin them, and keep them clean from weeds.

The fourth sort is an abiding plant; this grows naturally in many parts of England; the roots are yellow, and spread greatly in the ground; the stalks have four leaves at each joint, placed in form of a cross; the flowers are yellow, sitting in whorls round the stalks. It is sometimes used in medicine, but is generally gathered in places where it grows naturally.

VALERIANA. Tourn. Inst. R. H. 131. tab. 52. Lin. Gen. Plant. 43. Valerian.

The Characters are,

*The flower has a small empalement; it has one tubulous petal cut into five segments at the brim, with a gibbous honey gland on the inside; it has three small, erect, awl-shaped stamina the length of the petals, terminated by roundish summits. The germen is situated under the flower, supporting a slender style crowned by a thick stigma; it afterward turns to a crowned capsule which falls off, in which is lodged a single seed.*

This genus of plants is ranged in the first section of Linnæus's third class, which contains those plants whose flowers have three stamina and one style.

The Species are,

1. Valeriana (*Phu*) floribus triandris, foliis caulinis pinnatis, radicalibus indivisis. Hort. Upsal. 13. *Valerian*

*rian with flowers having three ſtamina, winged leaves to the ſtalks, and thoſe at the root undivided.* Valeriana hortenſis. Dod. Pempt. 342. *Garden Valerian.*

2. Valeriana (*Officinalis*) floribus triandris, foliis omnibus pinnatis. Hort. Cliff. 15. *Valerian with three ſtamina to the flowers, and all the leaves winged.* Valeriana ſylveſtris major. C. B. P. 164. *Greater wild Valerian.*

3. Valeriana (*Rubra*) floribus monandris caudatis, foliis lanceolatis integerrimis. Hort. Cliff. 15. *Valerian with flowers having tails, one ſtamina, and ſpear-ſhaped entire leaves.* Valeriana rubra. C. B. P. 165. *Red Valerian.*

4. Valeriana (*Anguſtifolia*) floribus monandris caudatis, foliis linearibus integerrimis. *Valerian with tailed flowers having one ſtamina, and linear entire leaves.* Valeriana rubra anguſtifolia. C. B. P. 165. *Narrow-leaved red Valerian.*

5. Valeriana (*Calcitrapa*) floribus monandris, foliis pinnatifidis. Hort. Upſal. 14. *Valerian with flowers having one ſtamina and wing-pointed leaves.* Valeriana foliis calcitrapæ. C. B. P. 164. *Valerian with leaves like thoſe of the Star-thiſtle.*

6. Valeriana (*Pyrenaica*) floribus triandris, foliis caulinis cordatis ſerratis petiolatis, ſummis ternatis. Hort. Cliff. 15. *Valerian with three ſtamina to the flowers, and heart-ſhaped ſawed leaves growing on foot-ſtalks, placed by threes at the top.* Valeriana maxima Pyrenaica, caliæ folio. Tourn. Inſt. R. H. 131. *The largeſt Pyrenean Valerian with a foreign Colt's-foot leaf.*

7. Valeriana (*Celtica*) floribus triandris, foliis ovato-oblongis obtuſis integerrimis. Lin. Mat. Med. 23. *Valerian with three ſtamina to the flowers, and oblong, oval, blunt, entire leaves.* Nardus Celtica. J. B. 3. p. 205. *Celtic Nard.*

8. Valeriana (*Siberica*) floribus tetrandis æqualibus, foliis pinnatifidis, ſeminibus paleâ ovali adnatis. Hort. Upſal. 13. *Valerian with four equal ſtamina to the flowers, wing-pointed leaves, and ſeeds faſtened by an oval buſk.* Valeriana lutea humilis. Amman. Ruth. 18. *Low yellow Valerian.*

9. Valeriana (*Locuſta*) floribus triandris caule dichotomo, foliis linearibus. Flor. Suec. 32. *Valerian with a forked ſtalk and linear leaves.* Valeriana arvenſis, præcox humilior, ſemine compreſſo. Mor. Umb. 53. *Corn-ſallad or Lamb's-lettuce.*

10. Valeriana (*Veſicaria*) caule dichotomo, foliis lanceolatis ſerratis, calycibus inflatis. Hort. Cliff. 16. *Valerian with a forked ſtalk, ſpear-ſhaped ſawed leaves, and ſwollen empalements.* Valerianelle Cretica, fructu veſicario. Tourn. Cor. 6. *Candia Lamb's-lettuce with a bladder fruit.*

11. Valeriana (*Coronata*) caule dichotomo, foliis lanceolatis dentatis, fructu ſexdentato. Hort. Cliff. 16. *Valerian with a forked ſtalk, ſpear-ſhaped indented leaves, and a fruit having ſix indentures.* Valerianella ſemine ſtellato. C. B. P. 165. *Lamb's-lettuce with a ſtarry fruit.*

12. Valeriana (*Cornucopia*) floribus diandris ringentibus, foliis ovatis ſeſſilibus. Hort. Cliff. 15. *Valerian with a ringent flower having two ſtamina, and oval leaves ſet cloſe to the ſtalk.* Valerianella cornucopoides, flore galeato. Mor. Umb. *Lamb's-lettuce with a helmet flower like thoſe of the Cornucopia.*

There are ſeveral other ſpecies of this genus, ſome of which grow naturally in England, and others in different parts of Europe; but as they are ſeldom cultivated in gardens, they are omitted, leſt the work ſhould ſwell too much beyond its intended bulk.

The firſt of theſe ſorts grows naturally in Alſatia, but is propagated in England for medicinal uſe, and is called in the ſhops by the name of Phu, to diſtinguiſh it from the Mountain Valerian, which is alſo uſed in medicine, and is preferred to all the other ſorts by the modern phyſicians; though the roots of this firſt are ſtill continued in ſome of the capital medicines, and are by ſome eſteemed equal in virtue, if not ſuperior, to the wild ſort.

This hath thick, fleſhy, jointed roots, which ſpread near the ſurface of the ground in a very irregular manner, croſſing each other, and matting together by their ſmaller fibres; theſe have a very ſtrong ſcent, eſpecially when dry. The lower leaves, which riſe immediately from the root, are many of them entire; others are divided into three, five, or ſeven obtuſe lobes; they are of a pale green colour and ſmooth. The ſtalks riſe three or four feet high; they are hollow, and ſend out branches from their ſide by pairs, and are garniſhed with winged leaves, placed oppoſite at each joint, which are compoſed of four or five pair of long narrow lobes terminated by an odd one. The ſtalks, and alſo the branches, are terminated by flowers diſpoſed in form of an umbel; they are ſmall, tubulous, white, and cut ſlightly at the brim into five parts; theſe appear in May and June, and are ſucceeded by oblong flat ſeeds having a downy crown. This plant is propagated by parting of its roots, either in the ſpring or autumn, but the latter is much preferable to the former, which ſhould be planted in beds of freſh dry earth, about two feet aſunder, for they commonly ſpread and multiply very faſt. If the ſeaſon is dry, you muſt water the plants until they have taken root; after which they will require no further care, but to keep them clean from weeds; and in autumn, when their leaves are decayed, the roots ſhould be taken up and dried for uſe.

The ſecond ſort is generally found upon dry chalky ſoils in ſhady places, in divers parts of England. The roots of this, which grow wild upon ſuch ſoils, are much preferable to thoſe of the ſame kind which are cultivated in gardens; which is alſo the ſame of all the ſorts of aromatic plants, when gathered from their native places of growth, where they are ſmaller, but have a ſtronger flavour.

The roots of this plant are compoſed of long fleſhy fibres which are ſlender, and unite in heads. All the leaves of this ſort are winged; thoſe at the bottom are compoſed of broader lobes than thoſe on the ſtalks, and are notched on their edges; they are compoſed of ſix or ſeven pair of lobes terminated by an an odd one; theſe end in acute points, and are hairy. The ſtalks, in their natural ſituation, ſeldom grow much more than a foot high; but, when the roots are cultivated in a garden, they grow more than twice that height; theſe are channelled, hollow, hairy, and are garniſhed at each joint with two winged leaves placed oppoſite, whoſe lobes are very narrow and almoſt entire. At the upper part of the ſtalk comes out two ſmall ſide branches oppoſite; theſe, and alſo the principal ſtalk, are terminated by cluſters of flowers formed into a kind of umbel, which are ſhaped like thoſe of the firſt ſort, but are ſmaller, and have a tinge of purple on their outſide. It flowers about the ſame time with the firſt ſort.

This plant may alſo be propagated by parting the roots either in ſpring or autumn, as was directed for the firſt ſort, but you ſhould always obſerve to plant them upon a dry, freſh, undunged ſoil, in which, though the roots will not make near ſo great progreſs as in a rich moiſt ſoil, yet they will be much preferable to them for uſe. Theſe roots ſhould alſo be taken up when the leaves decay in autumn, and preſerved dry until uſed.

The third ſort grows naturally in rough ſtony places in the ſouth of France, and in Italy, but has been long cultivated in the Engliſh gardens for ornament.

The roots of this ſort are ligneous, and as thick as a man's finger, ſpreading out on every ſide very wide. The ſtalks riſe about three feet high; they are round, ſmooth, of a grayiſh colour, and hollow; theſe are garniſhed at each joint with ſmooth ſpear-ſhaped leaves near three inches long and one broad, drawing to a point at each end; they are generally placed by pairs, but ſometimes there are three at the ſame joint ſtanding round the ſtalk. The upper part of the ſtalk ſends out branches by pairs, which, with the principal ſtalk, are terminated with red flowers growing in cluſters, which have long tubes, cut into five parts at the top, and from the tube is ſent out a ſpur or heel like the flowers of Larkſpur. It flowers moſt part of ſummer, and the ſeeds ripen accordingly in ſucceſſion; theſe

these have a down, by which they are transported to a good distance.

There is a variety of this with white flowers, and one with pale flesh-coloured flowers, but they do not differ in any other respect.

It is easily propagated by parting of the roots in autumn, or by sowing of the seeds soon after they are ripe, in a shady border, where the plants will sometimes come up the same autumn, especially if the season proves moist, otherwise they will not appear till the following spring. When these are fit to remove, they should be transplanted into beds at about nine inches or a foot asunder, observing to water them till they have taken new root; after which they will require no farther care but to keep them clear from weeds, and in autumn they must be transplanted where they are to remain.

These plants grow large, therefore should have room, so are not proper furniture for small gardens. When the seeds of these plants light on joints of old walls or buildings, the plants will come up, and thrive as well as in the ground, and will continue much longer, so the seeds may be scattered between the stones of grottos and such like buildings, where the plants will flower from May till the frost stops them, and will make a good appearance.

The fourth sort grows about Montpelier, and upon Mount Baldus in Italy. The root of this is ligneous, but not so large as that of the former sort; the stalks rise two feet high or better, and branch out on each side from the root to within six inches of the top; these are garnished with leaves which are three or four inches long, but are as narrow as those of Flax. The upper part of the stalk is naked, and terminated by a compact cluster of bright red flowers shaped like those of the former sort, but smaller. This flowers about the same time as the last, and may be propagated in the same way.

The fifth sort grows naturally in Spain and Portugal; it is an annual plant, which perishes soon after the seeds are ripe. The lower leaves, which spread on the ground, are cut into many obtuse segments; the stalks, when the plants are in good ground, will rise near a foot and a half high, but upon dry stony soils not half so high, and when they grow out of the joints of old walls, not more than three inches high; these are hollow, smooth, and round, sending out branches by pairs from the upper joints; they are garnished with wing-pointed leaves, whose lobes or segments are very narrow. The stalk and branches are termined by tufts of flowers shaped like those of the Garden Valerian, but are smaller, and have a flesh-coloured tinge at the top. The seeds have a down, which helps to spread them, so it propagates without care.

The sixth sort grows naturally on the Pyrenean Mountains; this has a fibrous perennial root, from which come out many heart-shaped leaves, standing upon foot-stalks more than a foot in length. The leaves are four inches over each way; they are bluntly sawed on their edges, of a bright green on their upper side, and smooth, but their under side is pale, and a little hairy. The stalks rise three feet high; they are hollow, channelled, and send out branches opposite toward the top, and are garnished with leaves placed opposite, which are shaped like those below, but are a little pointed; and frequently at the top there are three leaves placed round the stalks, standing upon short foot-stalks. The stalk and branches are terminated by pale flesh-coloured flowers, disposed in form of umbels, which have very short spurs or heels. It flowers in June, and the seeds ripen in August, which are crowned with down, whereby they are transported to a distance.

This plant delights in shade and a moist soil; it may be propagated by sowing of the seeds on a shady border soon after they are ripe, and when the plants come up, they should be treated in the same way as is before directed for the third sort.

The seventh sort grows naturally upon the Alps and Syrian Mountains; this was sent me by Dr. Allione from Turin, who gathered it on the Alps near that place; it is a very humble plant. The stalks trail upon the ground among the Moss, and put out roots at their joints, which swell into knobs or tubers.

The leaves are oblong, oval, and entire; the flower-stalks rise three or four inches high, and are garnished with two or three pair of small oval leaves; the flowers are small, of a pale incarnate colour, and are formed in a loose spike sitting very close to the stalk. It flowers in June, but does not produce seeds here.

This plant is difficult to preserve in gardens, for it naturally grows upon rocky mountains which are covered with Moss, where the snow continues six or seven months, so it requires a very cold situation and a stony soil.

The eighth sort grows naturally in Siberia; this is a biennial plant, which flowers and produces seeds the second year and then decays. The leaves of this are winged; the lobes of the lower leaves are oblong, oval, and end in roundish points; the stalks rise a foot high, and are garnished with leaves composed of four or five pair of lobes, terminated by a broad one, which is cut into three or five points. The lobes of these are acute-pointed; these leaves are placed by pairs, and sit close to the stalks; they are smooth, and of a pale yellowish colour. The upper part of the stalk has two pair of branches; the lower pair are near three inches long, but the upper are not half that length: these, and also the principal stalk, are terminated by bright yellow flowers collected in a sort of umbel, which are shaped like those of the first sort. It flowers in July, and the seeds ripen in autumn; it is propagated by seeds, which should be sown where the plants are to remain; this may be performed either in autumn, soon after they are ripe, or in the spring; they have succeeded with me equally at both seasons. When the plants come up, they must be thinned where they are too close, and kept clean from weeds, which is all the culture they require.

The ninth sort is is the common Corn-sallad which is cultivated in gardens, but is found growing naturally upon arable land among the Corn in many parts of England; this is an annual plant, which dies when it has perfected its seeds. The lower leaves of this are oblong, and broad at their points, which are rounded, and narrowed at their base, where they embrace each other; these are from three quarters of an inch to two inches long, in proportion to the goodness of the ground. From between the leaves arises an angular stalk, from three to eight or nine inches high, which divides into two branches which spread from each other, and these both divide again into two other in like manner. The stalks are garnished with leaves shaped like those at the bottom, but are smaller; these are placed by pairs at each joint. The branches are terminated by clusters of white flowers, shaped like those of the other species, which are succeeded by pretty large roundish seeds a little compressed on one side. It flowers in June, and the seeds ripen in August, which are very apt to drop before they have changed colour.

It is propagated as a sallad herb for the spring, but having a strong taste which is not agreeable to many palates, it is not so much in use as it was formerly: it is propagated by seeds, which should be sown in autumn on the spot where they are to grow for use. If they are sown the latter end of August, the first rains will bring up the plants; these should be hoed to thin them where they are too close, and to destroy the weeds. Early in the spring the plants will be fit for use. The younger the plants are when used, the less strong will be their taste, so they may supply the table in a scarcity of other herbs. When the seeds of this sort are sown in the spring, if the season proves dry, the plants will not appear till autumn or the spring following; besides, in summer the herb is not fit for use. I have known the seeds of this plant lie in the ground many years when they have happened to be buried deep, and upon being turned up to the air, the plants will come up as thick as if the seeds had been newly sown.

There are two other species of this which grow naturally in England, but as they are seldom admitted into gardens, I have not enumerated them; these are by some supposed to be only accidental varieties, but I have sown them all several years, and have never found either of them alter.

The tenth sort grows naturally in Candia; this is an annual plant, whose stalks rise six or eight inches high, and divide by pairs like the former. The leaves are much narrower than those of the former, end in acute points, and are sawed on their edges; the flowers are like those of the former sort, but have a swollen bladder empalement which incloses the seeds.

The eleventh sort grows naturally in Italy. The leaves at bottom are three or four inches long, round-pointed, and deeply notched on their edges; the stalk rises near a foot high, sending out branches by pairs from the joints below; the upper part divides by pairs in the same manner as the two former. The flowers are collected in globular heads; they are of an herbaceous white colour, and are succeeded by starry fruit having six indentures. It flowers in June, and the seeds ripen in August; this and the former sort are supposed to be only varieties arising from the same seeds, but I have sown them more than forty years, and have not observed either of them vary.

The twelfth sort grows naturally in the arable fields in Sicily and Spain; this is an annual plant. The stalks are pretty thick, channelled, and of a purplish colour; they rise eight or nine inches high, and are garnished by oval smooth leaves placed by pairs at each joint, sitting close to the stalks; they are an inch and a half long, and an inch broad, of a lucid green. From each side of the stalk springs out slender branches, but the upper part divides into two spreading branches like the other. The joints are swelling, and these branches divide again by pairs; these are terminated by clusters of red flowers, shaped like those of the red Valerian, but larger; they have two leaves close under the bunches, embracing the stalks with their base. When the flowers are past, the fruit stretches out in shape of a cornucopia or horn of plenty. The flowers appear in June, and the seeds ripen in autumn.

These three sorts are propagated by seeds, which should be sown in autumn where the plants are to remain. When these come up, they will require no other culture but to thin them where they are too close, and keep them clean from weeds. The plants which rise in autumn, will live through the winter, and come early to flower the following summer, so will produce good seeds; whereas those which rise in the spring, do not ripen their seeds unless the season proves warm.

VALERIANA GRÆCA. See POLEMONIUM.

VALERINELLA. See VALERIANA.

VANILLA. Plum. Gen. Nov. 25. tab. 28. Epidendrum. Lin. Gen. Plant. 907.

The CHARACTERS are,

*It has a single stalk. The flowers are included in sheaths, which are distant from each other; they sit upon the germen, and have no empalement; they have five oblong petals which spread open very wide, and turbinated nectariums, whose bases are tubulous, situated on the back side of the petals in the middle; their brims are oblique and bifid; the upper lip is short and trifid; the under one runs out in a long point; they have two very short stamina sitting upon the pointal, and the summits are fastened to the upper lip of the nectarium; they have a long, slender, contorted germen situated under the flower, supporting a short style fastened to the upper lip of the nectarium, crowned by an obsolete stigma. The germen afterward becomes a long, taper, fleshy pod, including many small seeds.*

This genus of plants is ranged in the second section of Linnæus's twentieth class, which includes those plants whose flowers have two stamina which are connected with the style.

The SPECIES are,

1. VANILLA (*Mexicana*) foliis oblongo-ovatis mucronatis, nervosis, floribus alternis. *Vanilla with oblong, oval, acute-pointed, veined leaves, and flowers growing alternately.* Volubilis siliquosa Mexicana, plantaginis folio. Cat. Car. 3. p. 7. *Mexican Climber having pods, and a Plantain leaf.*

2. VANILLA (*Axillaribus*) foliis oblongis obtusis, compressis articulatis, floribus alaribus. *Vanilla with oblong, blunt, compressed, jointed leaves, and flowers proceeding from the sides of the stalks.*

The first sort is that which the Spaniards cultivate in the West-Indies, which we shall describe hereafter.

The second sort was sent me from Carthagena in New Spain, where it grows naturally; this has a climbing stalk, which sends out roots from the joints, which fasten to the stems of trees or any neighbouring support, and climb to a great height. The leaves, which come out singly at each joint, are oblong, smooth, and jointed. The flowers come out from the side of the branches; they are shaped like those of the great Bee Orchis, but are longer. The galea or helmet of the flower is of a pale Pink colour, and the labia is purple. This plant flowered in the Chelsea Garden, but wanting its proper support, it lived but one year.

There are two or three varieties of the first sort, which differ in the colour of their flowers and the length of their pods; and there are many other species which grow naturally in both the Indies, which have been brought to this genus, but those above-mentioned are all I have seen growing.

The plant which produces the fruit called Vanilla or Banilla, by the Spaniards, hath a trailing stem, somewhat like common Ivy, but not so woody, which fastens itself to whatever tree grows near it, by small fibres or roots which are produced at every joint, which fasten to the bark of the tree, and by which the plants are often nourished, when they are cut or broken off from the root a considerable height from the ground, in like manner as the Ivy is often seen in England. The leaves are as large as those of the common Laurel, but are not quite so thick; these are produced alternately at every joint (which are six or seven inches asunder,) and are of a lively green colour on the upper side, but of a paler green underneath. The stems of these plants shoot into many branches, which fasten themselves also to the branches of the trees, by which means they rise to the height of eighteen or twenty feet, and spread quite over some of the smaller trees to which they are joined. The flowers are of a greenish yellow colour, mixed with white, which, when fallen, are succeeded by the fruit, which are six or seven inches long.

This sort, which is manufactured, grows not only in the Bay of Campeachy, but also at Carthagena, at the Caraccas, Honduras, Darien, and Cayan, at all which places the fruit is gathered and preserved, but is rarely found in any of the English settlements in America at present, though it might be easily carried thither and propagated; for the shoots of these plants are full of juice, so may be easily transported, because they will continue fresh out of the ground for several months. I had some branches of this plant which were gathered by Mr. Robert Millar at Campeachy, and sent over between papers by way of sample; these had been at least six months gathered when I received them, and upon opening the papers, I found the leaves rotten with the moisture contained in them, and the paper was also perished with it, but the stems appeared fresh; upon which I planted some of them in small pots, and plunged them into a hot-bed of tanners bark, where they soon put out leaves, and send forth roots from their joints; but, as these plants naturally fasten themselves to the stems of the trees, in the woods where they grow naturally, it is with great difficulty that they are kept alive when they have not the same support; therefore, whoever would preserve any of these plants in Europe, should plant them in tubs of earth, near the stem of some vigorous American tree, which requires a stove, and can bear a great deal of water, because the Vanillas must be plentifully watered in the summer season, other-

wiſe they will not thrive. They require alſo to be ſhaded from the ſun by trees, ſo that if theſe are planted at the foot of the Hernandia, or Jack-in-a-box, whoſe leaves are very large and afford a good ſhade, they will ſucceed better than when they are expoſed in ſingle pots alone; and as theſe plants require the ſame degree of heat in winter, they will agree well together.

When theſe plants are deſigned for propagation in the warm parts of America, there is nothing more required than to make cuttings of about three or four joints in length, which ſhould be planted cloſe to the ſtems of trees, in low marſhy places; and to keep down other troubleſome plants, which, if permitted to grow about the cuttings before they are well rooted, would overbear and deſtroy them; but after they are eſtabliſhed, and have faſtened their ſhoots to the ſtems of the trees, they are not in much danger of being injured by neighbouring plants, and when the ground is kept clear from weeds, the plants will be much better nouriſhed.

Theſe plants do not produce flowers until they are grown ſtrong, ſo that the inhabitants affirm, That it is ſix or ſeven years from the planting to the time of their bearing fruit; but when they begin to flower and fruit, they continue for ſeveral years bearing, and this without any culture; and as it is a commodity which bears a good price, it is well worth cultivating in ſeveral of the Engliſh ſettlements, eſpecially as they will grow on moiſt woody places, where the land is not cleared from timber.

The method uſed to prepare the fruit is, when it turns of a yellow colour, and begins to open, to gather it, and lay it in ſmall heaps to ferment two or three days, in the ſame manner as is practiſed for the Cocoa or Chocolate pods; then they ſpread them in the ſun to dry, and when they are about half dried, they flat them with their hands, and afterwards rub them over with the oil of Palma Chriſti, or of the Cocoa; then they expoſe them to the ſun again to dry, and afterward they rub them over with oil a ſecond time, then they put them in ſmall bundles, covering them with the leaves of the Indian Reed, to preſerve them.

Theſe plants produce but one crop of fruit in a year, which is commonly ripe in May, fit for gathering, for they do not let them remain on the plants to be perfectly mature, becauſe then they are not ſo fit for uſe; but when they are about half changed yellow, they eſteem them better for keeping, than when they are changed to a dark brown colour, at which time the fruit ſplits, and ſhews a great quantity of ſmall ſeeds, which are incloſed within it. While the fruit is green, it affords no remarkable ſcent, but as it ripens, it emits a moſt grateful aromatic odour. When the fruit begins to open, the birds attack them and devour all the ſeeds very greedily, but do not eat any other part of the fruit.

The fruit which are brought to Europe, are of a dark brown colour, about ſix inches long, and ſcarce an inch broad; they are wrinkled on the outſide, and full of a vaſt number of black ſeeds, like grains of ſand, of a pleaſant ſmell, like Balſam of Peru.

The fruit is only uſed in England as an ingredient in Chocolate, to which it gives a pleaſant flavour to ſome palates, but to others it is very diſagreeable; but the Spaniſh phyſicians in America uſe it in medicine, and eſteem it grateful to the ſtomach and brain, for expelling of wind, to provoke urine, to reſiſt poiſon, and cure the bite of venomous animals.

As this plant is ſo eaſily propagated by cuttings, it is very ſtrange that the inhabitants of America ſhould neglect to cultivate it, eſpecially as it is an ingredient in their Chocolate, which is ſo much drank all over America; but as the Engliſh have in a manner quite neglected the culture of the Cocoa, it is no wonder they ſhould neglect this, ſince the former was cultivated in great plenty by the Spaniards in Jamaica, while that iſland remained in their poſſeſſion, ſo that the Engliſh had an example before them, if they would have followed it; whereas the Vanilla was not found growing there, and therefore it is not to be ſuppoſed, that the perſons who were ſo indolent as to quit the culture of many valuable plants then growing on the ſpot, ſhould be at the trouble of introducing any new ones.

VAPORIFEROUS ſignifies cauſing or producing vapours.

VAPOUR is by ſome defined to be a thin veſicle of water, or other humid matter, filled or inflated with air, which, being rarefied to a certain degree by the action of heat, aſcends to a certain height in the atmoſphere, where it is ſuſpended till it returns in form of rain, ſnow, or the like.

Some uſe the term Vapour indifferently for all fumes emitted, either from moiſt bodies, as fluids of any kind, or from dry bodies, as ſulphur, &c. but Sir Iſaac Newton, and other authors, better diſtinguiſh between humid and dry fumes, calling the latter exhalations.

VAPOURS are defined by naturaliſts to be thoſe watery particles which are ſevered from others by the motion of the air, and are carried about in it ſeveral ways according as the wind, or warmneſs of the air ſerves; they riſe out of the ſea, rivers, lakes, and other waters.

As to their hanging in the air, we may obſerve, in a hot day, when there is no wind ſtirring, ſuch a company of Vapours to riſe out of moiſt ground, as make thick fogs, which are ſometimes higher, and ſometimes lower, as the multitude and motion of the Vapours happen to be. They are to be ſeen as well upon high grounds as low.

They are eaſily diſſipated by the wind, and particularly if it be a drying wind.

The ſun has the ſame effect upon them, and we commonly ſee, when there are thick fogs about ſun-riſing, they diſappear a little after it is up.

It is evident that fogs conſiſt of aqueous particles rarefied, becauſe they mightily bedew every thing that lies open to them. Theſe particles, being ſoundly moved, muſt needs fly aloft into the air, but if their motion be ſomething faint, they play about the ſurface of the earth; for this is agreeable to the laws of motion, that ſuch things as are about the globe of the earth, the more they are moved, the more they recede from the center of the earth.

Again, theſe fogs ariſe out of all places, mountainous or champaign, and continue till they are diſpelled by wind or heat; but they continue longeſt in the loweſt grounds, becauſe thoſe places are fulleſt of moiſture, and are not ſo much expoſed to the winds; but wherever they be when the wind riſes upon them, they are diſſipated and driven about, till we ſee no more of them.

So in like manner, the heat of the ſun, by putting them into a briſker motion, either diſſipates them by rarefaction, or raiſes them higher, and forms them into clouds.

And whereas ſometimes the fogs ſtink, it is not becauſe they come from ſtinking water, but becauſe the Vapours are mixed with ſulphureous exhalations, which ſmell ſo. Perhaps theſe exhalations would fly up directly to the clouds, if there were no fogs to hold them, and ſo would not affect the ſenſe of ſmelling; but when they are once entangled and blended with the fog, they laſt as long as that does.

The clouds are higher than the fogs; they hang in the air, and are carried about in it by the winds. The clouds are of various figures, and ſometimes ſo thin, that the rays of the ſun paſs through them, but at other times they are thick enough to intercept and obſtruct them; they alſo appear of ſeveral colours, as white, red, and ſometimes very dark.

The thickneſs of the clouds proceeds from the cloſeneſs of the vaporous particles one to another, and their thinneſs from the diſtance of thoſe particles one from another, of which there are ſeveral cauſes. When they are very thin, they leave ſo many interſtices, that the rays of the ſun dart through them in many places, but are intercepted in others.

As

As to the variety of the figures of the clouds, they arise from their plenty of Vapours, and the influence of the sun and wind, for they cannot be variously condensed, rarefied, and carried about in the air, but their figure must needs be changed.

To account for the clouds hanging in the air, is a matter of some difficulty.

All the watery particles, of which they consist, are heavier than air; and so, if there were nothing to hinder them, they would fall to the earth; but there are two things that seem to keep them up.

1. The winds which blow from all parts, under the region of the clouds, and bear about with them many lighter sorts of bodies; especially if those bodies contain but a small quantity of solid matter under a broad superficies. And thus it is visible, how easily paper kites are kept up by the wind, when they are mounted pretty high; and so the particles of water, pretty much rarefied, may easily be suspended at that height.

2. New exhalations and vapours are perpetually fuming out of the earth; and, by their moving upwards, prevent the clouds from descending, unless the density of the clouds overweigh them. Thus we see the Vapour of fire carries lighter bodies up the chimney; and smoke can turn a thin plate of iron, artfully placed in it, so strongly, as to turn about a spit, and roast meat.

It is a question among naturalists, Whether clouds and thicker fogs are composed alike; or, Whether there be something more in the clouds?

Some think that clouds are grosser than all fogs, and that they are composed of flakes of snow, rather than particles of water, such as make fogs.

Others say, It is enough to consider clouds as a closer sort of fogs, and indeed the fogs that hang upon the tops of very high hills, appear to people in the plains to be all one with clouds, tho' those that are at them, perceive nothing but a thick fog.

There being always many Vapours in the air, though not always visible, it comes to pass that great dews fall even in clear weather, and especially in those countries where it seldom rains; for when it happens that the scattered Vapours are collected and condensed together, and forced downwards, they must needs fall, and bedew plants and Grass.

The time for the falling of the dew, is either before the rising of the sun, or after the setting of it; but in order to its falling regularly at those times, it is necessary that the air be calm, for windy or stormy weather hinders it; but when the weather is calm, and gentle breezes are felt from the west about the time that the sun sets, and from the east about the rising of it, it is probable they collect the Vapours, and precipitate them, by moderately cooling the air; and because the morning breezes are more general than the evening ones, therefore the evening dews fall only here and there, but the morning ones seldom fail of being universal.

It is likewise found by experience, that the dews are more copious in hotter countries than in cold; the reason of which seems to be this, that the heat of the sun does, in the day time, raise abundance of Vapours out of the water, which Vapours are so extremely rarefied by the same heat, that they are dispersed far and wide; but the cool of the night brings them together again, and condenses them to that degree, that they fall to the ground, but not in such large drops as rain does.

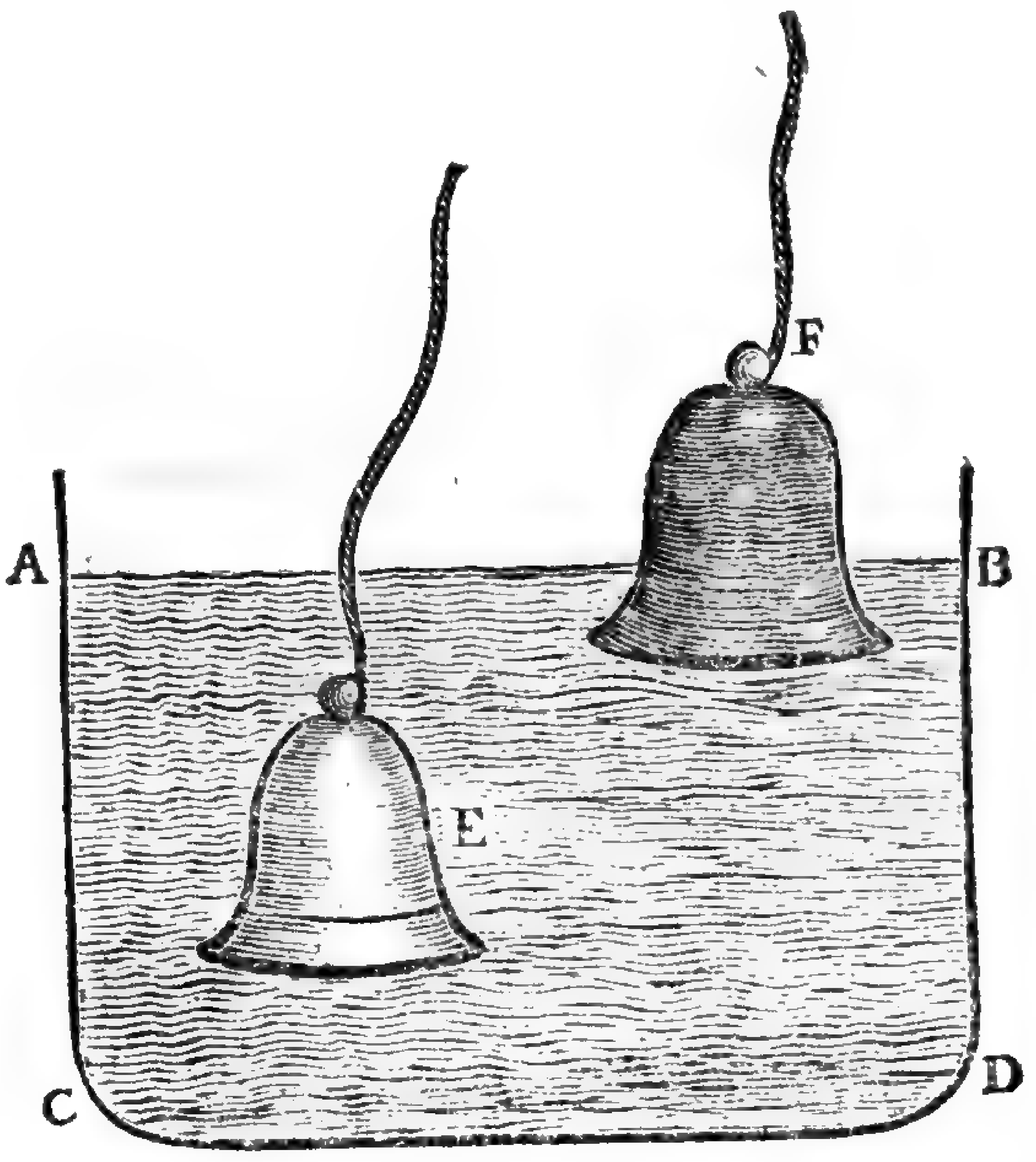
But in colder countries, where there are frequent rains, and the Vapours are less rarefied, most of them come down in rain, and but a small part turns to dew.

A certain author says, That in some of the hotter climates, the earth is without rain for six or seven months together; and it is every summer season so much parched and dried, that there is hardly any moisture to be found in it for three or four feet deep; and during that time the heats are so excessive, that without the refreshing dews of the nights (which are there very considerable) the plants must inevitably perish; for there is no moisture they can have but from the dews, and yet that moisture supports the trees and plants in a flourishing state. Toward the end of the day the leaves contract themselves, by reason of the excessive heat of the sun; but by the falling of the dews at night, they expand and open themselves, so that in the morning and fore part of the day they have a most agreeable verdure; and also this moisture of the dews, affords sufficient nourishment to the plants to bring the fruits to perfection.

By a great many observations made by Mr. Henry Beighton, F. R. S. and Dr. J. T. Desaguliers, to raise water by fire, according to Mr. Newcome's improvement of it, they found that the water by boiling, was expanded 14,000 times, to generate steam as strong (i. e. as elastic) as common air, which therefore must be near $16\frac{1}{2}$ times specifically lighter.

And it is plain, that this steam is not made of the air extricated out of the water, because it is condensed again into water by a jet of cold water spouting into it; and the little quantity of air that comes out of the injected water must be discharged at every stroke, otherwise the engine will not work well.

EXPERIMENT.




ABCD represent a pretty large vessel of water, which must be set on the fire to boil. In this vessel must be suspended the glass bell E, made heavy enough to sink in water, but put in, in such a manner, that it be filled with water when upright, without any bubbles of air at its crown within, the crown being all under water.

As the water boils, the bell will by degrees be emptied of its water, being pressed down by the steam which rises above the water in the bell; but as that steam has the appearance of air, in order to know whether it be air or not, take the vessel off the fire, and draw up the bell by a string fastened to its knob or top, then, as the steam condenses by the cold air on the outside of the bell, the water will rise up into the bell at F, quite to the top, without any bubble above it; which shews that the steam that kept out the water was not air.

N B. This experiment succeeds best when the water has been first purged of air, by boiling and the air-pump.

We know, by several experiments made on the fire-engine, (in Capt. Savory's way, where the steam is made to press immediately on the water,) that steam will drive away air, and that in proportion to its heat, though in the open air it floats and rises in it like smoke.

Now if the particles of water turned into steam or Vapour repel each other strongly, and repel air more than they repel each other, aggregates of such particles made of Vapour and vacuity may rise in air of different densities, according to their own density, dependent on their degree of heat, without having recourse

course to imaginary bubbles, formed in a manner only supposed, and not proved.

Indeed he owns, that if the watery particles had no repellent force, they must precipitate in the same manner that dust will do after it has been raised up; but there are too many observations and experiments, to leave any doubt of the existence of repellent force above-mentioned.

"And that he cannot shew by any experiment, how "big the moleculæ of Vapour must be which will "exclude air from their interstices; nor that these "moleculæ do vary in proportion to the degree of "heat by an increase of repellent force in each wa- "tery particle, or by a farther division of the parti- "cles still less; but in the general we may reasona- "bly affirm, that the rarity of the Vapour is pro- "portionable to the degree of its heat, as it happens "in other fluids. (See Philos. Trans. N° 270.) And "though the different degrees of the air's rarefac- "tion are also proportionable to the heat, yet the "same degree of heat rarefies vapours much more "than air."

Now to shew that what has been said will account for the rise of Vapours, and formation of clouds, we must only consider whether that degree of heat which is known to rarefy water 14,000 times, being compared with several of those degrees of heat in summer, autumn, and winter, which are capable of raising exhalations from water or ice (the rarity of Vapours being considered,) will appear to be such, that the Vapour will rise high enough in winter, but not too high in summer, to agree with the known phænomena.

That the effects are adequate to the causes in this case, he thinks may be made out in the following manner, viz.

The heat of boiling water, according to Sir Isaac Newton's table (Philosoph. Transact. N° 273,) is 34, the mean heat of summer 5, the mean heat of spring or autumn 3, and the least degree of heat, at which Vapours rise in winter (alias the mean heat of winter) is 2.

The rarity of Vapour proportionable to these four degrees of heat is 24,000, 2058, 1235, and 823.

The rarity of air is in summer 900, in spring or autumn 850, and in winter 800.

The density of water, compared with the above-mentioned densities, being inversly as one to the aforementioned four numbers.

The height above the earth to which the Vapours will arise, and at which they will be in equilibrio, in an air of the same density with themselves, will vary according to the rarity of the Vapour depending on the heat of the season.

For the Vapour which is raised by the winter's heat, expressed by the number 2, when the rarity of the air is 800, will rise to (and settle at) an height of about the sixth part of a mile, when the barometer is above thirty inches high.

But if the heat be greater, then the Vapours will rise higher; and pretty much higher if the sun shines, though in frosty weather, the barometer then being very high.

If the barometer falls, and thereby brings the place of the equilibrium (for Vapours raised by heat 2) nearer the earth, then also will the heat be increased, the Vapour more rarefied, and consequently the new place of equilibrium sufficiently high.

It is to be observed, that in winter when the heat is only equal to 2, the air is densed close to the earth, which has not any heat sufficient to rarefy it near the ground, as happens in warm weather; therefore the Vapour will rise gradually in an air whose density decreases continually from the earth upwards, neither will the Vapour be hindered of its full rise by any condensation from a greater cold of the ambient air; the air being then as cold next to the ground, where the vapour begins to rise, as it is at any height from the earth.

The Vapour which is raised by the heat of the spring or autumn, expressed number 3, will rise to the height of $3\frac{1}{2}$ miles when the barometer is at 30, and the rarity of the air is 850. But then as the air is hotter near the ground than at the height of half a mile or a mile, the Vapour will condense as it rises; and as the air when the earth is heated, is rather near the ground than at some height from it, the place for equilibrium will, upon these two accounts, be brought much lower than otherwise it would be; as for example, to the height of about a mile, which will agree with phænomena.

In summer the two causes above-mentioned increasing, the Vapour raised by the heat 5, (whose place of equilibrium would be $5\frac{1}{2}$ miles high, if the Vapour, after it began to rise, was not condensed by cooling, and the air was densed close to the earth) will settle at the height of about $1\frac{1}{2}$, or two miles, which is also agreeable to phænomena.

Lastly, as the density and rarity of the Vapour is chiefly owing to its degree of heat, and in a small measure to the increased or diminished pressure of the circumambient air, when it is not confined; and the density and rarity of the air is chiefly owing to the increased or diminished pressure, by the accumulation or exhaustion of superior air, whilst heat and cold alter its density in much less proportion; the clouds made of the Vapours above-mentioned, instead of conforming themselves to the altered density of the ambient air, will rise when it is condensed, and sink when it is rarefied; and also rise or sink, when the pressure of the air is not altered, and its density very little changed, by their own dilatation, owing to heat and cold, as may be often observed by seeing them change their height considerably, whilst the barometer continues exactly at the same degree, and the liquor of the thermometer rises or falls very little, and sometimes not at all.

As for the manner how clouds are changed into rain, it has been hinted at the beginning of this article; but for farther satisfaction let the reader have recourse to Dr. Halley's account of it in the Philosoph. Transact. N° 183, which Dr. Desaguliers says he has always found agreeable to the phænomena.

He adds, that since he had for brevity's sake, only mentioned at what heights from the surface of the earth Vapours of different densities will come to an equilibrium, without giving a reason for settling the place of equilibrium, at whose heights he thought it proper here to give the method by which they may be found, viz.

As the Vapours will settle and rise where the air is of the same density with themselves, it is only required to find the density of the air at any distance from the earth at several heights of the barometer, which may be deduced from Dr. Halley's two tables, Philosoph. Transact. N° 386. (the first shewing the altitudes to given heights of the mercury, and the second the heights of the mercury again at given altitudes,) and knowing the degree of heat by the thermometer, because the density of the Vapour depends upon the degree of heat of the season, provided that proper allowances be made for the great rarefaction of the air near the earth in hot and dry weather, and the condensation of the Vapours in their rise, by reason of the air being colder at a little height above the earth than just at the surface of it.

The quantity of Vapour raised from the sea by the warmth of the sun, is far greater than one would imagine. Dr. Halley has attempted to estimate it.

In an experiment made with that view, and described in the Philosophical Transactions, he found that a quantity of water no warmer than air in summer, lost in Vapour in the space of two hours, no less than $\frac{1}{53}$ part of an inch in depth: now for $\frac{1}{53}$ in two hours, taking for the easier calculation, $\frac{1}{60}$ in the twelve hours that the sun is up each day, it will rise $\frac{1}{10}$ of an inch from the surface of the sea.

On this supposition, every ten square inches of the surface of the water yield in Vapour per diem, a cubic inch of water of four feet square, a gallon; a mile square, 6914 tons; a square degree supposed of 60 English

English miles, will evaporate 33 millions of tons; and if the Mediterranean Sea be estimated at 410 degrees long, and four broad, allowances being made for the places where it is broader, by those where it is narrower, there will be 160 square degrees of sea, and consequently the whole Mediterranean must lose in vapour in a summer's day, at least 5280 millions of tons.

In this quantity of Vapour, though very great, are only the remains of another cause, which cannot be reduced to rule; that is, the winds, whereby the surface of the water is licked up, sometimes faster than it exhales by the heat of the sun, as it is well known to those who have considered those drying winds.

For the manner wherein Vapours are raised, see more in BAROMETER, COLD, DEW, HEAT, and RAIN.

For the effect of Vapours in formation of springs, see SPRINGS, &c.

VARIEGATED signifies streaked or diversified with several colours; of which there are now a great variety of plants in the gardens of the curious, whose leaves are variegated with yellow or white. Those which are spotted with either of these colours in the middle of their leaves, are called blotched (in the gardeners term;) but those whose leaves are edged with these colours are called striped plants. Those plants whose leaves are blotched are generally subject to become plain, when planted in a good soil; or at least in the growing season, will have but a small appearance of the two colours; but those which have edged leaves, rarely become plain again, especially if the edging is broad, and goes quite through the leaves, though these do not appear so finely variegated in the growing season, as they do in the other parts of the year.

All the different sorts of Variegation in plants were at first accidental, being no more than a distemper in the plant, which being observed, has been cherished by impoverishing the soil in which they grow, by which method their stripes are rendered more lasting and beautiful. But whatever some persons have affirmed of striping plants by art, I could never observe it done by any, unless in woody shrubs and trees, which may be variegated by putting in a bud or graft taken from a variegated plant; where, although the buds should not grow, yet if they keep fresh but eight or ten days, they will many times communicate their gilded miasma to the sap of the trees into which they were budded; so that in a short time after, it has appeared very visible in the next adjoining leaves, and has been afterwards spread over the greatest part of the tree; but in such plants as are herbaceous, where this operation cannot be performed, there is no way yet ascertained whereby this striping can be effected by art.

In some sorts of plants this distemper is often communicated to the seeds, so that from the seeds gathered from variegated plants, there will constantly be some variegated plants produced; as in the striped Wing Pea, the greater Maple, &c. therefore these may be constantly propagated that way.

That this striping proceeds from the weakness of plants is very evident, since it is always observed, that whenever plants alter thus in the colour of their leaves, they do not grow so large as before, nor are they so capable to endure the cold; so that many sorts of plants which are hardy enough to endure the cold of our climate in the open air when in their natural verdure, require to be sheltered in the winter after they are become variegated, and are seldom of so long continuance; which is a plain proof that it is a distemper in the plants, since whenever they become vigorous, this striping is either rendered less visible, or entirely thrown off; especially (as was before observed) if the plants are only blotched, or if the edging be of a yellow colour, it is less apt to remain than when it is white; which is esteemed the most beautiful striping, and which (when once thoroughly established) is hardly ever to be got out of the plants again, so as to render the leaves entirely green.

Nay, such is the venom of this morbid matter, that it not only tinges the leaves, but also the bark and fruit of trees are infected by it, as in the Orange, Pear, &c. whose bark and fruit are striped in the same manner as their leaves.

The different colours which appear in flowers also proceed from the same cause, though it is generally in a less degree in them than when the leaves and branches are infected: for the various colours which we see in the same flowers, are occasioned by the separation of the nutritive juice of plants, or from the alteration of their parts; whereby the smaller corpuscles, which are carried to the surfaces of the flower leaves, are of different forms, and thereby reflect the rays of light in different proportions. In order to understand this, it may not be improper to say something concerning the phænomenon of colours, as it hath been discovered by the late excellent philosopher Sir Isaac Newton.

1. Colour may be considered two ways: (1.) As a quality residing in the body that is said to be so and so coloured, or which doth modify the light after such a manner; or (2.) as more properly the light itself, which being so modified, shines upon the organ of sight, and produces that sensation we call colour.

2. Colour is defined to be a property inherent in light, whereby, according to the different sizes or magnitudes of its parts, it excites different vibrations in the fibres of the optic nerve, which being propagated to the sensorium, affects the mind with different sensations.

3. Again: colour may be defined a sensation of the soul, excited by the application of light to the retina of the eye; and different, as the light differs in the degree of its refrangibility, and the magnitude of its component parts.

4. According to the first definition, light is the subject of colour: according to the latter it is the agent.

5. So then light sometimes signifies that sensation occasioned in the mind, by the view of luminous bodies; sometimes that property in those bodies, whereby they are fitted to excite those sensations in us.

6. Various are the opinions of ancient and modern authors, and of the several sects of philosophers, with regard to the nature and origin of the phænomenon colour.

7. The peripatetics assert colours to be real qualities, and inherent in the coloured bodies; and suppose that light doth only discover them, but not any way affect their production.

8. Plato thought colour to be a kind of flame consisting of most minute particles, very congruous to the pores of the eye, and darted against it from the object.

9. Some moderns will have colour to be a kind of internal light of the more lucid parts of the object darkened, and consequently altered by the various mixtures of the less luminous parts.

10. Others, as did some of the antient atomists, maintain colour not to be a lucid stream, but a corporeal effluvium issuing out of the coloured body.

11. Others account for all colours out of the various mixture of light and darkness; and the chemists will have it sometimes arise from the sulphur, and sometimes from the salt that is in bodies; and some also from the third hypostatic principle, i. e. mercury.

12. The most popular opinion is that of the followers of Aristotle, who maintain, that colour is a property inherent in the coloured body, and that it exists without any dependence on light.

13. The Cartesians, who made the sensation of light to be the impulse made on the eye by certain solid, but very minute globules, easily penetrating the pores of the air, and diaphonous bodies; these derive colour from the various proportion of the direct progress or motion of these globules to their circumrotation or motion round their own centres, by which means they are qualified to strike the optic nerve, after distinct and divers manners, and so produce the perception of divers colours.

14. They own that as the coloured body is not immediately applied to the organ to occasion the sensation, as no body can affect the sense but by immediate contact, the coloured body does not excite the sensation of itself, or contribute any thing to it, otherwise than by moving some interposed medium, and by that the organ of sight.

15. They add, that as it is found that bodies do not affect the sense in the dark, and that light only occasions the sensation of colour, by moving the organ; and that coloured bodies are no farther concerned than in reflecting the light in a certain modification; the difference in colours, according to them, arises in a difference in the texture of their parts, by which they are disposed to reflect their light with this or that modification.

16. Dr. Hook, in his Micographia says, The phantasm of colours is caused by the sensation of the oblique or uneven pulse of light, and that this is capable of no more varieties than two, which arise from the two sides of the oblique pulse; so that there are in reality but two simple colours, yellow and blue; from the mixture of which, and a due proportion of black and white (that is, darkness and light) all colours may be be produced.

17. But this phænomenon of nature and colour, having long perplexed philosophers to account for the discoveries relating thereto, the incomparable Sir Isaac Newton found by two experiments on prisms, that there is a great deformity in the rays of light, and that hereby the origin of colours may be unfolded. The doctrine of colours therefore, according to his notion and experiments, are contained in the following propositions:

1. That light consists of an infinite number of rays, right lined and parallel, but of different degrees of refrangibility, when meeting with a different medium.

2. Each ray, according to its degree of refrangibility, when so refracted, appears to the eye of a different colour.

3. The least frangible rays appear of a deep scarlet colour; the most refrangible appear of a Violet blue; the intermediate proceeding from scarlet to yellowish, then to light green, and so to blue.

4. The colours arising from the different degrees of refrangibility of light are not only the more noted colours of red, yellow, green and blue, but also all the intermediate colours of red to yellow, of yellow to green, &c.

5. Whiteness, (such as the sun's light appears,) containing all those degrees of refrangibility, is consequently made up of all the above-mentioned colours.

6. Simple or homogeneal colours, are such as are produced by homogeneal lights or rays, which have the same degree of refrangibility; and mixed colours are such as are produced by rays of different refrangibility.

7. Rays of the same refrangibility produce the same colour; which colour is not alterable by repeated refractions, but only made strong or faint, as the rays are united or scattered.

8. All bodies appear of this or that colour, according as their surfaces are adapted to reflect only the rays of such a colour: or at least in more plenty than the rest.

But to explain these things farther:

It is found by experience, that rays or beams of light are composed of particles very heterogeneous or dissimilar to each other; i. e. some of them, as it is highly probable, are larger, and others less; for a ray of light, being received on a refracting surface in a dark place, is not wholly refracted, but split as it were, and diffused into several little rays; some of which are refracted to the extreme points, and others to the intermediate points; i. e. those particles of the light, which are most minute, are diverted the most easily and most considerably of all others, by the action of the refracting surface, out of their rectilineal course; and the rest, as each exceeds another in magnitude, so it is turned out of its right line with much difficulty, and less considerably.

Now each ray of light, as it differs from another in its degree of refrangibility, so likewise it differs from it in colour. This is warranted by numerous experiments.

Those particles which are more refracted, are found to constitute a ray of a Violet colour; i. e. in all probability, the most minute particles of light, thus separately impelled, excite the shortest vibration in the retina, which are thence propagated by the solid fibres of the optic nerve into the brain, there to excite the sensation of Violet colour, as being the most dusky and languid of all colours.

Again: those particles which are the most refracted constitute a radiolus, or little ray, of a red colour; i. e. the largest particles of light excite the longest vibrations in the retina, so as to excite the sensation of red colour, the brightest and most vivid of all colours.

It is remarkable, that in the growing of plants, the same plants do from time to time, alter and change their colours as the vessels which are in their young shoots grow larger. The leaves are of a faint yellow when they are in their smaller state, but they become of a bright green, or sometimes red, when they are in their middle state; but when their vessels are enlarged to their full growth, they become of a dark green, and then change to a feuillemort colour towards autumn, from the ripening of their juices; from thence to putrefaction, which resolves itself again into earth, its first principle.

VASCULIFEROUS PLANTS are such whose seeds are contained in vessels, which are sometimes divided; and these have always a monopetalous flower, either uniform or disform.

VASES: A Vase is a sort of a flower-pot to set in a garden.

VEGETABLE, a term applied to all plants, considered as capable of growth; i. e. to all natural bodies, which have parts organically formed for generation and accretion, but not for sensation.

Dr. Boerhaave defines a Vegetable to be a body generated of the earth, to which it adheres, and is connected by parts called roots, through which it receives the matter of its nourishment and increase, and consists of juices and vessels, sensibly distinct from each other; or a Vegetable is an organical body, composed of vessels and juices every where distinguishable from each other, to which the roots grow, or parts by which it adheres to some other body, from which it derives the matter of its life and growth.

This definition of a Vegetable is very scientific, and furnishes us with a just and adequate idea of it; for by its consisting of vessels and juices, it is distinguished from a fossil; and by its adhering to another body, and deriving its nourishment therefrom, it is distinguished from an animal.

He defines a Vegetable an organical body, because it consists of different parts, which jointly concur to the exercise of the same function.

The definition of its adhering by some of its parts to another body is very proper; for we know of no plant that is so absolutely vague and fluctuating, but has still a body it adheres to, though that body may be various, e. g. earth, as in our common plants; stone, as in rock plants; water, as in sea plants; air, as in some mucilages.

As to those few plants that appear to float with the water, their manner of growth is somewhat anomalous. Monsieur Tournefort has shewn, That all plants do not arise strictly from seeds; but that some, instead of semen, deposit or let fall a drop of juice, which sinking in the water by its gravity, reaches the bottom, or some rock, &c. in its way, to which it sticks, strikes root, and shoots into branches: such is the origin of coral.

To which may be added, That a root of a plant may have any situation at pleasure, with respect to the

body thereof; nor needs it be either lowest or highest, &c. Accordingly in Coral, Mosses, Funguses, &c. the root is frequently uppermost, and its growth downwards.

VEGETABLE STATICS signifies the weight or gravity, and the motion of the juices, in vegetable bodies.

VEGETATION is the act whereby plants receive nourishment, and grow; the word is derived from the Latin, vegeto, to quicken, to refresh, to make lively and strong; and signifies the way of growth, or increase of bulk, parts, and dimensions proper to all trees, shrubs, herbs, plants, minerals, &c.

To understand the process of nature in the business of Vegetation, it is to be considered, that there is in vegetables a principle of life, and this is differently seated; there are some who suppose it is seated exactly between the trunk and the root, which they say is observed to be the place of its position, in all or most of the seminiferous tribe; but if the Oak and some other trees be included in that general title, and their bodies be cut down near that place, ir is odds if they ever shoot again, or at least to any purpose.

In some trees it is only the roots which vegetate, so that let them be cut into as many pieces as reasonably may be, if these pieces are but planted in the ground, they quickly grow, as is seen in the Elm, &c. and in many other trees.

In some it is seated both in the roots, and all over the trunk and branches, as in the vimineous or Willow kinds, which, if they be cut into a thousand pieces, it is scarce possible to destroy or kill them, unless they are stripped of both their barks; for if you plant them in the earth but the length of three or four inches, either the roots or branches will certainly grow again.

In some it is found entirely in the body, branches, or leaves, and of this kind are many of the exotics, which being of a succulent nature, if the trunk or branches, or the leaves and stems, be put into the ground, they will strike root immediately, and grow, as in the Cereuses, Ficoides, Sedums, &c. nay, so strong is the principle of life in this kind of plants, that if they be hung a considerable time in the air without any earth, water, &c. they will maintain their natural verdure, and also this principle of life, admirably, by their succulent quality.

The use of this principle of life is accounted to be for the concoction of the indigested salts, which ascend through the roots, where they are supposed to assimulate the nature of the tree they are helping to form, though perhaps the root may likewise assist in the work.

These things being presupposed, in the spring of the year, as soon as the sun begins to warm the earth, and the rains melt the latent salts, the whole work of Vegetation is set on foot; then the emulgent fibres seek for food, which has been prepared as aforesaid.

It is very rational to suppose that a great part of the roots are formed under ground during the winter season, because in all lands there is always an innate heat, which seems to be a natural vital quality, or nitrous fermentation.

The roots, by seeking out and assuming those nitrous salts, are immediately (by the course of nature, and the attractive virtue of the sun) drawn upwards to the vital principle, and, after concoction, ascend still higher into the stem, and break out first in the buds, the shelly and tenderest part of the whole machine, and afterwards diffuse themselves into the leaves, flowers, fruits, &c. which lie inveloped therein, according to their natural frames, &c.

There are some who suppose that subterraneous fires are concerned in the work of Vegetation, or the growth of plants, yet as, upon the best observation that can be made, none can pretend to have discovered any heat or fumigation to issue from the bowels of the earth, adequate to the meanest artificial fire, it is plain that the sun is the principle, and so may be called the father of Vegetation, and the earth the mother, the rain and air being necessary co-efficients in this surprising work.

It is apparent, by the use of microscopes, that plants consist of different parts, vessels, &c. analogous to those of animals, and each kind of vessel is supposed to be the vehicle of a different humour, or juice, secreted from the matter of the sap, which is considered as the blood, or common fund of them all.

Dr. Grew farther explains this, by saying, That all kinds of vegetable principles are at the first received together in a plant, and are separated afterwards, i. e. they are filtered some from others in very different proportions and conjunctions by the several parts, so every part is the receptacle of a liquor, become peculiar, not by any transformation, but only by the percolation of parts out of the common mass or stock of sap, and those that are superfluous in any plant, are discharged back by perspiration.

The same author assigns the offices of the several vessels: he calls those vessels lympheducts, which are placed on the inner verge of the bark, and these, he supposes, are appointed for the conveyance of the most aqueous or watery liquor.

Those vessels that are in the middle of the plant, he calls lactiferous or resiniferous; these he takes to be the principle viscera of plants; and that as the viscera of animals are but conglomerated vessels, the viscera of plants are drawn out in length.

It is also remarkable in many cases, That the multitude and largeness of the vessels produce a sweet and vinous sap, and the fewness and smallness of the vessels produce an oily and aromatic sap.

It seems necessary to the nutrition of plants, as well as animals, that there be a concurrence of two specifically distant fluids; and a certain author maintains, That there is an intermixture of two such humours in every part of a tree, every part of sap being impregnated with other tinctures, and continually filtred from fibres of one kind to those of another, and from this mixture many of the phænomena of the ripening, odour, &c. are accounted for.

With regard particularly to the odour in plants, Dr. Grew is of opinion, that they chiefly proceed from the air-vessels that are in the wood, not but that the other parts also yield their smells, which is most plain to be perceived in plants that are fresh, undried, and unbruised; for he says that the air, bringing along with it a tincture from the root, and from the several organical parts, and at last entering the concave of the air-vessels, it consists there.

Others say, That it cannot be denied but the effluvia, which can be admitted into the wood-vessels, may give a smell to the wood; but however, as that vapour passes through the vessels which have a different structure, so as to alter the form of its parts, so in every one of its changes, it will yield a smell different from the rest. The smell of the wood will differ from that of the bark, the juices in the one being more essential than the other; but yet both, being bruised and mixed together, yield a scent different from either of them singly, and likewise the leaves give a scent that is different from either of the former, and so also do the flowers from that in the leaves, and also the fruit from that in the flowers.

Dr. Grew is of opinion that the chief governing principle in the juice of plants, is the saline, which saline principle, he says, must be understood as a generic term, under which divers species are comprehended. The vegetable salts seem to be four, viz. the nitrous and the acid, alkaline and marine, and of these the nitrous salts seem to be assigned by nature chiefly for the growth of plants.

The curious Malpighius has very accurately delivered the process of nature in the Vegetation of plants to the effect following.

The ovum or seed of the plant, being excluded out of the ovary (which is called the pod or husk) and requiring farther fostering and brooding, is committed

to

to the earth. The earth, like a kind mother, having received it into her bosom, does not only perform the office of incubation, by her own warm vapours and exhalations, in conjunction with the heat of the sun, but gradually supplies what the seed requires to its farther growth, as abounding every where with canals and sinuses, in which the dew and rain water, impregnated with fertile salts, glide like the chyle and blood in the arteries, &c. of animals.

This moisture, meeting with new-deposited seed, is percolated or strained through the pores or pipes of the outer rind or husk, answering to the secundines of fœtuses, on the inside whereof lie one more, commonly two, thick seminal leaves corresponding to the placenta in women, and the cotyledons in brutes.

The seed-leaves consist of a great number of little vesiculæ or bladders, with a tube corresponding to the navel-strings in animals.

The moisture of the earth, strained through the rind of the seed, is received into these vesiculæ, which causes a slight fermentation with the proper juice before contained therein.

This fermented liquor is conveyed by the umbilical vessel to the trunk of the little plant, and to the gem or bud which is contiguous to it, upon which a Vegetation and increase of the plant succeed.

This procedure in the Vegetation of plants, the aforesaid author exemplifies in a grain of Wheat as follows: The first day the grain is sown, it grows a little turgid, and the secundine or husk gapes a little in several places; and the body of the plant, being continued by the umbilical vessel to a conglobated leaf (which is called the pulp or flesh of the seed, and is what constitutes the flour) swells, by which means, not only the gem or sprout (which is to be the future stem) opens and increases, but the roots begin to bunch out, whence the placenta or seed-leaf, becoming loose, gapes.

The second day, the secundine or husk, being broken through the stem or top of the future straw, appears on the outside thereof, and grows upward by degrees. In the mean time, the seed-leaf, guarding the roots, becomes turgid with its visculæ, and puts forth a white down, and the leaf being pulled away, you see the roots of the plant bare, the future bud, leaves, and the rest of the stalk lying still hid. Between the roots and the ascending stem, the trunk of the plant is knit by the navel-knot to the flower-leaf, which is very moist, though it still retains its white colour, and its natural taste.

The third day the pulp of the conglobated or round leaf becomes turgid with the juice it has received from the earth fermenting with its own.

Thus the plant increases in bigness, and in its bud or stem becomes taller, and from whitish turns greenish. The lateral roots also break forth greenish and pyramidal, from the gaping sheaf, which adheres closely to the plant, and the lower roots grow longer and hairy, with many fibres growing out of the same.

Indeed, there are hairy fibres hanging all along on all the roots, except on the tops, and these fibres are seen to wind about the saline particles of the soil, or little lumps of earth, &c. like Ivy, whence they grow curled. About the lateral roots there now break out two other little ones.

The fourth day the stem, mounting upwards, makes a right angle with the seminal leaf. The last roots put forth more, and the other three, growing larger, are clothed with more hairs, which straitly embrace the lumps of earth, and where they meet with any vacuity, unite in a kind of net-work. The conglobate or flower-leaf, is now softer, and, when bruised, yields a white sweetish juice, like Barley cream. By stripping it off, the root and stem of the plant are plainly seen, with the intermediate navel-knot, whose outer part is solid like a bark, and in the inner more soft and medullary.

The fifth day the stalk, still rising, puts forth a permanent or stable leaf, which is green and folded. The roots grow longer, and there appears a new tumour of a future root; the outer or sheath is loosened, and the seed-leaf left begins to fade.

The sixth day the stable-leaf being loosened, the plant mounts upwards, the sheaf still cleaving round it like a bark. The seed-leaf is now seen sinuous or wrinkled, and faded; and this being freed or cut from the secundine, the flesh or pericarpium is found of a different texture, the outer part, whereby the outside of the seed or grain is heaped up, being more solid, but the inside viscular, and full of humour, especially that part next the navel-knot. All the leaves being pulled off, the roots torn, and the flower-leaf removed, the trunk appears, wherein, not far from the roots, the navel-knot bunches out, which is solid, and hard cut; above there is a mark of the sheath-leaf, which was pulled off, and underneath, as in an arm-pit, the gem is often hid; the hind part of the plant shews the breaking forth of the roots likewise, with the faded placenta, &c.

After the eleventh day the seed-leaf, as yet sticking to the plant, is crumpled, and almost corrupted; within it is hollow, and about the secundine, the mucus and white substance of the seed, being continued to the navel-knot forms a cavity; all the roots, becoming longer, put forth new branches out of their sides. The second leaf withers, and its vesicles are emptied; the internodes or spaces between the knots grow longer, new gems appear, and the middle root grows several inches longer.

After a month, the roots and stalk being grown much longer, new buds break out at the first knot, and little tumours bunch out, which, at length, break out into roots.

As to the vegetable matter, or the food where the plants grow, there is some doubt; it hath been a general opinion among almost all the modern naturalists, That the Vegetation of plants, and even of minerals too, is principally owing to water, which not only serves as a vehicle to convey to them the fine rich earth, &c. proper for their nourishment, but being transmuted into the body of the plant, affords the greatest part, if not all the matter with which they are nourished, and by which they grow and increase in bigness. This opinion is countenanced by very great names, particularly by the ingenious Dr. Woodward, who, in order to ascertain this point, made the following experiments:

In the first place, he carefully examined all sorts of water, and found that the clearest fine spring water, which he could any where meet with, exhibited even to the naked eye great numbers of exceeding small terrestrial particles, and that all other crasser waters had these in yet much greater quantity, and also, that they were of a larger bulk.

He found this terrestrial matter contained in all water to be of two kinds, the one properly a vegetable matter, but consisting of very different particles, some of which are very proper for the nourishment of some kinds of plants, others for different sorts, &c. The other kind of earthy matter he found to be purely of a mineral nature, and this also was of very various and different kinds.

The former sort of vegetable earthy matter abounds plentifully in all waters, but for the mineral, it is found mostly in spring water, next to that, in river water, and least of all, in rain water, though even there also it is to be found plentifully.

This fact, he says, any one may discover, by only keeping water for a competent time without stirring it, in a clear glass phial, closely stopped to keep out dust, &c. for then he will observe that these very small terrestrial particles, which before were scarcely visible singly, will now combine together into large and more conspicuous masses, which, by degrees, will join together, and form clouds, as it were, in the water, which will grow daily more and more opacous and thick by the continual accession of new matter; and if the earthy matter in the water be chiefly of the vegetable kind, it will turn the water green, the usual colour of vegetables, and this will grow

deeper and deeper coloured, but will not precipitate to the bottom of the glaſſes, as the mineral water will, if there be any conſiderable quantity, by reaſon of its much greater ſpecific gravity. On the whole therefore he concludes very juſtly, That there is in all water a conſiderable quantity of the earthy matter. And in order to determine whether the Vegetation of plants was chiefly owing to bare water or not, rather than to the terreſtrial matter therein contained, he made with very great accuracy and care ſeveral experiments.

Which experiments, becauſe they were done with an uncommon care and exactneſs, are a ſufficient number of them, and are followed by very ingenious reflections, ſerving to explicate many difficulties of philoſophy, and to ſet the whole affair of Vegetation in a very good light, I ſhall give the regiſter as follows:

Anno Dom. 1691, he choſe ſeveral glaſs phials, that were all, as near as poſſible, of the ſame ſhape and bigneſs. After he had put what water he thought fit into every one of them, and taken an account of the weight of it, he ſtrained and tied over the orifice of each phial a piece of parchment, having holes in the middle of it large enough to admit the ſtem of the plant he deſigned to ſet into the phial, without confining or ſtreightening it ſo as to impede its growth. His intention in this was to prevent the incloſed water from evaporating or aſcending any other way than only through the plant to be ſet therein.

Then he made choice of ſeveral ſprigs of Mint and other plants, that were, as near as he could poſſibly judge alike ſound, freſh, and lively. Having taken the weight of each, he placed them in a phial, ordered as above, and as the plant imbibed and drew off the water, he took care to add more of the ſame from time to time, keeping an account of the weight of all he added. Each of the glaſſes were, for better diſtinction, and the more eaſy keeping a regiſter of all the circumſtances, noted with a different mark or letter, as A, B, C. &c. and all ſet in a row in the ſame window, in ſuch a manner that all might partake alike of air, light, and ſun.

Then they continued from July the 20th to October the 5th, which is juſt 77 days, when he took them out, weighed the water in each phial, and the plant likewiſe, adding to its weight that of all the leaves that had fallen off, during the time it had ſtood thus, and laſtly he computed how much each plant had gained, and how much water was ſpent upon it.

*The particulars are as follow:*

The plant weighed, when put in, July the 20th, juſt 27 grains; when taken out, October the 5th, 42 grains, ſo that in the ſpace of 77 days it had gained in weight 15 grains.

The whole quantity of water, expended during the 77 days, amounts to 2558 grains. Conſequently the weight of the water had taken up 170 $\frac{8}{15}$ times the grains as much as the plant had gained in weight.

*This will be made plainer by the following* TABLE.

| Weight of the plant when firſt put into water. | Weight of the plant when taken out of the water. | Weight gained by the plant during the 77 days. | Weight of the water expended upon the plant. | Proportion of the increaſe of the plant to the expence of the water. |
|---|---|---|---|---|
| | A | | | |
| | *Common Spear-mint.* | | *Spring Water.* | |
| 27 grains. | 42 grains. | 15 grains. | 2558 grains. | as 1 to 170 $\frac{8}{15}$. |
| | B | | | |
| | *Common Spear-mint.* | | *Rain water.* | |
| 28 $\frac{1}{4}$ grains. | 45 $\frac{3}{4}$ grains. | 17 $\frac{1}{2}$ grains. | 3004 grains. | as 1 to 171 $\frac{23}{35}$. |
| | C | | | |
| | *Common Spear-mint.* | | *Thames water.* | |
| 28 grains. | 54 grains. | 26 grains. | 2493 grains. | as 1 to 95 $\frac{23}{26}$. |
| | D | | | |
| | *Common Solanum,* or *Nightſhade.* | | *Spring water.* | |
| 49 grains. | 106 grains. | 57 grains. | 3708 grains. | as 1 to 65 $\frac{3}{37}$. |
| | E | | | |
| | *Lathyrus, ſeu Cataputia.* | | *Ger. ſpring water.* | |
| 98 grains. | 101 $\frac{1}{2}$ grains. | 3 $\frac{1}{2}$ grains. | 2501 grains. | as 1 to 714 $\frac{4}{7}$. |

The ſpecimen D had ſeveral buds upon it, when firſt ſet into the water; theſe, in ſome days, became fair flowers, which were at length ſucceeded by berries. Several other plants were tried, which did not thrive in water, nor ſucceed any better than the Cataputia foregoing.

The phials F and G were filled, the former with rain, and the other with ſpring water, at the ſame time as thoſe above-mentioned were, and ſtood as long as they did, but they had neither of them any plant, the deſign of which was in order to learn, whether any water exhaled out of the glaſſes, otherwiſe than through the bodies of the plants.

The orifices of theſe two glaſſes were covered with parchment, each piece of it being perforated with an hole of the ſame bigneſs with thoſe of the phials above. In theſe was ſuſpended a bit of ſtick about the thickneſs of the ſtem of one of the aforeſaid plants, but not reaching down to the ſurface of the incloſed water, that the water in theſe might not have more ſcope to evaporate than that in the other phials.

Thus they ſtood the whole 77 days with the reſt, when, upon examination, none of the water was found to be waſted, or gone off; though he obſerved both in theſe and the reſt, eſpecially after very hot weather, ſmall drops of water, not unlike to dew, adhering to the inſides of the glaſſes, i. e. that part of them that was above the ſurface of the incloſed water.

 The

The water in these two glasses that had no plants in them, at the end of the experiment exhibited a larger quantity of terrestrial matter, than that in any of those that had the plants in them did.
The sediment in the bottom of the phials was greater, and the nubeculæ diffused through the body of the water thicker, and of that which was in the others, some of it proceeded from certain small leaves that had fallen from that part of the stem of the plants that was within the water, wherein they rotted and dissolved.
The terrestrial matter in the rain water was finer than that of the spring water.

*Experiments, Anno* 1692.

The glasses made use of in this were of the same sort with those of the former experiment, and covered over with parchment after the same manner.
The plants here were all Spear Mint, the most kindly, fresh, sprightly shoots he could chuse. The water and plants were weighed, as above, and the phials set in a line in a south window, where they stood from June the 2d to July the 28th, which was just 56 days.
The plant H was all along a very kindly one, and ran up about two feet in height. It had shot but one considerable collateral branch, but had sent forth many and long roots, from which sprung very numerous, though small and short lesser fibres. The lesser roots came out of the larger on two opposite sides for the most part, so that each root, with its fibrillæ, appears not unlike a small feather; to these fibrillæ adhered pretty much terrestrial matter. In the water, which was at last thick and turbid, was a green substance, resembling a fine thin conserva.
The plant I was as kindly as the former, but had shot no collateral branches. Its roots, the waters, and the green substance, all much as in the former.
The plant K, though it had the misfortune to be annoyed with very small insects that happened to fix upon it, yet had shot very considerable collateral branches, and at least as many roots as either H or I, which had a much greater quantity of terrestrial matter adhering to the extremities of them. The same green substance here that was in the two preceding.
The plant L was far more flourishing than any of the preceding, had several considerable collateral branches, and very numerous roots, to which terrestrial matter adhered very copiously.
The earth in both these glasses were very sensibly and considerably wasted, and less than when at first put in. The same sort of green substance here as in those above.
The plant M was pretty kindly, had two small collateral branches, and several shoots, tho' not so many as those in H or I, but as much terrestrial matter adhering to them as those had. The water was pretty thick, having very numerous small terrestrial particles swimming in it, and some sediment at the bottom of the glass. This glass had none of the green matter above-mentioned in it.
The plant N was very lively, and had sent out six collateral branches, and many roots, but the water was very turbid, and as high coloured as ordinary beer.

| Weight of the plant when first set in water. | Weight of the plant when taken out of the water. | Weight gained by the plant when it had stood 56 days. | What of the water is expended upon the plant. | Proportion of the increase of the plant to the expence of the water. |
|---|---|---|---|---|
| **H** | | | | |
| *Hyde-Park conduit water alone.* | | | | |
| 127 grains. | 255 grains. | 128 grains. | 14190 grains. | as 1 to 110 $\frac{110}{128}$. |
| **I** | | | | |
| *The same water alone.* | | | | |
| 110 grains. | 249 grains. | 139 grains. | 13140 grains. | as 1 to 94 $\frac{74}{139}$. |
| **K** | | | | |
| *The same water, with an ounce and a half of common garden earth dissolved in it.* | | | | |
| 76 grains. | 244 grains. | 168 grains. | 10731 grains. | as 1 to 63 $\frac{147}{168}$. |
| **L** | | | | |
| *Hyde-Park water, with the same quantity of garden mould as the former.* | | | | |
| 92 grains. | 376 grains. | 284 grains. | 14950 grains. | as 1 to 52 $\frac{182}{284}$. |
| **M** | | | | |
| *Hyde-Park water distilled with a gentle still.* | | | | |
| 114 grains. | 155 grains. | 41 grains. | 8803 grains. | as 1 to 214 $\frac{29}{41}$. |
| **N** | | | | |
| *The residue of the water which remained in the still after that in M was distilled off.* | | | | |
| 81 grains. | 175 grains. | 94 grains. | 4344 grains. | as 1 to 46 $\frac{30}{94}$. |

The glass O had also Hyde-Park conduit water, in which was dissolved a drachm of nitre. The Mint set in this suddenly began to wither and decay, and died in a few days, as likewise did two more sprigs that were set in it successively. In another glass he dissolved an ounce of good garden mould, and a drachm of nitre, and in a third, half an ounce of wood ashes, and a drachm of nitre, but the plants in these succeeded no better than the former. In other glasses he dissolved several other sorts of earth, clay, marles, and variety of manures, &c. and he set Mint in distilled Mint water, and made other experiments of several kinds, in order to get a light and information what hastened or retarded, promoted or impeded Vegetation.

The

The glass P, Hyde-Park conduit water: in this he fixed a glass tube ten inches long, the bore one sixth of an inch diameter, filled with very fine and white sand, which he kept from falling down out of the tube into the phial, by tying a fine piece of silk over that end of the tube that was downwards. Upon immersion of the lower end of it into the water, this, by little and little, ascended quite up to the orifice of the tube, and yet in all the 56 days that it stood thus, a very inconsiderable quantity of water had gone off, viz. scarcely 20 grains, though the sand continued moist up to the top till the very last.

The water had imparted a green tincture to the sand quite to the very top of the tube, and in the phial it had precipitated a greenish sediment mixed with black. To the bottom and sides of the tube, as far as it was immersed in the water, adhered pretty much of the green substance described above.

Other like tubes he filled with cotton, lint, pith of Elder, and several other porous vegetable substances, setting some of them in clear water, others in water tinged with Saffron, Cochineal, &c. and several other trials were made, in order to give a mechanical representation of the motion and distribution of the juices in plants, and of some other phænomena observable in Vegetation.

Several plants being also set in the phials Q, R, S, &c. ordered in like manner as those above in October, and the following colder months those throve not near so much; nor did the water ascend nigh the quantity it did in the hotter seasons, in which the before cited trials were made.

The result of all which experiments he gives us in the following observations and reflections:

I. *In plants of the same kind, the less they are in bulk, the smaller quantity of the fluid mass in which they are set is drawn off; the consumption where the mass is of equal thickness, being pretty nearly proportioned to the bulk of the plant.*

In effect, the water seems to ascend up the vessels of the plants, in much the same manner as up a filtre; and it is not to be wondered at, that the larger filtre should draw off more water than the smaller; or that a plant that hath more or larger vessels, should take up a greater part of the fluid in which it is set, than one that has fewer can. Nor is it thus noted as a thing very considerable in itself, but chiefly with regard to what follows:

II. *Much the greater part of the fluid mass, thus drawn off, and conveyed into the plant, does not settle or abide there, but passes through their pores, and exhales up into the atmosphere.*

That the water in these experiments, ascended only through the vessels of the plants is certain, since some glasses, which had no plants in them, though disposed in the like manner as the rest, did remain, at the end of the experiment, as at first, and without any diminution of water, and that the greatest part of it flies off from the plant into the atmosphere, is as certain.

The least proportion of the water expended was to the augment of the plant, as 46 or 50 to 1; and in some 100, 200 in 1, as 700 to 1.

Thus so continual an emission of water, in so great plenty, from the parts of the plant, affords a manifest reason, why countries that abound with trees, and the larger vegetables especially, should be very obnoxious to damp, great humidity in the air, and more frequent rains, than others that are more open and free.

The great moisture of the air was a great inconvenience and annoyance to those who first settled in America, which at that time was overgrown with woods and groves; but as these were burnt down and destroyed, to make way for habitations, and the culture of the earth, the air mending, changed into a temperature more serene and dry than before.

Nor does this humidity go off pure and alone, but usually carries with it many parts of the same nature with those whereof the plant consists; the crasser indeed are not so easily borne up into the atmosphere, but are usually deposited on the surface of the leaves, flowers, and other parts of the plants; whence proceed our mannas, our honeys, and other gummous exsudations of vegetables; but the finer and lighter parts are with greater ease sent up into the atmosphere, thence they are conveyed to our organs of smelling, by the air we draw in respiration, and are pleasant or offensive, beneficent or injurious to us, according to the nature of the plants from whence they arise: and since these owe their rise to the water that ascends out of the earth through the bodies of plants, we cannot be far to seek for the cause why they are more numerous in the air, and a greater quantity of odours is found exhaling from vegetables in warm humid seasons, than in any other.

III. *A greater part of the terrestrial matter that is mixed with water, ascends up into the plant as well as the water.*

There was much more terrestrial matter at the end of the experiment, in the water of the glasses that had no plants in them, than in those that had plants. The garden mould dissolved in some of the glasses was considerably diminished, and carried off; nay, the terrestrial and vegetable matter was borne up in the tubes filled with sand, cotton, &c. in that quantity as to be evident even to sense; and the bodies in the cavities of the other tubes, that had their lower ends immersed in water, wherein Saffron, Cochineal, &c. had been infused, were tinged with yellow, purple, &c.

To look abroad a little towards our shores and parts within the verge of the sea, these will present us with a large scene of plants, that, along with the vegetables, take up more mineral matter also in great abundance; such as our Sea Purslain, several sorts of Algas, of Samphires, and other marine plants; those contain common sea salts, which are the same as the fossil, in such plenty, as not only plainly to be distinguished in the palate, but may be drawn out of them in a considerable quantity; nay some affirm there are plants found, that will yield nitre and other mineral salts.

The vegetable matter, being very fine and light, is surprisingly apt and disposed to attend water in all its motions, and follow into each of its recesses, as appears not only from the instances above alledged, but many others percolate it with all the care imaginable, filtre it with ever so many filtrations, yet some terrestrial matter will remain.

Dr. Woodward has filtred water thro' several sheets of thick paper, and after that through very close fine cloth, twelve times double, and this over and over; and yet a considerable quantity of this matter discovered itself in the water after all.

Now if it thus passes interstices that are so very small and fine along with the water, it is less strange it should attend it in its passage through the ducts and passages of plants. It is true filtring and distilling of water interrupts, and makes it quit some of the earthy matter it was before impregnated withal; but then that which continues with the water after this, is fine and light, and such consequently, as is in a peculiar manner fit for the growth and nourishment of vegetables.

And this is the case of rain water. The quantity of terrestrial matter it bears up into the atmosphere is not great; but what it doth bear up is chiefly of that light kind, or vegetable matter, and that too perfectly dissolved, and reduced to single corpuscles, all fit to enter the tubes and vessels of plants; on which account it is, that this water is so very fertile and prolific.

The

The reason why all the terrestrial matter mixed with the water does not ascend into that, is, that the mineral matter makes a great deal of it, which is not only gross and ponderous, but scabrous and inflexible, and so not disposed to enter the pores of the roots; besides, a great many of the simple vegetable particles do by degrees unite and form small clods, or moleculæ, which stick to the extremities of the roots of those plants, and others of them entangled in a looser manner for the nubeculæ, or green bodies, so commonly observed in stagnant water; these, when thus conjoined, are too big to enter the pores, or ascend up the vessels of plants, which singly they might have done.

Hence it is, that in agriculture, be the earth never so rich, good, and fit for the production of Corn, or other vegetables, little will come of it, unless the particles be separated and loose; and it is on this account such pains are bestowed in the digging, tilling, ploughing, fallowing, harrowing, and breaking the clodded lumps of earth; and it is the same way that sea salt, nitre, and other salts promote Vegetation.

Some authors imagine nitre essential to plants, and that nothing in the vegetable kingdom is transacted without it; but Dr. Woodward says, by all the trials he has been able to make, the thing seems to him quite otherwise; and when contiguous to the plant, nitre rather destroys than nourishes it. This I have myself found to be true, for by scattering some nitre round the roots of three or four plants, it killed them in a few days.

But nitre and other salts certainly loosen the earth, and separate the concreted parts of it, by that means fitting and disposing them to be assumed by the water, and carried up into the seed or plant for its formation and increase.

It is evident to observation, how apt all sorts of salts are to be wrought upon by moisture, how easily they run with it; and when these are drawn off, and have deserted the lumps with which they are incorporated, they must moulder immediately, and fall asunder in course.

The hardest stone that is to be met with, if it happens (as it frequently does) to have any salt intermixed with the sand of which it consists, upon its being exposed in a humid air, in a short time dissolves and crumbles all to pieces; and much more will clodded earth or clay, which is not of so compact and solid a constitution.

Lime likewise is in the same way serviceable in this affair. The husbandmen say, it does not fatten, but only mellows the ground; by which they mean, it doth not contain any thing in itself, that is of the same nature with the vegetable mould, or afford any matter fit for the formation of plants, but merely soften and relaxes the earth; by that means rendering it more capable of entering the seeds and vegetables set in it, in order to their nourishment, than otherwise it would have been.

The properties of lime are well known, and how apt it is to be put into a ferment and commotion by water; nor can such commotion ever happen, when lime is mixed with earth, however hard and clodded it may be, without opening and loosening it.

IV. *The plant is more or less nourished, in proportion as the water in which it stands, contains a greater or smaller quantity of proper terrestrial matter in it.*

The truth of this proposition is discernible through the whole process of the Doctor's experiments. The Mint in one of the glasses was of much the same bulk and weight with that of two or three others; but the water in which the first was, being river water, which was apparently more copiously stored with terrestrial matter than the spring or rain water, in which the other stood, occasioned it to arrive at almost double the bulk that either of them had, and with less expence of water too.

So likewise the Mint in another glass, in the water of which was dissolved a small quantity of good garden mould, though it had the disadvantage to be less when first set, than either of the Mints in the two other glasses had, the water in which was the very same as the first, only none of the earth mixed with it; yet in a short time the plant not only overtook, but much outstripped the other.

The reason why the proportion of the increase of the plant was limited to the quantity of proper terrestrial matter in the water, is, that all, even vegetable matter, is not proper for the nourishment of every plant; nor do there want good indications, that every kind requires a peculiar and specific matter for its formation and nourishment, nay, each part of the same vegetable; and that there are very many and different ingredients, to go to the composition of the same individual plant.

If therefore the soil wherein any vegetable or seed is planted, contains all or most of these ingredients, and those in due quantity, it will grow and thrive, otherwise it will not. If there be not as many sorts of corpuscles as are requisite for the construction of the main and more essential parts of the plant, it will not prosper at all. If there are these, and not in sufficient plenty, it will never arrive to its natural stature, or if any of the less necessary and essential corpuscles are wanting, there will be some failure in the plant. It will be defective in smell, taste, colour, and some other way.

Indeed it is inconceivable, how one uniform homogeneous matter, having its principles, or original parts, of the same substance, constitution, magnitude, figure, and gravity, should constitute bodies so unlike in all those respects, as vegetables of different kinds are, nay, even as the different parts of the same vegetable; that one should carry a resinous, another a milky, a third a yellow, and a fourth a red juice in its veins; that one affords a fragrant, another an offensive smell; one sweet to the taste, another acid, bitter, acerb, austere; that one should be nourishing, another poisonous; one purging, another astringent; and these all receive their nourishment from the same soil.

A Cataputia, Tithymalus latifolius Cataputia dicta, in one of the glasses afforded but a little increase, only $3\frac{1}{4}$ grains all the while, though 2501 grains of water were spent upon it; but this might possibly be owing not to the water's wanting matter fit for the nourishment of that particular plant, but from its being an improper medium for that to grow in. Too much of that liquor in some plants, may probably hurry the terrestrial matter through the vessels too fast for them to lay hold of it.

But a farther proof of this matter is, that the soil once proper for the production of some sort of vegetables, does not ever continue so, but in tract of time loses its property; and sooner in some lands, and later in others.

As for example: if Wheat be sown upon land proper for that grain, the first crop will succeed very well, and perhaps the second and third, as long as the ground is in heart, as the farmers call it; but in a few years it will produce no more, if sowed with that Corn; some other grain it may, as Barley; and after this has been sown so oft, that the land can bring no more of it, it may afterward yield some good Oats, and perhaps Peas after them.

At length it becomes barren; the vegetative matter that at first it abounded with, being reducd by the successive crops, and most of it borne off, each sort of grain takes out that peculiar matter that is proper for its own nourishment.

It may be brought to bear another series of the same vegetables, but not till it is supplied with another fund of matter of the like sort with what it first contained; either by the ground's lying fallow for some time, till the rain hath poured a fresh stock upon it, or by the manuring it.

That this supply is of the like sort is evident, by the several manures found best to promote the Vegeta-

tion;

tion, which are chiefly either of parts of vegetables, or of animals; of animals, which either derive their own nourishment immediately from vegetable bodies, or from other animals that do so; in particular, the blood, excrements, and urine of animals that do so; shaving of horns and hoofs, hair, feathers, calcined shells, lees of wine and beer, ashes of all sorts of vegetable bodies, leaves, straw, roots, and stubble, turned into earth by ploughing, or otherwise, to rot and dissolve there.

These are our best manures; and, being vegetable substances, when refunded back again into the earth, serve for the formation of other bodies.

But to apply this to gardens, where the trees, shrubs, and herbs, after their having continued in one station till they have derived thence the greatest part of the matter fit for their increase, will decay and degenerate, unless either fresh earth, or some fit matter be applied to them.

It is true they may maintain themselves there for some time, by sending forth roots farther and farther, to an extent all around, to fetch in more provision; but at last they must have a fresh supply brought to them, or they will decay.

All these instances argue a particular terrestrial matter, and not water, for the subject to which plants owe their increase; were it water only, there would be no need of manures, or changing the species; the rain falls in all places, in this field and in that, indifferently, on one side of an orchard or garden, as well as the other; nor could there be any reason why a tract of land should yield Wheat one year and not the next, since the rain showers down all alike upon the earth.

V. *Vegetables are not formed of water, but of a certain peculiar terrestrial matter.*

It has been shewn, that there is a considerable quantity of this matter both in spring, rain, and river water; and the experiments before-mentioned shew, that the much greatest part of the fluid mass that ascends up into plants, does not settle or abide there, but passes through the pores of them, and exhales into the atmosphere; and that a great part of the terrestrial matter mixed with the water, passes up into the plant along with it, and that the plant is more or less augmented, in proportion as the water contains a greater or less quantity of matter; from all which we may reasonably infer, that earth, and not water, is the matter which constitutes vegetables.

One of the sprigs of Mint before-mentioned drew up into it 2501 grains of the fluid mass, and yet had received but $3\frac{1}{2}$ grains of increase from it.

A second, though it had at first the disadvantage to be much less than a third, yet being set in water, wherein earth had been plentifully mixed, and the other in water without any such earth, it had vastly outgrown it, weighing at least 145 grains more than that did.

A fourth plant, though at first a great deal less than the fifth, yet being set in foul crass water, that was left in the still, after that in which the last was set was drawn off, had gained in weight at the end, above double what that in the finer and thinner water had.

The proportion of the augment of that plant, which throve most, was in the said mass spent upon it, but as 1 to 46; in others as one to 60, 100, 200; and in the Cataputia, but as 1 to 714.

One of the sprigs took up 39 grains of water a day, one day with another, which was much more than the whole plant originally; and yet it gained not $\frac{1}{4}$ of a grain a day in weight.

And another took up 253 grains a day, which was near twice as much as its original weight; and after all, the daily increase of the plant was no more than 2 $\frac{15}{16}$ grains.

VI. *Spring and rain water contain near an equal charge of vegetable matter; river water more than either of them.*

These proportions hold in the main, but a strict and just composition is hardly to be expected; inasmuch as in all probability, the water that falls in rain, contains sometimes a greater share of terrestrial matter, than that which falls at other times; a more powerful and intense heat, of necessity, hurrying up a larger quantity of that matter, along with the humid vapours that form rain, than one more feeble and remiss possibly can.

The water of one spring may flow forth with a higher charge of this matter than that of another, this depending partly upon the quickness of the ebullition of the water, and partly on the quantity of that matter latent in the strata, thro' which the fluid passes, and the greater or less laxity of those strata; for the same reason the water of one river may abound with it more than that of another; nay, the same river, when much agitated and in commotion, must bear up more of it, than when it moves with less rapidity and violence. That there is a great quantity of ordinary fertility of the earth, the Nile affords a pregnant instance, and so does the Ganges and other rivers, which annually overflowing the neighbouring plains, their banks shew the fairest and largest crops of any in the world.

VII. *Water serves only for a vehicle to the terrestrial matter which forms vegetables, and does not itself make any augmentation to them.*

Where the proper terrestrial matter is wanting, the plant is not augmented, though never so much water ascend into it: water then is not the matter that composes vegetable bodies, it is only the agent that conveys the matter into them, that distributes it to their several parts to their nourishment; that matter is sluggish and inactive, and would lie eternally confined to its beds of earth, without advancing up into plants, did not water or some like instrument fetch it forth, and carry it into them.

This fluid is capacitated several ways for the office here assigned it, by the figure of its parts, which appears from many experiments to be exactly and mathematically spherical, their surfaces being perfectly polite, and without any the least irregularities.

It is evident, that corpuscles of such a figure are easily susceptible of motion, and far above any others whatever, and consequently more capable of moving and conveying other matter that is not so active; then the intervals of the bodies of that figure are, in respect to their bulk, of all others the largest, and so the most fitted to receive and entertain foreign matter in them; besides, as far as the trials hitherto made inform us, the constituent corpuscles of water are each singly considered absolutely solid, and do not yield to the greatest external force; this secures their figure against any alteration, and the intervals of their corpuscles must be always alike.

By the latter it will be ever disposed to receive matter into it; and by the former, when once received, to bear it along with it. Water is farther capacitated to be a vehicle to this matter, by the tenuity and fineness of the corpuscles of which it consists. We hardly know any fluid in all nature, except fire, whose constituent parts are so exceeding subtile and small as those of water are; they will pass pores and interstices that neither air nor any other fluid will. This enables them to enter the tubes, and finest vessels of plants, and to introduce the terrestrial matter, and convey it to all parts of them, whilst each, by means of organs it is endued with for that purpose, intercepts and assumes into itself, such particles as are suitable to its own nature, letting the rest pass on through the common ducts.

VIII. *Water is not capable of performing this office to plants, unless assisted by a due quantity of heat.*

Heat must concur, or Vegetation will not succeed. The plants set in the glasses in October, and the following

lowing months, had not near the quantity of water ſent up into them, or ſo great an additional increaſe by much as thoſe that were ſet in June, July, or the hotter months.

It is plain the water has no power of moving itſelf, or riſing to the vaſt height it doth, in the more tall and lofty plants; ſo far from it, that it doth not appear by any diſcovery yet made, that even its own fluidity conſiſts in the inteſtine motion of its parts, whatever the Carteſians think.

Indeed we want nothing more to ſolve all the phænomena of fluidity, than ſuch a figure and diſpoſition of parts as water has: ſpherical corpuſcles muſt ſtand ſo ticklish upon each other, as to be ſuſceptible of every impreſſion, and though not perpetually in motion, muſt be always ready and liable to be put into it by any the ſlighteſt force imaginable. It is true, the parts of fire or heat are not capable of moving themſelves any more than thoſe of water, but they are more ſubtile, light, and active than thoſe are, and ſo the more eaſily put in motion.

That the concourſe of heat is really neceſſary in this work, appears not only from the experiments before us, but from all nature, from the fields and foreſts, gardens and orchards. We ſee in autumn, as the ſun's power is gradually leſs and leſs, ſo its effect on plants is remitted, and Vegetation ſlackens by little and little.

Its failure is firſt diſcernible in trees, which, being raiſed higheſt above the earth, require a more intenſe heat to elevate the water charged with nouriſhment to their tops, ſo that, for want of freſh ſupport and nutriment, they ſhed their leaves, unleſs ſupported by a very firm and hard conſtitution, as our evergreens are. Next, the ſhrubs part with theirs; then the herbs and lower tribes, the heat at length not being ſufficient to ſupply even to theſe, though ſo near the earth, the fund of their nouriſhment.

As the heat returns the ſucceeding ſpring, they all recruit again, and are furniſhed with freſh ſupplies and verdure; but firſt, thoſe which are loweſt, and neareſt the earth, and that require a leſs degree of heat to raiſe the water with its earthy charge into them, then the ſhrubs and higher vegetables in their turn, and laſtly the trees.

As the heat increaſes, it grows too powerful, and hurries the matter with too great rapidity through the finer and more tender plants; theſe therefore go off and decay, and others that are more hardy and vigorous, and require a greater degree of heat, ſucceed in their order. By which mechaniſm, provident nature furniſhes us with a very various and different entertainment, and what is beſt ſuited to each ſeaſon all the year round.

As the heat of the ſeveral ſeaſons affords us a different face of things, the ſeveral diſtant climates ſhew the different ſcenes of nature, and productions of the earth.

The hotter countries ordinarily yield the largeſt and talleſt trees, and thoſe too in a much greater variety than the colder; even thoſe plants common to both attain to a much greater bulk in the ſouthern, than in the northern climates.

Nay, there are ſome regions ſo cold, that they raiſe no vegetables at all to a conſiderable ſize; this we learn from Greenland, Iceland, and other parts of like cold ſituation and condition: in theſe there are no trees, and the ſhrubs are poor, little, and low.

Again, in the warmer climates, and ſuch as furniſh trees and the large vegetables, if there happen a remiſſion or diminution of the uſual heat, their productions are impeded in proportion. Our own ſummers give us proof enough of this, for though at ſuch times there is heat ſufficient to raiſe the vegetative matter into the lower plants, as Wheat, Barley, Peas, and the like, and we have plenty of Strawberries, Raſpberries, Gooſberries, Currants, and the fruits of ſuch vegetables as are low, and near the earth, and a moderate ſtore of Cherries, Plums, &c. and ſome others, that grow at ſomething of a greater height, yet our Apples, Pears, Peaches, Nectarines, and Grapes, and the production of warmer countries, have been fewer, and thoſe not ſo thoroughly ripened, and brought to perfection as they are in more benign ſeaſons.

Nor is it that heat only which promotes Vegetation, but any other indifferently, according to its power and degree, as we find from our ſtoves, hot-beds, &c.

And by the rightly adapting of theſe artificial heats, the Engliſh gardeners have of late years ſo much improved their art, as in a great meaſure to ſupply the want of natural heat, and to vie with the people, who inhabit countries ſeveral degrees ſouth of England, in the early products of eſculent plants, and the accelerating and ripening the fruits of the warmeſt climates.

And as the knowledge of Vegetation is improved, and the practitioners of the art are better acquainted with the theory, it may be hoped the art may be farther extended and improved; therefore it is highly neceſſary, that the theory of Vegetation ſhould be ſtudied by every perſon who propoſes to make any proficiency in gardening and agriculture.

VELLA. Lin. Gen. Plant. 714. Spaniſh Creſs.

The Characters are,

*The empalement of the flower is cylindrical, and compoſed of four linear obtuſe leaves, which drop off. The flower has four petals in form of a croſs, whoſe tails are the length of the empalement, and ſix ſtamina of the ſame length, two of which are a little ſhorter, terminated by ſingle ſummits, and an oval germen, ſupporting a conical ſtyle, crowned by a ſingle ſtigma. The germen afterward turns to a globular capſule with two cells, divided by an intermediate partition twice as large as the pod, and is oval and erect, ſtretching beyond the capſule, each cell containing one ſeed.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifteenth claſs, which includes thoſe plants whoſe flowers have two long and two ſhorter ſtamina, and the ſeeds are included in ſhort pods.

The Species are,

1. Vella (*Annua*) foliis pinnatifidis, ſiliculis pendulis. Lin. Sp. Plant. 641. *Vella with wing-pointed leaves, and hanging pods.* Naſturtium ſylveſtre Valentinum. Cluſ. Hiſt. 2. p. 130. *Wild Creſs of Valentia.*
2. Vella (*Pſeudo Cytiſus*) foliis integris obovatis ciliatis ſiliculis erectis. Lin. Sp. Plant. 641. *Vella with entire, oval, ciliated leaves, and erect pods.* Pſeudo cytiſus flore leucoii luteo. C. B. P. 230. *Baſtard Cytiſus with a flower like the yellow Wall-flower.*

The firſt ſort grows naturally in Valentia; it is an annual plant, which ſeldom riſes more than one foot high. The ſtalk divides toward the top into ſeveral branches, each ending in a looſe ſpike of flowers, which are followed by round ſwelling pods, having a leafy border or creſt on the top, which is hollowed like a helmet. The pod opens with two valves, and has two cells, which contain roundiſh ſeeds like thoſe of Muſtard. The leaves are jagged, and end in many points.

This plant is preſerved in gardens for the ſake of variety, but as it is not very beautiful, nor of any uſe, it is ſeldom cultivated unleſs in botanic gardens. If the ſeeds of this plant are permitted to ſcatter, the plants will come up and thrive very well; or if they are ſown in autumn, they will ſucceed much better than thoſe which are ſown in the ſpring; for when the ſeaſon proves dry, thoſe ſeeds which are ſown in the ſpring, frequently lie in the ground till the following autumn before the plants appear; whereas thoſe which are ſown in autumn, always come up ſoon after, or early in the ſpring, ſo will more certainly produce ripe ſeeds. Theſe plants ſhould not be tranſplanted, therefore the ſeeds ſhould be ſown where the plants are to remain, and if they are kept clean from weeds, and thinned where they are too cloſe, they will require no other culture.

The ſecond ſort grows naturally in Spain. The leaves of this are entire, hairy, and ſit cloſe to the ſtalk; they are oval, and of a grayiſh colour. The ſtalks become ligneous; they riſe about two feet high, and are terminated by roundiſh bunches of pale yellow

yellow flowers, which ſtretch out in length; the flowers have four croſs-ſhaped petals, and are ſucceeded by pods like the former. This plant will continue two or three years; it is propagated by ſeeds in the ſame manner as the former.

VERATRUM. Tourn. Inſt. R. H. 272. tab. 145. Lin. Gen. Plant. 1013. [ſo called as though vere atrum, i. e. truly black, becauſe this plant has a black root, or becauſe it purges a black humour.] White Hellebore; in French, *Ellebore blanc.*

The Characters are,

*It has hermaphrodite and male flowers intermixed in the ſame ſpike. The flowers have no empalement; they have ſix oblong ſpear-ſhaped petals which are permanent, and ſix awl-ſhaped ſtamina ſitting on the point of the germen, ſpreading aſunder, terminated by quadrangular ſummits; they have three oblong erect germen ſitting upon the ſtyle, which are ſcarce viſible, crowned by a ſingle ſpreading ſtigma. The germen afterward become three oblong, erect, compreſſed capſules with one cell, opening on the inſide, including many oblong, compreſſed, membranaceous ſeeds. The male flowers have the ſame characters of the hermaphrodite, but are barren.*

This genus of plants is ranged in the firſt ſection of Linnæus's twenty-third claſs, which contains thoſe plants which have flowers of different ſexes in the ſame plant.

The Species are,

1. Veratrum (*Album*) racemo ſupradecompoſito, corollis erectis. Lin. Sp. Plant. 1044. *White Hellebore with a ſpike decompounded above, and erect petals.* Veratrum flore ſubviridi. Tourn. Inſt. R. H. 273. *White Hellebore with a greeniſh flower.*
2. Veratrum (*Nigrum*) racemo compoſito, corollis patentiſſimis. Lin. Sp. Plant. 1044. *White Hellebore with a compound ſpike, and very ſpreading petals.* Veratrum flore atrorubente. Tourn. Inſt. R. H. 273. *White Hellebore with a dark red flower.*
3. Veratrum (*Luteum*) racemo ſimpliciſſimo, foliis ſeſſilibus. Lin. Sp. Plant. 1044. *White Hellebore with a ſingle ſpike, and leaves ſitting cloſe to the ſtalk.* Veratrum caule ſimpliciſſimo, foliis ſeſſilibus. Flor. Virg. 195. *White Hellebore with a ſingle ſpike.*
4. Veratrum (*Americanum*) racemo ſimpliciſſimo, corollis patentibus, ſtaminibus longioribus. *White Hellebore with a ſingle ſpike of flowers, ſpreading petals, and longer ſtamina.*

The firſt ſort grows naturally on the mountains in Auſtria, Helvetia, and Greece. The root is perennial, and compoſed of many thick fibres gathered into a head; the leaves are oblong, oval, ten inches long, and five broad in the middle, and rounded at the points, having many longitudinal plaits like thoſe of Gentian; the ſtalks riſe three or four feet high, and branch out on every ſide almoſt their whole length; under each of theſe branches is placed a narrow plaited leaf, which diminiſhes in its ſize as it is nearer the top of the ſtalk. The branches and principal ſtalk are terminated by ſpikes of flowers ſet very cloſe together, which are compoſed of ſix petals which ſtand erect; theſe are green, and in their center is ſituated three obtuſe germen. From the point of theſe ariſe ſix ſtamina which ſpread aſunder, and are terminated by four-cornered ſummits. Theſe appear in June and July, and are each ſucceeded by oblong compreſſed capſules with one cell, filled with membranaceous ſeeds.

The ſecond ſort grows naturally in Hungary and Siberia; it has a perennial root like the former. The leaves are longer and thinner than thoſe of the firſt ſort; they are plaited in the like manner, but are of a yellowiſh green colour, and appear ſooner in the ſpring; the ſtalks riſe higher than thoſe of the former. It has fewer leaves upon it, and does not branch out into ſo many ſpikes: the flowers of this are of a dark red colour, and the petals ſpread open flat, in which it differs from the former. This flowers almoſt a month before the other.

The third ſort grows naturally in Virginia, and other parts of North America, where it is ſometimes called Rattle Snake Root. The root of this is tuberous and large; the leaves are oblong, and ſhaped like thoſe of Plantain, having ſeveral longitudinal furrows or plaits; they are four or five inches long, and two broad in the middle, ſpreading themſelves on the ground. Between theſe come out a ſingle ſtalk which riſes near a foot high, having a few very ſmall leaves or ſheaths placed alternately; and at the top the flowers are produced in a ſingle, thick, cloſe ſpike; they are ſmall, and of a yellowiſh white colour; theſe appear in June, but are rarely ſucceeded by ſeeds here.

The fourth ſort was ſent me from Philadelphia by Mr. John Bartram, who found it growing naturally in that country. The root of this is compoſed of thick fleſhy fibres; the leaves are oblong, oval, of a light green colour, having ſix longitudinal veins or plaits; they are four or five inches long, and between two and three broad, ſpreading on the ground; theſe are rounded at their points, and continue all the year. In the center of the leaves ſprings up a ſingle erect ſtalk a foot high, having a few veſtiges or ſmall leaves ſtanding alternately cloſe to the ſtalk, which end in acute points. The ſtalk is terminated by a thick obtuſe ſpike of dark red flowers, whoſe petals ſpread open flat. In the center of the petals is ſituated three obtuſe germen joined together, from whoſe point ariſes ſix ſtamina which ſpread aſunder, and are longer than the petals; theſe are terminated by four-cornered ſummits of a purple blue colour. This plant flowers the latter end of June, and in warm ſeaſons the ſeeds will ripen here.

The firſt of theſe plants is that which is ordered for medicinal uſe, and is by much the ſtronger and more acrid plant than the ſecond; for when both ſorts are placed near each other, the ſnails will entirely devour the leaves of the ſecond ſort, when at the ſame time they ſcarcely touch thoſe of the firſt.

Theſe plants are very pretty ornaments, when planted in the middle of open borders of the pleaſure-garden; for if they are placed near hedges or walls, where ſnails generally harbour, they will greatly deface the leaves, eſpecially of the ſecond ſort, by eating them full of holes before they are unfolded; and as a great part of the beauty of theſe plants is in their broad-folded leaves, ſo when they are thus defaced, the plants make but an indifferent appearance.

Both theſe ſorts may be propagated by parting their roots in autumn, when their leaves decay, but they ſhould not be parted too ſmall, for that will prevent their flowering the following ſummer; theſe heads ſhould be planted in a light, freſh, rich ſoil, in which they will thrive exceedingly, and produce ſtrong ſpikes of flowers. The roots ſhould not be removed oftener than once in three or four years, by which time, (if they like the ſoil,) they will be very ſtrong, and produce many heads to be taken off; but if they are frequently tranſplanted, it will prevent their increaſing, and cauſe them to flower very weak.

Theſe plants may alſo be propagated by ſeeds, which ſhould be ſown as ſoon as ripe, either in a bed or box filled with freſh light earth, and the ground kept conſtantly from weeds. In the ſpring the plants will appear, at which time, if the ſeaſon proves dry, you ſhould now and then refreſh them with water, which will greatly promote their growth; and you muſt carefully clear them from weeds, which, if permitted to grow, will ſoon overſpread and deſtroy theſe plants while young. The autumn following, when their leaves decay, you ſhould prepare a bed of freſh light earth, and carefully take up the young plants (obſerving not to break their roots) and plant them therein about ſix inches ſquare, where they may remain until they are ſtrong enough to flower, when they ſhould be tranſplanted into the borders of the pleaſure-garden; but, as theſe plants ſeldom flower in leſs than four years from ſeeds, this method of propagating them is not much practiſed in England.

The two American ſorts are at preſent rare in the Engliſh gardens, but, as they hardy enough to thrive in the open air, in a few years they may become plenty; theſe may be propagated by offsets or ſeeds, in the ſame manner as the former.

VERBASCUM. Tourn. Inſt. R. H. 146. tab. 61. Lin. Gen. Plant. 217. Mullein; in French, *Bouillon blanc.*

The CHARACTERS are,

*The flower has a ſmall permanent empalement of one leaf, cut into five parts; it hath one wheel-ſhaped petal, with a very ſhort cylindrical tube, the brim ſpreading, and cut into five oval obtuſe ſegments, and five awl-ſhaped ſtamina which are ſhorter than the petal, terminated by roundiſh, compreſſed, erect ſummits; with a roundiſh germen ſupporting a ſlender ſtyle inclining to the ſtamina, crowned by a thick obtuſe ſtigma. The germen afterward becomes a roundiſh capſule with two cells opening at the top, having a half oval receptacle fixed to the partition, and filled with angular ſeeds.*

This genus of plants is ranged in the firſt ſection of Linnæus's fifth claſs, which includes thoſe plants whoſe flowers have five ſtamina and one ſtyle.

The SPECIES are,

1. VERBASCUM (*Thapſus*) foliis decurrentibus utrinque tomentoſis. Vir. Cliff. 13. *Mullein with running leaves which are woolly on both ſides.* Verbaſcum mas latifolium luteum. C. B. P. 239. *Great white Mullein, Hig Taper, or Cow's Lungwort.*

2. VERBASCUM (*Lychnitis*) foliis cuneiformi-oblongis. Hort. Upſal. 45. *Mullein with oblong wedge-ſhaped leaves.* Verbaſcum pulverulentum, flore luteo parvo. J. B. *Hoary Mullein with ſmall yellow flowers.*

3. VERBASCUM (*Album*) foliis cordato-oblongis, ſubtus incanis, ſpicis racemoſis. *Mullein with oblong heart-ſhaped leaves which are hoary on their under ſide, and branching ſpikes of flowers.* Verbaſcum fæmina, flore albo. C. B. P. 239. *Female Mullein with a white flower.*

4. VERBASCUM (*Luteum*) foliis radicalibus ovatis petiolatis, caulinis oblongis ſeſſilibus ſubtus tomentoſis ſerratis. *Mullein, with oval lower leaves growing on foot-ſtalks, but thoſe on the ſtalks oblong, ſawed, woolly on their under ſide, and ſitting cloſe.* Verbaſcum blattariæ foliis nigrum, amplioribus foliis luteis, apicibus purpuraſcentibus. Flor. Leyd. Boerh. Ind. alt. 1. 228. *Mullein with black Mullein leaves, large yellow petals to the flower, and purple ſummits.*

5. VERBASCUM (*Grandiflorum*) foliis ovato-acutis utrinque tomentoſis, floribus in ſpicâ denſiſſimâ ſeſſilibus. Haller. Helvet. 507. *Mullein with oval acute-pointed leaves which are woolly on both ſides, and flowers diſpoſed in thick ſpikes ſitting cloſe to the ſtalk.* Verbaſcum fæmina, flore luteo magno. C. B. P. 239. *Female Mullein with a large yellow flower.*

6. VERBASCUM (*Nigrum*) foliis ſerratis ſupernè rugoſis, infernè ſubhirſutis, petiolis ramoſis, ſtaminum barbâ purpuraſcente. Haller. Helvet. 511. *Mullein with ſawed leaves whoſe upper ſides are rough, thoſe on the under ſide hairy, branching foot-ſtalks, and purpliſh beards to the ſtamina.* Verbaſcum nigrum, flore ex luteo-purpuraſcente. C. B. P. 240. *Black Mullein with a yellowiſh purple flower, commonly called Sage-leaved black Mullein.*

7. VERBASCUM (*Sinuatum*) foliis radicalibus pinnatifido-repandis tomentoſis, caulinis amplexicaulibus nudiuſculis, rameis primis oppoſitis. Lin. Sp. 254. *Mullein whoſe under leaves are wing-pointed, woolly, and turn back, the upper naked, embracing the ſtalks, and the firſt branches are oppoſite.* Verbaſcum nigrum, folio papaveris corniculati. C. B. P. 240. *Black Mullein with a horned Poppy leaf.*

8. VERBASCUM (*Glabrum*) foliis amplexicaulibus oblongis glabris pedunculis ſolitariis. Hort. Upſal. 46. *Mullein with oblong ſmooth leaves embracing the ſtalks, and ſingle foot-ſtalks to the flowers.* Blattaria alba. C. B. P. 241. *White Moth Mullein.*

9. VERBASCUM (*Blattaria*) foliis radicalibus pinnato-ſinuatis, caulinis dentatis acuminatis ſemi-amplexicaulibus, pedunculis ſolitaris. *Mullein with the lower leaves jagged like wings, thoſe on the ſtalks acute-pointed, indented, half embracing the ſtalks, and ſingle foot-ſtalks to the flowers.* Blattaria lutea, folio longo, laciniato. C. B. P. 240. *Yellow Moth Mullein with a long jagged leaf.*

10. VERBASCUM (*Ferrugineum*) foliis ovato-oblongis obſoletè crenatis, utrinque virentibus petiolatis, caule ramoſo. *Mullein with oblong oval leaves having obſolete crenatures, and both ſides green, with a branching ſtalk.* Blattaria flore ferrugineo. H. R. Par. *Moth Mullein with an iron-coloured flower.*

11. VERBASCUM (*Annuum*) foliis radicalibus oblongis integerrimis, utrinque viridibus, caulinis acutis ſeſſilibus, pedunculis aggregatis. *Mullein with oblong, entire, lower leaves which are green on both ſides, thoſe on the ſtalks acute-pointed, ſitting cloſe, and cluſtered foot-ſtalks.* Blattaria annua, flore majore luteo, capſulâ item majore. Mor. Hiſt. 2. p. 498. *Annual Moth Mullein with a larger yellow flower, and a larger capſule.*

12. VERBASCUM (*Phœnicium*) foliis ovatis crenatis radicalibus, caule ſubnudo racemoſo. Lin. Sp. Plant. 178. *Mullein with naked, oval, crenated, lower leaves, and an almoſt naked branching ſtalk.* Blattaria purpurea. C. B. P. 241. *Purple Moth Mullein.*

13. VERBASCUM (*Myconi*) foliis lanatis radicalibus, ſcapo nudo. Lin. Sp. Plant. 179. *Mullein with woolly lower leaves, and a naked ſtalk.* Verbaſcum humile Alpinum villoſum borraginis flore & folio. Tourn. Inſt. 147. *Low, hairy, Alpine Mullein, with the leaf and flower of Borage, commonly called Borage-leaved Auricula.*

The firſt is the common Mullein or Hig Taper which is uſed in medicine; this grows naturally by the ſide of highways and on banks in moſt parts of England; it is a biennial plant, which periſhes ſoon after it has perfected ſeeds. The lower leaves, which ſpread on the ground, are nine or ten inches long, and ſix broad; they are very woolly, and of a yellowiſh white colour, having ſcarce any foot-ſtalks. The ſtalk riſes four or five feet high, and the lower part is garniſhed with leaves ſhaped like thoſe below, but ſmaller, whoſe baſe half embrace the ſtalk, and have wings running along the ſtalk from one to the other. The upper part of the ſtalk is cloſely garniſhed with yellow flowers, ſitting very cloſe, formed into a long thick ſpike; theſe are compoſed of five obtuſe roundiſh petals, having five ſtamina in the center; they have an agreeable odour. It flowers in July, and the ſeeds ripen in autumn.

The ſecond ſort grows naturally in ſome parts of England; I have obſerved it in plenty in ſome parts of Nottinghamſhire: this is a biennial plant. The lower leaves are oblong, indented on their edges, and end in acute points. The ſtalk riſes three or four feet high, ſending out from every joint ſhort ſpikes of ſmall yellow flowers, which are paler than thoſe of the firſt, and have a pleaſanter odour. At the baſe of each ſpike is ſituated a ſmall, oblong, acute-pointed leaf; theſe are covered with a white powder which waſhes off. When the flowers decay, they are ſucceeded by oval capſules, filled with ſmall ſeeds, which ripen in autumn.

The third ſort grows naturally in Italy and Spain. The lower leaves of this are more than a foot long, and five or ſix inches broad, rough on their upper ſide, and a little hoary; their under ſide is pale and very hoary. The ſtalk riſes ſix or ſeven feet high, ſending out ſome ſide branches which are erect; the flowers are diſpoſed in long ſpikes which are branched; they are white, and ſometimes yellow, having the moſt agreeable ſcent of all the ſpecies. This flowers about the ſame time with the former, and the ſeeds ripen in autumn.

The fourth ſort has oval leaves a foot long, and ſix inches broad in the middle, ſtanding upon thick foot-ſtalks; they are of a ſoft texture, of a pale green on their upper ſide, but hoary on their under, having many prominent nerves. The ſtalk riſes three or four feet

feet high; the lower part is garnished with smaller leaves of the same shape with those below; the upper part is garnished with pale yellow flowers disposed in a loose spike, having small leaves intermixed with the flowers the whole length. This flowers and ripens its seeds about the same time with the former.

The fifth sort has oval leaves which terminate in a point; they are of a yellowish green colour, and woolly on both sides. The stalks rise about four feet high; they are of a purplish colour, covered with a hoary down. The flowers sit very close to the stalk, forming a very thick spike, having no leaves between them; they are much larger than those of the first sort, and are of a deeper yellow colour. It flowers and ripens its seeds about the same time as the former.

The sixth sort grows naturally in several parts of England. The lower leaves of this are spear-shaped, and rounded at the foot-stalk, where they are indented like a heart; they are of a pale green on their upper side, and hoary on their under, indented on their edges; those upon the stalk are oblong, acute-pointed, and sawed. The stalks rise three or four feet high, the upper part ending in a long spike of yellow flowers, which are formed in short spikes or clusters on the side of the principal stalk; these have purplish stamina which are bearded; they have an agreeable odour at a small distance, but, if smelt too near, become less agreeable.

The seventh sort grows naturally in Italy and Greece, and also upon the rocks at Gibraltar. The lower leaves are oblong, sinuated on their borders, a little waved and hoary. The stalk rises four or five feet high, sending out many slender branches; the lower part of the stalk is garnished with heart-shaped leaves, whose base embrace the stalk; the upper part of the stalk and branches have no leaves, but the flowers are disposed along their sides in small clusters at distances; they are small, yellow, and have little odour.

The eighth sort grows naturally in the south of France and Italy. The leaves of this are oblong, smooth, and of a dark green colour; the stalk rises three or four feet high, and sends out two or three side branches; they are garnished with oblong, smooth, green leaves, whose base embrace the stalk. The flowers come out singly from the side of the stalk, upon foot-stalks an inch long; they have one petal, cut into five obtuse segments almost to the bottom; they are white within, and have a little blush of red on the outside: the seed-vessels of this sort are round, and filled with small seeds. This flowers about the same time as the former sorts.

The ninth sort grows naturally in some parts of England; this differs from the former, in the lower leaves being much longer; they are also deeply sinuated on their edges, in a regular manner, in imitation of the rangement of the lobes of winged leaves; they are of a brighter green colour than those of the former. The stalks rise much taller; the flowers are of a bright yellow colour, and the stamina, which are hairy, are of a purple colour.

The tenth sort is commonly cultivated in gardens here, and is commonly known by the title of Iron-coloured Moth Mullein; this has a perennial root, in which it differs from all the former sorts, though there are some who suppose it to be only a variety of the last mentioned, but it differs greatly from that in other respects. The bottom leaves are oblong, oval, a little crenated on their edges, but are almost entire; they are of a dark green on their upper side, of a pale green on their under side, standing upon pretty long foot-stalks. The stalk rises three or four feet high, branching out on each side, and has a few sharp-pointed small leaves on the lower part, sitting close to the stalk. The flowers are disposed in a long loose spike on the upper part of the stalk; they come out upon short slender foot-stalks, three or four from the lower joints; above those there are two at each joint, and at the top they are single; these are of one petal, cut almost to the bottom into five obtuse segments, and are of a rusty iron colour, but are larger than those of the common sort. This plant flowers in July and August, but does not produce seeds here.

The eleventh sort grows naturally in Sicily, from whence the seeds were sent me; this is a biennial plant, which perishes soon after the seeds are ripe. The lower leaves of this are ten inches long, and two inches and a half broad, rounded at their points; they are entire, and of a deep green on both sides. The stalk is strong, and rises five or six feet high; it is garnished with small, acute-pointed, green leaves, whose base sits close to it. The flowers form a very long loose spike at the top; they stand upon slender foot-stalks, which come out in clusters from the side of the stalk; they are large, of a deep yellow colour, and are succeeded by large round capsules which are brown, opening in two parts, and filled with small dark-coloured seeds. It flowers in July and August.

The twelfth sort grows naturally in Spain and Portugal. The root of this is perennial; the leaves are oval, and of a light green colour; they are entire, and a little hairy; the stalk rises three feet high, and is almost naked of leaves, but the flowers are ranged along it almost the whole length, standing upon short foot-stalks, which for the most part come out single. The flowers are of a dark blue inclining to purple; these appear in June and July, but are not succeeded by seeds here.

The thirteenth sort grows naturally upon the Alps and Pyrenean Mountains; this is a very humble plant. The roots of this are composed of slender fibres; the leaves are thick, fleshy, and hairy; they are oval, crenated on their edges, and have compressed hairy foot-stalks; these are spread flat on the ground. Between them arise slender naked foot-stalks about four inches long, which divide into three or four small ones at the top, each sustaining one large blue flower, composed of five oval petals which spread open flat, and five thick erect stamina which stand erect. This flowers in May, and, after the flowers are past, the germen turns to an oblong-pointed capsule which opens in two parts, and is filled with small seeds.

The root of this is perennial, and the plant is usually propagated by offsets, which come out from the side of the old plant; these should be taken off in autumn, and planted in small pots filled with light sandy earth; they must always have a shady situation, for they will not thrive when they are exposed to the sun.

The first nine and the eleventh sorts are biennial plants; these may be all cultivated by sowing their seeds in August, on a bed of light earth, in an open situation, where the plants will sometimes come up the succeeding month, and will endure the winter's cold very well, provided they have a dry soil. In February the plants should be transplanted where they are to remain, allowing them a greater distance; for, as they grow pretty tall and large, they must not be planted nearer than two feet asunder. In June following they will flower, and their seeds will be ripe in August or September: as the seeds of these plants frequently lie in the ground a whole year, so the ground should not be disturbed; but notwithstanding some of these plants grow wild in England, yet two or three of each kind may be admitted into large gardens, for the variety of their hoary leaves, together with the extreme sweetness of their flowers, which have a scent somewhat like Violet; and, as they require little care, they may be allowed a place in the borders of large gardens, where, during their continuance in flower, they will add to the variety; and, if their seeds are permitted to scatter, will come up without care, but the seventh sort seldom produces good seeds in England.

The tenth and twelfth sorts have perennial roots, and as they do not produce good seeds here, they are propagated by offsets; these should be taken off in autumn, time enough to get good root before winter, otherwise they will not flower the following summer. These plants thrive best in a sandy loam, and should be

be planted on an east border, where they may have only the morning sun, for they do not thrive well when they are too much exposed to the sun.

VERBENA. Tourn. Inst. R. H. 200. tab. 94. Lin. Gen. Plant. 30. Vervain.

The Characters are,

*The flower has an angular, tubulous, permanent empalement of one leaf, indented in five parts at the brim; it has one petal, with a cylindrical tube the length of the empalement, which is recurved, and cut into five points at the brim, which spread open, and are nearly equal; it has four very short bristly stamina within the tube, two of which are shorter than the other, with as many incurved summits as stamina, or half that number, with a four-cornered germen, supporting a slender style the length of the tube, crowned with an obtuse stigma. The germen afterward become two or four oblong seeds closely shut up in the empalement.*

This genus of plants is ranged in the first section of Linnæus's second class, which includes those plants whose flowers have two stamina and one style.

The Species are,

1. Verbena (*Officinalis*) tetrandra, spicis filiformibus paniculatis, foliis multifido laciniatis, caule solitario. Lin. Sp. 20. *Vervain with four stamina, slender spikes of flowers disposed in panicles, leaves having many-pointed jags, and a single stalk.* Verbena communis, cæruleo flore. C. B. P. 269. *Common Vervain with a blue flower.*

2. Verbena (*Hastata*) tetrandra, spicis longis acuminatis, foliis hastatis. Hort. Upsal. 8. *Vervain with four stamina to the flowers, long acute-pointed spikes, and spear-shaped leaves.* Verbena Americana, spicâ multiplici, foliis urticæ angustissimis, floribus cæruleis. Prod. Par. Bat. *American Vervain with many spikes of blue flowers, and narrow Nettle leaves.*

3. Verbena (*Supina*) tetrandra, spicis filiformibus solitariis, foliis bipinnatifidis. Lin. Sp. 21. *Vervain with four stamina to the flowers, single slender spikes of flowers, and double wing-pointed leaves.* Verbena tenuifolia. C. B. P. 269. *Narrow-leaved Vervain.*

4. Verbena (*Urticæfolia*) tetrandra, spicis filiformibus paniculatis, foliis indivisis serratis petiolatis. Hort. Upsal. 9. *Vervain with four stamina to the flowers, slender spikes growing in panicles, and undivided sawed leaves having foot-stalks.* Verbena urticæ folio Canadensis. H. R. Par. *Canada Vervain with a Nettle leaf.*

5. Verbena (*Spuria*) tetrandra, spicis filiformibus, foliis multifido laciniatis, caulibus numerosis. Hort. Upsal. 8. *Vervain with four stamina to the flowers, slender spikes, leaves with many jagged points, and numerous stalks.* Verbena urticæ folio Canadensis foliis incisis flore majore. H. R. Par. *Nettle-leaved Vervain of Canada, with cut leaves and a larger flower.*

6. Verbena (*Bonariensis*) tetrandra, spicis fasciculatis, foliis lanceolatis amplexicaulibus. Hort. Upsal. 8. *Vervain with four stamina to the flower, spikes disposed in bunches, and spear-shaped leaves embracing the stalks.* Verbena Bonariensis altissima, lavendulæ Canariensi, spicâ multiplici. Hort. Elth. 406. *Tallest Vervain of Buenos Ayres, with many spikes like the Canary Lavender.*

7. Verbena (*Carolina*) tetrandra, spicis filiformibus paniculatis, foliis infernè cordato-oblongis caulinis lanceolatis serratis petiolatis. *Vervain with four stamina to the flowers, slender spikes growing in panicles, the under leaves oblong and heart-shaped, and those on the stalks spear-shaped and sawed, having foot-stalks.*

8. Verbena (*Nodiflora*) tetrandra, spicis capitato-conicis, foliis serratis, caule repente. Flor. Zeyl. 399. *Vervain with four stamina to the flowers, spikes growing in conical heads, sawed leaves, and a creeping stalk.* Sherardia repens, folio subrotundo crasso, nodiflora. Vail. Serm. *Creeping Sherardia with roundish thick leaves, and flowers collected in knots.*

9. Verbena (*Indica*) diandra, spicis longissimis carnosis subnudis. Lin. Sp. Plant. 19. *Vervain with two stamina to the flowers, and very long fleshy spikes which are almost naked.* Verbena folio subrotundo serrato, flore cæruleo. Sloan. Hist. 171. *Vervain with roundish sawed leaves, and a blue flower.*

10. Verbena (*Americana*) diandra, spicis carnosis subnudis, foliis ovatis obtusis, obsoletè crenatis petiolatis. *Vervain with two stamina to the flowers, fleshy spikes which are almost naked, and oval obtuse leaves growing upon foot-stalks, having worn out indentures.* Sherardia Americana, verbenæ folio subrotundo crasso, floribus cæruleis spicâ longissimâ & crassissimâ. Millar. *American Sherardia with a thick, roundish, Vervain leaf, blue flowers, and a very long thick spike.*

11. Verbena (*Orubica*) diandra, spicis longissimis foliosis. Lin. Sp. Plant. 18. *Vervain with two stamina to the flowers, and the longest leafy spikes.* Sherardia urticæ folio subtus incano, floribus violaceis. Ehr. tab. 5. f. 1. *Sherardia with a Nettle leaf, which is hoary on the under side, and a Violet-coloured flower.*

12. Verbena (*Jamaicensis*) diandra, spicis brevioribus, foliis ovatis serratis, subtus incanis. *Vervain with two stamina to the flowers, shorter spikes, and oval sawed leaves which are hoary on their under side.*

13. Verbena (*Stœchadifolia*) diandra, spicis ovatis, foliis lanceolatis serrato-plicatis, caule fruticoso. Prod. Leyd. 327. *Vervain with two stamina to the flowers, oval spikes, spear-shaped leaves which are sawed and plaited, and a shrubby stalk.* Sherardia nodiflora, stœchadis serrati-folii folio. Vaill. Serm. 48. *Sherardia with a knotted flower, and a leaf like that of the sawed-leaved Stœchas.*

14. Verbena (*Fruticosa*) diandra, spicis rotundis, foliis ovatis serratis, caule fruticoso ramoso. *Vervain with two stamina to the flowers, round spikes, oval sawed leaves, and a shrubby branching stalk.* Sherardia nodiflora, fruticosa, foliis subrotundis serratis. Houst. MSS. *Shrubby Sherardia, with a knotted flower and roundish sawed leaves.*

15. Verbena (*Angustifolia*) diandra, spicis carnosis subnudis, foliis lineari-lanceolatis obsoletè serratis. *Vervain with two stamina to the flowers, naked fleshy spikes, and narrow spear-shaped leaves, with worn-out sawed edges.* Sherardia spicata, folio angusto serrato, flore cæruleo. Houst. MSS. *Sherardia with spiked blue flowers, and a narrow sawed leaf.*

16. Verbena (*Mexicana*) diandra, spicis laxis, calycibus fructus reflexo-pendulis subglobosis hispidis. Lin. Sp. Plant. 19. *Vervain with two stamina to the flowers, loose spikes, the empalement of the fruit almost globular, prickly, and reflexed downward.* Verbena Mexicana, trachelii folio, fructu aparines. Hort. Elth. 407. *Mexican Vervain with a Throatwort leaf, and fruit like Clivers.*

17. Verbena (*Curassavica*) diandra, spicis laxis, calycibus aristatis, foliis ovatis argutè serratis. Lin. Sp. Plant. 19. *Vervain with two stamina to the flowers, loose spikes, bearded empalements, and oval leaves which are sharply sawed.* Kempfera frutescens, chamædryos folio, floribus spicatis cæruleis. Houst. MSS. *Shrubby Kempfera with a Germander leaf, and blue spiked flowers.*

18. Verbena (*Rugosa*) diandra, spicis ovatis, foliis subrotundis serratis & rugosis, caule fruticoso ramoso. *Vervain with two stamina to the flowers, oval spikes, roundish, sawed, rough leaves, and a shrubby branching stalk.* Sherardia arborescens nodiflora foliis serratis & rugosis flore purpureo. Houst. MSS. *Tree-like Sherardia with a purple flower, and rough sawed leaves.*

The first sort here mentioned, is very common on the side of roads and foot-paths near habitations; for although there is scarce any part of England, in which this plant is not found in plenty, yet it is never found growing above a quarter of a mile from a house; which occasioned its being called Simpler's Joy, because wherever this plant is found growing, it is a sure token of a house being near; this is a certain fact, but not easy to be accounted for. It is rarely cultivated in gardens, but is the sort directed by the College of Physicians for medicinal use, and is brought to the markets by those who gather it in the fields.

There is another species which approaches near to this, but is taller, the leaves are broader, and the flowers larger. It came from Portugal, and is by Tour-

Tournefort titled Verbena Lusitanica, latifolia procerior. Inst. R. H. 200. Taller broad-leaved Portugal Vervain. But I am in some doubt of its being specifically different from the common sort, though the plants in the garden grow much taller than that, and the flowers are larger, yet as there is so near an affinity, I cannot be sure they are different.

The second sort grows naturally in most parts of North America; this sends up many four-cornered furrowed stalks from the root, which rise five or six feet high, garnished with oblong leaves about three inches long, and one broad near the base, ending in acute points; they are deeply sawed on their edges, and stand upon slender foot-stalks by pairs; and from the same joints come out short branches, set with smaller leaves of the same form. The stalks are terminated by spikes of blue flowers in clusters, which appear in August, and if the autumn proves favourable, the seeds will ripen the middle of October.

The third sort grows naturally in Spain and Portugal; this is a biennial plant, which perishes soon after the seeds are ripe. The stalks rise near two feet high, and branch out greatly. The leaves are double wing-pointed, and sit close to the stalks. The flowers are disposed in long loose spikes singly at the end of the branches; they are of a light blue colour, and larger than those of the common sort. It flowers in July and August, and the seeds ripen in autumn.

The fourth sort grows naturally in most parts of North America; this is a biennial plant. The stalks are four-cornered, and rise about three feet high. The leaves are three inches long, and one broad in the middle, ending in acute points; they are sawed on their edges, and are placed by pairs. The stalks are terminated by panicles of flowers, which are long, slender, and sustain small white flowers, which are ranged loosely; these appear in July, and are succeeded by seeds which ripen in autumn.

The fifth sort grows naturally in North America; this is a biennial plant, whose bottom leaves are six inches long, deeply jagged on their sides, and sawed on their edges; they are rough, and of a deep green colour. The stalks rise two feet high, and are garnished at the joints with two smaller leaves of the same shape, placed opposite. The upper part of the stalk branches out into numerous foot-stalks, which sustain panicles of spiked blue flowers; these appear in July and August, and if the season proves favourable, the seeds will ripen in autumn.

The sixth sort grows naturally at Buenos Ayres; this has four-cornered stalks which rise to the height of five or six feet, sending out branches by pairs from the side; they are garnished with spear-shaped leaves which are three inches long, and about three quarters of an inch broad, whose base embrace the stalks; they are of a pale green colour, and are sawed on their edges. The stalks are terminated by spikes of blue flowers, which are clustered together. The longest spikes are about two inches, the other are about half so long; these appear late in summer, so are not often succeeded by good seeds in England.

The seventh sort grows naturally in Philadelphia. The seeds of this were sent me by Dr. Bensel; this is a perennial plant. The lower leaves are heart-shaped and rough; they are five inches long, and three and a half broad near their base, ending in acute points; they are of a dark green colour, and sawed on their edges. The stalks rise six feet high; they are four-cornered, and branch toward the top, and are terminated by slender spikes of white flowers, formed into panicles; these appear late in autumn, so that unless the season proves favourable, the seeds do not ripen here.

The eighth sort grows naturally in Virginia, and also in Jamaica; from the latter the late Dr. Hostoun sent me the seeds. The stalks of this trail upon the ground, and emit roots from their joints, whereby they spread, and propagate greatly; and from these arise other branches about eight or nine inches high, which are garnished with oval spear-shaped leaves, placed opposite; these are about an inch long, and half an inch broad, sawed on their edges, and sit close to the stalks. The flowers are collected in conical heads, standing upon long naked foot-stalks which spring from the wings of the branches; they are of a yellowish white colour, and come late in autumn, so are rarely succeeded by good seeds here.

The ninth sort grows naturally in most of the islands in the West-Indies; this is an annual plant. The stalk rises a foot and a half high, and is garnished with oblong oval leaves placed by pairs; they are of a light green colour, and are sawed on their edges. The stalk is terminated by a long fleshy spike of blue flowers which appear in July, and are succeeded by two oblong seeds which ripen late in autumn. The spikes of flowers are from a foot to a foot and a half in length.

The seeds of the tenth sort were sent me from Panama, where it grows naturally in moist places; this is an annual plant, whose stalks rise about a foot high, and are garnished with oval, blunt-pointed, fleshy leaves, standing upon long foot-stalks; and at the same joints come out other stalks, sustaining three or four small leaves of the same shape; they are notched slightly on their edges, and are of a light green colour. The stalks are terminated by thick fleshy spikes of blue flowers, which appear late in autumn, so that unless the season proves warm, the seeds do not ripen in England.

The seeds of the eleventh sort were sent me from Panama, by the late Mr. Robert Millar; this rises with a shrubby stalk near three feet high, which divides into three or four branches; these are garnished with oblong oval leaves placed by pairs, which are deeply sawed on their edges; they are of a deep green on their upper side, but are hoary on their under; their foot-stalks are short, and have leafy borders running from the base of the leaves. The flowers grow on thick spikes, which terminate the branches, and are about a foot long. The flowers are large, and of a fine blue colour, so make a fine appearance, and have small acute-pointed leaves intermixed with them on the spikes. This plant flowers in August, and when the season proves warm, the seeds ripen in autumn.

The seeds of the twelfth sort were sent me from Paris, and were said to come from Senegal in Africa; this is a perennial plant, with a branching stalk which rises near two feet high, and is garnished with oval sawed leaves placed by pairs, which are two inches and a half long, and almost two inches broad, of a deep green on their upper side, but hoary on their under, and have pretty long foot-stalks. The flowers are disposed in fleshy spikes at the end of the branches; these spikes are shorter, and not so thick as those of the former sorts. The flowers are small and white, so make no great appearance; they appear in June and July, and the seeds ripen in autumn, but the plants may be preserved two or three years in a warm stove.

The thirteenth sort grows naturally in Jamaica, and several other places in the West-Indies. The seeds of this were sent me from La Vera Cruz by the late Dr. Houstoun; this rises with a shrubby branching stalk five or six feet high. The branches are adorned with spear-shaped leaves, which are two inches long, and half an inch broad; these are sawed on their edges, the teeth of the jags coming from the point of a fold or plait in the leaf; these stand by pairs upon short foot-stalks. The flowers stand upon long naked foot-stalks, which rise from the wings of the stalk; they are blue, and are collected in oval heads; these appear late in autumn, and unless the season proves warm, the seeds do rarely ripen in England, but the plants may be kept two or three years in a warm stove.

The fourteenth sort was found growing naturally at Campeachy by the late Dr. Houstoun, who sent the seeds to England; this has a shrubby branching stalk, which rises three or four feet high. The branches are garnished with oval sawed leaves set on by pairs; they

are of a light green colour, about an inch and a half long, and near an inch broad. The flowers are of a pale blue colour, collected into oval heads which ſtand upon long naked foot-ſtalks, ſpringing from the wings of the branches; theſe flower late in autumn, and are not ſucceeded by ſeeds in England.

The fifteenth ſort grows naturally at La Vera Cruz, from whence the late Dr. Houſtoun ſent the ſeeds; this is an annual plant, with a branching ſtalk which riſes a foot and a half high, garniſhed with pale green leaves three inches and a half long, and half an inch broad, ending in acute points, and are ſlightly ſawed on their edges. The branches are terminated by fleſhy ſpikes of blue flowers which are naked; theſe appear in Auguſt, and in warm ſeaſons are ſucceeded by ſeeds which ripen in autumn.

The ſixteenth ſort grows naturally in Mexico; this hath a ſhrubby ſtalk which riſes five or ſix feet high, and divides into ſeveral branches, which are garniſhed with oblong ſawed leaves which end in acute points; they are two inches long, and one broad near their baſe, ſitting cloſe to the branches; they are of a light green colour on both ſides. The branches are terminated by ſlender looſe ſpikes of pale flowers which are very ſmall, whoſe empalements afterward become ſwelled, and almoſt globular; they are reflexed downward, and are ſet with ſtinging hairs. It flowers late in the ſummer, and in good years the ſeeds ripen in England.

The ſeeds of the ſeventeenth ſort were ſent me from La Vera Cruz, by the late Dr. Houſtoun; this has a ſlender ligneous ſtalk which branches out on each ſide, and riſes near three feet high; the branches are adorned with ſmall oval leaves, which are ſharply indented on their edges; they are of a light green colour, and ſtand upon ſhort foot-ſtalks. The flowers ſtand ſparſedly upon ſlender footſtalks ariſing from the wings of the branches; theſe are naked, ſix or ſeven inches in length, and toward the top the flowers are ranged at a diſtance from each other in a looſe ſpike; they are ſmall, and of a bright blue colour, ſitting very cloſe; theſe are ſucceeded by two ſeeds incloſed in the empalement, which is terminated by ſhort awns or beards. This plant has flowered in the Chelſea Garden, but did not produce ſeeds.

The eighteenth ſort was diſcovered by the late Dr. Houſtoun growing naturally at Campeachy, from whence he ſent the ſeeds to England; this has a ſtrong woody ſtalk, which riſes ten or twelve feet high, covered with a light brown bark, and ſends out many ligneous branches on every ſide, which are garniſhed with roundiſh, ſawed, rough leaves, of a light green colour, ſtanding upon ſhort foot-ſtalks. The flowers are ſmall, of a pale blue colour, and are collected into oval heads, ſtanding upon naked foot-ſtalks which ſpring from the wings of the branches; theſe ſeldom appear in this country, and are not ſucceeded by ſeeds here; but the plants are eaſily propagated by cuttings during the ſummer months, and may be preſerved many years in a moderate ſtove.

The firſt ſort, as was before obſerved, being a common weed in England, is not kept in gardens.

The third ſort may be eaſily propagated by ſeeds which ſhould be ſown in autumn, and requires no other culture than to keep it clean from weeds, and thin the plants where they are too cloſe.

The fourth and fifth ſorts may alſo be propagated in the ſame manner, and are equally hardy. If the ſeeds of theſe three ſorts are permitted to ſcatter, the plants will come up the following ſpring.

The ſecond and ſeventh ſorts have perennial roots, and are hardy enough to thrive in the open air; theſe may be propagated by ſeeds, which ſhould be ſown in autumn, for when they are ſown in the ſpring, they rarely grow the ſame year; theſe plants require no other culture but to keep them clean from weeds, and allow them proper room to ſpread; they may alſo be propagated by parting their roots in autumn. They love a ſoft loamy ſoil not too dry.

The other ſorts being natives of warmer climates, require more care. The ſeeds of theſe ſhould be ſown upon a hot-bed early in the ſpring, and when the plants are fit to remove, they ſhould be each tranſplanted into a ſeparate ſmall pot, and plunged into a freſh hot-bed to bring them forward; they muſt be ſhaded in the day time with mats until they have taken new root, then they muſt be treated in the ſame method as other tender plants from the ſame countries.

Thoſe ſorts which are annual muſt be removed into the ſtove, or a good glaſs-caſe, when they are become too tall to remain longer under the frames; for if they are placed abroad in the open air, they will not ripen their ſeeds here, unleſs the ſummer is very warm; and where there is a conveniency of having a bark-bed in a glaſs-caſe, for plunging ſome of theſe tender annual plants, they will thrive much better, and come to greater perfection than thoſe which are placed on ſhelves.

The ſorts which are perennial may be kept in ſuch a glaſs-caſe till autumn, allowing them a large ſhare of air in warm weather, to prevent their drawing up weak as they increaſe in their ſize; but this muſt be done with caution, for if they are put into pots too large, they will not thrive.

The ſeventeenth ſort is by much the tendereſt plant of all the ſpecies, and is very difficult to preſerve when young. The ſeeds of this ſhould be ſown in a ſmall pot, and plunged into a good hot-bed of tanners bark. When the plants appear, they ſhould be ſhaded from the ſun in the heat of the day. They muſt be frequently refreſhed with water, but it muſt be given to them ſparingly, for much wet will kill them. When they are tranſplanted into ſmall pots, they muſt be carefully ſhaded till they have taken new root, and they muſt be conſtantly kept in the bark-bed.

VERBESINA. Lin. Gen. Plant. 873. Eupatoriophalacron. Vaill. Act. Par. 1720.

The Characters are,

*The common empalement of the flower is concave, and compoſed of a double order of leaves, which are channelled. The flower is made up of hermaphrodite florets in the diſk, and female half florets in the border or rays. The hermaphrodite florets are funnel-ſhaped, and cut into five parts at the brim; they have five very ſhort hair-like ſtamina, terminated by cylindrical ſummits, and a germen the ſame figure as the ſeed, ſupporting a ſlender ſtyle, crowned by two reflexed ſtigmas. The germen afterward becomes a thick angular ſeed, crowned by a few three-pointed chaff. The female half florets are ſtretched out on one ſide in ſhape of a tongue, which form the rays; theſe have no ſtamina, but have a germen, ſtyle, and two ſtigmas like the hermaphrodite florets, and are ſucceeded by ſeeds like thoſe.*

This genus of plants is ranged in the ſecond ſection of Linnæus's nineteenth claſs, which includes thoſe plants whoſe flowers are compoſed of hermaphrodite and female florets which are all fruitful.

The Species are,

1. Verbesina (*Alata*) foliis alternis decurrentibus undulatis obtuſis. Hort. Cliff. 411. *Verbeſina with alternate running leaves, which are obtuſe and waved.* Bidens Indica hieracii folio caule alato. Tourn. Inſt. 462. *Indian Water Hemp Agrimony, with a Hawkweed leaf and a winged ſtalk.*
2. Verbesina (*Alba*) foliis lanceolatis ſerratis ſeſſilibus. Hort. Cliff. 500. *Verbeſina with ſpear-ſhaped ſawed leaves, which ſit cloſe to the ſtalks.* Eupatoriophalacron balſaminæ fœminæ folio, flore albo diſcoide. Vaill. Act. Par. 1719. *Eupatoriophalacron with a female Balſamine leaf, and a white diſcous-ſhaped flower.*
3. Verbesina (*Lavenia*) foliis ovatis trinerviis glabris petiolatis, feminibus tricornuis. Flor. Zeyl. 310. *Verbeſina with oval three-veined leaves, having foot-ſtalks and ſeeds with three horns.* Eupatoriophalacron ſcrophulariæ aquaticæ foliis oppoſitis. Burm. Zeyl. 94. *Eupatoriophalacron with leaves like thoſe of the Water Betony, and placed oppoſite.*

4. Ver-

4. Verbesina (*Prostrata*) foliis lanceolatis serratis alternis geminis sessilibus, floribus sessilibus. *Verbesina with spear-shaped sawed leaves, and two flowers sitting close to the branches.* An? Verbesina foliis oppositis lanceolatis serratis, floribus alternis geminis subsessilibus. Lin. Sp. Plant. 902. *Verbesina with opposite, spear-shaped, sawed leaves, and double flowers which are placed alternate, and sit close to the stalk.*

5. Verbesina (*Pseudo Acmella*) foliis lanceolatis subserratis, pedunculis flore longioribus. Flor. Zeyl. 308. *Verbesina with spear-shaped leaves a little sawed, and the foot-stalks longer.* Bidens Zeylanica, flore luteo, melissæ folio, Acmella dicta. Seb. Thes. 1. p. 19. *Bidens with a yellow flower and a Baum leaf, called Acmella.*

6. Verbesina (*Acmella*) foliis oblongo-ovatis trinerviis subdentatis petiolatis, pedunculis elongatis axillaribus, floribus conicis. Lin. Sp. Plant. 1271. *Verbesina with oblong oval leaves having three veins, and long foot-stalks from the wings of the stalks with conical flowers.*

7. Verbesina (*Nodiflora*) foliis ovatis serratis, calycibus oblongis sessilibus caulinis confertis lateralibus. Amœn. Acad. 4. p. 290. *Verbesina with oval sawed leaves, and oblong empalements in clusters sitting close to the wings of the stalks.* Bidens nodiflora, foliis tetrahit. Hort. Elth. 53. *Bidens with a naked flower, and a Nettle leaf.*

8. Verbesina (*Mutica*) foliis trifido-laciniatis serratis, caule repente. Lin. Sp. Plant. 1273. *Verbesina with trifid, cut, sawed leaves, and a creeping stalk.* Chrysanthemum palustre minimum repens, apii folio. Sloan. Cat. Jam. 126. *Least Marsh Corn Marygold, with a Parsley leaf.*

9. Verbesina (*Fruticosa*) foliis ovatis serratis petiolatis, caule fruticoso. Lin. Sp. Plant. 1271. *Shrubby Verbesina, with oval sawed leaves upon foot-stalks.* Bidens frutescens, ilicis folio, flore luteo. Plum. Sp. 10. *Shrubby Bidens with an evergreen Oak leaf, and a yellow flower.*

The first sort grows naturally in most of the islands of the West-Indies; it is an annual plant, with an upright winged stalk about two feet high, from the sides of which spring out toward the top a few short branches. The leaves are oval, blunt, and waved on their edges; they are three inches and a half long, and two broad, and are placed alternate; from the base of each leaf is extended a leafy border running along two sides of the stalk, so that it is winged the whole length. The flowers stand upon long naked foot-stalks, arising from the top and the wings of the stalk; they are of a deep Orange colour, and are composed of hermaphrodite and female florets, included in one common spherical empalement, and are both fruitful; these are succeeded by broad, compressed, bordered seeds with two teeth, which ripen in the empalement. This plant begins to flower in July, and continues till the frost kills them.

The second sort grows naturally in the West-Indies; this has an upright branching stalk a foot and a half high. The leaves are spear-shaped, about two inches long, and three quarters broad, a little sawed on their edges, sitting close to the stalk opposite. The flowers arise from the wings of the stalk, upon slender foot-stalks two inches long, three, four, or more springing from the same joint; each of these sustain one white radiated flower composed of many florets, which are succeeded by oblong black seeds. It flowers at the same time with the former.

The third sort grows naturally in both Indies; this rises with an upright branching stalk two or three feet high. The leaves are oval, acute-pointed, and smooth, having three longitudinal veins; they stand opposite upon pretty long foot-stalks. The flowers spring from the wings and ends of the branches; they are yellow, and stand upon short foot-stalks. It flowers about the same time with the former.

The fourth sort grows naturally in India; this has trailing stalks which spread on the ground; they extend two feet or more in length, and put out roots from their joints, sending out many side branches. The leaves are two inches long, and half an inch broad, smooth and entire. The flowers are very small and white; these sit close to the stalks at the base of the leaves. They appear at the same time with the former.

The fifth sort grows naturally in Ceylon; this is an annual plant whose stalks rise two feet high, which are garnished with spear-shaped sawed leaves placed opposite. The flowers come out from the wings of the stalk upon very long foot-stalks; they are yellow, having short rays of female florets, of the same colour.

The sixth sort is the true Acmella, which is a plant greatly esteemed in India: this grows naturally in Ceylon. The stalks rise two feet high, which are garnished with oblong, oval, indented leaves placed opposite at each joint; the foot-stalks of the flowers are very long, each supporting one yellow flower, whose rays are very short. This begins to flower in July, and continues producing them till the frost puts a stop to them, when the plant decays.

The seventh sort grows naturally in most of the islands of the West-Indies; it rises with stalks more than three feet high, which are garnished with oval sawed leaves placed opposite; they are near two inches long, and one broad; the flowers spring from the sides of the stalks in clusters, sitting very close thereto, having scarce any foot-stalks. The flowers are long, composed of several hermaphrodite florets which are yellow; these appear in July, and are succeeded by others till the frost stops them. The seeds ripen soon after the the flowers decay, and the first frost kills the plants.

The eighth sort grows naturally in moist places in Jamaica, where the stalks trail upon the ground and emit roots at their joints, which are garnished with trifid leaves, cut and sawed on their sides, standing opposite. The flowers are small; these arise from the joints of the stalks in July, and the seeds ripen in August.

The ninth sort grows naturally in the islands of the West-Indies; this rises with a shrubby stalk seven or eight feet high, garnished with oval leaves which are deeply sawed, and cut on their borders, somewhat like those of the Ilex or Evergreen Oak. The flowers are produced from the side of the stalks; they are yellow, and appear in July.

These plants are propagated by seeds, which should be sown upon a moderate hot-bed in the spring, and when the plants are fit to remove, they should be transplanted on a fresh hot-bed to bring them forward; they must be shaded till they have taken new root, then they must be treated in the same way as other tender annual plants, being careful not to draw them up too weak. In June they may be taken up with balls of earth, and planted in a warm border, where they must be shaded and watered till they have taken new root, after which they will require little care. These will produce good seeds in autumn, but several of them may be kept through the winter in a stove.

VERONICA. Tourn. Inst. R. H. 143. tab. 60. Lin. Gen. Plant. 25. Male Speedwell, or Fluellin; in French, *Veronique*.

The Characters are,

*The flower has a permanent empalement cut into five acute segments; it has one petal, with a tube the length of the empalement; the brim is cut into four oval plain segments which spread open, and two stamina which are rising, terminated by oblong summits, with a compressed germen supporting a slender declining style, crowned by a single stigma. The germen afterward becomes a compressed heart-shaped capsule with two cells, filled with roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's second class, which contains those plants whose flowers have two stamina and one style.

The Species are,

1. Veronica (*Officinalis*) spicis lateralibus pedunculatis, foliis oppositis, caule procumbente. Lin. Mat. Med. 11. *Speedwell with spikes of flowers growing upon foot-stalks, and springing from the sides of the stalks, leaves placed opposite, and a trailing stalk.* Veronica mas supina

pinâ & vulgatiſſimâ. C. B. P. 246. *Common male Speedwell, or Fluellin.*

2. Veronica (*Spuria*) ſpicis terminalibus, foliis ternis æqualiter ſerratis. Hort. Upſal. 7. *Speedwell with ſpikes of flowers terminating the ſtalks, which have three equal ſawed leaves ſurrounding them.* Veronica ſpicata anguſtifolia. C. B. P. 246. *Narrow-leaved ſpiked Speedwell.*

3. Veronica (*Longifolia*) ſpicis terminalibus, foliis oppoſitis lanceolatis ſerratis acuminatis. Hort. Upſal. 7. *Speedwell with ſpikes of flowers terminating the ſtalks, and acute-pointed ſawed leaves which are lance-ſhaped, and placed oppoſite.* Veronica major latifolia erecta. Mor. Hiſt. 2. p. 317. *Greater, broad-leaved, upright Speedwell.*

4. Veronica (*Spicata*) ſpicâ terminali, foliis oppoſitis crenatis obtuſis, caule adſcendente ſimpliciſſimo. Lin. Sp. Plant. 10. *Speedwell with a ſpike of flowers terminating the ſtalk, obtuſe crenated leaves placed oppoſite, and a ſingle aſcending ſtalk.* Veronica ſpicata minor. C. B. P. 247. *Smaller ſpiked Speedwell.*

5. Veronica (*Pannonica*) ſpicis lateralibus paniculatis, foliis ovatis inæqualiter crenatis ſeſſilibus. *Speedwell with ſpikes of flowers proceeding in panicles from the wings of the ſtalk, and oval leaves which are unequally notched, and ſit cloſe.* Veronica multicaulis pannonica. Tourn. Inſt. 145. *Hungarian Speedwell, having many ſtalks or ſpikes of flowers.*

6. Veronica (*Hybrida*) ſpicis terminalibus, foliis oppoſitis obtuſè ſerratis ſcabris, caule erecto. Lin. Sp. Plant. 11. *Speedwell with ſpikes of flowers terminating the ſtalk, rough, obtuſe, ſawed leaves, which are placed oppoſite, and have an erect ſtalk.* Veronica ſpicata Cambro-Britannica, bugulæ ſubhirſuto folio. Raii Syn. Edit. 3. 278. *Welſh ſpiked Speedwell, with a hairy Bugle leaf.*

7. Veronica (*Virginica*) ſpicis terminalibus, foliis quaternis quinisve. Lin. Sp. Plant. 9. *Speedwell with ſpikes of flowers terminating the ſtalks, and four or five leaves at each joint.* Veronica Virginiana altiſſima, ſpicâ multiplici, floribus candidis. Flor Bat. *Tall Virginian Speedwell, with many ſpikes and white flowers.*

8. Veronica (*Maritima*) ſpicis terminalibus, foliis ternis inæqualiter ſerratis. Lin. Sp. Plant. 10. *Speedwell with ſpikes of flowers terminating the ſtalks, and leaves growing by threes, which are unequally ſawed.* Veronica foliis ſæpius ternis. Vir. Cliff. 2. *Speedwell with leaves generally growing by threes.*

9. Veronica (*Auſtriaca*) ſpicis lateralibus pedunculatis laxis, foliis oppoſitis linearibus argutè dentatis. *Speedwell with looſe ſpikes of flowers growing upon foot-ſtalks, ſpringing from the wings of the ſtalk, and very narrow leaves placed oppoſite, which are ſharply indented.* Veronica Auſtriaca, foliis tenuiſſimè laciniatis. Inſt. R. H. *Auſtrian Speedwell with leaves finely jagged.*

10. Veronica (*Orientalis*) ſpicis terminalibus, foliis pinnato-inciſis acuminatis. *Speedwell with ſpikes of flowers terminating the ſtalks, and acute-pointed leaves cut in form of wings.* Veronica Orientalis minima, foliis laciniatis. Tourn. Cor. 7. *The leaſt Eaſtern Speedwell having jagged leaves.*

11. Veronica (*Maxima*) racemis lateralibus, foliis cordatis rugoſis dentatis, caule ſtricto. Lin. Sp. Plant. 13. *Speedwell with ſpikes of flowers proceeding from the wings of the ſtalk, rough, heart-ſhaped, indented leaves, and a ſtrait ſtalk.* Veronica maxima. Lugd. *The greateſt Speedwell, or falſe Germander.*

12. Veronica (*Incana*) ſpicis terminalibus, foliis oppoſitis crenatis obtuſis, caule erecto tomentoſo. Hort. Upſal. 7. *Speedwell with ſpikes of flowers terminating the ſtalks, crenated obtuſe leaves placed oppoſite, and an erect woolly ſtalk.* Veronica ſpicata lanuginoſa & incana, floribus cæruleis. Amman. Ruth. 30. *Hoary, woolly, ſpiked Speedwell with blue flowers.*

13. Veronica (*Fruticuloſa*) ſpicis longiſſimis lateralibus pedunculatis, foliis oppoſitis inæqualiter ſerratis. *Speedwell with the longeſt ſpikes of flowers ſpringing from the wings of the ſtalk, growing upon foot-ſtalks, and leaves placed oppoſite which are unequally ſawed.* Veronica major fruteſcens altera. Mor. Hiſt. 2. p. 319. *Another greater ſhrubby Speedwell.*

14. Veronica (*Becabunga*) racemis lateralibus, foliis ovatis planis, caule repente. Flor. Suec. 11. *Speedwell with lateral ſpikes of flowers, oval plain leaves, and a creeping ſtalk.* Veronica aquatica major, folio ſubrotundo. Mor. Hiſt. 3. 323. *Greater Water Speedwell with a roundiſh leaf, commonly called Brooklime.*

There are a much greater number of ſpecies of this genus than are here enumerated, ſeveral of which grow naturally in England, but as they are rarely admitted into gardens, it is beſide the intention of this work to mention them.

The firſt ſort grows wild in woods, and other ſhady places in divers parts of England, and is a plant of little beauty; but, as it is the ſort which is uſed in medicine, under the title of Paul's Betony, I thought it neceſſary to inſert it here. This is a low plant, whoſe ſtalk trails upon the ground, and put out roots from their joints, whereby it ſpreads and propagates. The leaves are oval, about an inch long, ſawed on their edges, and are placed oppoſite. The flowers are diſpoſed in ſpikes which ariſe from the wings of the ſtalk; they are ſmall, of a pale blue colour, and have one petal, which is cut at the brim into four ſegments; they appear in June, and when they decay, the germen turns to a capſule, not unlike that of Shepherd's Pouch in ſhape, filled with ſmall ſeeds which ripen in Auguſt.

This is generally brought to market by ſuch perſons as make it their buſineſs to gather herbs in the fields, ſo that it is not often cultivated in gardens; but thoſe who have a mind to propagate it, may do it with much eaſe, for as the branches trail upon the ground, they puſh out roots from their joints, which branches being cut off and planted, will take root, and grow in almoſt any ſoil or ſituation. The whole herb is uſed in medicine, and is one of the wound herbs which are brought from Switzerland. A tea of this herb is much recommended for the gout and rheumatiſm.

The ſecond ſort grows naturally in Italy and Spain; this has a perennial root, which ſends out many offſets, by which it is eaſily propagated. The lower leaves of this are two inches long, and half an inch broad, of a pale green colour, and hairy; the ſtalks riſe a foot high, they are garniſhed with very narrow ſpear-ſhaped leaves placed oppoſite, which have a few ſlight ſerratures on their edges. The ſtalks are terminated by long ſpikes of blue flowers, which appear in June and July; theſe are ſucceeded by ſeeds which ripen in autumn. It has been doubted, if this was ſpecifically different from the common upright Speedwell; but I have many times propagated this by ſeeds, and have always found the plants ſo raiſed, maintain their difference. There is a variety of this with a fleſh-coloured flower.

The third ſort grows naturally in Auſtria and Hungary. The lower leaves of this are two inches long, and one broad in the middle, drawing to a point at each end; they are ſawed on their edges, and are of a lucid green colour. The ſtalks riſe a foot and a half high, and are garniſhed with leaves of the ſame ſhape with the lower, but are ſmaller, and placed oppoſite; they are terminated by long ſpikes of blue flowers which appear in June, and are ſucceeded by flat ſeed-veſſels filled with compreſſed ſeeds, which ripen in autumn.

The fourth ſort grows naturally in the northern parts of Europe, and in England grows in ſeveral cloſes near Newmarket Heath. The lower leaves of this are about an inch and a half long, and three quarters of an inch broad; they are of a pale green colour, and notched on their edges. The ſtalks riſe a foot and a half high, they do not branch; the leaves on the lower part ſtand oppoſite, but on the upper part they are alternate; the ſtalks are terminated by ſhort ſpikes of blue flowers, which appear about the ſame time as the former.

The fifth ſort grows naturally in Hungary. The lower leaves of this are an inch and a half long, and three quarters of an inch broad, and are unequally notched; the ſtalks riſe a foot high, and are garniſhed

 with

with the same sort of leaves placed opposite; these are of a lucid green, and sit close to the stalks. The flowers are disposed in panicled spikes, which stand upon long naked foot-stalks that spring from the upper wings of the stalk; they are larger than those of the other species, and are of a beautiful green colour, so make a fine appearance, but are of short duration. This sort flowers the beginning of June.

The sixth sort grows naturally on the Alps and Pyrenean mountains, and also upon the mountains in Wales. The lower leaves of this are rough and hairy; they are three inches long, and one and a half broad, blunt-pointed, and obtusely sawed on their edges, standing upon pretty long foot-stalks; the stalks grow erect, about six inches high, and are garnished with oval notched leaves placed opposite. From the side of the stalk spring out two or three branches, which toward the bottom are garnished with small leaves placed opposite, but terminate in long spikes of pale blue flowers. The spikes on these side branches are four or five inches long, but those of the principal stalk are eight or nine. This sort flowers in June and July.

The seventh sort grows naturally in Virginia. The stalks of this sort are erect, and rise four or five feet high, garnished at each joint by four or five spear-shaped leaves which stand round the stalk in whorls; these are sawed on their edges, and end in acute points. The stalks are terminated by long slender spikes of white flowers, which appear late in July; these are succeeded by compressed capsules filled with seeds, which ripen in autumn.

The eighth sort grows near the sea in several parts of Europe. The stalks of this do not rise so high as those of the former; the leaves are placed by fours and threes round the stalk, and have longer foot-stalks; they are broader at the base, and run out into long acute points; they are unequally sawed on their edges, and are of a bright green colour. The flowers are disposed in spikes which terminate the stalks, are of a bright blue colour, and appear in July. The seeds ripen in autumn.

The ninth sort grows naturally in Austria. The lower leaves of this are narrow, and cut into fine segments; the stalks are slender, and incline downward; they are garnished with linear leaves, which are acutely notched on their edges; the flowers are disposed in long loose spikes, which spring from the wings of the stalk; they are of a bright blue colour, and stand upon foot-stalks. This flowers the end of May and the beginning of June.

The tenth sort grows naturally in the Levant; this has slender branching stalks which decline, and are garnished with narrow leaves which are acutely cut on their edges; these are regular on both edges like the lobes of winged leaves; they are of a pale green colour, and smooth. The flowers are disposed in loose spikes on the top and side of the stalks; they are of a pale blue colour, and appear the end of April.

The eleventh sort grows naturally upon Mount Baldus in Italy. The stalks of this are slender, stiff, and upright, and are garnished by rough heart-shaped leaves, which are indented and placed opposite; those on the lower part of the stalk are small, in the middle they are much larger, and diminish again in their size toward the top. The flowers come out in long bunches from the wings of the stalk toward the top; they are of a bright blue colour, and appear in May.

The twelfth sort grows naturally in the Ukrain Tartary. The stalks of this are very white and woolly; they rise about a foot high, and are garnished with oblong hoary leaves placed opposite; they are two inches and a half long, three quarters of an inch broad, notched on their edges, and sit close to the stalks, which are terminated by spikes of deep blue flowers, and from the wings of the stalk toward the top are produced slender spikes of the like flowers, which stand erect. This flowers in June and July.

The thirteenth sort grows naturally in Austria and Bohemia. The stalks are slender, about a foot and a half long, inclining downward; the leaves are nearly oval, but are acute-pointed, about an inch long; they are unequally sawed, and sit close to the stalks. The flowers are disposed in long loose spikes, upon foot-stalks arising from the wings of the stalk; those on the lower part of the stalk are eight or nine inches long. The flowers are of a bright blue colour, and appear in May; the leaves of this sort are frequently variegated with yellow.

The fourteenth sort is the common Brooklime, which grows naturally in brooks and streams of water in most parts of England, so is not cultivated in gardens; but as it is much used in medicine, I have given it a place here. The stalks of this are thick, succulent, and smooth, emitting roots from their joints, whereby they spread and propagate. The leaves are oval, flat, succulent, and smooth; they stand opposite; the flowers come out in long bunches from the wings of the stalk; they are of a fine blue colour, and stand upon short foot-stalks; these appear great part of summer, and are succeeded by heart-shaped seed-vessels filled with roundish seeds. The whole herb is used, and is esteemed an excellent antiscorbutic.

These plants may all be propagated by parting their roots, which may be done every other year, for if they are not often parted or divided, they will many of them grow too large for the borders of small gardens; but yet they should not be parted into very small heads, because when they have not a number of stems so as to form a good bunch, they are soon past their beauty, and have but a mean appearance. The best time to part these roots is at Michaelmas, that they may be well rooted again before winter, for when they are removed in the spring, they seldom flower strong the same year, especially if the season should prove dry. Those sorts which grow pretty tall, are very proper to plant on the sides of open wilderness quarters, but those with trailing branches are fit for the sides of banks or irregular shady slopes, where they will make an agreeable variety; they are all of them hardy, so are in no danger of suffering by cold, and require no other care but to keep them clean from weeds, and to be transplanted every second or third year.

They may be propagated by seeds, which should be sown in autumn, for when they are sown in the spring, the plants rarely come up the same year; but as most of the sorts propagate very fast by their offsets, their seeds are seldom sown.

If these plants are placed in a shady border, they will thrive much better than when they are more exposed to the sun, and their flowers will continue much longer in beauty.

VIBURNUM. Lin. Gen. Plant. 332. Under this genus is included the Viburnum, Tinus, and Opulus of Tournefort. The Wayfaring, or pliant Meally-tree.

The Characters are,

*The flower has a small permanent empalement, which is cut into five parts; it has one bell-shaped petal, cut at the brim into five obtuse segments which are reflexed; it has five awl-shaped stamina the length of the petal, terminated by roundish summits; and a roundish germen situated under the flower, having no style, but the place is occupied by a roundish gland, and crowned by three obtuse stigmas. The germen afterward turns to a roundish fruit with one cell, inclosing one hard roundish seed.*

This genus of plants is ranged in the third section of Linnæus's fifth class, which includes those plants whose flowers have five male, and three female parts.

The Species are,

1. Viburnum (*Lantana*) foliis cordatis serratis venosis subtus tomentosis. Vir. Cliff. 25. *Wayfaring-tree with heart-shaped, sawed, veined leaves, which are woolly on their under side.* Viburnum. Math. 217. *The Wayfaring, or pliant Meally-tree of Italy.*

2. Viburnum (*Prunifolium*) foliis subrotundis crenato-serratis glabris. Flor. Virg. 33. *Wayfaring-tree with roundish, crenated, sawed leaves which are smooth.* Mespilus

pilus prunifolia Virginiana, non spinosa, fructu nigricante. Pluk. Alm. 249. *Virginia Haw with a Plum leaf having no thorns, and a black fruit, commonly called Black Haw, and by some Sheeps Turds.*

3. Viburnum (*Dentatum*) foliis ovato-orbiculatis profunde serratis venosis. *Wayfaring-tree, with oval round leaves which are deeply sawed, plaited and veined.* An? Viburnum foliis ovatis dentato-serratis plicatis. Lin. Sp. Plant. 268. *Wayfaring-tree with oval, indented, sawed leaves.*

4. Viburnum (*Tinus*) foliis ovatis integerrimis, ramificationibus subtus villoso-glandulosis. Lin. Sp. Plant. 267. *Wayfaring-tree with oval entire leaves, whose branches are hairy, and glandulous on the under side.* Tinus prior. Clus. Hist. 49. *Hairy-leaved Laurustinus.*

5. Viburnum (*Lucidum*) foliis ovato-lanceolatis integerrimis utrinque virentibus lucidis. *Wayfaring-tree with oval spear-shaped leaves which are entire, shining, and green on both sides.* Tinus 2d. Clusii Hist. 50. *The shining-leaved Laurustinus.*

6. Viburnum (*Nudum*) foliis ovato-lanceolatis integerrimis, subtus venosis. *Wayfaring-tree with oval, spear-shaped leaves which are entire, and veined on their under side.* Tinus foliis ovatis in petiolis terminatis integerrimis. Flor. Virg. 33. *Tinus with oval leaves which are entire, and terminate in a foot-stalk.*

7. Viburnum (*Opulus*) foliis lobatis petiolis glandulosis. Lin. Sp. Plant. 268. *Wayfaring-tree with leaves divided into lobes, and glandulous foot-stalks.* Opulus. Ruell. 281. *Guelder-rose with flat flowers.*

8. Viburnum (*Americanum*) foliis cordato-ovatis acuminatis serratis, petiolis longissimis lævibus. *Wayfaring-tree with heart-shaped, oval, acute-pointed, sawed leaves, growing upon very smooth foot-stalks.* Opulus Americana, foliis acuminatis & serratis, floribus albis. Dale. *American Guelder-rose with acute-pointed sawed leaves, and white flowers.*

9. Viburnum (*Cassinoides*) foliis ovatis crenatis glabris oppositis, petiolis eglandulosis carinatis. *Wayfaring-tree with oval, crenated, smooth leaves placed opposite, whose foot-stalks have keel-shaped glands.* Viburnum Phillyreæ folio. Duham. Arb. 2. p. 350. *Viburnum with leaves like Phillyrea, commonly called Hysson-tea.*

The first sort grows naturally in England, in Italy, and other parts of Europe, and is the common Viburnum or Lantana of the old botanists. The leaves of this tree are heart-shaped, nine inches long, and four inches and a half broad; they are much veined, and irregularly sawed on their edges, and are very woolly on their under side. The stalks are woody, and rise near twenty feet high, sending out strong ligneous branches on every side, which are covered with a light coloured bark; these are terminated by umbels of white flowers whose summits are red. The flowers appear in June, and are succeeded by roundish compressed berries, which turn first to a bright red colour, and are black when ripe, inclosing one seed of the same shape.

There is a variety of this with variegated leaves, which is preserved in some of the gardens near London; but when the plants are removed into good ground, and are vigorous, their leaves become plain.

The second sort grows naturally in most parts of North America, where it is commonly called Black Haw; this rises with a woody stalk ten or twelve feet high, covered with a brown bark, and sends out branches from the side the whole length; these, when young, are covered with a purple smooth bark; they are garnished with oval smooth leaves two inches long, and an inch and a quarter broad, which are slightly sawed on their edges, and stand upon short slender foot-stalks, sometimes opposite, and at others without order. The flowers are disposed in small umbels, which come out from the side and at the end of the branches; they are white, and smaller than those of the common Viburnum; these appear in June, and are sometimes succeeded by berries which do not ripen here.

The third sort grows naturally in North America. The stalks of this are soft and pithy; they branch out greatly from the bottom upward. The bark is of a gray colour; the leaves are roundish, oval, three inches long, and nearly as broad; they are strongly veined, and sawed on their edges, of a light green colour, and placed opposite upon pretty long foot-stalks. The flowers are disposed in a corymbus at the end of the branches; they are white, and almost as large as those of the common sort; these appear the latter end of June, but are not succeeded by seeds in England.

The fourth sort is the Laurustinus with small leaves, which are hairy on their under side; this plant is so well known as to need no description, but as it is frequently confounded with the next, it may be necessary to point out its difference. The leaves of this are seldom more than two inches and a half long, and one and a quarter broad; they are rounded at their base, but end in acute points; they are veined and hairy on their under side, and are not of so lucid a green colour on their upper side. The umbels of flowers are smaller, and appear in autumn, continuing all the winter, and the plants are much hardier.

The fifth sort is commonly known in the nursery-gardens by the title of shining-leaved Laurustinus. The stalks of this rise higher, and the branches are much stronger than those of the former sort. The bark is smoother, and turns of a purplish colour; the leaves are larger, of a thicker consistence, and of a lucid green colour; the umbels are much larger, and so are the flowers; these seldom appear till the spring, and when the winters are sharp, the flowers are killed, so never open unless they are sheltered. The plants of this sort were formerly kept in tubs, and housed in winter; and, when they were so treated, made a fine appearance early in the spring; and in very mild seasons, the plants in the open air do the same.

There is a variety of this with variegated leaves, which makes as good a figure as any of the striped plants which are preserved in gardens.

The sixth sort is a native of North America, where it rises to the height of ten or twelve feet, sending out branches on every side their whole length; these have a smooth purplish bark; they are garnished with oval entire leaves, five inches long, and two inches and a half broad, of a thick consistence, and a lucid green; they stand opposite. The flowers are produced in umbels at the end of the branches; they are white, and not unlike the flowers of Laurustinus; these appear in July, and are succeeded by berries which seldom ripen in England.

There seems to be two sorts of this in the gardens, one of which comes from the more northern parts of America, and sheds its leaves in winter; the other, which grows in Carolina and Virginia, is an evergreen, but both are so much alike in summer, as scarce to be distinguished.

The seventh sort is the common Marsh Elder, which grows naturally in marshy grounds, and on the sides of rivers in many parts of England, so is not often kept in gardens; it is called by some of the nursery-gardeners Guelder-rose with flat flowers, to distinguish it from the other, whose flowers are globular. The Marsh Elder is the original species, and Guelder-rose is a variety which accidentally arose from it. The former has a border of male flowers which are large, and the middle of the umbel is composed of hermaphrodite flowers, which are succeeded by oval red berries; the latter has all male flowers of the same size and shape with those of the border of the first, so that they swell out into a round figure, which has occasioned some country people giving it the title of Snow-ball-tree. This sort is cultivated in gardens for the beauty of its flowers, which make a fine appearance during their continuance.

It will rise to the height of eighteen or twenty feet, if it is permitted to stand. The stem becomes large, woody, and hard; the branches come out opposite, and are apt to grow irregular; they have a gray bark. The leaves are placed opposite; they are divided into three or four lobes, somewhat like those of the Maple: they are about three inches long, and two and a half

half broad, jagged on their edges, and of a light green colour. The flowers come out at the end of the branches; those of the first in large umbels, and those of the second in a corymbus; they are very white, and appear the beginning of June; those of the first have oval berries succeeding the hermaphrodite flowers, which turn of a scarlet colour when ripe, but the other, having only male flowers, are barren.

The eighth sort grows naturally in Carolina, and some other parts of North America; this rises with a shrubby stalk eight or ten feet high, sending out many side branches, which are covered with a smooth purple bark, and garnished with heart-shaped oval leaves ending in acute points; they are deeply sawed on their edges, have many strong veins, and stand upon very long slender foot-stalks opposite. The flowers are collected into large umbels at the end of the branches; those ranged on the border are male and barren, but the middle is composed of hermaphrodite flowers, which are succeeded by oval berries. The flowers are white, and the berries are red when ripe.

The ninth sort grows naturally in South Carolina; this has a shrubby stalk which rises twelve or fourteen feet high, sending out branches from the root upward; these are garnished with oval leaves about one inch long, and more than half an inch broad, of a light green colour, placed opposite on short foot-stalks; the flowers spring from the wings of the leaves upon very short foot-stalks, supporting small umbels of white flowers, which appear in July, but are rarely succeeded by seeds in England.

The first sort may be propagated either from seeds, or by laying down the tender branches, but the former method being tedious, is seldom practised, because the seeds seldom grow the first year, unless they are sown in autumn; and as the branches easily put out roots, that is the more expeditious method.

The best time for laying these branches is in autumn, just as the leaves begin to fall; (the manner of laying them being the same as for other hardy trees, need not be here repeated.) By the succeeding autumn the layers will be rooted, when you may take them off from the old plants, and transplant them into a nursery for two or three years, in which they may be trained up to regular stems and heads, and may afterward be planted where they are to remain. This sort is very hardy.

The striped sort may be propagated by inarching or budding it upon the plain sort; this is preserved by such as delight in variegated plants, but there is no great beauty in it. The trees seldom grow near so large as those of the plain sort, as is the case of all other striped plants.

The third sort is generally propagated by layers here, because the seeds do not ripen in England. The young shoots of this take root very freely; the cuttings will also take root, if they are planted in autumn; the seeds, when they are brought to England, always remain in the ground a year like those of the other sorts, so that the propagating the plants by seeds is a tedious method.

The Laurustinuses are propagated by laying down their young branches, which put out roots very freely, so that when they are layed in autumn, they will be well rooted by that time twelve months, when they should be taken off from the old plants, and may either be planted where they are to remain, or into a nursery to grow two years to get strength. The best season to transplant these is at Michaelmas, when they may get new root before winter; for as these plants begin to flower early in winter, it is a plain indication of their growing at that season; for they will more surely succeed then, than at any other time of the year; though they may be removed in the spring with balls of earth to their roots, provided it is done before they begin to shoot; they may also be removed the latter end of July or the beginning of August, if rain happens at that time; for after they have done shooting, which is soon after Midsummer, they will be in no danger, provided they are not kept out of the ground any time.

These plants may also be propagated by seeds, which should be mixed with earth in autumn, soon after they are ripe; these should be exposed to the open air, and receive the rain in winter, and in the spring they may be sown upon a gentle hot-bed, which will bring up the plants; these should remain in the bed till autumn, and then may be transplanted, and treated in the same way as the layers. I have raised many of these plants from seeds, which I find hardier than those raised by layers.

Some people train up the Laurustinus with naked stems to have round heads; but if these are planted in the open air, they will be in more danger of suffering by severe frost, than those whose branches grow rude from the bottom; for if the frost kills the outer part of the shoots, the stems will be protected, so will soon put out new branches; but where the stems are naked, the frost frequently kills them to the root.

The seventh sort may be propagated in the same way as the Laurustinus, and requires the same treatment; it loves a soft loamy soil, and should have a sheltered situation.

The eighth sort is easily propagated by layers or cuttings. The common Guelder-rose sends out plenty of suckers from the roots, by which it is frequently propagated; but as the plants so raised are very subject to put out suckers, they are not so good as those which come from layers or cuttings. This sort loves a moist soil, in which it will make much greater progress, and produce flowers in greater plenty than on a dry soil.

The ninth sort is tender while young, so requires to be sheltered under a common frame in winter, till the plants have obtained good strength; when, if they are planted against a good aspected wall, they will resist the cold of our ordinary winters very well, and make good progress; but as they are liable to be killed by severe cold, so it will be proper to keep a couple of plants in pots, to be sheltered in winter. This may be propagated by laying down of the branches, which will take root in one year.

VICIA. Tourn. Inst. R. H. 396. tab. 221. Lin. Gen. Plant. 782. [so called of vincio, *Lat.* to bind, because it clings about any props or supporters.] Vetch; in French, *Vesse*.

The Characters are,

*The flower has an erect tubulous empalement of one leaf, cut into five equal parts at the brim; the petal is of the butterfly kind; the standard is oval, broad at the tail, indented at the point, and the borders are reflexed; the two wings are almost heart-shaped, and are shorter than the standard; the keel is shorter than the wings; the tail is oblong, and divided into two parts. It has ten stamina, nine joined, and one separated, terminated by erect summits with four furrows, and a linear, compressed, long germen, supporting a slender style crowned by an obtuse stigma, which is bearded on the under side. The germen afterward turns to a long pod, with one cell opening with two valves, and ending with an acute point, containing several roundish seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which contains those plants whose flowers have ten stamina joined in two bodies.

The Species are,

1. Vicia (*Cracca*) pedunculis multifloris, floribus imbricatis, foliolis lanceolatis pubescentibus, stipulis integris. Lin. Sp. 1035. *Vetch with many imbricated flowers on each foot-stalk, the lobes of the leaves spear-shaped, and entire stipula.* Vicia multiflora. C. B. P. 345. *Tufted Vetch.*
2. Vicia (*Sylvatica*) pedunculis multifloris, foliolis ovalibus, stipulis denticulatis. Lin. Sp. Plant. 734. *Vetch with foot-stalks supporting many flowers, oval lobes to the leaves, and indented stipula.* Vicia sylvatica, multiflora, maxima. Phy. Britt. *The largest many-flowered Wood Vetch.*

3. Vicia (*Cassubica*) pedunculis subsexfloris, foliolis denis ovatis acutis, stipulis integris. Lin. Sp. Plant. 735. *Vetch with foot-stalks having about six flowers, leaves with ten oval acute lobes, and entire stipulæ.* Vicia multiflora Cassubica frutescens, siliqua lentis. Breyn. Prod. 52. *Many-flowered shrubby Vetch of Cassubia, with a Lentil pod.*

4. Vicia (*Biennis*) pedunculis multifloris, petiolis sulcatis, sub-dodecaphyllis, foliolis lanceolatis glabris. Lin. Sp. Plant. 736. *Many-flowered Vetch with furrowed foot-stalks, and for the most part twelve spear-shaped smooth lobes to each leaf.*

5. Vicia (*Sativa*) leguminibus sessilibus subbinatis erectis foliis retusis, stipulis notatis. Lin. Sp. Plant. 736. *Vetch with erect pods growing by pairs, and sitting close to the stalks, blunt lobes to the leaves, and spotted stipulæ.* Vicia sativa vulgaris semine nigro. C. B. P. 344. *Common cultivated Vetch with a black seed, frequently called Tares.*

There are many more species of this genus than are here enumerated, some of which grow naturally in England, but as they are rarely cultivated, except in botanic gardens for the sake of variety, they are omitted, as they are plants of little use or beauty.

The first sort here mentioned grows naturally among bushes, and by the sides of woods in most parts of England. The root is perennial, but the stalks are annual; these are weak, requiring support; they rise five or six feet high, fastening their tendrils, which grow at the end of their leaves, to the bushes or hedges, whereby they climb; they are hairy, as are also the leaves, which are composed of about ten pair of spear-shaped lobes terminated by a tendril. The flowers stand upon long foot-stalks which spring from the wings of the stalk; the spikes are long; the flowers lie one over the other; they are of a fine blue colour, so make a pretty appearance when they come out from between the bushes or shrubs which support them; they appear in July, and are succeeded by compressed pods filled with round seeds, which ripen in autumn.

The second sort grows naturally in the woods near Bath and Bristol; this hath a perennial root. The stalks are weak, and climb by the help of their tendrils over the neighbouring bushes and hedges, rising to the height of seven or eight feet. The leaves are composed of seven or eight pair of oval smooth lobes, terminated by tendrils. The flowers are produced in long spikes from the wings of the stalks; they are of a pale blue colour, and are larger than those of the former sort; they appear in July, and are succeeded by short smooth pods, filled with round seeds which ripen in autumn.

The third sort grows naturally in Cassubia; this has a ligneous creeping root; the stalks trail upon the ground; they grow three feet long, and their lower part become more ligneous toward autumn, but they die to the root in winter. The leaves are composed of ten pair of oval acute-pointed lobes. The flowers come out from the wings of the stalk; they are disposed in short spikes, each containing, for the most part, six pale blue flowers which appear in July, and are succeeded by short smooth pods like those of Lentils, including three or four round seeds which ripen in autumn.

These sorts have been recommended to be sown in the fields for fodder for cattle, but as their stalks are slender, and less succulent than those of the common Vetch, so it is doubtful if these will answer the purpose of farmers to cultivate them; for as their stalks trail to a great length, so if they have not support, they will be subject to rot by lying upon the ground; and although their roots are perennial, yet as it is late in the spring before they shoot to a height sufficient to cut for use, so there is little want of green feed for cattle at that time.

However, a few of these plants may be allowed a place in large gardens for the sake of variety, where, if they are properly placed, they may be ornamental, particularly on the borders of wood-walks, or in thickets of shrubs. If some of the first sort are allowed to climb up upon their branches, they will have a good effect during their continuance in flower.

These sorts are propagated by seeds, which should be sown in autumn soon after they are ripe, for if they are kept out of the ground till spring, the seeds often fail, or at least remain in the ground a year before they vegetate; they should be sown in the places where the plants are designed to remain, for they do not bear transplanting well. These plants grow naturally in woods and thickets of bushes, where their roots are screened from the sun, and their stalks furnished with supports by the bushes, point out the places where the seeds should be sown, which should be where they are sheltered by shrubs. If three or four seeds are sown on each patch, it will be sufficient, for if one or two plants come up in each place it will be enough. When the plants come up, they will require no other culture but to keep them clean from weeds, and their stalks must be permitted to climb upon the neighbouring shrubs; for if they trail upon the ground, they will produce few flowers, and in wet seasons the stalks will rot, so the plants will be rather unsightly.

The fourth sort grows naturally in Siberia; this is a biennial plant, which promises fairly to become a useful one for fodder; for the stalks of this grow to a great length, and are well furnished with leaves. These do not decay in autumn, but continue green through the winters in defiance of the most severe frost; so that in February and March, when there is often a scarcity of green feed for ewes and lambs, this may be of great service.

The stalks of this rise five or six feet high. The leaves are composed of five or six pair of smooth spear-shaped lobes, terminated by tendrils. The foot-stalks are deeply furrowed. The flowers are produced in spikes upon long foot-stalks, which spring from the wings of the stalks; they are of a light blue colour, and appear in July; these are succeeded by short compressed pods, containing three or four round seeds which ripen in autumn.

This sort is propagated by seeds, which may be sown in the spring or autumn; and when the plants come up, they will require no other culture but to keep them clean from weeds; and if they are supported from trailing upon the ground, they will continue in verdure all the winter, and the following summer they will flower and produce ripe seeds.

If this plant is designed for feed, the seeds should be sown in rows at four feet distance, and should be dropped thin in the rows; for as the stalks send out many branches, and extend to a great length, so when the plants are too close, the branches will intermix, and mat so closely together, as to rot each other by excluding the air. When the plants come up, they must be kept clean from weeds, which, while they are young, should be performed with Dutch hoes, but afterward it may be done by the hoeing plough, which will save expence, and with this instrument the plants may be earthed up in the same manner as Peas and Beans, which will greatly strengthen their stalks, and make them and the leaves larger and more succulent, so increase the quantity of feed. If this is practised as often as may be found necessary to destroy the weeds in summer, it will prepare the ground for any crop which may afterward be put upon the land; and as this will be in no danger of suffering from frost, so it should be preserved till the spring, when there is a want of green feed for ewes, at which time it may be cut as it is wanted; but a part of the plants should be permitted to stand for seeds, for those which are cut, if they do shoot again, will flower so late in summer, that unless the autumn proves very warm, the seeds will not ripen; therefore it will be a better way to sow a sufficient quantity of seeds for this purpose in a separate spot of ground, because, when the other is cut, the ground may be ploughed for other crops; and if in mild seasons there may be so great plenty of other green feed as not to want this, if the plants are ploughed into the ground, it will be a good dressing for other crops.

This is what I am now beginning to try in the field, where I have not as yet had experience of its culture; but what I have here advised, is founded upon experiments which I have for six years made upon small patches of it sown in gardens, in different situations. In all these patches I have found the plants continue in great verdure, when most of the perennial plants in the same situation have suffered greatly by the frost; and from eight of these plants I could have cut as much feed, as would have been equivalent to half a truss of green Clover.

The fifth sort is the common Vetch or Tare, which is much cultivated in the fields for fodder; of this there are two varieties, if not distinct species. The first, which is the most common, has a black seed; the other has seeds as white, if not whiter than the whitest Peas; and this difference is permanent, for I have sown both sorts many years, and have never found either of them vary. These plants are annual, and perish soon after they have perfected their seeds. The stalks are angular, streaked, and hairy; they are weak and want support, so generally decline where they have nothing near to fasten themselves to. The leaves are composed of several pair of blunt lobes, and are terminated by tendrils. The flowers come out from the wings of the stalk, sitting very close to the base of the foot-stalks of the leaves; two of these generally spring from the same joint; they are pretty large, and of the butterfly shape; they are purple: these appear in June and July, and are succeeded by erect pods, containing three or four round seeds in each, which ripen in August and September.

The sort with white seeds is rather the more succulent plant of the two, so is better for fodder; but many people refuse to cultivate them, because they say the seeds being white, are much sooner found out by the rooks, than those which are nearer the colour of the ground, so are often devoured soon after they are sown, especially where any of the seeds are not buried; but if the seeds are sown in drills, they may be so carefully covered, as that the birds will not easily find them.

There is another kind of Vetch which is cultivated in the fields, with a smaller black seed; this is called in some counties Rath ripe Vetch, and in others Pebble, or Summer Vetch; but this being much tenderer than the common Vetch is seldom cultivated, for this must always be sown in the spring, and will ripen its seeds the same summer, but it will not afford near so good fodder as the other.

Vetches are generally sown at two seasons, one is in autumn, and the other early in the spring; but the best time is in August, for the seeds which are sown then will come up soon, and the plants will have time to get strength before winter, so will be in less danger of suffering by frost than those which are sown later, and will be fit to cut for feed much earlier in the spring, for it is then green feed is most wanted; and if they are designed for feed and not to be cut for fodder, those early-sown Vetches will come early into flower, and the seeds will be ripe early, so they may be cut and stacked in good weather; which is a great advantage, for those which ripen late are often stacked or housed wet, and then the seeds frequently sprout in the mow and are spoiled.

The usual method of sowing Vetches is in broad-cast, ploughing them lightly in; in this way the common allowance of seeds for one acre of land is two bushels, but there are some who sow two bushels and a half; this practice may do well enough for those Vetches which are designed to be cut for fodder in the spring, but those which are sown with an intent to stand for seeds, will do much better if they are sown in drills in the same way as is practised for Peas, and then less than half the quantity of seeds will be sufficient; for the drills should not be nearer to each other than three feet, that the hoe plough may have room to go between them, to destroy the weeds, and earth up the plants; for by this management they will produce a much greater crop, and ripen earlier in the season. These drills should be about the same depth as those usually made for Peas, and the seeds should be scattered about the same distance in the drills. These seeds should be carefully covered as soon as they are sown, for if they are left open the rooks will discover them; and when they once find the rows, if they are not carefully watched, they will entirely devour them. Indeed, these being sown early in autumn, will be in less danger than those which are sown late, or in the spring, because there is more food for rooks and pigeons in the open fields at this season, and the plants will appear much sooner above ground. The best time to sow them is about the beginning of August, for the rains which usually fall about that season, will bring them up in a short time. Toward the latter end of October the plants will have obtained considerable strength, therefore they should be earthed up with the hoeing plough. This work should be performed in dry weather, and in doing it care must be had to lay the earth up as high to the stems of the plants as possible, so as not to cover their tops, because this will secure them against frost. The whole space of ground between the rows should also be stirred, in order to destroy the weeds, which, if carefully performed in dry weather, will lay the land clean till March; at which time the crop should be earthed a second time, and the ground cleaned again between the rows, which will cause the plants to grow vigorous, and in a little time they will spread so as to meet, and cover the spaces; whereas those sown in the spring will not grow to half this size, and will be very late in flowering.

Some people sow these Vetches, and when they are fully grown, plough them into the ground to manure it. Where this is designed, there will be no occasion to sow them in drills at this distance, nor to husband them in the manner before directed; but in this case it will be the best method to sow them in autumn, because they will be fit to plough in much sooner the following year, so that the land may be better prepared to receive the crops for which it is intended. In some parts of France, and in Italy, these Vetches are sown for feeding of cattle while green, and are accounted very profitable; and in many parts of England they are cultivated to feed cart-horses, &c. though upon such land where Lucern will thrive, it will be much better husbandry to cultivate that for this purpose.

Where these plants are cultivated for their seeds, they should be cut soon after the pods change brown; and when they are dry, they must be immediately stacked, for if they are suffered to lie out in the field to receive wet, and there comes one hot day after it, the pods will most of them burst, and cast out the seeds. When the seeds are threshed out, the haulm is esteemed very good food for cattle, and some have recommended the seeds for horses, and affirm they are as proper for those animals as Beans; which, if true, will render them more valuable, because these will grow on the lightest sandy land where Beans will not thrive, so may be a good improvement to some counties in England, where they do not attempt to cultivate Beans.

**VINCA.** Lin. Gen. Plant. 261. Pervinca. Tourn. Inst. R. H. 119. tab. 45. Periwincle; in French, *Pervenche.*

The CHARACTERS are,

*The empalement of the flower is permanent, and cut into five acute parts at the top. The flower has one salver-shaped petal, whose tube is longer than the empalement. The brim is broad, spreading open, and slightly cut into five obtuse segments; it has five very short inflexed stamina, terminated by erect, obtuse, membranaceous summits, and two roundish germen, which have two roundish corpuscles on their side, supporting one common style the length of the stamina, crowned by two stigmas; the under is orbicular and plain, the upper is concave and headed. The germen afterward turns to a fruit composed of two taper acute-pointed husks, opening lengthways with one valve, and filled with oblong cylindrical seeds.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which includes those plants whose flowers have five stamina and one style.

The Species are,

1. Vinca (*Minor*) caulibus procumbentibus, foliis lanceolato-ovatis, floribus pedunculatis. Lin. Sp. Plant. 209. *Periwincle with trailing stalks, and oval spear-shaped leaves.* Pervinca vulgaris, angustifolia, flore cæruleo. Tourn. Inst. 120. *Common narrow-leaved Periwincle, with a blue flower.*
2. Vinca (*Major*) caulibus erectis, foliis ovatis, floribus pedunculatis. Lin. Sp. Plant. 209. *Periwincle with erect stalks and oval leaves.* Pervinca vulgaris, latifolia, flore cæruleo. Tourn. Inst. 119. *Common broad-leaved Periwincle with a blue flower.*
3. Vinca (*Rosea*) foliis oblongo-ovatis integerrimis, tubo floris longissimo, caule ramoso fruticoso. Tab. 186. *Periwincle with oblong, oval, entire leaves, a very long tube to the flower, and a shrubby branching stalk.*

The first sort grows naturally under hedges and bushes in many parts of England. The stalks are slender, and trail upon the ground, emitting fibres from their joints, which take root, whereby the plant multiplies and spreads greatly. The leaves are placed opposite on their stalks; they are oval, spear-shaped, about an inch and a half long, and three quarters of an inch broad, of a thick consistence, very smooth, and entire; the upper side is of a deep lucid green, and their under side of a bright green colour; they stand upon short foot-stalks. The flowers stand singly upon foot-stalks, which spring from the wings of the stalks; they are nearly of a funnel-shape, but spread more at their brim, which is almost flat like a salver; their brim is divided into five broad obtuse segments: the most common colour of the flower is blue, but it is often found with a white flower, and sometimes the flowers are variegated with both colours. These flowers begin to appear in April, and there is often a succession of them continued great part of summer. The flowers are very rarely succeeded by seeds. Tournefort says he was at a loss for the fruit of this plant, to engrave the figure of it in his Elements of Botany, which he obtained by planting some plants in small pots to confine their roots, and prevent their stalks from trailing upon the ground. This experiment I tried several years without success, but I afterward planted three or four plants in the full ground, and constantly cut off their lateral shoots, leaving only the upper stalks, and these plants the second year produced plenty of the pods.

There are two varieties of this plant with variegated leaves; one has white, and the other yellow stripes; these are by some preserved in their gardens for the sake of variety. There is also one with double purple flowers, which I believe to be only an accidental variation, therefore have not enumerated it here.

The second sort is also found growing naturally in several parts of England. The stalks of this are larger than those of the former, and do not trail so close to the ground; they rise two feet high, but their tops decline again to the ground, and often put out roots when they are suffered to lie on the ground. The leaves of this sort are oval, heart-shaped, about three inches long, and two broad; they stand opposite upon thick foot-stalks; their upper surface is of a lucid green, their under is of a lighter green colour; they are of a thick consistence and entire. The flowers come out from the wings of the stalk in like manner as the former, and are of the same shape, but much larger. Their usual colour is blue, but they are sometimes seen with white flowers. This sort flowers earlier in the spring than the former, and there is a succession of them great part of summer.

As these plants delight to grow under the cover of trees and bushes, so they may be made ornamental in large gardens, if they are planted on the verges of wildernesses, where they will spread and cover the ground: and as their leaves continue green all the year, they will have a good effect in winter, and their flowers appearing great part of summer, will add to the variety.

They are easily propagated by their trailing stalks, which put out roots very freely, especially those of the first sort; and if the stalks of the large sort are laid in the ground, they will root very soon, and may be cut off and transplanted where they are to remain, and when they are once rooted, they will spread and multiply very fast without farther care. The first sort is used in medicine, and is esteemed a good vulnerary plant.

The third sort grows naturally in the island of Madagascar, from whence the seeds were brought to the Royal Garden at Paris, where the plants were first raised, and produced their flowers the following summer; from these plants good seeds were obtained, part of which was sent me by Mr. Richard, gardener to the King at Versailles and Trianon. These succeeded in the Chelsea Garden, where many plants were raised. It rises with an upright branching stalk to the height of three or four feet, which when young are succulent, jointed, and of a purple colour; but as the plants advance, their lower parts become ligneous. The branches which come out from the side, have their joints very close; they have a smooth purple bark, and are garnished with oblong, oval, entire leaves, two inches and a half long, and one and a half broad; they are smooth and succulent, sitting pretty close to the branches. The flowers come out from the wings of the branches singly, standing upon very short foot-stalks; their tube is long and slender; their brim spreads open flat, which is divided into five broad obtuse segments, which are reflexed at their points. The upper surface of the petal is of a bright crimson or Peach colour, and their under side is of a pale flesh colour. There is a succession of these flowers upon the same plant, from February to the end of October. Those flowers which appear early in the summer, are succeeded by taper seed-vessels, filled with roundish black seeds, which ripen in autumn.

This sort is propagated by seeds or cuttings; those plants which arise from seeds grow more upright, and do not branch so much as the plants which are propagated by cuttings. The seeds of this should be sown upon a moderate hot-bed in the spring, and when the plants come up, and are fit to remove, they should be transplanted on a fresh hot-bed at about four inches distance, shading them from the sun till they have taken new root; then they must be treated in the same way as other young tender plants which are natives of warm countries; but there must be great care had to prevent their drawing up weak, nor should they have water in too great plenty. When the plants have obtained strength, they should be carefully taken up with balls of earth to their roots, and planted in pots filled with good earth, and plunged into a moderate hot-bed to facilitate their taking new root, observing to screen them from the sun, and when they are well rooted in the pots, they must be gradually hardened to bear the open air; but unless the summer proves warm, these plants should not be placed in the open air, for they will not thrive if they are exposed to cold or wet; therefore during the summer they should be placed in an airy glass-case, and in winter they must be removed into the stove, where the air is kept to a temperate heat, without which they will not live through the winter in England.

If these plants are propagated by cuttings, they should be planted in pots during any of the summer months. The pots should be plunged into a moderate hot-bed, and if they are closely covered with bell or hand-glasses, it will cause them to put out roots sooner than they otherwise would do; when these have put out roots, they must be gradually hardened, and afterward planted in pots, and treated in the same way as the seedling plants.

This plant deserves a place in the stove, as much as any of the exotic plants we have in England, because

the flowers are very beautiful, and there is a constant succession of them all the summer.

VINCITOXICUM. See Asclepias.

VINE. See Vitis.

VIOLA. Tourn. Inst. R. H. 419. tab. 236. Lin. Gen. Plant. 898. Violet.

The Characters are,

*The flower has a short permanent empalement of five leaves, which are differently ranged in the different species. The flower is of the ringent kind, and is composed of five unequal petals; the upper is broad, obtuse, and indented at the point, having a horned nectarium at the base; two side petals are opposite, the two lower are larger, rising and reflexed; it has five small stamina, which are annexed as appendages to the entrance of the nectarium, terminated by obtuse summits, which are sometimes connected, and a roundish germen supporting a slender style which stands out beyond the summits, and is crowned by an oblique stigma. The germen afterward turns to an oval three-cornered capsule with one cell, opening with three valves, including many oval seeds.*

This genus of plants is ranged in the fifth section of Linnæus's nineteenth class, which includes those plants whose flowers are single in the empalements, but have their summits connected.

The Species are,

1. Viola (*Odorata*) acaulis, foliis cordatis, stolonibus reptantibus. Lin. Sp. Plant. 934. *Violet having no stalks, heart-shaped leaves, and creeping shoots.* Viola martia purpurea, flore simplici odoro. C. B. P. 199. *Purple March Violet, with a single sweet flower.*
2. Viola (*Hirta*) acaulis, foliis cordatis piloso-hispidis. Flor. Suec. 718. *Violet without a stalk, having heart-shaped leaves with stinging hairs.* Viola martia hirsuta inodora. Mor. Hist. 2. p. 475. *Hairy, scentless, March Violet.*
3. Viola (*Palustris*) acaulis, foliis reniformibus. Haller. Helvet. 501. *Violet without a stalk, having kidney-shaped leaves.* Viola palustris rotundifolio, glabra. Mor. Hist. 1. p. 475. *March Violet with round smooth leaves.*
4. Viola (*Mirabilis*) caule triquetro, foliis reniformi-cordatis, floribus caulinis apetalis. Lin. Sp. 1326. *Violet with a three-cornered stalk, kidney heart-shaped leaves, and flowers whose petals are fastened to the stalks.* Viola montana latifolia, flores e radice, semina in cacumine ferens. Hort. Elth. 408. tab. 303. *Mountain Violet with a broad leaf, whose flowers and seeds join to the roots.*
5. Viola (*Multifida*) acaulis, foliis pedatis septempartitis. Lin. Sp. Plant. 933. *Violet without a stalk, and leaves growing like feet, divided into seven parts.* Viola Virginiana tricolor, foliis multifidis, cauliculo aphyllo. Pluk. Alm. 388. *Three-coloured Virginia Violet, with many-pointed leaves, and a naked stalk.*
6. Viola (*Pinnata*) acaulis, foliis pinnatifidis. Lin. Sp. Plant. 734. *Violet without a stalk, and leaves having many points.* Viola Alpina, folio in plures partes dissecto. C. B. P. 199. *Alpine Violet, with a leaf cut into many parts.*
7. Viola (*Cenisia*) acaulis, grandiflora, foliis ovalibus uniformibus integerrimis. Allion. *Violet without a stalk, having a large flower, and oval entire leaves which are uniform.*
8. Viola (*Montana*) caulibus erectis, foliis cordatis oblongis. Lin. Sp. Plant. 935. *Violet with erect stalks, and oblong heart-shaped leaves.* Viola martia arborescens purpurea. C. B. P. 199. *Tree-like purple March Violet.*
9. Viola (*Tricolor*) caule triquetro diffuso, foliis oblongis dentatis, stipulis dentatis. Flor. Suec. 721. *Violet with a three-cornered diffused stalk, oblong indented leaves, and indented stipulæ.* Viola tricolor hortensis repens. C. B. P. 199. *Creeping three-coloured Garden Violet, commonly called Heart's-ease or Pansies.*
10. Viola (*Calcarata*) caule diffuso decumbente, foliis oblongis incisis, stolonibus reptatricibus. *Violet with a diffused trailing stalk, oblong cut leaves, and creeping shoots.* Viola montana, lutea grandiflora. C. B. P. 200. *Yellow Mountain Violet with a large flower.*

The first sort, which is the common sweet Violet, grows naturally under hedges in the neighbourhood of London; but in several of the distant counties, the Violet without scent is the most frequent. Of the common Violet there are the following varieties; the single blue and white, the double blue and white, and the pale purple. These are all of them commonly preserved in gardens for the odour of their flowers; this has a thick fibrous root, sending forth long trailing shoots, which put out fibres, and take root in the ground, whereby it spreads and propagates. The leaves grow upon pretty long foot-stalks; they are heart-shaped, and somewhat hairy. The flowers stand upon slender naked foot-stalks, which arise immediately from the heads of the plants; they are of an irregular figure, in some resembling the snout of an animal, composed of five unequal petals, one of which has a heel, or horned nectarium at the base. These flowers generally appear in March, from whence they had the appellation of March Violets. After the flowers are past, the germen swells to a roundish capsule with three furrows, having one cell, in which are lodged four or five round seeds which ripen in July.

The flowers of this sort are one of the four cordial flowers; they are esteemed cooling, moistening, and laxative. The leaves of the plants are sometimes used in clysters; but the flowers of the second sort have been frequently brought to the markets, and sold for this, which have no scent, so are unfit for the purposes intended, but being larger they fill the measure sooner.

The second sort is found growing naturally in many parts of England. The leaves of this sort are larger, and are covered with rough stinging hairs. The flowers are larger and have no scent, which are the only differences.

The third sort grows naturally in marshes and on bogs in several parts of England. The leaves of this are small, kidney-shaped, and smooth. The flowers are small, and of a pale blue colour; they appear in June, and are succeeded by small oblong capsules filled with roundish seed.

The fourth sort grows naturally in Germany and Sweden; it is preserved in some curious gardens for variety. The leaves of this are spear-shaped and entire, standing upon foot-stalks. The flowers are larger than those of the common sort, but have no scent.

The fifth sort is a native of North America. The leaves of this are divided into seven parts or lobes, which are united at the foot-stalk. The flowers stand upon naked foot-stalks; they are of the Pansy kind, and have no scent; they appear in June, but are not succeeded by seeds here.

The sixth sort grows naturally on the Alps; this was sent me by Dr. Allione from Turin; it is a very low plant, seldom rising two inches high. The leaves are small, and cut into wing points; the flowers are of a pale blue colour, and appear in June.

The seventh sort was sent me by the same gentleman, who found it growing on the Alps; this is an humble plant, with oval, entire, uniform leaves, not more than half an inch long, and a quarter broad, standing upon short foot-stalks. The flowers are large, of a light blue colour, and appear in June. These have no scent.

The eighth sort grows naturally on the Alps, and the mountains in Austria. The root of this is perennial, but the stalks and leaves decay in autumn; this has erect stalks which rise more than a foot high; they are garnished with oblong heart-shaped leaves. The flowers stand upon long foot-stalks, which spring from the wings of the stalks; they are shaped like those of the Dog Violet, and are of a pale blue colour; these appear the end of May, and are succeeded by roundish capsules filled with small seeds, which ripen in August.

The ninth sort is the Heart's-ease or Pansies, which grows naturally in some of the northern counties of England, but is generally cultivated in gardens. Of

this there are many varieties, which differ greatly in the ſize and colour of their flowers. Some of theſe varieties have very large beautiful flowers, which have an agreeable odour; others have ſmall flowers without ſcent; whether theſe are diſtinct ſpecies or accidental varieties, I have not been able to determine, for I have ſaved the ſeeds of moſt of the varieties as carefully as poſſible, and have ſown them ſeparate, but have always had a mixture ariſe, which may have come from ſeeds lying in the ground; for in gardens where theſe plants have been permitted to ſcatter their ſeeds, it is impoſſible to know how long the ſeeds may lie in the ground; and when they are turned up to the ſurface, they will grow, which renders it difficult to determine the ſpecific differences of theſe plants in ſuch places.

This is an annual plant, whoſe roots decay after they have flowered and perfected their ſeeds. The lower leaves are roundiſh or oblong, and are indented on their edges; the ſtalks riſe ſeven or eight inches high, ſending out many diffuſed branches; they are four-cornered, and are garniſhed with leaves which are longer and narrower than thoſe below; theſe are notched on their edges, and ſit cloſe to the branches. The flowers ſtand upon long naked foot-ſtalks, which ſpring from the wings of the ſtalk; they are in ſhape like thoſe of the common Violet. Some of the varieties have flowers much larger, and others are of the ſize of March Violets; ſome of them have the two upper petals of a deep yellow colour with a purple ſpot in each, the two middle of a paler yellow with a deep yellow ſpot, and the lower petal of a velvet colour; in others the petals are white, with yellow and purple ſpots; in ſome the yellow is the moſt prevailing colour, and in others the purple.

The tenth ſort grows naturally upon mountains in the north of England, and in Wales; this is a perennial root, ſending out ſhoots from the ſide, which ſpread and propagate, in which it differs from all the Panſies. The lower leaves are oblong and jagged; the ſtalks ſeldom riſe more than four or five inches high; they decline at the bottom, and are garniſhed with narrower leaves than thoſe below, which are deeper cut on their ſides. The flowers ſtand upon naked foot-ſtalks two inches long; they are much larger than thoſe of the common ſort, and are of a deep yellow colour, with a few purple ſtreaks in the center. This plant continues flowering great part of ſummer, but the flowers have no ſcent.

The common Violets are eaſily propagated by parting of their roots; this may be done at two ſeaſons: the firſt or moſt common ſeaſon for removing and parting of theſe roots is at Michaelmas, that the young plants may be well rooted before winter; this is generally practiſed where the plants are put on the borders of wood walks in large plantations, but in the the gardens where they are cultivated for their flowers, the gardeners tranſplant and part their plants ſoon after their flowering ſeaſon is over; ſo they gather all the flowers firſt, and the plants, which are then removed, will have all the remaining ſummer to grow and get ſtrength, ſo will produce a greater quantity of flowers the following ſpring, than thoſe which are removed in autumn; but this is not to be practiſed, where they cannot be ſupplied with water till they have taken new root, unleſs in moiſt ſeaſons.

When theſe are planted, they ſhould be placed at a good diſtance from each other to allow them room to ſpread, for if they are expected to produce many flowers, they ſhould not be tranſplanted oftener than once in three or four years, ſo that in that time the offſets will ſpread over the ground, if the roots are three feet aſunder.

Violets may alſo be propagated by ſeeds, which ſhould be ſown ſoon after they are ripe, which is about the end of Auguſt. The plants will come up the following ſpring, and when they are fit to remove, they ſhould be tranſplanted in ſhady borders to grow till autumn, and then they may be planted where they are to remain, but the double-flowering Violets do not produce ſeeds. Although the white, blue, and purple Violets are generally ſuppoſed to be varieties which have accidentally ſprung from ſeeds, yet I have ſeveral years ſowed the ſeeds of all the three ſorts, and have not found either of them vary.

The other ſorts of Spring Violets are ſometimes preſerved in botanic gardens for the ſake of variety; theſe may be propagated in the ſame way as the common ſort, but require a moiſt ſoil and a ſhady ſituation.

The upright ſort does not ſend out ſhoots like the common Violet, ſo increaſes but ſlowly by offſets; this may be propagated by ſeeds in plenty, and is as hardy as the common ſort.

The ſeveral varieties of Panſies will ſcatter their ſeeds in a ſhort time after the flowers are paſt, and from theſe ſelf-ſown ſeeds the plants which come up in autumn, will flower very early in the ſpring, and theſe will be ſucceeded by the ſpring plants; ſo that where they are indulged in a garden, and their ſeeds are permitted to ſcatter, there will be a conſtant ſucceſſion of their flowers the greateſt part of the year; for they will flower all the winter in mild ſeaſons, and moſt part of the ſummer in ſhady ſituations, which renders them worthy of a place in every good garden; but then they muſt not be allowed to ſpread too far, leſt they become troubleſome weeds, for their ſeeds, when ripe, are caſt out of their covers with great elaſticity to a conſiderable diſtance, and the plants will ſoon ſpread over a large ſpace of ground, if they are permitted to ſtand.

The common Panſy ſtands in the College Diſpenſatory as a medicinal plant, but is rarely uſed in England.

The great yellow Violet propagates by offſets in pretty great plenty, if it has a moiſt ſoil and a ſhady ſituation; this may be tranſplanted in autumn, and the offſets may then be taken off, but the roots ſhould not be divided into ſmall heads; nor ſhould they be too often tranſplanted, becauſe they will not produce many flowers, unleſs the plants are ſtrong, and have good root in the ground. This ſort will not live in a dry ſoil, nor in a ſituation much expoſed to the ſun.

**VIORNA.** See Clematis.

**VIRGA AUREA.** See Solidago.

**VISCUM.** Tourn. Inſt. R. H. 609. tab. 380. Lin. Gen. Plant. 979. [ſo called, becauſe its fruit is full of a glutinous ſubſtance.] Miſleto, in French, *Gui.*

The Characters are,

*It has male and female flowers upon ſeparate plants. The male flowers have an empalement compoſed of four oblong leaves; they have no petals, but have four ſummits, which are oblong and acute-pointed, each faſtened to one of the leaves of the empalement. The female flowers have an empalement of four ſmall oval leaves ſitting upon the germen; theſe have no petals or ſtamina, but have an oblong three-cornered germen ſituated under the flower, having no ſtyle, but is crowned by an obtuſe ſtigma. The germen afterward turns to a globular ſmooth berry with one cell, including a fleſhy heart-ſhaped ſeed.*

This genus of plants is ranged in the fourth ſection of Linnæus's twenty-ſecond claſs, which contains thoſe plants whoſe flowers have four male organs, and grow on ſeparate plants from the fruit.

We have but one Species of this genus in Europe, viz.

Viscum (*Album*) foliis lanceolatis obtuſis, caule dichotomo, ſpicis axillaribus. Lin. Sp. Plant. 1023. *Miſleto with blunt ſpear-ſhaped leaves, forked ſtalks, and ſpikes of flowers riſing from the wings of the ſtalk.* Viſcum baccis albis. C. B. P. 423. *Miſleto with white berries.*

This plant, inſtead of rooting and growing in the earth like other plants, fixes itſelf, and takes root on the branches of trees; it ſpreads out with many branches, and forms a large buſh. The branches are ligneous; they have a yellow green bark; the largeſt is about the thickneſs of a man's finger, the other are gradually ſmaller; they are full of joints which eaſily part aſunder, at each of which grow two thick fleſhy leaves, which are broad and rounded at their points,

points, and narrow at their baſe. The flowers come out from the wings of the ſtalk in ſhort ſpikes; they have four yellow leaves, which are by ſome called petals, and others make them the empalement. The female flowers are ſucceeded by round white berries, which are almoſt pellucid, about the ſize of large white Currants, full of a tough viſcid juice, in the middle of which lies one heart-ſhaped flat ſeed.

It grows upon the white Thorn, the Apple, the Crab, the Hazel, the Aſh, and Maple, but is rarely found upon the Oak, though the Miſleto of the laſt has been always accounted the beſt of all; which opinion, as Mr. Ray well obſerves, may be owing to the ſuperſtitious honour which the ancient Druids of this iſland gave to this Miſleto, to whom nothing was more ſacred.

This plant is always produced from ſeed, and is not to be cultivated in the earth, as moſt other plants, but will always grow upon trees; from whence the ancients accounted it a ſuper-plant, moſt of whom thought it was an excreſcence on the tree, without the ſeed being previouſly lodged there, which opinion is now generally confuted from a repeated number of experiments.

The manner of its being propagated is this, viz. The Miſleto Thruſh, which feeds upon the berries of this plant in winter, when it is ripe, doth often carry the ſeeds from tree to tree; for the viſcous part of the berry, which immediately ſurrounds the ſeed, doth ſometimes faſten it to the outward part of the bird's beak, which, to get diſengaged of, he ſtrikes his beak againſt the branches of a neighbouring tree, and thereby leaves the ſeed ſticking by this viſcous matter to the bark, which, if it lights upon a ſmooth part of the tree, will faſten itſelf thereto, and the following winter will put out and grow; and in the ſame manner it may be propagated by art, for if the berries, when full ripe, are rubbed upon the ſmooth part of the bark of a tree, they will adhere cloſely thereto, and, if not deſtroyed, will produce plants the following winter.

The trees which this plant doth moſt readily take upon, are the Apple, the Aſh, the white Thorn, and other ſmooth-rind trees before-mentioned; but I have ſeveral times tried it upon the Oak without ſucceſs, for the bark of that tree is of too cloſe a texture to admit the ſeeds ſticking thereto, which is alſo the reaſon it is ſo rarely found upon that tree; and notwithſtanding the great encomiums which have been given to the Miſleto of the Oak for its medicinal virtues, yet I cannot help thinking that it is equally good from whatever tree it be taken, nor is it poſſible to find this plant growing in any quantity upon the Oak; ſo that thoſe perſons who pretend to furniſh the town with it for phyſical uſe, do but impoſe upon the world, for it is ſo rarely met with, that whenever a branch of an Oak-tree hath any of theſe plants growing upon it, it is cut off, and preſerved by the curious in their collections of natural curioſities, and of theſe there are but few to be ſeen in England.

As to what ſome perſons have aſſerted of the manner how it is propagated, from tree to tree, by the Miſleto thruſhes, which eat the berries, and void the ſeed in their dung upon the branches of trees, whereby the ſeeds are ſtuck thereon, and take root into the bark, and produce freſh plants, I can by no means agree to, ſince, if it were only this way propagated, it would always be found on the upper part or the ſides of ſuch branches, upon which the dung can only be ſuppoſed to lodge; whereas it is generally found upon the under ſide of the branches, where it is almoſt impoſſible for theſe birds to caſt their dung; beſides, I believe the ſtomachs of theſe birds are too powerful digeſters to ſuffer any ſeeds to paſs ſo entire through the inteſtines as to afterwards grow; but I ſhall leave this to ſuch as have leiſure to make obſervations in thoſe places where this plant abounds, and ſhall add only a ſhort account of the method uſed to make birdlime, which may not be improper to inſert in this place for the ſatisfaction of the curious.

The Italians make their birdlime of the berries of Miſleto heated and mixed with oil, as is that made of Holly bark, and to make it bear the water, they add turpentine.

Of the berries of this plant birdlime was formerly made in England. This was done by boiling the berries in water till they burſt, when they were well beaten in a mortar, and afterward waſhed till all the branny huſks were cleared away.

That which is now commonly uſed with us is made of the bark of Holly, which is ſtripped off about Midſummer; this they boil for ten or twelve hours, and when the green coat is ſeparated from the other, they cover it up with Fern for a fortnight, and put it in a moiſt place, where it lies a fortnight, by which time the bark will be turned to a jelly, and no fibres of the wood be left; then they beat it in a ſtone mortar till it becomes a tough paſte; this they waſh in a running ſtream till no motes appear, and put it up to ferment for four or five days, and ſcum it as often as any thing ariſes, and then lay it up for uſe. When they uſe it, they incorporate with it a third part of that oil over the fire.

The birdlime that is brought from Damaſcus is ſuppoſed to be made of Sebeſtens, their kernels being frequently found in it, but this will not endure either froſt or wet.

The birdlime brought from Spain is of an ill ſmell.

The bark of our Wayfaring Shrub, as it is ſaid, will make birdlime as good as the beſt.

VISNAGA. See DAUCUS.

VITEX. Tourn. Inſt. R. H. 603. tab. 373. Lin. Gen. Plant. 708. [ſo called of vieo, *Lat.* to bend, becauſe its branches are very flexible; it is alſo called Agnus Caſtus, becauſe it is believed to allay luſt, for which the monks were wont to uſe it in their cloiſters; but by the taſte and ſmell it ſhould rather be a provocative.] Agnus Caſtus, or the Chaſte-tree.

The CHARACTERS are,

*The empalement of the flower is ſhort, cylindrical, and indented in five parts. The flower has one ringent petal, with a ſlender cylindrical tube; the brim is plain, and divided into two lips; the two lips are trifid; the middle ſegment is the broadeſt in both. It has four hair-like ſtamina which are a little longer than the tube, two being ſhorter than the other, terminated by moveable ſummits, and a roundiſh germen, ſupporting a ſlender ſtyle, crowned by two awl-ſhaped ſpreading ſtigmas. The germen afterward turns to a globular berry with four cells, each containing one oval ſeed.*

This genus of plants is ranged in the ſecond ſection of Linnæus's fourteenth claſs, which contains thoſe plants whoſe flowers have two long and two ſhorter ſtamina, and the ſeeds are included in capſules.

The SPECIES are,

1. VITEX (*Agnus Caſtus*) foliis digitatis, ſpicis verticillatis. Lin. Sp. Plant. 938. *Chaſte-tree with fingered leaves, and whorled ſpikes of flowers.* Vitex foliis anguſtioribus cannabis modo diſpoſitis. C. B. P. 475. *Chaſte-tree with narrow leaves diſpoſed like thoſe of Hemp, or common Chaſte-tree.*
2. VITEX (*Latifolia*) foliis digitatis ſerratis, ſpicis paniculatis. *Chaſte-tree with fingered ſawed leaves, and ſpikes in panicles.* Vitex folio latiore ſerrato. Lob. Icon. 139. *Chaſte-tree with a broader ſawed leaf.*
3. VITEX (*Integerrimis*) foliis ternatis quinatiſve integerrimis, paniculis dichotomis. Lin. Sp. Plant. 890. *Chaſte-tree with trifoliate and quinate leaves, and panicles of flowers riſing from the diviſion of the branches.* Vitex trifolia minor Indica. Pluk. Alm. 390. *Smaller Indian trifoliate Chaſte-tree.*
4. VITEX (*Negunda*) foliis quinatis ternatiſque ſerratis, ſpicis alaribus terminalibuſque. *Chaſte-tree with quinate and trifoliate ſawed leaves, and ſpikes of flowers from the wings terminating the branches.*
5. VITEX (*Chinenſis*) foliis ternatis quinatiſque pinnato-inciſis, ſpicis verticillatis terminalibus. *Chaſte-tree with alternate*

*ternate and quinate leaves which are cut like wings, and whorled spikes of flowers terminating the branches.*

The first sort grows naturally in Sicily, and near Naples, by the sides of rivers and in moist places; it has a shrubby stalk eight or ten feet high, sending out branches opposite the whole length, which are angular, pliable, and have a grayish bark; these are garnished with leaves for the most part placed opposite, upon pretty long foot-stalks; they are composed of five, six, or seven lobes which unite at the foot-stalk, and spread out like the fingers of a hand; the lower are small, and the middle are largest; they are smooth and entire; the largest are about three inches long, and half an inch broad in the middle, ending in blunt points, of a dark green on their upper side, but hoary on their under. The flowers are produced in spikes at the extremity of the branches; the spikes are from seven to fifteen inches long; these are disposed in whorls round the stalks, with intervals between each whorl; they are of the lip kind; the two lips are each cut into three segments, the middle being larger than the two side segments; they are in some plants white, and in others blue; these are generally late before they appear, so that in bad seasons they do not open fair in England, and in warm years the plants produce no seeds here. The flowers have an agreeable odour when they open fair, and make a good appearance in autumn, when the flowers of most other shrubs are gone, for in warm mild seasons I have seen these shrubs in full flower the middle of October.

The second sort grows naturally in the south of France, and in Italy; this is a lower shrub than the first; it seldom rises more than four or five feet high, coming up with several stalks from the root, which do not branch so much as the former; their bark is also whiter. The leaves are fingered, and composed of five or seven lobes which unite at the foot-stalk; these are not so disproportionate in their length, the longest being seldom more than three inches, and the shortest an inch and a half; they are near an inch broad, and are sawed on their edges, and are not so stiff as those of the former. The flowers come out in panicled spikes toward the end of the branches; the spikes are shorter, and the flowers smaller than those of the first sort, and appear sooner; they are all of them blue which I have seen.

The third sort grows naturally in both Indies; this has a shrubby stalk which rises nine or ten feet high, sending out many side branches which have a brown bark, and are garnished with leaves which have sometimes three, and at others five, oval acute-pointed lobes which are entire, and a little downy on their under side. The flowers are disposed in panicles, which arise at the division of the branches; these are small and white, but are not succeeded by any seeds in England.

The fourth sort grows naturally in the northern parts of China, where it rises with woody stalks eight or ten feet high, having a gray bark. The branches come out opposite, and are garnished with leaves placed opposite upon long foot-stalks; these are composed of three or five spear-shaped lobes which are deeply sawed on their edges, and end in very acute points; the largest of these lobes are three inches and a half long, and an inch and a quarter broad, of a dark green on their upper side, but gray on their under. The flowers are disposed in whorled spikes, which come out opposite from the wings of the stalk, and the branches are terminated by branching spikes of flowers; these are blue, and about the size of those of the first. This flowers in July and August, but does not produce seeds in England.

The fifth sort is a native in China; this is a lower shrub than either of the former. The stalk seldom rises more than three feet high, sending out spreading branches on every side, which are slender and angular; these are garnished with leaves placed opposite, which stand upon pretty long foot-stalks; they are some of them composed of three, and others of five lobes, which are deeply and regularly cut on their sides in form of winged leaves, and end in acute points. The largest of these lobes is about an inch and a half long, and three quarters of an inch broad in the middle; they are of a dull green colour on their upper side, and gray on their under. The branches are terminated by spikes of flowers about three or four inches long, which are disposed in whorls round the stalks; these are in some plants white, in others blue, and some have bright red flowers; they are in beauty from the middle of July to the beginning of September, but the plants do not produce seeds in Europe.

The first sort is pretty common in many English gardens, where it has been long an inhabitant, but was not much propagated till of late years. The second sort is less common, and only in some curious gardens at present. These plants are very hardy, and may be propagated by planting their cuttings early in the spring, before they shoot; they require a fresh light soil, and must be frequently refreshed with water until they have taken root; after which they must be carefully cleared from weeds during the summer season, and if the following winter prove severe, you must lay a little mulch upon the surface of the ground between the plants, to prevent the frost from penetrating to their roots, which would injure them while they are young; and as these cuttings are apt to shoot late in the year, their tops will be very tender, and the early frosts in autumn often kill them down a considerable length, if they are not protected, therefore they should then be covered with mats, which will be of great service to them. Toward the middle of March, if the season is favourable, you should transplant them either into the places where they are designed to remain, or into a nursery to grow two or three years to get strength, where they must be pruned up, in order to form them into regular stalks, otherwise they are very subject to shoot out their branches in a straggling manner.

They may also be propagated by laying down their branches in the spring of the year, in doing of which you must be very careful not to break them, for their shoots are apt to split if they are violently forced; these will take root in one year, provided they are watered in very dry weather, and may then be transplanted out, and managed as was directed for those plants raised from cuttings.

The third sort is too tender to live in the open air in England, so must be planted in pots, and constantly kept in the stove; it is propagated both by cuttings and layers, but the cuttings of this must be planted in pots, and plunged into a moderate hot-bed, covering them close with a bell or hand-glass to exclude the air; they should be refreshed with water now and then, but it must not be given them too freely. The best time to plant the cuttings is about the middle or latter end of April, for if they succeed, they will put out roots in six or seven weeks, and will then begin to shoot, so they should have the free air gradually admitted to them to prevent their shooting weak; then they may be carefully taken up, and each planted into a separate small pot filled with light earth, and plunged into the hot-bed again, shading them from the sun till they have taken new root; after which they should have plenty of free air at all times when the weather is good, treating them in the same manner as other tender plants. In winter they must be kept in a moderate temperature of heat, but in the summer they should have the free air in mild weather, but not removed into the open air.

As this plant retains its leaves all the year, it makes a variety in the stove, but the flowers have no great beauty.

The fourth sort is, I believe, lost in the English gardens, for it had lived in the open air some years, which had encouraged people to plant them in the full ground, where they were all destroyed by the severe frost in 1740, since when I have not seen one of the growing plants.

This sort casts its leaves in autumn like the two first, and it is late in the spring before the new leaves come out; it was propagated by cuttings planted in the spring, a little before the buds opened; these were placed on a moderate hot-bed, and covered down with glasses, with which management they put out roots freely, and afterward they were gradually hardened to live in the open air.

The fifth sort has been lately introduced into the English gardens from Paris, where the plants were raised from seeds, which were sent from China by the missionaries. I was favoured with some young plants by Monsieur Richard, gardener to the King at Versailles. The two sorts with white and blue flowers have succeeded in the Chelsea Garden, but that with red flowers was injured in the way and miscarried.

This is propagated by cuttings, which must be planted in the spring in pots, plunging them into a moderate hot-bed, and treating them in the same way as the fourth sort. When the cuttings are well rooted, they should be carefully taken up, and each planted in a separate small pot filled with light earth, and placed in the shade until they have taken new root; then they may be removed to a sheltered situation, placing them with other green-house plants, where they may remain all the summer; but in autumn they must be put into shelter, for they will not live in the open air in this country; but as they cast their leaves early in autumn, so they must not have much wet in winter. The plants are late in putting out new leaves in the spring, and before these appear they have so much the appearance of dead plants, that they have been turned out of the pots by some, supposing they were so.

VITIS. Tourn. Inst. R. H. 613. tab. 384. Lin. Gen. Plant. 250. [So called from vieo, *Lat.* to bend or bind, because its claspers take hold of the neighbouring plants.] The Vine.

The CHARACTERS are,

*The flower has a small empalement indented in five parts; it has five small petals which drop off, and five awl-shaped stamina which spread and fall away, terminated by single summits, with an oval germen having no style, crowned by a headed obtuse stigma. The germen afterward turn to an oval or roundish berry with one cell, including five hard seeds or stones.*

This genus of plants is ranged in the first section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and one stigma.

I shall not trouble the reader with an enumeration of all the sorts of Grapes which are at present known in England, which would swell this work much beyond its intended bulk, and be of little use, since many of them are not worth the trouble of cultivating; so I shall only select those which ripen pretty well in this country, or that merit a little assistance to bring them to perfection by artificial heat.

The July Grape is called by the French, Morillon noir hatif. This is a small, round, black berry, growing loose on the bunches. The juice is sugary, but has little flavour, and has no merit but that of ripening early. It ripens the beginning of August.

The Black Sweet Water, is a small roundish berry, growing close in the bunches, which are short. The skin is thin, the juice very sweet, and the birds and flies are very apt to devour them if they are not guarded. It ripens soon after the other.

The White sweet Water is a large round berry when in perfection, but these are very different in size on the same bunch; some of them will be of a large size, and others extremely small, for which reason it is not much esteemed. The juice is sugary, but not vinous. This ripens about the same time with the former.

The Chasselas Blanc, or Royal Muscadine, as it is called by some, is an excellent Grape; the bunches are generally large, and at the upper part divide with two smaller side bunches or shoulders. The berries are round, and when perfectly ripe, turn to an amber colour. The juice is rich and vinous; it ripens in September, but if carefully preserved they will hang very late and become excellent.

The Chasselas Musque, or Le Cour Grape, as it is here called, but by some called the Frankindal, is an excellent Grape, and generally ripens well in England if it has a good aspected wall. The berries are very like those of the former in shape, size, and colour, but are fleshy and have a little musky flavour. It ripens at the same time with the former.

The Black Cluster, or Munier Grape, as it is called by the French, from the hoary down of the leaves in summer; it is a good fruit, and ripens well here. The bunches are short, the berries are oval, and are very close to each other, so that many of those which grow on the inside continue green, when the outer are perfectly ripe. It ripens in September, and is by some called the Burgundy Grape.

The Auverna, or true Burgundy Grape, sometimes called Black Morillon, is an indifferent fruit for the table, but is esteemed one of the best sorts for making wine. The berries of this are oval, and hang looser on the bunches than those of the Cluster Grape, so ripen equally, which gives it the preference.

The Corinth, or as it is vulgarly called the Currant Grape, is a small roundish berry generally without stone, of a deep black colour, and much clustered on the bunches, which are short; it has a sugary juice, and ripens in September, but will not last long.

The Red Chasselas is very like the White in size and shape, but is of a dark red colour; it is a very good Grape, but ripens later than the White, and is pretty rare in England.

The White Muscadine is somewhat like the Chasselas, but the berries are smaller, and hang looser on the bunches, which are longer, but not so thick as those of the Chasselas. The juice is sweet, but not so rich as the Chasselas.

The Black Frontinac, or Muscat noir, is a round berry of good size; they grow loose on the bunches, yet do not ripen equally. The bunches are short, the berries when fully ripe are very black, and are covered with a meal or flue like the black Plum. The juice of this is very rich and vinous. It ripens the end of September, or the beginning of October.

The Red Frontinac, or Muscat rouge, is an excellent Grape when fully ripe, but unless the season proves very warm, they rarely ripen without artificial heat in England. The bunches of this sort are longer than those of the former; the berries are large and round; when they are fully ripe, they are of a brick colour, but before they are gray with a few dark stripes, and this is frequently taken for a different kind, and is commonly called Grisley Frontinac, but I am convinced it is the same Grape. The juice of this has the most vinous flavour of all the sorts, and is greatly esteemed in France.

The White Frontinac has larger bunches than either of the former; the berries are round, and are so closely clustered on the bunches, as that unless they are carefully thinned early in the season, when the berries are very small, the sun and air will be excluded from many of the berries, so that they will not ripen; and the moisture will be detained in the autumn, which will cause them to rot. The juice of this is excellent, and if the fruit is perfectly ripe, is inferior to none. This the French call Muscat blanc.

The Alexandrian Frontinac, or Muscat d'Alexandrie, is by some called Muscat of Jerusalem. The berries of this are oval, and hang loose on the bunches; these are long and are not shouldered. There are two sorts, one with white, and the other has red berries; their juice is very rich and vinous, but they seldom ripen in England without artificial heat.

The red and black Hamburgh, by some called the Warner Grape, from the person who brought them to England. These have middle-sized berries inclining to an oval shape. The bunches are large, and their juice when ripe is sugary, with a vinous flavour. This ripens in October.

The St. Peter's Grape has a large oval berry, of a deep black colour when ripe. The bunches are very large, and make a fine appearance at the table, but the juice is not rich, and it ripens late in the year. The leaves of this ſort are much more divided than thoſe of the other ſorts, approaching to thoſe of the Parſley-leaved Grape, ſo it may be diſtinguiſhed before the fruit is ripe.

The Claret Grape, Bourdelais, or Verjuice Grape, the Raiſin Grape, the ſtriped Grape, and many other ſorts which never come to perfection here, are not worthy of any place in gardens, unleſs for the ſake of variety; for when they have the aſſiſtance of heat to bring them to maturity, their juice is harſh, and without flavour, ſo they ſhould not occupy the room of better fruit.

All the ſorts of Grapes are propagated either from layers or cuttings, the former of which is greatly practiſed in England, but the latter is what I would recommend, as being much preferable to the other; for the roots of Vines do not grow ſtrong and woody, as in moſt ſorts of trees, but are long, ſlender, and pliable; therefore when they are taken out of the ground, they ſeldom ſtrike out any fibres from their weak roots, which generally ſhrivel and dry; ſo that they rather retard than help the plants in their growth, by preventing the new fibres from puſhing out; for which reaſon I had rather plant a good cutting than a rooted plant, provided it be well choſen, and there is little danger of its not growing.

But as there are few perſons who make choice of proper cuttings, or at leaſt that form their cuttings rightly in England, ſo it will be proper to give directions for this in the firſt place, before I proceed. You ſhould always make choice of ſuch ſhoots as are ſtrong, and well ripened of the laſt year's growth: theſe ſhould be cut from the old Vine, juſt below the place where they were produced, taking a knot, or piece of the two years wood to each, which ſhould be pruned ſmooth; then you ſhould cut off the upper part of the ſhoots, ſo as to leave the cutting about ſixteen inches long. When the piece or knot of old wood is cut at both ends near the young ſhoot, the cutting will reſemble a little mallet, from whence Columella gives the title of Malleolus to the Vine cuttings. In making the cuttings after this manner, there can be but one taken from each ſhoot; whereas moſt perſons cut them into lengths of about a foot, and plant them all, which is very wrong; for the upper part of the ſhoots are never ſo well ripened as the lower, which was produced early in the ſpring, and has had the whole ſummer to harden, ſo that if they take root, they never make ſo good plants; for the wood of thoſe cuttings being ſpongy and ſoft, admits the moiſture too freely, whereby the plants will be luxuriant in growth, but never ſo fruitful as ſuch whoſe wood is cloſer and more compact.

When the cuttings are thus prepared, if they are not then planted they ſhould be placed with their lower part in the ground in a dry ſoil, laying ſome litter upon their upper parts to prevent them from drying: in this ſituation they may remain till the beginning of April (which is the beſt time for planting them) when you ſhould take them out, and waſh them from the filth they have contracted; and if you find them very dry, you ſhould let them ſtand with their lower parts in water ſix or eight hours, which will diſtend their veſſels, and diſpoſe them for taking root. Then the ground being before prepared where the plants are deſigned to remain (whether againſt walls, or for ſtandards, for they ſhould not be removed again,) the cuttings ſhould be planted; but in preparing the ground, you ſhould conſider the nature of the ſoil, which, if ſtrong, and inclinable to wet, is by no means proper for Grapes; therefore where it ſo happens, you ſhould open a trench where the cuttings are to be planted, which ſhould be filled with lime rubbiſh, the better to drain off the moiſture; then raiſe the border with freſh light earth about two feet thick, ſo that it may be at leaſt a foot above the level of the ground; then you ſhould open the holes at about ſix feet diſtance from each other, putting one good ſtrong cutting into each hole, which ſhould be laid a little ſloping, that their tops may incline to the wall, but it muſt be put in ſo deep, as that the uppermoſt eye may be level with the ſurface of the ground; for when any part of the cutting is left above ground, as is the common method uſed by the Engliſh gardeners, moſt of the buds attempt to ſhoot; ſo that the ſtrength of the cuttings are divided to nouriſh ſo many ſhoots, which muſt conſequently be weaker than if only one of them grew; whereas on the contrary, by burying the whole cutting in the ground, the ſap is all employed on one ſingle ſhoot, which conſequently will be much ſtronger; beſides, the ſun and air are apt to dry that part of the cutting which remains above ground, and ſo often prevents their buds from ſhooting.

Then having placed the cutting into the ground, you ſhould fill up the hole gently, preſſing down the earth with your foot cloſe about it, and raiſe a little hill juſt upon the top of the cutting, to cover the upper eye quite over, which will prevent it from drying; this being done, there is nothing more neceſſary, but to keep the ground clear from weeds until the cuttings begin to ſhoot; at which time you ſhould look over them carefully to rub off any ſmall ſhoots, if ſuch are produced, faſtening only the firſt main ſhoot to the wall, which ſhould be conſtantly trained up, as it is extended in length, to prevent its breaking or hanging down; you muſt continue to look over theſe once in about three weeks during the ſummer ſeaſon, conſtantly rubbing off all lateral ſhoots which are produced, leaving only the firſt main ſhoot; and be ſure to keep the ground conſtantly clear from weeds, which, if ſuffered to grow, will exhauſt the goodneſs of the ſoil, and ſtarve the cuttings.

The Michaelmas following, if your cuttings have produced ſtrong ſhoots, you ſhould prune them down to two eyes, which, though by ſome people may be thought too ſhort, yet I am ſatisfied, from ſeveral experiments, to be the beſt method. The reaſon for adviſing the pruning Vines at this ſeaſon, rather than deferring it till ſpring is, becauſe the tender parts of thoſe young ſhoots, if left on, are ſubject to decay in winter, for they are apt to grow late in the year, ſo the tops of their ſhoots are tender, and the early froſts will pinch them, and then they frequentquently are killed down a conſiderable length, which weakens their roots; but if they are cut off early in autumn, the wounds will heal over before the bad weather, and thereby the roots will be greatly ſtrengthened.

In the ſpring, after the cold weather is paſt, you muſt gently dig up the borders to looſen the earth; but you muſt be very careful in doing this, not to injure the roots of your Vines; you ſhould alſo raiſe the earth up to the ſtems of the plants, ſo as to cover the old wood, but not ſo deep as to cover either of the eyes of the laſt year's wood. After this they will require no farther care until they begin to ſhoot, when you ſhould look over them carefully, to rub off all weak dangling ſhoots, leaving no more than one or two ſhoots, which are produced from the eyes of the laſt year's wood, which ſhould be faſtened to the wall; and ſo from this, until the Vines have done ſhooting, you ſhould look them over once in three weeks or a month, to rub off all lateral ſhoots as they are produced, and to faſten the main ſhoots to the wall as they are extended in length, which muſt not be ſhortened before the middle or latter end of July, when it will be proper to nip off their tops, which will ſtrengthen the lower eyes; and during the ſummer ſeaſon, you muſt conſtantly keep the ground clear from weeds; nor ſhould you permit any ſort of plants to grow near the Vines, which would not only rob them of nouriſhment, but ſhade the lower part of the ſhoots, and thereby prevent their ripening, which will not only cauſe their wood to be ſpongy and luxuriant, but render it leſs fruitful.

As ſoon as the leaves begin to drop in autumn, you ſhould prune theſe young Vines again, leaving three buds to each of the ſhoots, provided they are ſtrong, otherwiſe it is better to ſhorten them down to two eyes if they are good; for it is a very wrong practice to leave much wood upon young Vines, or to leave their ſhoots too long, which greatly weakens the roots; then you ſhould faſten them to the wall, ſpreading them out horizontally each way, that there may be room to train the new ſhoots the following ſummer, and in the ſpring dig the borders as before.

The third ſeaſon you muſt go over the Vines again as ſoon as they begin to ſhoot, to rub off all danglers as before, and train the ſtrong ſhoots in their proper places, which this year may be ſuppoſed to be two from each ſhoot of the laſt year's wood; but if they attempt to produce two ſhoots from one eye, the weakeſt of them muſt be rubbed off, for there ſhould never be more than one allowed to come out of each eye. If any of them produce fruit, as many times they will the third year, you ſhould not ſtop them ſo ſoon as is generally practiſed upon the bearing ſhoots of old Vines, but permit them to ſhoot forward till a month after Midſummer, at which time you may pinch off the tops of the ſhoots; for if this were done too ſoon, it would ſpoil the buds for the next year's wood, which in young Vines muſt be more carefully preſerved than on older plants, becauſe there are no other ſhoots to be laid in for a ſupply of wood, as is commonly practiſed on old Vines.

During the ſummer you muſt conſtantly go over your Vines, and diſplace all weak lateral ſhoots as they are produced, and carefully keep the ground clear from weeds, as was before directed, that the ſhoots may ripen well; which is a material thing to be obſerved in moſt ſorts of fruit-trees, but eſpecially in Vines, which ſeldom produce any fruit from immature branches. Theſe things being duly obſerved, are all that is neceſſary in the management of young Vines; I ſhall therefore proceed to lay down rules for the government of grown Vines, which I ſhall do as briefly as poſſible. And,

Firſt, Vines rarely produce any bearing ſhoots from wood that is more than one year old, therefore great care ſhould be taken to have ſuch wood in every part of the trees; for the fruit are always produced upon the ſhoots of the ſame year, which come out from buds of the laſt year's wood. The method commonly practiſed by the gardeners in England is, to ſhorten the branches of the former year's growth, down to three or four eyes, at the time of pruning; though there are ſome perſons who leave theſe ſhoots much longer, and affirm that by this practice they obtain a greater quantity of fruit; but however this may be, it is a very wrong practice, ſince it is impoſſible, that one ſhoot can nouriſh forty or fifty bunches of Grapes, ſo well as it can ten or twelve; ſo that what is gotten in number, is loſt in their magnitude; beſides, the greater quantity of fruit there is left on Vines, the later they are ripened, and their juice is not ſo rich; and this is well known in the wine countries, where there are laws enacted to direct the number and length of ſhoots that are to be left upon each Vine, leſt by overbearing them, they not only exhauſt and weaken the roots, but thereby render the juice weak, and ſo deſtroy the reputation of their wine.

Wherefore the beſt method is, to ſhorten the bearing ſhoots to about four eyes in length, becauſe the lowermoſt ſeldom is good, and three buds are ſufficient, for each of theſe will produce a ſhoot, which generally has two or three bunches of Grapes; ſo that from each of thoſe ſhoots there may be expected ſix or eight bunches, which is a ſufficient quantity. Theſe ſhoots muſt be laid about eighteen inches aſunder, for if they are cloſer, when the ſide ſhoots are produced, there will not be room enough to train them againſt the wall, which ſhould always be provided for; and as their leaves are very large, the branches ſhould be left at a proportionable diſtance from each other, that they may not croud or ſhade the fruit.

At the winter pruning of your Vines you ſhould always obſerve to make the cut juſt above the eye, ſloping it backward from it, that if it ſhould bleed, the ſap might not flow upon the bud; and where there is an opportunity of cutting down ſome young ſhoots to two eyes, in order to produce vigorous ſhoots for the next year's bearing, it ſhould always be done, becauſe in ſtopping of thoſe ſhoots which have fruit upon them as ſoon as the Grapes are formed, which is frequently practiſed, it often ſpoils the eyes for producing bearing branches the following year, and this reſerving of new wood is what the vignerons abroad always practiſe in their vineyards. The beſt ſeaſon for pruning of Vines is the end of October, for the reaſons before laid down.

The latter end of April, or the beginning of May, when the Vines begin to ſhoot, you muſt carefully look them over, rubbing off all ſmall buds which may come from the old wood, which only produce weak dangling branches; as alſo when two ſhoots are produced from the ſame bud, the weakeſt of them ſhould be diſplaced, which will cauſe the others to be ſtronger; and the ſooner this is done, the better it is for the Vines.

In the middle of May you muſt go over them again, rubbing off all the dangling ſhoots as before, and at the ſame time you muſt faſten up all the ſtrong branches, ſo that they may not hang from the wall; for if their ſhoots hang down, their leaves will be turned with their upper ſurfaces the wrong way, and when the ſhoots are afterwards trained upright, they will have their under ſurface upward; and until the leaves are turned again, and have taken their right poſition, the fruit will not thrive; ſo that the not obſerving this management, will cauſe the Grapes to be a fortnight or three weeks later before they ripen; beſides, by ſuffering the fruit to hang from the wall, and be ſhaded with the cloſeneſs of the branches, it is greatly retarded in its growth; therefore, during the growing ſeaſon, you ſhould conſtantly look over the Vines, diſplacing all dangling branches and wild wood, and faſten up the other ſhoots regularly to the wall, as they are extended in length; and towards the middle of June you ſhould ſtop the bearing branches, which will ſtrengthen the fruit, provided you always leave three eyes above the bunches; for if you ſtop them too ſoon, it will injure the fruit, by taking away that part of the branch which is neceſſary to attract the nouriſhment to the fruit, as alſo to perſpire off the crudities of the ſap, which is not proper for the fruit to receive.

But although I recommend the ſtopping thoſe ſhoots which have fruit at this ſeaſon, yet this is not to be practiſed upon thoſe which are intended for bearing the next year, for theſe muſt not be ſtopped before the middle of July, leſt, by ſtopping them too ſoon, you cauſe the eyes to ſhoot out ſtrong lateral branches, whereby they will be greatly injured.

During the ſummer ſeaſon you ſhould be very careful to rub off all dangling branches, and train up the ſhoots regularly to the wall as before, which will greatly accelerate the growth of the fruit, and alſo admit the ſun and air to them, which is abſolutely neceſſary to ripen and give the fruit a rich flavour; but you muſt never diveſt the branches of their leaves, as is the practice of ſome perſons; for although the admitting of the ſun muſt be neceſſary to ripen them, yet if they are too much expoſed thereto, their ſkins will be tough, and it will retard their ripening; beſides, the leaves being abſolutely neceſſary to nouriſh the fruit, by taking them off, the fruit is ſtarved, and ſeldom comes to any ſize, as I have ſeveral times obſerved; therefore a great regard ſhould be had to the ſummer management of the Vines, where perſons are deſirous to have their fruit excellent, and duly ripened.

When

When the fruit are all gathered, you ſhould prune the Vines, whereby the litter of their leaves will be entirely removed at once, and their fruit will be the forwarder the ſucceeding year, as has been before obſerved.

As many of the richeſt and beſt ſorts of Grapes will not ripen in England, unleſs the ſeaſon proves very warm, or the ſoil and ſituation are very favourable, there have been many hot walls built to accelerate the ripening of this fruit, and bring it to full perfection by artificial heat; and as theſe ſucceed very well when they are properly contrived, and the Vines rightly managed, I ſhall here give proper directions, which, if duly attended to, will be ſufficient to inſtruct perſons in both.

The method of building hot walls will be treated under the article WALL, ſo I ſhall paſs it over in this place, and proceed to the preparing of the ground for planting. The borders againſt theſe hot walls ſhould have the earth taken out two feet deep (provided the ground is dry,) otherwiſe one foot will be ſufficient, becauſe in wet land the borders ſhould be raiſed at leaſt two feet above the level of the ground, that the roots of the Vines may not be injured by the wet. When the earth is taken out, the bottom of the trench ſhould be filled with ſtones, lime rubbiſh, &c. a foot and a half, or two feet thick, which ſhould be levelled and beaten down pretty hard to prevent the roots of the Vines from running downward. The trenches ſhould be made five feet wide at leaſt, otherwiſe the roots of the Vines will in a few years extend themſelves beyond the rubbiſh, and finding an eaſy paſſage downwards, will run into the moiſt ground, and thereby imbibe ſo much wet, as to leſſen the vinous flavour of the Grapes; but before the rubbiſh is filled into the trench, it is a better method to raiſe a nine inch wall, at five feet diſtance from the hot wall, which will keep the rubbiſh from intermixing with the neighbouring earth, and alſo confine the roots of the Vines to the border in which they are planted, ſo that they cannot reach to the moiſture of the ground about them. This nine inch wall ſhould be raiſed to the height of the intended border, ſo will be of great uſe to lay the plate of timber of the frames upon, which will be neceſſary to cover the Vines when they are forced, whereby the timbers will be better preſerved from rotting; and where the borders are raiſed to any conſiderable height above the level of the ground, theſe walls will preſerve the earth of the borders from falling down into the walks; but in carrying up theſe walls, it will be proper to leave little openings about eight or ten feet diſtance, to let the water paſs off, becauſe when the rubbiſh at the bottom of the trench unites and binds very hard, the water cannot eaſily find a paſſage through it; therefore it will be the better method to leave theſe ſmall paſſages in the front wall, leſt the moiſture being confined at bottom, ſhould be pent up as in a ditch, which will be of ill conſequence to the Vines, but theſe openings ſhould be two feet below the ſurface.

When the walls are finiſhed and thoroughly dry, the rubbiſh ſhould be filled in, as before directed; then there ſhould be freſh light earth laid upon it two feet thick, which will be a ſufficient depth of ſoil for the Vines to root in. Theſe borders ſhould be thus prepared at leaſt a month or ſix weeks before the Vines are planted, that they may have time to ſettle. The beſt time to plant them is about the end of March, or the beginning of April, according as the ſeaſon proves early or late. Theſe I would alſo adviſe to be planted with cuttings, rather than rooted plants, for the reaſons before aſſigned, but there ſhould be two cuttings put into each hole, or placed at a nearer diſtance, leſt any of them ſhould fail; for if all ſhould ſucceed, the weakeſt of them may be eaſily drawn out the following ſpring. Theſe cuttings ſhould be well choſen from good bearing Vines, and the ſhoots ſhould be well ripened, otherwiſe they will never make good plants. The diſtance theſe Vines ſhould be allowed to remain is the ſame as for common walls, i. e. about ſix feet. In planting them there ſhould be holes opened with a ſpade, about fourteen or fifteen inches deep, for if there be but three or four inches of good earth under the foot of the cuttings it will be ſufficient; then the cuttings ſhould be laid in the holes a little ſloping, afterward the earth ſhould be filled into the holes, and gently preſſed with the foot to the cuttings, and raiſed in a heap over them, ſo as juſt to cover the uppermoſt eyes of the cuttings; afterward lay a little mulch on the ſurface of the ground about the cuttings, to prevent the ſun and air from drying the earth, and if the ſpring ſhould prove very dry, they ſhould have ſome water once a week, which will be as often as the cuttings require it, for nothing will deſtroy them ſooner than too much water, which rots their bark, and deſtroys them. If theſe cuttings are well choſen, and the inſtructions here laid down duly obſerved, they will make ſtrong ſhoots the firſt ſummer, for I have frequently planted cuttings which have ſhot five feet in one year, but then I carefully rubbed off all the ſide dangling ſhoots as they were produced, and never permitted more than one ſhoot to remain on each cutting, which is what ſhould always be obſerved by thoſe who have the care of Vines. With this management there will be little hazard of the cuttings taking root, for in upwards of five hundred cuttings which I received from Italy, and which had been cut off from the Vines in the beginning of November, wrapped up in Moſs, and put on board the ſhip, (which did not arrive at the port of London until March, ſo that they were full four months cut off before they were planted,) there were not twenty of the number which failed, and many of them ſhot about ſix feet the firſt ſeaſon.

As I have directed the pruning of Vines to be performed in autumn (which is without diſpute the beſt ſeaſon for this work,) ſo in preſerving of the cuttings till the planting ſeaſon, I have adviſed them to be cut to their lengths, and their ends laid into the ground, and then covered with litter or Moſs to keep the air from them; but ſince I have found it a much better method not to ſhorten the ſhoots, from which the cuttings are to be made, but to lay their ends juſt into the ground, about two inches deep, and ſo leave them at full length, only obſerving to cover them with dry litter or Peas haulm in froſty dry weather, tho' in moiſt weather the covering ſhould not remain on, becauſe it would make the cuttings grow mouldy, which would greatly injure them. Then in the ſpring, when they are to be planted, they ſhould be taken out of the ground, and their upper part cut off, ſo as to reduce them to about fourteen inches in length, according to the diſtance of the buds or eyes; for thoſe cuttings whoſe buds grow pretty cloſe together, need not be left more than one foot long, but in others fourteen or ſixteen inches will be full ſhort. The leaving the upper part of the ſhoots on all the winter is of great ſervice to the cuttings, becauſe when they are cut off in autumn, the air penetrates the wounded part, and greatly injures the other eyes.

The management of theſe Vines, for the three firſt years after planting, being the ſame as is practiſed for thoſe againſt common walls, I ſhall not repeat it in this place, having fully treated of that already; only will obſerve, that during theſe three years, the Vines ſhould be encouraged as much as poſſible, and the ſhoots not left too long, nor too many in number on each root, that they may be duly ripened and prepared for bearing the fourth year, which is the ſooneſt they ſhould be forced; for when any ſorts of fruit-trees are forced by fire too young, they ſeldom continue long in health, ſo that what fruit they produce is ſmall, and not well-flavoured; therefore, in being over haſty to ſave a year or two, very often the whole deſign miſcarries; for unleſs the trees are in a proper condition to bear much fruit, it is not worth while to make fires for a ſmall quantity of ſtarved ill-taſted fruit,

fruit, the expence and trouble being the ſame for ten or twelve bunches of Grapes, as it will be for a hundred or more.

Theſe Vines ſhould not be forced every year, but with good management they may be forced every other year, though it would be better if it were done only every third year; therefore, in order to have a ſupply of fruit annually, there ſhould be a ſufficient quantity of walling built to contain as many Vines as will be neceſſary for two or three years, and by making the frames in front moveable, they may be ſhifted from one part of the wall to another, as the Vines are alternately forced; therefore I would adviſe about forty feet length of walling to be each year forced, which is as much as one fire will heat; and when the Vines are in full bearing, will ſupply a reaſonable quantity of Grapes for a middling family; but for great families, twice this length will not be too much.

In moſt places where theſe hot walls have been built, they are commonly planted with early kinds of Grapes, in order to have them early in the ſeaſon; but this I think is hardly worth the trouble, for it is but of little conſequence to have a few Grapes earlier by a month or ſix weeks, than thoſe againſt common walls, therefore I ſhould adviſe, whenever a perſon is willing to be at the expence of theſe walls, that they may be planted with ſome of the beſt kinds of Grapes, which rarely come to any perfection in this country without the aſſiſtance of ſome artificial heat, of which the following ſorts are the moſt valuable.

The Red Muſcat of Alexandria.
The White Muſcat of Alexandria.
The Red Frontinac.
The White Frontinac.
The Black Frontinac.

When the Vines which are planted againſt the hot walls are grown to full bearing, they muſt be pruned and managed after the ſame manner as hath been directed for thoſe againſt common walls, with this difference only, viz. that thoſe ſeaſons when they are not forced, the Vines ſhould be carefully managed in the ſummer for a ſupply of good wood, againſt the time of their being forced, ſo that it will be the better method to diveſt the Vines of their fruit, in order to encourage the wood; for as few of the ſorts will ripen without heat, it is not worth while to leave them on the Vines during the ſeaſon of reſting, except it be the common Frontinacs, which in a good ſeaſon will ripen without artificial heat, but even theſe, I would not adviſe many Grapes to be left on them during the years of their reſting; becauſe as the deſign of this is to encourage and ſtrengthen them, therefore all poſſible care ſhould be had that the young wood is not robbed by overbearing; for thoſe years when the Vines are forced, the joints of the young wood are generally drawn farther aſunder, than they ordinarily grow in the open air; ſo that when they are forced two or three years ſucceſſively, the Vines are ſo much exhauſted, as not to be recovered into a good bearing ſtate for ſome years, eſpecially if they are forced early in the ſeaſon; or where great care is not taken in the ſummer to let them have a proper ſhare of free air, to prevent their being drawn too much, and alſo to ripen their ſhoots. Thoſe years when the Vines are forced, the only care ſhould be to encourage the fruit, without having much regard to the wood, ſo that every ſhoot ſhould be pruned for fruit, and none of them ſhortened for a ſupply of young wood, becauſe they may be ſo managed by pruning in the years of their reſting, as to repleniſh the Vines with new wood. Thoſe Vines which are deſigned for forcing in the ſpring, ſhould be pruned early the autumn before, that the buds which are left on the ſhoots, may receive all poſſible nouriſhment from the root, and at the ſame time time the ſhoots ſhould be faſtened to the trellis in the order they are to lie; but the glaſſes ſhould not be placed before the Vines till about the middle or end of January, at which time alſo the fires muſt be lighted, for if they are forced too early in the year, they will begin to ſhoot before the weather will be warm enough to admit air to the Vines, which will cauſe the young ſhoots to draw out weak, and thereby their joints will be too far aſunder, ſo conſequently there will be fewer Grapes on them, and thoſe bunches which are produced will be ſmaller than when they have a ſufficient quantity of air admitted to them every day.

If the fires are made at the time before directed, the Vines will begin to ſhoot the middle or latter end of February, which will be ſix weeks earlier than they uſually come out againſt the common walls, ſo that by the time that other Vines are ſhooting, theſe will be in flower, which will be early enough to ripen any of theſe ſorts of Grapes perfectly well. The fires ſhould not be made very ſtrong in theſe walls, for if the air is heated to about ten degrees above the temperate point on the botanical thermometers, it will be ſufficiently warm to force out the ſhoots leiſurely, which is much better than to force them violently. Theſe fires ſhould not be continued all the day time, unleſs the weather ſhould prove very cold, and the ſun does not ſhine to warm the air, at which times it will be proper to have ſmall fires continued all the day; for where the walls are rightly contrived, a moderate fire made every evening, and continued till ten or eleven of the clock at night, will heat the wall, and warm the incloſed air to a proper temperature; and as theſe fires need not be continued longer than about the end of April (unleſs the ſpring ſhould prove very cold,) ſo the expence of fuel will not be very great, becauſe they may be contrived to burn either coal, wood, turf, or almoſt any other ſort of fuel; though where coal is to be had reaſonable, it makes the eveneſt and beſt fires, and will not require ſo much attendance.

When the Vines begin to ſhoot, they muſt be frequently looked over to faſten the new ſhoots to the trellis, and rub off all dangling ſhoots; in doing of which great care muſt be taken, for the ſhoots of theſe forced Vines are very tender, and very ſubject to break when any violence is offered. The ſhoots ſhould alſo be trained very regular, ſo as to lie as near as poſſible to the eſpalier, and at equal diſtances, that they may equally enjoy the benefit of the air and ſun, which is abſolutely neceſſary for the improvement of the fruit. When the Grapes are formed, the ſhoots ſhould be ſtopped at the ſecond joint beyond the fruit, that the nouriſhment may not be drawn away from the fruit in uſeleſs ſhoots, which muſt be avoided as much as poſſible in theſe forced Vines; upon which no uſeleſs wood ſhould be left, which will ſhade the fruit, and exclude the air from it by their leaves.

As the ſeaſon advances and the weather becomes warm, there ſhould be a proportionable ſhare of free air admitted to the Vines every day, which is abſolutely neceſſary to promote the growth of the fruit; but the glaſſes ſhould be ſhut cloſe every night, unleſs in very hot weather, otherwiſe the cold dews in the night will retard the growth of the fruit. The bunches of the White Frontinac ſhould alſo be carefully looked over, and the ſmall Grapes cut out with very narrow-pointed ſciſſars, in order to thin them, for theſe berries grow ſo cloſe together on the bunches, eſpecially the White Frontinac, that the moiſture is detained between them, which often occaſions their rotting, and the air being excluded from the middle of the bunches, the Grapes never ripen equally, which by this method may be remedied, if done in time; and as theſe Grapes are protected by the glaſſes from the blights which frequently take thoſe which are expoſed, there will be no hazard in thinning theſe Grapes ſoon after they are ſet, at which time it will be much eaſier to perform this operation, than when the Grapes are grown larger, and conſequently will be cloſer together; but in doing of this the bunches muſt not be roughly handled, for if the Grapes are the leaſt bruiſed, or the farina, which there naturally is upon them, be rubbed off, their ſkins will harden, and turn of a brown colour,

so the fruit will never thrive after; therefore the sciscars which are used for this purpose, should have very narrow points, that they may be more easily put between the Grapes without injuring the remaining ones. The other sorts of Grapes which I have recommended for these hot walls, do not produce their fruit so close together on the bunches, so they will not require this operation, unless by any accident they should receive a blight, which often occasions a great inequality in the size of the Grapes; which, whenever it thus happens, will require to be remedied by cutting off the small Grapes, that the bunches may ripen equally, and appear more sightly.

By the middle of June these Grapes will be almost full grown, therefore the glasses may be kept off continually in the day time, unless the season should prove very cold and wet, in which case they must be kept on, and only opened when the weather is favourable; for as the racy vinous flavour of these fruits is increased by a free air, so during the time of their ripening, they should have as large a share as the season will admit to be given them.

Before the Grapes begin to ripen, they must be carefully guarded against birds, wasps, and other insects, otherwise they will be destroyed in a short time: to prevent which, the Vines should be carefully covered with nets, so as to exclude the birds, who make great havock with the Grapes, by breaking their skins; and if there are a few twigs covered with birdlime placed here and there on the outside of the nets, it will be of service, because the birds are often so bold as to attempt to break the nets to get to the Grapes; which, if they attempt, they may be so entangled on these twigs, as not to get loose; and whenever that happens, they should not be disengaged, but suffered to remain to keep off their companions; and if they get off themselves, it will have the desired effect, for there will few other birds come to the same place that season, as I have more than once experienced.

As to the wasps, the best method is to hang up some phials about half filled with sugared water, and rub the necks of the phials with a little honey, which will draw all the wasps and flies to them, which, by attempting to get at the liquor, will fall into the phials and be drowned; these phials should be carefully looked over once in three or four days to take out the wasps and destroy them, and to replenish the phials with liquor. If this be duly observed, and the phials placed in time, before the Grapes are attacked, it will effectually prevent their being injured; but where these precautions are not taken, the Grapes will be in danger of being absolutely destroyed; for as these early Grapes will ripen long before any others against common walls, they will be in much more danger, there being no other fruit for them at that season in the neighbourhood; whereas, when Grapes in general begin to ripen, there is a quantity in almost every garden; so that if they destroy a part in each garden, yet there will be a greater chance to have some escape, than where there is only one wall for them to attack.

These sorts of Grapes being forced in the manner before directed, will begin to ripen early in August, especially the Black and Red Frontinacs, which will be fit for the table a fortnight earlier than the other sorts; but as the design of forcing them is to have them in as great perfection as possible in this climate, they should not be gathered until they are thorough ripe, for which reason some of the later sorts should be left on the Vines till September; but then the glasses should be kept over them in wet and cold weather to protect the fruit from it, but whenever the weather is fair, the glasses must be opened to let in the free air, otherwise the damps, arising from the earth at that season, will cause a mouldiness upon the Grapes, which will rot them; so that if the season should prove very cold and wet while the fruit are upon the Vines, it will be proper to make a small fire every night to dry off the damps, and prevent this injury. Most people in England gather their Grapes too soon, never suffering them to remain on the Vines to ripen perfectly, even in the warmest seasons, when, if they are left on till after Michaelmas, they will be good.

Of late years many persons have planted Grapes against espaliers, which in some places have succeeded very well in good seasons; but if they are not planted in a good soil and to a proper aspect, and the sorts rightly chosen, they seldom produce any fruit which are fit to be eaten. The soil proper to plant Vines in espaliers, should be the same as is hereafter directed for vineyards, viz. either a chalky or gravelly bottom, with about a foot and a half or two feet of light hazel earth on the top, a little sloping to the south or south east, that the wet may easily find a passage, so as not to remain on the ground. In such a soil situated to the sun, and screened from cold winds, there are several sorts of Grapes, which in warm seasons will ripen very well in England.

But there are some curious persons who line the back side of their espaliers with low Reed hedges, and others who do it with thin slit deals; both of which are a good defence to the Vines against blights in the spring, and accelerate the ripening of the Grapes, so that in tolerable seasons they will come to good maturity. Neither of these methods are very expensive, for these close fences need not be more than four feet high, because the Vines being to be managed after the same manner as those in vineyards, the branches which carry the fruit will never rise above that height; for the bearing shoots must always be trained about two feet above the surface of the ground, so that the fruit will be always below the top of the close fences; and as for the upright shoots, which are designed for the next year's bearing, it matters not how much they rise above the fence; so these may have a loose trellis, to which they may be fastened, to prevent their overhanging the fruit.

In the making of these kinds of close espaliers for Grapes, it will be proper to lay one strong oaken plank (such as are procured in breaking up old ships or barges,) next the surface of the ground, which will last many years sound, and be very useful in supporting the fences. If these planks are fifteen inches broad, as they may always be readily procured, and the upper part of the fence be Reeds, there may be two lengths cut out of them (provided the Reeds are of a due length,) without including their tops. In the front of these hedges should be a slight trellis to fasten the Vines to, which may be made of Ash poles. The upright poles of these trellisses need not be nearer together than eighteen inches; and if there are three cross poles, at about a foot asunder, they will be sufficient to fasten the bearing shoots of the Vines at proper distances in the manner they are designed to be trained, which should be in such positions, that the fruit may not be overshadowed by the branches; and if the upright poles are cut so long, as to be a foot and a half above the Reeds, they will be tall enough to support the upright shoots for the next year's bearing, which being trained singly at proper distances, will have the advantage of the sun and air to ripen the wood, much better than where four or five shoots are fastened to the same pole.

To this trellis the Reeds may be fastened with hoops on the back side, after the manner usually practised in making common Reed fences; and if on the top of the Reeds there is fastened a thin slip of deal, to secure their tops from being broken, it will preserve them a long time. In making of these fences, the Reeds should not be laid too thick, for that will not only be more expence, but will be troublesome to fasten, and not last so long as when they are made of a moderate thickness: therefore as the Reeds will be cut into two lengths, each bundle will spread about six feet in length, observing first to spread the bottom parts of the bundles, which contain the largest ends of the Reeds the whole length; and then the upper parts of the other Reeds should be reversed, and spread in front of them, which will make the upper part

part of the fence almoſt as thick as the bottom. But neither theſe, nor the boarded fences, need be made till the Vines are in full bearing, which will be the fourth or fifth year after planting, according to the progreſs they make; during which time the ſhoots may be ſupported by any common ſtakes, for if the fences are made before the Vines are planted, as is frequently practiſed, they will be half decayed by the time the Vines are fit to bear, and before this time the fences are of no uſe to them.

The ſorts of Grapes which are proper to plant againſt theſe fences are,

The Miller Grape.
The Chaſſelas White.
The White Muſcadine.
The Sweet Water, and
Le Cour Grape.

Theſe, if well managed, will ripen very well, provided the ſeaſon is tolerably good, and will come in ſoon after thoſe of the walls; ſo that if they are taken care of, by hanging of mats before them, when the nights prove cold in autumn, and are permitted to hang till October, the fruit will prove very good. But where the Sweet Water Grape is planted againſt theſe fences, they will require to be covered in the ſpring, at the time when they are in flower, if there ſhould be cold nights; otherwiſe the bunches will receive a blaſt, which will deſtroy the greateſt part of the Grapes, ſo that many times there will not be more than ſix or eight good Grapes on each bunch; and the others will be ſmall ſtarved fruit, hardly ſo large as the ſmalleſt Peas.

In planting of theſe Vines, either for open eſpaliers, or the cloſe fences, it ſhould be performed in the ſame manner as for walls; the cuttings ſhould be planted ſix feet aſunder; and as theſe are only deſigned for the table, a ſingle row of Vines of a moderate length will be ſufficient to ſupply a family, where there are others againſt walls to come before them. But where a perſon is inclinable to have more rows than one, they ſhould be placed at leaſt twelve feet aſunder, that they may equally enjoy the ſun and air.

As to the pruning and other management of theſe Vines, that being the ſame as for thoſe againſt walls, I ſhall not repeat it in this place, it being fully treated of before, and to which I have nothing here to add.

Having thus treated of the management of Vines againſt walls and eſpaliers, I come next to the culture of ſuch as are planted in vineyards; but as the number of thoſe in England is ſmall, and the experience of them not very great, I ſhall firſt ſubjoin an account of their planting and managing their vineyards in Italy and France, and then ſhall add ſome obſervations and experiments of my own upon this ſubject. And firſt I ſhall inſert a curious account of the method the Italians follow in planting their vineyards, and making their wine, which I received from an ingenious correſpondent in that country, who has ſome vineyards of his own, and hath been very exact in his obſervations upon the different methods now practiſed by the Italian in their vineyards, which is as follows.

*The method of managing their vineyards, and making their wines in Italy.*

1. As to the ſoil; next to that of Chianti, which is in a manner all rocky, they prefer that of the hilly parts of this country, which has a warm ſtony bottom, with a loamy ſuperficies; and next to that, ſuch as has a lime ſtone, or chalky bottom, with a reaſonably deep ſurface of any good earth; but in the plains, where the wines are nothing comparable to thoſe on the hills and mountains, they are forced to content themſelves with any tolerably good ſort of ground, that is neither ſandy nor light to exceſs; nor too clayey or binding, though a pretty ſtiff marl does well enough.

2. As to its expoſure, they chuſe one that is due ſouth, or that inclines to the weſt, rather than to the eaſt; and in the plains, they are obliged to be contented, as will be here related, with a north one for part of their vineyards; which they fence however, if not naturally covered with ſome wood or adjacent hill, with either a good hedge, or a ſtone wall, againſt the northern blaſts.

3. The manner of preparing the ground for planting differs according to the ſituation of it; being performed one way when on mountains, another when on more moderate hills, and a different in ſome reſpects, to that when on a plain or level.

In thoſe plains which are very mountainous and rocky, as alſo on hills, where the bottom of ſtone is found near the ſuperficies, and is hard, they with the help of proper inſtruments, or elſe with gunpowder, make a trench of four feet and a half wide, drawing it from eaſt to weſt (and though it may be near, yet always ſomewhat under the ſummit or top of the mountain, to be covered from the north wind thereby;) and with part of the ſtones which they raiſe out of the foundation, they make a dry wall, i. e. without mortar, juſt below the trench; about twelve feet below this they make a ſecond trench in like manner, levelling the ground between the trenches as well as they can, with mattocks, crows of iron, &c. and ſo proceed till they have finiſhed the whole ground they intend to plant.

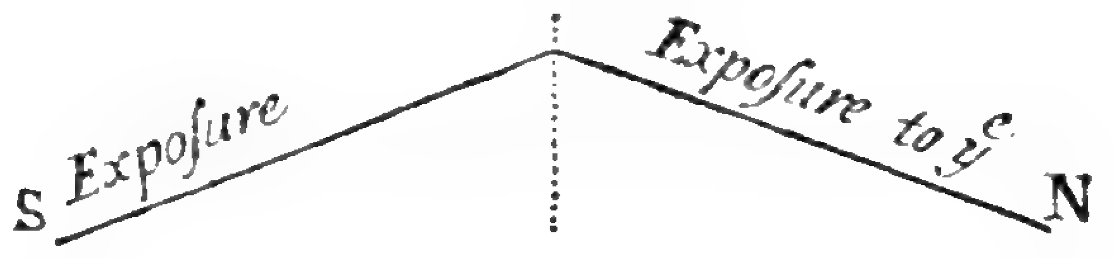
The uſe of theſe little walls is, to keep the little earth there is from being waſhed away by the impetuous rains, for the carrying off of which, they make proper channels at convenient places; ſo that the whole plantation at ſome diſtance, reſembles a regular magnificent pair of ſtairs. In which trenches, at about three feet diſtance one from the other, they plant the cuttings of Vines ſomewhat ſlanting, about the depth of two and a half, or near three feet; which being dreſſed as hereafter related, and when they come to their bearing, being kept of an equal height, make a moſt agreeable appearance.

When the ground is hilly, but not very mountainous, they dig a trench about four feet and a half deep, and three and a half wide; and then having thrown the earth to the northward, they make a ſecond, with the earth whereof they fill the firſt; and ſo on one under and cloſe to the other, till they have finiſhed the ground they would plant; the laſt ſerving for a ditch to carry the water off, into which, at proper diſtances, they alſo make little ditches to convey the water; and having ſo done, and thrown the earth taken out of the firſt trench on the trenched ground, and levelled it ſo as to give it an even proper declivity, they plant it with cuttings of Vines in quadrangles, or other manner, at the diſtance of about five feet and a half or more, as they think moſt proper for their ground; if ſtony in the manner before related, as practiſed in the mountains; but if not, then as they do it in the plains, as will be hereafter deſcribed.

When the vineyard is to be made on a plain or an exact level, having ſtaked the part out they deſign for walks, and laid out the diviſions they intend for Vines, their next care is, that each of them have a proper declivity, and that there be good drains to carry water off; in order to which, they make the firſt trench in the middle of the diviſion, extending from eaſt to weſt, of the depth of four feet and a half, and near four feet in breadth, throwing the earth taken out of it northward; then laying at the bottom ſtones, bruſhwood, bones, or almoſt any ſort of rubbiſh, to raiſe and drain it, they proceed to the ſecond trench, with the earth of which they fill the firſt, and ſo on, till they have finiſhed as far as the ſecond diviſion extends ſouthward, laying at the bottom of every trench ſuch rubbiſh as they can get; and then removing the earth taken out of the firſt trench over to the ſouth ſide already trenched, they proceed in the ſame manner on the north ſide, as far as the diviſion extends; when in the laſt trench there will naturally remain a ditch (the

ſide of which ſome very curious people wall with a dry wall) to carry off the water, whence they take care to make proper drains to carry it away.

This being done, they proceed to level this piece of ground, giving each ſide thereof its proper declivity; ſo that it ſomewhat reſembles a roof that is not ſteep, or as they here term it, a mule's back, bearing the following figure; and this they do to preſerve the

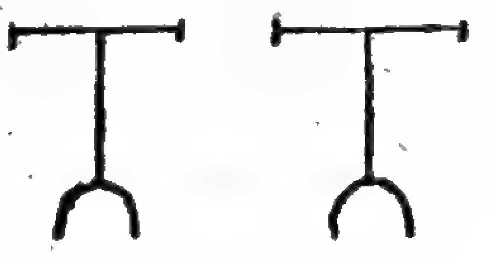



Vines they plant the longer, and to make them tender better wines, whilſt thoſe that are planted on the flat, and on the borders of ditches, where they are ſupported by a ſort of Poplar-trees, and ſerve for the diviſion of the Corn fields; though the Vines grow to a great thickneſs, and produce much fruit, yet they render a wine that is good for little, and the Vines will not laſt above thirty-five or forty years; whereas what is ſo planted, being tolerably well looked after, hold good for one hundred and forty, or one hundred and fifty, and in Chianti they will laſt above three hundred years, they there accounting thoſe of one hundred years old as young Vines.

N. B. *To defray in good part the charge of this expenſive culture, thoſe in the plains, the very firſt year, ſow a hole of Melons between Vine and Vine, which they make about ten inches diameter, and a foot deep, filling about three fourths of it with good macerated dung, and the reſt with fine good earth (of which that left by land floods is eſteemed the beſt,) in which they put about fifteen or twenty ſeeds; which being come up, before they put out the domeſtic leaf, they nip the tops of all but two, or at moſt three, of the ſtrongeſt plants, which they leave to bear fruit, and order accordingly. After which they plant Cauliflowers, or Broccoli of Cauliflowers; and this they alſo do in the hills ſo trenched; but in the mountains Melons do not well in the trenches; but Beet-root is often produced, and Cauliflowers.*

4. The ground being ſo ordered, where the vineyard is a plain, or on the hills, they proceed to mark it out with lines according to the diſtances they would plant at, endeavouring to do it in rows about three feet Vine from Vine, and about four or four and a half, from row to row; but for the moſt part in a quadrangular manner, at the diſtance of about four feet one from the other, drawing lines lengthways and athwart; in the croſs they plant the cut of a Vine in the following manner:

Having an iron crow of an inch or more diameter a little pointed at the end, they therewith make a hole directly down about three feet and a half deep; then being provided with an inſtrument they call a crucciolo, having a handle of wood like that of a large augur, and the body of iron four feet long, and more than half an inch in diameter, at the end of which there is a nich ſomething like a half moon, making this figure,



they, after twiſting the end of the cutting, put it therein, and force it down to the bottom of the hole, where they then leave it, and afterwards fill up the vacancy with fine ſifted earth or ſand, obſerving to tread the earth cloſe to the plants, which otherwiſe (unleſs it be ſtiff land) is often inclinable to be looſe and dry, eſpecially if rain does not ſoon follow their planting; and it is incredible how many Vines three perſons can in this manner plant in one day, viz. upwards of two thouſand.

As the cuttings are of a good length, there generally remain about two feet or more of them above the ground when planted, and ſometimes more. When, as it frequently happens, they find the earth ſhallow, ſo that in the trenching they arrive at prime rock, or a cold bleaky clay, at the depth of about three feet, and therefore they trench not lower, they plant the depth of two feet and a quarter, or two and a half, ſhallower than which they never plant, and even then, if the bottom be clay, they will do but little; and if rocky, are apt to ſuffer in the ſummer by dry hot weather, (though if once they ſtrike their roots in the rock, they do well enough,) and yield the beſt wine that is made in the plains; which however, though planted with the ſame ſort of Vines as thoſe of the mountains, and even of cuttings brought from thence, never produce near ſo good wines as thoſe that grow there, notwithſtanding the Grapes ripen three weeks, if not a month ſooner.

N. B. *This tillage and plantation is performed at any time between November and March, in dry, but not froſty weather; ſince then the frozen earth in working, being naturally thrown into the bottom of the trench, where the Vines are to make their principal roots, it retains ſuch a frigidity, that they will thrive but badly in it; which will be the caſe alſo, if the ground be laboured too wet; wherefore this trenching, or thorough tillage, is generally performed in February, after the ſeverity of the froſts is over, and may be planted at any time between that and April; whilſt, as for the cuttings, they are obſerved to do beſt when planted as ſoon as cut off in the dreſſing; but if that conveniency is not to be had, they may be brought from any reaſonable diſtance, their cut ends only being tied up, and covered from the air with Moſs, ſtraw, or the like; or if from a greater, with ſome earth about them, and may be kept, burying their cut ends in the ground, till ſuch time as they can be uſed; but juſt before this is done, it is proper to put them in water for twelve hours or more, ſince that will influence them to ſtrike root the better.*

*It is not of much importance that the cuttings be from the beſt ſort of Grapes; tho' that is beſt, if eaſily to be had, but may be from any Vines in the neighbourhood that thrive well; for afterwards, when they come to their bearing, you may with little trouble, ingraft them with cuttings from Vines of the ſorts you deſire, and theſe will bear ſome fruit the very year they are ingrafted, and moſt abundantly the next; beſides that, the foot of the Vine or ſtock will receive benefit by this operation.*

5. The plantation having been made in the manner before related, the firſt culture of it is performed different ways, which may be termed the old, and the modern.

According to the old way, above a month after the planting, when they begin to ſhoot, they cut off the tops of the plants juſt above the ſecond eye that is above the ground, and ſo let them remain, and ſhoot out at pleaſure; only after the Melons, &c. (which, as is ſaid before, are planted or raiſed in the vacancies) are gathered, they dig and ſow, at proper diſtances, the ground with Beans, Kidney-Beans, Turneps, Beets, or the like; and let the Vines ſhoot and grow at liberty till the third year, (that is, when they have been planted three years complete;) then opening the earth about each plant in March, or towards the beginning of April, to the depth of about a foot, they, with their hand, clear away the ſuperficial roots, and then throw in two handfuls of good half conſumed ſheeps dung, or elſe of Lupines that have been parboiled; after which with a ſharp inſtrument, (either a bill or a ſtrong pruning knife) and a ſteady hand, they cut off the head of the plant juſt below the loweſt ſhoot, which is ſometimes a finger or two under ground, rubbing the part cut over with ſome of the contiguous earth; and then, upon its ſhooting, take the principal ſhoot (gently cleaning away the reſt,) and fix it with a green Bulruſh to a ſmall ſtick, to keep it when tender from being broken by the winds, and ſo let it remain till the next dreſſing ſeaſon; when having pruned it, leaving but one eye, they put a ſtick that is ſomething more ſubſtantial, of between three or four feet long, to ſupport it from time to time, tying the ſhoot to it till the month of July, before

fore the entrance of the dog days, at which time they nip off the head of it, which checks its luxuriancy, and renders the fruit, which it will then begin to have in small bunches nine or ten Grapes each, better and larger, tying the remainder of the said shoot to the stick. In the next year they order it in the same manner; and so on till the seventh year after planting, when it begins to give fruit to purpose; and then at dressing they generally leave but one head on the most vigorous plants, and only two eyes on that, and stake them with substantial stakes of more than an inch diameter, and near six feet long; one of which, or more, go into the ground (of which those made of wild Chestnut, the coppices of which they cut once in seven or eight years, for resisting both wet and dry, are accounted the best;) and when they begin to shoot, they tie them to those with the small twigs of Broom or Osiers, and so visiting them frequently in the course of the summer, to keep them tied, as also to nip off luxuriant branches, they let them remain till the dog days are over, when they clear them of some of their leaves, that the fruit may ripen the better.

N. B. *In dressing them after the sixth year, if they have made more shoots than one, as most of them will have done, they, as before, cut them all away, unless they have occasion for them to supply the places of some contiguous plants that have miscarried; and in moist warm weather they lay those shoots down more than a foot under the ground, carrying the heads of them where they design, and this they term propagination. The best of the shoots that they cut off from their Vines of seven years old or older, they either reserve for any new plantations that they are to make, or to sell, at about nine-pence sterling per hundred.*

*In dressing from the seventh year forward, they reserve the lowest head they can, provided it be vigorous, and endeavour to keep their Vines as low as may be, for the fruit to enjoy the warm reflection of the earth after the sun beams are gone from it, to ripen it, and give it life and vigour; but not so as to let the ends of the bunches touch the ground, or be so near to it as that they might be dashed therewith by the rains, since that would be apt to rot the Grapes; whilst in Chianti (where the Vines, though most abundant in the product of their fruit, are not so lavish of their shoots, but are easily kept in good order, by a hand that is tolerably skilful) it is incredible how exactly even the Vines are kept, about the height of four feet from the ground, which contributes to the making the beautiful prospect before-mentioned.*

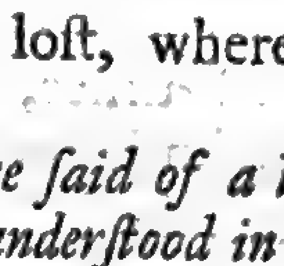
*The modern way is as follows:*

A month or thereabouts after planting, when the young plants begin to shoot, they prune them just above the first eye that remains out of the earth, whereat, when they (as they naturally will) have made their shoots, toward the beginning of June, and so that they can discern which of the several they put out are the strongest, and appear the most thriving, they carefully and gently with the thumb, rub off all of them except one, which they judge to be the strongest, and for the most part the nearest the ground; which diligence they renew every eight or ten days, or oftener, if the weather chance to be wet, taking away all the new shoots which they will abundantly make, ever leaving only the principal shoot; which, that it may not be prejudiced by the winds, or the feet of the people (who frequently, during the progress of the Melons sown between them, must go to nip off the running branches, and cultivate them, and who, at the same time, with great convenience, do this work about the Vines,) they gently tie, as soon as it is capable of it, to a small stick; and if, as it often happens, it proves very luxuriant, they nip off its top; and this rubbing off of the young shoots they continue till the month of October, (though unless there be frequent rains, there will, about the beginning of August, be few shoots to ease them of,) whilst sometimes the principal shoots will bear fruit in small bunches of five or six Grapes each; but as they are always late, they will not ripen; wherefore, that the strength of the plant may not be lessened or impaired thereby, they generally crop them off; after which they let the Vines remain till pretty early in the spring, when the intermediate crop of Cauliflowers, or Broccoli of Cauliflowers is taken off; then in the month of February, they open the earth about the foot of each plant, and clear it of its superficial roots, and manure it in the manner before described in the cultivation of those in the old way. The third year they dress the shoot so as to leave but one eye upon it, and afterwards digging all the ground in the intermediate spaces, to requite the expence of culture, they sow a sort of Kidney-beans, which not rising above a foot in height, or scarce so much, does not prejudice the young Vines; to which they now give somewhat more substantial sticks, whereto they continue to tie them, as also to rub off any new shoots that they make, visiting them for that end; as also to crop off all the lavish tops of the shoots, only three or four times in the summer; and the next year in dressing, they bestow substantial stakes on them, whereto they tie them with Broom twigs, or small Osiers when they begin to be in a pretty good state of bearing, producing two or three pretty large bunches of Grapes which (as those of the antecedent year) ripen well, but come not to be the full of their bearing till the fourth or fifth year; however, they anticipate those ordered the other way three or four years; and this is withal the surer way of the two, since in cutting off the heads of the others many are lost, whereas this way, few, if any fail.

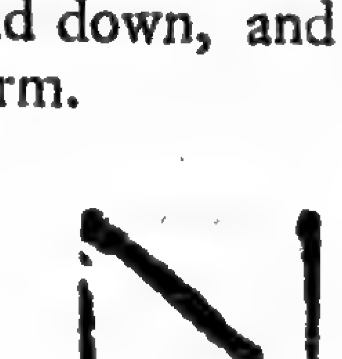
N. B. *What is before said of a Vine's coming to its full bearing, is only to be understood in respect to the quantity of the fruit, a little more or less; for as to the quality, it is generally esteemed to be meliorating till the twentieth year (being duly cultivated,) and the wines coming from it richer and better; and in Chianti they mix not with their best Grapes, those of the product of Vines of a less age than fifteen or sixteen years, and pretend they are always meliorating for fifty years.*

The Vines being by one or other of those methods, brought to a full bearing state, they must be annually dressed, according to the vigour of the plant, and duly staked.

In dressing, to those of moderate strength and vigour, they leave but one eye, or at most two; and to the most strong and vigorous, but three or four at the very most; and then they tie them not as they do when they are but one or two, but fixing another less substantial stick in the ground near the main one, to the top of which, for its better support, they tie it with an Osier; they bend down, and fix the head thereto in the following form.



And sometimes, when they find one of a very extraordinary vigour, and that has two good heads, they leave them both, and disposing of one in the manner just before related, to the other, having fixed another stick on the other side of the principal stake, and tied it, they in the like manner bend down to tie thereto, when it comes to form the following figure.



This done, they continue from time to time to bind the new shoots to the stakes, and to nip off the tops of them, when too luxuriant, till towards the time of ripening. When the dog days are past, they disburden them of some of their leaves, to expose the fruit

then turning colour more to the sun, and to accelerate the ripening of it.

N. B. *What is said above in relation to the leaving more than one head, and the ordering thereof, only relates to such as are in vineyards on the plains and hills; for in the mountains, as their stakes are stronger and thicker, they affix some wood work to them; on which frame they run two and sometimes three heads, making the shape of a wheel.*

*Here also it may be proper to observe, That all landlords of vineyards, at letting them, ever reserve to themselves the privilege of visiting them at their pleasure, to see if they are duly dressed, and not more eyes left to a Vine than there ought to be; for it is possible, in three years time, only by pruning, to spoil the best vineyard that is, past almost the power of art to recover it, and at the same time make it yield much wine; for it is but leaving instead of one or two eyes, five or six; and of three or four, eight or nine, and it will be reduced unto so weak and exhausted a state, and the Vines so run into wood, that it will be past recovery; and the only method is to cut the Vines down a foot of six inches under ground, and rear up a new shoot, which, besides the time that will be lost in so doing, will hardly after all, prove effectual. And this manner of pernicious pruning the Italians call a lascia podera, which in English, is quit farm, which is a proper term enough.*

As for the time of dressing Vines, if it may properly be so called, there is nothing wherein those people differ more, some performing it immediately after the Grapes are gathered, as in Carignano and Val d'Arno; others do it at all times, as their conveniency permits, and if the season is mild and open (leaving their youngest Vines till the last,) from November to March; and in Chianti, as the region is colder, and their Vines late to move, they do it late in the month of March, and even to the beginning of April; others again do it at twice, in November, when they leave an eye extraordinary, and in March they cut off that extraordinary eye, which last method seems to be the best; though, to have cuttings for a new plantation, it can only properly be done in February or March.

As to sowing in their vineyards, they also differ as much. In Chianti they leave a space of about three feet from their Vines, from thence to the low wall, many sow Wheat; and though the soil seems to be little else but stones, and such as only can be worked by a mattock, yet it bears prodigious crops, thirteen or twenty for one. Others again, in that space, will only sow the low sorts of Kidney-beans, Lentils, and such low plants, and others again will not sow any, the least thing at all, as in the general they do not in the vineyards on the hills, but in the plains, after the heads of their Vines are risen so high, as to be higher than the tops of Beans, they make no difficulty between every row of Vines, to sow a row of them, as the most scrupulous do not, to sow late in April a row of low Kidney-beans; whilst some of late, laying two rows of Vines into one, whereof with strong stakes and canes they make a sort of espaliers, and in the middle, (that is between row and row,) being near four feet from each, plant a row of Artichokes, which they say, being well dug in their proper seasons, part of the nourishment going to the Vines, does them more good than harm.

As for the season of digging their vineyards, they all agree that the later it is done in the year, the better it is; wherefore, in the places where they sow nothing, they let that work alone till the latter end of April, or beginning of May, when according to the nature of the ground, they do it with a spade or mattock. And again, the more especially to kill the weeds, and forward the ripening of the plants, they stir it with a strong hoe or mattock, and when they can, with a spade in the dog days; but in so doing they take a most particular care that they touch not any of the roots of the Vines, for that, if it d d not kill them, would at least make them wither, and spoil their fruit.

6. As for manuring their vineyards in all parts, when they are in a bearing condition, they practise it but once in five or six years, when they open the earth about the roots, and taking away the small ones, which they may have made towards the superficies, they throw in a handful or two of sheeps dung, or of that of goats or deer, for if any of these are not easily or in sufficient quantity to be had, then of parboiled Lupines, which, although agreeable to the Vine, yet being of little substance, must be the oftener repeated, every three years at least, when they cover it again; and this they perform in the months of October and November, that the winter rains falling thereon, may make it descend to the utmost fibres of the roots, and afford them nourishment.

7. The season for gathering the Grapes, and making the vintage, is very uncertain, depending upon the weather that has been the preceding spring and summer, which makes it sooner or later fifteen or twenty days in Chianti. When the season has been good, they begin to cut their Grapes about Michaelmas, and in the plains a week or ten days sooner. In this they every where govern themselves according to the ripeness of their Grapes, and the prospect of the weather, aiming to have a perfect dry season to do it in.

8. The Grapes being of a due ripeness, and the weather warm and dry, as soon as the sun or wind has dried up the dew that was on them, they cut them and put them into piggins, and carry them, if at a distance, on mules, or if near, between two men, to the wine vat, and then, either bruising them to mash in the said piggins with a club, throw them directly therein, or else into a thing resembling a very large hopper, with a grate lengthwise; then boards being placed over the vat, a lad with his feet treads them out, the juice, husks, stones, and stalks all passing through the grate into the vat, and so they continue to do till the vat (which usually contains from four to five tons, sometimes eight, ten, nay, as far as fifteen or twenty in some large vineyards, in which there are sometimes several of them) is full, when immediately, or sometimes in a few hours before they fill it, it will set a boiling, which raises the husks, stalks, and stones to the top, and these make a thick crust, and thus it continues boiling for many days, more or less, according to the strength of it, till it be fit to be drawn off, which is to be distinguished by the palate, wherein the greatest skill in making wine consists. The low wines of the plains are ready in about ten days, those of the hills in about fifteen, of the mountains of Chianti eighteen or twenty, and sometimes more; in the hastening or retarding whereof the weather has some share, so that when they are near ready, they taste them every eight hours.

N. B. *The more the wines boil, the drier they will be, the colour deeper, and the less, the sweeter and paler; and what is said above, is to be understood of red wines, which are the chief produce of this country, whilst to make their strong white wines or muscadines, they gather their Grapes carefully, and lay them three or four days or more in the sun, taking care to carry them within doors, or under shelters, in the night time, that so no dew may fall on them.*

*And when they are put into the vat, they let them boil but little, five or six days at most, and then put them into the cask, shifting them from one cask to another, twice or thrice to make them become fine; and for the Verdea or White Florence, as it is called, they draw it off from the vat almost as soon as it begins to boil, and has raised the crust, and then letting it boil in the cask into which they have drawn it, thirty-six hours, or at most two days, they shift it into another, and in a few hours into a third and fourth, to prevent and check the fermentation, which gives it the sweetness it has; but then it is never perfectly fine, though some people both in Italy and England, especially among the women, are very fond of it.*

N. B. *Those Grapes at the end of the bunches are weaker in quality, as well as less ripe, than those that grow nigher to the stalk, and therefore some extreme curious persons,*

*persons, to make a small quantity of very choice wines, cut them off and make a wine by itself, which is much inferior to that which is made of the upper part of the bunch. This practice, though attended with trouble, may be recommended for a larger parcel, in such years as the Grapes are hardly ripe, to have some wine, at least, in perfection.*

N. B. *Those persons who value themselves on making the best wines, and endeavour to keep up the reputation of their vineyards and cellars, in cutting their Grapes, leave the unripe, or those that are infected with a rottenness, together, till the last, and with them make a vat or more, by themselves of vin scauro, or refuse wine, which serves for common use, for which also they mix water with the bottom of their vats, and the husks, &c. and make a pleasant brisk drink much preferable to water cyder, but the weather once coming in warm, turns it eager and undrinkable.*

9. When the wines are found to be ready, they proceed to draw them off, which are now properly called wines (before which they are termed mosto, i. e. in English, wort,) for which purpose, within three or four inches of the bottom of the vat, there is a cock fixed therein. When in small barrels, they carry and put into the large butts, which in Chianti hold, some of them, seven or eight tons, but generally two or three tons, made of thick Chestnut, the staves being more than an inch and a half thick, and more than twice as high as they are long, which they never wash, but having left a gallon or two, it may be three or four, of wine in them, when they draw it off the spring or summer before, when they are about filling them again to clear them out, they send in a lad at the door, which is made in the head of the cask, to do it with a sponge, and to wash it with some new wine, and this without wiping off any of the argol, which they think preserves the wine the better. In which casks, which last many years, (and have argol in them of the thickness sometimes of three or four inches) they let them remain till they have an opportunity of selling them, taking care to keep them full quite to the bung with a wooden stopper. This is what they practise in Chianti, where the best wines are made, and whence, from those butts they are drawn into flasks, and carried at the expence of about a crown for a mule-load, to Florence, in order for exportation; but in other places they draw them off into less casks, of which wines, except some Carniguano's, and those of Val d'Arno, few or none are exported, but serve for the consumption of the country. Some of these have a pleasant flavour and briskness, though of no great body, many of which will not keep the summer over, except in cool cellars, in the places where made, such is the nice nature of this country wines in general. Nor are the choicest Chianti's exempt, for at two seasons of the year, the beginning of June and September, the one when the Grapes are in flower, and the other when they begin to ripen, some even of the best wines are apt to change, especially at this latter season; not that they turn eager, but take a most unpleasing taste, which renders them unfit not only for drinking, but even to make vinegar of, and is called the settembrine. And what is most strange, is, that one cask drawn out of the same vat shall be infected, and another not, but be perfectly good, and yet have both been kept in the same cellar too.

As this change happens not to wine in flasks, though that will turn eager, I am apt to attribute it to some fault in filling of the cask, which must always be kept full, which either by letting alone too long, till the decrease be too great, and the scum that there naturally is on all wine, thereby being too much dilated, is subject to break, or else being broken by hasty filling up, gives it that vile taste of a rotten Vine leaf.

But against this there is a very strong objection, that this defect seizes the wine at a particular season, in September, over which if it gets, it will hold good for many years.

As for the time that the wines are fit to drink, the poorer sort of people drink that of the plains almost as soon as drawn off, but from the 11th of November may be said to be its proper season.

Those of the hills are a very pleasant drink about Christmas, and during the spring, but till June the Chianti's are not esteemed to be fit for drinking, tho' they are fit for exportation in butts in December, and in the flasks and chests about the beginning of February; but if sooner shipped off in that manner, though apparently fine, there will be a sediment in the flasks.

The art of brewing wines (further than the throwing into each great butt the quantity of two or three hatfuls of the choicest Grapes they had preserved, and laid on mats in the sun for that purpose, which were picked from the stalks, and are esteemed proper for their wines to feed on, and which they call governo) was not known in Chianti (though the hosts here practised something like it, mixing the small wines of this country with the strong ones of other parts, and fining their white wines with isinglass, whites of eggs, lime, and the like, and were thought to put allum into the red wines to preserve them, and promote a thirst in their guests) till on the breaking out of the French war, an English merchant from Bourdeaux came into these parts, with a view to accommodate the wines which were made in the best parts of Chianti, and were naturally of a true bright ruby, with a pleasant flavour, and a silky softness, to the English palates, then in love with the deep-coloured rough clarets, who instructed them first in the making of black wines with a Labrusco or wild Grape, which, being mixed with the Chianti's, giving them a deeper colour and a rougher taste, and being liked in England, gave the first occasion to great quantities being sent thither every year in casks, in making of which the said gentleman was the first that instructed them, for before, their casks were, as above related, very unwieldy. This put them also (there being a demand for their wines) upon increasing and enlarging their cultivations, and making some of them in such places as the exposition was not very proper for, as also to cultivate in vineyards the said Labrusco or wild Grape, and which certainly was the most proper to mix with their other Grapes in the vat, boiling them together. So all succeeded pretty well till the year 1607, when the vintage proving very bad, and there being a great demand of their wines for England, by mixing the low wines with the high ones of Chianti, which that season were not very good, they brought these wines into such a disreputation, that they have never been able to regain their credit, though they have since, many times, had those that are good.

At present, therefore, what goes for England is chiefly in chests, and no more black wines, as used to be formerly, and these are sent just as they are made; but still in Chianti, as they have cultivations of the Brusco Grape (which however is much different from the wild one, and becomes much larger and more generous,) they continue to mix them with other Grapes, which gives the great colour as well as roughness to their wines, and is agreeable enough to the English taste.

Having thus acquainted you with what I know and can learn in relation to the making and managing of vineyards, and the wines they produce, it remains for me to add an evil, that besides the ordinary ones of hails, storms, and frosts, attends the cultivation of Vines in Chianti, and the parts contiguous, for in the plains there is no such thing, and that is a very small kind of blackish, or very dark green caterpillar, which in the month of May attacks the young shoots of the Vines, when the Grapes are in embryo, and destroys them; for which however they have a most certain remedy, which is to make a little ring of birdlime round the foot of each Vine, about eight inches above the ground, which none of these noxious insects (which I presume proceed from the earth, and are not brought in the air, as some of the like are thought to be, though these come generally with an

easterly

easterly dry wind) being able to pass, most effectually does the business; and as they in that region come almost every year, the trouble of so providing against them is become habitual to the cultivators.

*The manner of making wine in Champaign, and how it may be propagated in other provinces, to bring it to perfection.*

Wine is so delicate a liquor, and an aliment so proper to give strength, and to preserve health, if used with moderation, that one may very well wonder, that in most of the provinces of France, they make it with so much negligence in all those places, where it might be excellent.

The Champenois are exempted from this reproach, and whether it be from a delicacy of taste, or a desire of making an advantage of their wines, or a facility in rendering them better, they have been always more industrious to make them more exquisite, than those of the other provinces of the kingdom.

It is true, it is scarce eighty years since they have studied to make pale wine, which is very near white, but before, their red wine was made with more care and neatness, than any other of the wines of the kingdom.

I shall not enter upon the ancient or modern dispute, as to the preference between the wines of Champaign and Burgundy, but content myself with taking notice of all that the people of Champaign have invented to give the fineness and agreeableness to their wines; and by the observation that may be made therefrom, it will be easy to see that the same may be imitated in other provinces, so as to come pretty near that lightness and exquisiteness.

If these essays shall give hopes of success for the future, the wines of those provinces might be brought to perfection by degrees where they might be delicious, and where they are but poor, because they have never studied to give them that fineness.

In order to have the wine excellent, the Vines ought to be well exposed to the sun, especially to the south, and also on the decline, or in the manner of a little hill, rather than on the plain. Vines should be well chosen, and should be such as generally produce none but small black Grapes: the bottom of the soil should be good, a little stony, and not naturally moist. The grain of the soil of Champaign is very fine, and has a singular quality that is not found in other provinces.

As these kinds of lands are light, there is occasion to dung them from time to time, and to lay on new earth; but the dunging ought to be sparingly done, for too much of it will render the wine soft and insipid, and apt to be ropy; it ought to be commonly cow dung, because that is not so hot as horse dung. In strong lands it may be mingled with horse dung and sheeps dung, provided that the horse dung be so rotten, that it may be reduced to a powder, and that there be but one half as much as of the cow dung, otherwise it will burn the Vines. Let it be laid on a trench or pit, and mix one layer of dung and another of new earth, and let it lie and rot during a whole winter, and toward the month of February take from thence half a basket of every Vine, especially for each new plant, to help them to push forth. It is sufficient for a vineyard to be dunged once in eight or ten years, or an eighth or a tenth part every year.

After the dung has been carried, the Vines ought to be opened round about, and a little trench to be made round the foot of the Vine, in order to bury the dung at a proper time.

Divers persons leave it there many weeks before they bury it, but this is not the best way, for the air, the cold, or the sun, will be apt to dissipate the most subtile substance of it; but when it is neither too cold nor too hot, it may be left open eight or ten days to exhale its ill savour, especially the dung of sheep.

They give to a Vine four ordinary dressings, according to their seasons; but it is proper to take notice of one thing, which is scarcely observed in Champaign, which is, that they cut their Vines in the month of February, and even in January, instead of which they ought never to begin to cut them till after the 14th of February: when they are cut before, they push forth sooner, and are exposed to injury, and are sometimes killed, if any hoar frosts come presently after they have been cut; but when they stay till after the 14th of the month of February, there is no danger of their being injured by the frosts.

The covetousness of vignerons leave them to undertake the cultivation of more Vines than they well can manage, and for this reason they cut their Vines in January, which does an infinite injury to them, and to the greatest part of the plants, which they are sensible of for many years.

In Champaign they cultivate two sorts of Vines, which they call the high Vines and the low Vines. The high Vines are such as they leave to grow in those places that are less fine, to the height of four or five feet; the low Vines are those, which they do not suffer to grow above three feet high; these they inter, or ravale, according to the country term, every year, so as to leave but a little of the end to appear, which is repeated annually.

The high Vines produce plentifully, and give often seven or eight pieces of wine an arpent; the low Vines produce but little, but then the Vine is much more delicate; they often do not give above two pieces of wine an arpent, oftentimes less, seldom three, but much seldomer four.

In order that the wine may be the finer, all the wines which give the white Grapes must be taken away, and those also that give the large black Grapes, but one need not pluck these up, but graft them.

But sometimes these grafts will not succeed, which being observed, they must be plucked up, and new ones that have a root set in their room, which they chuse out of the nurseries, that are common in the country. They ordinarily purchase these plants for a pistole a thousand.

A private man that has a great many Vines, may make himself nurseries.

These plants that have a root are put into the earth, in the middle of a great hole about a foot deep, which they make with a stake, or strait mattock, or pickax, and these produce sooner than the others, which have no root. A plant that has a root begins to give wine a little the third year, indifferently the fourth and fifth, and in abundance in the following years, and so for above sixty years.

These new plants ought to be dunged the second year, and in the sixth year, and afterwards in the eighth and tenth as other Vines.

It will be to the purpose every year, to pull up part of the old plants, which take up room and produce little or nothing, and by this means a vineyard will be constantly renewed, as one may say, and in a perfect good condition.

When there are dews or humidities in May, June, and September, the vignerons must not be suffered to enter the vineyards in a morning, for the dews of these months are commonly very cold, if the sun do not draw them up, which burns the leaves of the Vines which are touched before they are drawn up.

It is very essential not to enter the vineyards at the time when there is hoar frost, or showers attended with frost, for this will certainly kill the Vines.

The vineyards must be weeded now and then, and if there be any beetles, which are pernicious animals to plants, they must be picked off and put into sacks, and burnt at some distance from the vineyard, and the ashes buried.

About the end of June, and also of the month of May, according as the vineyard is advanced, it is necessary to cut off the end of each twig, that the plant may grow no more in height, and that it may convey all its nourishment to the Grapes. It is enough, if it have two feet and a half, or three at most, above ground; all the rest is to be cut off, as must also the

tops

tops or ends of the young ſhoots, which proceed from the bottom or ſides of the ſtocks. This ought to be done twice, thrice, or four times in a ſummer, according as the Vines put forth, more or leſs in certain years.

In the ſpring ſeaſon they put a prop to every Vine to ſupport it; they ought to be choſen, as much as may be, of Oak, and to procure them of the quarter or heart thereof, if you are willing to go to the charge of it. Theſe will laſt above twenty years, and when they are once made ſharp, they will always keep ſo, for when they begin to rot, they periſh equally throughout, and remain always pointed. The other laſt ſcarce four or five years, and the maſters muſt have an eye over the ſervants when they ſharpen them yearly, that they do not cut them too much, and make them too ſhort, and that they do not break a great many that might ſerve; for oftentimes in cutting off that which is rotted, they cut off two or three inches of that which is ſound, which prejudices it as to duration. They call theſe props foot-props.

When a vineyard has been cultivated and managed during the ſummer after the accuſtomed manner, and the vintage time approaches, when they have made choice of, and prepared a new caſk that will contain it, and when the preſs has been waſhed, cleaned, and rubbed over, you muſt be very watchful to find when the Grapes are come to maturity, for if they are too ripe, the wine will not be ſufficiently ſtrong; if they are too green, it will be hard, more difficult, and longer before it is fit to be drank.

In the provinces of Languedoc and Provence, the Grapes have too large ſtones, they have too many white ones; they ſuffer them to be too ripe, which gives them over much liquor; they let their ſtocks grow to be too old, and do not renew them often enough; they are planted for the moſt part upon too good bottoms, or too moiſt, and have not an aſpect of the ſun good enough.

To make an excellent wine of the firſt preſſing, having firſt well examined the maturity of the Grapes, you ought to endeavour not to gather them but on days that are very dewy, and in hot years, after a little rain, when you can be ſo happy as to have it. As the Grapes are not ripe till toward the end of September, and ſometimes the beginning of October, dew is rarely wanted in vintage time. This dew gives the Grapes a flower or farina on the outſide, which they call azur, and inwardly a freſhneſs, which cauſes that it doth not heat very eaſily, and that the wine is not coloured.

It is very lucky, if there chances to be a miſty day in dry years, which now and then happens, for the wine is not only thence more white and delicate, but the quantity is by much the greater, being augmented by near one fourth part. A private perſon who has but twelve pieces of wine, in gathering his vintage in a morning which has the ſun without dew, will have ſixteen or ſeventeen, if the morning be miſty, and fourteen or fifteen if it has no miſt, but yet has a good dew; the reaſon of this is, that the dew, and above all, the miſt renders the Grapes tender, ſo that the whole in a manner turns into wine.

The wine produced from the Grapes that have not been warmed the moment they are cut, will ſtill remain much paler, whereas, when the ſun has warmed the ſubſtance of the Grape, it will become more red by the motion of the parts, but the quantity will be leſſened either by reaſon of tranſpiration, or becauſe the rind has been thickened and hardened by the ſun, whereby it yields its juice with more difficulty. This, which experience has taught, is of ſo much the more concern, by how much the more certain it is.

They agree in Champaign, that the wine which they call river wine, is ordinarily paler than that of the mountains, but they do not give the reaſon for it. I believe the vineyards that are near a river enjoy all the night a freſh air, which the river exhales, whereas the vineyards of mountains do not reſpire, during the night, that warmth which proceeds from the exhalations of the earth, and it is that which makes the colour more or leſs; alſo when the years are very hot, they cannot, either to thoſe of the rivers, or of the mountains, warrant the colour; and when the years are cold, neither the wines of the mountains nor thoſe of the rivers are coloured; the reaſon is the ſame, becauſe the wines of the rivers are more ſoft, forward, and ſooner fit for drinking, than the others that are harder, more heady, and later fit.

They gather not all the Grapes without diſtinction, neither at all hours in the day, but they chuſe the ripeſt and blueſt; thoſe are the beſt, and make the moſt exquiſite wine, whoſe berries grow not too cloſe together, but are a little ſeparated, whereby they ripen perfectly well, for thoſe that are cloſe joined together never ripen thoroughly; they cut them with a ſmall crooked knife, with as much neatneſs and as little of the tail as they can, and they lay them very gently on the baſkets, ſo as not to bruiſe one Grape.

With thirty Grape-gatherers they will run over a vineyard of thirty arpents in three or four hours, to make one firſt preſſing of ten or twelve pieces.

In wet years great care ſhould be taken not to put any Grapes that is ſpoiled into the baſkets, and at all times you muſt be very careful to cut away the rotten Grapes, or thoſe that are bruiſed, or quite dried up, but you muſt never pull them off the bunches.

They begin the gathering of Grapes half an hour after ſun-riſing, and if the ſun is not clouded, and is a little hot about nine or ten o'clock, they leave off gathering, and make their ſack, which is one of the firſt preſſing, becauſe after this hour the Grape being warm, the wine will be of a red colour or teint, and will be a long while very heady.

Upon theſe occaſions they get a great number of gatherers, to be able to make up a ſack for preſſing in two or three hours; if it be overcaſt, they may gather the whole day, becauſe the Grape will preſerve its freſhneſs upon the ſtock.

The gatherers and preſſers ought to take great care that the Grapes be neither foul nor heated when they are preſſed, and alſo that the Grapes have their flower under the preſs.

When the preſs is near the vineyard, it is eaſy to prevent the wine from having a colour, becauſe the Grapes may be carried gently and neatly in a little time; but when they are two or three leagues off, they being obliged to ſend the Grapes in caſks and in carts, to preſs it as ſoon as may be, it is hardly to be avoided but that the wine will be coloured, except in ſome very moiſt and cold years.

This is a certain principle, that when the Grapes are cut, the ſooner they are preſſed the more pale and delicate is the wine; for by how much the more wine ſtands upon the marc, the redder it is, ſo that it is of great importance to haſten the gathering of the Grapes and preſſing of them.

The preſſes of Champaign are very commodious. The particular perſons that have many vineyards of their own, have them in or near the ſame vineyards; in ſmall places the preſſes are bannaux, which are of different ſizes and faſhions. An exact deſcription of theſe ſeveral preſſes will be inſerted in the article of Wines.

The ſmall ones are about ſeven feet and a quarter, the middle ones about ten or twelve, the large ones fifteen or eighteen; the leaſt, which they call etiquets, coſt ſeven or eight hundred livres; the ſecond, which they call a cage or a teiſſons, about two thouſand franks; the large ones a thouſand crowns, and ſometimes more, according as the wood is cheaper or dearer in certain places. In Languedoc and Provence, where the wood is ſcarce, theſe ſorts of preſſes coſt a very great price, and but few perſons are in circumſtances to be at the charge of them.

When the Grapes have been put under the preſs, or on the marc, they put three great rods or poles of ten or twelve inches round upon them, one at either end in length, and the third in the middle on the

ſame ſide; theſe at the extremities ſerve to deſcribe the lines which they ought to follow with their cutting ſhovels in cutting the marc, the ſubſtance ſqueezed on two ſides; after the cut is made, they lay upon theſe poles and on the Grapes, planks of the ſize of the preſs; and upon theſe planks half beams of eight or nine inches ſquare, which they call moyaux, at a foot diſtance one from the other; they put four or five rows of theſe moyaux acroſs, one upon another, which elevate it with the bag about four or five feet, and they let down upon the whole three or four great beams of an immenſe weight, which are placed in the middle of the preſs acroſs, and borne up at one end by two ſtrong ſide beams, which are ſunk fifteen or twenty feet in the ground, and which are faſtened to the baſes which croſs them; at the other end there is a cage as they call it, or a wheel with a ſcrew, to raiſe or lower theſe great beams upon the moyaux, and thus to preſs the Grapes; then they preſently raiſe, by the means of a ſcrew, the end of the trees on the ſide of the wheel, or of the cage, which lowers the other end of the cheeks or ſide beams; then they drive with a great mallet two or four wooden quoins between the notch, which is in the ſide beams or cheeks; and theſe beams are alſo lowered to keep them in their poſition, and to prevent them from riſing: and after this they lower the other end by the aid of the ſcrew, which ſerves alſo to raiſe it.

They uſe in theſe preſſes large ſteel ſhovels, about a foot in breadth, and one and a half in depth, very heavy, and ſharp at the bottom, to cut the marc of the Grapes eaſily at the four ſides.

The firſt time they lower the great beams upon the Grapes, they call the wine that runs out, the wine of goute, becauſe it is the fineſt and moſt exquiſite in the Grape. This wine is very thin, and has not body enough: ſome call this firſt preſſing l'abaiſſement; this muſt be done with a great deal of dexterity and briſkneſs, that the beams may be raiſed immediately, to thruſt back to the middle inſtantly all the Grapes which are ſlipped to the ſides of the preſs, that they may be briſkly preſſed the ſecond or third time. They call theſe two other lowerings of the beams the firſt and ſecond cutting; they muſt be done in leſs than an hour, if you would have the wine very pale, becauſe time is not to be given the Grapes to heat, nor the liquor to remain upon the marc.

They ordinarily mix the wine of the abaiſſement, or firſt lowering, with that of the firſt and ſecond cut; and ſometimes, but very rarely, according as the years are more or leſs hot; and thence they call a wine of the firſt preſſing fine.

Some reſerve one or two carteaux of the firſt taſte, which is that of the firſt lowering, by itſelf; but it is too ſmall or thin, and has not a ſufficient body for keeping for tranſportation.

There are ſome ſkilful perſons who pretend, that the firſt lowerings of the wines ought not to be mixed but with thoſe of the firſt cut, becauſe that is much more delicate than that of the ſecond or third; and that beſides there is time enough to mix them afterwards, if they are found to be too thin and pale enough; and the rather becauſe there is no remedy, if it be done at the firſt.

At every cut they raiſe the great beams, and they take away all the moyaux with the planks, and the rods that are immediately on the Grapes, or upon the marc; with theſe ſteel cutting ſhovels they cut the marc on four ſides, and they caſt down with their wooden ſhovels that which is cut, and ſpread it even all over the ſquare, to the end that it may not diſperſe ſo eaſily, that is to ſay, in thoſe preſſes which they call etiquets; they take care, that the wheel which is upon the middle may be made to bear, eſpecially upon the rammer, over all the breadth, in ſuch manner that the bag may be equal.

Inſtead of the preſſes, a cage, or teiſſons, as the beams bear more upon the ſide of the wheel, than on the corners, there muſt needs be more of the marc when the bag is placed ſloping toward the wheel than toward the ſide of the quoins, it will be eaſily comprehended by viewing the deſcriptions of the different preſſes. It is alſo to be obſerved, that every time they cut the Grapes, or the marc, they raiſe up the bag, becauſe it has always a certain elevation, in ſuch ſort, that it is one third leſs at bottom than at the top.

The ſecond cut is more plentiful than the firſt lowering, and the firſt cut; becauſe the Grapes begin to be well bruiſed, and they do not ſlip ſo much to the ſides.

The wine ſtrains from the preſs into a puncheon having the head ſtaved out, or ſome other large veſſel prepared for the purpoſe, and ſunk into the ground on the foreſide to receive it; it appears at firſt drawing to be a little upon the red, but it loſes this little of its colour according as it is boiled, and as it clarifies itſelf in the tun; and it becomes perfectly white, eſpecially when they have preſſed the two firſt cuts with much diſpatch; but principally when they have gathered the Grapes during the dew, or in a ſhady time. Although theſe wines are white, they call them gray, becauſe they are made only of black Grapes.

If the year be hot, and the wine of the third cut has a colour, it muſt be mingled not with that of the foregoing, but with that of the fourth; and ſometimes, tho' very rarely, with that of the fifth. They are not in ſo much haſte for theſe cuts as for the firſt; they make an interval of a good half hour between the one and the other. The wine that comes thence has more of colour than this, which they call the partridge's eye, or the wine of the cut; it is a ſtrong wine, pleaſant, fine, good for an ordinary, but is better when it is old.

When the wine of the fourth cut is too deep, they do not mingle it with wine of the firſt or ſecond cut, but they obſerve to mingle it with wine of the fifth, ſixth, or ſeventh cut, which they call wine of the preſs, which is of a deep red, pretty hard, but fit for houſhold drinking; but when they are not in haſte, they leave an interval of an hour and a half between every one the three laſt cuts; as much to give time to the wine to ſtrain inſenſibly, as to give the preſſers time to ſleep or reſt themſelves, for the fatigue is very great, they being obliged to carry it on night and day for about three weeks. The preſſers of Champaign preſs the Grapes ſo hard, that after they have done, the marc is as hard as a ſtone; they put this marc into old caſks with the heads out, and they ſell it to people who draw from it an aqua vitæ of a very bad taſte, which they call aqua vitæ of Aixne; but it is good for a great many purpoſes.

Thoſe who have many vineyards alſo make two, three, or four firſt preſſings of the fine wine, by chuſing always the moſt delicate and ripeſt Grapes for their firſts; theſe are always much ſuperior the one to the other for goodneſs and price, ſo that if the wine of one of the firſt preſſings ſells for ſix hundred livres a queue, that of the ſecond will not ſell for above four hundred and fifty, and that of the third two hundred and fifty, although all the Vines are of one and the ſame vineyard.

In every firſt preſſing there are ordinarily two thirds of fine wine, one half third of wine of the cut, and one half third of the wine of the preſs; thus one cuvée of five or ſix pieces of wine, will conſiſt of nine or ten of fine, three or four of the taille, and two or three of the preſs.

Of the common black Grapes, which remain after the firſt, ſecond, or third cuvée, they make one with thoſe that are not very ripe, and which they call verderons, they make of the whole a wine pretty high-coloured, which they ſell to the country people, or that ſerves for their domeſtics; they alſo leave theſe Grapes two whole days in a great tub before they preſs them, to the end that the wine may be the redder; and they mix all that comes from the different tailles of this vintage together.

The

The white Grapes don't come into this cuvée; they leave them upon the stock till toward All Saints-day, or sometimes till toward the eighth or tenth of November, (at which time the mornings are cold) to make of it a vin bourra, as they call it, i. e. a new and sweet white wine that has not worked, which they sell while it is quite hot.

This wine is still the better when the Grapes have been pinched by the white frosts of October and November, or at least very cold mornings. A little rottenness in these Grapes does no harm; you need only take care to give the wine time to throw out the filth by the ferment, and purify.

This white wine may be mixed with the wine of the taille, if you please, when you have an opportunity of selling it presently after it is boiled. This makes a very good wine to drink, is pretty pale, and has a good body.

All these fine wines ought to be put into a new cask, as also should those of the taille; but the red wines, the green, and those of the press, may be put into an old cask, but it ought to be a very good one.

You must never rub the tuns over with brimstone, you should only wash them in common water a little while before they are filled, and give them time to drain well: some handfuls of flowers or Peach leaves may be mingled with the water, and they pretend that this will do the wine good.

In Champaign they rarely put it in any thing but pieces, cateaux and cades.

The river measure is different from that of the mountains: the pieces of the rivers contain about two hundred and ten Paris pints (a Paris pint is equal to an English quart;) the carteau a hundred and ten; the pieces of the mountains contain about two hundred and forty pints, at the least two hundred and thirty Paris measure; and the carteau a hundred and fifteen, or a hundred and twenty.

They mark regularly with chalk every piece, and every carteau, to denote the first, second, or third cuvée; the wine of the cutting of the press, the white wine, and the green; they also write the name of the vineyard from whence the Grapes came.

A few years since, some private persons in Champaign attempted to make wine as red as that of Burgundy; and they succeeded pretty well as to the colour: but in my opinion these sorts of wines do not come up to those of Burgundy, in that they are not so soft, nor so agreeable to the palate: nevertheless many persons call for these wines, and some esteem them the best.

And as those gray wines are a little fallen, there has been made some years past, a great deal of red Champaign. These wines do well for Flanders, where they are frequently sold for those of Burgundy.

Of all these wines, there is none better for health, nor more agreeable to the palate, than the gray wine of Champaign, of the colour of a partridge's eye, or the wines of the two first tailles of a first pressing in pretty hot years.

This wine has a body, a tartness, a headiness, a balsamickness or perfume, a quickness and delicateness, that exceeds all the most exquisite ones of Burgundy.

And that which should engage one to drink it, is its lightness, which makes it strain and pass quicker thro' the body than any other wine in the kingdom. It is a mistake to be of opinion, that the wine of Champaign can give the gout. I have scarce ever seen one gouty person in this whole province, and there need be no better proof.

To make good red wine in Champaign, the black Grapes ought to be gathered in the heat of the day; care is to be taken to chuse them well, and not to mingle with them the Grapes of the tall Vines, nor the green ones, or those that are partly rotten; to let them be two days in one tub, where the liquor grows red by the heat that it contracts there: some hours before it is put into the press, it ought to be trampled with the feet, and the juice to be mingled with the marc; without this the wine will not be of a sufficient redness. If it be let stand more than two days in the tub, it will taste too much of the stone. If it be mingled with the wine of the press, it will be too thick, too hard, and too unpleasant.

The wine of the first pressing being finished, and the vessels marked, they set them in a row in a cellar or court yard: those who have a great deal of wine and are good œconomists, take great care to gather the scum that comes out of every vessel, while the wines ferment, by the means of a kind of tin funnel, made bending downwards, which lets the scum fall into a wooden bowl, which is placed between two casks; they afterwards put these scums into the wines of the press, but nevertheless there are but few that use this piece of œconomy.

They let these gray wines stand to ferment in the casks ten or twelve days, because these wines throw out their ferment so much the more or less slowly, by how much they have more or less warmth, or as the years are more or less hot.

After the wine has done fermenting, they stop up the vessels at the great bung-hole, and leave on the foreside an opening, about the bigness of a French farthing, by which one may put in his finger; this they call le broqueleaur; and they stop this up ten or twelve days after, with a wooden peg, about two inches long, for the more readily taking it out, a d putting it in.

All the while the wines are fermenting, the vessels are to be kept full, to give them an opportunity of casting out all that is impure. In order for this, they must be filled up every two or three days, within a finger's breadth of the bung; after they have been bunged up, they must be filled up every eighth day, at the little hole, for the space of two or three weeks more; and after that, once a week for a month or two; and after that once in every two months, as long as the wine remains in the vault, if it be there for years.

When the wines have not body enough, or are too green, as it often happens in moist cold years, and when they have too much liquor, as in hot and dry years, three weeks after the wines have been made, hey must be rolled in the casks five or six turns to mix them well with the lees; and this must be continued every eight days for three or four weeeks. This mixing of the lee with the wine being repeated, will strengthen it, soften it, ripen it, render it more forward, and make it fit to drink in as short a time as if it had been transported from one place to another.

The wines must be let stand in the cellar till toward the 10th of April, when they carry them down into the vault; but as soon as it begins to be cold in autumn, they are to be carried up again into the cellar: it is of consequence to be observed upon this subject, that the wines ought always to be in cool places, and never to suffer heat; and as the vaults are cooler in summer, and warmer in winter than the external air, as soon as it begins to be hot, the wines must be carried down, whether they be in pieces or in bottles, into the vaults; and when it begins to be cold, they must be carried up into the cellar.

There has been nothing better invented and more useful, than the manner of drawing off wines. Certain experience convinces, that it is the lee that spoil wines; and that they are never better and more lively, than when they have been well drawn off; whether you would bottle it, or keep it in pieces, it ought always to be drawn off, out of one vessel into another, at least twice into another vessel well washed, leaving the lee in the former.

You should draw off the wines the first time towards the middle of December, the second towards the middle of February, and to fine them in March and April, eight days or thereabouts before you bottle it. For every piece of wine, you must have of isinglass, that is the whitest, of the weight of a crown of gold, weighing two deniers fifteen grains, or sixty-three grains. They take so many times the weight of a

crown of gold, as they have pieces of wine to draw off; they put this quantity of isinglass in one or two pints of the same wines, in a bucket, for a day or two, to give it time to dissolve; others put it in a glass, or a pint of water, according to the quantity, in order to hasten its dissolving, which is always difficult to be done; some mix it in a pint of spirit of wine, or excellent aqua vitæ. When the isinglass is grown soft, they beat it well to divide, and distribute it; then, when the parts begin to separate, they put in the bucket or vessel, in which this dissolution is made, so many pints of wine as they have casks or pieces to draw off; then they beat the isinglass again and pass it through a strainer, the holes of which should be very small; they often pour in of the same wine to dilute it well; and when there remains nothing in the strainer, they pass all the liquor over again through a linen cloth, and squeeze it very well; and afterwards they put one good pint or less into each cask, and half a pint into each carteau.

They stir the wine in the piece with a stick about the middle, without suffering the stick to go any lower. It is sufficient to stir the wine for the space of three or four minutes.

A certain private person has newly contrived a quicker method of dissolving this isinglass; after it has been steeped one day in water, he melts it in a skillet upon the fire, and reduces it to a ball, like a bit of paste, and afterwards put it into the wine, where it distributes itself with less difficulty. After what manner soever it is dissolved, care ought to be taken not to put in too much liquor, and not to put more than a proportionable quantity of water or wine to that of isinglass.

The isinglass works itself ordinarily in two or three days, though sometimes it does not clarify the wine in six or eight; but nevertheless, you must wait till the wine is clear before you change the vessel. In the winter the seasons are oftentimes so improper for this, that there is a necessity of putting isinglass a second time into the piece, but then you must not put in more than the quantity before mentioned; but when it freezes, or the weather is clear and cold, the wine will clarify itself perfectly well, and in fewer days; it has a colour more lively and brilliant, than when it is fined and drawn off in faint moist weather.

As soon as the wines are clear, they are to be drawn off, and the vessels changed. Four or five new casks are sufficient to draw off two or three hundred pieces of wine; for when they have emptied one piece, they take out the lee, and put it into the old casks, wash it, and it serves to draw off another into it.

Nothing is more curious than their contrivance in Champaign, to shift their wines without displacing their casks. They have a leathern pipe like a gut, four or five feet long, and about six or seven inches in circumference, well sewed with a double seam, that the wine may not run through; there is at both ends a cannon or pipe of wood, about ten or twelve inches long, and about six or seven in circumference at one end, and about four at the other; the great end of each pipe is set in a leathern pipe, and well bound with strong twine on the outside, that the wine may not run out; they take out the bung that is at the top of the tun that they would fill, and drive the wood of the pipe in with a wooden mallet, which they beat upon a sort of chin cloth, that is fixed to each of these pipes, which being fastened about two inches within an inch or less of the great end, and which loses itself insensibly in going towards the small end, they set a large siphon of metal below the cask they would empty, and also put into this siphon the small end of the other pipe of wood, which is fastened to the leather pipe, and afterwards open the siphon, and without the help of any person, almost the half of the full vessel passes into the empty one by the weight of the liquor; and when it is come near the level, and will run no longer, they have recourse to a kind of bellows of a very particular construction, to force the wine from the cask they would empty, to pass into that they would fill.

These kinds of bellows are about three feet long, and a foot and a half broad, and are made and shaped in the common manner to about four inches of the small end; but from this distance the bellows have three or four inches in breadth. In the inside of this place, the air passes only through one great hole of an inch bore: near this hole, on the side of the small end of the bellows, there is a piece of leather like a tongue or sucker of a pump, which is fastened there, and lies close against the side of the hole and the mouth, so that when the bellows is lifted up to take in the air, the air that has passed once through this hole, and has entered into the cask, cannot return back into the bellows, which takes not back a new air, but by those holes below to fill it again.

The end of the bellows is different from that of others, being closely shut up with a nozel of wood of a foot long, which is jointed in, glued, and very strongly fastened by good pegs at the end of the bellows, to conduct the air downwards. The nozel is round, and thick without, about nine or ten inches in circumference at the top, and diminished insensibly towards the small end, that it may enter conveniently into vessels by the bung-hole, and also to shut it up so close, that the air can neither get in nor out any way.

This nozel enters for this purpose two inches near the level at the end of the bellows, and is made in a half round at the top, that it may be beaten in with a wooden mallet, and forced into the cask; there is, about two fingers length below the upper end of this nozel, a hook or brace of iron of a foot long passing through an iron ring, which is fastened with nails to the nozel, in order by this hook to fasten the bellows to the hoops of the cask, without which the force of the air would drive the bellows out again by the bung-hole, and the operation of emptying the broached vessel would not be performed.

The mechanism of these bellows thus described, is easy to be conceived. The air enters by the holes below in the common manner; it advances toward the end, according to the degree that the bellows are pressed, there it meets with a pipe that causes it to descend downwards; but to hinder it from rising up again, as it would do, when the bellows were opened to give it a new air, there is in this space a sucker or tongue of leather, which, as has been said, is on the inside of the hole at about three or four inches from the end of the bellows, which shut up the hole according as you would have it take in again a new air; this new air pushes still gently, in pressing the bellows in the pipe, because this tongue opens according as it is forced by the air; thus there continually enter a new air into the cask, without being able to get out, because it finds itself close stopt by the same pipe that carries the air into it, and the tongue hinders it from getting out again.

The force of this air which continually pushes in, pressing strongly upon the bellows, presses equally the superficies of the wine over the whole length of the piece, without causing the least agitation in the wine; and the force causes it to pass down in the pipe of leather, from thence into the other cask that is to be filled, where it rises, because the air is driven toward the bung-hole, which is open.

The bellows push all the wine in the cask to about ten or twelve pints, or thereabouts, which is known when they perceive the wine to hiss in the siphon; at which time they take from the two casks, the two pipes that have been forced into them, and which are joined together by the leather pipe, and nimbly stop up the hole at the bottom of the piece with a bung of Oak made round, a little sloping, and drive it with a mallet; from the other cask, that has been emptied, they pull out the cannon or pipe of wood from the fountain of metal, and leave it to drain gently some pints of clear wine into a vessel that receives it.

They

They observe attentively every moment, in a clear glass, if the wine be neat; and when they perceive but the least thickness, without waiting till it appears foul, they stop the fountain, and take it away immediately, and turn out into a bucket that little wine that remains in the piece. That clear wine that has drained out of the fountain, they put into the cask that they have been filling; they use for this purpose a funnel of tin, the tail of which is about a foot long, to the end that the wine that passes through it, may not cause any agitation in that of the piece; and that there may not any filth pass into the wine, there is, toward the bottom of the funnel, a tin plate pierced through with small holes, which prevents any thing gross from passing through into the piece.

They put together into a separate cask, all the remainders of the empty pieces; presently after they have emptied one, which they do in less than half an hour, they wash it with a bucket of water, let it stand to drain some moments, and then fill it with another that is to be drawn off.

After the wine has been emptied out of one vessel into another the first time, they draw it off a second time, at the time we have before mentioned; sometimes they are obliged to do it a third time, to give it a lively colour, if it has it not already; but four days before they change the cask, they give it a frizure, as they call it, and put in it one third part of the ordinary quantity of isinglass.

The most experienced persons shift their fine wines out of one vessel into another, as often as they change the vault or its place, as well when they carry it down into the vault, as up into the cellar, according to the different seasons: I have known when, in four years time, they have drawn it off twelve or thirteen times; and they pretend, that this preserves and sustains the wine, and that it has been the finer and more delicate.

Their opinion is, that the wine is continually forming a fine lee, which gives it the colour; and that to preserve it of a good white, it must be often shifted out of one vessel into another, if it be not put into bottles; and that there is no reason to fear, that the wine will be weakened by this means, because the oftener it is removed, the oftener you give it new vigour, and the oftener it is drawn off, the more lively and brilliant is the colour.

And although I have said they should not brimstone their casks, they do not fail to use a match of brimstone the first time they change their vessels; they mingle a piece of thick linen cloth in the melted brimstone, and they cut off a bit for each cask of fine wine about the bigness of one's little finger, and one as big again for every piece of common wine; they light it, and put it under the bung of the piece they empty, before they have recourse to the bellows; according as the wine descends, it draws along with it a small scent of the brimstone, which is not very strong so as to make it perceivable, and that only leaves what will give it a liveliness of colour; the same may be done the second time, when they change the cask, if it has not taken the scent the first time, otherwise it ought to be drawn off the second time without a match, to cause it to lose the scent of the brimstone, which it ought never to have.

The wines that are thus clear and fine, keep very well in the cask for two or three years, and hold their goodness in the vaults and cellars, but especially the mountain wines that have a good body; those of the river lose their quality in wood, and they ought to be drank in the first and second year, or else they must be put into bottles. This wine will keep very well four, five, or six years in glass bottles.

The use of round bottles is very common in Champaign; they having plenty of wood in the province, have there set up very good glass-houses, which they seldom make use of but in making these bottles, which are about six inches high, and four or five in the neck. These bottles contain ordinarily a Paris pint, or half a glass less. They sell them commonly for twelve or fifteen franks a hundred. They have a certain quantity in every house. Before they enter upon a piece of wine to drink, they put it into bottles well washed and drained, in order to have the wine of one piece equally good.

When they have a mind to draw off a piece of wine into bottles, they put a little siphon of metal into the cask, which is bent downwards, to strain it into the bottle, under which there is a tub or bucket to catch the wine that shall run over. They stop up every bottle carefully with a good well chosen cork that is not worm eaten, but that is solid and close. These sorts of fine corks cost fifty or sixty sols a hundred. There cannot be too much care taken in the chusing corks, lest the wine spoil in some of the bottles, when the corks are defective; therefore great care should be taken in the chusing them, when you would draw off fine wines into bottles, whether it be for keeping, or to be sent abroad.

When bottles are used that have been made use of before, they should be washed with leaden shot, and a little water to fetch out the filth that shall remain on the bottom of the bottles; but it is much better in the room of them to use small nails, because they perfectly take off all that which sticks to the glass.

When all the bottles that suffice to empty one cask are filled, they tie the mouth of the bottle over to the neck with a strong packthread; and if it be a fine wine they commonly seal it with Spanish wax, that the wine may not be changed, nor the bottles by the domestics; and some persons have their coats of arms made on the bottles, which does not enhance the price above thirty sols per cent.

When all the bottles are well stopped, tied down, and sealed, they ought to be set in a vault or cellar, upon sand two or three fingers depth, and laid sideways, leaning against one another; when they are set upright, they form a white flower upon the wine at the top, in the small empty space that is between the top of the mouth of the bottle and the wine; for the bottles ought never to be be filled up to the top, but there must be left a small empty space of about half an inch, between the wine and the end of the cork.

If this was not done, the wine would set a working in the different seasons of the year, and break a great number of bottles; and it does, notwithstanding, break a great many, in spite of all the caution that can be taken, and more especially when the wine has a great deal of heat, or is a little tart.

In some years the wine grows ropy in the bottles even in the vaults, so as to rope when it is poured out as if it had oil, so that it cannot be drank. This is a malady that seizes the wine, that has stood several months without being removed from one place to another. If it be set in the air, it will lose more of its ropiness than it will if left in the vault. It will recover itself, if set in a very airy granary, better than it will oftentimes do in six months in a vault.

When one is obliged to drink a ropy wine, if he shake the bottle strongly for the space of half a quarter of an hour, and then uncork it immediately after he has done shaking it, the bottle being a little inclined on the side, will cast out presently half a glass of froth or scum, and the rest of the wine will be drinkable, whereas otherwise it would not be so.

For about forty years last past, the taste of the French has been determined for a frothy wine; and this they used to love, as one may say, even to distraction. They have begun a little to come off from that for some years past. Their sentiments are much divided as to the opinion of this kind of wine; some believe that it proceeds from the force of the drugs they put in it, which makes it froth so strongly; others attribute it to the tartness of the wines, because the greatest part that do froth are extremely tart; others attribute this effect to the moon, according to the times in which these wines are bottled.

It is true, there are a great many wine merchants, who, seeing the great fondness that there is for their frothy wines, oftentimes put in allum, spirit of wine, and pigeons dung, and a great many other drugs, to make it froth extremely; but it is certain by experience, that the wine froths when it is any time bottled from the vintage to the month of May. There are some who pretend that the nearer the vintage time the wine is produced when it is bottled, the more it froths. Many do not agree to this opinion, but nothing is more certain than that there is no time in which the wine froths more, than about the end of the second quarter of the month of March, and this always happens toward the holy week. There does not need any artifice at all, one may be always sure to have wine perfectly frothy, when it is bottled from the 10th to the 14th of the month of March; of this there is such reiterated experience, that it cannot be doubted.

It is good to know that the wine does not froth presently after it is put in bottles; it must be at least six weeks, and sometimes six months, before it froths well. If it is to be transported, you must give it near a month of the vault, especially in the summer, to recover its remove.

But as wines, especially the mountain wines, are not ordinarily bottled in the holy week, because they are then too green, or have too much hardness, especially if the year has been cold and moist, or too much liquor expressed, if the year has been hot, the most sure and advantageous way to have exquisite wine, that is perfectly frothy, is not to bottle it till the rise of the sap of August. It is certain by experience, that it froths excessively when it is bottled from the 10th to the 14th of August, and as it will then have lost the tartness or greenness of its liquor, one may be assured in bottles to have the ripest and most frothy wine.

There has been another experiment tried, which is, not to bottle the mountain wine till the holy week of the second year, that is, eighteen months after the vintage; and it has been found that it froths sufficiently, but less by half than that which has been bottled in the rising of the sap of March the year before.

It is not believed that the river wine, which has a less body than that of the mountains, can froth so much in the second year. When one would have wine that will not froth at all, it should be bottled in October or November, the year after the vintage; if it be bottled in June or July, it will froth slightly, though but a little, if any thing at all.

To find in the wine of Champaign all the merit that it ought to have, it should be taken out of the vault not above half a quarter of an hour before it is drank, and it must be put into a bucket, with two or three pounds of ice; the cork should be opened and put in again lightly, which, if it be not done, the wine will break the bottle, or will not grow cool, if it were not unstopped, and it would evaporate itself, if it remained quite open. When the bottle has been half a quarter of an hour in this ice, it must be taken out, because the ice would otherwise chill it too much, and make it lose its briskness. This wine will be excellently good, and of a delicious flavour, when it has been a little affected by the ice, but great care must be taken that it may not be either too much or too little.

As these wines, especially those of the same year, work continually in the vaults and cellars, and still more in bottles than in pieces, according to the different seasons, and the divers impressions of the air, it ought not to be surprising, if the same wine, especially the new, oftentimes appears different in taste. We find a wine potable in January and February, which will seem hard in March and April, because of the rising of the sap, which agitates it more; the same wine in June and July will appear entirely soft, and in August and September we shall find it hard again, which one shall not be able to perceive any thing of during the preceding months, because the rising of the sap in August will put the parts in a great motion. This effect motion will have on the river wines of the year, but oftentimes the wines of two years from the mountains will appear more mellow, more or less exquisite, more or less forward, according to the different motions it has received by the different impressions of the air, which will vary more sensibly in the different seasons of the year.

There ought to be a very great attention to keep the wine continually in cool places, for, as nothing does it more hurt than heat, it is of the greatest importance to have good cellars, and excellent vaults. No part of the world has so good vaults as those in Champaign, which is the reason it is so difficult to find any where else so good wines as those of this province.

Those who would lay up a stock of wine, and are able to keep it two or three years, or whose business it is to send it into other far distant provinces, or to foreign countries, ought to chuse the mountain wine; for as it has more body, it will better bear transportation than those of the river; and besides, the English, the Flemings, the Dutch, the Danes, and the Swedes, desire these strong wines that can bear the transportation, and hold good for two or three years, which the river wines will not do.

The most noble river wines are those of Auvillers, Ay, Epernay, Pierry, Cumieres; those of the mountain are, of Sillery, Verzenay, Taissy, Mailly, and above all, those of St. Thierry have the most reputation. The last has for a long time had the greatest name, and been the most called for, and one may venture to say, that it comes nothing behind the best wines of Champaign.

By all the observations which have been made on what is practised in this province, in cultivating and ordering the Vines, and in fining off the wines, in bottling and carrying them up and down into cellars and vaults, and from vaults to cellars, it will be found that even persons of good taste, in the provinces of Burgundy, Berry, Languedoc, and Provence, who are yet very curious and delicate in making wines, especially for their own tables, know not so well how to bring it to perfection, as those who are accustomed to make it in this province; for though their wines have not the tartness of those of Champaign, yet they are able to make them more clear, fine, and light. They might therefore try if they would not be preserved better in drawing them off from the lee, than in letting them lie on it, according to their usual custom, which some are of opinion is absolutely wrong. They should chuse and pick, in the fresh of the morning, their finest black Grapes, and those whose berries adhere the least together, because they are the ripest, and they should observe to leave as little stalk to them as may be; and with regard to pressing, in which they are usually faulty, they should immediately, as soon as carried, trample every load of Grapes successively as they are brought in, and collecting the first, must put it in new casks of a less size; and when they have finished treading the remainder of each carriage, they should put them into the common vat, but let them not remain there so many days as they are generally used to do, that so their common wines may be thinner, and less strong. By this management they might make four, five, or six pieces of fine wine, more or less, according as they shall find it good, and then they should take the same care, as has been said those of Champaign do; and if they would be content now with a less produce, they would have a far greater quantity the following years, and would be continually bringing it to a still greater perfection, as they improved more and more in experience. In those countries, where they can conveniently have presses, they should make them.

Their wines would be more delicate, more light, and less coloured, by this attention, and with half the fining, would be better for transportation, in drawing them

them from the lee, and especially if they are put into bottles.

All these observations which we have made, will be of great use to those persons who would improve their wines, or desire to drink delicious liquor; but such persons must remember that they ought, above all this, to study to have good vaults, and those which are coolest in the summer, and warmest in the winter, are ever the best.

It may seem to many persons in this country that we have been too prolix in the account we have given, but these observations are not designed for those who are acquainted with the practice already, but for such persons as are wholly ignorant of these things, and who are so far from taking any pains in the ordering their wines, that it is a pain to them to conceive the greatest part of those things which I have taken notice of to be necessary, and who cannot be persuaded but that they observed every thing requisite to the proper management of wines, as exactly as those of Champaign do.

They practise nothing in Champaign, which may not be perfectly imitated in other places; the drawing off the wines, the manner of fining them, and putting them in bottles, &c. is all equally possible, and also easy. Many persons might enrich themselves, if they would set themselves about it, with the help of these observations, and of those they might make themselves, to bring their wines to perfection, and instead of selling them for one or two sols per pot, as they ordinarily do, they might sell them for upward of eight or ten. They would have the satisfaction of augmenting their income, and see their wines sought after, and they would be able to sell them not only at home, but also to transport them into foreign countries, because their situation is more favourable to send them by sea, than that of the Champagnois, who are obliged to transport theirs upon waggons, and by rivers, into Germany, and the farthest parts of the north.

Perhaps some critics will object the difference of climates, which will not permit the same culture of the same plants, which, by their different qualities, require particular managements. This way of reasoning might have place, if I had pretended to speak to a people who studied to order the Vines with great attention, and to give them a fineness, but I have it chiefly in view, as I have had in collecting these different observations, to instruct those people who are entirely ignorant of the method used in those countries where they are accustomed to make excellent wines, as well by reason of the goodness of the lands, and the warmth of the climate, as by the industry of those who inhabit them.

In Champaign, where their Grapes do not ripen but with difficulty, because their country is cold, they make pale and white wines, the wines truly gray, which are a little coloured, and the velvet wines: Why cannot they make all these sorts of wines in Berry, in Burgundy, in Languedoc, in Provence, &c.? The warmth of the climate will not permit wines to be made perfectly white with black Grapes; they will have a little colour, and they will not thence be less exquisite than those they have made these fifty years in Champaign, and in the main are better in taste, and better for health, than those wines that are perfectly white, which cannot be used but after dinner.

*A dissertation on the situation of Burgundy, and the wines that it produces. By Mr. Arnoux.*

The town of Beaune is the center of Upper Burgundy; it is situate in a territory the most fertile and serene in France; it is all round encompassed with cities, among which is Autun the ancient capital of the Gauls, Dijon the capital of the duchy of Bourgogne, Nuis, St. Jean de Laune, Verdun, Seure or Bellegarde, Chalons on the Saone, Arnay le Duc, Sanlieu, Flavigny, and Semeur. Beaune is placed almost in the middle of these towns, which are not above eight, nine, twelve, twenty-one, or twenty-four miles at the farthest, to be as it were, a nurse to them all, in distributing plentifully amongst them the liquors which it produces.

All the learned are agreed unanimously that it is the ancient Bibracte, of which mention is made in Cæsar's Commentaries.

Cæsar, not having above two days provision for his army, and being not above thirteen miles at the most from Bibracte, the biggest, richest, and most fertile city of the Eduans, thought proper to march thither to procure provision for his troops, and that is the reason he quitted his way to Switzerland, and came to Bibracte. Com. Cæs. Lib. de Bel. Gal.

But to return to the town of Beaune: this town cannot pretend to glory in these ancient remains of antiquity, which the air consumes, and time reduces to dust; it only glories in its good wines, which every year bring to the citizens new riches. However, it has been within an age past a strong place, and is still surrounded with a large ditch, which runs into the river Burgoise; this takes its source at about half a mile from one of its hills; it is also encompassed with a rampart flanked with some towers, and five great bastions. The ditch which encompasses the town, is above a mile and a half in circumference; the citizens there enjoy almost continually a pure air, and a clear sky, being equally about a hundred leagues off from the Mediterranean and the ocean. The waters are, as one may say, in suspence, when it is about to determine its course. There is also a great body of water in its neighbourhood, which is seen in all the charts of France under the name of the Pond of long Extent. It is the opinion of some persons, that this partakes of the waters of both seas.

This town can count fourteen or fifteen thousand inhabitants, of which the fourth part are employed in cultivating the vineyards, and another fourth part in carelesly exercising some professions they are ignorant of, and the other half in enjoying the pleasure of a soft, idle, and delicious life. The gout and sickness are banished from these walls. From these hills, that produce such exquisite wines, issue out fountains of ice, and little rivers as clear as melted crystal. These waters issue out from the earth in a line opposite to the perpendicular, bubbling up, and pushing out of the earth on high globes of rock crystal, which keep their spherical figure, till they are at the superficies.

The hills of Upper Burgundy, which produce the wine, the only wine which one can or ought to call Burgundy wine, do not extend farther than from Dijon to Chalon, upon the Saone, yet we ought not to reckon these vineyards to be in perfection but from Chambertin to Chagni, about twenty-four miles in extent, for the Vines at Dijon and Chalons do not enjoy those climates which produce those wines that are fit to be transported into Great-Britain, the circles of the Empire, and the Low Countries, as those which are confined within the limits, that I shall mention as exactly as I can, without being apprehensive of passing under any censure upon this account.

The same row of hills in the same situation, and having the same aspect of the sun, extends itself almost as far as Lyons, and all those little mountains are wholly covered with Vines, but the lands are less fine, and less light at Chalons, heavier at Tornus, and coarser at Maçon. This alters the form of the productions of these little hillocks, which, notwithstanding they have the same arrangement, and the same situation, produce so different liquors.

All those little valleys are linked one to the other to the east aspect of the sun, and form the figure of an unbent bow, and have opposite to them a row of mountains of the like figure, but a great deal higher, which appear or seem to join them, although they may be fifteen, twenty, thirty, and some sixty leagues off, and forming an oval figure, contribute to make the

the finest prospect in the world. This oval must have more than one hundred and fifty leagues in circumference.

From these hills of Beaune all the opposite mountains are seen, and they are those of Switzerland, the Franche Comté, and Mount Jura, of which Cæsar speaks, at this time called Mount St. Claude, those of Savoy; beyond these is a frightful void, and of an immense length, and Mount St. Bernard rises into the clouds, always covered with snow in the most violent heats of the dog days; and although it be sixty-five leagues off from Beaune, it is seen distinctly without the help of any glass.

This perfect oval forms a plain of the same figure, to which these mountains that environ it, seem to serve for walls and ramparts; this vast plain is watered by the Saone, which he calls Alduasdubis in his Commentaties, which has its source at the foot of Mount Jura, passes by Besançon, and by Dole, and casts itself into the Saone at Verdun; there are also a thousand pretty rivers and streams, which, after many turnings and windings, lose themselves in the Saone.

This great plain, which is at the center of the continent, is so even, that the Saone which runs through it, by its gentle course deceives the eyes of those who look upon it, it being difficult to discover which way its stream glides. Cæsar himself was surprized at it, as he declares in lib. i. of his Commentaries.

The Saone is a river that separates the Eduani and Sequani, i. e. Bourgogne from the Franche Comté, and flows into the Rhone with an incredible gentleness, that one cannot distinguish by the eye which way its waters run.

This is a vast plain, so fertile and even, that all the kings of France are wont to assemble their armies there, when they have a mind to shew the encampment of all their troops to the queens, and the ladies of the court.

Behind the first row of hills that produce so good wines, there is nothing to be found but hills and valleys; the hills that are the least distant are all planted with vineyards, and these situations are called backward hills. In the hottest years, when the rains are less frequent, the Grapes there make a very good wine, but it never has the perfume of the wines produced by the forward hills.

The plain of this oval is in part covered with wines, fertile in all sorts of grain, embellished with vast meadows, where a thousand streams play in their different windings, adorned with fine forests inhabited with stags, wild boars, and above all, with roe bucks, which are there very delicious, and agreeably furnish the gentry with the divertisements of hunting.

A great part of these lands are planted with trees in form of orchards, which produce without culture excellent fruit, which, when they have been once grafted, it is enough, the sun and the earth do the rest. The Peach-trees, which throughout sympathize with the Vine, there make upon the banks a fair forest, and the branches of these trees grow thinly, and the leaves being narrow, they do not hinder the sun from darting his rays on the Grapes to ripen them; the Peaches which they produce are of a figure and a colour that would not anticipate one in their favour, nevertheless, when one has tasted of them, it seems to the palate to be a fruit made of wine and sugar.

It ought not to be forgotten, that when the sun is risen above the mountains of Savoy, there is a prospect of the hills of Burgundy, where it shines during the whole day, and in setting behind the hills of Beaune, parts its rays upon the mountains of the Franche Comté, which lie opposite to it, and there in going down, ripens very excellent wines, as those of Arbois, which are so well known throughout Europe for their excellent qualities.

Before I begin to speak of the quality of the wines of Beaune, it will be proper to give an account of the manner in which they there cultivate their vineyards, and make their wines, for although Burgundy, by the goodness of its soil, and its exposure to the rising sun, does naturally produce delicious Grapes, yet the manner of cultivating their Vines, and of making their wine, contributes much to its goodness.

During the winter the vignerons employ themselves in examining the earth of their vineyards, and by some loads of earth conveniently laid, which they carry thither, they fatten the places which appear to be worn out, and seem to require assistance to produce the better Grapes, which happens however but very seldom. But then they take notice of those places which are void of Vines, whether they are declining by age, or do not appear to promise Grapes, and they make large trenches from a foot and a half to two feet and a half long, and a foot deep. If the earth is too lean, they put in half a foot of good earth, and sometimes a little old well rotted dung, but generally speaking, they put in nothing at all, and taking one or two branches of a neighbouring Vine, they bend them down into each trench, and cover them afterwards entirely with the proper earth of the vineyard, in such manner, that you may see the two ends of the Vine branch bent come out of the earth; to wit, that by which it holds by the Vine, and that of the other end, which comes out of the trench, where they have bent it, about three or four fingers in length. They make a great many of these trenches in a vineyard, that they may be always supplied with young Vines that will produce a good plenty of Grapes, for it ought to be observed that this Vine branch bent down in a semicircle in this trench, which is a shoot of the preceding year, having its pores open, takes in two sorts of nourishment, the one from the Vine to which it is united, and the other from the trench in which it has been bent, in which it takes root. These are what they call provins or layers.

They produce abundance of Grapes, which are commonly first ripe, well nourished, large, and well relished, but their juice is not so good as that of the Grapes of the old Vine. The physical reason is, that the nourishing juice has not been so well filtred in passing through those layers, whose pores are very open, and in passing thro' the pores of the old Vine, whose pores are more close, and less spongy.

They dig with a spade the vineyard ordinarily three times a year, that is about the end of February, or the beginning of March, when they give it the first time, and it is in the month of March, or about the end of February, that they prune their vineyards.

And in this consists the address and skill of the vigneron, for he ought to make a right choice of those fine branches that he is to prune, and of the joint where he is cut the shoot, as well as that which he is to cut entirely off.

Observe what I have seen practised by the vignerons. Of four or five branches, the shoots of a year, belonging to the same stock or Vine, they leave but one or two of the best made, which they cut off to the third or fourth joint at most.

The same they practise on the Vines of the hills, which produce the finest wines, for as to the Vines on the backside, or of the plain, they cut them to the second or to the first knot, for these Vines put forth too many shoots; but, as this is an art of which it will be difficult to give the precepts, because the manner of cutting the Vines is different, according to the ground, the nature of the Vine, its quality, exposition, and nearness to the sun, I will go on with my dissertation.

When the Vine is cut, they place stakes or Vine props, to which, at the height of half a foot above the earth, they bind the branches of the Vines in a horizontal manner, and afterwards, when the buds or eyes are opened, and have put forth shoots in length about a foot and a half, they bind them to the props which sustain the branches and produce the fruit. These props are of the height of three or four feet, and the thickness of two inches; they are stuck into the ground without any arrangement or order, at the distance

diſtance of a foot more or leſs one from the other, according as the vineyard is more or leſs furniſhed with Vines.

Nevertheleſs, the end of the ſhoots which are there bound horizontally, as one may ſay, look all to the ſame ſide.

This manner of placing the props without order is of great conſequence, i. e. that one branch may not be covered by the ſhadow of another but as little time as may be, and that if the rot comes to ſome Grapes, they may not be able to communicate it to others. This manner is contrary to that of the Engliſh, who plant their Vines in rows, and thence it is that the one hinders the ſun from ſhining upon the other, and of conſequence, that hinders the ripening of the Grapes.

The moſt dangerous ſeaſon for the Vine is when there has been a north wind, which has cauſed a ſmall white froſt. If the ſun comes to appear in the morning, it dries and burns all the young leaves, the buds, and the Grapes, after the ſame manner as if fire had been there.

It is for this reaſon that the friars in Burgundy have recourſe to prayers at this time more than at any other, and that after calm and cold nights, the ſuperſtitious peaſants run to the churches, and ring the bells with all their might. Whether it be that they imagine that God has any regard to this work of religion, or that the agitation that they make in the air may, in ſome ſort, warm the air again, or change the wind, but however it be, they do at this time ring the bells with ſuch violence, that there is no ſleeping; during which times the prieſts and monks are buſy in reading in the churches the paſſion of our Saviour, according to the goſpel of St. John, and for this occupation they make a collection among all the preſſes at the time when they make their wine, and every vigneron is obliged to give them a certain quantity of wine, and that by an order of parliament at Dijon.

When the vineyard has eſcaped the danger of the froſt, they dig it again, and this they call biner, or the digging of the vineyard the ſecond time; after which the Grapes ſoon begin to flower, which ſpread a ſweet ſavour all over the country, and is the time when all the wines which are in the tuns in the vaults, though never ſo deep, if they are upon their lee, without having been drawn off or clarified, work, ferment, grow thick, and cover their ſuperficies with ſmall white flowers like ſnow; a thing difficult to be explained by philoſophers, in this queſtion in phyſics, when they demand, Utrum detur actio in diſtans?

It muſt be obſerved that all the Vines of the good hills of Burgundy paſs from their flowers to the Grape, that is to ſay, that the flower of the Grapes changes into berries in the ſpace of twenty-four hours; and if, during that time, there happens a cold fog, or a cold rain, their flowers, inſtead of turning to Grapes, fall, and the ſecond peril is no leſs dangerous than the firſt, when that happens. The term that they make uſe of to expreſs it, is to ſay the Vines are coulées, i. e. drop their Grapes.

At the end of June, or the beginning of July, is the time when the Vine changes from the flower to berries, after which the Vine has nothing to fear but the hail, or a too great drought. As ſoon as ever the vignerons ſee the leaſt cloud to riſe upon the horizon, and the air ſeems to threaten the leaſt ſtorm, they have recourſe to their prieſts, their bells, and their pater noſters, which they would not recite, but for fear that the people would riſe againſt them, if hail ſhould happen during that time that they were not at their prayers.

The reaſon that they are ſo much afraid of the hail in Burgundy is, becauſe the vintage is all the dependence of the inhabitants, and that the Grapes being ſmitten by this ſcourge, give to the wine, in ſome meaſure, the ſame taſte, and the ſame ſcent, which lightning ſpreads on the places where it falls, a ſcent which is impoſſible to take away.

As to drought it is not only to the bells, or to the prieſts that they have recourſe, but to one or two ſtone buſts in two villages about ſeven or eight miles from the town of Beaune, one of which idols is known and worſhipped under the name of St. Revereen, and the other under the name of St. Marguerite; they aſſemble together, and go in proceſſion to ſearch in triumph for this ſtone, which they carry ſolemnly to a church in the town. All the prieſts go in proceſſion, followed by the pariſhioners of which they are curées, and they offer their incenſe and prayers, rub their books and their chaplets againſt theſe extraordinary figures, and oftentimes it happens to rain in this conjuncture, which does not a little contribute to keep up this ſuperſtition of the people.

It is in July that they dig the vineyard the third time; this they call thirdling. There are many years in which they dig their vineyards the fourth time, and this is in the month of Auguſt that they give it this fourth digging, but they take great care to dig the fourth time when the ſeaſon is not too hot and dry, or on the contrary, to defend the Grapes from the heat of the ſun, they let the Graſs grow in the vineyards; this ſhades them, and hinders the vapours of the earth from burning the Grape.

A month before the vintage, the magiſtrates of Beaune, accompanied with many experienced judges, and perſons of probity, make three viſits to examine the maturity of the Grapes, and at this third viſit and examination they decide the day of gathering the vintage. No private perſon dares to cut in his own vineyard one ſingle baſket of Grapes, upon pain of confiſcation, and a conſiderable fine; for, if it were permitted to each particular perſon to gather his vintage according to his own fancy, and his particular opinion, and according to his taſte, there would be wines too green ſent abroad into other countries, to the diſhonour of Burgundy, and to the diſcredit of the wines.

And alſo for fear that any vapour ſhould ſpread itſelf over the vineyards, for fifteen days before the vintage, they take care not to burn any ſtraw or Hemp ſtalks in the ſtreets, leſt the ſmoke ſhould give any bad taſte to the Grapes.

The Grapes being come to maturity, the magiſtrates give notice a few days before by a trumpet to the town, of the time they have appointed and fixed for gathering the vintage. Volnet begins firſt, a day before Pomard, and afterwards all the little hills gather their vintage indifferently; for after the town of Beaune has gathered their vintage one ſingle day, the vintage is opened for all the other vineyards on the ſide of Burgundy. It will be ſeen by and by why Beaune decides the vintage of Volnet and Pomard. It will ſcarce be believed that all the hills from Chamberry to Chagny ſhould have their vintage gathered in the ſpace of four or five days, and alſo it is ſcarce credible, what a vaſt number of mountaineers from every part come to labour in this work.

They gather the vintage perhaps (and my conjecture is founded upon more than twenty-five vintages which I have ſeen made) more than two thouſand (queues) tuns of wine upon theſe hills, and the queue, which is always divided into two puncheons, ſometimes into four fuellettes, and very rarely into eight cabillons, contains five hundred bottles of wine, or, to ſpeak more exactly, four hundred and forty pints Paris meaſure.

It will be proper here to obſerve, that in this great extent the vineyards produce but one kind of Grapes, which they call Noirons; the berries of which are black when they are ripe, and quite round. The plain and the backſides produce only a ſort of Grape, of which the berries are bigger and a little longer, which they call Gamet.

Thoſe who would make excellent wines, never cut the Grapes till after the ſun has dried up the dew which has fallen in the night time; for this moiſtneſs, although it be but a rarefied air, cools the Grapes, which, being caſt into the firſt vat, ſuſpends, and often-

oftentimes hinders the fermentation. Those covetous persons who are more desirous of the quantity than the quality, use not these precautions; but on the other hand, those who would make excellent wines, do not put into the same vat any Grapes but those of the same Vine; but almost all the particular persons who have a hundred perches of vineyard in different cantons, mingle their Grapes the one with the other, because the strong helps the weak, and the good mends that which is worse, and in a word, that they may make the vat the larger. The choice of the cantons from whence the wine is produced, depends on the discernment that the commissioners ought to have, when they taste the wines they would send into other countries, and that which the English gentlemen ought to recommend to their commissioners who furnish them with wine for their drinking.

The Grapes, being put into the fermenting vat, throw up a great scum, which by the agitation, make to the ears a continual trembling, a little cluttering, and spread abroad such a scent, that is capable of intoxicating, and perfumes the houses, and spreads itself all over the town.

They do not let the Grapes lie still in the vat, they stir them and disturb them. The labourers trample them briskly three different times, for the space of two hours each time. And to give a clear idea of the manner of treating the Grapes in the vat, as soon as they begin to ferment in the vat, they tread them for two hours at the least; six hours after they tread them again for as long time as before; and six hours after that they tread them the third time; and after that they put them into the press.

It must be observed, that the Grapes of Volnet, of Pomard, and Beaune, being fermented in the vat in the field, cannot be let stand above twelve or eighteen hours there; those of Pomard a little less; those of Beaune so long, or a little longer, according to the delicateness of the ground, and the heat of the Grapes; for there are vineyards behind the hills of Beaune, the Grapes of which do not begin to ferment till after they have been eight or ten days in the vat.

Note farther, That to give a colour to the wine, depends on the time more or less that it is left in the vat. As for example, the wines of Volnet have the colour of a partridge's eye. This is the cause they do not leave the Grapes of this ground but a very little time in the vat; and if they should let them be there but a little longer than they ought, the wine would lose its delicacy, and would taste of the Grape stones or the stalks.

After the Grapes have been, according to their quality, more or less time in the vat, and have been trodden, there swims over a liquor they call surmou. The have casks of sixscore pots, or half hogsheads of sixty pots, ranged upon chantiers, or stillings for hogsheads, into which, by equal portions, they cast in this first running; and afterwards they put the Grapes that remain on the press, when the surmou has been drawn off; and when these have been well pressed, all the liquor that comes from them is equally distributed into those pieces where they have already put the unpressed wine: and then they open the press, and afterward with a planer, they cut the pressed mark three or four fingers thickness round about, and put the parings in the middle, and afterward press it again; then they cut it again, and press it a third time; and all the liquors of these different pressings are equally distributed into the tuns till they are full.

Upon which it ought to be observed, that the unpressed wine is the most light, delicate, and least coloured liquor; that which comes off the first cut of the press the most racy, and that which comes from the second and third cut of the press, is more hard, red, and green, so that these three sorts of qualities being united, make a wine much better, more durable, and finer coloured.

All these pieces or tuns being full, they leave the bung open, and the wine, in a fury, shakes and agitates itself in such a manner, that it sends all over the cellar, fumes that will intoxicate; and which are in such motion, that a lighted candle being carried thither will be extinguished: and if this wine be put in an essay and shaken a little with the hand, and you stop the neck with your thumb, the essay will break in a thousand pieces.

In Burgundy, that which they call an essay, is a little round bottle, in length about three or four inches, and about two in circumference, which grows less all of a sudden at the top, in order to form a little neck open, having a little rim to receive the wine and the cork.

The wine having cast its fire and scum out of the casks, eight days after they fill them up again, and stop them up with a Vine leaf, which they spread over the bung; and lest the vapours of the wine should move this leaf out of its place, they lay a little stone upon it to keep it down; because if they should put upon it a seal, or a bung, the wine not having air, would push the heads of the casks out. Five or six days after they seal it, and near the bung they bore a hole, and stop the hole which the gimlet has made in the tun with a little bit of round-pointed wood, which they call a faucet, which they take out from time to time to let the spirits evaporate; which precaution prevents the wine from bursting the vessel.

This is the time when at Beaune are to be seen the merchants from all the corners of Europe, who come to secure the best vats for their kings, princes, and masters.

The commissioners and their wine conners prove the wines, although they are not yet drinkable. The commissioners are the public managers, to which all those who would have the wines from Burgundy, address themselves either by letters, or in person. These are the judges, which, time out of mind, from father to son, have certain experience of all the vats, who know the climates, closes, and the cantons, from which they are produced, and all the good cellars; to whom it is sufficient to write for what quantity of wine one would have, and of what district or canton one would have it; and, provided they have the purchase money paid in the space of the current year, one may be sure to be well served.

These managers, having received all the commissions from private persons, go to the citizens, and fill their essays of the different vats which they find in good cellars; and with the tickets that they tie to the neck of every little bottle, or the name of the vat, with the quantity of the pieces of wine which they contain, they carry them to their houses, and let them be unstopped. They examine and attend them carefully, and by the different changes, taste, and colour, they see the future colours and qualities of the wine, that are in the tuns from which the essays are taken. They also make yet another proof with the wine which is in the essays; they take glasses, upon which they put a sinking paper, which they spread, and which juts out over the glasses, and press their finger to make a concavity, which may contain a fourth part of a glass of wine. The liquor passes by little and little, and filters through the paper, and drains drop by drop in an imperceptible manner into the glass which receives it. By the sight of the wine which passes thro' this paper, they make good conjectures, founded upon long experience, concerning the destinated taste, of the colour, and of the lastingness of the colour, of the wines they have proved.

The commissioners having made their purchases according to the order which they have received from their correspondents and merchants, they make preparations to send them according to their orders; and as to the price of the purchase, they cannot deceive any person without running great risques, for if they should make those who send for these wines pay more for them than they can buy them for in the cellar, they would expose themselves to hanging by an arret of the parliament of Burgundy, who have made a law for the ascertaining the fidelity of the commerce of

VIT

of those wines; which orders, that the commissioners shall take one sol per livre for as much as comes to sixty livres; and for what exceeds this sum, they shall not take more than six deniers per livre. Thus a private person who shall receive for six hundred livres of wine French money, shall pay three livres to the commissioner for what he shall have sent above sixty livres; and for the five hundred and forty which are over and above, for which he is to pay the commissioner, he shall not demand more than six deniers per livre, which will be the sum of twelve livres six sous; which being added to the three livres above, make the sum of fifteen livres ten sous; a sum which would amount to twelve or thirteen shillings, according to the exchange; and for this small profit, the commissioner is obliged to advance his money to the citizens of whom he buys the wines; and that too, when he does not receive his payment from the persons to whom they are sent, as it sometimes happens. And the commissioner that shall be convicted of taking more, whether by books or other proofs, will be punished as has been said above.

The commissioners having purchased and proved their wines according to the orders they have received, they cause the tuns be new hooped, and put bars surrounded with pins of wood of the Aspen-tree, and mark them with the town mark. And it ought to be observed, that no other country has a right to imitate or counterfeit their second hooping; and for the greater surety, they put upon each cask the fire mark, which is a B on the top, two inches in length, with the cypher of the year in which the casks were sent from Beaune to go to any other place.

These are the precautions that are taken in Beaune, by which the wines that come from thence cannot be mistaken; a caution otherwise not very necessary, since they manifest themselves so plainly by their delicacy and superiority above all the wines in the universe. They are besides very beneficial and proper to establish and preserve health; in this surpassing the wines of Champaign, which flatten the taste, and grate the palate; but which weaken and extenuate, enervate, and render dull, as one may say, the most healthful bodies; and which also, according to sad experience, and the writing of the learned, which I have read, breed the gravel, the gout, and the stone.

After having given an account of the situation of the town of Beaune, and the hills which produce the wines of Burgundy; after having related the manner of cultivating their vineyards, and of making their wine, of proving, chusing, and buying it, I shall next explain the different qualities of the wines which these divers hills produce; and in order to this, I shall divide what follows into three small articles, by treating first of the forward wines; secondly of the wines de garde, or for keeping; and thirdly, of white wines; and conclude in giving instructions for the different methods that are to be used in bringing the wines of Burgundy to London, and advise how the Beaune wine may be sent to London in bottles.

*The first article of the wines of primeur, or the forward wines.*

They call that wine of primeur, which will not keep good more than one year, or that can be kept but a few months of the second year.

The first wine of primeur grows at Volnet, which is a village situated about three miles from Beaune, upon a descent of a mile in height at least, and two miles in length on the side which is exposed to the rising sun. This village, as well as Pomard, have their dependence on the city of Beaune. Since the citizens have been their lords, as I have said before, these two plots of vineyards have been obliged to receive the law of their vintages from the magistrates and sages named for this purpose.

This hill produces the finest, most lively, and most delicate wine in Burgundy. The bunches of Grapes of the vineyards of Volnet are very small, as well as the berries. The branches rise scarce above three feet high, through the whole year. The Grapes of it are so delicate, that they will not bear the vat more than twelve, sixteen, or eighteen hours; for if they be suffered to stand longer, they would take the taste of the stalk.

This wine is in colour a little deeper than the eye of a partridge; it is full of fire, strong, and light; it is almost all spirit, and is in short, the most excellent of all Burgundy; which by reason of its violence, is not traded in, but its intoxicating quality is soon dissipated. The duration of the wine is from one vintage to another, though it perishes at the beginning of the dog days, after which it changes its colour, and is turned, but yet I doubt not but that it would keep longer in very cold vaults. The finest of their vats is drawn from a canton of vineyards that is called Champan.

Pomard is the second plot of vineyards of the primeur; it is situated between Volnet and Beaune, not quite so high as the first, and a little higher than Beaune. It produces a wine that has a little more body than the preceding, is of the colour of fire, and has a great deal of perfume and balsam; it will hold good some months longer than that of Volnet; it is more merchantable, and better for health; if it be kept above a year, it fattens, ropes, wastes, and becomes of the colour of the skin of an Onion. The best vat is that of Commeraine, which will sometimes keep eighteen months, but that is according as the year is.

The city of Beaune contains one very considerable plot of vineyards; it contains only four hills, which are about four miles in length from Pomard to Savigny. The first of these is called St. Desire, the second the Montée Rouge, the third Les Greves, and the fourth the Fountain of Marconney. These different soils produce wines which participate of those of Volnet and Pomard, without the faults of them; they have a little more colour, many good qualities, and lastingness.

The wines of Beaune last some more, and some less, but they do not last above two years; they are sweeter, more agreeable, and more merchantable, than the two preceding, and much better for health. The colour of these wines is not equal, because that depends much upon the manner of making them; or that they let it remain more or less hours in the vat, according as the climate is more or less delicate where it is made. There are in these four hills, certain inclosed cantons, which are in great reputation. The Feves, Cras, Greves, as also the king's inclosures, are very delicious.

Alosse is the fourth vineyard in the primeur; it is situated upon the declivity of a hill about three miles from Beaune. This valley is an ascent so gentle, that one can scarce perceive that one ascends, till one has come to the top of it. This little village produces wines of an extreme delicacy; they are less brisk than the former, but of a taste more flattering. The colour is a little more soft, and less sparkling, but fine; and like the hill that produces it, the wine is too little elevated, and too much declining; it partakes neither of the firmness, nor stiffness, of the wines of the height of the hills; it has all the tenderness, none of the hardness, and of consequence is subject, in a little while, to grow ropy, and to take the bad quality of sweetness; nevertheless, it is sent to foreign countries; but it requires much choice and judgment.

Pernand, which is between the last vineyard and the grand vineyard of Savigny, is of a greater extent, but is of small account, the wines not being very delicate. They are of the quality of the preceding vineyards, but harder and firmer, because they are produced upon a hill that is higher and steeper. There are some vats very delicious, and these go into other countries, but under the name of Beaune wine.

Chaſſagne is not very conſiderable for its extent, but is of great reputation for its wines. This, in my opinion, would be more fit for England, becauſe it would better bear carriage by land and ſea. It is extremely ſtrong, full of fire, and heady. It is commonly tart, which renders it more durable than the others; but if perſons have ſkill and leiſure to bottle it in the proper time, and to drink it when its tartneſs begins to fall, it is one of the nobleſt wines in the world. If I had the office of providing the king's wine, I would go into Burgundy to chuſe it; and in chuſing the wine of this climate, I ſhould be likely to ſucceed. This is the only wine that one may leave in bottles without fear of its growing ropy, changing its colour, growing eager, or turning. The longer you keep it, the better it is.

It is more balmy and nouriſhing, but nevertheleſs you may not preſcribe above three years for the bounds of its duration. It will be fit for drinking at the end of the ſecond year; ſometimes it laſts four years, when the vintage has been very good.

This is the rank of wines in the primeur, though its duration is a great deal longer.

Savigny is a great extent of ground between Beaune and Pernand, ſituated in a valley formed by the ſeparation of the two mountains. As the hills that compoſe this vineyard are open to the riſing ſun by a great ſpace, and as they are ſhut up as they approach to the ſetting ſide, they participate of the rays of the ſun obliquely, and on the other directly. This ſoil produces excellent ſtrong racy wines, which have both body and delicacy, when they have been drawn out into bottles; but they muſt be viſited now and then, ſo as not to let ſlip the time when they ſhould be drank. This would be a very good wine for England; it will keep as well, and better than Chaſſagne; it is not ſo delicate, nor ſo briſk, but it is more oily and very good for health.

Auxey is pretty near of the ſame ſituation, in a corner between two hills, which open themſelves to Muſſault, or as far as St. Romaines, where may be ſeen high mountains crowned with very high rocks. This vineyard produces wines more red and ſtrong than thoſe of Savigny, but they have not the reputation of them. Theſe wines have more body than the preceding, and ought to be the drink of all thoſe gentlemen that would not ſhorten their days by drinking thoſe heady ſparkling wines, an exceſs in which is ſo dangerous.

*The ſecond article, of the wines de garde, or thoſe which will keep a great while.*

Nuis is a very ſmall village, about nine miles from Beaune, in the road to Dijon. The territory of this village contains between four and five miles in extent. All thoſe gentlemen that love the moſt delicate and healthful drinks, have the wines of the hills of Nuis for their tables. Theſe wines are at firſt very rough, ſharp, and tart; they require to be kept till the ſecond, third, fourth, and fifth year; and when their roughneſs and hardneſs are gone, their tartneſs being fallen, there comes in their place a perfume and balmineſs very delicious; they are of a deep velvet colour, and yet neat and brilliant. Lewis XIV. drank no other wine.

The cloſe of Vogeot is ſituated a league from Nuis on the ſide of Dijon; it appertains entirely to the monks of the famous abbey of Citteux, built between the Saone and this hill. The wine which it produces, comes nearer to that of Chaſſagne than to any other; it is very excellent, and is drank in foreign countries.

Chambertin produces the moſt valuable wine of all Burgundy; it is ſituated between Dijon and Nuis, and contains the qualities of all the other wines without their faults. This is what one may forget without fear, I have drank it ſix years after it has been produced, and it poured troubled and thick into the glaſs, but grew clear immediately, and by its motion recovered its ſpirits, and a colour the moſt lively and neat; and they alſo ſell it as dear again as the other wines of Burgundy. It was ſold the laſt vintage for forty and forty-two pounds ſterling the chantier; when the wines of Volnet, Pomard, and Beaune, ſold for not above twenty pounds ſterling a queue, which contains, as I have ſaid before, four hundred and eighty Paris pints.

*The third article, of white wines.*

Before I begin to treat of white wine, it is proper to let you know, that it is made from a maſculine kind of Grape. This has two qualities, that the Grapes of the other colour have not. The firſt is this: That if the vinntage be late, and the white froſts and great cold come, it reſiſts the hoar froſt; while the black Grapes grow ſour, withered, and ſhrivel immediately.

The ſecond is, That as ſoon as theſe white Grapes are cut, they muſt be put into the preſs without entering the vat, and without being trod as the black Grapes are; for if they were put there, they would give only a livid, ruddy, yellowiſh liquor. I thought myſelf obliged to acquaint the public with that.

Muſſault is, after Beaune and Nuis, the largeſt vineyard of Burgundy in extent; its wines are generally approved in Germany, the Low Countries, and throughout all France. The wines which this ſoil produces in all hot and dry years, are delicious, ſparkling, agreeable, warm, and beneficial; they are not dear, and if they were well choſen, they would be a pleaſure to thoſe that drank them. When they are kept above a year and a half, they ſometimes grow yellow and eager.

Puligny is a vineyard next to Muſſault, but much more in the plains, which produces the beſt white wines. They are, within a very little, of the ſame quality with the wines of Muſſault, but their fame is not divulged, and the name is almoſt unknown.

Aloſſe, in which I have ſpoken in the article of the firſt wines, produces alſo excellent wines.

Morachet is a little plot of ground between Chaſſagne and Puligny in the plain, which is in the poſſeſſion of one vein of earth, which renders its ſoil wholly of the ſame kind. It produces a white wine the moſt curious and moſt delicious in France, and there is no wine of Cote Rotie, Muſcat, nor Frontignan, that equals it; it produces but a very ſmall quantity, and it ſells very dear; and, in order to have a ſmall quantity of it, it ought to be beſpoken a year before, becauſe this wine is always beſpoken before it is made; but great caution is to be taken not to be deceived, for the neighbouring vineyards of this cloſe partake a little of the quality, and oftentimes paſs for Morachet, and therefore it will be abſolutely neceſſary to have a faithful correſpondent. This wine has thoſe qualities that neither the Latin nor French tongue can expreſs. I have drank of it ſix or ſeven years old, and am not able to expreſs its delicacy and excellence.

I am now going to treat concerning all the vineyards of the Upper Burgundy. Thoſe who have paſſed the grand road that leads from Dijon to Lyons, the length of the hills, will do juſtice to my exactneſs, and I deſire thoſe that have not been there, to believe that this relation is agreeable to truth.

I have a hundred times heard boaſting of the wines of many hills near Auxerre, to which they give the name of the wine of Burgundy. It is true thoſe hills are in Burgundy, but they are ninety miles diſtant from the true hills, of which I ſpoke juſt now, which only produce theſe wines of Burgundy which are in reputation, and which they drink after two manners, by the noſe, and by the mouth, either both at once, or ſeparately; both at once in that when one drinks them, the pleaſure which he has in the ſmell, vies with the reliſh it has on the palate; and ſeparately, ſo that a perſon that has been uſed to drink it, may know whether it be the true Burgundy or not, by the ſmell,

or ſweet odour. The good taſters taſte it by their noſe, before they put it to their mouths; and all the other climates of Burgundy, as thoſe of Chablis and Auxerre, have no ſuch quality as the true wines of Burgundy have, although they are really made and produced there.

It remains for me to relate how theſe wines may be brought to England. It has always been the cuſtom to bring thoſe wines from Burgundy in their caſks; but as the carriage is long, and there is oftentimes a riſque run, ſo the carriers as well by land as by ſea, are not always faithful; for notwithſtanding all the precaution that can be taken to hinder them from drinking the wine, they will always find out ſtratagems to do it. If it be packed up in caſks with ſtraw and linen cloths, this is but a feeble obſtacle to their induſtry. And for all this precaution, if the caſk happens to leak by the way, this will be at the peril and loſe of the purchaſer. If theſe wines be put into double caſks, this precaution will have no better ſucceſs than the foregoing, and is expoſed to the ſame riſque; and the caſks of the beſt vintages are a great prejudice to the delicate wines, becauſe this gives the full ſcope to the ſpirits to evaporate, and of conſequence they will cauſe a great diminution of the quality of the wine.

It ought to be brought in bottles from Beaune to London: for this purpoſe, ſome agent who buys the wines by order of the perſon, ſhould be addreſſed to, to draw it out into bottles, and to ſend it in caſes to England. Theſe caſes being filled, need not be carried by land above ninety miles to Auxerre, where they may be embarked on the river Yone, which paſſes into the river Seine, and from thence to Paris, and afterwards to Rouen, where are veſſels which paſs very often to London.

The agents of Beaune would alſo be very well pleaſed to bottle the wine that they were ordered to buy, provided their correſpondents would give orders for enough to make a carriage. As for example; if two or three perſons would join to give orders for a thouſand bottles, this would be a complete carriage; and as thoſe of Volnet draw their wines into bottles at the end of December, a perſon that would have five hundred bottles of Chaſſagne or Nuis, ought to join with another that would have the like quantity. The agent might bottle up theſe wines a year after the vintage, either more or leſs, and the purchaſers might receive the wines of Burgundy exquiſite and delicious; and in like manner, all other wines that they have a mind to have. As to the price of the wines of Beaune, Volnet, Pomard, Chaſſagne, and Nuis, it is pretty near equal, or at moſt the difference is not very great. A queue of Volnet wine contains four hundred eighty Paris pints, which will make five hundred bottles, and will coſt in the country, ſome years ten, twelve, fourteen, or eighteen, and at moſt twenty pounds ſterling. The carriage may coſt to Calais twelve or thirteen livres, and afterward from Calais to London a very ſmall matter; ſo that taking the years one with another, the deareſt wines of Burgundy, except that of Chambertin, which is the deareſt, would ſcarce, in London, ſtand in fourteen or fifteen ſols a bottle, the cuſtoms not being reckoned in.

*The method of making wine in Provence.*

The delicateneſs of the taſte of Grapes is not always a certain proof of their goodneſs for making wine; it is not always with theſe Grapes, ſo agreeable to the taſte, that the beſt wines are made: we ſhould not be ſurpriſed, that our wines are not the moſt exquiſite, ſince we do not obſerve any rule in the choice of the Grapes, which ought to be done.

It is certain, that the juice of Grapes of different kinds, cannot but produce a confuſed mixture, which ſuffers divers alterations in the caſks, by the different fermentations, which the ſulphureous particles of the Grapes excite there; by which they ſuffer themſelves to be very eaſily opened at the approach of heat. This is what happens to wines which have been made of a mixture of many kinds of wild Grapes. Experience informs us, that wine drawn from ſuch Grapes is very ſubject to ferment and grow foul, as ſoon as the heats of the ſpring begin to approach; which does not happen in the winter, when the coldneſs of the air holds it, as it were, bound and embarraſſed by the ſulphureous particles of the wine. It is the ſame thing in the juice of the Grapes called Claretos, Plans, Eſtrans, Pignalets, &c. when they are mingled in too great a quantity with the others. The common fault of our wine is, that they cannot be kept the year throughout; they are apt to grow foul, or turn, as it is called, upon the leaſt tranſport.

The greateſt part of our citizens believe it to be the fault of the ſoil, principally the vineyards planted in the places where the bottom of the ſoil is plaſter or tranſparent ſtone, which is the caſe of all that extent of ground, which begins from R. P. Capucins, as far as Aguilles, which they commonly call Payblank, i. e. white country. But how many vineyards have we planted in different ſoils, that are ſubject to the ſame vice? It is generally agreed, that the ſoil which they call gris [gray,] is the beſt for vineyards; nevertheleſs it is found, that the quarter of Molieres, of Repentance de Barret, and of Montaguez, are not exempt from this vice. I am of opinion, that it proceeds from the mixture of too great a quantity of different ſorts of Grapes; I cannot deny, after experience, but the nature of the ſoil, the culture, and the dung they uſe, contributes very much to this vice, which is what I ſhall hereafter examine into.

Therefore it is neceſſary to know, what Grapes are fit to make good wine, that may be in a condition to be kept without being foul or turning, and how to make it.

It is very true, that a perſon cannot make from one vineyard a great quantity of wine, that ſhall be at the ſame time good in quality. A vineyard ought to be planted on thoſe high grounds or hills, which are expoſed either to the ſouth or ſouth weſt.

And the ſoil ought to be a ſort of brown, or approaching to it. Thoſe which we call Arpielo, Malauſene, and Saveon, are ſoils which are ſcarce proper to nouriſh ſtocks that will produce Grapes for making good wine. The vineyards which are round about the Peres Auguſtins Reformez, commonly called Saint Pierre, are planted in a ſoil of Saveon aforeſaid, very unfit for producing Grapes of a delicate reliſh, or for making good wine.

The entrance into the territory of Tholonet is, for the moſt part, a ſoil which our country people call Malauſene; and alſo the wines that they produce are none of the beſt.

Thoſe Grapes ought to be choſen, which grow upon ſtocks that are planted in a ſoil ſomewhat rocky.

As to the culture it is certain, that good wine cannot be drawn from Grapes that have too much nouriſhment, and of which the ſap has not attained the leaſt degree of concoction or ripeneſs.

Thoſe which we call Ollieros, which are commonly dunged, and which they cultivate with pains, give a great quantity of Grapes; but their great nouriſhment is an obſtacle to their making good wine. Thoſe which we call open vineyards, are to be preferred to them.

We ought to prefer the Grapes of old vineyards to thoſe of young ones. The proper vineyards for making good wine, are thoſe which have been planted twenty-five or thirty years; the older they are, the more proper they are for making good wine; and till the vineyard has been made ſeven or eight years, good wine ought not to be expected from it.

As to the choice of Grapes, we ought to mix ſome of the beſt ſorts that we have. Theſe kinds are, of the white Grapes, the Aragnan, Roudeillat, Paſeau Blanc, Eſtrani, Yni, and Aubré. Of the black, the Catalan, Bouteillan, Uni Negré. The muſt that is drawn from theſe Grapes ought to ferment in the vat

at least three weeks, when the husks must be separated from the must.

It ought to be noted, that the proportion which should be kept between the quantity of these kinds is different, according to the design which every one has of keeping these wines.

The black Grapes, and above all the Catalan, and the Boutellan, should make more than half the quantity of all the rest.

Those that desire to have a wine of a deeper red, should take a greater quantity of black Grapes, and ought to let them stand a longer time in the vat, if they have occasion to change the wine from time to time.

They make white wine of the Grapes they call Aubier, Uni, Roudeillat, Aragnan, Pignolet. If they would have wine proper to keep in the heat of summer, they ought to use none but Uni, Aubier, and Aragnan.

Nobody is ignorant, that we have wines made of but one species of Grapes; as that of Muscat wine, and claret: for the first they make use of Muscats, as well white as red; for the second, of the Grapes they call Clareto.

They keep these Grapes with us, during the whole winter, and some part of the spring, hanging upon a beam in a room. All sorts of Grapes are not fit for keeping; those kinds that are called Pendoulans, or Rin de panse, le Land de Poüerre, le Verdau, are the best for this purpose; the Aragnan and Estrani are so likewise; also the Clareto, Muscat, and red Uni; the Barbaroux, and the Espaguin, the Taulier, and the Roudeillat, will not keep so long. They ought to be gathered full ripe, and before the rains, and none to be chosen but those that grow upon old stocks.

They also preserve those Grapes to make what the Latins call Uvæ Passæ; not because dried in the sun, but because they are exposed to the sun hanging; they call them in French dried Grapes; the provincials call them Panses. They make use of none but Grapes called Rin de Panse or Pendulem, or of Rin Panse Muscat, to make the best Panse. They also make use of the Grapes which are called Aragnans, which is the most common Panse in the hottest places.

They also make use of the Grapes called Roudeillats, and the Plan Estrani. The Grape which we call the Land de Pouërre, is not made use of with us for this purpose, although I have been informed, that they are used in hot countries near the sea coasts. They make their Panses with us, after the following manner; they tie the Grapes in a string, and put them upon another string at both ends; then they plunge them into a boiling lye, in which they mingle a little oil, until the Grapes shrivel, and afterwards expose them to the sun for six or seven days; and then they lay them in rows in cases, pressing them gently.

Wine is different in virtue and delicacy of taste. The difference proceeds, for the most part, from the different natures of the Grapes with which it is made, the different degree of their maturity, and the diversity of the soil where the vineyards are planted; and also the different culture of the vineyards, and the preparation of the wine; to which may be added, the difference of the climates, according to the greater or lesser degree of heat.

The Romans, as we learn from Pliny, were very curious in searching after the most excellent wines: all their differences consisted in the places where they were made; as the Setinum, Cæcubum, Falernum, Gauranum, Faustianum, Albanum, Surrentinum, and Massicum, which were the most delicate wines of Italy in the time of Pliny. Among the wines of Greece, they esteemed the Maronean, Thasian, Cretan, Coan, Chian, Lesbian, Icarian, Sinyrean, &c. Their luxurious taste carried them in search of the wines of Asia, as that of Mount Libanus, and others, as may be seen in Pliny.

It is to be noted, that the Romans had their most excellent wines from Campania, which is now called Terre de Labour, a province of the kingdom of Naples. Those of the other parts of Italy did not come near these last in point of excellency. The Falernian, Gauranian, and Massic, were made from vineyards planted on the hill round about Mondragon, at the foot of which passes the river Garigliano, antiently called the Iris. The Cæcuban, which differs nothing from the Falernian but in age; (this is that which the Latins call the length of time which the wines are able to preserve their strength,) was produced in the Terre de Labour, as the Fundanum and Amyclum were near Gaeta, the Suessanum of Suessa Pometia, a maritime territory of the kingdom of Naples; the Colenum about the town of the Terre de Labour; and also many others, with which that province furnishes the city of Rome.

These wines, which are very excellent in their nature, acquired rather by age than by art, a degree of perfection to which none of the other common wines of Italy can attain.

The last, which the Greeks call Oligophora, and the Latins Tenuia and Paucifera, are very easily preserved by the cold, or rather by a fresh air, and grow eager by heat. Also those which the Greeks call Polyphora, Multifera, and Vinosa, become more vigorous and spirituous by the heat.

The Grapes of which the first are made, abound in crude phlegm; the sulphureous parts of the must are more dilated. The last, on the contrary, are drawn from Grapes that are more ripe; of which the must or the sulphureous parts which compose it, are concentred, and fixed by the evaporation of the humid parts which dilate it. To this may be added, the abundance of the sulphur of these last, which is the cause of the true strength of these wines; and it is by being opened that they acquire this spirituousness. It was only to procure this opening, that the ancients invented the preparing these wines in the manner I am going to express.

Pliny informs us, that in the year 633, from the foundation of Rome, they lodged their tuns full of wine in places covered, which were exposed to the north, such as we now call cellars.

On the contrary, those casks which were filled with vigorous and spirituous wine, such as Polyphorum, were set in an open place, and exposed to the rain and sun, and all the injuries of the weather. Those which contained wines of less strength, were kept under cover. Those which were full of a weak wine, were put into a hollow place and covered with earth.

Galen, in his book de Antidot. chap. 111. and in the Treatise of Vines, that is ascribed to him, remarks very much to the purpose, That the wines of the first order, or Polyphora, were preserved two or three years in these cold places; but if they let them lie there too long, they grew eager, if they did not remove them to warmer places, as they used to practise in Asia, before the Romans had any knowledge of it; and it was by this means that the people of Asia, as well as the Romans and Greeks, attained to the art of making wine keep so long.

The most ancient epocha of the preparation of these wines among the Romans (as Pliny says) was about the year of Rome 633. This author who lived a long time after in Vespasian's time, assures us, that these wines had been kept for the space of a hundred years, and that they grew thick to the consistence of honey, so that they could not be drank without mixing them with water.

He also adds, Quo generosius est vinum, eo majus vetustate crassescit, i. e. by how much more generous the wine is, by so much the more it grows thick by age. The same that is seen in our days in the Span sh wines.

This thickness of the wines, of which I am speaking, is less extraordinary than that of the wines of Asia, of which Galen speaks in his book of Respiration; which being inclosed in large flasks, and suspended near the fire of their chimnies, acquire by the evaporation

ration of the humidity, the hardness of salt. What Aristotle says of the wines of Arcadia, exposed to the fire and the smoke, is yet more surprising; Ita exsiccatur in utribus, ut derasum bibatur; i. e. so dried in the bottles, that it is scraped off to be drank. It was so solid, that they were forced to scrape the flasks to drink it, and could not drink it without diluting it with water.

The Romans prepared their wines after the following manner: they took the must that had run from the Grapes that had been trod; they put them into a wooden vat, of which the staves had been bound together by hoops, or flexible bands.

After the wine had been fermented all the time necessary for separating the grossest impurities, they drew it out of the vat to put it into the casks, where it continued to ferment; and to assist the depuration, they mingled as much plaster, or chalk, or clay, or powder of marble, or of pitch, or of salt, or of resin, or of lee of new wine, or of sea water, or of myrrh, or of aromatic herbs, as they judged necessary, every country having its particular mixture. And this is what the Latins call Conditura Vinorum.

They left the wine in the casks until the spring following; also many left them until the second or third year, according to the nature of the wine, and the country; afterwards they drew it out to put it into earthen vessels, which they did over on the inside with melted pitch, and marked on the outside the name of the place from whence the wine was made, and that of the Roman consuls, in whose consulate it was made. The Latins called this changing of the wine from casks to earthen vessels, Diffusio Vinorum, or Vina defundere.

They had two different sorts of vessels; the one the amphora, and the other the cadus. Pancirollus and others say, the amphora was of a square or cubic figure. As to the contents authors are not agreed, but most suppose they held about eighty pounds of liquor. This vessel was contracted at the neck. After it was filled with wine, they stopped the mouth close with cork. The cade was of the figure of a Pine Apple, which is supposed to contain half as much more as the amphora. These vessels being stopped, were carried into a room exposed to the south, situated in the highest story of the country-house where the wine had been prepared. This place was called apotheca.

It was to dissipate the superfluous humidity of the wine, that they exposed these vessels to the heat of the sun, and of that of the fire, and of the smoke, which has given to this place the name of Fumarium, because of the smoke which was gathered by the funnel, through which the smoke of the fire was carried off, when it was lighted below.

These wines could be kept for two hundred years, and would, as has been said, arrive at the consistence of honey, during which, Adhuc Vina ducentis fere annis jam in speciem redacta mellis asperi; etenim hæc natura vini in vetustate est, says Pliny, lib. xiv. cap. 4. So that it is troublesome to drink this wine because of its thickness, and in order to render it drinkable, they diluted it with warm water to give it a fluidity, and afterwards they passed it through a strainer, and this they called Saccatio Vinorum, as Martial says,

> Turbida solicito transmittere cæcuba sacco.

It is true, they had other wines of the same nature, which they did not pass through a strainer, as the Massicum, which they only exposed during a night to the air, to procure a fluidity and depuration, as Horace says, lib. ii. sat. 4.

> Massica si cœlo supponas vina sereno,
> Nocturna, si quid crassi est, tenuabitur aura,
> Et decedet odor nervis inimicus: at illa
> Integrum perdunt lino vitiata saporem.

This lukewarm wine had been very disagreeable to drink, if they had not cooled it with ice or snow, whether in mingling it with the wine, or setting the bottles in ice. The most luxurious mingled snow with the wine, and passed it through a silver strainer, which Paulus, the jurisconsult, calls Colum Vinorum.

*Of the method of planting vineyards in Orleans.*

*Of the distance that should be given to the rows, and the breadth of the paths, when a vineyard is planted. The different kinds of plants. Of planting between, and of digging up old Vines, and planting again.*

The trenches ought not to be opened, till after the ground that is designed to be planted has been marked out, to the end that a length and breadth, proportionable and uniform, may be given to all the rows and paths, as much as the ground to be planted will permit. And forasmuch as the Vine receives its nourishment in the trench, it will be proper to give it some inches in breadth more than to the paths.

The most common practice is to allow five feet in breadth for the trench, and as much for the path, when red wines are planted, especially the Auvernats, whose branches ought always to be trained pretty long. This is the best method for this sort of Vines, and the plants ought to be planted two feet six inches distant one from another. Some do not exactly observe this distance; they allow but four feet and a half for a trench, and the same for a path.

There are also some that allow but a foot and a half distance between each plant, when the trench and the path have no more breadth than that which I am about to mention; but the Vines planted so close together ought, of necessity, to be twisted circularly; and as their roots will in a few years run one into another, the Vines will not last so long; besides, they will require to be a little oftener and more plentifully dunged, than those that have been planted at a greater distance.

Others, on the contrary, allow near six feet for the breadth, and sometimes more for the trench, and the path, but this certainly is greater than is possible to dig or cultivate between the stocks, which is the best manner of performing this work. And when they dig otherwise, they will have a great deal of trouble to work to the middle of the trench, which nevertheless ought to be as well digged as the rest.

But the vignerons of Burgundy do not dig the whole ground, for when the distances are so large, they content themselves to touch but lightly the middle of these trenches, and only dig about the rows of plants. It is then advantageous for the citizens not to give so much breadth to the trenches.

Those vignerons, that purchase or rent vineyards which have the trenches so wide, pluck them up oftentimes, that they may be able to plant others there, where they allow much less breadth for the trenches, and the distance between the plants without concerning themselves about the Vines lasting the less while.

But the citizens ought to follow a better method, which is, to give five feet for the breadth of the trench, and as much to the path, and two feet six inches for the distance between each plant, especially when one plants Vines of Auvernat, because these will furnish layers, so the trench must necessarily be larger, and the plants at greater distances the one from the other, that they may find more nourishment, and that the shoots of the Vines may be extended the better.

A vineyard planted after this manner will last longer, will defend itself better against the winter's frosts, will produce finer and better fruit, which will ripen better, and of consequence make better wine; and also the vignerons of Burgundy would find their account of planting their Vines in this manner, in that they would have fewer Vines to tie, to prune, and to disbranch, &c. because there are a great many fewer plants

plants in those whose trenches and paths are wide, and the plants less crouded, and for this reason there would be but few vignerons but would be of this opinion.

When I say, that when one plants Auvernats, they should have five feet in breadth for the trench, and as much for the path, and two feet six inches distance between each plant, I speak of those Vines planted in a very good bottom of earth, because they will last many ages without being renewed after the usual manner.

For as to those lands where one is obliged to renew the vineyard in about twenty or five and twenty years, it will be sufficient to allow four feet and a half for the breadth of the trench, and the same for the path, and twenty inches for the distance between each plant, because these Vines will not last a very long time, by reason the roots will grow large, and spread far in the earth, in such a manner, that they would injure one another. I suppose, nevertheless, this land to be passably good, for otherwise the breadth of the trench and the path must be greater, and the distance between each plant, or the vineyard, must be the oftener dunged.

There are two sorts of plants, those from cuttings, and from layers.

The cutting is a young shoot of the same year that has no roots; they always leave at bottom a knot of the wood of the preceding year. These are the most commonly used. They give it no other management than to cut off the claspers and the tops, at the same time that they take them off from the Vines, and lay them down in the earth in a bundle, when they cut them before winter, and cannot plant them till the spring.

This plant is good, and commonly succeeds when it has been well chosen, being planted in lands well disposed and well cultivated; but yet there is an inconveniency in using it, and that when it is to be planted in lands that are naturally moist, or that retain the water. If it be planted early, and there fall cold rains in great abundance, the plant soaks in the water, and the skin or rind comes off, and it perishes instead of taking root; and if it be planted too late, and the great heats and droughts overtake it before it has put forth buds that are passably strong, it is scorched, wherefore it is better to make use of the second species of plants, not only in these sorts of lands, but all others.

The layers are the long shoots of Vines of three years growth, which have been layed down in the ground, and have put out small roots; these are better, and less liable to fail; they may be planted at all times in winter and in any kinds of lands, provided they are such as do not retain the water. In this case it were better to wait till March to plant them, or at least till the ground appears healthful, for we should never plant in ground which is very wet.

Before the layers are planted, they ought to be pruned, that is, to cut off a few of their roots; and when they are weak at the place where they were bent, these must not only be cut, but also the other branches or spurs, leaving that which has the most and strongest roots.

The layers are a great deal less subject to soak in the water than the cuttings, because having roots before they were planted, they make new ones sooner than those which have none.

It is true, these layers are more rare than the other, but it is an easy matter to render them common enough, because one may have whole acres of them, and all the precaution that is necessary for it, consists in making layers, when they are well grown, from the shoots.

These may be planted in two different places, either in some piece of land designed solely for this purpose, or in the middle of each ridge, at the time that a vineyard is planted.

If they be planted in a particular piece of ground, they must be laid in rows betwixt the Vines, and there so, that betwixt each row and the shoot there may be a sufficient distance, that the shoots may not hurt one another, and that the vigneron may have room to pass between them when he is trimming them; for he must hoe them three times a year to hinder the weeds from growing about them, and choaking them, and depriving them of a part of their nourishment.

This portion of ground is a sort of nursery, since the gardeners make them, that they may have plants to plant in those places where they are wanting.

I am also of the opinion, that it is the prudence of a citizen to have on his estate (especially since the cuttings do not take root but with difficulty) a place where he may always have layers in as large a quantity as he pleases, or shall suffice for all those that shall not succeed, at least if they be not well chosen, and which require a particular care in their cultivation. I shall consider, at the end of the following article, after what manner we should plant the layers in the ridges.

It is for the interest of a citizen to order his affairs so, that his vineyard may be always full of plants, to the end that it may produce a good quantity of wine; because it often happens, notwithstanding all the precaution that can be taken to keep a vineyard well furnished, that it will want to be supplied, by reason of the quantity of plants that die from time to time, because one cannot always supply their places by the means of layers; and likewise sometimes there will not be wood enough upon the Vines that are near for that purpose, and that it would not be proper to make use of the top of the shoot, for several reasons that might be given, and therefore it will be proper to place plants between the others.

Some vignerons will say, that it is very rare that these middle plants succeed in a vineyard where they are planted; to which it may be answered, that it is true, that a middle plant may not succeed, when the earth has not been well prepared before the planting, or when it has no other management but that of the vineyard in common; but it is very certain that it will scarce fail, if care be taken, after the vintage, to pluck up the dead shoots, to open the earth to a good depth before winter, not only to the end that it may mellow, but also that the Vines may not be damaged in cutting off part of its roots, by which it would be greatly weakened, if it were not done before the spring; and if in every hole were put a basket of fresh earth, or about the twentieth part of a scuttle full of well rotted dung, especially when the plant is set in stony, clayey, or gravelly ground.

I have seen among Vines very strong in wood, and of a hundred years of age, a middle plant very strong to the third eye, and which always continued to do well; and I can affirm, that these Vines are planted in as strong lands as any are in our plot of vineyards. Now if the middle plant does well there, as it is certain it does, we may take it for granted that it will still do better in those lands which are light; and hence it is, that there is not any land where one may not plant, or where it will not succeed.

Perhaps the vignerons may say that a middle plant will be worth nothing among young Vines, because these push with so much force, that their shoots would choke it.

I agree that it may sometimes so happen, but then this is a proof that the year following there will be found in the vineyard wood enough to make layers there. Therefore it would be useless to set a middle plant, because it is more likely to fail, and likewise it will not produce fruit so soon as the layers, which produce it the same year in which they are made.

This reasoning is more just than the consequence that they would draw from thence; that is to say, that it would be useless to plant a middle plant; for if a vigneron should every year cut off the wood of the vineyard, which might serve for the making the layer, and not set a middle plant there, the vacancy that would be

be there, would never be filled; and this is the reason that a middle plant should every year be set in the empty places, to the end that they may be filled out with the layers.

*Of the time and different manners of planting a vineyard.*

Lands being of different natures, there ought also to be different times of planting.

In lands that are sandy, or full of flints, the bottom or soil of which does not retain the water, one may plant and interplant after the severity of the winter, without being under any apprehension of the plants not succeeding; because these sorts of lands, never retaining the water, are always wholesome at the bottom; and therefore the plants set in them will succeed.

They do not ordinarily plant in the lands of Olivet, St. Mesmin, &c. whole pieces of Vines entire in the places where they have been already, because the custom is, not to pluck up in these lands those plants that they find good either as to wood or kind.

As for myself, I have always found, that these different stools, mixed among very small ones, make a grotesque figure in one and the same piece of land, and could never approve of this ridiculous method.

In strong lands, or such as retain the water, one ought not to plant but in the month of April or beginning of May, because it is not easy to make a Vine take root in these sorts of lands, the year being often very hot and dry, or very rainy, which are equally to be feared, in respect to the plant set in them.

And as, in an estate of but a small extent, it often happens that the lands are of different natures, and that of consequence the plants of one certain species will not do well but in one part of these lands, and will succeed ill in another, and that the seasons are different one from another, and since they too often happen to be either too hot, or too cold, and rainy, and that the kinds of the plants are good or bad, according to their nature, and that of the ground on which they are planted, and the disposition of the season, I am of opinion, to be more certain not to plant any plants but what will succeed, and to have always some vintage to gather, that it will be proper to plant several kinds of plants, according to the lands that they will agree best with, especially if we be not very sure, that one species of plant will do better than all others: in such case, we should plant none but that which may succeed there.

When I say that it is often advantageous to have different kinds of plants in a certain extent of land, I do not mean that you should put many kinds of plants in one and the same ridge, or in one and the same row, as is common for vignerons to do, when they plant vineyards for those who are obliged to make but one sort of wine of all sorts of Grapes, which, nevertheless, they would have passed for pure Auvernat, although there is not in it perhaps above a third part; but I mean, that in every different kind of land there should be planted but one kind of plant, to the end that, every kind being separate, we may, in the time of vintage, easily make such wine as we desire; which will be very difficult, if all the different species of plants be planted confusedly one among another; for there will scarce be found among the vintage gatherers either men or women, such as have skill enough to distinguish them, and besides, if they had, it would be a loss of time.

A vineyard may be planted after two manners, either upon the even ground, or in open rows.

In planting upon the even ground, when the land has been levelled and marked out, they make a hole with a spade to put in the plant, but it ought nevertheless, to be supposed that this land has been prepared, and well trenched.

The manner of planting a vineyard in open rows is almost the only one in use in the Orleannois, and is, without contradiction, the best; in that it is certain, that in planting in this manner, the earth has been opened and removed even to the bottom, which by this means will become better furnished, and the roots of the Vine will be capable of spreading themselves.

The best time to plant cuttings, which have been bundled and buried in the ground, is when the rind swells; which may be known by a kind of protuberance rising round about the wound, and also by the buds being just ready to open; and that the cuttings may not dry too much, they ought to be kept for some time in a vessel full of water, and not to be taken from thence, but as they are planted, for if the heat should shrivel those that are planted, they will not so readily take root, and many of them might die.

For this reason it is better to plant a vineyard in a rainy moist season, or at least cloudy, than when it is too hot, or there is a too drying wind.

They commonly make use of two different utensils of iron to make the hole where they put the cutting of the plant, either a spade, or a large kind of pickax. The first is the most proper to make good work, provided the earth be wrought the whole length and breadth of the trench, and also the depth that the plant is laid, that is to say, as far as the hollow of the earth.

When they make use of the second utensil, it is commonly with a design to make bad work, for the lazy vignerons content themselves in making a hole to put the cutting of the plant in, without digging the rest of the ground.

But by this last way of planting, it often happens that the young roots of the plants finding nothing but hard earth, into which they are not able to penetrate, it is impossible that they should be able to extend themselves as they would do, in a land that has been exposed to the air, frosts, &c. by the good digging that has been given it, when the trench has been dug with the spade the whole length.

*Of gathering the vintage.*

The vintage of the Auvernats being the most precious of all those which we have to make in this plot of vineyards, in order to have good wine, we ought to attend the maturity of the Grapes.

And as there are certain soils, where the Grapes, having been cut a little too green, are too much fermented in the vat, and others, on the contrary, cut very ripe, are but little fermented, which keep the better; it is absolutely necessary that those who have those vineyards do carefully apply themselves to be acquainted with the quality of their ground.

But one may say, in the general, of all the good Auvernats of this country, that they ought to have always one point of green when they are gathered, particularly when the year has been hot, and the lands where they grew have been fat, or very much dunged; for it is not sufficient, when one would have good wine, to cut the Grape in its degree of maturity, but he must take a fit season to do this in. As thus, one ought neither to begin nor continue to gather when it rains, though many are not very scrupulous as to this point, for they say the wine will sell never the worse for it.

I own that it may sometimes happen so, but it ought to be allowed me that it has a bad quality. One ought also to see to it, that the dew that falls often very plentifully in this season, be entirely dissipated, and that there be no dew either upon Grapes, or the leaves of the Vines, for it is found by experience, that for the little quantity of water there is in this sort of wine, it loses a great deal of its quality.

Therefore the season cannot be too fine for cutting the Auvernats, for this reason: in a great many vineyard plots in this kingdom, as in Burgundy, and other places, where the wines have great reputation, they do not gather their vintage, but during the finest part of the day; that is to say, the gardeners begin their

work very late, and leave off some hours before sunset, and the wine is the better for it.
It is true, that sometimes it is good to wait for the falling of the rains, but this ought to be some weeks, or at least many days before the vintage, and not in the time of gathering.
As for example: when no rain has fallen for a long time, and the Grapes have been so shrivelled by the heat, that there is scarce any thing but Grape stones, and a tough thick skin, if one should gather them then, they would yield but very little wine, and also it might turn to a tartness, as it happened for the most part to the red wines of the year 1718, which was extraordinary hot and dry.
So then we ought not to gather the Grapes so soon as the rain that we have waited for is fallen, because the Grapes ought to have time to have the advantage of it, which may be known when the berries grow large, and fall upon the ground.
As to the other sorts whether red or white, they may be gathered with less precaution, but they must always have their degree of ripeness, according to the different lands on which the vineyards are planted.

*Of the wines made in Orleans.*

For a long time, at Paris and other places, there have been those who have endeavoured to decry the wines of our vineyard plots, especially the red wines. In the mean time it is observable, that those who speak of them with the greatest contempt, cannot do without them, but procure them as they did formerly, either to put off their weak wines, without colour, or that have some other faults, and also to preserve the finest, most delicate, and most celebrated.
For the wines of Burgundy are no sooner brought in, than they mix them with our wines to drink them, so long as they last; and there is this to be said of our wines, that there is not one single wine merchant at Paris, who has not our wines in his vaults, not only for mixing with others which are meaner, but for selling without any mixture; for tho' they have much strength, yet for all that, they do not fail to sell them pure, as well for their tables as their offices, to those that have the curiosity to drink a wine that is good, natural, and without sophistication.
The Rapes which are yearly made, and the great quantity of wines, both red and white, which they are so solicitous to purchase a long time before they are made, in order to transport them from Paris into Flanders, Holland and England, and as far as the American islands, where they drink good to the very last drop, are in my opinion, sufficient proofs that our wines are not so contemptible as they would represent them.
For it must be owned, that if they had not such good qualities, or if they had any fault, they would not come in search of them so far, and would not take such care to furnish themselves with them in time.
Some say that our wines being harsh, red, and too violent, they are not so agreeable to be drank, and that those that drink them to any excess, find themselves incommoded, which never happens to them when they drink the same quantity, or even a greater, of the wines of Champaign and Burgundy, and many other vineyard plots of the kingdom.
I answer, that these pretended faults are the real qualities of our wines, and those are what cause them to be so much sought after; for this very colour and harshness (provided that it be not too much fermented in the vat) serve to give a quality to other wines that are weak, which would never be vended to any advantage without being mixed with others.
Besides, if the harshness of them, which they sometimes have, be their fault, this is not always so, it is but accidental, and may be prevented by letting them remain less time in the vat.
As for the inconvenience that those are sensible of, that drink too much of it, it is a very easy thing for them to remedy that themselves; they need only drink less of it, and then it would not incommode them.
As for example: aqua vitæ is not drank in so great a quantity as wine, nor a strong wine as a weak one. When the wine is very strong, they ought to drink water with it, or drink less of it, then it would nourish a person, instead of wearing his body, or stupefying his spirits. Thus, when one is sensible of any bad effects from our wines, it is not from their quality that they proceed, but from their quantity, which people know not how to use rightly.
Whatsoever ill-founded prejudice may be taken up against the wines of our vineyard plots, it must nevertheless be allowed that we have the advantage over the greatest part of other wines, that we are able to make them such as we would have, and such as are demanded; that is to say, a delicate wine fit for present drinking, red without being harsh, and more or less hard, without losing its quality, and thus we are able to make a wine equally good to drink through the whole course of the year, and also for many years after.
There are in this kingdom many vineyard plots, the Vines of which have this bad quality, and yet these are the wines that are so much boasted of, which will not keep the year without spoiling, if they were not preserved by ours, which have more of the quality than they.
But if those who put so great a slight upon our wines, should say we do not know how to make them, they would reason more justly than they do, when they would have us to believe that our wines are not good; for they ought to allow that they are good in themselves, and we shall agree, that if there is any fault in them, it is by accident, since it only proceeds from the manner of making it.
Then it must be said, that the wines of Orleans are good, but they make them ill, and then there is nothing more wanting, but to avoid the faults in the manner of making, and that is what I am going to treat of.
We have in this plot of vineyards so many different sorts of soils and plants, that it would not be easy to give a direction for the manner of making the wines from each of them; I can only say in the general, that in order to make good wine, the soil ought to be proper for the Vines, well exposed to the sun, on a gentle declension from the north to the south, rather dry than moist; that the plants set there be of a good kind, and well chosen; that the vineyard be rather old than young, never dunged, or but very little, but rather earthed, and always well wrought, and in the proper times to work them, and that the Grapes have a certain degree of ripeness before they be cut, and that they be tunned after they have been trodden, when one would make wine that should have a colour, and not for present drinking.
It is certain that when all these things concur, it will be easy to make good wine; but there are yet other things to be observed, of which I shall speak in the following part of this article.
They make in this plot of vineyards, as well as in many others, both red wine and white; I shall speak first of the red, and afterwards of the white, of which there are a few things to be said.
The best and most precious wines of all that are made in this plot of vineyards, is the Auvernat. Of this there are six species, viz. the Auvernat Teint, the black, red, gray, and two kinds of whites; which are the white Auvernat of Soler, and that of the Low Country.
The Auvernat Teint is the reddest; and as it has always the quality, it gives the colour and the body to the Auvernats, and prevents them from growing ropy. And when it is mingled with the red only, they ought to let it remain in the vat a little while; especially in those years, that there is reason to believe the wine will take as much colour as they would that it should have, or where it grows on a soil where the wine has always

always been accustomed to have colour enough by being tunned but a little.

Some pretend that one quart, or thereabouts of the wine [De Teint] of the tincture, or of [Gros Noir] the large black, to a vat of fifteen puncheons of red Auvernat, will have a good effect.

I own that it will give it a fine colour, without rendering it harsh, provided it be not tunned too long; but as this Teint, or this Gros Noir, have no quality but that of giving it the colour, I am of opinion that the Auvernat Teint, which is very red, substantial, and vinous, produces a better effect; but it requires only to put more of that of the Teint, than of the Gros Noir; because this Auvernat colours a great deal less than those of the two other kinds of Grapes.

The riper both the one and the other are, the more wine they yield, and the more colour they have; and for this reason they ought never to be gathered, but when they are in their perfect maturity.

The Auvernat Teint ought not to be planted indifferently in all sorts of land, because it will not do well in all; and for this reason, those who would have them, ought at first to plant but a few, to see if they will succeed in their lands. Also care must be taken not to mix them with other in planting, that one may the better know what quantity we should put into every vat; which will be difficult to do, if they were planted confusedly with other Auvernats, or red plants, to make thence good mixed wine.

Although the Auvernat Teint is a very good Grape of itself, yet it must be owned, that if too much of it be put into the red Auvernat, it will alter the quality of it; for the last wine is never better, than when it is made without any mixture of other Grapes; and it has ordinarily as much colour and strength as it should have, not only to maintain itself by itself, but also to put off other wines of an inferior quality.

But then I suppose, that this red Auvernat grew upon good lands, for there are some which of themselves do not give enough to the wines that they produce; in this case it is good to plant the Auvernat Teint.

It is true, that this wine being mixed, will not be so fine, as if it were only the pure red Auvernat; but then again, it will maintain itself better; and when one would make an Auvernat, which has a strong tartness and a good flavour, without having any colour, you must put to the red Auvernat, about the seventh part of the Melier, or of good white Auvernat, such as now grows in the vineyard of Blois; but that one may be able to make this mixture, it is necessary that this Melier, or white Auvernat, be ripe at the same time as the red Auvernat.

A wine made after this manner, is so excellent, and so disguised, that is is made to pass for pure Burgundy wine; and is sold at Paris and other places as such, in wickered bottles. The best wine conners are there deceived every day.

The Auvernat, without distinction, is red; they also name it from its skin, which is brown, because its colour is not of so deep a red as that of the Auvernat Teint, and because it is deeper than the gray Auvernat, which is almost quite white, and that too when it has been tunned very much. This kind of red Auvernat is the most common among the black Auvernats, and is one of the best wines that grow in this plot of vineyards.

The [Auvernat Noir] black Auvernat is very uncommon in this country, and known by few persons; its berry is rounder than the other Auvernats; its skin is as black as jet, and that is the only thing that it is known by. There is also another species of it, which some vignerons call the Auvernats of Tours; it differs nothing from the red, but in that its wood is very big as well as its fruit. The Grape is long and well filled; and it were to be wished, that this kind was not so scarce in this country; for it is the finest, and one of the best that we have.

The gray Auvernat is neither white, black, nor red, but of a gray or pearl colour, when at the greatest maturity. But some have made this observation, that in certain lands this colour becomes black in about twelve or fifteen years after the planting of these Vines, but nevertheless without losing their quality. The change of the colour does not come universally. I have seen vineyards very old, that did produce the Auvernat of this quality.

When this gray Auvernat has been made off hand, or when it has been tunned but a very little while, and it is once gone from this vineyard plot, and is denominated by a borrowed name, it is an easy matter to make it pass for such a wine as is desired, whether it be sold as it is, or whether it be mingled with others of a higher colour. But this mixture must be made in such a manner, that the quantity of the gray Auvernat be not absorbed by the red that is mixed with it.

*Of making wines in Orleans.*

The Grapes being cut, and carried from the vineyard to the press, they tread them either in a scuttle, which they place there, or in a vat, when the gathering of the vintage is finished; or, in fine, they cast them into a trough of a wine press to be bruised. Also sometimes they carry them directly to the press; but this is when they would make wine fit for present drinking, and that it is not fermented in the vat at all.

Those who make use of a scuttle to bruise their Grapes, cannot possibly tread the Grapes well, or at least they will be a long time in doing it, and have a great deal more trouble, in that they are obliged to raise up, with all their strength, the puncheons in which they tread the Grapes, to cast them into the vat with the marc, in order to work it all together.

The manner of bruising the Grapes in the vat when it is filled, is much worse than the first; in that, notwithstanding all the precaution that can be taken, and whatever time is allowed to endeavour to do this work well, it is absolutely impossible it should succeed; for when the wine has been tunned as much as it ought, and they have put it on the press with its marc, there will be a part of the Grapes that have not been half bruised, and this causes the marc to yield less wine, and there is not all the colour that it might have; and therefore the Grapes ought never to be bruised this way, when it can be done otherwise.

But if this is a loss to the citizens, not to draw from the marc all the wine which it ought to yield, if all the Grapes had been well bruised, yet it affords an advantage to the vigneron, in that his drink will be so much the better.

As there is an inconvenience in treading the Grapes, either in a scuttle, or a vat, as I shall make it appear, it will be better to make use of a wine press; that is, without contradiction, the best way to bruise the Grapes.

And besides, a wine press will serve for four baskets, when the other will not serve for two, if they make use of a scuttle; for according to the measure that the Grapes are bruised in the wine press, the wine falling into the vat, does not rise above the Grape; by which it may be more easily known, when the Grapes have been well or ill trod before the marc is turned into the vat; or it is a great deal more easy to push it with the foot, when the trap door of the trough is lifted up, than to lift up the whole with bodily strength, as they are obliged to do when they tread in a scuttle.

The trough of the press ought to be set in a kind of litter, and placed upon, or over the vat; but when the covering of the structure, where the press is, is low, it must be placed over the middle of the press without a litter; then there will be a little more trouble, because it must be emptied into the vat with a bucket or scuttle; but this is no great matter, there are hands enough to do this work.

The Grapes having been trodden as before, the marc may be thrown into the vat, either with the Grape and

and skins, or separated the one from the other; this depends on the manner after which one would make the wine.

When it has been tunned a considerable time, the wine is less green, less subject to be ropy, and better for keeping, than if it were done off-hand, or fit for present drinking.

But if the Grape be tunned too much, it takes from it much of its quality, because it leaves a harshness which renders it not fit for drinking for above a year in certain lands, and in others it never loses the taste of the Grape stone; and when with this excess of the vat, it has a colour as red as ox blood, it is a wine which they call grossier or matin; and it is commonly said it is better to keep than to drink.

When a wine has this fault, one cannot render it drinkable, but by mingling it with good dry new white wine.

Then it is this excess of the vat which renders our wines hard, and makes them disesteemed without any distinction, although all our wines are not made after this manner. But it is an easy matter to avoid this fault, which renders our wines contemptible.

There are those who tun the Grape stone with the skin, and would give to their wine only that degree of the vat which it ought to have; and not to be strong, they draw it out from time to time by a pipe, or by some little hole which they make in the vat, but this I do not approve of, for reasons to be given in the following article.

Others make use of a Vine prop, or some other piece of wood, which they thrust into the vat, from whence they draw it out quick, and let it drop into a glass, where they examine if it have colour enough, and if it makes a circle of scum, and boils and bubbles, which they call faire le roue: others watch till the marc is risen to such a height, and make a judgment by that.

As for myself, I am of the opinion, that it would be a surer way to thrust one's hand a pretty way into the vat, (which I suppose to be raised, and to have been worked,) to take from thence a handful of the marc, and to put it to one's nose, as the dyers do, to judge of the disposition of their vats; then one may know if the wine be made, and if it has colour enough.

When it smells sweet, you should let it work a little longer in the vat, until it has lost that smell, and has a strong scent that affects the nose; then it ought to be taken, for one quarter of an hour at most is sufficient to force it.

A wine taken in its proper degree of the vat, will never taste of the Grape stone; it will be always fit to drink, and also will keep good for many years.

I agree also, that the wine that has been tunned too much, becomes tart and harsh, and that is what takes away its quality; and as it is the Grape stone, and not the skin, that causes this tartness and harshness, the means to prevent this inconvenience is, in being very careful as to the degree of the vat that is given to the wine.

But as one may often be deceived in giving it too much or too little of the vat, I think the surest way would be, to stone the Grapes when they are trampled, before they are put into the vat.

This work would not be so much trouble as it may be imagined; for one stoner would suffice to employ one treader, let him tread as fast as he can.

When the Grapes are bruised in a wine press, several may employ themselves in stoning. One method of doing it is, to put them into a basket plated, &c. about six feet long, four feet broad, and ten or twelve inches high; and that this may not be any incumbrance, it may be placed about the middle of the press, and have two men to sift and separate the skins from the Grape stones.

I find that a cribble is much more convenient, for it takes up less room, and there needs but one man to work above, and the work will be as easily, or more easily done.

I have seen many of these cribbles, but that which I am going to describe, appears to me to be the most commodious.

The cribble for stoning the Grapes ought to be made with brass wire, because this is more pliant, and does not rust so much, and lasts longer than iron wire.

The holes ought to be an inch in breadth, almost of an octagonal figure; it is worked upon two hoops joined together, the one upon the other; and when it is finished, it is to be covered with a third hoop or band, that is about four inches high.

As the marc is falling in by the wine being pressed out, and is risen to the height of the cribble, they put under to support it a band of wood, or little hoop, two or three fingers high, which goes round at the bottom of the cribble; and besides this, four round iron bars of the thickness of a little finger; because if they were broad, the skins of the Grapes would rest there, which would hinder the other from passing.

It is proper to put these iron bars in such a manner, that two of the four may sustain the other two, and that they may be all of one length.

The ends ought to cross the two hoops, and to cover the third; and they must be joined to many places of the trellis of brass wire, which may be double or treble.

The wood of the hoop ought to be notched in two places over against one another, and about an inch in depth, and three in breadth, according to that of the staves upon which it is to be placed; and these staves should be placed upon a scuttle resting upon the vat, upon which they tread the Grapes.

It is also proper that these notches be plated with iron, and that they have two handles or grasps of iron, pretty thick and round, to prevent the hurting the hands of him that manages the cribble, because it is weighty, and there is often occasion to remove it from place to place.

This cribble may be about a foot in height, eight or nine in circumference, and an inch in thickness at the top, and something more at the bottom, because of a band of wood that is placed round about to sustain the trellis, as I have said before.

The treader having bruised the Grapes, instead of pushing the mass in the vat with his foot, as is done when he would tun the Grapes with the skin, it is taken either with a bowl, or a pail, or with the hand, and put into the cribble; then the stoner separates the marc as well as he can, the skin from the stone, and casts the latter into a vessel that stands near him; and when that is filled with the Grapes, they carry it to the middle of the press in a pail, or in a basket, and from time to time empty into the vat, the skins and the wine which are in the vessel, which has been stoned.

The business of the vintage gatherers being finished, they put the marc and all the stones that are upon the middle, and they lower the plank to draw from thence the wine that is found there.

Some give it another bruising, but I believe very unprofitably, for that cannot get out much wine, and also that which they get from these stones has nothing but a harshness; but nevertheless one may, because there is a little of it may be mingled with the other that is in the vat.

One marc of Grapes, which one may reckon ten poinçons, may yield about fifty pints of wine, or thereabouts. This depends upon the size of the Grapes, and the heat which has been during the time of the vintage gathering.

The wine being boiled with its skin, it will be necessary to observe, from time to time, if it have colour enough, and if it be sufficiently made to be drawn off; and when it is found that it is not yet red enough, the marc must be thrust down in the vat in order to give it the colour, and never to be forced; you may also cover the vat with a coarse linen cloth double, and put the board of the press upon that, in case one is apprehensive that it will lose a part of its strength.

It is not the same, when the stones are left and put into the tun with the wine, because then they will easily force; whereas this inconvenience never happens when the Grapes have been stoned, for this reason it ought always to be done: one is sure to have wine well made, and such as may be kept many years without spoiling, according to the time that it has been left to ferment.

And if all our red wines were made in this manner, we should not have occasion to say, as it hath been said for a long time, that our wines are harsh and coarse, for it must be agreed, that it is nothing but the stones that gives it this bad quality; which is however accidental, since I have offered a method to remedy it, which may easily be put in practice.

Many citizens complain, that the merchants will not give a greater price for the wine whose Grapes have been stoned, than for that which has not, but in the mean time it is better; it does indeed cost something more in making it after this manner, in that it takes up more time in pressing.

Upon this account many citizens have discontinued the stoning their Grapes, but I do not approve of that; we ought to spare nothing to make good wine; and I am persuaded that there will always be found merchants reasonable enough to make a distinction between a wine, the Grapes of which have been stoned, and that which has not, not only by their taste, but in the price too.

As the Grapes that are fermented without their stones are subject to grow ropy, it is good to prevent this inconvenience in gathering them before they come to their full maturity, and to give them but little fermentation; it can then never be too thick, because the Grape stones not being there, it is impossible they should force it.

During the time that the wine is working in the vat, one may pierce the casks, and put into each of them about a pint of water; it should be boiling hot, or at least very hot; this will purify the vessels, and render them more tight.

The hole of the bung being well stopped, as soon as the hot water has been put in, it should be shaken and turned on all sides, to be able to see if it has vent in any place.

Some pretend, that this hot water will take away the taste of the casks, but I very much doubt of this.

In order to make this experiment, it is requisite, that one be first sure that the casks have any bad taste.

When the casks have been seasoned and drained as dry as may be, they must be placed upon the stillings, and there set firm with stones, or some other thing, to hinder them from rolling while they are filling.

The basket that is hung up by means of a prop to receive and hold the Grapes and skins which fall from the middle of the press into the wooden pipe, ought to be well closed up to hinder the stones from going into the casks when they are filling; because when the wine boils, it casts out the scum, lee, skins, and stones, in order to purify itself; and sometimes a small quantity of these is sufficient to stop entirely the holes of the casks.

But to prevent this accident, one may nail, at the small hole, at which the wine runs down, a small lattice of brass wire, the holes of which must be very fine; then there would but a few of the skins pass, and no stones; and the basket, which is very troublesome when one would empty the pipe, would be useless.

One may yet, for the greater security, have another grate, and fasten it with nails, above the socket on the inside of the funnel; but this grate must be raised three or four fingers, to the end that the skins may not hinder the wine from passing.

Before the marc is begun to be put upon the middle of the press, I suppose the press to be in such condition, that nothing is wanting of all the utensils that is necessary, for it would be an imprudence to have at this very moment, any thing wanting that is necessary for the making a marc.

The screw being the most brittle and most necessary part belonging to a press, a master ought always to have one in reserve, ready to put in, in case of need.

In like manner the feet of the beams should be examined some time before the vintage, that they be not rotten, for that is the place they commonly fail in; and when this happens, it is not so easy to remedy it as it is to remedy a broken screw.

In order to make the beams of a press last a long time, when they are good of themselves, it ought to be so contrived, that they may always have the air under the middle of the press; especially at the end of these pieces, there ought not to be either any marc or earth, and therefore it should be hindered from falling there.

Some make a small piece of brick work round each of these beams, and that is the best precaution that can be taken to make them last a long time.

After the press has been put in order, and the wine has had its degree or time in the vat that it ought to have, or they can give it, it must be put upon the middle of the press.

When it is at a great distance from the vat, they make use of a scuttle or basket, or if it be near, of a pail; which they let drain upon a board, which bears at one end upon the vat, where it is fastened with a nail, or other thing, and the other upon the middle of the press; this board should be bordered on both sides with ledges, strait and well joined, and about an inch in height, to hinder what drains out of the basket from running on the ground.

A piece of wood, with a hollow or channel about an inch deep, would be much better than this board with ledges, for they cannot be with ease so closely joined, but that the wine will find some chinks to run out at, which will not be in the wood thus hollowed.

Some, in order to empty their vats the more easily, put in a pipe, thro' which they draw the wine clear through a little bucking tub made for this purpose; out of which they take the wine in a pail or pannier, to empty it into the casks.

For this purpose the vat must be set high on a stilling or gauntry, and the earth hollowed at the place where the pipe is placed.

Before the wine is drawn off clear, you must always begin to keep off the cover of the vat, in order to prevent the wine from forcing; and this must be done in such a manner, that he who empties has not the trouble of lifting it up so high to put it in the scuttle.

I own that this manner of emptying a vat is very commodious, and shall in the following article speak of the inconveniency that may happen thence.

The marc being placed on the middle of the press, they cover it with a board, with bolsters, cushions, and bags or pillows. There must be two rows of these last, and sometimes three, when the marc is thin, because by how much less the screw appears, by so much less is it in danger of breaking; and as the marc will be thick, according as they have ordered it, there must be some rows of the bags retrenched; for it is sufficient, that there is a certain distance between the wheel and the screw, which would not be so, if the marc were very thick, or there were many sacks.

There is no need to put the ring of the rope into the hook, before the wheel has been lowered on the bags, and that you have examined if all is made even, and that none of the bags are removed.

Before you begin to lower the wheel upon the bags, the screw ought to be well greased above the nut of it, and also below, when it touches the bags.

They also grease that part of the screw that was within the nut screw, before they have brought it down to the point where it ought to be; for the first operation after the plank of the axle-tree has been let down, and before the loosening, the screw must be soaped on the places where it has had none.

White dry soap without oil is the best for greasing the screw, for when oil is mingled with the soap, that draws the rats, which gnaw the screw, and it occasions a gum or thick substance, which makes it go hard when they press the marc.

The trendle ought also to be placed at a reasonable distance from the middle of the press upon the nave of the wheel, and being well rubbed with hog's lard, the trendle will turn the better. Others make use of an iron crow, which at least produces as good an effect as the nave.

When the staves or rammers are rather long than short, and that the trendle is pierced with a height agreeable to a man of a middle stature, they will have the more force to press the marc.

After the plank has been let down, and the troughs filled to a pannier or thereabouts, and they have afterwards added the wine that comes from these pressings, they give the first squeezing, which ought to be followed by three others in a short time, because the Auvernat having in it much fire, its marc would dry quickly, and yield much less wine, if there were much time between these pressings.

It is not enough to grease the screw of the press the first operation, before the balance is let down, when it is a wheel press; it ought to be done from time to time, especially when the screw is perceived to be rough, or screaks in the nut, when the trendle is turned.

Some, before they give the marc the last operation, barbager; that is to say, they work it, or prick it with an instrument of iron, but without touching the sides, because they chuse to hinder it from falling on the middle. They pretend that this little squeezing makes the marc yield about two pints of wine the puncheon.

I have never made the experiment, but this is seldom practised but in the marcs of white wine, because they are thicker, and not so hot by much as those of Auvernat.

The last operation or pressing being given, you may wait twelve or fifteen hours for taking off the marc, that it may have time to drain; and they seldom do it sooner, except they want the press for making other wine.

Although the wine that comes out of one vat is the same, yet they give it two different names; the one they call unpressed wine, and the other the wine of the press.

The first is that which comes from the red or white Grapes, when they have been trod, whether they have been tunned or not, and the second is that which comes from the marc after the pressing. As this last has always a great deal more colour and harshness than the first, they mix them together, to the end that they may make an equal wine; and if they do not do this, they would have one part of the wine of the same vat too delicate and weak in colour, and the other too red, and too harsh, which would not be fit for the merchants, who are for an equal wine.

When I say the wine should be equal, I mean only that of one vat, and not of one whole cellar; for as all the wine that one buys cannot be all spent at the same time, and that the merchants search sometimes for wine high-coloured, and a little firm, and sometimes for a wine more delicate and fit for present drinking, therefore it is, in my opinion, the prudence of a citizen to have tuns of different degrees of colour and firmness, that the more delicate may be first drank, and the firmest some time after, or the year following, for most persons love old wine better than new.

But it is yet more advantageous for a citizen to have wine that is rather a little firm and too delicate, because, if that be not sold quickly, it may grow ropy, or be spoiled; when, on the other hand, that which is well mixed will keep a great while, and he may sell it a long time after.

It is true the merchants often slight, or rather seem to slight than reject, a wine that has been but little fermented; but it is very often nothing but a little chicane that those make use of, who are employed to purchase wines to buy them the cheaper; therefore we must give them leave to say what they will, but always give the wine something of the tun; because if it be not sold at first, it will at last; whereas, when it is made for present drinking, it must be sold as soon as may be, and perhaps under price.

Some persons, out of thriftiness, or rather sordid covetousness, fearing to lose a little wine, never entirely fill their casks till the wine has cast forth its greatest fire, i. e. they will not make it boil till it has no force left; and there being only one pannier full of wine put into the cask the next day, or two days after it has been filled, that it has not the force to warm it again sufficiently to make it boil.

This way of managing wine is very wrong; for it causes all its excrement to remain at the bottom of the cask, which augments the lee, and often contributes to the spoiling the wine, and to keep it for a long time foul, which therefore the merchants reject.

It would be much better to fill it presently up to the bung with the pressurage, or with what has been pressed, which is taken from the pressings that they give to the marc, because the casks being always full, the wine purifies itself the more, and becomes clear in less time, and of consequence is more palatable, and may be sooner sold.

It is not enough to fill the casks up to the bung the first time that the wine is put into them, they ought to be refilled many times; that is to say, as soon as the boiling is over, wine must be put in to excite it to boil; and the same thing is to be done the next day, and afterwards for eight or ten days every other day.

The necessity there is of filling the casks as soon as the new wine has been put in them, is proved by the accident that happened to the wines in the year 1718, when the season was too hot and dry during the months of July and August.

The wines were then so extreme hot as to boil very low in the casks, so that many who had neglected to fill them at first up to the bung, had their wines turned sour, which did not happen to those who had used the precaution of filling them to the bung, and keeping them full; and for this reason, those who have many tuns of wine ought always to take of the last they have made to fill all those puncheons of the other tuns; and when a person has but one, he must put wine into a cask called a gueulebée, to fill those puncheons as far as the bung, as soon as the wine has done boiling; then the wine that remains must be put into the casks of gueulebée, or into a very close vessel, for fear of its evaporating or losing its spirit.

I will say, by the bye, that many deceive themselves in making wine these hot years; for they let it ferment but a little, because it boils as soon as it is trod; but this is but a false boiling, which comes rather from the fire that is in the Grape, than from the working in the tun, therefore it ought to be tunned a considerable time. It is in such years the Grapes should the rather be stoned, and the wine sufficiently fermented.

It is true there is some inconvenience in filling the casks up to the bung the first time the wine is put in, because it is impossible not to lose some of it, for it will mix with the scum and the lee which come out at the bung; but this inconvenience may be remedied by setting gutters above the bung, and pans or vessels of wood under the gutters, to receive all that which comes out.

And whereas some pretend, that lead communicates an ill taste to the wine, it is the surest way to have them of pewter, in such a manner, that nothing but the end of the socket may enter into the hole of the bung, for if the hole be made larger than that the socket may play within it, the gutter will be useless, because the wine would run out between the wood and the socket.

There must also be a vessel called gueulebée to empty these vessels in as they fill, and it should be covered with a thick double linen cloth, and closed or fastened all round about with a hoop to hinder the wine from growing flat.

The lee descends by little and little to the bottom of the casks, where it is joined with the scum which there falls together, and is incorporated with it.

Some days after, the wine being grown clear, they empty the vessel, and the lee remains at the bottom. This wine may be put into a vessel by itself, without mixing with the wine which is in the casks out of which it came. Some say this collected wine is the more fine and strong, and others say to the contrary; but they may say what they will, for it is always true that this wine is very good, provided it has been kept very close in the vessel where it was collected.

And I believe that one might, without any scruple, make use of it for filling the wine; but as to this, you need not consult either the merchants or the vignerons, since the one has not judgment or sincerity enough, and the other are too much interested; and I speak with a knowledge of the matter, founded on the experience I have had many times, and without any interest but that of the public.

Those who, from a covetous temper, will not be at the charge of procuring these gutters and vessels to receive the wine of the casks while they are boiling, have no skill in it; for the wine, which they would save by this means, would make amends entirely the first year for the expence they would be at in procuring them.

Others, that are afraid that they shall not sell their wine, say that the merchants have always an opinion in favour of that wine, of which the two sides of the bung of each cask are filled with scum as far as the first bands or circles, and that they have a quite contrary opinion of those where it does not appear.

It is true that formerly they did mind this, and their opinion might be well grounded, because they never made use of these gutters; but at this time their opinion is altered, for they are persuaded that these gutters being in use, a cask may have cast out all the scum, without its appearing at the sides of the bung, because it falls into these vessels that are set to receive it, and likewise that all the wine that is there is well mixed.

Besides, it is an easy matter for a merchant to know if there be much lee in the cask, for he needs only to pierce it into the lee, that is to say, at the bottom, about two fingers of the notch of the cask where the head pieces come in.

The wine having cast out all its scum, it will be proper to taste all the casks into which it has been put; to the end that, if any one be found that has a bad relish, those who have purchased them may be apprised of it, that they may put all the bad ones to their own account.

Some say, that St. Martin's day being passed, you cannot oblige the merchants, who have purchased the wine, to take that again which has been spoiled in the casks, because they say it is the more difficult to remedy it. Others pretend that the merchants are answerable three months after the casks have been filled, provided they have not been removed from off the stillings.

When the wine has done boiling, it must be covered with the largest side of the bung to hinder it from evaporating; and eight or ten days afterwards it must be filled full, and bunged up.

Some make use of bungs about half a foot long, because they can take them out without daubing the casks with the scum; but I am of opinion that broad bungs are better, and to make two holes on the side, the one about the bigness of a little faucet, the other about the bigness of one's little finger, that a pewter funnel may be put in, having in it a piece of pewter soldered about two inches from the end, the holes of which may be as big again as those of a tobacco grater; to the end that, when one uses it to fill the casks, neither stone, nor skin, nor kernels, nor lee, may pass. The great hole serves for the putting in of a funnel, and the other to give vent for the casks during the time the wine is pouring in them.

The little hole ought to be made at the time that the casks are bored, to put in the wine with the great wooden funnel; for if the socket exactly fills the bung hole, the cask would fill very slowly, if it had not vent given it by the little hole.

When it is done after this manner, the tuns are not daubed with the scum. It is not disturbed, as is done in striking to beat in the bung, and the wine will have less vent.

You must be sure to fill the wine every fifteen day after it has been bunged, until towards St. Andrew's day; you are not to meddle with it any longer, till after the severity of the winter is over, which commonly happens towards the middle of February, because the frost may make it swell.

The Auvernat is not the only red wine that we have in this vineyard plot; there are also other wines made, that have the same colour, but are of a different quality.

There is, for example, the Bon Lignage, or the good wine, and that which is made of all sorts of Grapes. As to the first, it is made of the red Auvernat, the Teint, the Gray, the White, the tender Samoireau, the Melier, and all the best sorts of red Grapes.

The second is composed of all sorts of Grapes, good and bad, but more of the latter than the former; whence it is easy to be comprehended, why the one has less of the quality than the other. And as this second is generally spent in the country, they make it all manner of ways, either fit for present drinking, or firm, or hard, according to the occasion they have for it, and the quantity they are to provide. As to the other, they do not fail to make it, and often send it to Paris.

All these sorts of Grapes are not gathered with the same care as the red Auvernat, which cannot bear the water, nevertheless the wine is the better, when the Grapes, with which it is made, are cut in a season that is rather hot and dry than cold and moist.

We have, in some places of this vineyard plot, three sorts of red wines, bearing the same name, which, nevertheless, they distinguish the one from the other. There is the tender Samoireau, the hard, and the Fourchu, which have all three different qualities.

The tender Samoireau does very well in the lands of the Olivet, St. Mesmin, and Clery, where it is more plentiful than any where else. They make of it a particular wine which will keep a long time, provided it have no mixture, and that they give it but little of the vat; this renders it firm, and prevents it from growing ropy.

This Grape may be mixed with the red Auvernat, because they both ripen at the same time. The Samoireau gives the colour to the Auvernat; it sustains it, and causes it to keep a long time; but you must put but a small quantity, for fear of altering or entirely absorbing the quality of the Auvernat, which after it has lost, it also loses its name, and is no more regarded, but as a good Vin de Lignage, or one composed of all sorts of Grapes, which is vulgarly called Vigneron Auvernat, very different from that of the citizens, which is in a manner pure Auvernat. When one would render this Vin de Lignage yet better, he may put to it a fourth part of good Melier.

The hard Samoireau is a little higher coloured than the tender. When it has but its proper degree of the vat, they may mix one or two puncheons of white, and a little less, when they tun it; they should also, when it may be done, take a Melier of a better kind, for this wine has not much fire. When it is pure, and it has passed the year, that quality diminisheth; it is then proper to make use of rapes, not of chips or shavings, but of Corn, without putting Grapes to it, as some do, for that renders it hard and disagreeable to drink.

It is sufficient to put a third part, or at most a half, of the grains into the puncheons, and after that they fill the wine up to the bung. They make use of these rapes to put off the grounds or bottoms of wine, and the weak ones, which they also mix sometimes with them. The third kind of Samoireau, of which I shall speak, renders them the better for keeping.

The Samoireau Fourchu is the best of the three kind; this is proper to give the colour to the others, and to sustain those that are weak, and to restore those that have any defect.

In order to know the colour, they cast some of it against a wall, and according to the impression it makes, they judge of the effect it will produce.

One single puncheon of that will colour six of white, and sometimes more, according as the seasons are hot, and the quantity of the wine that the vineyard has yielded; this wine is not only good to drink, when it is taken in time, but it serves for a remedy against the dysentery and other maladies; its marc is good against rheumatisms.

This sort has a virtue that is not found in any others, because the longer it is kept the better it is; for it is better for drinking at the end of twelve or fourteen years, than one or two years after it has been made.

Some put it in bottles, but it keeps equally as well in casks, provided care be taken to keep them always full, and to observe that the casks do not want hoops, and it will be proper to put on several iron hoops at each end.

The wine, the marc, and the wood, or rather the ashes of this plant, have also a great many other properties which I shall not relate.

The time of gathering these two species of Samoireau comes much later than those of the first, which ripens at the same time with the Auvernat.

The territory of Mardic is the most proper for these plants, and that which produces the most of it, (I mean of the hard and Fourchu Samoireau;) there is of it at Bou and Checi, and but a very little in any other places of this vineyard plot.

As the Fourchu never produces more wine than when the plants are a little old, many eager to enjoy the fruit of their labours, and their expences, have not patience to wait so long, and therefore they pull up those of them they had, and cannot resolve to plant them when they have them not.

Nevertheless this is a precious plant, and one may judge of it by the effects that it produces, and by the price which it bears, for it is commonly sold for double the price of the best wines of this country; and I do not know, but that those who destroy them, and those that do not raise them, will repent it one time or other.

As there is not much to be said of the manner of making white wine, and having taken notice of it at the beginning of this article, I shall say but little of it particularly.

Although there are many kinds of white Grapes, yet they make, as one may say, but two sorts of wine of them, the one the moist, and the other the dry wines.

The first, such as the Muscat or the Gendin of St. Mesmin, those of Mariguy, of Rebrechein, and other neighbouring places, may be looked upon as the most precious, in that they bring the money into the kingdom, rather than the dry wines, for they send them into Holland, Flanders, England, &c. To render this wine the better, they do not content themselves to see that the Grapes have their perfect maturity, and be half rotten; they wait oftentimes till the frost has taken them, to have the wine which they call Bourou; and in some years they defer the vintage until the fifteenth or twentieth of November, and it is then sometimes so cold, that the icicles hang upon those Grapes that are perished, so that they are obliged to carry fires into the vineyards in great pans, to warm the gatherers.

It is true, that those who tarry so long before they gather, have a great deal less wine than the others, but then at the same time it is much better, and sells a great deal dearer, so that I believe it comes much to the same, or very near the matter.

The wines of which I am speaking, although sweet of themselves, have, nevertheless, not always the same degree of liquor; this depends upon the condition of the season, that is to say, by how much the summer and autumn are the hotter, the wine has the more liquor, and it has a great deal less when the season is the contrary.

What I say is so true, that the season having been very hot in the year 1719, the sweet wines themselves had abundance more liquor than ordinary, and kept good more than a year; also the dry wines of many places were sweet and clear.

Some red wines were also very soft (which is very rare,) and held good till the month of February in the year 1721. It is true they were thick, and that they did not become clear till the time that they lost their sweetness, which altered their strength.

The softness of the white wines being over, they were nevertheless good, but as there remains a certain flavour, which pleases the palate of most persons, it is best to sell them, or spend them as soon as may be.

One may know by experience that good Grapes almost always make good wine. Among the white Grapes, without contradiction, the best are Melier, and the white Auvernat of the Low Countries. As the white Formentes or Bourgignons, the Maledeueaux, the Tramboises, the white Gois, &c. make a wine which is better to throw away than to drink, yet vineyards of the vignerons are stuffed with these wretched Vines, because they yield more wine, and for the most part, better resist those accidents that happen to a vineyard; for these people have no regard to any thing but the quantity, which is the reason that they do not ordinarily sell their wines to that advantages as the citizens do.

The white Grapes cannot be gathered too ripe, because the riper they are, the more wine they produce, and their rottenness does not give it any bad taste; but when it is begun before they come to their full ripeness, they are subject to grow yellow, yet regard is to be had to those lands of which the wine is subject to grow ropy.

For this reason, when they are gathered, it is good that the Grape has a little greenness, to the end that the wine that comes from them may be able to keep dry, to which the white Auvernat of the Low Countries, and the green Melier, contribute very much; the last hinders the wine from being ropy, and the first makes it clear, and for this reason it is good to plant of it with the Melier, because at the time of gathering, they may be both mingled together, and make a wine without any fault.

One ought to endeavour not to gather the white Grapes but when the weather is fair; a rainy season is not so favourable, for one ought never to mingle water with the wine that one makes, tho' some are not over scrupulous as to this point. It is true, the inconvenience is not so great in respect to the Auvernats, but that should not hinder one from always endeavouring to make good wine, and for this reason it is best to gather the vintage in a dry hot time.

As the white wine is not tunned, when they bring the Grapes in panniers from the vineyards, they empty them directly on the middle of the press, where they trample them with their wooden shoes; the broadest and smoothest are the most proper for this work.

The Grapes ought to be trod immediately, that is to say, every pannier as they bring them from the vineyard, otherwise the wine would be yellow; and this colour is disagreeable to the sight, and still more to the palate, and consequently gives the wine a bad quality.

According as the Grapes are pressed on the middle, and that the pipe fills, they empty it to fill the puncheons,

cheons, or the quarter puncheons, to a pail full, or thereabouts, according to the largeneſs of the caſk wherein it is put; to make it boil, they fill them up to the hole of the bung with the wine which comes from the two firſt preſſings, and that which remained in the pipe before they gave the two firſt ſqueezings, and that which the others yield, ſerve to put into the wine, when the firſt boiling begins to be diminiſhed.

One ought always to give the marc, whether it be white or red, four preſſings, without taking in the lowering of the beam, that is to ſay, that it ought to be cut four times.

Some give it to the third working with an iron grapple in the middle of the marc, and they leave all round about half a foot in breadth, to keep in that which is wrought, and at the fourth preſſing they cut the border that they left, and put it back upon the other.

They pretend that a marc ſo ordered yields the more wine. As the marc of white wine is the more thick, and has leſs fire than the Auvernat, it does not dry ſo ſoon; for this reaſon there ought to be longer times between theſe ſqueezings.

They give them theſe commonly in the night-time, becauſe they do not lower the beam; but when the day's work is finiſhed, when the men who are to work the marc have ſupped.

When the white wine is cold, it muſt be filled up and bunged, and kept always full, at leaſt if it be not in the depth of winter, for when this kind of wine is emptied, it becomes yellow in moſt countries; but when this happens, it is eaſy remedied, either by ſtirring it with a ſtick of Hazel cleft into four, which is put in at the bung-hole, or in ſhaking briſkly the puncheon, which they leave ſometimes on the bung, to the end that the lee that deſcends thither, and afterwards is mixed again when the caſk is turned up, may take away the yellowneſs.

The ſecond method ſeems to be the beſt, for beſides that the wine does not take wind, it is alſo done in a great deal leſs time, for one is not obliged to unbung and bung again every caſk, for they may be filled up with a ſmall tin funnel.

For ſome years paſt they have made rapes of white wines, from which they do not reap any great advantage; they make uſe of them to mix with the coarſe, harſh, red wines, that have but little of the quality. In the mean time, this fits the meaner ſort of people, who have not a very nice taſte, in that it pleaſes their palates, and is ſold cheap.

It will not be to any purpoſe to name the places of this plot of vineyards, which produce the beſt white wines, for the merchants do not take the pains to make a diſtinction between the wines which have much of the quality, from others that have leſs; beſides, they are many times deceived, for ſome citizens who have a great many houſes of wines in different places, after the vintage is over, ſend that wine they have made in one leſſer vintage to be added to that of another that is much better, and ſo a merchant thinks that all the wine he buys is from the ſame place, when it is not.

I do not approve of this practice of the citizens, for a merchant, who would have wine of one certain place, will not be prepared to manage that which he ſhall have from another, becauſe thoſe different wines will not produce the ſame effects, with the management he ſhall uſe to them, and no perſon ought to be deceived.

When the vintage, either of red or white wines, is finiſhed, the preſs ought to be taken care of, that the rats do not gnaw the ſcrew of it. It ſhould be rubbed with Garlick, the ſmell of which thoſe animals cannot endure; it is alſo good to cover it with ſome old caſks, to hinder any filth from falling on the ſcrew, which cannot be kept too clean.

*Of vineyards in England.*

There have of late years been but very few vineyards in England, tho' it appears by ancient records that they were formerly very common, as may be gathered from the ſeveral places in divers parts of England, which yet retain that name, which teſtify the quantities of ground which were allotted for vineyards, to abbeys and monaſteries, for wine for the uſe of the inhabitants; but as to the quality of the wines which were then produced in England, we are at preſent ignorant; and how theſe vineyards were rooted up, and became ſo generally neglected, we have no very good accounts left. Whatever might be the cauſe of this total neglect in cultivating Vines in England, I will not pretend to determine, but ſuch was the prejudice moſt people conceived to any attempts of producing wine in England, that for ſome ages paſt, every trial of that kind has been ridiculed by the generality of people, and at this day very few perſons will believe it poſſible to be effected.

Indeed if we judge only by the ſucceſs of ſome modern eſſays made near London, where ſmall vineyards have been planted a few years paſt, there would be no great encouragement to begin a work of this kind, becauſe the produce of very few of theſe vineyards has not been ſo kindly as were to be wiſhed; but however, this ſhould not deter others from making farther trials, eſpecially when they conſider the many diſadvantages, which moſt or all of thoſe plantations, which have been made, were attended with; for firſt, there is ſcarce one of them placed upon a proper ſoil and ſituation for this purpoſe; and ſecondly, there is not one which is rightly planted and managed, as I ſhall preſently ſhew; and how can we expect ſucceſs from vineyards under theſe diſadvantages, when even in France or Italy they would ſucceed little better, if their management were not directed with more judgment? I ſhall therefore humbly offer my opinion, which is founded upon ſome trials I have ſeen made, and from the inſtructions that I have received from ſeveral curious perſons abroad, who cultivate vineyards for their own uſe, and that of their friends, and who have been very exact in obſerving the ſeveral methods of practice amongſt the vignerons of thoſe countries, from whence it is hoped that the prejudice which moſt people have againſt a project of this kind, will either be removed, or at leaſt ſuſpended, until trials have been judiciouſly made of this affair.

The firſt and great things to be conſidered in planting vineyards is the choice of ſoils and ſituations, which, if not rightly choſen, there will be little hopes of ſucceſs, for upon this the whole affair greatly depends. The beſt ſoil for a vineyard in England is ſuch, whoſe ſurface is a light ſandy loam, and not above a foot and a half or two feet deep, above the gravel or chalk, either of which bottoms are equally good for Vines; but if the ſoil is deep, or the bottom either clay, or a ſtrong loam, it is by no means proper for this purpoſe; for although the Vines may ſhoot vigorouſly, and produce a great quantity of Grapes, yet theſe will be later ripe, fuller of moiſture, and ſo conſequently their juice not mature, nor well digeſted, but will abound with crudity, which in fermenting will render the wine ſour and ill taſted, which is the common complaint of thoſe who have made wine in England.

Nor is a very rich, light, deep ſoil, ſuch as is commonly found near London, proper for this purpoſe; becauſe the roots of theſe Vines will be enticed down too deep to receive the influences of ſun and air, and hereby will take in much crude nouriſhment, whereby the fruit will be rendered leſs valuable, and be later ripe, which is of ill conſequence to theſe fruits, which are known to imbibe a great ſhare of their nouriſhment from the air, which, if replete with moiſture (as is commonly the caſe in autumn,) muſt neceſſarily contribute greatly to render the juices leſs perfect, therefore great attention ſhould be had to the nature of the ſoil upon which they are planted.

The next thing neceſſary to be conſidered, is the ſituation of the place, which, if poſſible, ſhould be on the north ſide of a river, upon an elevation inclining to the ſouth, with a ſmall gradual deſcent, that the

moisture may the better drain off, but if the ground slopes too much, it is by no means proper for this purpose; but if, at a distance from this place, there are larger hills, which defend it from the north and north-west wind, it will be of great service, because hereby the sun's rays will be reflected with a greater force, and the cold winds being kept off, will render the situation very warm. Add to this, a chalky surface; which if those hills do abound with (as there are many such situations in England,) it will still add to the heat of the place, by reflecting a greater quantity of the sun's rays.

The country about this should be open and hilly, for if it be much planted, or low and boggy, the air will constantly be filled with moist particles, occasioned by the plentiful perspiration of the trees, or the exhalations from the adjoining marshes, whereby the fruit will be greatly prejudiced (as was before observed.) These vineyards should always be open to the east, that the morning sun may come on them to dry off the moisture of the night early, which, by lying too long upon the Vines, greatly retards the ripening of their fruit, and renders it crude and ill tasted. And since the fruit of Vines are rarely ever injured by easterly winds, there will be no reason to apprehend any danger from such a situation, the south-west, north-west, and north winds being the most injurious to vineyards in England (as indeed they are to most other fruit,) so that, if possible, they should be sheltered therefrom.

Having made choice of a soil and situation proper for this purpose, the next thing to be done is, to prepare it for planting. In doing of which the following method should be observed: in the spring it should be ploughed as deep as the surface will admit, turning the sward into the bottom of each furrow; after this it should be well harrowed, to break the clods, and cleanse it from the roots of noxious weeds, and it must be often ploughed and harrowed for at least one year, to render the surface light; and hereby it will be rendered fertile, by imbibing the nitrous particles of the air (especially if it be long exposed thereto before it is planted;) then in March the ground should be well ploughed again, and after having made the surface pretty even, the rows should be marked out from south-east to north-west, at the distance of ten feet from each other; and these rows should be crossed again at five or six feet distance, which will mark out the exact places where each plant should be placed; so that the Vines will be ten feet row from row, and five or six feet asunder in the rows, nearer than which they ought never to be planted. And herein most people who have planted vineyards have greatly erred, some having allowed no more than five feet row from row, and the plants but three feet asunder in the rows; and others, who think they have been full liberal in this article, have only planted their Vines at six feet distance every way, but neither of these have allowed a proper distance to them, as I shall shew: for in the first place, where the rows are placed too close, there will not be room for the sun and air to pass in between them to dry up the moisture, which, being detained amongst the Vines, must produce very ill effects: and, secondly, where the Vines are placed in exact squares, so near together as six feet, there can be no room for the current of air to pass between them, when their branches are extended on each side, and so consequently the damps in autumn will be entangled and detained amongst the Vines, to the great prejudice of their fruit; for since the autumns in England are often attended with rains, cold dews, or fogs, all proper care should be taken to remove every thing which may obstruct the drying up the damps which arise from the ground.

The skilful vignerons abroad are also sensible how much it contributes to the goodness of their Vines, to allow a large space between the rows; and therefore where the quality of the wine is more regarded than the quantity, there they never plant their Vines at less than ten feet row from row, and some allow twelve. It was an observation of Bellonius, almost two hundred years since, that in those islands of the Archipelago, where the rows of Vines were placed at a great distance, the wine was much preferable to those which were close planted; and this he positively affirms to be the case, in most countries where he had travelled. Indeed we need not have recourse to antiquity for the certainty of such facts, when we are daily convinced of this truth in all close plantations of any kind of fruit, where it is constantly observed, that the fruits in such places are never so well coloured, so early ripe, nor near so well flavoured, as those produced on trees, where the air can freely circulate about them, and the rays of the sun have free access to the branches, whereby the juices are better prepared before they enter the fruit.

Having thus considered the distance which is necessary to be allowed to these plants, we come next to the planting; but in order to this, the proper sorts of Grapes should be judiciously chosen; and in this particular we have egregiously erred in England. All the vineyards at present planted here, are of the sweetest and best sort of Grapes for eating, which is contrary to the general practice of the vignerons abroad, who always observe, that such Grapes never make good wine; and therefore, from experience, make choice of those sorts of Grapes, whose juice, after fermenting, affords a noble rich liquor; which Grapes are always observed to be austere, and not by any means palatable. This is also agreeable to the constant practice of our cyder-makers in England, who always observe, that the best eating Apples make but poor cyder; whereas the more rough and austere sorts, after being pressed and fermented, afford a strong vinous liquor. And I believe it will be found true in all fruits, that where the natural heat of the sun ripens and prepares their juices, so as to render them palatable, whatever degree of heat these juices have more, either by fermentation, or from any other cause, will render them weaker and less spirituous. Of this we have many instances in fruits; for if we transplant any of our summer or autumn fruits, which ripen perfectly in England, without the assistance of art, into a climate a few degrees warmer, these fruits will be meally and insipid; so likewise if we bake or stew any of these fruits, they will be good for little, losing all their spirit and flavour by the additional heat of the fire; and such fruits as are by no means eatable raw, are hereby rendered exquisite, which, if transplanted into a warmer climate, have, by the additional heat of the sun, been also altered so as to exceed the most delicious of our fruit in this country.

From whence it is plain, that those Grapes which are agreeable to the palate for eating, are not proper for wine; in making of which, their juices must undergo a strong fermentation; therefore since we have in England been only propagating the most palatable Grapes for eating, and neglect the other sorts, before we plant vineyards, we should take care to be provided with the proper sorts from abroad, which should be chosen according to the sort of wines intended to be imitated; though I believe the most probable sort to succeed in England is the Auvernat, or true Burgundy Grape, (which is at present very rare to be found in the English vineyards, though it is a common Grape in the gardens against walls.) This sort of Grape is most preferred in Burgundy, Champaign, Orleans, and most of the other wine countries in France; and I am informed, that it succeeds very well in several places to the north of Paris, where proper care is taken of their management; so that I should advise such persons as would try the success of vineyards in England, to procure cuttings of this Grape from those countries; but herein some person of integrity and judgment should be employed, to get them from such vineyards where no other sorts of Grapes are cultivated; which is very rare to find, unless some particular vineyards of the citizens, who are very exact to keep up the reputation of their wines, nothing

nothing being more common than for the vignerons to plant three or four sorts of Grapes in the same vineyard, and at the time of vintage to mix them all together; which renders their wines less delicate, than in such places where they have only this one sort of Grape. And here I would caution every one against mixing the juice of several Grapes together, which will cause the wine to ferment at different times, and in different manners.

The cuttings being thus provided (for I would always prefer these to layers, or rooted plants, for the reasons given at the beginning of the article VITIS) about the beginning of April is the best season for planting, when it will be proper to put the lower ends of the cuttings in water about three inches, setting them upright for six or eight hours before they are used; then at the center of every cross mark already made by a line, to the distance the Vines are designed, should be a hole made with a spade, or other instrument, about a foot deep, into each of which should be put one strong cutting, placing it a little sloping; then the hole should be filled up with earth, pressing it gently with the feet to the cutting, and raising a little hill to each about three inches, so as just to cover the uppermost eye or bud, which will prevent the wind and sun from drying any part of the cuttings, and this upper eye only will shoot; the under ones most of them will push out roots, so that this shoot will be very strong and vigorous.

After they are thus planted, they will require no other care until they shoot, except to keep the ground clear from weeds, which should be constantly observed; but as the distance between the rows of Vines is very great, so the ground between them may be sown or planted with any kind of esculent plants, which do not grow tall, provided there is proper distance left from the Vines, and care taken that the Vines are not injured by the crops, or in the gathering, and carrying them off the ground; and this husbandry may be continued three or four years, till the Vines come to bearing; after which time, there should be no sort of crop put between them in summer, because the cleaner the ground is kept between the Vines from weeds or plants, the more heat will be reflected to the Grapes; but after the Grapes are gathered, there may be a crop of Coleworts for spring use planted between the rows of Vines, and the cultivating of these will be of use to the Vines, by stirring of the ground; but as to watering, or any other trouble, there will be no occasion for it, notwithstanding what some people have directed, for in England there is no danger of their miscarrying by drought.

When the cuttings begin to shoot, there should be a small stick of about three feet long stuck down by each, to which the shoot should be fastened, to prevent their breaking or lying on the ground; so that as the shoots advance, the fastening should be renewed, and all small lateral shoots (if there are any such produced) should be constantly displaced, and the ground between the Vines always kept clean. This is the whole management which is required the first summer.

But at Michaelmas, when the Vines have done shooting, they should be pruned; for if they are left unpruned till spring, their shoots being tender (especially toward their upper parts) will be in danger of suffering if the winter should prove severe.

This pruning is only to cut down the shoots to two eyes; and if, after this is done, the earth be drawn up in a hill about each plant, it will still be a greater defence against frost.

At the beginning of March the ground between the Vines should be well dug to loosen it, and render it clean; but you should be careful not to dig deep close to the Vines, lest thereby their roots should be cut or bruised, and at the same time the earth should be again laid up in a hill about each plant; but there must be care taken, not to bury the two young eyes of the former year's shoot which were left to produce new wood.

At the beginning of May, when the Vines are shooting, there should be two stakes fixed down to the side of each plant, which must be somewhat taller and stronger than those of the former year; to these the two shoots (if so many are produced) should be fastened, and all the small trailing or lateral shoots should be constantly displaced, that the other shoots may be stronger, and the ground should also be kept very clear from weeds as before.

The autumn following these Vines should be pruned again in the following manner; those of them which have produced two strong shoots of equal vigour, must be cut down to three eyes each; but in such as have one strong shoot and a weak one, the strong one must be shortened to three eyes, and the weak one to two; and such Vines as have produced but one strong shoot, should be shortened down to two eyes also, in order to obtain more wood against the succeeding year.

In the spring, about the beginning of March, the ground between the Vines should again be dug, as before, and two stakes should be placed down by the side of all such Vines as have two shoots, at such distance on each side of the plant as the shoots will admit to be fastened thereto, and the shoots should be drawn out on each side to the stakes, so as to make an angle of about forty-five degrees with the stem; but by no means should they be bent down horizontally, as is by some practised, for the branches lying too near the earth, are generally injured by the damps which arise from thence, but especially when they have fruit, which is never so well tasted, nor so early ripe upon those branches, as when they are a little more elevated.

In May, when the Vines begin to shoot, they must be carefully looked over, and all the weak dangling shoots should be rubbed off as they are produced, and those shoots which are produced from strong eyes, should be fastened to the stakes to prevent their being broken off by the wind.

This management should be repeated at least every three weeks, from the beginning of May to the end of July; by which means the shoots which are trained up for the succeeding year will not only be stronger, but also better ripened and prepared for bearing, because they will have the advantage of sun and air, which is absolutely necessary to prepare their juices; whereas if they are crouded by a number of small dangling weak branches, they will shade and exclude the rays of the sun from the other shoots; and so by detaining the moisture a longer time amongst the branches, occasion the vessels of the young wood to be of a larger dimension; and hereby the crude juice finds an easy passage through them; so that the shoots in autumn seem to be mostly pith, and are of a greenish immature nature, and wherever this is observed, it is a sure sign of a bad quality in the Vines. The soil also should be constantly kept clean, because if there are any vegetables (either weeds or plants of other kinds) growing between the Vines, it will detain the dews longer, and by their perspiration, occasion a greater moisture than would be, if the ground were entirely clear; so that those who plant other things between their rows of Vines, are guilty of a great error.

In autumn the Vines should be pruned, which season I approve of rather than the spring (for reasons before given;) and this being the third year from planting, the Vines will now be strong enough to produce fruit, therefore they must be pruned accordingly. Now suppose the two shoots of the former year, which were shortened to three eyes, have each of them produced two strong branches the summer past, then the uppermost of these shoots upon each branch should be shortened down to three good eyes (never including the lower eye, which is situate just above the former year's wood, which seldom produces any thing, except a weak dangling shoot;) and the lower shoots should be shortened down to two good eyes each, these being designed to produce vigorous shoots for the

the succeeding year, and the former are designed to bear fruit; but where the Vines are weak, and have not produced more than two or three shoots the last season, there should be but one of them left with three eyes for bearing; the other must be shortened down to two, or if weak one good eye, in order to obtain strong shoots the following summer; for there is nothing more injurious to Vines, than the leaving too much wood upon them, especially while they are young; or the overbearing them, which will weaken them so much, as not be recovered again to a good state in several years, though they should be managed with all possible skill.

In March the ground between the Vines should be well dug as before, observing not to injure their roots by digging too deep near them; but where there are small horizontal roots produced on or near the surface of the ground, they should be pruned off close to the places where they were produced; these being what the vignerons call day roots, and are by no means necessary to be left on: and after having dug the ground, the stakes should be placed down in the following manner: on each side of the Vine should be a stake put in at about sixteen inches from the foot, to which the two branches, which were pruned to three eyes, each for bearing, should be fastened, (observing, as was before directed, not to draw them down too horizontally;) then another taller stake should be placed down near the foot of the Vine, to which the two shoots which were pruned down to two eyes, should be fastened, provided they are long enough for that purpose; but if not, when their eyes begin to shoot, these must be trained upright to the stakes, to prevent their trailing on the ground, hanging over the fruit branches, or being broken by the wind.

In May the Vines should be carefully looked over again, at which time all weak lateral branches should be rubbed off as they are produced; and those shoots which shew fruit, must be fastened with bass to the stakes to prevent their being broken, until they are extended to three joints beyond the fruit, when they should be stopped; but the shoots which are designed for bearing the following season, should be trained upright to the middle stake, by which method the fruit branches will not shade these middle shoots, nor will the middle shoots shade the fruit, so that each will enjoy the benefit of sun and air.

This method should be repeated every fortnight or three weeks, from the beginning of May to the middle of July, which will always keep the shoots in their right position, whereby the leaves will not be inverted, which greatly retards the growth of the fruit; and by keeping the Vines constantly clear from horizontal shoots, the fruit will not be crouded with leaves and shaded, but will have constantly the advantage of the sun and air equally, which is of great consequence; for where the fruit is covered with these dangling shoots in the spring, and are afterwards exposed to the air, either by divesting them of their leaves, or else displacing their branches entirely, as is often practised, the fruit will become hard, and remain at a perfect stand for three weeks, and sometimes will never advance afterward, as I have several times observed; therefore there cannot be too much care taken to keep them constantly in a kindly state of growth, as the vignerons abroad well know, tho' in England it is little regarded by the generality of gardeners, who, when their Grapes suffer by this neglect, immediately complain of the climate, or the untowardness of the season, which is too often a cover for neglects of this nature. And here I cannot help taking notice of the absurd practice of those who pull off their leaves from their Vines, which are placed near the fruit, in order to let in the rays of the sun to ripen them; not considering how much they expose their fruit to the cold dews, which fall plentifully in autumn, which, being imbibed by the fruit, greatly retard them; besides no fruit will ripen so well when entirely exposed to the sun, as when they are gently screened with leaves; and by the pulling off these leaves, which are absolutely necessary to prepare the juices before they enter the fruit, the gross parts of which are perspired away by the leaves, the fruit must either be deprived of nourishment, or else some of the gross particles will enter with the more refined parts of the juice, and thereby render the fruit worse than it would otherwise be, were the leaves permitted to remain upon the branches; for if the weak dangling shoots are constantly displaced as they are produced, the fruit will not be too much shaded by the leaves that are upon the bearing branches.

When the fruit is ripe, if the stalks of the bunches are cut half through a fortnight before they are gathered, it will cause the juice to be much better, because there will not be near so great a quantity of nourishment enter the fruit, whereby the watery particles will have time to evaporate, and the juice will be better digested. This is practised by some of the most curious vignerons in the south of France, where they make excellent wine. But if, after the fruit be cut, it is hung up in a dry room upon strings, so as not to touch each other, for a month before they are pressed, it will also add greatly to the strength of the wine, because in that time a great quantity of the watery parts of the juices will evaporate. This is a constant practice with some persons who inhabit the Tyrolese, on the borders of Italy, where is made a most delicious rich wine, as hath been attested by Dr. Burnet in his travels; and I have heard the same from several gentlemen, who have travelled that road since. But with all the care that can possibly be taken, either in the culture of the Vines, or in making the wine, it will not be near so good while the vineyard is young, as it will be after it has been planted ten or twelve years; and it will be constantly mending, until it is fifty years old, as is attested by several curious persons abroad, as also by the most skilful wine-coopers at home, who can tell the produce of a young vineyard from that of an old one, after it is brought to England, by the colour of the wine. This difference is very easily accounted for from the different structure of the vessels of the plants; those of the young Vines being larger, and of a looser texture, easily admit a larger quantity of gross nourishment to pass through them; whereas those of old Vines, which are more woody, are more closely constricted, and thereby the juice is better strained in passing through them, which must consequently render it much better, though the Grapes from a young vineyard will be larger, and afford a greater quantity of juice; so that people should not be discouraged if their wines at first are not so good as they could wish, since afterward, when the vineyard is a few years older, the wine may answer their expectation. As to the fermenting and managing the wine, that is treated of particularly under the article Wines, to which the reader is desired to turn.

The vineyard being now arrived to a bearing state, should be treated after the following manner: first, in the pruning there should never be too many branches left upon a root, nor those too long; for although by doing of this, there may be a greater quantity of fruit produced, yet the juice of these will never be so good as when there is a moderate quantity which will be better nourished, and the roots of the plants not so much weakened; which is found to be of so bad consequence to vineyards, that when gentlemen abroad lett out vineyards to vignerons, there is always a clause inserted in their leases to direct how many shoots shall be left upon each Vine, and the number of eyes to which the branches must be shortened; because were not the vignerons thus tied down, they would overbear the Vines, so that in a few years they would exhaust their roots, and render them so weak as not to be recovered again in several years; and their wine would be so bad, as to bring a disreputation on the vineyard, to the great loss of the proprietor.

The number of branches which the Italians generally agree to leave upon a strong Vine are four; two of the

the strongest have four eyes, and the two weaker are shortened down to two eyes each, which is very different from the common practice in England, where it is usual to see six or eight branches left upon each root, and those perhaps left with six or eight eyes to each; so that if these are fruitful, one root must produce near four times the number of bunches which the Italians do ever permit, and so consequently the fruit will not be so well nourished, and the roots will also be greatly weakened, as is the case of all sorts of fruit-trees, when a greater number of fruit is left on than the trees can nourish.

The next thing is, constantly to keep the ground perfectly clean between the Vines, never permitting any sort of plants or weeds to grow there. The ground should also be carefully dug every spring, and every third year have some manure, which should be of different sorts, according to the nature of the ground, or which can be most conveniently procured.

If the land is stiff, and inclinable to bind on the surface, then sea-sand, or sea-coal ashes, are either of them very good manure for it; but if the ground be loose and dry, then a little lime mixed with dung is the best manure for it. This must be spread thin upon the surface of the ground before it is dug, and in digging should be buried equally in every part of the vineyard. These are much preferable to that of all dung for Vines, so that it will be worth the expence to procure either of them; and as they require manuring but every third year, where the vineyard is large, it may be divided into three equal parts, each of which may be manured in its turn, whereby the expence will be but little every year; whereas when the whole is manured together, it will add to the expence; and in many places there cannot be a sufficient quantity procured, to manure a large vineyard in one year.

This digging and manuring should always be performed about the beginning of March, at which time all the superficial or day-roots, as they are called, must be cut off, but the larger roots must not be injured by the spade, &c. therefore the ground close to the stem of the Vines must not be dug very deep. After this is done, the stakes should be placed down, one on each side the Vines, at about sixteen inches from their stems, to which the longest bearing branches should be fastened, and one stake on each side close to the stem, to which the two shorter branches should be trained upright, to furnish wood for the succeeding year.

In the summer they must be carefully looked over, as before, rubbing off all weak dangling shoots, and training the good ones to the stakes regularly, as they are produced; and those of them which have fruit should be stopped in June, about three joints beyond the bunches, but the upright shoots, which are designed for bearing the following year, must not be stopped till the middle of July, when they may be left about five feet long; for if they are stopped sooner in the year, it will cause them to shoot out many dangling branches from the sides of the eyes, which will not only occasion more trouble to displace them, but also will be injurious to the eyes or buds.

N. B. *All this summer dressing should be performed with the thumb and finger, and not with knives, because the wounds made by instruments in summer do not heal so soon as when stopped by gently nipping the leading bud, which, if done before the shoot is become woody, may be effected with great ease, being very tender while young.*

When a vineyard is thus carefully dressed, it will afford as much pleasure in viewing it as any plantation of trees and shrubs whatever, the rows being regular; and if the stakes are exactly placed, and the upright shoots stopped to an equal height, there is nothing in nature which will make a more beautiful appearance; and during the season that the Vines are in flower, they emit a most grateful scent, especially in the morning and evening; and when the Grapes begin to ripen, there will be a fresh pleasure arising in viewing of them.

But as the beauty of vineyards arises from the regular disposition of the branches of the Vines, great care should be taken in their management, to train them regularly, and to provide every year for new wood to bear the succeeding year; because the wood which has produced fruit is commonly cut quite away after the fruit is gathered, or at least is shortened down to two eyes, to force out shoots for the next year; where there is not a sufficient number of branches upon the Vine of those trained upright, so that in summer, when the Vines are in perfection, there should be six upright shoots trained for the next year's wood, and three or four bearing branches with fruit on them; more than these ought never to be left upon one Vine, for the reasons before given.

N. B. *The Auvernat, or true Burgundy Grape, is valued in France before any other sort, because the fruit never grows very close upon the bunches, therefore are more equally ripened, for which reason it should also be preferred in England; though in general, those sorts are most esteemed with us that have always close bunches, which is certainly wrong; for it may be observed, that the Grapes on such bunches are commonly ripe on one side, and green on the other, which is a bad quality for such as are pressed to make wine.*

I shall now subjoin a few sorts of Vines, which are preserved in some curious gardens, more for the sake of variety, than the value of their fruit: these are,

1. Vitis (*Indica*) foliis cordatis dentatis subtus villosis, cirrhis racemiferis. Flor. Zeyl. 99. *Vine with heart-shaped indented leaves, which are hairy on their under side, and branching tendrils.* Vitis sylvestris Indica, acinis rotundis. Raii Dend. 67. *Wild Indian Vine, with round berries.*
2. Vitis (*Labrusca*) foliis cordatis subtrilobis dentatis, subtus tomentosis. Lin. Sp. Plant. 203. *Vine with heart-shaped indented leaves, which are almost three-lobed, and woolly on their under side.* Vitis sylvestris Virginiana. C. B. P. 299. *Wild Virginia Grape.*
3. Vitis (*Vulpina*) foliis cordatis dentato-serratis utrinque nudis. Lin. Sp. 203. *Vine with heart-shaped, sawed, indented leaves, which are smooth on both sides.* Vitis vulpina dicta Virginiana nigra. Pluk. Alm. 392. *The Virginia Fox Grape.*
4. Vitis (*Laciniatis*) foliis quinatis, foliolis multifidis. Hort. Cliff. 74. *Vine with leaves having five lobes, and cut into many points.* Vitis laciniatis foliis. Corn. Canad. 182. *Vine with jagged leaves, commonly called the Parsley-leaved Grape.*
5. Vitis (*Arborea*) foliis supradecompositis, foliolis lateralibus pinnatis. Lin. Sp. Plant. 203. *Vine with more than decompounded leaves, and lateral winged lobes.* Frutex scandens petroselini foliis, Virginiana, claviculis donatus. Pluk. Mant. 85. *Climbing Virginia Shrub with Parsley leaves, sending out tendrils.* Reynardsonia. Rand. Ind. Hort. Chelf. *Falsly called the Pepper-tree.*

The first sort grows naturally in both Indies. The stalks of this are woody, and send out many slender branches, which are furnished with branching tendrils, by which they fasten themselves to the neighbouring trees, and are thereby supported. The leaves are heart-shaped, indented on their edges, and hairy on their under side. The flowers are disposed in bunches like those of the other species, and are succeeded by round berries or Grapes, of an austere taste.

The second sort hath ligneous stalks which send out many branches, that fasten themselves by tendrils to any neighbouring support. The leaves of this are large, and for the most part divided into three lobes which are indented on their edges. The under side of the leaves is covered with a white down. The fruit is disposed in bunches like the other Grapes. The berries are round and black; the juice has a rough flavour.

The third sort has heart-shaped leaves which are indented on their edges, and are smooth on both sides. The plants climb on trees by the help of their tendrils, like those of the other sorts. The fruit is disposed in bunches. The berries are black, and their juice has a flavour resembling the scent of a fox, from whence

whence the inhabitants have given it the title of Fox Grape.

The fourth sort is supposed to grow naturally in Canada, but it has been long cultivated in the European gardens for its fruit; but as it has but little flavour, and ripens late in autumn, so it has been almost banished the English gardens, where at present there are only a few plants preserved for the sake of variety. The stalks and branches of this are like those of the common Grape, but the leaves are cut into many slender segments. The Grapes are round and white, and are disposed in loose bunches.

The fifth sort is by Dr. Linnæus ranged under this genus of Vitis, but the characters of this plant are not sufficiently known in Europe, to determine the proper genus to which it belongs, for the plant seldom produces flowers here, and has never produced any fruit in England, for which reason I have ranged it under the same genus, upon Dr. Linnæus's authority. The stalk of this plant is ligneous, and sends out many slender branches furnished with tendrils, which fasten themselves to any neighbouring plants for support, and are garnished with leaves composed of many smaller winged leaves, so that they are divided somewhat like those of common Parsley; they are of a lucid green on their upper side, but are much paler on their under. The flowers spring from the wings of the stalks in loose bunches; they are very small, white, and are composed of five small petals which expand, and soon fall off; these are not succeeded by any fruit in England, but the berries which I have received from America, had generally three seeds in each.

Mr. Rand gave it the title of Reynardsonia, from Mr. Reynardson of Hillendon, near Uxbridge, who was a great collector of foreign plants, but the characters of the genus were not mentioned by him.

The first sort being a native of warm countries, will not live in England without artificial heat; it is easily propagated by seeds, when they are brought from the countries where the plants grow naturally, for they do not produce any here; these must be sown in small pots, which should be plunged into a hot-bed of tanners bark. When the plants come up and are fit to remove, they should be each transplanted into a separate small pot filled with light earth, and plunged into a fresh hot-bed of tanners bark, shading them from the sun till they have taken new root; then they must be treated in the same way as other tender exotic plants from the same countries, always continuing them in the stove, otherwise they will not thrive. These plants cast off their leaves every winter.

The second and third sorts grow in great plenty in the woods of America, where, I have been informed, are many other sorts, which produce fruit very little inferior to some of the fine sorts which are cultivated in Europe; notwithstanding which, it is generally thought impossible to make wine in America: this I dare say, must proceed from a want of skill, rather than any bad quality in the soil or climate; so that instead of planting vineyards on their loose rich lands (as hath been generally practised by the inhabitants of these countries) if they would plant them upon rising ground, where the bottom was rocky or hard near the surface, I dare say they would have very good success; for the great fault complained of in those countries is, that the Grapes generally burst before they are fully ripe, which must certainly be occasioned by their having too much nourishment; therefore, when they are planted on a poorer soil, this will be in part remedied. Another cause of this may proceed from the moisture of the air, (occasioned by the perspiration of trees, &c.) which being imbibed by the fruit, may break their skins. This indeed cannot be prevented, until the country is better cleared of the timber: but however, this should caution people not to plant Vines in such places where there are great quantities of wood, because of this effect, which it hath on the Grapes. But to return:

These two Vines are preserved in the gardens of those who are curious in botany, but I have not seen either of them produce fruit in this country. They may be propagated by layers in the same manner as the common Grapes, which will take root in one year, and may be taken off, and transplanted in the spring where they are to remain, which should be against a warm wall; because if they are exposed to much cold in winter, they are often destroyed, especially while they are young.

Their pruning and management is the same with any other sorts of Grapes, but only they should have fewer shoots, and those shortened down very low; indeed the Fox Grape does not like much cutting; otherwise they will make very weak shoots the following year, and never arrive to any considerable strength, so will not be capable of producing any fruit.

The fourth sort is planted against walls, and treated in the same way as the common Vines, and may be propagated by cuttings or layers in like manner.

The fifth sort is preserved in some gardens for the sake of variety, but as it rarely produces flowers in England, so it has not much beauty; it is a native in Virginia and Carolina, from both of these countries I have received the seeds. As this sort does not produce seeds here, it is generally propagated by laying down the young branches, which will put out roots in one year fit to remove, when they may be taken off, and transplanted where they are to remain. These require support; and as their young branches are tender, and liable to be killed by frost, so if they are planted against a wall or pale, exposed to the south, they will succeed much better than when they are fully exposed to the open air, and supported by props. The young shoots of these plants should be shortened down to two or three buds in the spring, which will cause the shoots of the following summer to be much stronger, and when they are regularly trained against the wall or pale, they will produce flowers in warm seasons.

This plant is very apt to push out suckers from the root, by which it is often propagated, but the plants so raised are very subject to send out suckers again, whereby they are robbed of their nourishment, and do not thrive so well as those which come from layers.

VITIS IDÆA. See Vaccinium.

VITIS SYLVESTRIS. See Clematis.

ULEX. Lin. Gen. Plant. 786. Genista Spartium. Tourn. Inst. R. H. 645. tab. 412. Furze, Gorse, or Whins.

The Characters are,

*The flower has a two-leaved empalement; it has five petals, and is of the butterfly kind. The standard is large, erect, oval, heart-shaped, and indented at the point. The wings are shorter and obtuse. The keel is composed of two obtuse petals, whose borders are joined at bottom; it has ten stamina, nine joined, and one separate, terminated by single summits, and an oblong cylindrical germen, supporting a rising style, crowned by a small obtuse stigma. The germen afterward turns to an oblong turgid pod with one cell, opening with two valves, inclosing a row of kidney-shaped seeds.*

This genus of plants is ranged in the third section of Linnæus's seventeenth class, which includes those plants whose flowers have ten stamina joined in two bodies.

The Species are,

1. Ulex (*Europæus*) foliis villosis acutis spinis sparsis. Lin. Sp. Plant. 741. *Ulex with acute-pointed hairy leaves, and sparsed spines.* Genista spinosa major, longioribus aculeis. C. B. P. 394. *The common Furze, Whins, or Gorse.*
2. Ulex (*Capensis*) foliis obtusis solitariis, spinis simplicibus terminalibus. Flor. Leyd. Prod. 372. *African Furze, or Whins, with single blunt leaves.* Genista spartium bacciferum, ericæ foliis Africanum. Pluk. Alm. 166. *African Berry-bearing Furze, with a leaf like Heath.*

This genus of plants has been titled by the antient botanists Genista spinosa, and Genista spartium, but these being compound names have been rejected; and

as there is another genus of plants under the title of Genista, Dr. Linnæus has applied this title of Ulex, which is a name used by Pliny, to this genus.

The common Furze, Gorze, or Whins, as it is called in the different counties in England, is so well known as to need no description.

There are two or three varieties of this, which are frequently met with on the commons and heaths in most parts of England; but as they are not specifically different, they are not worthy to be enumerated here, especially as they are plants which are seldom cultivated.

But these have by many botanists been mentioned as specifically different, for which reason I sowed their seeds in the garden, and found all the varieties arise from the same seeds.

These plants propagate themselves very plentifully by seeds, so that when they are established in a spot of ground, they soon spread over the place; for as the seeds ripen, the pods open with the warmth of the sun, and the seeds are cast out with an elasticity to a great distance all round, and these soon vegetate; whereby the ground is filled with young plants, which are not easily destroyed, when they are well rooted in the ground.

Some years ago the seeds of this plant were sown to form hedges about fields, where, if the soil was light, the plants soon become strong enough for a fence against cattle; but as these hedges in a few years became naked at the bottom, and some of the plants frequently failed, there became gaps in the hedges, therefore the raising of them has been of late years little practised. But there are some persons who have sown the seeds of this plant upon very poor hungry gravel or sandy land, which has produced more profit than they could make of the ground by any other crop, especially in such places where fuel of all sorts is dear; for this Furze is frequently used for heating ovens, burning lime and bricks, and also for drying malt. And in some places where there has been a scarcity of fuel, I have known poor land, which would not have lett for five shillings per acre, which has been sown with Furze, produce one pound per acre per ann. so that there has been a considerable improvement made by this plant. But this is not worth practising in such countries where fuel of any kind is cheap, or upon such land as will produce good Grass or Corn; therefore it is only mentioned here to shew, that poor lands may be so managed, as to bring an annual profit to their proprietors.

The second sort is a native of the country near the Cape of Good Hope, where it usually grows to the height of five or six feet; but in Europe, where it is preserved as a curiosity in some gardens, it seldom rises so high. The stalk is ligneous and hard, covered with a greenish bark when young, but it afterward becomes grayish. The branches are slender and ligneous, the leaves are single, obtuse, and the shoots terminate with spines. This plant has been several years in the English gardens, but has not produced any flowers.

This plant is too tender to live in the open air through the winter in England, therefore it is preserved in green-houses with the hardier sorts of exotic plants, which do not require any artificial heat to preserve them.

It is very difficult to propagate either by layers or cuttings, for the layers are generally two or three years before they have sufficient root to transplant, and the cuttings do very rarely take root, and as the plant does not produce seeds in Europe, it is very rare in the European gardens. It is a plant of no great beauty, but, as it is an evergreen, it is admitted into the gardens of those who are curious in botany for the sake of variety.

ULMARIA. See Spiræa.

ULMUS. Tourn. Inst. R. H. 601. tab. 372. Lin. Gen. Plant. 281. The Elm-tree; in French, *Orme*.

The Characters are,

*The flower has a rough permanent empalement of one leaf, cut at the rim into five points, and coloured within; it has no petals, but has five awl-shaped stamina twice the length of the empalement, terminated by short erect summits having four furrows, and an orbicular erect germen supporting two styles which are reflexed, and crowned by hairy stigmas. The germen afterward turn to a roundish, compressed, bordered capsule, including one roundish compressed seed.*

This genus of plants is ranged in the second section of Linnæus's fifth class, which contains those plants whose flowers have five stamina and two styles.

The Species are,

1. Ulmus (*Campestris*) foliis oblongis acuminatis, duplicato-serratis, basi inæqualibus. *Elm with oblong acute-pointed leaves, which are doubly sawed on their edges, and unequal at their base.* Ulmus vulgatissima, folio lato, scabro. Ger Emac. 1480. *The common rough, or broad-leaved Witch Elm.*
2. Ulmus (*Scabris*) foliis oblongo-ovatis inæqualiter serratis, calycibus foliaceis. *Elm with oblong oval leaves which are unequally sawed, and have leafy empalements to the flowers.* Ulmus folio latissima, scabro. Ger. Emac. 1481. *The Witch Hazel, or rough and very broad-leaved Elm; by some unskilful persons called the British Elm.*
3. Ulmus (*Sativus*) foliis ovatis acuminatis duplicato-serratis, basi inæqualibus. *Elm with oval acute-pointed leaves which are doubly sawed, and unequal at their base.* Ulmus minor, folio angusto, scabro. Ger. Emac. 1480. *The small-leaved or English Elm.*
4. Ulmus (*Glabris*) foliis ovatis glabris, acutè serratis. *Elm with oval smooth leaves, which are sharply sawed on their edges.* Ulmus folio glabro. Ger. Emac. 1481. *The smooth-leaved Witch Elm.*
5. Ulmus (*Hollandicus*) foliis ovatis acuminatis rugosis, inæqualiter serratis, cortice fungoso. *Elm with oval, acute-pointed, rough leaves, which are unequally sawed, and a fungous bark.* Ulmus major Hollandica, angustis & magis acuminatis samarris, folio latissimo, scabro. Pluk. Alm. *The Dutch Elm.*
6. Ulmus (*Minor*) foliis oblongo-ovatis glabris acuminatis duplicato-serratis. *Elm with oblong, smooth, acute-pointed leaves, which are doubly sawed.* Ulmus minor, folio angusto, glabro. *The smooth narrow-leaved Elm, by some called the upright Elm.*

The first sort is very common in the north-west counties of England, where it is generally believed to grow naturally in the woods; this grows to a very large size. The bark of the young branches is smooth and very tough, but that of the old trees cracks and is rough. The branches spread, and do not grow so erect as those of the third sort. The leaves are rough, and are doubly sawed on their edges. Their base is unequal, about three inches long and two broad, of a dark green colour, and stand upon short foot-stalks. The flowers come out in March upon the slender twigs, standing in clusters; they are of a deep red colour; these are succeeded by oval bordered capsules, containing one roundish compressed seed which ripens in May. The wood of this tree is good for all the purposes of any kind of Elm, and the trees grow to a very large size, but the leaves do not come out till late in the spring, so there are few persons who plant these trees near their habitations.

The second sort grows naturally in some of the northern counties of England, where it is frequently called Witch-hazel, from the resemblance of the young shoots and leaves to those of Hazel. This grows to a tree of great magnitude. The bark of the young shoots is very smooth and tough; it is of a yellowish brown colour, with spots of white. The leaves are oval, six inches long, and almost four broad, and are unequally sawed on their edges. The flowers grow in clusters toward the end of the twigs; they have long leafy empalements of a green colour, and appear in the spring before their leaves, and the seeds ripen the latter end of May. The wood of this tree is not so good for use as that of the first sort. Formerly, when long bows were in use, many of them were made of the boughs of this tree.

The third sort is commonly known in the nursery-gardens by the title of English Elm, which is far from being a right appellation, for it is not a native of England, and is only found growing near London, or in plantations where the young trees were procured from the neighbourhood of London. Where this tree grows naturally is not easy to determine; some persons have supposed it was brought from Germany. As this tree is well known, it requires no description. The flowers of this are of a purplish red colour, and generally appear the beginning of March, but I could never observe any seeds upon this sort.

The fourth sort is very common in several parts of Hertfordshire, Essex, and other north-east counties of England; this grows to a large tree, and is much esteemed. The branches spread out like those of the first sort. The leaves are oval, and sharply sawed on their edges; they are smoother than most of the other sorts, and do not appear till the middle or latter end of May, so the trees are seldom planted near habitations.

The fifth sort is well known by the title of Dutch Elm; this was brought from Holland the beginning of King Willliam's reign, and was for some time a fashionable tree, and has been recommended for its quick growth; it was some years ago in great request for forming hedges in gardens, for which purpose it was one of the most improper trees that could be chosen, for they made very strong irregular shoots, which are distant from each other. The leaves were very large and rough, and the branches covered with a fungous rough bark, which was disagreeable, so that when the hedges were sheared, they appeared naked and disagreeable the whole summer after. The wood of this tree is good for nothing, so it is almost banished this country.

The sixth sort is found growing in hedge-rows in several parts of England. The branches of this sort have a smooth grayish bark, and grow erect. The leaves are narrower, and more pointed than those of the English Elm, and are smoother; they are later in coming out in the spring than those, but continue longer in autumn; this has been by some called the Irish Elm.

There are some other varieties of this tree which are preserved in the nursery-gardens, but their difference is not remarkable enough to deserve notice, therefore they are omitted, as are also those with variegated leaves, of which there are several varieties propagated in the nurseries about London; these are by some persons esteemed.

All the sorts of Elm may be either propagated by layers or suckers taken from the roots of the old trees, the latter of which is generally practised by the nursery gardeners; but as these are often cut up with indifferent roots, they often miscarry, and render the success doubtful; whereas those which are propagated by layers are in no hazard, and always make better roots, and come on faster than the other, and do not send out suckers from their roots in such plenty, for which reason this method should be more universally practised. And since a small compass of ground filled with stools of these plants will be sufficient to furnish a nursery of a considerable extent, annually, with layers to be transplanted, it is richly worth every person's while, who would cultivate these trees, to allot a spot of ground for this purpose.

The best soil for such a nursery is a fresh Hazel loam, neither too light and dry, nor over moist and heavy; this ground should be well trenched, and if a little rotten dung is buried therein, it will be of service; in doing of this great care should be taken to pick out all the roots of pernicious weeds, which, if left in the ground, would be very injurious to the layers, and cannot afterwards be so easily rooted out; then having laid the ground level, the plants must be planted at about eight feet asunder each way. The best season for this work is in autumn, as soon as the leaves begin to decay, that they may take root before the dry weather in the spring comes on, whereby a great expence of watering them will be saved; for if they are well settled in the ground before the dry weather, they will require little more than to mulch their roots to keep the earth from drying.

These plants should be permitted to grow rude two years, during which time the ground between should be carefully cleaned and dug every spring, by which time they will be well rooted and have made pretty strong shoots, so that they may be laid in the ground. The manner of performing this being already described in the article Layers, I shall forbear repeating it in this place.

When these layers are well rooted, which will be in one year, they should be taken off, and transplanted out into a nursery, which should be upon a good soil, and well prepared, (as before for the stools.) The plants should be planted in rows about four feet asunder, and two feet distance plant from plant in the rows. This should be done in autumn, as soon as the leaves begin to decay, and if there is some mulch laid upon the surface of the ground about their roots, it will preserve them from being hurt by frost in winter, and from drying winds in spring, and thereby secure them from all hazard.

The following summer the ground between them should be constantly kept clean from weeds, and in autumn they should be pruned up, cutting off all strong lateral branches, which, if left on, would impede their upright growth; but there must be some of the smaller shoots left on to detain the sap, in order to augment the stems of the trees; for where they are pruned up too naked, they are apt to grow up too slender to support themselves, so that their heads will recline to the ground, and cause their stems to grow crooked.

In this nursery they may remain four or five years, observing constantly to dig the ground between them every spring, and to trim them as before directed, which will promote their growth, and render them strong enough to transplant out where they are to remain, in the time before mentioned.

These trees are very proper to plant in hedge-rows, upon the borders of fields, where they will thrive much better than when planted in a wood, or close plantation, and their shade will not be very injurious to whatever grows under them; but when these trees are transplanted out upon banks after this manner, the banks should be well wrought, and cleared from all other roots, otherwise the plants, being taken from a better soil, will not make much progress in these places. About Michaelmas will be a good time for this work, for the reasons before assigned; but when they are planted, there should be some stakes fixed in by them, to which they should be fastened to prevent their being displaced by the winds, and part of their heads should be taken off before they are planted, which will also be of use in preventing their being easily overturned by winds; but by no means should their leading shoot be stopped, nor the branches too closely cut off; for if there are not some shoots left on to draw and attract the sap, they will be in danger of miscarrying.

These trees are also proper to plant at a distance from a garden or building to break the violence of winds, for which purpose there is not any tree more useful, for they may be trained up in form of a hedge, keeping them cut every year, which will cause them to grow very close and handsome to the height of forty or fifty feet, and be a great protection against the fury of winds; but they should not be planted too near a garden, where fruit-trees or other plants are placed, because the roots of the Elms run superficially near the top of the ground to a great distance, and will intermix with the roots of the other trees, and deprive them of nourishment; nor should they be planted near gravel or Grass walks, which are designed to be well kept, because the roots will run into them, and send forth suckers in great plenty, which will deface the walks, and render them unsightly.

But for large gardens, where ſhade is required, there is ſcarce any tree ſo proper for that pupoſe, being eaſy to remove when grown to a conſiderable ſize, ſo that a perſon who is willing to have his plantations for ſhade in a ſhort time, may procure trees of near one foot circumference in their trunk, which will be in little danger of ſucceeding, provided they are removed with care. And theſe will take root, and grow very well, though not ſo well as young plants, which is what few other ſorts of trees will do; but then they ſhould be ſuch trees as have been thus regularly trained up in a nurſery, and have good roots, and not ſuch as are taken out of hedge rows (as is by ſome practiſed,) which ſeldom riſe with any tolerable roots, and conſequently often miſcarry; and this has been the occaſion of ſo many plantations of theſe trees failing, for although ſome of them may live a few years, yet few of them are of long duration, and they rarely increaſe much in their ſtems, but frequently grow hollow, their heart decaying firſt, ſo that they are ſupported only by their bark or ſhell, for a few years, and the firſt ſevere winter, or very dry ſummer, they are generally deſtroyed.

But althovgh I have ſaid, that Elms which are trained up in a nurſery may be removed with ſafety, at a larger ſize than moſt other trees, yet I would not have it underſtood, that by this I would recommend the planting of them when large, for if people would have a little patience when they plant, and never plant any of theſe trees which are more than four or five inches in the girt of their ſtems, they will in a few years become better trees than any of thoſe which are tranſplanted of a much larger growth, and they will always grow to a much larger ſize; beſides, they are much more eaſily removed, and do not require to be ſo ſtrongly ſupported, nor is there much danger of the young trees miſcarrying; therefore it is much more eligible to make choice of young thriving trees (but not out of a better ſoil than that where they are to be planted,) and never to plant any large trees, unleſs where a ſmall number may be wanted for an immediate ſhade, and in ſuch caſes it is always proper to plant ſome young trees amongſt the large ones, to ſucceed them when they fail.

In planting of theſe trees, great care muſt be taken not to bury their roots too deep, which is very injurious to them, eſpecially if they are planted on a moiſt loam or clay; in which caſe, if the clay is near the ſurface, it will be the beſt way to raiſe the ground in a hill, where each tree is to be planted, which will advance their roots above the ſurface of the ground, ſo that they will not be in danger of rotting in winter with moiſture.

When theſe trees are propagated by ſuckers taken from the foot of old trees, they are commonly laid into the ground in rows pretty cloſe together in beds, where, in dry weather, they may be frequently watered to encourage their putting out roots. In theſe beds they are left commonly two years, by which time thoſe that live will be rooted (though a great many of them generally die;) they then are tranſplanted into the nurſery, and managed as hath been directed for the layers.

There are ſome who raiſe the Witch Elm from ſeeds, which it generally produces in great plenty, and are ripe in May; theſe ſhould be ſown upon a bed of freſh loamy earth, and gently covered. In dry weather they ſhould be watered, and if the bed is ſhaded from the violent heat of the ſun, it will be of great ſervice to the ſeeds (for I always obſerve the plants to come up better in the ſhade, than when expoſed to the ſun.) When the plants come up, they ſhould be carefully cleared from weeds, and after they have ſtood two years in the ſeed-bed, they will be fit to plant out into the nurſery, where they muſt be managed as the former.

When we view many of the late plantations which have been made in parks and gardens within forty years paſt, at a very great expence, and obſerve the little progreſs they have made, it is enough to deter others from attempting to make plantations of this tree; for, as great part of the trees have been taken out of hedge rows, and from places where they have ſprung up from the roots of old trees, they had but few roots, and thoſe not furniſhed with fibres, ſo ſuch of the trees as ſurvived their removal have made ſcarce any progreſs; and I have ſeen many plantations which had been growing ten, twelve, or more years, almoſt totally deſtroyed in a ſevere winter, and ſometimes by a very dry ſummer; for, as their roots had not extended far in the ground, the trees were weak, and though they kept alive, yet were not able to reſiſt a ſevere froſt, or a great drought; but the planters were in a hurry, and wanted immediate ſhade and proſpect, ſo in order to obtain theſe, purſued a method in which they could never hope to have either in any degree of perfection; whereas if they had planted trees no bigger in their ſtems than a man's thumb, in ten or twelve years time they would have had both, with the pleaſure of ſeeing an annual progreſs of their trees, at a time when their large-planted trees are decaying.

I have ſeen ſome expenſive plantations of this kind, which have ſeemed to ſucceed for two or three years, by making ſtrong ſhoots moſt part of the length of their ſtems, which has greatly deceived their planters, who did not doubt but their trees were out of danger, but in a few years after, they found moſt of their tops decay, and their hearts were rotting apace, ſo became hollow; and although they continued to put out lateral ſhoots, yet their ſtems never increaſed in ſize.

In ſome plantations made in the ſame place a few years after, with trees not a tenth part ſo large as the former, yet are now more than double the ſize of the large ones, and in a moſt thriving ſtate, whereas the others do little more than juſt keep alive; therefore I adviſe every perſon, who wiſhes to have their trees thrive and become large, to plant them young, which may be performed for a very ſmall ſum, when compared with that of the other.

Another piece of advice may be alſo neceſſary here, which is, not to top or cut the trees, as is too much practiſed near London, which not only impedes their growth, but occaſions their decaying ſoon.

UMBELLA, an umbel, is the extremity of a ſtalk or branch, divided into ſeveral pedicles or rays, beginning from the ſame point, and opened in ſuch a manner as to form an inverted cone. When the pedicles, into which the ſtalk is divided, are ſubdivided into others of the ſame form, upon which the flowers or fruits are diſpoſed, the firſt order is called rays, the ſecond pedicles. That umbel which conſiſts of pedicles only is called a ſimple umbel; that which is compoſed both of rays and pedicles is called a compound umbel.

UMBELLIFEROUS PLANTS are thoſe whoſe flowers are produced in an umbel, on the top of the ſtalks, where they, in ſome manner, repreſent an umbrella. Of this kind are Parſneps, Carrots, Fennel, Parſley, &c.

URENA. Hort. Elth. 319. Lin. Gen. Plant. 754. Indian Mallow.

The Characters are,

*It hath a malvaceous flower with a double empalement, the outer being of one leaf, ſlightly cut at the brim into five parts, but the inner is five-leaved, permanent, and cut to the bottom. The flower is compoſed of five leaves which are oblong, and blunt at their extremity, but narrow at their baſe, where they coaleſce. In the center there are many ſtamina which are joined, and form a column at their baſe, but ſpread open above. It has a roundiſh five-cornered germen with a ſingle ſtyle, and ten hairy reflexed ſtigmas. The germen changes to a pentagonal fruit which is burry, and divides into five cells, each having one angular ſeed.*

This genus of plants is ranged in the third ſection of Linnæus's ſixteenth claſs, which includes thoſe plants whoſe flowers have many ſtamina, which, with the ſtyle, are joined in one body.

The Species are,

1. Urena (*Lobata*) foliis angulatis. Lin. Hort. Cliff. 348. *Indian Mallow with angular leaves.* Urena Sinica Xanthii facie. Hort. Elth. 340. *Urena of China having the appearance of lesser Burdock.*

2. Urena (*Aculeata*) foliis inferioribus angulatis, superioribus trilobis quinquelobisque acutè serratis. *Urena with angular lower leaves, and the upper ones divided into three or five lobes which are sharply sawed.* Alcea Indica frutescens foliis ad marginem exasperatis, bryoniæ albæ divisuris, e Sinu Bengalensi. Pluk. Phyt. tab. 5. fig. 3. *Indian shrubby Vervain Mallow from Bengal, with leaves having prickles on their edges, and divided like those of the white Briony.*

3. Urena (*Sinuata*) foliis sinuato-multifidis villosis. Flor. Zeyl. 257. *Urena with sinuated hairy leaves having many points.* Alcea Indica frutescens, foliis in lacinias variè dissectis. Pluk. Phyt. tab. 74. fig. 1. *Shrubby Indian Vervain Mallow, with leaves variously cut.*

The title of Urena was applied to this genus by Dr. Dillenius, in the Hortus Elthamensis, as the characters of the plants differ from all the genera of the malvaceous tribe, and this being a name applied to it in the Hortus Malabaricus.

The first sort grows naturally in China, and also in America; this rises with an upright stalk upward of two feet high, which become ligneous toward the autumn. It sends out a few side branches which are taper, stiff, and have a dark green bark; they are garnished with roundish angular leaves about two inches long, and two inches and a quarter broad, standing upon pretty long foot-stalks; they are of a dark green on their upper side, and are pale on their lower. The flowers come out single from the wings of the stalk, sitting close to it; they are shaped like those of the Mallow, but are small, and of a deep blush colour; these are succeeded by roundish capsules, armed with prickly hairs, divided into five cells, each containing one kidney-shaped seed. It flowers from July till winter, and the seeds ripen in succession.

The second sort grows naturally on the coast of Malabar, from whence I received the seeds: this rises with a ligneous stalk three feet high, dividing into four or five branches, which have a grayish bark; they are garnished with leaves of different forms; those on the lower part are angular, an inch and a half long, and about the same breadth; those above are cut some into three, and others have five angular obtuse lobes; they are of a dark green on their upper side, but pale on their under, and are sharply sawed on their edges, standing upon long foot-stalks. The flowers come out singly from the wings of the stalk; they are shaped like those of the other, but are larger. The petals are narrower at their base, and they have deep red bottoms. These appear in August and September, but unless the autumn proves warm, the seeds will not ripen in this country.

The seeds of the third sort came from Malabar; the stalks of this are hairy, and divide into many branches: it rises about two feet high, and is garnished with oblong leaves, divided into three obtuse lobes to the midrib. The lobes are indented in several parts; they are of a light green on both sides, and hairy. The flowers sit close to the stalks singly at the wings; they are shaped like those of the former, but are of a pale blush colour, with a a deep red bottom. These appear in August and September, but unless the season proves warm, the seeds do not ripen in England.

These plants are propagated by seeds, which should be sown on a hot-bed early in the spring; and when the plants are fit to remove, they should be transplanted into pots, and plunged into a fresh hot-bed to bring them forward, and afterward they must be treated in the same manner as hath been directed for the tender sorts of Hibiscus, to which the reader is desired to turn. If the plants are brought forward in the spring, and afterward placed in the stove, or under a deep frame, they will ripen seeds the first season; but if they should not, they may be preserved through the winter in the stove, and will ripen their seeds the following season, after which the plants seldom continue.

URTICA. Tourn. Inst. R. H. 534. tab. 308. Lin. Gen. Plant. 935. [so called from urere, *Lat.* to burn, because this plant, being touched, burns very much.] The Nettle; in French, *Ortie.*

The Characters are,

*It has male and female flowers at remote distances, sometimes on the same, and at others on separate plants. The male flowers have an empalement composed of four roundish concave leaves; these have no empalements; they have a pitcher-shaped nectarium in the center of the flower, and four awl-shaped spreading stamina, terminated by summits with two cells. The female flowers have an oval permanent empalement with two valves; they have neither petals nor stamina, but an oval germen without any style, crowned by a hairy stigma. The germen afterward turns to an oval compressed seed, which ripens in the empalement.*

This genus of plants is ranged in the fourth section of Linnæus's twenty-first class, which contains those plants which have distinct male and female flowers on the same plant, and the male flowers have four stamina.

The Species are,

1. Urtica (*Dioica*) foliis oppositis cordatis, racemis geminis. Lin. Sp. Plant. 984. *Nettle with heart-shaped leaves which are placed opposite, and double spikes of flowers.* Urtica urens maxima. C. B. P. 232. *The greatest stinging Nettle.*

2. Urtica (*Urens*) foliis oppositis ovalibus. Lin. Sp. Plant. 984. *Nettle with oval leaves which are placed opposite.* Urtica urens minor. C. B. P. 232. *Smaller stinging Nettle.*

3. Urtica (*Pilulifera*) foliis oppositis cordatis, amentis fructiferis globosis. Lin. Sp. 1395. *Nettle with heart-shaped leaves placed opposite, and seeds in globular katkins.* Urtica urens pilulas ferens. s. Dioscoridis, semine lini. C. B. P. 232. *Stinging Nettle bearing pills and seeds like Flax, commonly called Roman Nettle.*

4. Urtica (*Dodartii*) foliis oppositis ovatis subintegerrimis, amentis fructiferis globosis. Lin. Sp. 1395. *Nettle with oval leaves which are almost entire, placed opposite, and globular seed-bearing katkins.* Urtica altera, pilulifera, parietariæ foliis. Act. Par. 131. *Another pill-bearing Nettle with a leaf like Pellitory, commonly called Spanish Marjoram.*

5. Urtica (*Cannabina*) foliis oppositis tripartitis incisis. Hort. Upsal. 282. *Nettle with leaves placed opposite, which are cut into three parts.* Urtica foliis profundè laciniatis, semine lini. Amman. Ruth. 249. *Nettle with leaves which are deeply cut, and seeds like Flax.*

6. Urtica (*Cylindrica*) foliis oppositis oblongis, amentis cylindricis solitariis indivisis. Lin. Sp. Plant. 984. *Nettle with oblong leaves which are placed opposite, and single, cylindrical, undivided katkins.* Urtica foliis oblongis serratis nervosis petiolatis. Flor. Virg. 187. *Nettle with oblong, sawed, veined leaves, growing upon foot-stalks.*

7. Urtica (*Mariana*) foliis oppositis ovato-lanceolatis acuminatis crenatis, amentis cylindricis indivisis. *Nettle with oval, spear-shaped, acute-pointed, crenated leaves, which are placed opposite, and cylindrical undivided katkins.* Urtica minor iners Mariana, seminibus ex alis foliorum racemosis non ramosis. Pluk. Mant. 190. *Smaller Nettle of Maryland, with seeds growing in long bunches from the wings of the leaves, but not branched.*

8. Urtica (*Canadensis*) foliis alternis cordato-ovatis, amentis racemosis distichis erectis. Hort. Cliff. 441. *Nettle with oval heart-shaped leaves which are placed alternate, and erect, branching, double katkins.* Urtica maxima, racemosa Canadensis. H. R. Par. *Greatest branching Nettle of Canada.*

9. Urtica (*Nivea*) foliis alternis orbiculato utrinque acutis subtus tomentosis. Hort. Cliff. 441. *Nettle with orbicular leaves pointed at both ends, placed opposite, and woolly on their under side.* Urtica racemifera maxima sinarum, foliis subtus argenteâ lanugine villosis. Pluk. Amalth. 212. *Greatest branching China Nettle*

*whose*

*whose leaves are covered with a silvery hairy down on their under side.*

10. Urtica (*Balearica*) foliis oppositis cordatis serratis, amentis fructiferis globosis. Lin. Sp. 1395. *Nettle with heart-shaped sawed leaves placed opposite, and globular katkins and fruit.* Urtica pilulifera, folio angustiori, caule viridi Balearica. Boerh. Ind. alt. 11. 106. *Narrow-leaved pill-bearing Nettle, of the Balearic Islands, with a green stalk.*

The first of these sorts is a very common weed upon the sides of banks, ditches, and other uncultivated places, where its roots will spread, and over-run the grounds, so that it should always be carefully extirpated from gardens; it is sometimes used in medicine, but may be easily procured from the fields at almost any season.

The second sort is also a very common weed in gardens, and in cultivated fields; but it being an annual plant, is not so difficult to eradicate as the former.

These plants are so well known as to need no description.

The third sort grows naturally in Romney Marsh, and near Yarmouth; this is an annual plant which rises near three feet high. The stalk is herbaceous, thick, of a purplish colour, and armed in every part with stinging hairs. The branches come out opposite. The leaves are heart-shaped, the lower ones are three inches long, and two broad toward their base, and end in acute points; they are deeply sawed on their edges, and stand opposite upon long foot-stalks; these are also armed with stinging hairs on both sides. The male and female flowers come out from the wings of the leaves at the same joint, on each side the stalk; the male standing above the female, upon long slender foot-stalks or katkins, placed very loosely. The female flowers have shorter foot-stalks, and are in globular heads; these are succeeded by smooth shining seeds like those of the Flax. It flowers in July and August, and the seeds ripen in autumn.

The tenth sort grows naturly in the Balearic Islands. This was discovered by Mr. Salvadore, an apothecary in Barcelona, who sent the seeds to many botanic gardens, where the plants have been cultivated several years; this differs from the third sort in having narrower leaves and globular katkins, but being somewhat like it, is not often distinguished from it.

The fourth sort grows naturally in Spain and Italy; this is also an annual plant, whose stalks are much slenderer than those of the former, and seldom branch. The leaves are placed by pairs, upon very slender foot-stalks; they are oval, spear-shaped, and for the most part entire, and have male and female flowers springing from the wings of the leaves, which are shaped like the former, the whole plant being armed with stinging hairs. This flowers and perfects its seeds at the same time as the other.

These plants may be easily propagated by sowing their seeds in March, upon a bed of light rich earth, and when the plants are come up, they should be transplanted out into beds, or the borders of the pleasure-garden, interspersing them amongst other plants, that they may not be easily discovered by persons whom there is a design to deceive, by gathering a sprig for them to smell to. After the plants have taken root, they will require no farther care but only to keep them clear from weeds. In July they will flower, and their seeds will ripen in autumn, which, if permitted to shed upon the ground, will come up the following spring, and flourish without farther care.

The seeds of the third sort are sometimes used in medicine.

The fifth sort grows naturally in Tartary, from whence the seeds were brought to the Imperial Garden at Petersburgh; and have since been dispersed to most parts of Europe; this has a perennial root, from which springs up many square stalks which rise five or six feet high, garnished with oblong leaves deeply cut into three lobes, which are acutely indented on their edges; these stand opposite upon long foot-stalks. The flowers are produced from the wings of the leaves in long cylindrical katkins; the male are produced on the lower part of the stalk, and the female on the upper; the latter are succeeded by seeds like those of Flax, inclosed in the three-cornered empalement of the flower. This flowers in July, and the seeds ripen in autumn. The stalks and leaves of this sort are armed with stinging hairs.

This plant is easily propagated either by seeds or parting of the roots, and will thrive in most soils or situations.

The sixth sort grows naturally in Canada, and other parts of North America; it is an annual plant, with a lucid herbaceous stalk, which divides into several branches, garnished with oblong sawed leaves, having three longitudinal veins; they are placed opposite upon pretty long foot-stalks. The flowers are produced from the wings of the stalks in single katkins, which are not divided; they appear late in the year, and unless the autumn is very favourable, the seeds will not ripen in England.

The seventh sort grows naturally in North America; this has a perennial root, from which spring out many stalks from two to three feet high, garnished with oval spear-shaped leaves placed opposite, standing upon long foot-stalks; they are crenated on their edges, and end in acute points. The flowers come out from the wings of the leaves on every side the stalk, in long, cylindrical, undivided katkins; these appear in August, but the seeds do not ripen in England.

The eighth sort grows naturally in Canada and Virginia. The root is perennial; the stalks rise two feet high; the leaves are oval, heart-shaped, and stand alternately upon the stalks; the flowers come out in branching katkins from the wings of the stalks; these appear toward autumn, but are seldom succeeded by seeds in this country.

The two last sorts are common in many English gardens, where they are preserved more for the sake of variety than for any beauty. They may be propagated by parting their roots in the spring, and planted in almost any soil or situation, and will endure the severest cold of this climate in the open air.

The ninth sort grows naturally in China, where it is titled Peama; this is a perennial plant, sending up many stalks from the root, which rise three or four feet high, garnished with oval leaves drawing to points at both ends; they are four inches long, and two inches and a half broad, sawed on their edges, of a deep green on their upper side, but very white on their under, and have five longitudinal veins; they are placed alternately, and stand upon very long slender foot-stalks. The flowers spring from the wings of the stalk in loose katkins; these are not succeeded by seeds in England.

This may also be propagated by parting of the roots, which should be done in May, for at that season this plant is in its least vigour, the winter being the time when it is most flourishing.

The plants must be planted in pots filled with light earth, and as they are too tender to thrive in the open air in England, so they should be kept in pots, and housed in winter, and only exposed to the open air for three months in the heat of summer.

UVA URSI. See Arbutus.

VULNERARIA. See Anthyllis.

UVULARIA. Lin. Gen. Plant. 373.

The Characters are,

*The flower has no empalement; it has six oblong, erect, spear-shaped petals, and six awl-shaped stamina terminated by oblong, erect, four-cornered summits; it has an oblong, obtuse, three-cornered germen, supporting a style longer than the stamina, crowned by a triple, obtuse, spreading stigma. The germen afterward turns to an oblong obtuse capsule with three lobes and as many cells, filled with flat orbicular seeds ranged in a double order.*

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes those plants whose flowers have six stamina and one style.

The Species are,

1. Uvularia (*Amplexicaule*) foliis amplexicaulibus. Lin. Sp. Plant. 304. *Uvularia with leaves embracing the ſtalk.* Uvularia foliis cordato-oblongis. Flor. Leyd. 29. *Uvularia with oblong heart-ſhaped leaves.*
2. Uvularia (*Perfoliata*) foliis perfoliatis. Amœn. Acad. 2. p. 3. *Uvularia with perfoliate leaves.* Polygonatum ramoſum, flore luteo majus. Cornut Canad. 38. *Branching Solomon's Seal, with a large yellow flower.*

The firſt ſort grows naturally in Bohemia and Saxony. The root is perennial, but the ſtalk is annual; it riſes about two feet high, ſending out one or two branches from the lower part; it is garniſhed with oblong ſmooth leaves ending in acute points, whoſe leaves embrace the ſtalks. The flowers come out ſingly from the boſom of the leaves upon long ſlender foot-ſtalks; they are compoſed of ſix oblong naked petals of a yellow colour; theſe hang downward; they appear the latter end of April, but are rarely ſucceeded by ſeeds here.

The ſecond ſort grows naturally in North America; this has a perennial root and an annual ſtalk. The root is compoſed of many thick fleſhy fibres, from which ſpring up ſeveral ſtalks, which for the moſt part divide into two at a ſmall height from the ground; theſe ſpread aſunder, and are garniſhed with oblong, ſmooth, pointed leaves, which are broad at their baſe, ſurrounding the ſtalk in ſuch a manner, as if the ſtalk run through them. The flowers are compoſed of ſix oblong yellow petals ending in acute points; they ſtand upon ſlender foot-ſtalks which ariſe from the boſom of the leaves, and hang downward. The flowers appear about the ſame time with the former, but are not ſucceeded by ſeeds in England.

Theſe plants were firſt ranged in the genus of Polygonatum, and by Dr. Boerhaave they were placed with the Fritillaria; but this title of Uvularia was given to it by Dr. Linnæus, from the reſemblance which the fruit of it has to the Uvula.

They are both very hardy plants, ſo will live in the full ground, but as the flowers have not much beauty, they are only cultivated for the ſake of variety; they are propagated by parting of their roots. The beſt ſeaſon for removing them is about Michaelmas, when their roots may be ſeparated, and planted in the borders of the flower-garden; but this ſhould be done every third year, for if they are often removed, the plants will not thrive ſo well, or flower ſo ſtrong, as when they ſtand two or three years unremoved; they delight in a ſoil not too wet or ſtiff, but a gentle hazel loam.

# W.



## WACHENDORFIA. Burman.

The Characters are,

*The (ſpatha) or ſheath of the flower is bivalve; the flower hath ſix oblong petals, the three upper ones are erect, and the three under ſpread open; it hath two briſtly nectariums placed on each ſide the upper petals, and three ſlender declining ſtamina which are ſhorter than the petals, terminated by incumbent ſummits. The germen which is ſituated above, is roundiſh and three-cornered, ſupporting a ſlender declining ſtyle, crowned by a ſimple ſtigma. The germen becomes an oval capſule, having three obtuſe angles, divided into three cells, each containing one hairy ſeed.*

The title of this genus was given to it by Dr. John Burman, profeſſor of botany at Amſterdam, in honour of Dr. Everard Jacob Wachendorf, profeſſor of phyſic, botany, and chemiſtry at Utrecht.

This genus of plants is ranged in the firſt ſection of Linnæus's third claſs, the flower having three ſtamina and one ſtyle.

The Species are,

1. Wachendorfia (*Thyrſiflora*) ſcapo ſimplici. Lin. Sp. Plant. 59. *Wachendorfia with a ſingle ſtalk bearing flowers in a thyrſe.* Wachendorfia foliis lanceolatis quinquenerviis canaliculo-plicatis, floribus in thyrſum collectis. Burman. Monogr. 2. f. 2.
2. Wachendorfia (*Paniculata*) ſcapo polyſtachyo. Lin. Sp. Plant. 59. *Wachendorfia with a divided ſtalk, bearing flowers in panicles.* Wachendorfia foliis enſiformibus trinerviis, floribus paniculatis. Burm. Monogr. 4. f. 1. *Wachendorfia with ſword-ſhaped leaves having three veins, and flowers in panicles.*

The firſt ſort grows naturally at the Cape of Good Hope; it has a thick, tuberous, Reed-like root, of a deep red colour, ſending out many perpendicular fibres of the ſame colour, and ſpreading into ſeveral offſets. The leaves which riſe immediately from the root are large, ſpear-ſhaped, and channelled; they have five plaited veins, and reſemble the folds in fans. The largeſt of theſe leaves are two feet long, and three inches broad, and of a deep green colour. The flower-ſtalk riſes from the center of the heads between the leaves, to the height of three or four feet, and is garniſhed with leaves of the ſame form with thoſe below, but are narrower, and are ranged alternately, embracing the ſtalk half round with their baſe. The flowers, when young, are incloſed in ſheaths, which, after ſome time, open and make way for the flowers to come out; then they wither and dry, but remain upon the ſtalk like thoſe of the yellow Aſphodel. The flowers are produced from the wings of the ſtalk, forming a looſe ſpike at the top; there are ſeveral flowers ſuſtained upon one common foot-ſtalk which open after each other, ſo that there is ſeldom more than one open at the ſame time upon the ſame foot-ſtalk. The upper flowers ſtand almoſt upright, but the lower nod downward; they are hairy, and of a Saffron colour on the outſide, but ſmooth and yellow within, having generally ſix petals, but ſometimes the lower one is wanting; but then the place is occupied by the pointal, which is a ſingular ſport of nature. After the flower fades, the germen ſwells to an almoſt oval, three-cornered, blunt capſule with three cells, each containing three purple hairy ſeeds, fixed to an oblong placenta.

This plant is propagated by offſets, which are ſent out from the main head, after the ſame manner as ſome of the Flag-leaved Iriſes. Theſe offſets ſhould be taken off the latter end of Auguſt, or the beginning of September, which is the time when the roots are in the moſt inactive ſtate; theſe muſt be planted in

in pots filled with soft loamy earth mixed with a little sea sand, and if the season proves hot and dry, it will be proper to place the pots where they may have only the morning sun, until the offsets have put out new roots, for when they are exposed to the full sun, the earth will dry too fast, and if the roots are much watered, they are apt to rot; after they have taken new root, they may be placed in a sheltered situation, where they may enjoy the full sun. In this place they may remain till there is danger of frosty mornings; then the pots should be placed in a hot-bed frame, with the Ixias, and other bulbous and tuberose-rooted plants from the Cape of Good Hope, and treated in the same manner as hath been directed for them.

The second sort is also a native of the same country with the first, but is of smaller growth; the root is in shape like that of the former, sending out several plaited leaves about six inches long, having three deep longitudinal veins in each; in the center of the leaves the flower-stalk arises, which is a foot high, sending out one or two side branches; the lower part of the stalk is of a purple colour, the upper is green and hairy; the foot-stalks of the flowers come out at the joints of the stalk, sustaining two or three flowers of a pale purple colour. These appear in the beginning of August, and are succeeded by capsules, but the seeds rarely ripen in England.

This sort requires the same culture as the former, and is equally hardy.

WALKS are made either of gravel, sand, or Grass; these three sorts of Walks are the most common in England, but where gravel or sand cannot be procured, they are sometimes laid with powdered coal, sea-coal ashes, and sometimes of powdered brick, but these are rarely used, when either gravel or sand can be procured; however, where sea-coal ashes can be had, it is preferable to the powdered coal or bricks, because they bind very hard, and never stick to the feet in frosty weather, which is a good quality; but the darkness of its colour has been an objection to the use of it in gardens, however, for the wilderness Walks I think it is preferable to most other materials; but I shall proceed to give directions for the making of the several sorts of Walks, and first of the gravel Walks.

In order to the laying of Walks in gardens, when they are marked out, the earth should be taken away to a certain depth, that the bottom of them be filled with some lime rubbish, or coarse gravel, flint-stones, or other rocky materials, which will be serviceable to prevent weeds from growing through the gravel, and also to keep away worm-casts. This bottom should be laid ten inches or a foot thick, over which the coat of gravel should be six or eight inches, which gravel should be very fine, but yet not screened, because that spoils it. This should be laid on a heap, rounding, that the larger rough stones may run down on the sides, which being every now and then raked off, the gravel by that means will be sufficiently fine.

After the gravel has been laid to the thickness abovementioned, then the Walks must be exactly levelled, and raked true from all great drips, as well as little holes. By this means most of the stones of the Walks will be raked under your feet, which should rather be gently sprinkled back again, over the last length that is raked, then buried (as is the practice of many gardeners;) by this means the Walk will lie much harder, and the coarsest stones will very much contribute to its firmness.

There is also a great fault committed frequently, in laying Walks too round, and some to that degree, that they cannot be walked on with that ease and pleasure that ought to be; and besides, this too great rounding takes off much from the seeming breadth and beauty of the Walk.

The common allowance for a gravel Walk of five feet breadth, is an inch rise in the crown; so that if a Walk be twenty feet wide, according to this proportion, it will be four inches higher in the middle than on each side; and a Walk of twenty-five feet will be five inches, one of twenty feet four inches, and so on.

When a Walk has been thus carefully laid, trodden down, and raked, or rather, after every length or part of it (which commonly is about fifteen feet each,) then it should be rolled well, both in length and also cross-ways. The person who rolls it should wear shoes with flat heels, that he may not make holes in the Walks, for when these are once made in a new Walk, it will not be easy to roll them out again.

In order to lay gravel Walks firm, it will be necessary to give them three or four water rollings, that is, they must be rolled when it rains so very fast, that the Walks swim with water; this will cause the gravel to bind, so that when the Walks come to be dry, they will be as hard as terrace.

Iron-mould gravel is accounted the best for binding, or gravel with a little binding loam amongst it; which latter, though it be apt to stick to the heels of shoes in hot wet weather, yet nothing binds better in dry weather.

When the gravel is over-sandy or sharp, loam is frequently mixed with it, which, if they be cast together in heaps, and well mixed, will bind like a rock; whereas, loose gravel is as uncomfortable and uneasy to walk on, as any other fault in a Walk can render it.

The best gravel for Walks is such as abounds with smooth pebbles (as is that dug at Black-heath,) which, being mixed with a due proportion of loam, will bind like a rock, and is never injured by wet or dry weather, and the pebbles being smooth, are not liable to be turned up, and loosened by the feet in walking, as are those which are angular and rough; for where Walks are laid with such gravel as is full of irregular stones, they appear unsightly in a day's time after rolling, because the stones will rise upon the surface whenever they are walked upon, but the smooth pebbles will remain handsome two or three days without rolling.

Gravel Walks are not only very necessary near the house, but there should always be one carried quite round the garden, because, being soon dry after rain, they are proper for walking on in all seasons; but then these should be but few, and those adjoining to the house ought to be large and magnificent, proportionable to the grandeur of the house and garden. The principal of these walks should be elevated, and carried parallel with the house, so as to form a terrace; this should extend itself each way, in proportion to the width of the garden, so that from this there may be a communication with the side Walks, without going on the Grass, that there may be a dry Walk continued quite through the gardens; but there is not a more ridiculous sight, than that of a strait gravel Walk, leading to the front of the house, intersecting the Grass, so as to make it appear like the stiff formal Grass plats frequently made in little court-yards by persons of low taste.

Grass Walks in gardens were formerly in great esteem, and looked upon as necessary ornaments to a garden, but of late years they have justly been banished by every person of true taste; for those narrow slips of Grass were very unsightly, and far from being ornamental, and for the most part useless, being generally too damp for persons of tender constitutions to walk upon; and whenever they were constantly used, they became bare in the places frequently trodden, so were rendered more unsightly; and as the intention of Walks in gardens is to have at all seasons a dry communication throughout the garden, for exercise and recreation, Grass Walks were very improper, because every shower of rain made them so wet, as not to be fit for use a considerable time, and the dews rendered them too damp for use either in the morning or evening; and if the Grass of Walks is not very fine and short, like that of the downs, it will be very troublesome to walk upon; besides, whenever the ground is so dry, as that persons may with safety walk upon Grass, the lawns and other parts of verdure in gardens are better adapted for use than any of those formal stiff Walks, which were so much esteemed in the last age.

Having given directions for the making of gravel Walks, I shall come next to treat of sand Walks, which are now very frequently made in gardens, as being less expensive in the making, and also in keeping, than the former; and in very large irregular gardens, which are such as most persons esteem, this is a very great article; for as the greatest part of the Walks which are made in gardens are carried about in an irregular manner, it would be very difficult to keep them handsome, if they were laid with gravel, especially where they are shaded by trees; for the dripping of the water from their branches, in hard rains, is apt to wash the gravel in holes, and render the Walks very unsightly; and when these wood Walks are of Grass, they do not appear sightly, nor are they very proper for walking on; for after rain they continue so long damp as to render them unfit for use, and the Grass generally grows spiry and weak for want of air, and by the continual dropping of the trees, will by degrees be destroyed; therefore it is much better to lay these Walks with sand, which will be dry and wholesome; and whenever they appear mossy, or any weeds begin to grow on them, if they are scuffled over with a Dutch hoe in dry weather, and then raked smooth, it will destroy the weeds and Moss, and make the Walks appear as fresh and handsome as if they had been new laid.

In the modern way of laying out gardens, the Walks are carried through woods and plantations, so that these are shady and convenient for walking in the middle of the day. These are usually carried about, winding as much as the ground will admit of, so as to leave a sufficient thickness of wood to make the Walks private; and that the persons who are walking in one part of them, may not be seen by those who are in any of the other parts. Where these Walks are contrived with judgment, a small extent of ground will admit of a great many turns, so that a person may walk some miles in a small garden. But these turns should be made as natural as possible, so as not to appear too much like a work of art, which will never please so long as the former.

The breadth of these Walks should be proportioned to the size of the ground, which in a large extent may be twelve or fourteen feet wide, but in small gardens five or six feet will be sufficient. There are some persons who allow a much greater breadth to their Walks than what I have assigned to the largest gardens, but as these walks are supposed to be shaded by trees, so when they are made too broad, the trees must be planted close to the sides of the Walks; and then it will be a long time before they will afford a sufficient shade, if the trees are young. Therefore I imagine, the width here allowed will by most people be thought sufficient, especially as the walks are designed to wind as much as the ground will allow, because the wider they are, the greater must be the turns, otherwise the Walks will not be private for any small distance. Besides, as it will be proper to line the sides of these Walks with Honeysuckles, Sweetbriar, Roses, and many other sweet flowering shrubs, so the tall trees should be placed at least five or six feet from the Walk, to allow room for these. But as I shall particularly treat of the method of laying out wildernesses, and planting of them, in such a manner as to render them as nearly resembling a natural wood as possible, under its proper head, I shall add nothing more in this place, except a few common directions for making of these sand Walks.

When the ground is traced out in the manner as the Walks are designed, the earth should be taken out of the Walks, and laid in the quarters. The depth of this must be proportioned to the nature of the soil; for where the ground is dry, the Walks need not be elevated much above the quarters, so the earth should be taken out four or five inches deep in such places; but where the ground is wet, the bottom of the Walks need not be more than two inches below the surface, that the Walks may be raised so high as to throw off the wet into the quarters, which will render them more dry and healthy to walk on.

After the earth is taken out to the intended depth, the bottom of the Walks should be laid with rubbish, coarse gravel, or whatever of the like nature can be most readily procured. This should be laid four, five, or six inches thick, and beaten down as close as possible, to prevent the worms from working through it; then the sand should be laid upon this about three or four inches thick, and after treading it down as close as possible, it should be raked over, to level and smooth the surface. In doing of this, the whole should be laid a little rounding to throw off the wet, but there will be no necessity of observing any exactness therein; for as the whole ground is to have as little appearance of art as possible, the rounding of these Walks should be as natural, and only so contrived, as that the water may have free passage from them.

The sand with which these Walks are laid, should be such as will bind, otherwise it will be very troublesome to walk on them in dry weather; for if the sand be of a loose nature, it will be moved with strong gales of wind, and in dry weather will slide from under the feet. If after these Walks are laid, they are well rolled two or three times, it will settle them, and cause them to be firm. If the sand is too much inclinable to loam, it will also be attended with as ill consequence as that which is too loose, for this will stick to the feet after every rain; so that where sand can be obtained of a middle nature, it should always be preferred.

In some countries where sand cannot be easily procured, these Walks may be laid with sea shells well pounded, so as to reduce them to a powder, which will bind extremely well, provided they are rolled now and then; but where neither of these can be easily procured, sea-coal ashes, or whatever else can be gotten, which will bind, and will be dry to the feet, may be used for this purpose; and where any of these can only be had in small quantities, the walks should have a greater share of rubbish laid in their bottom, and these spread thinly over them; and in most places rubbish, rough stones, or coarse gravel, may be easily procured.

WALLS are absolutely necessary in gardens, for the ripening of all such fruits as are too delicate to be perfected in this country without such assistance. These are built with different materials; in some countries they are built of stone, in others with brick, according as the materials can be procured best and cheapest.

Of all materials proper for building Walls for fruit-trees, brick is the best; in that it is not only the handsomest, but the warmest and kindest for the ripening of fruit; besides that, it affords the best conveniency of nailing, for smaller nails will serve in them than in stone Walls, where the joints are larger; and brick Walls, with copings of free-stone, and stone pilasters or columns, at proper distances, to separate the trees and break off the force of the winds, make not only the most beautiful, but the most profitable Walls.

In some parts of England there are Walls built both of brick and stone, which have been very commodious. The bricks of some places are not of themselves substantial enough for Walls, nor are they any where so durable as stone; and therefore some persons, that they might have Walls both substantial and handsome, have built double ones, the outside being of stone, and the inside of brick, or a stone Wall lined with brick; but when these are built, there must be great care taken to bind the bricks well into the stone, otherwise they are very apt to separate one from the other, especially when frost comes after much wet, which swells the mortar, and frequently throws down the bricks, when the Walls are only faced with them, and not well tied into the stone.

Where the Walls are built entirely of stone, there should be trellisses fixed up against them, for the more con-

convenient fastening the branches of the trees: the timbers of these espaliers need not be more than an inch and a half thick, and about two inches and a half broad; these should be fixed cross each other, at about four inches distance; for if they are at a much greater distance, it will be difficult to fasten the shoots of the trees properly. As this trellis will be laid close to the wall, the branches of the trees will lie about two inches from the wall, in which position the fruit will ripen better than when it lies quite close to the wall; so that where stone Walls are built, there should always be these espaliers framed against them, which will render these Walls very good for fruit trees, which, without the espaliers, seldom are found to answer the purpose of ripening the fruits well, besides the inconvenience of having no good fastening for the branches of the trees.

There have been several trials made of Walls built in different forms; some of them having been built semicircular, others in angles of various forms, and projecting more towards the north, to screen off the cold winds; but there has not been any method as yet which has succeeded near so well, as that of making the Walls strait, and building them upright.

The fairest trial which I have seen made of circular Walls, was at Goodwood in Sussex, the seat of the Duke of Richmond, where, in the middle of two south Walls, there were two large segments of circles, in which were the same sorts of fruit-trees planted, as against the strait parts of the Walls; but there never was any fruit upon the trees in the circular part of the Walls, which came to maturity; nor were the trees of long continuance, being blighted every spring, and in a few years were totally destroyed; and when the branches of those trees which grew upon the strait parts of the Walls, had extended themselves so far, as to admit of their being led into the circular parts of the Walls, they were constantly blighted and killed.

When the trees which had been planted in the circular parts were destroyed, the Walls were filled with Vines; but the Grapes of the same sort were a full month later than those growing against the strait parts of the Walls, so that they rarely ripened, which occasioned their being rooted out, and Figs were afterwards planted, but the fruit of these succeeded little better; nor can it be supposed that any trees or plants will thrive so well in these circles, where there is a constant draught of air round them, which renders the situation much colder than the open free air.

I have also seen at Mr. Le Cour's garden in Holland, some Walls built in angles of different forms, but these succeeded no better than the circles before-mentioned; for I did not find one tree in health against the Walls, nor did they produce fruit.

There are several other schemes which have been proposed by different persons, for the building of Walls to accelerate the ripening of fruits, among which there was a very ingenious book written some years ago, intitled, Fruit Walls improved, by inclining them to the horizon; in which the author has shewn by calculation that there will be a much greater number of the rays of the sun fall upon such Walls, than upon those which are built perpendicular; and from thence he has drawn calculations, that Walls so built will be of great service in the accelerating of fruit; and he has taken the trouble of calculating the different inclinations which such Walls should have in the different climates, in order to receive the greatest number of the sun's rays. This theory seems to have all the demonstration necessary for its support, but upon trial they have not succeeded in the least; for as these Walls must be built against banks of earth, the damps which arise from the ground overbalance the advantage of the sun's rays; besides, these sloping Walls being more exposed to the cold dews in the night, the fruit will be much more chilled thereby; and in the spring the morning frosts will prove much more destructive to the tender blossoms of the fruit-trees, as they will be more exposed to them, than against an upright Wall; add to this, their being much more exposed to the winds and the rain; and it will be found, by comparing the advantages proposed from these Walls, with the disadvantages to which the fruit-trees will be exposed, that upright Walls will have the preference; for it is not the strongest rays of the sun in the heat of summer, which are so much wanting for ripening of fruit, as the continuance of a moderate share of warmth; and above all, the having of the sun in a morning, to dry off the cold dews of the night early, is of the greatest use; and in this respect the upright Walls are much preferable to the sloping, as they will have the direct rays of the sun in the morning, which will be oblique on the other, and renders those Walls which are built inclining to the east preferable to south Walls, as the fruit will always ripen earlier against them.

There are some persons who recommend the painting of Walls black, or of a dark colour, as they suppose the dark colour will imbibe more of the sun's rays, so will retain the warmth longer; this also answers better in theory than in practice; for although it must be allowed that a black Wall is warmer to the touch than a common brick wall, yet, as the fruit generally is situated at a small distance from the Wall, it receives no benefit from the warmth of the Wall, and it is the reflected heat which accelerates the ripening of fruit; therefore I would advise every one to make fair trials of these things, before they put them in practice, and not to take upon trust what they may be told by persons who are too sanguine in recommending to others schemes which they have adopted upon very slight principles, or perhaps upon a single trial; this painting of the Walls is recommended by the same person who wrote upon inclining Walls, and he has proposed this upon the same principles; but the introducing of these schemes should be avoided, until there have been sufficient trials made to warrant their use.

Where persons are willing to be at the expence, in the building of their Walls substantial, they will find it answer much better than those which are slightly built, not only in their duration, but also in their warmth; therefore a Wall two bricks thick, will be found to answer better than one brick and a half; and if in the building of garden Walls they are grouted with soft mortar, to fill and close all the joints, the Walls will be much stronger, and the air will not so easily penetrate through them, as it does through those which are built in the common way.

According to the modern taste in gardening, there are very few Walls built round gardens, which is certainly very right, not only with regard to the pleasure of viewing the neighbouring country from the garden, but also in regard to the expence, 1. Of building these Walls; 2. If they are planted with fruit, as is frequently practised, to maintain them will be a constant charge, without receiving much profit or pleasure; for when there is too much Walling planted with fruit-trees, they are seldom taken much care of; so that the quantity of fruit produced will be small, and that ill-nourished and bad tasted, therefore the quantity of Walling should be proportioned to the fruit consumed in the family; but as it will be necessary to inclose the kitchen-garden for the security of the garden-stuff, so if that be walled round, it will contain as much fruit as will usually be wanted in the family; because the kitchen-garden is always proportioned to the number of persons maintained; but if the quantity of Walling which surrounds the kitchen-garden should be judged too little for the supply of fruit, there may be a cross Wall built through the middle of the kitchen-garden; or, where the size of the garden will admit, there may be two cross Walls built; but this must not be done, where there is not room to place the Walls at least eighty or one hundred feet asunder; and if they are allowed a much greater distance it will be better; and as the kitchen-garden should always be placed out of sight from the house, the Walls may be hid by plantations of trees, at some little distance, which will be of use in sheltering the fruit.

The

The best aspect for Walls in England is, to have one point to the eastward of the south, for these will enjoy the benefit of the morning sun, and will be less exposed to the west and south-west winds (which are very injurious to fruits in England) than those Walls which are built due south. I know there are many persons who object to the turning of Walls the least point to the east, on account of the blights which they say come from that quarter in the spring; but from many years experience and observation I can affirm, that blights as often attack those Walls which are open to the south-west, as those which are built to any other aspect; and I believe, whoever will be at the trouble to observe for seven years, which aspected Walls suffer most from blights, will find those which are built with a point to the eastward of the south, as seldom blighted, as those which are turned to any other aspect; therefore, in the contrivance of a kitchen-garden, there should be as great length of these Walls built, as the situation of the ground will admit.

The next best aspect is due south, and the next to that south-east, which is preferable to the south-west, for the reasons before assigned; but as there will, for the most part, be south-west, and west Walls in every garden, these may be planted with some sorts of fruit, which do not require so much heat to ripen them, as those designed for the best Walls; but wherever there are north Walls, those will only be proper for baking Pears, Plums, and Morello Cherries for preserving, or some Duke Cherries may be planted against these Walls, to continue them longer in the season, which will be found useful in supplying the table till Peaches, Nectarines, and Plums, are ripe.

Where persons are very curious to have good fruit, they erect a trellis against their Walls, which projects about two inches from them, to which they fasten their trees; which is an excellent method, because the fruit will be at a proper distance from the Walls, so as not to be injured by them, and will have all the advantage of their heat; and by this method the Walls will not be injured by driving nails into their joints, which by every year being drawn out, draws out the mortar from between the bricks, and thereby makes holes, in which snails and other vermin will harbour and destroy the fruit, and the Walls will be also greatly impaired.

These trellisses may be contrived according to the sorts of fruit which are planted against them. Those which are designed for Peaches, Nectarines, and Apricots (which, for the most part, produce their fruit on the young wood) should have their rails three, or at most four inches asunder every way; but for the other sorts of fruit, which continue bearing on the old wood, they may be five or six inches apart, and those for Vines may be eight or nine inches distance. For as the shoots of Vines are always trained at a much greater distance than those of any other sort of fruit, the trellisses for these need not be near so close, especially as those must for Peaches and Nectarines, whose shoots are generally shortened to about five or six inches or less; so that if the rails are not pretty close, many of the short branches cannot be fastened to them.

These trellisses may be made of any sort of timber, according to the expence which the owner is willing to bestow; but Fir is most commonly used for this purpose, which if made of yellow deal, well dried and painted, will last many years; but if any person will go to the expence of Oak, it will last found much longer, especially if the trees are fallen in winter. And if any one is unwilling to be at the expence of either, then a trellis may be made of Ash poles, in the same manner as is practised in making espaliers for counter borders, with this difference only, that every fourth upright rail or post should be very strong, and fastened with iron hooks to the Wall, which will support the whole; and as these rails must be laid much closer together, than is generally practised for espaliers, these strong upright rails or posts should not be farther distant than three, or at most four feet from each other. To these the cross rails which are laid horizontally should be well nailed, which will secure them from being displaced, and also strengthen the trellis, but the other smaller upright poles need only be fastened with wire. To these trellisses the shoots of the trees should be fastened with osier twigs, rope-yarn, or any other soft bandage, for they must not be nailed to it, because that will decay the wood-work.

These trellisses need not be erected until the trees are well spread, and begin to bear fruit plentifully; before which time the young trees may be trained up against any ordinary low espaliers, made only of a few slender Ash poles, or any other slender sticks; by which contrivance the trellisses will be new when the trees come to bearing, and will last many years after the trees have overspread them; whereas, when they are made before the trees are planted, they will be half decayed before the trees attain half their growth.

Where these trellisses are intended to be made against new Walls, it will be proper to fasten some strong iron hooks into the Wall as it is built, at the distance which the upright posts are intended to be placed; because when these are afterwards driven into the Wall, they displace the mortar in the joints, and injure the Wall.

In the building of the Walls round a kitchen-garden, the insides, which are designed to be planted with fruit-trees, should be made as plain as possible, so that the piers should not project on those sides above four inches at most; and these should be placed about fourteen feet asunder, in such Walls as are designed for Peach and Nectarine-trees; so that each tree may be planted exactly in the middle between the piers, which will render them more sightly, and be better for the trees; but where Apricots, Plums, or Cherries are to be planted, the piers may be only ten feet asunder; and against every other pier the trees should be planted, which will allow them sufficient room to spread; as the trellis will project as forward as the piers, the branches of the trees may be trained on a plain; but when the piers project no more on the inside of the garden, they should be built stronger on the outside, for the better supporting of the Walls.

The usual thickness which garden Walls are allowed, if built with bricks, is thirteen inches, which is one brick and a half, but this should be proportionable to the height; for if they are built twelve or fourteen feet high or more, as is often practised, then the foundations of the Walls should be at least two bricks and a half thick, and brought up a foot or more above the level of the surface of the ground, of the same thickness; then they should be set off two inches on each side, which will reduce them to two bricks; and five or six feet above the surface of the ground, they may be diminished on each side, to reduce them to the thickness of a brick and a half; which must be continued to the top of the Walls, and the piers in these high Walls should also be proportionably stronger than is commonly allowed to lower Walls; for as these will be much more exposed to strong gales of wind, if they are not well built, they will be in danger of being blown down; therefore the piers of these Walls should be projected the length of a brick on their backside, and the thickness of a brick on their front; and if these are built about ten or twelve feet asunder, they will greatlystrengthen the Walls.

But there is no necessity for building Walls higher than nine or ten feet, unless it be for Pears, which, if properly managed, will spread over a great compass of walling; but as only some of the latest winter Pears require the assistance of a Wall, there need no more but that part of the Wall where these are designed to be built higher; for Peaches and Nectarines never require a Wall higher than nine or ten feet, provided they are rightly managed; because whenever they are carried to a greater height, the lower part of the Wall is unfurnished with bearing branches; and although Apricots, Plums, and Cherries will frequently grow higher, yet, if they are planted at a proper distance, and the branches trained horizontally from the bottom,

they will not soon cover a Wall of this height; and Vines may be kept as low as any sort of fruit, for when they are planted against low Walls, they must be treated somewhat after the same manner as those in vineyards, which is, to cut out the greatest part of the wood which produced fruit the preceding year, and train in new shoots for the next year's bearing, which are rarely left a yard in length, therefore will not require very high Walls.

If the Pears which are designed to be planted, are allowed a south-west aspect, on which they will ripen very well, then the Wall to this aspect should be built fourteen feet high or more; for as these trees spread very far when on free stocks, they should not be shortened and stopped in their growth, which will prevent their bearing, by causing them to send out a great number of gross luxuriant shoots, which will never produce fruit; therefore these should never be planted amongst other sorts of fruit-trees which are of less growth, because then the Walls must appear very unsightly, in having some trees planted more than double the distance which the others require; so that there is no other sort of fruit which requires the assistance of Walls to ripen their fruit, which need so great room for spreading as Pears, except it be Figs, a few trees of which may be planted against the same Walls where there is room; though these may be planted against the back Walls of offices or stables, where there is conveniency, because this fruit is seldom coveted by servants; and being planted in places which are much frequented, they will not be in so much danger of being destroyed by birds, as those which are in private places. But I shall now proceed to give some directions for the building of hot Walls, to accelerate the ripening of fruits, which is now pretty much practised in England.

In some places these Walls are built at a very great expence, and so contrived as to consume a great quantity of fuel; but where they are judiciously built, the first expence will not be near so great, nor will the charge of fuel be very considerable, because there will be no necessity of making fires more than three or four months, beginning about the midde are latter end of January, and ending by the end of May, when there will be no want of fires, if the glasses are close shut every night, or in bad weather; for half an hour's sun-shine on the glasses at that season will sufficiently warm the air inclosed in the glasses, for the growth of any of our European fruits.

There are some persons who plant Vines, and other fruit-trees by the sides of stoves, and draw some of their branches into the stove, in order to obtain early fruit; but this is by no means right, where the stove is designed for Ananas, because the air must be kept much warmer for them than is required for any of the other fruits, so that they can never succeed well together; for when there is only a sufficient quantity of air admitted for the growth of the other fruit, the Ananas are starved for want of proper heat; and so on the contrary, when the stove is kept up to the proper heat for the Ananas, it will be too hot for other fruits; and it will also be proper to have the Vines on a particular Wall by themselves, because these require to have a greater share of air admitted to them when they begin to shoot, than some other sorts of fruit, so that it is by much the better method to have them separate.

The ordinary height of those hot Walls is about ten feet, which will be sufficient for any of those sorts of fruits which are generally forced; for by forcing of the trees, they are commonly weakened in their growth, so that they will not grow so vigorously as those which are always exposed to the open air; and where there is not a quantity of Walling planted sufficient to let one part rest every other year, the trees will never be very healthy, and will last but a few years. The quantity of Walling to produce early fruit for a middling family, cannot be less than eighty or one hundred feet in length; therefore where a person is desirous to have the fruit in perfection, and the trees to continue in a good condition many years, there should be three times this quantity of Walling built; so that by dividing it into three parts, there will be two years for the trees to recover their vigour between the times of their being forced, whereby a greater quantity of bearing wood may be obtained, and the fruit will be fairer, and in larger quantities, than when they are forced every year, or every other year; and as the glasses may be contrived so as to move from one to the other, the expence of building the Walls so much longer, will not be very great, because the frames and glasses will be the same as for one year's fruit.

The foundations of these Walls should be made four bricks and a half thick, in order to support the flues; otherwise, if part of them rest on brick-work, and the other part on the ground, they will settle unequally, and soon be out of order; for wherever there happen any cracks in the flues, through which the smoke can make its escape, it will prevent their drawing; and if the smoke gets within the glasses, it will greatly injure the fruit, and give it a smoky taste. This thickness of Wall need not be continued more than six inches above the ground, where should be the foundation or bottom of the first flue, which will be sufficient to raise it above the damps of the earth; then the Walls may be set off four inches on each side, which will reduce it to the thickness of three bricks and a half, so that the back Wall may be two bricks thick, which is absolutely necessary to throw the heat out more in front; for when the back Walls are built too thin, the heat will escape through them. The Wall in front next to the fruit, should be only four inches thick, whereby there will be allowance of nine inches for the flues, which may be covered with twelve inch tiles; for if they have an inch and a half bearing on each side, it will be sufficient. The ovens in which the fires are made, must be contrived on the backside of the Walls, which should be in number proportionable to the length of the Walls. The length usually allowed for each fire to warm is forty feet, though they will do very well for fifty feet; but I would not advise the flues to be longer than this to each fire, because when the ovens are made at a great distance, there is a necessity of making the fires so much stronger to warm the Walls, which will occasion the heat to be too violent near the fires. These ovens should be shedded over, to keep out the wind and rain, otherwise the fires will not burn equally. Some people make these sheds of timber, but it is much better to build them of brick, and tile them over, because the wooden sheds will in a few years decay, and afterwards be a constant charge to keep them in repair; and besides they may be in danger of firing, if great care is not constantly taken of the fires. As it is absolutely necessary to have the ovens below the foundation of the first flues, there must be steps down into the sheds, to come to the mouth of the ovens to supply the fuel, therefore the sheds should not be narrower than eight feet in the clear; for as the steps will require four feet space, there should be at least four feet more for the person who attends the fire, to have room to turn himself to clear out the ashes, and to put in the fuel. Where the length of Walling requires two ovens, it will be proper to have them in the middle included in one shed, which will save expence, and allow more room to attend the fires; for in this case the sheds must be at least ten feet long, and they need not be more than six in breadth. The steps down into these should be at one end, so that the door opening into the sheds will not be opposite to the mouths of the ovens, therefore the fires will burn more regular; for whenever the doors are contrived to front the mouth of the ovens, if the wind sets directly against them, it will cause the fire to burn too fiercely, and the fuel will be soon consumed.

These ovens may be contrived in the same manner as those which are already described for stoves, wherefore I shall not repeat it again in this place; but

muſt obſerve, that when the two ovens are joined together, there ſhould be a partition Wall at leaſt three bricks thick between them, otherwiſe the fires will ſoon deſtroy it; and if there ſhould be the leaſt hole in the Wall, through which the ſmoke of the two fires can communicate, it will prevent their drawing.

The lower flue, through which the ſmoke firſt paſſes from the fire, may be two feet and a half deep: therefore the back Wall ſhould be at leaſt two bricks and a half thick, as high as to the top of this flue; and then it may be ſet off to two bricks, which muſt be continued to the top of the Wall. The ſecond flue, which ſhould return over the firſt, may be made two feet, the third a foot and a half, and the fourth one foot deep; which four flues, with their coverings, will riſe near eight feet in height; ſo that there will be about two feet left for fixing of the frames at the top to ſupport the glaſſes, and for the coping of the Wall. And theſe four returns will be ſufficient to warm the air in the frames, for the ſmoke will have loſt its heat by the time it has paſſed thus far.

In the carrying up of theſe Walls, there ſhould be ſome ſtrong iron hooks faſtened at convenient diſtances, which ſhould project about two inches from the Wall, to which the trellis muſt be faſtened which is to ſupport the trees. Theſe hooks ſhould be long enough to faſten into the back Wall, for the Wall in front being but four inches thick, will not be ſtrong enough to ſupport the trellis; but in placing of them care ſhould be taken not to lay them croſs the middle of the flues, becauſe they would obſtruct the clearing the flues of ſoot whenever there ſhould be occaſion; ſo that the beſt way is to lay them juſt under the tiles which cover each flue, at about three or four feet aſunder, which will be near enough, provided the hooks are made ſufficiently ſtrong. As the flues muſt be well pargetered with loam on their inſide, ſo likewiſe ſhould the loam be ſpread under the tiles which cover them, to the thickneſs of the hooks, that the flues may be very ſmooth, otherwiſe the ſoot will hang to the iron hooks, and ſtop the ſmoke from paſſing. It will be very proper to cover theſe flues on the ſide next the trellis with Hop-bags, or ſome ſuch coarſe cloth, in the manner as hath been directed for the ſtoves, which will make them ſo tight that no ſmoke will find its way into the frame, which, without this covering, it is very apt to do through the joints of Walls, eſpecially when they are ſo thin as theſe muſt be built; and this covering will alſo ſtrengthen the wall of the flues, and join the whole work together. If at each end of theſe flues there are ſmall arches turned in the back Walls, in ſuch a manner that there may be holes opened to clean the flues of ſoot whenever there is a neceſſity for it, the trouble will be much leſs than to open the flues in front, by which there will be no damage done to the trees, nor will the flues be in the leaſt injured by this, which they muſt be, when they are opened in front.

The borders in front of theſe hot Walls ſhould be about four feet wide, which will make a ſufficient declivity for the ſloping glaſſes; and in theſe borders there may be a row of Dwarf Peas planted to come early, or a row of dwarf Kidney-beans, either of which will ſucceed very well; and if they are not planted too near the trees, will not do them much injury. On the outſide of theſe borders ſhould be low Walls erected, which ſhould riſe four or ſix inches above the level of the borders, upon which the plate of timber ſhould be laid, on which the ſloping glaſſes are to reſt; and this Wall will keep up the earth of the border, and alſo preſerve the wood from rotting.

The glaſſes which are deſigned to cover theſe Walls, muſt be divided into two ranges, for as they muſt reach from the ground-plate (juſt above the level of the border) to almoſt the top of the Wall, they will be more than twelve feet long, which will be too great a length for ſingle frames, which, when they are much more than ſix feet long, are too heavy to move, eſpecially if the frames are made of a proper ſtrength to ſuſtain the glaſs. Theſe frames ſhould be contrived in ſuch a manner, as that the upper row may ſlide down; and by making on one ſide three ſmall holes in the wood-work which ſupports the frames, at about a foot diſtance, and having a ſmall iron pin to fix into them, the top glaſſes may be let down one, two, or three feet, according as there may be occaſion to admit air. The lower row of glaſſes may be contrived ſo as to take eaſily out; but as they muſt lie ſloping, and the upper row muſt bear on them, they cannot be contrived to ſlide upwards; nor indeed will there be any occaſion for their moving, becauſe it is much better to let the air in at the top, than in the front of the trees.

The ſloping timbers which are to ſupport the glaſs frames, muſt be faſtened at bottom into the ground-plate in the front of the border, and at the top into ſtrong iron cramps fixed in the upper part of the Wall for that purpoſe. Theſe timbers ſhould be made of Fir, which will not twiſt, as Oak and ſome other wood will, where it is laid in ſuch poſition. They muſt be made ſubſtantial, otherwiſe they will not laſt many years, eſpeciallly as they are deſigned to be moveable. On the top of theſe ſhould be fixed a ſtrong board, under which the upper row of glaſſes ſhould ſlide. The uſe of this board is, to ſecure the upper part of the glaſſes from being raiſed by the winds, and alſo to keep the wet from getting to the trees; therefore it ſhould be joined as cloſe as poſſible to the Wall, and ſhould project about two inches over the glaſs frames, which will be enough to throw the wet on the glaſſes, and likewiſe to ſecure them faſt down.

The breadth of theſe frames for the glaſſes may be about three feet or a little more, according as the diviſions of the length of the Wall will admit; for a ſmall matter in their width is of no conſequence, provided they are not too wide to be eaſily moved; for when they are wider than a man can eaſily reach his arms to manage, they will be very troubleſome to carry from one place to another. The bars of theſe frames, which are to ſupport the glaſs, ſhould be placed lengthwiſe of the frames; for when they are placed acroſs, they ſtop the moiſture which is lodged on the inſide of the glaſſes, and cauſe it to fall in drops on the borders at every bar, which will be very injurious to any plants which are put there; and if it falls on the trees will greatly damage them, eſpecially when they are in bloſſom. The lead into which the glaſſes of theſe frames are fixed, ſhould be very broad, and the joints well cemented, otherwiſe the wet will find an eaſy paſſage through, and do great damage to the fruit.

At each end of the range of glaſſes, there will be an angular ſpace between the glaſſes and the Wall, which muſt be cloſely ſtopped to prevent the air from getting in, which might greatly injure the fruit. Theſe are by ſome perſons cloſely boarded up; but if they are cloſed with glaſſes, ſo contrived as to open to let in air at proper times, it will be of great advantage; becauſe when the wind may be ſtrong againſt the front-glaſſes, one or both of theſe end-glaſſes may be opened, according to the warmth of the air incloſed, which will be often very uſeful to cool the air, and to admit a ſmall quantity of freſh air to the fruit.

The ſorts of fruit which are uſually planted for forcing, are Cherries, Plums, Peaches, Apricots, and Nectarines, but the laſt-mentioned rarely ſucceed well, nor will the trees continue long, ſo that they are ſcarce worth planting againſt hot Walls. As for the Vines, I would propoſe they ſhould be planted by themſelves againſt a particular Wall; for as they will require more air to be admitted to them when they begin to ſhoot, than any of the above-mentioned fruits, they will not all ſucceed if they are included in the ſame frame. As to the others, they will do very well in the ſame border, and will demand the ſame temperature of warmth. The beſt of theſe ſorts to plant againſt theſe hot Walls, are thoſe here mentioned:

Cherries.

The Early May, and May Duke.

Plums.

The Mirabelle.
The Early Black Damaſk, or Morocco.
The Great Damaſk Violet of Tours.
The Drap d'Or.

Peaches.

The Red Nutmeg.
The Red Magdelain.
The Montauban.
Early Newington.
Violet Hative.

Nectarines.

Fairchild's Early Nutmeg.
The Elruge.

Apricot.

The Maſculine.

Theſe being the ſorts which ripen early, are the moſt proper to plant againſt theſe Walls, although they are not ſo valuable as ſome other ſorts of theſe fruits: yet, as they naturally ripen three weeks or a month earlier in the ſeaſon, they will be very early ripe, when they are brought forward by artificial warmth.

In the preparing of the borders for planting theſe fruit-trees, there ſhould be the ſame care taken as for thoſe againſt open borders, which, being fully treated of in another part of this work, I ſhall not repeat here. There muſt alſo be the ſame care in training up the trees when they ſhoot; but the treliſſes need not be made againſt theſe Walls till the trees are grown large enough to ſpread, and produce a quantity of fruit; till which time they may be ſupported by any low ordinary trellis, which will do very well till the time that the trees will have ſtrength enough to force, which will not be until the fourth or fifth year after planting, according to the progreſs they have made; for if they are forced too young, it will weaken them ſo much, as that they ſeldom make vigorous trees afterward; beſides the quantity of fruit which ſuch young trees produce, is not worth the expence and trouble of forcing; for the quantity of fuel uſed, and the trouble will be the ſame for ſmall trees, which are not capable of producing more than ſix or eight fruit each, as for thoſe trees which may produce three or four dozen; ſo that the greater time the trees have to grow before they are forced, the better they will pay for the trouble and expence.

But it will be the beſt way not to have any of the frames made, nor the trellis, or any other of the wood-work, until the trees are ſtrong enough to force; for if theſe are done when the Walls are firſt built, as is by ſome perſons practiſed, they will be half decayed before there is any uſe for them; but then the perſons who are employed in making the trellis, muſt be very careful in putting it up, not to injure the trees.

When the trees have acquired ſtrength enough to produce a quantity of fruit, the part which is deſigned to be forced the following ſpring, ſhould be carefully pruned early in autumn, when the very weak ſhoots muſt be either entirely cut out, or pruned very ſhort, becauſe theſe, by being forced, will for the moſt part decay; and though ſome of them may be full of flower-buds, yet theſe ſhoots being weak cannot nouriſh them; ſo that the flowers having exhauſted all the ſap, the ſhoots will die ſoon after, and rarely produce any fruit, or at leaſt do not bring them to perfection. The other more vigorous ſhoots ſhould alſo be ſhortened to a proper length, after the ſame manner as is directed for thoſe trees in the open air, with this difference only, viz. that theſe which are deſigned for forcing, ſhould not have their ſhoots left ſo long, becauſe the forcing of them will weaken them; and conſequently, ſhould there be as great a length of branches, there will probably be a greater number of fruit on them; becauſe, as theſe will be ſcreened from the open air, they will not be liable to blaſts, or the injuries of the froſt; and the having too many fruit on the trees will render them ſmall, and alſo too much weaken the trees; then the ſhoots ſhould be all regularly faſtened to the trellis, at a proper diſtance from each other, ſo that when the branches ſhoot the following ſpring, they may not over-hang each other. The reaſon for my adviſing theſe trees to be pruned ſo early in the ſeaſon, is, that thoſe branches which are left on, may enjoy the whole nouriſhment of the ſap, ſo that the buds will become very turgid during the winter ſeaſon, and will be prepared to open when the fires are ſet to work.

The time for beginning to make the fires is about the middle or latter end of January, according as the ſeaſon is more or leſs favourable; for if the trees are forced too early into flower, they will be in ſome danner of miſcarrying, if the weather ſhould prove ſevere; ſo that it is by much the ſureſt method to begin about the time here directed, becauſe there will be a neceſſity of admitting freſh air to the trees when they are in flower, which cannot be done ſafely when they flower in very bad weather. And thoſe trees which are forced into flower by the middle of February, will ripen their fruit as early as moſt people will deſire to eat them; for the Cherries will ripen early in April, and the Apricots by the beginning of May, and ſoon after the Plums, Peaches, and Nectarines, will be ripe.

There are ſome perſons who plant Strawberries in their borders before the fruit-trees, in order to have early fruit, which often ſucceed very well; but whereever this is practiſed, great care ſhould be taken to keep them from ſpreading over the border, becauſe theſe plants will exhauſt the principal goodneſs of the earth, and thereby injure the trees; ſo that when it is deſigned to have Strawberries in theſe borders, I would adviſe, that the roots ſhould be either planted in pots, or ſingly at a good diſtance on a ſhady border of loamy earth, one year before they are deſigned to be forced; during which time the runners ſhould be diligently pulled off, to encourage the main roots for fruiting; and at Michaelmas theſe plants may be tranſplanted, with large balls of earth to their roots, into the borders, before the fruit-trees which are to be forced the following ſpring, ſo that they may have time to get new root before that ſeaſon; and if theſe plants are carefully watered when they begin to ſhew their flower-buds, they will produce a good quantity of fruit, which will ripen the latter end of April, or the beginning of May; but then I would alſo adviſe, that theſe plants be taken away as ſoon as they have done bearing, that they may not rob the trees of their nouriſhment.

Since I have mentioned this method of having early Strawberries, I ſhall take the liberty to inſert another method, which is often practiſed to obtain this fruit early in the ſpring, though it doth not ſo properly come under this article, which is to train up the plants either in pots or borders, after the manner before directed, for at leaſt one year or more; then in the beginning of February there ſhould be a moderate hot-bed prepared, in length proportionable to the number of plants deſigned to be forced, and the breadth ſhould be proportionable to the width of the frames which are deſigned to cover them. Theſe frames may be ſuch as are uſed for common hot-beds, to raiſe early Cucumbers, &c. This hot-bed muſt be covered with freſh loamy earth about eight inches thick, into which the Strawberry plants ſhould be placed, with large balls of earth to the roots, as cloſe as they can conveniently be planted; (for as they muſt be kept clear from runners, they will not ſpread much during the time they remain in the bed, which will be no longer than until their fruit is gone.) Then they ſhould be gently watered to ſettle the earth to their roots, which muſt be frequently repeated as the earth becomes dry, otherwiſe they will produce new fruit. While the nights continue cold, the glaſſes of the hot-bed ſhould be covered with mats, to preſerve a kindly warmth in the beds; but in the day time, when the weather is favourable,

vourable, the glasses should be raised to admit fresh air to the plants; for if they are too much drawn, (especially when they begin to flower) they will not produce much fruit. If the season should continue long cold, and the heat of the beds should decline, it will be proper to lay some fresh hot dung round the sides of the beds to renew their heat, being always careful not to make them too hot, for that will scorch their roots, and prevent their fruiting. If the plants which are planted in these beds are strong, and in a good condition for bearing, and care be taken in transplanting of them to preserve good balls of earth to their roots, as also to keep a due temperature of warmth in the beds, they will produce ripe fruit by the end of April, or the beginning of May, in plenty; and will continue bearing, until some of those in the open air come in to succeed them.

The best kinds of Strawberries to plant for forcing, are the Scarlet and Alpine, for the Hautboys grow too rampant for this purpose.

But to return to the subject of hot Walls; what I have here inserted concerning the forcing of fruits, has been only to obtain these fruits earlier in the season, than they would naturally ripen against common Walls. But in some parts of England, where most of our good kinds of fruit seldom ripen, it might be very well worth while to build some of these Walls, to obtain good fruit from the best kinds of Peaches, Plums, &c. especially in such places where fuel is plenty, because there the expence will not be great after the first building of the Walls. For I would not propose to have coverings of glass, excepting for a small proportion of the Walls; the rest may have frames of canvas, or oiled paper, to shut over them, in the same manner as the glasses are contrived, which will succeed very well where proper care is taken; for as there will not be occasion to cover these trees until the beginning of March, at which time also the fires must be made, so before the trees are in flower, the weather may be frequently warm enough to open the covers to admit sun and air to the trees in the middle of the day; for if these covers are kept too closely shut, the shoots of the trees will draw very weak, and their leaves will turn pale for want of light and air. And as the design of these contrivances is only to bring the trees into flower three, or at most four weeks earlier, than they would naturally come against common Walls, there will be no necessity of making very large fires, or keeping the covers too closely over the trees.

Instead of canvas for these covers, oiled papers may be used, which should be done in the manner directed for raising of Melons, by pasting as many sheets of paper together, as will fit the frames on which they are to be fixed; and when the paste is dry, the paper should be fastened into the frames, and then the oil rubbed over on the outside with a brush, which will soak through the paper, and when the paper is dry, the covers may be used. This paper will last very well one season, and the expence of repairing it will not be very great; wherefore these are to be preferred to the canvas, because all sorts of plants will thrive much better under them, than they will under canvas, or any other close covering, which will not admit the rays of the light so well through to the plants. The frames designed for either canvas or paper may be made much slighter than those for glass, because these being very light, will not require so much strength to support them; and if these are well painted, and every year, when their use is over, carried into shelter, they will last a long time, for they will not be wanted abroad longer than three months, viz. from the beginning of March to the end of May; for after this time the fruit will not require any covering, the trees being then full of leaves, and the young shoots will by that time have made such progress, as to become a good defence for the fruit; but these covers should not be too suddenly taken away, but by degrees the trees should be inured to the open air, otherwise the change will be too great, and may occasion most of the fruit to fall off, especially if cold nights should follow.

By this method gentlemen may be supplied with most of the best kinds of fruit in the northern parts of England, where without some such care, they cannot expect much good fruit in their gardens. And as coal is in great plenty in those places, the expence will be very little; therefore I am surprised that most of the gentlemen who live in the north, do not put this method in practice. That there are some few of these Walls built in the north is well known, but then they are chiefly designed to produce a little early fruit, more for curiosity than any real use; and these Walls are, for the most part, so ill contrived, that four times the fuel is expended, as will be requisite when the Walls are built after the manner here directed; and where the heat is not pretty equally distributed through every part of the Wall, some of the trees will have too much heat, while others will have little benefit from the fires.

There are some persons who build their hot Walls in such a manner, as to have the greatest heat under the border, near the roots of the trees, supposing there is a necessity for heat to the roots, as well as the branches; but this is a great mistake, for the fires must greatly injure the roots of the trees, by drying up the moisture of the earth, as also in scorching the tender fibres of those roots which lie near them; therefore this practice should not be continued, for it is much the better method to elevate the first flue nine inches or a foot above the level of the border, according as the ground is dry or wet, than to place it the least below ground, which will only dry the earth, and not warm the air about the trees, which is the only use of artificial heat; for it is very commonly practised to draw a branch of a Vine, or other fruit-tree, into a stove, which branch will produce its fruit as early as if the whole tree had been forced; when, at the same time, all the other branches of the same tree, which are exposed to the open air, will not be the least forwarded, though they are all nourished by the same root; which is a plain proof, that there is no necessity for adding any warmth to the roots of fruit-trees, to have their fruit earlier or better ripened.

I have also heard of some Walls which have been built for forcing of fruit, with one continued chasm from their bottoms to the top, so that they have been like double Walls, with places at proper distances to make the fires; but these can be of little use, for if the Walls are open at their tops to let out the smoke, the heat will also escape with it; because, if the smoke be not led about three or four times in flues in order to warm the bricks, the heat will pass off at the top, without doing much service to the trees.

Where the Walls are planted with the best kinds of fruit, which are designed to ripen them in perfection, if the autumns should prove cold, or very wet, before the fruit are ripe, it will be proper to put the covers over the trees; and if there are some slow fires made to dry off the damps, it will be of great use to prevent the fruit from growing mouldy, and to hasten their ripening; but when this is practised, the covers should be taken off, whenever the weather will admit of it, that the fruit may enjoy the benefit of the free air, without which they will be insipid or ill-tasted.

Although in the former directions for forcing trees in order to have early fruit, I have advised, that such trees should have one or two years rest in order to recover vigour, yet that is not to be understood of these trees, which are only designed to be brought forward enough to produce their fruit in perfection; for as the fires are not designed to be made till the beginning of March, the trees will not be weakened thereby, because they will be inured to the open air long before their fruit is ripe, and will have time to ripen their shoots, and form their buds for the next year's bearing; therefore these trees may be thus forced every year, without doing them much injury, provided they are carefully managed.

In forcing of fruit-trees people generally hang up thermometers under their glasses, for the better adjusting the heat and regulating the fires; but when this is practised, they should be hung where the sun can never shine on them, for one hour's sun-shine upon the ball or tube of the thermometer, in the spring of the year, will so much rarefy the spirits, that they will rise to the top of the tube, when, at the same time, the circumambient air may not be much more than of a temperate heat; but as the principal use of these thermometers is to regulate the fires, they are seldom of much use in the day time; because, if there be only one hour's sun-shine in the day on the glasses, it will warm the air sufficiently for the production of European fruits, without any additional heat; wherefore there will rarely be occasion for continuing of the fires in the day, unless the weather should prove very bad. And if, by the fires in the night, the air is warmed to the temperate point marked on the botanic thermometers, the fruit will thrive much better than in greater heat.

There are some persons near London, who make it their business to raise early fruit to supply the markets, which they perform by the heat of dung only, having no fire Walls in their gardens. The method which these people follow, is to have a good quantity of new dung laid in a heap to warm (after the same manner as is practised for making of hot-beds.) When this dung is in a proper temperature of heat, they lay it close on the back side of their fruit Wall, about four feet thick at the bottom, and sloping to about ten inches or a foot thick at the top. This dung should be gently beat down with a fork to prevent the heat going off too soon, but it should not be trodden down too hard, lest that should prevent its heating. The outside of the dung should be laid as smooth as possible, that the wet may run off more easily; and if there is a covering of thatch, as is sometimes practised, it preserves the dung from rotting too soon, whereby the heat is continued the longer. The time for laying this dung to the back of the Wall is somewhat later than for making the fires, i. e. about the middle of February. The first parcel of dung will continue warm about a month or five weeks, when there should be a supply of new dung prepared, and the old taken quite away, or mixed up with this new dung, to renew the heat, which, if it works kindly, will be sufficient to last the season. These Walls are covered with glasses or oiled paper, in the same manner as the fire Walls, and the trees must be treated in the same way; but there must be more care taken to open the glasses against these Walls, whenever the weather will permit, otherwise the steam of the dung will occasion a great dampness through the Wall, which, if pent in about the trees, will be very pernicious to them, especially at the time they are in flower.

By this method some gardeners have forced long Walls filled with old well-grown fruit-trees, which have produced great quantities of fruit annually, which has well answered their expence; but as, in many parts of England, it will be very difficult to procure a sufficient quantity of new dung for this purpose, therefore fire Walls are most useful, and least expensive in such places.

I have seen in some places long timber fences erected to force fruit-trees, by laying new dung against the back side, in the same manner as is practised for the Walls, but these are by no means proper, because the steam of the dung will easily get through every little crack or joint of the boards, to the great prejudice of the trees; besides, these boards will continue very damp, as long as any moisture remains in the dung, which will also be very injurious to them; and as these boards will in a few years decay, these will be more expensive than Walls, if they are kept in repair for some years, and will never answer the design so well.

WALL FLOWER. See CHEIRANTHUS.

WALNUT. See JUGLANS.

WALTHERIA. Lin. Gen. Plant. 741.

The CHARACTERS are,

*The flower is of the malvaceous tribe, and has a cup-shaped permanent empalement of one leaf, cut into five points at the rim; it has five heart-shaped petals which spread open, and five stamina, joined in a cylinder, terminated by loose summits, and an oval germen, supporting a single style, crowned by a bifid stigma. The germen turns to an oval capsule with one cell, inclosing one obtuse seed.*

This genus of plants is ranged in the first section of Linnæus's sixteenth class, which includes those plants whose flowers have five stamina joined in one body or column.

The SPECIES are,

1. WALTHERIA (*Americana*) foliis ovalibus plicatis serrato-dentatis capitulis pedunculatis. Lin. Sp. Plant. 941. *Waltheria with oval plaited leaves, which are saw-indented, and the flowers on foot-stalks.* Althæa Americana pumila, flore luteo spicato. Breyn. Cent. 1. f. 57. *Low American Marsh Mallow with a yellow spiked flower.*
2. WALTHERIA (*Indica*) foliis ovatis serratis plicatis, capitulis sessilibus. Prod. Leyd. 348. *Waltheria with oval, sawed, plaited leaves, and the heads of flowers sitting close to the branches.* Betonica arborescens, villosis foliis profunde venosis, floribus ex alis foliorum glomeratis. Pluk. Mant. 31.
3. WALTHERIA (*Angustifolia*) foliis lanceolatis serratis, capitulis pedunculatis. Prod. Leyd. 348. *Waltheria with spear-shaped sawed leaves, and heads of flowers upon foot-stalks.* Betonica arborescens Maderaspatana villosa, foliis profunde venosis. Pluk. Alm. 67. tab. 150. *Tree-like Betony of Madras, with hairy deep-veined leaves.*

This genus of plants is described in the French Memoirs of the Academy of Sciences, by Monf. D'Isnard, who has given it the title of Monospermalthæa, from the habit of the plant being like Althæa; and, having a single seed to each flower, he compounded this name; but Dr. Linnæus has altered it to this of Waltheria, in honour of Augustus Frederic Walther, Professor at Leipsic, who is a curious botanist.

The first sort grows naturally in the Brasils, and also in many parts of the islands in the West-Indies; it has a soft ligneous stalk which rises about two feet high, sending out two or three side branches. The leaves are oblong, oval, plain, and sawed on their edges, of a pale yellowish green colour, soft and hairy, and are placed alternately. The flowers are collected in a close thick spike at the top of the stalk, having soft hairy empalements; they are composed of five petals, connected at their base, which are small, of a bright yellow colour, and spread open; these are each succeeded by angular seeds which ripen in the empalement. It flowers in July and August, and the seeds ripen in autumn.

The second sort grows naturally in both Indies; this rises with a shrubby branching stalk to the height of eight or ten feet, covered with soft hairs. The leaves are placed alternately upon foot-stalks; they are four inches long, and two broad in the middle, and are rounded at both ends, of a yellowish green colour, very hairy and soft, having several longitudinal veins. From the wings of the branches arise the foot-stalks of the flowers, which sit close to the branches, and are terminated by clusters of very small yellow flowers, which just peep out of their soft hairy empalements. The flowers are succeeded by a single seed wrapped in the empalement of the flower. It flowers most of the summer months, and the seeds ripen in succession.

The third sort grows naturally at Campeachy and in India; from the first place the seeds were sent me. The stalks of this are ligneous; they rise six or seven feet high, dividing into several branches, which are less hairy than those of the former sort. The leaves are spear-shaped, about three inches and a half long, and one inch and a half broad; they are of a yellowish green colour, sawed on their edges, and hairy, but are not so soft as those of the former, having many veins running from the midrib, standing upon long foot-stalks. The flowers are very small, yellow, and are collected into round clusters, standing upon very short

foot-stalks, close to the wings of the leaves; these appear in June, July, and August, and the seeds ripen in autumn.

These plants are propagated by seeds, which must be sown on a hot-bed; and when the plants are fit to transplant, they must be each planted into a separate small pot, and plunged into a fresh hot-bed, and afterward treated in the same manner as other tender plants of the same country, for they must be kept in the bark-stove, otherwise they will not thrive in England. The second year the plants will flower and produce good seeds, but the plants may be continued three or four years if they are often shifted, and the roots pared, to keep them within compass; for if they are permitted to remain long undisturbed in the tan-bed, their roots will run out through the holes in the bottom of the pots, and extend to a great distance in the tan; and when this happens, if their roots are torn, or cut off, the plants seldom survive it. When the plants root into the tan, they grow very luxuriant, and cannot be kept within reasonable compass; but on their roots being disturbed, their branches will hang, and their leaves shrivel up and drop off; therefore, to keep these plants within bounds, they should be drawn up out of the tan at least once in six weeks, during the summer season, and the plants shifted out of the pots once in two months; with this management the two last sorts may be continued several years, but the first seldom lives longer than two years.

WARNERA. Hydrastis. Lin. Gen. 704.

The CHARACTERS are,

*The flower hath no empalement, but consists of three oval regular petals, including a great number of linear compressed stamina which are shorter than the petals, terminated by obtuse compressed summits. It hath many germen collected into an oval head, having short styles, crowned by broad compressed stigmas. The germen becomes one berry, composed of many oblong acini like Strawberries, including one oblong seed in each.*

This genus of plants is ranged in the seventh section of Linnæus's thirteenth class, which contains those plants whose flowers have many male and female organs of generation.

The title of this genus is given to it in honour of Richard Warner, Esq; of Woodford-row, Essex, who is a very curious botanist, and a great collector of growing plants.

We know but one SPECIES of this plant at present, viz.

WARNERA (*Canadensis.*) *Warnera, or Yellow Root.* Hydrastis. Lin. Sp. 784. *Water Herb.*

This plant grows naturally in Canada, and several other parts of North America; the root is composed of thick fleshy tubers of a deep yellow colour within, but covered by a brown skin, sending out fibres from several parts in the spring; it sends up one or two foot-stalks about nine inches high, on which are one or two lobated leaves on the side, which are composed of hand-shaped leaves, which are sawed on their borders; the foot-stalk is terminated by one flower, composed of three oval white petals, including many stamina and styles, and is succeeded by a fruit composed of many acini like those of Strawberries, which when ripe, change to a red colour; it flowers in May, and the fruit is ripe in July.

This plant is pretty uncommon in the English gardens, where it does not increase much; it delights in great shade and moisture; for when it is planted in dry ground, or much exposed to the sun, it rarely lives through one summer. Therefore it should be planted in a moist loamy soil, in a shady situation, where it should remain undisturbed three or four years.

WATER is one of the most considerable requisites belonging to a garden: if a garden be without it, it brings a certain mortality upon whatsoever is planted. By waterings the great droughts in summer are allayed, which would infallibly burn up most plants, had we not the help of Water to qualify the excessive heats; besides, as to noble seats, the beauty that Water will add, in making jets d'eau, and cascades, which are some of the noblest ornaments of a garden, if rightly placed. I shall first take notice of the qualities of Water, with the several opinions of the most eminent philosophers thereon, and then take notice of the beauty which large pieces of Water add to such seats as are conveniently situated for them.

Sir Isaac Newton defines Water (when pure) to be a very fluid salt, volatile, and void of all savour and taste; and it seems to consist of small, hard, porous, spherical particles of equal diameters, and equal specific gravities; and also that there are between them spaces so large, and ranged in such a manner, as to be pervious on all sides.

Their smoothness accounts for their sliding easily over the surfaces of one another.

Their sphericity keeps them from touching one another in more points than one, and by both these, their frictions, in sliding over one another, are rendered the least possible.

The hardness of them accounts for the incompressibility of Water, when it is free from the intermixture of air.

The porosity of Water is so very great, that there is at least forty times as much space as matter in it, for Water is nineteen times specifically lighter than gold, and of consequence rarer in the same proportion; but gold will, by pressure, let Water pass through its pores, and therefore may be supposed to have (at least) more pores than solid parts.

Monf. Le Clerc says there are these things observable in Water, which naturalists study to know, and account for:

1. It is transparent; because, as some are of opinion, it consists of flexible particles like ropes, which are not so close as to leave no pores, nor so entangled, but that there are right lines enough to transmit the light.

For since the particles are not joined close together, and in perpetual motion, the very particles of light easily pass through their right lines, unless the Water be very deep, or put into motion by some outward cause; then, indeed, the transparency of Water is very much obstructed, and it looks of a cloudy obscure colour, as it is obvious to sight in a rough sea, for at such a time the vehement agitation of the Water disturbs their pores, and spoils their straitness.

2. Water is liquid, but capable of being fixed. Water seems to be liquid for the same reason that other bodies are so; for since the particles of it are flexible like ropes, and leave pores between one another, which are filled with finer matter; when this matter is put into a vehement commotion, the particles are easily tossed about every where; yet when the motion of this restless matter is restrained, as it is in winter, then the Water congeals into ice, whether this comes of cold only, or there be, besides, nitrous particles, which fall out of the air at that time, and with their rigidness fix the watery ones.

3. It may be made hot or cold, the particles of Water being, as has before been said, ice, are soon dissolved by the motion of those of fire; for the particles of fire, getting into the pores of the ice, mightily shake the fine flexible particles of it, and restore them to their former motion in a little time.

But, if this Water be set in cold air, the fiery particles will soon vanish, and the Water become as cold as before.

4. Water easily evaporates by the heat of fire or air. This is because its particles are quickly separated, and got into motion; so that the airy particles easily carry those of the Water about with them.

5. It is heavy, if compared with air, and some other bodies, but much heavier than air. It has been shewn, by various experiments, that the gravity of the air in the place where we live, is to that of Water, as one to eight hundred, or something more; so that Water is eight hundred times heavier than air. And for this reason a bladder, or any other thing, filled with air,

can

can hardly be sunk under Water; and indeed, to make air sink, there must be a weight added to it that shall exceed the weight of the Water as much, and something more, than that of the Water exceeds that of the air.

Hence it comes to pass, that Water easily supports wood, and vast ships fraught with the heaviest cargo; for the weight alone will never sink them, unless the goods and vessel together should make up a weight which exceeds that of Water; and as salt Water is heavier than fresh, it bears a greater weight.

Those things which are heavier than Water, as stones, metals, &c. when they are thrown into it, go strait down to the bottom; and as their weight is greater, by so much the quicker; while other bodies, which are of the same weight with the Water, neither float on the surface, nor sink quite down, but remain suspended between the top and bottom, as is seen in the carcases of animals.

6. Water is insipid, and without smell. The reason is, because its flexible parts slip gently over the tongue, and are not sharp enough to prick the nerves, and affect the taste; but this is to be understood of pure Water, void of all kind of salt, such as distilled Water is, and next, that of rain; for the most wholesome fountain Water commonly derives a saltness from the earth; though in this place are not meant medicinal fountain Waters, the taste of which is more acute, but such Water as is usually drank.

And that it is without smell; the purer any Water is, the less smell it has; for the reason why the particles do not prick the tongue, is the reason why they do not affect the smell. The flexibility and smoothness of Water is such, that they cannot pierce the olfactory nerves; for some fountain Water has indeed some smell, but then it is a sign that it is not pure.

7. Water is subject to putrify, according as the place is where it is kept. Water will grow thick and stinking by heat and rest, as we find it does in ponds and marshes, and in close vessels; but here it ought to be remembered, that this is what was spoken of before, as such Water is not pure, for unmixed Water cannot putrify. This is proved,

First, by distilled Water, which may be kept very long without putrefaction.

Secondly, in rain Water, which is caught in clean vessels, and presently stopped up close, and buried under ground, which is kept many years in countries where they want fountains. This shews that the cause of putrefaction is not in the Water itself, but in other things that are mingled with it; because pure Water, such as is distilled, or comes from the clouds, keeps sweet for a great while; but then those vessels in which such Water is kept, must be so well stopped, that the least fly may not get into them; and they must be made of such stuff as will not corrupt, such as glass or clay.

But as for standing Water, in ponds or marshes, that is corrupted two ways:

1. By the nature of the soil, which often abounds with noisome sulphur, whereby the Water is impregnated, and comes to smell in warm weather, as it does at Amsterdam, not only in the canals, but wherever the ground is opened for the foundations of houses. This putrefaction is owing to the soil, and not to the Water.

2. By the nasty things that are thrown into it, or bodies of insects which die in it, as also by the eggs of flies, which are dropped about wherever they go, and breed worms. Water is corrupted in wooden vessels, especially at sea, by the sulphureous parts of the wood, and by uncleanly things, as flies, eggs, &c.

Water penetrates the pores of those bodies, whose pores are wide enough to receive its particles; thus it enters the pores of sugar and salts, so as to separate and quite dissolve their particles; but it cannot get into the pores of stones, or but a very little way; so that it only wets their surface, without diluting them; hangs on the outside of them, because they are rough, and because the extremities of their pores are open a little way. But such bodies, when they are wet, are soon dried in the air, because the motion of the dry particles carries off the soft and smooth ones of the Water.

It is observable, that if bodies, rubbed over with oil or fat, be dipped in water, they get very little wet, because the roughness of their surface, whereon the Water should hang, is smoothed, and made even by the fat, and the mouths of the pores are closed up, so that there is nothing left for the watery particles to hold by, and therefore they must needs slide off.

Most liquors are formed by the cohesion of particles of different figures, magnitudes, gravities, and attractive powers, swimming in pure Water, or an aqueous fluid, which seems to be the common basis of all. And the only reason why there are so many sorts of Water differing from one another by different properties, is, that the corpuscles of salts and minerals, with which that element is impregnated, are equally various.

Wine is only Water impregnated with particles of Grapes, and beer is Water impregnated with particles of Barley, &c. All spirits seem to be Water saturated with saline and sulphureous particles.

And all liquors are more or less fluid, according to the greater or smaller cohesion of the particles, which swim in the aqueous fluid; and there is hardly any fluid without any cohesion of particles, not even pure Water itself, as will appear from the bubbles, which will sometimes stand on the surface of it as well as on that of spirits, and other liquors.

Water contributes much to the growth of bodies, in that it both renders and keeps the active principles fluid, so that they are capable of being conveyed by circulation into the pores.

The learned Dr. Halley has demonstrated, that if an atom of Water be expanded into a shell or bubble, whose diameter shall be ten times as great as before, such an atom would be superficially lighter than the air, and will rise so long as that flatus, or warm spirit, which at first separated or raised it from the mass of Water, shall continue to distend it to the same degree; but when that warmth declines, and the air grows cooler, and withal specifically lighter, these vapours will stop at a certain region of the air, or else descend.

Therefore, if it should be supposed, that the whole earth were covered with Water, and that the sun should make his diurnal course round it, as now he does, he is of opinion, that the air would be impregnated with a certain quantity of aqueous vapours, which it would retain in it, like salts dissolved in Water; and that the sun in the day time warming the air, that part of the atmosphere would sustain a greater proportion of vapours (as warm weather will hold more salt in it dissolved than cold) which by the absence of the vapours at night would be discharged into dews.

And in this case he concludes, there could not be any diversity of weather, other than periodically every year alike; the mixture of all terrestrial, saline, and heterogeneous vapours here being excluded, which he judges to be, when variously compounded, and driven by winds, which are the causes of these various seasons and changes of weather which we now find.

But, instead of supposing an earth to be covered all over with Water, you suppose the sea interspersed about wide and spacious tracts of land, and also divided by high ridges of mountains, such as the Alps, the Appenine, and the Pyrenean, in Europe; the Caucasus, the Imaus, and the Taurus, in Asia; the Mount Atlas, and the mountains of the Moon, in Africa; the Andes and Apalachian mountains, in America; each of which surpasses the usual height, to which the aqueous vapours do of themselves ascend, and on the tops of which the air is so cold and rarefied, as to retain but a small part of these vapours, which are brought thither by the winds.

Then the vapours thus raised from the sea, and carried by the winds over the low lands to those ridges of mountains, are there compelled by the steams of the air,

air, to mount with it up to their tops, where the Water presently precipitates, gleeting down by the crannies of the stones; and part of the vapours entering into the caverns of the hills, the Water thereof gathers, as in an alembic, in the basons of stones; and these being once full, the overplus of the Water runs down at the lowest place of the bason, and breaking out by the sides of the hills, form single springs, many of which run down by the vallies or guts between the ridges of the hills, and, after uniting, form little rivulets or brooks; and many of these meeting again, form large rivers.

Whether Water be originally a fluid? It is a point that has been controverted among philosophers, whether fluidity be the natural state of Water, or rather the effect of violence.

Sometimes we find it appear in a fluid form, and sometimes in a solid one; and as the former is the more usual in our warmer climate, we are apt to conclude fluidity to be its proper state, and suppose the other to proceed from the extraneous action of cold. But the learned Boerhaave asserts the contrary, and maintains, that Water is of the crystalline kind; because wherever a certain degree of fire (heat) is wanting to keep it in fusion, it readily grows into a hard glebe, which we call ice.

Mr. Boyle is much of the same opinion; he observes, that ice is commonly reputed to be Water, brought into a preternatural state by cold. But with regard to the nature of things, and setting aside our arbitrary ideas, it might as justly be said, that Water is ice, preternaturally thawed by heat. If it be urged, that ice left to itself will, upon the freezing agents being removed, return to Water, it may be answered, That, not to mention the snow and ice that lie all the summer long on the Alps, and other high mountains, even in the torrid zone, we have been assured, that in some parts of Siberia the surface of the ground continues more months of the year frozen, by the natural temperature of the climate, than it has been thawed by the heat of the sun; and a little below the surface of the ground, the Water which chances to be lodged in the cavities there, continues in a state of ice all the year round; so that when, in the heat of summer, the fields are covered with Corn, if you dig three or four feet deep, you shall find ice, and a frozen soil.

Dr. Boerhaave is of opinion, That if Water could be had alone and pure, it would have all the requisites of an element, and be as simple as fire; but there has been no expedient hitherto found out for making it such.

Rain Water, which seems to be the purest of all those we know of, is replete with infinite exhalations of all kinds, which it imbibes from the air, so that though it be filtered and distilled ever so often, yet there still remain fæces.

The purest of all Waters we can any way arrive at, is that distilled from snow, gathered in a clear, still, pinching night, in some very high place, taking none but the outer, or superficial part thereof. By a number of repeated distillations thereof, the greatest part of the earth, and other fæces, may be separated from it; and this is what we must be content to call pure Water.

Mr. Boyle indeed relates, that a friend of his by distilling a quantity of Water a hundred times, found at length, that he had got six tenths of the quantity in earth: whence he concludes, that the whole Water, by the further prosecuting the operation, might be converted into earth.

But it should be considered, that as the Water cannot be removed or poured into a vessel, without the mixture of some dust with it, so neither can the luting of the vessel be distilled without losing something every time; therefore Dr. Boerhaave rather concludes, That the Water thus often distilled, might acquire new earth from the dust floating in the air, and the instruments employed in the operation.

That author assures us, That after he had distilled some very pure Water by a gentle fire, for the space of four months, it appeared perfectly pure; and yet leaving it to rest in vessels perfectly closed, it conceived a certain kind of weedy matter, somewhat like the stamina of plants, or the little tufts of a mucilage; and yet it is related that Schotus saw Water in Kercher's Musæum, that had been kept in a vessel hermetically sealed upwards of fifty years; and yet it still remained clear and pure, and stood to the same height in the vessel as at the first, without the least sign of sediment.

Dr. Boerhaave adds, That he is convinced nobody ever saw a drop of pure Water; that the utmost of its purity known, only amounts to its being free from this and that sort of matter; and that it can never, for instance, be quite deprived of its salt, since air will always accompany it, and that has always salt.

Water seems to be diffused every where, and to be present in all space where there is matter. There is not a body in all nature but will yield Water. It is also asserted, that even fire itself is not without Water. A single grain of the most fiery salt, which in a moment's time will penetrate through a man's hand, readily imbibes half its weight of Water, and melts even in the driest air imaginable. Thus salt of tartar, placed near the hottest fire, will attract or imbibe Water, and by that means increase considerably its weight in a small time. So in the driest summer's day, a pewter vessel with ice in it, brought up from some cold subterraneous place, into the hottest room, will immediately be covered with little drops of Water gathered from the contiguous air, and condensed by the coldness of the ice.

Even dry bodies afford a plenteous stock of Water. Dr. Boerhaave says, oil of vitriol, being exposed a long time to a violent fire, to separate all the Water from it as much as possible, did afterwards, by only standing a few minutes, contract fresh Water so fast, as soon to afford it as plenteously as at first.

And that hartshorn that had been kept for forty years, and was as hard and dry as any metal, so that if struck against a flint, it would yield sparks of fire; yet this very hartshorn being put into a glass vessel, and distilled, afforded him one eighth of its quantity of Water. He adds: we have known bones dead dried twenty-five years, and thus become almost as hard as iron, which yet, by distillation, afforded half their weight of Water; and the hardest stones ground and distilled, always discover a portion thereof.

Mr. Boyle, by distillation, found that eels yielded some oil, spirit, and volatile salt, besides the caput mortuum; yet all these were so disproportionate to the Water, that they seemed to have been nothing but that coagulated.

The same author, from human blood itself, as spirituous and elaborate a liquor as it is reputed, did, by distillation, out of seven ounces and a half, draw near six of phlegm, before ever any other of the principles began to rise.

Vipers, though they are esteemed hot in operation, and will, in a convenient air, survive for some days the loss of their heads and hearts, yet it is surprising how great a share of Water they yield by distillation.

Some have been of the opinion, that Water was the common matter of all bodies. And Thales, with some other philosophers, have held, that all things were made of Water; which opinion, probably had its rise from the writings of Moses, where he speaks of the Spirit of God moving upon the face of the Waters.

But Mr. Boyle does not conceive the Water here mentioned by Moses, as the universal matter, to be our elementary Water; since though we should suppose it to have been an agitated congeries, consisting of a great variety of seminal principles, and of other corpuscles fit to be subdued and fashioned by them, it yet might be a body fluid like Water, in case the corpuscles it was made up of were, by their Creator, made small enough, and put into such an actual motion as might make them all roll, and glide over one another.

However, Basis Valentine, Paracelsus, Van Helmont, Bentivoglio, and others have maintained, on his principles, that Water is the elemental matter or stamen of all things, and that it suffices for the production of all things; which Helmont endeavours to prove from the following experiment.

He burnt a quantity of earth in a potter's vessel, till such time as all the oil it contained was quite consumed; then mixing it with Water, he drew out all the salt. The earth thus prepared, he put into an earthen pot, such as is used by gardeners, and took care that nothing but rain Water could enter into the same; and yet a Willow being planted in this earth, grew up to a considerable height; whence he concluded, that Water was the only nutriment of the vegetable kind, as vegetables are of the animal.

The same thing Mr. Boyle likewise argued from a similar experiment, and the whole is countenanced by Sir Isaac Newton, who observes, that Water standing a few days in the open air, yields a tincture, which, like that of malt, by standing longer, yields a sediment and a spirit; but before putrefaction, is fit nourishment for animals and vegetables.

But Dr. Woodward endeavours to shew, that they were both mistaken; proving, that Water contains in it divers extraneous corpuscles, and that some of these are the proper matter of nutrition; Water being found to afford so much the less nourishment, the more it is purified. Thus Mint planted in Water purified by distillation, will not grow so fast, as if put in Water not distilled; and if the Water be distilled three or four times over, the plant will scarce grow at all, or receive any nourishment from it.

So that Water as such, is not the proper nutriment of vegetables, but only the vehicle thereof; which contains the nutritious particles, and carries them along with it through all the parts of the plants; so that a Water plant, e. g. a Water Cress, being put in a glass vessel full of Water, will be found to contain the more salt and oil.

In effect, Water nourishes the less, the more it is purged of its saponaceous salts, in its pure state it may suffice to extend or swell the parts, but affords no new vegetable matter.

*Of the fluidity of Water.*

Water, says Dr. Boerhaave, is fluid, but the fluidity is not natural thereto; for naturally, it is of the crystalline kind; and accordingly, wherever a certain degree of fire is wanting, there we see Water become ice. That this ice is the proper effect of the want of heat, and not of any additional spicula introduced into the Water, as Mariotte and others contend, is evident enough, were it only hence, that on this supposition, it could not penetrate the substance of all bodies, as we find it does, and even that of metals.

This Water in its state of solution, never remains at rest; its parts are in perpetual motion, as was first discovered by the French with the help of microscopes; and is farther confirmed by this, that if a little Saffron be suspended in the middle of a vessel full of Water, the Saffron colour will in a little time, form as it were, a kind of atmosphere around, and at length be diffused through the whole Water. Now this could no way be effected without a motion of the watery particles among each other. Add, that if you cast a quantity of the driest salt, in the coldest weather into Water, it will soon be dissolved; which argues the continual motion of the particles of that element.

He adds, that he had more than once filled a large wide vessel with Water, and narrowly watched with a good microscope, but could never perceive it without some sort of undulatory motion.

Water scarce ever continues two moments exactly of the same weight; but is always varying more or less, by reason of the air and fire contained in it. Thus if you lay a piece of pure limpid ice in a nice balance, you will find it continue in equilibrio. The expansion of Water, in boiling, shews what effect the different degree that fire has on the gravity of Water.

This uncertainty makes it difficult to fix the specific gravity of Water, in order to settle its degree of purity; but this we may say in the general, that the purest Water we can procure is, that which weighs 880 times as much as air.

However, neither have we any tolerable standard for air; for Water being so much heavier than air, the more Water is contained in air, the heavier of course must it be; as in effect, the principal part of the weight of the atmosphere, seems to arise from the Water.

Of all Waters, the purest is that which falls in rain in a cold season, and a still day; and this we must be content to take for elementary Water. The rain Water in summer, or when the atmosphere is in commotion it is certain, must contain infinite kinds of heterogeneous matter. Thus if you gather the Water that falls after a thunder clap in a sultry summer's day, and let it stand and settle, you will find a real salt sticking at the bottom; but in winter, especially when it freezes, the exhalations are but few, so that the rain falls without much adulteration; and hence, what is thus gathered in the morning, is found of good use for taking aways spots in the face; and that gathered from snow, against inflammations in the eye. Yet this rain Water, with all its purity, may be filtred and distilled a thousand times, and it will still leave some fæces behind it; so that to procure the purest Water possible, a man must look for it in a spacious plain in the winter time, when the earth is covered with snow, and its pores locked up with frost.

The next in point of purity is spring Water. This, according to Dr. Halley, is collected from the air itself; which, being saturated with Water, and coming to be condensed by the evening's cold, is driven against the cold tops of mountains, where, being farther condensed and collected, it gleets down or distils, as much as in an alembic.

Spring Water becomes the better by running; for during all its course, it is depositing what heterogeneous matters it contained; but while the river drives on its Waters in an uninterrupted stream, all its salts, with all the vegetable and animal matters drained into it, either from exhalations, or from the ground it washes gradually, either sink to the bottom, or are driven to the shore.

But what Water descends from springs on the tops of mountains, is generally pretty free from heterogeneous bodies.

*Of the solutive power of Water.*

Water considered as a menstruum, dissolves,

1. All salts; as sugar, borax, &c. which air only dissolves by virtue of the Water it contains; which fire only liquifies, and earth leaves untouched, so that Water alone is the proper menstruum of salts.

The particles of salts, as has been observed, can insinuate themselves into the interstices between the particles of Water; but when those interstices are filled with any salt, the same Water will not any longer dissolve the same salt; but a salt of another kind it will, by reason its particles being of a different form, will enter and occupy the vacancies left by the former. And thus again, it will dissolve a third or fourth salt, &c. So when Water has imbibed its fill of common salt, it will still dissolve nitre; and when saturated with heat, will dissolve sal armoniac; and so on.

2. It dissolves all saline bodies; it being the constituent quality of a saline body, to be uninflammable and dissoluble in Water. Hence Water may dissolve all bodies, even the heaviest and most compact, as metals, inasmuch as these are capable of being reduced into a saline form; for these may be so intimately dissolved by Water, as to be sustained therein.

3. It dissolves all saponaceous bodies, i. e. all alka-

linous salts and oils blended together: these two bodies make a sapo, which is a saline body, but not a salt. Now oil itself is not dissoluble in Water; but the admixture of the salt here rendering it saline, Water readily dissolves it.

All the humours in the human body, are apparently saline, though none of them are salt itself. The same may be said of the juices of all vegetables, excepting the oils, which accordingly dissolve in Water.

Salts are the active instruments of nature; and yet these do not act, unless dissolved either by Water or fire.

4. It dissolves glass itself; for this, if melted with salt of tartar, becomes soluble in Water.

5. It dissolves all gummous bodies; this being part of the definition of a gum, that it dissolves in Water, in contradistinction from a resin: but oleaginous bodies it leaves untouched; nay, and what is more extraordinary, it repels them; and by repelling, drives the oily particles into eddies.

If a hundred drops of oil be thrown upon Water, all the several drops, which before were perfectly dispersed, will soon gather together again, and leave the Water alone; so that there should be some repugnance between Water and oil, and some attraction between the particles of Water, as also between that of oil.

Add, that Water seems to repel all oleaginous, fatty bodies, wherein oil predominates; and hence also it is, that the fatty parts in our bodies escape being dissolved by Water; and it is in all probability, by this means, that fat is collected in the adipose cells of all animals.

Nor does Water dissolve sulphur; for though you boil sulphur ever so long in Water, yet it will still remain untouched.

Nor does it dissolve terrene or earthy bodies, but rather unites and consolidates them; as we see in tiles, &c.

Water however, mixed with alkaline salts, dissolves oil, and oily bodies; thus though mere Water poured on greasy wool be repelled thereby, and contributes nothing towards cleansing the same; yet mix a strong lixivium, or an alkaline salt with the Water, and then it readily dissolves, and absorbs all that is greasy and oleaginous; and thus it is woollen cloths are scoured. But neither will Water alone do, as being immiscible with oil, nor will any other sort of salts; for sea Water, with all its salts, will never wash out any oily impurities. So, in the ordinary methods of scouring and fulling, the stuffs are washed in stale, putrefied, human urine, which is known to be a thorough alkali.

Lastly; it does not dissolve resin, as we conceive a resin to be no other than an inspissated or concentrated oil.

Having thus fully treated of the properties of Water philosophically, I shall next consider it as essentially necessary in gardens for use, and also of the beauty which Water adds to gardens, where it can be obtained in plenty, if it is properly disposed; and first of its use.

In the kitchen-garden, Water is absolutely necessary, for without it there can be little expected; therefore in such places where there cannot be a supply of Water obtained for basons or ponds, wells must be dug; and where the depth to the Water is too great to be raised by pumps, there must be either machines for raising it contrived, or it must be drawn by hand; but in such places which are so unhappily situated, as to require machines for the raising of Water from a great depth, there is but small encouragement to make kitchen-gardens; for then constant supplying of Water in those dry situations will be attended with great expence, and generally the produce of such land is of little worth, especially in dry seasons.

Where kitchen-gardens are supplied with Water from wells, there should be a contrivance of large cisterns, into which the Water should be raised, to be exposed to the sun and air some time before it is used; for the rawness of this Water, when fresh drawn from wells, is not agreeable to the growth of vegetables; so that where large ponds are in the neighbourhood of these gardens, from whence the Water can be led into them, that is by much the best for the growth of vegetables; next to this, river Water is to be preferred, especially from those rivers which run through or near large towns, where the Water is fattened by the soil thrown into the rivers; but the Water of some very clear rivers, is as hard as that from the deepest springs, rising through gravel or sand; but the springs issuing through chalk are generally much softer.

If good Water can be obtained in plenty from the neighbourhood of the kitchen-garden, then there should be two or three basons made in different parts of the garden, so that no part of the garden should be too far distant from the Water; for where the Water is to be carried to a considerable distance, the expence of labour will be great, and there will be great danger of the plants suffering, from their being but sparingly watered; labourers being very apt to slight their work, when attended with trouble, if they are not well looked after. The size of these basons should be in proportion to the quantity of Water which will be required, or that they can be supplied with, but their depth should not be more than four feet; for when they are deeper, there is danger of persons being drowned, if by accident they should fall into them; besides Water, when very deep, is not so well warmed and tempered by the sun and air, as when it is shallow; therefore the Water of shallow basons is best for the use of gardens.

In making of these basons, there must be particular regard had to the natural soil of the garden, for in loose sandy land there will require much care in making of the clay walls so as to hold Water; but where the ground is loamy, or inclining to clay, there will be little difficulty in making basons, and the clay walls need not be so thick. Where the ground is loose, the clay walls at the bottom should not be less than two feet thick, and those on the sides one foot and a half. The clay should be well wrought over and trod after it is taken from the pit, before it is used in building the wall. The true sign of good clay is, that it be close and firm, without any mixture of sand, and that it be fat and tenacious in handling: as for the colour, it is no matter whether it be green, yellow, blue, or red; but before the clay is brought to the place, the bason should be dug out and formed; for if the clay is too long exposed to the sun and air, it will not be so fit for use, especially if it be laid in small parcels.

The best time of the year for making basons, is in autumn when the sun is declining, and the weather temperate; for in the spring of the year the east and north-east winds generally blow, which are drying; so that the clay walls, which are not very carefully covered as fast as they are made, very often crack in many places; and these small cracks often grow wider, and the Water will find a passage through them. The same inconveniency happens from the violent heat of the sun in summer; for when the clay dries fast, it will be very difficult (not to say impossible) to prevent its cracking, and these will let off the Water; and if the clay wall should not be well made at first, it will be very difficult to mend it after; besides the uncertainty there is in finding out the places through which the Water finds a passage, which is seldom done without strictly examining every part of the clay.

When the ground is dug out level, where the bason is designed, the clay must be brought in, and laid very carefully in the bottom, being very careful that no dirt or small stones be mixed with the clay; and there must be some Water thrown from time to time upon it, as it is closely trod by mens naked feet, and then it must be rammed very close: in the performing of this, there must be great care taken that every part of the clay is equally kneaded and rammed, without which there will be great danger of the Wa-

ter

ter making its way through those parts of the clay which are not well wrought. After the bottom is finished with clay, there should be a stratum of coarse gravel laid over it about four or five inches thick, which will greatly secure the clay wall, and render the Water clear; but where the basons are large, so that the clay walls are long in making, the clay should be covered with moist litter to prevent its drying, which may be taken off when the whole is finished, to lay on the gravel; but if part of the side walls are finished before this is done, it will be the better, because there may be some Water let into the bason as soon as the gravel is laid, which will prevent the clay from cracking; then the walls round the side of the bason must be carried up with the same care as hath been directed for the bottom, observing also to cover the clay first with litter while the work is carrying on, and afterward lay it with coarse gravel; and as the walls are finished round, the Water may be let in, to secure the clay from drying and cracking.

When the whole is finished, the upper part of the walls must be laid with turf, which will secure them from being broken, and prevent the sun from penetrating the clay; but before this is done, there must be a stratum of sand laid upon the clay, four or five inches thick, and upon this a thin stratum of good earth laid, for the Grass to take root in. The bed of sand will prevent the Grass from rooting into the clay, and this will also keep out the frost, which will penetrate the clay, where there is not a covering of sand to secure it, and by being frozen and swelled, and afterward drying, the clay is very apt to crack in many places. The turf on the side of the bason should be laid as far down as the Water is apt to shrink, that no part of the clay may be wholly exposed to the weather, for the reasons before given.

Where these basons are made, there should be no trees growing near, for the roots of trees or shrubs will extend themselves to the clay walls, and by penetrating them will occasion fissures, through which the Water will find an easy passage; and where tall trees are growing near basons or ponds, the shaking of the trees with violent winds is apt to loosen the clay walls, and occasion cracks in them, therefore these cautions are necessary to be observed.

In some countries, where clay cannot be easily procured, the walls of these basons are frequently made of chalk, which is beaten into fine powder, and made into a sort of mortar, and with this the walls are made, by ramming and working it very hard and firm. These basons hold Water very well where they can be well supplied with it, so as not to be too long dry, for when it so happens, the sun and wind dry the chalk, and cause it to crack, and these cracks commonly extend through the thickness of the walls, so as to let off the Water.

There are others who build their walls with brick laid in terrass, which is a good method for such places where the ground is very loose and sandy, because the walls, when well built, will support the loose earth from falling or settling away from the sides; but where terrass is used, the walls should not be long dry and exposed, for the heat is apt to crack the terrass.

Some persons make a cement of powdered tile and lime, two thirds of the former to one third of the latter, being very careful in the mixing of it not to add too much Water, but to labour it well in the beating, which is a principal thing to be observed. With this cement they cover the surface of the walls of basons, about two inches thick, laying the plaister very smooth, and being very careful that no sticks, straws, or stones are mixed with it; this plaistering is commonly performed in dry weather, and as soon as it is finished, it is rubbed over with oil or bullock's blood, and the Water let into the bason as soon as possible. This cement has the property of hardening under Water, so as to be equal to stone, and will continue as long sound.

Whatever the materials are with which the walls are made, there must be great care taken, that they are built so strong, as that they may resist the weight of the Water; so that where the ground about the bason is not very solid, the walls should be thicker, and supported on the backside by buttresses of the same materials, placed at proper distances; or if the walls are made of clay, there should be planks supported by strong timbers placed at proper distances to support the clay, otherwise there will be great danger of their being broken down, especially where the basons are large, so as that the winds have room to act upon the surface of the Water, and drive it in large waves against the banks, the sides of which should have a very easy slope.

The directions here given are only for basons or reservoirs of Water for use, so must not be supposed for large pieces of Water for beauty; for where the ground is of a loose sandy nature, so as not to hold Water, the expence of claying the bottom and sides will be too great, if the Water is of a large extent, therefore it would be imprudent to attempt it in such places; but where there is a supply of Water, and the ground is well adapted to hold it, there can be no greater beauty than that which Water affords to a seat, provided it is properly disposed; therefore I shall give some general hints, by which persons may be directed in the forming of large pieces of Water, so as to render them beautiful.

In those places where there is a command of running Water, it will be a great additional beauty, because the Water will always be much clearer, so more beautiful than still Water; besides, if it moves with any degree of velocity, there may be one or more falls of Water contrived, which will still add to the beauty. In the conducting of this Water, the level of the ground must be carefully taken, for the great skill in the contriving of rivers, or other pieces of Water, is in the saving of expence in the digging; therefore where the ground is naturally low, the Water should be conducted through these low parts, and never endeavour to carry it through higher ground, for in such places the banks will be so high, as to shut out the sight of the Water, to persons who stand at a little distance from it on either side, unless the Water is very broad; and where it is so, the eye is thrown to a considerable distance over the surface of the Water, by the steepness of the banks, therefore the slopes on the side of Water should always be made as easy as possible; nor should they be made flat, with sharp edges on the top (as is too generally practised;) for these stiff regular slopes are not near so pleasing, as those which are made gently convex, for the eye will slide over these to the Water, having no ridge to cut the sight, and at a small distance there will be no appearance of a cut, as will always be seen where the upper part of the slope is finished in a sharp angle; and the great skill is to contrive, that as much of the surface of the Water may appear to the sight as possible.

In most of the old gardens, where there are pieces of Water, there is nothing more common than to see them brought into regular figures, such as long strait canals or basons, either round or polygonal, so that all the boundaries of the Water are seen at one view; but these, however large may be their extent, are not near so pleasing as where the Water is so conducted, as that the termination may be seen as little as posible; for when the Water is lost from the sight, by some gentle easy turns, the imagination may be led to suppose the surface of the Water extended to a considerable distance; so that sometimes small pieces of Water are so artfully contrived, as to make them appear very considerable.

As in the old stile of laying out gardens, the Water was generally wrought into regular strait canals, which corresponded with the strait walks, hedges, and regular lines of trees, which were then chiefly studied; so, as the taste altered from this stiff method of disposing gardens, to that which approached nearer to nature in the forming of rivers, or other large pieces of Water, those who have succeeded best have always had

had great regard to the natural ſituation of the ground, ſo as to lead the Water through the natural hollows of the ground, whereby the great expence of digging is ſaved; and by contriving to make the head in ſome narrow part of the ground, it may be done at a much leſs expence, and will be better ſecured, than where the head is of great extent; therefore it is better either to ſhorten the extent of the Water, or to carry it farther, according to the natural ſituation of the ground, than to terminate it where it may occaſion great expence; and it is always obſerved, that where there is the greateſt expence in the making of theſe large heads, the whole will appear leſs beautiful than where nature is chiefly conſulted; for nothing can be more unſightly, than thoſe extenſive heads which are ſometimes made to pieces of Water, which riſe ſix or eight feet, and ſometimes much more, above the ſurface of the ground, whereby the Water is hid from the ſight, to thoſe perſons who are ſituated on that ſide of the head, and a large bank of earth ſhuts up the view; and ſometimes theſe heads are ſo ſituated, as to appear in ſight of the houſe, or from a principal part of the gardens, which is a very great abſurdity.

Since the taſte has been altered in the diſpoſition of gardens, and that a more natural method has been purſued by perſons of judgment, there have been great improvements made in the diſtribution of Waters, ſo as to render it truly ornamental to the ſeats where they are placed; but there are ſome, who, by pretending to imitate or copy from theſe works, have erred as much in making ſo many ſhort unnatural turns in their Water, as thoſe before-mentioned have done by their regular ſtrait ſides; for in what is uſually termed ſerpentine rivers, nothing is more common than to ſee a ſmall ſurface of Water twiſted in ſo many ſhort turns, as that many of them appear at one view; and theſe windings are often made like parts of circles, with ſuch an air of ſtiffneſs, as to render them equally diſagreeable with any the moſt ſtudied figures, to perſons of good taſte. Another thing is alſo common to theſe unnatural pieces of Water, which is, their being made of the ſame width in every part, which ſhould always be avoided; for nothing is more beautiful, than to ſee the Water extend to a large ſurface in ſome places, and to have it in others more contracted; and this may be generally done at a much leſs expence than the other, where the natural ſite of the ground is well conſidered, which ſhould be done with the utmoſt care, before any work of this ſort is begun, for want of which many perſons have repented after having been at great expence.

There is alſo another material thing to be obſerved, in the ſituation of large pieces of Water, which is, never to extend them ſo near to the houſe, as that they may annoy it, by the damp, which the vapours exhaling from the Water may occaſion, eſpecially when expoſed to the wind, which will drive the vapours toward the houſe, and thereby render the habitation unhealthy, and deſtroy the furniture; therefore it is much better to walk out to ſee the Water, than to ſacrifice the habitation for the pleaſure of ſeeing the Water from the houſe: nor ſhould the Water be ſo ſituated, as that the ſurface may be level with the floor of the houſe, for there is generally ſome moiſture, which will percolate through the veins of the earth, enough to occaſion ſo much damp, as to render the lower part of the houſe unwholeſome; and where there is a conſiderable damp in the foundation of a houſe, part of it will aſcend upward, and render the apartments ſo, therefore great care ſhould be had as to this.

Where perſons are not ſo happily ſituated as to have the command of a conſtant running Water, but yet from ſome neighbouring reſervoirs or ponds can be ſupplied with it, there may be ſome agreeable pieces of Water contrived, both for uſe and beauty, eſpecially where there is a large ſupply; for otherwiſe it will be better to contract the deſign; for nothing can be more ridiculous than that of having either ponds or rivers deſigned, where they cannot be ſupplied with Water in the dry ſeaſons, when there is the greateſt want of it, both for uſe and pleaſure.

In thoſe places where there is a great ſcarcity of Water, there ſhould be large reſervoirs contrived, into which the Water which deſcends from the hills and riſing grounds may be led; ſo that a large body of Water may be collected during the rainy ſeaſon, for a ſupply in time of drought; theſe reſervoirs, when large, may contain as much Water as may be neceſſary for the uſe of the houſe and gardens; but theſe can rarely ſupply Water enough for beauty, therefore in ſuch ſituations it ſhould not be attempted.

As Water never appears ſo well as when it is ſituated near woods, ſo in the contrivance of rivers, or pieces of Water, they ſhould be ſo placed as to have planting near, that the contraſt between the wood and Water may appear as perfect as poſſible; and in ſome places where the Water can be ſeen through the open groves, between the ſtems of large trees, it will add greatly to the beauty of the place; but where the Water is deſigned to terminate, the head ſhould be as much concealed as poſſible, by cloſe plantations of evergreen trees, which may be faced with Alders and Weeping Willows, planted cloſe on the ſides of the Water, ſo as that their branches may hang over; and if the Water is contracted, and led through theſe trees with a gentle winding, it may ſeem to run much farther, and to communicate with a larger body of Water at a diſtance; in the contriving of which, the greateſt art is to make it appear as natural as poſſible; for the leſs art there appears in theſe things, the longer they will pleaſe, and the more they will be eſteemed by perſons of good judgment.

## WATSONIA.

The title of this genus is given to it in honour of my learned friend Dr. William Watſon, F. R. S. whoſe knowledge in the ſcience of botany juſtly demands this tribute.

The Characters are,

*The flower hath a permanent ſpatha (or ſheath) which divides into two parts almoſt to the bottom; it is of one petal. The tube is long, a little curved, and ſwells at the upper part; the rim is cut into ſix obtuſe ſegments which ſpread open. It has three long ſlender ſtamina which are terminated by proſtrate oblong ſummits, and a roundiſh three-cornered germen, ſupporting a ſlender ſtyle a little longer than the ſtamina, crowned by three bifid ſtigmas. The germen afterward turns to a roundiſh three-cornered capſule having three cells, opening with three valves, each containing three or four roundiſh ſeeds.*

This genus belongs to the firſt ſection of Linnæus's third claſs, the flower having three male and one female part. It differs from the Gladiolus, in having a tubulous flower of one petal, and from Crinum, in having but three ſtamina.

This has been titled by Dr. Trew, Meriana flore rubello, before he had been acquainted with the name which I had applied to it; but he has ſince informed me by a letter, that as I had raiſed the plant from ſeeds, he would ſuppreſs his title, and adopt mine, who he thought had the moſt right to give it; and that he rather chuſes to do ſo, becauſe the figure he has publiſhed of it was drawn from the plant in the Chelſea Garden.

The Species are,

1. Watsonia (*Meriana*) floribus infundibuliformibus, ſubæqualibus. *Watſonia with funnel-ſhaped flowers whoſe petals are equal.* Meriana flore rubello. Trew. tab. 40. *Meriana with red flowers.*
2. Watsonia (*Humilis*) foliis gladiolatis, floribus majoribus. *Dwarf Watſonia, with ſword-ſhaped leaves and large flowers.*

Theſe plants are natives in the country about the Cape of Good Hope. The root of the firſt ſort is bulbous, compreſſed, and ſhaped like a kidney, and is covered with a fibrous brown ſkin. The leaves are ſword-ſhaped,

ſhaped, about a foot long, and an inch broad, ending in points; the two ſides have ſharp edges, but the middle is thicker, and has a prominent midrib; they are of a dark green colour, and riſe immediately from the root. The ſtalk comes out from the root between the leaves, and riſes a foot and a half high toward the upper part. The flowers are produced from the ſide, ſtanding alternately at about an inch and a half diſtance from each other; they have each a ſpatha or ſheath, compoſed of two leaves which are joined at their baſe, where they are broad, but gradually leſſen to their points. Before the flowers appear, they are of the ſame green colour with the ſtalk, and are divided but a ſmall part of their length, incloſing the flower, but afterward they are ſplit almoſt to the bottom, and wither before the flowers decay, becoming dry, and wrap round the ſeed-veſſel. The tube of the flower is an inch and a half long, narrow at the baſe, and a little curved, ſwelling much larger the upper half. The rim is divided into ſix obtuſe ſegments which ſpread open, and are nearly equal; the flower is of a copper red colour on the outſide, but of a deeper red within; it has three ſtamina a little longer than the petal, which are incurved, and are terminated by oblong ſummits of a dark brown colour, which are faſtened in the middle to the apex of the ſtamina, lying proſtrate. At the bottom of the tube of the petal is ſituated an oval three-cornered germen, ſupporting a ſlender ſtyle a little longer than the ſtamina, crowned by three bifid reflexed ſtigmas. The flowers generally appear in April or May, and the ſeeds ripen in July.

The ſeeds of this, and alſo ſome of the ſorts of Ixia, were ſent me by my friend Dr. Job Baſter, F. R. S. of Zirkzee, which ſucceeded in the Chelſea Garden, where many of them have ſince produced their beautiful flowers.

The ſecond ſort is of a humbler growth than the firſt; the leaves of this are rarely more than ſix inches long, but are full as broad as thoſe of the other ſort, and of a lighter green colour; the flower-ſtalk riſes between the leaves, about nine inches high, ſupporting four or five flowers ſitting cloſe thereto. The flowers are larger, but of the ſame colour with thoſe of the other ſort, and is later in flowering.

Theſe plants are propagated by offsets from the root, in the ſame manner as the Crocus or Gladiolus, which are produced in pretty great plenty; the time for tranſplanting of the roots is in Auguſt, ſoon after the ſtalks decay; the larger roots muſt be each put into a ſeparate pot filled with light freſh earth, and may be placed in the open air till toward the end of September, when the leaves will begin to appear above ground, at which time it will be proper to remove them into ſhelter; for as this plant is a native of a warm country, it will require ſome ſhelter from the froſt, at leaſt hitherto it has been ſo managed; for until the roots are become more common, it would be imprudent to venture them abroad in winter; tho' they may probably be hardy enough to reſiſt the cold of our ordinary winters, when planted in a warm border and a dry ſoil, at leaſt with a little ſhelter in hard froſts; for thoſe plants which have been placed in an open airy glaſs-caſe, have ſucceeded better than thoſe which have been in the ſtove; and the flowers have been much ſtronger, and of longer duration, though thoſe in the ſtove have flowered a month earlier; but theſe have been ſo much drawn, as not to produce ſeeds; whereas thoſe which have been treated pretty hardily, and had plenty of air, have ſeldom failed.

The beſt way of treating theſe roots, is to plunge the pots into an old bed of tanners bark, which has loſt its heat ſome time in October; this bed ſhould be covered with a frame, the glaſſes of which ſhould be drawn off every day in mild weather, that they may enjoy as much free air as poſſible, to prevent their drawing up weak; but they muſt be covered in bad weather, and ſcreened from froſt. The latter end of March, when they begin to put out their flower-ſtalks, the pots ſhould be removed to an airy glaſs-caſe, where they may ſtand to flower, and when the flowers are decayed, they ſhould be placed in the open air to perfect their ſeeds.

The offsets and ſmall roots may be planted three or four in a pot, according to their ſize, and ſhould have the ſame treatment as the larger roots the firſt year, and by that time twelvemonth they will be ſtrong enough to flower, ſo ſhould have ſeparate pots.

WEATHER is the ſtate or diſpoſition of the atmoſphere, with regard to moiſture or drought, heat or cold, wind or calm, rain, hail, froſt, ſnow, fog, &c.

As it is in the atmoſphere that all plants and animals live and breathe; and as that appears to b the great principle of moſt animal and vegetable productions, alterations, &c. there does not ſeem any thing in all philoſophy of more immediate concernment to us, than the ſtate of the Weather.

In effect, all living things are only aſſemblages or bundles of veſſels, whoſe juices are kept in motion by the preſſure of the atmoſphere, and which, by that motion, maintain life; ſo that any alterations in the ſtate of the rarity or denſity, the heat, purity, &c. of the atmoſphere, muſt neceſſarily be attended with proportional ones with theſe. Almoſt every body knows what vaſt, yet regular alterations, a little change of Weather makes in a tube filled with mercury, or ſpirit of wine, by barometers, thermometers, hygroſcopes, &c. and we ſhould not fail to feel as great and as regular alterations in the tubes, chords, and fibres of our own bodies, were it not partly for our inattention, and partly for our unequal and intermediate courſe of living.

The knowledge of the Weather is of great ſervice in gardening and agriculture; but the imaginary prognoſtications of almanack writers have been found to be a mere deluſive cant or jargon. There is nothing more wanting than a juſt theory of the Weather on mechanical principles.

Were regiſters carefully kept in divers parts of the globe for a good ſeries of years, we might by them be enabled to determine the directions, breadth, and bounds of the winds, and of the Weather they bring with them; the correſpondence between the Weather in divers places, and dependence between one ſort and another at the ſame place, and thence we might in time learn to foretel divers great emergencies; as extraordinary heats, rains, froſts, droughts, dearths, &c. But in order to this, a complete hiſtory of the Weather will be required.

Indeed there have been ſome eſſays made this way by the members of our Royal Society, the French Academy of Sciences, and divers other perſons of note; but the dryneſs of the ſubject has put a ſtop to their progreſs in that matter.

As for inſtance: Eraſ. Bartholinus has obſervations of the Weather every day throughout the year 1671; and Mr. Werle made the like at Oxford for ſeven years, from the year 1337, to 1343. Dr. Plot did the ſame at the ſame place for the year 1684. Mr. Hiller at Cape Corſe, for the years 1686, and 1687, and Mr. Hunt, &c. at Greſham College, for the years 1695, 1696. Dr. Derham at Upminſter in Eſſex, for the years 1691, 1692, 1697, 1698, 1699, 1703, 1704, 1705. Mr. Townly in Lancaſhire, for the years 1697, 1698. Mr. Cunningham at Emen in China, for the years 1698, 1699, 1700, 1701. Mr. Locke at Oats in Eſſex, 1692. Dr. Scheuchzer at Zurich, 1708; and Mr. Tilly at Piſa, the ſame year.

The moſt certain ſigns and prognoſtics of good and bad Weather may be collected from thoſe things that are nearer to us than the orbs of the planets; nor need we go any farther than this our ſublunary world, for the moſt probable conjectures in relation to the Weather; and may deduce our prognoſtications in relation thereto, from animals and vegetables, &c.

It is certain, that a great part of the brute creation have a ſenſibility and ſagacity this way beyond mankind;

kind; and that without any means or disposition thereto, more than we, except that their vessels, fibres, &c. being in other respects in one equable habitude, the same, or a proportionable cause from without, has always a like or proportionable effect on them; that is, their vessels are regular barometers, &c. affected only from one external principle, viz. the disposition of the atmosphere; whereas ours are acted on by divers from within, as well as without; some of which check, impede, and prevent the action of others.

Animals that live in the open air must necessarily be supposed to have a quicker sense of it than men that live within doors; and especially the airy inhabitants, the birds, which live in the freest and clearest air, and are more apt, by their flight, and other motions, as well as their voices, to discover their sensations of it.

Therefore those who have applied themselves to the observations of the signs and prognostics of good or bad Weather, have laid down these following rules:

*Signs or prognostications of rainy Weather.*

The Lord Bacon says, that water fowls, such as sea-guls, moor-hens, &c. when they flock and fly together from the sea towards the shore, foretel rain and wind.

And, on the other hand, when land birds, such as crows, swallows, &c. fly from land to the waters, and beat the waters with their wings, it betokens rain and wind.

The natural reason of that seems to be, the pleasure that both land and water fowl take in the moistness and density of the air, and their love to be in motion, and upon the wing.

It is no strange thing that water fowls delight in that air which is most like water, their natural element; and that land fowl also, many of them, delight in bathing, and moist air.

And also, for the same reason, many birds prune their feathers; geese gaggle, and the crows call for rain; all which seems to be but the pleasure they take in the relaxation of the air.

When crows flock together in large flights, and hold their heads upward as they fly, and cry louder than they usually do, it is a sign of rain; and when they walk stalking by rivers and ponds, it is the same.

When swallows chatter, and fly low about lakes and ponds (which they do, in order to catch flies; for the air, being clogged with vapours, hinders the flies from ascending) it bespeaks rain.

When peacocks cry much, when birds that usually perch upon trees fly to their nests, when fowls pick up their feathers with their bills, when cocks crow before their usual hour, and hens creep in clusters into the dust, they are signs of rainy Weather.

Not only birds, but beasts, give notice of rain; as when sheep leap mightily, and push at one another with their heads, it denotes rain.

When asses bray, or shake their ears, or are annoyed with flies; when deers fight, when foxes and wolves howl mightily, when hogs at play break or scatter their food, and oxen that are tied together, raise their heads and lick their snouts, it is a sign of rain.

When cattle leave off feeding, and make haste to shelter under bushes and hedges, &c. when cats rub their heads with their fore paws (especially that part of their heads which is above their ears) and lick their bodies with their tongues, it is a sign of rain.

Beasts generally delight in a moist air, and it causes them to eat their meat the better; cattle, deer, and rabbets, will feed heartily before rain. Heifers will put up their noses, and snuff in the air against rain. Sheep will rise early in a morning to feed against rain.

Also fishes, either sea or river fish, do often, by their playing towards the top of the waters, foretel rain. For this the Lord Bacon gives this reason, That when the Weather is dry, the fish love to keep as much as they can from the air, and swim lower, and will not come near the air till it is moist.

Insects and reptiles also give prognostics of rain.

Ants quit their labour, and hide themselves in the ground against rain; for these provident insects, by a secret instinct in nature, carry their eggs and food to a place of drier security, when they find the air changed into moistness, and clogged with vapours.

Bees, when rain is coming on, do not stir from their hives, or at least not far.

Moles will cast up more earth; and earth-worms will creep out of the ground against rain.

Even the bodies of men and women give tokens of rain or frost, by aches, corns, and wounds, which will be more troublesome against such seasons; for rain makes the humours of the body to abound more, and frost makes them sharper.

Mr. Ozanam says, That the very body of all animals and vegetables is, as it were, a contexture of barometers, hygrometers, and thermometers; for the humours, with which organized bodies are replenished, increase or decrease, according to the different dispositions of the air.

*Prognostics of the Weather from vegetables.*

Mr. Pointer tells us, he has observed, that many, if not most vegetables, expand their flowers and down in sun-shiny Weather, and towards the evening, and against rain, close them again, especially at the beginning of their flowering, when their leaves are young and tender.

This is evident in the down of Dandelion and other downs, and evidently in the flowers of Pimpernel, the opening and shutting of which, he says, are the countryman's Weatherwiser.

And Mr. Gerard says, If the flowers be close shut, it betokens rain and foul Weather; but if they be spread abroad, fair Weather.

The Lord Bacon says, Trefoil swells in the stalk against rain, and so stands more upright; for by wet, stalks do erect, and leaves bow down; and Pliny says much to the same purpose.

The former says likewise, that there is in the stubble fields a small red flower, which country people call the Wincopipe (which is the Pimpernel); which, if it opens in the morning, you may be sure of a fair day to follow.

Mr. Ozanam gives, as a natural reason for this, that plants are a sort of natural hygrometers, which are composed of an infinite number of fibres, trachæ, or air-vessels, which are like so many canals or pipes, through which the moisture of the air, as well as the juice of the earth, is conveyed to all its parts.

These trachæ, or air-vessels are visible, and appear very pretty in the leaf of the Scabious, or the Vine; if you pull asunder some of its principal ribs, you may see between them the spiral air-vessels (like threads or cobwebs) a little uncoiled.

In warm dry weather, if the leaves of Cabbages, Cauliflowers, and other broad-leaved plants, are very lax, and hang down more than usual, it is a sure sign of rain in a short time.

There are many kinds of vegetables, whose surface of their leaves are altered in their position before rain, particularly most of those of the pulse kind, as Vetches, Beans, Saintfoin, Clover, &c. the leaves of these close, some of them turning their upper surface outward, and others their inner, and this they constantly do toward the evening at all times, for as the rays of the sun become oblique, so the vapours begin to rise from the ground; therefore those surfaces of the leaves which imbibe the greatest quantity of moisture, are turned outward to receive it. This change of the position of the leaves of plants in the evening has been idly called the sleep of plants, but those who will be at the trouble of consulting Mr. Bonnet's book on the use of the leaves of plants, will soon be convinced this alteration in the position of leaves is designed for a nobler purpose.

*Signs of rainy Weather by solid bodies.*

The hardest and most solid wood will swell by the moisture of the air; this is evident by the difficulty of shutting doors and windows in wet weather; and boxes, especially of deal, and pegs of wood, when they draw and wind hard, are signs of wet Weather; and this is caused by the admission of air through the pores of the wood.

Mr. Ozanam says, The moist vapours do readily insinuate into wood, especially that which is light and dry, it being extremely porous; so that they are sometimes made use of in dilating and breaking the hardest bodies, and in particular mill-stones; for when they have cut a rock into a cylinder, they divide that into several lesser cylinders, by making several holes round the great cylinder, at proportional distances, according to the thickness they design the mill-stones, and then fill them with as many pieces of Sallow wood dried in an oven; for when the wet Weather comes, these wedges or pieces of wood become so impregnated with the moist corpuscles of the air, that they swell and break, or separate the cylindrical rock into several stones.

And stones, especially marble, will sweat against wet Weather, though it be from an outward cause, in that the stones are so hard and solid, as not to admit the moisture of the air, and therefore it only lies upon the superficies of the stones.

And the humidity of the air insinuates itself into the hardest bodies, which are not destitute of pores, and especially into light bodies that take up a great space.

*Signs of rainy Weather from the planets.*

By the sun. If the sun, at its rising, looks red, and broader than usual, then many moist vapours are gathering from the sea, and the air is thickening; and the beams of the sun, being diffused in it, cause the sun's face to shew a great deal bigger than usual; and in a short time you will perceive the clouds mustering, and overspreading the heavens, and the air condensing into a watery body.

If this happens in summer or autumn, when the Weather is hot, the showers that fall will be violent, but of short continuance; but if this happens in the winter or spring, it denotes settled rains, but more moderate.

It has been an observation, confirmed by long experience, That if the sun rises with a bluish circle, inclining to white, the air is gross and condensed, and rain will soon fall.

And if, when the sun rises, he is pale, and the sky is of a dusky red in the morning, it will be soon overcast, and there must quickly follow rain, attended with whisking winds.

Also if the sun rises of a misty muddy colour, or in a black cloud, and diffuses his rays palish toward the north and south, it foretels rain.

It has been an observation, That if the sun sets under a thick cloud, rain will fall the next day; or if it rains immediately, there will be a great deal of wind the next day; and this is almost the constant consequence of a pale setting sun.

Though a red sky at the sun rising is a sign of rain, yet a red sky when the sun sets is a sign of fair Weather; though indeed, if the sky be red at a great distance from the part where the sun sets, as in the east, there will be either rain or wind the next day.

As to the moon. A pale moon is a forerunner of rain, a red one of wind, and a clear one of fine Weather.

When the moon is encompassed with a very large circle, or is dim and misty, then there will follow wind, rain, or snow, very quickly, probably within twenty-four hours.

If the horns of the moon, at her first rising, or within two or three days after her change, are blunt, it betokens rainy Weather from that quarter.

An iris round the moon is also a sign of rain, with a south wind.

Two or three discontinued and speckled circles or rings round the moon, bespeak a storm.

*Signs of rainy Weather from the clouds.*

If in an evening there appear many small clouds from the west, it shews that rain is gathering, and will soon fall.

When cloulds appear like rocks or towers, they signify great showers.

Mr. Ozanam says, That when we see little, black, loose clouds, wandering too and fro, lower than the rest, we apprehend a future storm; and when at the rising of the sun, several clouds are seen to gather in the west, and, on the other hand, if these clouds disperse, it bespeaks fair Weather.

When the sun through the clouds appears double or triple, it shews a storm of long duration.

*Signs of rain from the rainbow.*

If the rainbow appears very big, it denotes much wet; but if very red, wind withal.

If a rainbow appears after a long drought, it signifies rain; but if it appears after a long time of wet, it betokens fair Weather.

If a rainbow appears in the morning, it betokens small rain, and fair Weather presently after.

If a rainbow vanishes altogether, fair Weather will follow, winds will arise, and bring great showers from the part that the rainbow first begins to break or vanish.

If the rainbow be broken in many parts, tempestuous winds are gathering in the air.

If, after a rainbow appears, the colours grow darker and darker, rain is gathering; if lighter, and the colours fairer, fair Weather.

Mr. Ozanam says, a rainbow in the east, especially if it be of a bright lively colour, is a sign of great rain.

A rainbow in the east, in an evening, presages fair weather; but if the colour is lively and red, it presages wind.

A rainbow in the west foretels an indifferent quantity of rain and thunder.

If two rainbows appear together, it foretels fair Weather for the present, but rain two or three days after.

*Prognostications of the Weather from mists.*

If mists arise out of ponds and rivers to the top of hills, it betokens that there will be rain soon, either the same day, or commonly within two or three days; but if, when they arise out of such places, they vanish away, it is a sign of fair Weather.

If there be a general mist, both on the hills and vales, before the sun rising near the full moon, it denotes fair Weather.

Mr. Ozanam says, If you observe a white vapour arising upon waters, or marshes, or meads, after sunset, or before sun-rising, it will be fair warm Weather the next day.

*Signs of fair Weather.*

When the sun is fair and bright at its rising in a morning, and is blushing, without spots or black clouds near him when he sets at night, it is a sign of fair Weather.

When the moon is three or four days old, and has her horns sharp, and pointed very bright, it is a sign of fair Weather till she comes to the full, if not the whole month.

If the moon has a bright shining circle about her when she is at the full, it promises fair Weather for many days.

When the stars shine out clear and bright, and seem to dart out pointed rays, it is a sign of fair Weather.

Also

Also when little clouds sink low, as into valleys at south-east, or south-west, it is a sign of fair Weather.
If the the tops of hills be clear, it is a sign of fair Weather.
If there are to the north-west white scattering clouds, like fleeces of wool, it is a sign of fair Weather.
When white clouds or mists hang just over rivers, and disperse no farther, it is a sign of fair Weather.
When a rainbow appears after a shower, and the blue or yellow part of it be very bright, and the highest colour, they are tokens of fair Weather.
When bees fly far from their hives, and come home late, it is a sign of fair Weather.
When there are great swarms of gnats, it presages fair Weather.
Glow-worms shining by night, are a sign of fair Weather.
When kites fly aloft, it bespeaks fair dry Weather. The Lord Bacon gives this reason for it; because the kite mounts most into the air of that temper wherein he delights; for this aspiring bird does not so much affect the grossness of the air, as the cold and freshness of it; for being a bird of prey, and therefore hot, he delights in the fresh air.
When swallows fly high, it is a sign of fair Weather.
When owls whoot much, it is a sign of fair Weather; and though owls do always whoot much, both in wet and dry Weather, yet there is this difference, that their whooting is more clamorous in wet Weather, but more easy and sedate in fair Weather.
When halycyons, coots, and other sea fowls, leave the shores, and flock to the sea, it is a sign of fair Weather.
When cattle feed eagerly, without looking about them, it is a sign of fair Weather.
When fish rise frequently, and flirt upon the Water, it is a sign of fair Weather.
Spiders webs in the air, or on the Grass and trees, foretel much fair Weather.

1. A thick dark sky, lasting for some time, without either sun or rain, always becomes first fair then foul, i. e. changes to a fair clear sky ere it turns to rain. Thus the Rev. Mr. Clarke, who kept a register of the Weather for thirty years, since put into Dr. Derham's hand, by his grandson, the learned Dr. Samuel Clarke. This he says he hardly ever knew to fail, at least when the wind was in any of the easterly points; but Dr. Derham has observed the rule to hold good, be the wind where it will.

The cause is obvious. The atmosphere is replete with vapours, which, though sufficient to reflect and intercept the sun's rays from us, yet want density to descend; and while the vapours continue in the same state, the Weather will do so too. Accordingly such Weather is generally attended with moderate warmth, and little or no wind to disturb the vapours, and a heavy atmosphere to sustain them, the barometer being commonly high. But when the cold approaches, and by condensing drives the vapours into clouds or drops, then way is made for the sun beams, till the same vapours being by farther condensation formed into rain, fall down in drops.

2. A change in the warmth of the weather is generally followed by a change of the wind. Thus the northerly and southerly winds, commonly esteemed the causes of cold or warm weather, are really the effects of the cold or warmth of the atmosphere, of which Dr. Derham assures us he had so many confirmations, that he makes no doubt of it.

Thus it is common to see a warm southerly wind changed to the north, by the fall of snow or hail; or to see the wind in a cold frosty morning north, when the sun has well warmed the earth and air, wheel toward the south, and again turn northerly or easterly in the cold evening.

*Prognostics of the Weather by the wind.*

The winds, says Mr. Pointer, are the causes of the most sudden and extraordinary alterations of the air. The nature of the winds is such, that, by the experience we have of them, we may very nearly predict what Weather we shall have for two or three days after. As for example: we know that in our climate a south wind generally brings rain, and a west wind more; and the west wind is the predominant wind with us, because the ocean lies on the west side of our country. And also that a north wind brings fair weather to us, as well as the east wind, which does not last so long as the north; therefore the north-east and south-west winds are those that are necessary chiefly to be treated of.

Some curious observers of the Weather have made this observation for many years; That there is as much south and west wind in eight years, as there are north and east winds, and of consequence as many wet years as dry ones.

Mr. Pointer gives the following rules to know when the wind will set in one of these two points, for the most part, for two or three months together.

First, as to the north-east wind: when the wind turns to the north-east point, and continues in it two days without rain, and does neither turn to the southward the third day, nor rain, then it is likely to continue eight or nine days without rain, and then to return into the south.

If the wind turn out of the south into the north-east again, and continue two days in that point, and neither rains nor turns to the south the third day, it is likely to continue north-east for two months, and for the most part for three months. The wind will finish these turns towards the north in three weeks time.

Secondly, as to the south-west winds: when the wind has been in the north for two months or more, and comes to the south, there are usually three or four fair days at first, and then on the fourth or fifth day comes rain, or else the wind turns north, and continues still dry. If within a day or two without rain, it return into the south, and with rain, turn northward, and return into into the south the first or second day, as before, two or three times together after this manner; then it is like to be in the south or south-west two or three months together, for the most part, as it was in the north before.

He does not mention the east or west winds, because he says, the rains come usually from the south, or, in the shifting of the wind from the south to the north; as for the drought, the wind is, for the most part, north-east.

If it prove fair weather out of the south for a week together, which is not usual, it is like to be a great drought, when it has rained a long time out of the south before.

The wind usually turns from the north to the south quietly without rain, but comes back again into the north with a strong wind and rain.

The greatest winds, which blow down houses and trees, usually come by the turning of the wind out of the south by west into the north, which drives away rain, and clears the air.

*Of Prognostications of the Weather from the barometer.*

Dr. Derham presents us with the following remarks:

1. That foggy Weather makes the mercury rise in the barometer, as well as the north wind. The cause he suggests, probably enough, to be the accession of the load of vapour to the former weight of the atmosphere. Mizzling Weather he likewise observes to have the like effect.

2. The colds and heats in England and Switzerland begin and end nearly about the same time; nay, and any remarkable weather, especially if it continues any while, affects one place as well as the other.

3. That the remarkably cold days in June 1708, were found in Switzerland to precede ours commonly about five days or more; and that the remarkable heats in the following months begin to abate in both places about the same time, only somewhat sooner here than there.

4. That the winds in both places frequenly agree, yet they sometimes differ.

5. That the barometer is always lower at Zurich than at Upminster, by sometimes one and sometimes two English inches; but the common difference is about half an inch, which may be solved either by supposing Zurich situate one fourth of an inch higher above the level of the sea than Upminster; or else by supposing that part of the terraqueous globe, as lying near the line, to be higher and more distant from the center than ours is, which lies nearer the pole.

6. That the barometer generally rises and falls together at far distant places, though this agreement of the barometer is not so constant between Zurich and Upminster, and places near home, viz. at London and Paris, where again the agreement of the barometer is not so great, as between Upminster and Lancashire.

7. That the variations of the barometer are greatest, as the places are nearest the poles. Thus, e. g. the mercury at London has a greater range by two or three lines than at Paris, and at Paris a greater than at Zurich; in some places near the equinoctial, there is scarce any variation at all.

8. That the rain in Switzerland and Italy is much greater in quantity throughout the year than that in Essex; yet the rains are more frequent, i. e. there are more rainy days in Essex, than at either of those places.

The proportion of the annual rains that fall in the several places we have any good observations of, stand thus: at Zurich the depth of the annual rain, at a medium, is about $32\frac{1}{4}$ inches; at Pisa $43\frac{1}{4}$; at Paris 23; at Lisle in Flanders $23\frac{1}{4}$; at Townly in Lancashire $42\frac{1}{2}$; at Upminster $19\frac{1}{4}$.

9. That cold contributes greatly to rain, and that apparently, by condensing the suspended vapours, and making them descend. Thus very cold months or seasons are generally followed immediately by very rainy ones, and cold summers are always wet.

10. That high ridges of mountains, as the Alps, and the snows they are covered withal, not only affect the neighbouring places by the colds, rain, vapours, &c. they produce, but even distant countries, as England, often partake of their effects.—Thus the extraordinary colds, December 1708, and the relaxations thereof were felt in Italy and Switzerland several days before they reached us. This Dr. Derham thinks is an indication that they were driven from them to us.

WILDERNESSES, if rightly situated, artfully contrived, and judiciously planted, are very great ornaments to a fine garden; but it is rare to see these so well executed in gardens as could be wished, nor are they often judiciously situated; for they are frequently so situated as to hinder a distant prospect, or else are not judiciously planted; the latter of which is scarce ever to be found in any of our most magnificent gardens, very few of their designers ever studying the natural growth of trees so as to place them in such manner, that they may not obstruct the sight from the several parts of the plantation which are presented to the view; I shall therefore briefly set down what has occurred to me from time to time, when I have considered these parts of gardens, whereby a person will be capable to form an idea of the true beauties which ought always to be studied in the contrivance of Wildernesses.

1. Wildernesses should always be proportioned to the extent of the gardens in which they are made, that they may correspond in magnitude with the other parts of the garden; for it is very ridiculous to see a large Wilderness planted with tall trees in a small spot of ground; and on the other hand, nothing can be more absurd, than to see little paltry squares, or quarters of Wilderness work, in a magnificent large garden.

2. As to the situation of Wildernesses, they should never be placed too near the habitation, because the great quantity of moisture which is perspired from the trees will cause a damp unwholesome air about the house, which is often of ill consequence. Nor should they be situated so as to obstruct any distant prospect of the country, which should always be preserved wherever it can be obtained, there being nothing so agreeable to the mind as an unconfined prospect of the adjacent country; but where the sight is confined within the limits of the garden from its situation, then there is nothing so agreeable as to terminate the prospect, as a beautiful scene of the various kinds of trees judiciously planted; and if it is so contvried, that the termination is planted circularly, with the concave toward the sight, it will have a much better effect, than if it end in strait lines or angles, which are never so agreeable to the mind.

3. The trees should always be adapted to the size of the plantation, for it is very absurd to see tall trees planted in small squares of a little garden; and so likewise, if in large designs are planted nothing but small shrubs, it will have a mean appearance. It should also be observed, never to plant evergreens amongst deciduous trees, but always place the evergreens in a Wilderness, or a separate part of the Wilderness by themselves, and that chiefly in sight, because these afford a continual pleasure both in summer and winter, when in the latter season the deciduous trees do not appear so agreeable; therefore, if the borders of Wilderness quarters are skirted with evergreens, they will have a good effect.

4. The walks must also be proportioned to the size of the ground, and not make large walks in a small Wilderness (nor too many walks, though smaller) whereby the greatest part of the ground is employed in walks; nor should the grand walks of a large Wilderness be too small, both of which are equally faulty. These walks should not be entered immediately from those of the pleasure-garden, but rather be led into by a small private walk, which will render it more entertaining; or if the large walk be turned in form of a serpent, so as not to shew its whole extent, the mind will be better pleased, than if the whole were to open to the view.

The old formal method of contriving Wildernesses was to divide the whole compass of ground, either into squares, angles, circles, or other figures, making the walks correspondent to them, planting the sides of the walks with hedges of Lime, Elm, Hornbeam, &c. and the quarters within were planted with various kinds of trees promiscuously without order; but this can by no means be esteemed a judicious method, because first hereby there will be a great expence in keeping the hedges of a large Wilderness in good order by shearing them, which, instead of being beautiful, are rather the reverse; for as these parts of a garden should, in a great measure, be designed from nature, whatever has the stiff appearance of art, does by no means correspond therewith; besides, these hedges are generally trained up so high, as to obstruct the sight from the stems of the tall trees in the quarters, which ought never to be done.

In the next place the walks are commonly made to intersect each other in angles, which also shew too formal and trite for such plantations, and are by no means comparable to such walks as have the appearance of meanders or labyrinths, where the eye cannot discover more than twenty or thirty yards in length; and the more these walks are turned, the greater pleasure they will afford. These should now and then lead into an open circular piece of Grass, in the center of which may be placed either an obelisk, statue, or fountain; and if in the middle part of the Wilderness there be contrived a large opening, in the center of which may be erected a dome or banqueting-house surrounded with a green plat of Grass, it will be a considerable addition to the beauty of the place.

From the sides of the walks and openings, the trees should rise gradually one above another to the middle of the quarters, where should always be planted the largest growing trees, so that the heads of all the trees will appear to view, but their stems will be hid, which will have a vastly different effect from the common method, where the trees are planted large and small

without order; ſo that many times the largeſt are next the ſight, and ſmall ones behind them, juſt according as it happens, in which manner the ſmall ones, being overhung and ſhaded, ſeldom thrive well.

But in order to plant a Wilderneſs with judgment, the uſual growth of all the different ſorts of trees ſhould be well conſidered, that each may be placed according to the magnitude to which they generally arrive; otherwiſe, if they are at firſt planted one above another, as before directed, they will not continue to grow in this order many years; for ſome ſorts will greatly outgrow the others, and thereby render the plantation leſs beautiful; but when they are placed according to their uſual manner of growing, they will always continue nearly in the ſame order, which renders them very entertaining to the ſight.

Theſe trees ſhould alſo be allowed a proportionable diſtance, according to their growth, and not be crouded ſo cloſe as is commonly practiſed, whereby there are four times the number of trees planted which need be; and this cloſe planting cauſes them to aſpire to a great height, but then they want the noble diffuſion of branches, which is vaſtly more agreeable to the ſight, than a parcel of thin taper ſtems, with ſcarcely any heads, as is too often the caſe in ſome of the largeſt gardens in England, where, inſtead of looking at a noble parabola of trees, with their ſpreading globular heads, a parcel of naked ſtems preſent themſelves to view; and where the trees are thus crowded, they never thrive half ſo well, nor will they continue half ſo long, as thoſe which are allowed a proper diſtance; for their roots running and interfering with each other, draw the nouriſhment away faſter than the ground can ſupply them, which cauſes their leaves to be ſmall, and, in dry ſeaſons, to decay and fall off, long before their uſual time, and thereby renders the plantation leſs agreeable.

In the diſtribution of theſe plantations, in thoſe parts which are planted with deciduous trees, there may be planted next the walks and openings, Roſes, Honeyſuckles, Spiræa Frutex, and other kinds of low-flowering ſhrubs, which may be always kept very dwarf, and may be planted pretty cloſe together; and at the foot of them, near the ſides of the walks, may be planted Primroſes, Violets, Daffodils, and many other ſorts of wood flowers, not in a ſtrait line, but rather to appear accidental, as in a natural wood. Behind the firſt row of ſhrubs ſhould be planted Syringas, Cytiſuſes, Althæa frutex, Mezereons, and other flowering ſhrubs of a middle growth, which may be backed with Laburnums, Lilacs, Guelder Roſes, and other flowering ſhrubs of a large growth: theſe may be backed with many other ſorts of trees, riſing gradually to the middle of the quatters, from whence they ſhould always ſlope down every way to the walks.

By this diſtributon you will have the pleaſure of the flowering ſhrubs near the ſight, whereby you will be regaled with their ſcent as you paſs through the walks, which is ſeldom obſerved by thoſe who plant Wilderneſſes; for nothing is more common than to ſee Roſes, Honeyſuckles, and other ſmall flowering ſhrubs, placed in the middle of large quarters, under the dropping and ſhade of large trees, where they ſeldom thrive; and if they do, the pleaſure of them is loſt, becauſe they are ſecluded from the ſight. If theſe quarters are ſlightly dug every winter, it will keep the ground clean from noxious weeds, and be a great benefit to the trees. And the expence of doing this, where labour is cheap, cannot be very conſiderable, unleſs in very great plantations.

But, beſide theſe grand walks and openings, (which may be laid with turf, and kept well mowed) there ſhould be ſome ſmaller ſerpentine walks through the middle of the quarters, where perſons may retire for privacy. There need be nothing but the ground of the place made level, and kept hoed, to clear it from weeds, which will be no great trouble to do with a Dutch hoe, which is broad, and will make great riddance, and then rake them over to make them handſome. Theſe walks need not be very broad, but ſhould be turned in ſuch a manner, as not to deviate far from the middle of the quarter, becauſe there the trees being largeſt, will afford the ampleſt ſhade. Five or ſix feet will be a ſufficient width for theſe walks in large quarters, but in ſmall ones four feet is full enough. By the ſides of theſe private walks may alſo be ſcattered ſome wood-flowers and plants, which, if artfully planted, will have a very good effect.

In the general deſign for theſe Wilderneſſes it ſhould not be ſtudied to make the ſeveral parts correſpondent, for that is ſo formal and ſtiff, as to be now quite rejected. The greater diverſity there is in the diſtribution of theſe parts, the more pleaſure they will afford; and ſince, according to this method of deſigning and planting, the different parts never preſent themſelves to the ſame views, it is no matter how different they are varied aſunder; that part of them which is moſt in view from the houſe, or other parts of the garden, may be planted with evergreens, but the other parts may be planted with deciduous trees in the foregoing manner.

The part planted with evergreens may be diſpoſed in the following manner, viz. in the firſt line next the great walks may be placed Lauruſtinus, Boxes, Spurge Laurel, Juniper, Savin, and other dwarf evergreens; behind theſe may be planted Laurels, Hollies, Arbutuſes, and other evergreens of a larger growth; next to theſe may be placed Alaternuſes, Phyllireas, Yews, Cypreſſes, Virginian Cedars, and other trees of the ſame growth; behind theſe may be planted Norway and Silver Firs, the True Pine, and other ſorts of the like growth; and in the middle ſhould be planted Scotch Pines, Pinaſter, and other of the largeſt growing evergreens, which will afford a moſt delightful proſpect, if the different ſhades of their greens are curiouſly intermixed. And in order to render the variety greater, there may be ſeveral kinds of hardy evergreen trees and ſhrubs obtained from the north parts of America, as there are already many in England, which are very fit for this purpoſe, and are mentioned in different parts of this book.

This manner of ſeparating the evergreens from the deciduous trees, will not only make a much better appearance, but alſo cauſe them to thrive far beyond what they uſually do when intermixed; therefore I ſhould never adviſe any perſon to plant them promiſcuouſly together.

By what I have ſaid concerning the planting the trees one behind another, according to their different growths, I would not have it underſtood, that I mean the placing them in ſtrait lines, which is too ſtiff and formal for theſe plantations; all that is intended is, to place the front rows of trees on each ſide the walks, at an equal diſtance from the ſide of the walks, which being twiſted in eaſy natural turns, the ſhrubs having the curves will ſtand in the ſame direction, and muſt turn in the ſame manner as the walks. Thoſe behind may be placed after any manner, provided care be taken to allow each ſufficient room to grow, and that there may appear no uneven gaps in the diſtance of their heads, but that they may all riſe gradually, ſo as to form a handſome ſlope.

In ſmall gardens, where there is not room for theſe magnificent Wilderneſſes, there may be ſome riſing clumps of evergreens, ſo deſigned as to make the ground appear much larger than it is in reality; and if in theſe there are ſome ſerpentine walks well contrived, it will greatly improve the places, and deceive thoſe who are unacquainted with the ground as to its ſize. Theſe clumps or little quarters of evergreens ſhould be placed juſt beyond the plain opening of Graſs before the houſe, where the eye will be carried from the plain ſurface of Graſs to the regular ſlope of evergreens, to the great pleaſure of the beholder; but if there is a diſtant proſpect of the adjacent country, from the houſe, then this ſhould not be obſtructed, but rather be left open for the proſpect bounded on each ſide with theſe clumps, which may be extended to thoſe parts of the ground, where no view is obſtructed.

ſtructed. Theſe ſmall quarters ſhould not be ſurrounded with hedges, for the reaſons before given; nor ſhould they be cut into angles, or any other ſtudied figures, but be deſigned rather in a rural manner, which is always preferable to the other, for theſe kinds of plantations.

In Wilderneſſes there is but little trouble or expence after their firſt planting, which is an addition to their value; the only labour required is to mow and roll the large Graſs walks, and to keep the other ground walks free from weeds. And in the quarters, if the weeds are hoed down two or three times in a ſummer, it will ſtill add to their neatneſs. The trees ſhould alſo be pruned to cut out all dead wood, or irregular branches, where they croſs each other, and juſt to preſerve them within due bounds; and as was before obſerved, if the ground be ſlightly dug between the trees, it will greatly promote their vigour. This being the whole labour of a Wilderneſs, it is no wonder they are ſo generally eſteemed, eſpecially when we conſider the pleaſure they afford.

SWEET WILLIAM. See Dianthus.

WILLOW. See Salix.

WILLOW, the French. See Epilobium.

WIND is defined to be the ſtream or current of the air, together with ſuch vapours as the air carries along with it; or it is a ſenſible agitation of the air, whereby a large quantity thereof flows out of one place or region to another.

The ancients made but four Winds, according to the four cardinal points, but this was quickly looked upon as too groſs a diviſion. The following age added eight more to this number, which was thought too nice a ſubdividing, and therefore they reduced the laſt number to four, taking every other or middle Wind, and adding them to the old account; but our ſailors, who are far beyond the ancients for their ſkill in navigation, have divided the horizon into thirty-two equal parts, adding twenty-eight to the four cardinal Winds; a thing uſeful in navigation, but of no great concern in natural philoſophy, unleſs it be to give a hint, that the Wind blows from all parts of the heavens.

*As to the phyſical cauſe of the Winds;*

Some philoſophers, as Des Cartes, Rohault, &c. account for the general Wind from the diurnal rotation of the earth, and from this general Wind derive all the particular ones.

They ſay, the atmoſphere inveſting the earth, and moving round it, that part will perform its circuit ſooneſt, which has the ſmalleſt circle to deſcribe. The air therefore, near the equator, will require a ſomewhat longer time to perform its courſe in from weſt to eaſt than nearer the poles; that as the earth turns eaſtward, the particles of the air near the equinoctial being exceeding light, are left behind, ſo that in reſpect to the earth's ſurface, they move weſtward, and become a conſtant eaſterly Wind.

This opinion ſeems confirmed, for that theſe Winds are found only near the equinoctial, in thoſe parallels of latitude, where the diurnal motion is ſwifteſt, but the conſtant calms of the Atlantic ſea, near the equator, the weſterly Winds near the coaſt of Guiney, and the periodical weſterly Monſoons, under the equator of the Indian ſea, ſeemingly declare the inſufficiency of that hypotheſis.

Beſides, the air, being kept to the earth by the principle of gravity, would in time acquire the ſame degree of velocity, that the earth's ſurface moves with, as well in reſpect of the diurnal rotation, as of the annual about the ſun, which is about thirty minutes ſwifter.

It remains therefore to ſubſtitute ſome other cauſe, capable of producing a like conſtant effect; not liable to the ſame objections, but agreeable to the known properties of the elements of air and water, and the laws of the motion of fluid bodies; ſuch an one is the action of the ſun's beams upon the air and water, as he paſſes every day over the oceans, conſidered together with the nature of the ſoil and ſituation of the adjoining continents. This has been done by Dr. Halley.

Therefore, according to the laws of ſtatics, the air, which is leſs rarefied or expanded by heat, and conſequently more ponderous, muſt have a motion towards thoſe parts thereof which are more rarefied, and leſs ponderous, to bring it to an equilibrium. Alſo the preſence of the ſun continually ſhifting to the weſtward, that part to which the air tends, by reaſon of the rarefaction made by his greateſt meridian heat, is with him carried weſtward; and conſequently, the tendency of the whole body of the lower air is that way.

Thus a general eaſterly Wind is formed; which being impreſſed upon all the air of a vaſt ocean, the parts impel one the other, and ſo keep moving till the next return of the ſun; whereby ſo much of the motion as was loſt, is again reſtored, and thus the eaſterly Wind is made perpetual.

From the ſame principle it follows, that the eaſterly Wind ſhould, on the north ſide of the equator, be to the northward of the eaſt; and in ſouth latitudes, to the ſouthward thereof; for near the line the air is much more rarefied, than at a greater diſtance from it; becauſe the ſun is twice in a year vertical there, and at no time diſtant above twenty-three degrees one half; at which diſtance the heat being at the ſine of the angle of incidence, is but little ſhort of that of the perpendicular ray; whereas, under the tropics, tho' the ſun ſtay long vertical, yet he is a long forty-ſeven degrees off; which is a kind of winter, wherein the air ſo cools, as that the ſummer heat cannot warm it to the ſame degree with that under the equator. Wherefore the air towards the northward and ſouthward being leſs rarefied than that in the middle, it follows, that from both ſides it ought to tend towards the equator. This motion, compounded with the former eaſterly Wind, anſwers all the phænomena of the general trade Winds; which, if the whole ſurface of the globe were ſea, would undoubtedly blow all round the world, as they are found to do in the Atlantic and Ethiopic oceans.

But ſeeing ſo great continents interpoſe, and break the continuity of the oceans, regard muſt be had to the nature of the ſoil, and the poſition of the high mountains, which are the two principal cauſes of the ſeveral variations of the Wind from the former general rule; for if a country, lying near the ſun, prove to be flat, ſandy, and low land, ſuch as the deſarts of Lybia are uſually reported to be, the heat occaſioned by the reflection of the ſun's beams, and the retention thereof in the ſand, is incredible to thoſe who have not felt it; whereby the air being exceedingly rarefied, it is neceſſary, that this cooler and more denſe air ſhould run thitherwards to reſtore the equilibrium.

This is ſuppoſed to be the cauſe, why, near the coaſt of Guiney, the Wind always ſets in upon the land, blowing weſterly inſtead of eaſterly; there being ſufficient reaſon to believe, that the inland parts of Africa are prodigiouſly hot, ſince the northern borders thereof were ſo intemperate, as to give the ancients cauſe to conclude, that all beyond the tropics was uninhabitable by exceſs of heat.

From the ſame cauſe it happens, that there are ſo conſtant calms in that part of the ocean called the Rains; for this tract being placed in the middle, between the weſterly Winds blowing on the coaſt of Guiney, and the eaſterly trade Winds blowing to the weſtward thereof, the tendency of the air here is indifferent to either, and ſo ſtands in æquilibrio between both; and the weight of the incumbent atmoſphere being diminiſhed by the continual contrary Winds blowing from hence, is the reaſon that the air here holds not the copious vapour it receives, but lets it fall in frequent rains.

But as the cool and denſe air, by reaſon of the greater gravity, preſſes upon the hot rarefied, it is demon-

ſtrative, that this latter muſt aſcend in a continual ſtream as faſt as it rarefies; and that being aſcended, it muſt diſperſe itſelf to preſerve the equilibrium, that is, by a contrary current the upper air muſt move from thoſe parts where the greateſt heat is; ſo, by a kind of circulation, the north-eaſt trade Wind below will be attended with a ſouth-weſterly above. That this is more than a bare conjecture, the almoſt inſtantaneous change of the Wind to the oppoſite point, which is frequently found in paſſing the limits of the trade Winds, ſeems to aſſure us; but that which above all confirms this hypotheſis, is the phænomenon of the Monſoons, by this means moſt eaſily ſolved, and without it hardly explicable.

Suppoſing therefore, ſuch a circulation as above, it is to be conſidered, that to the northward of the Indian ocean, there is every where land within the uſual limits of the latitude of thirty degrees; viz. Arabia, Perſia, India, &c. which for the ſame reaſon as the mediterranean parts of Africa, are ſubject to unſufferable heats, when the ſun is in the north, paſſing nearly vertical; but yet are temperate enough, when the ſun is removed toward the other tropic, becauſe of a ridge of mountains at ſome diſtance within the land, ſaid to be frequently in winter covered with ſnow, over which the air, as it paſſes, muſt needs be much chilled.

Hence it comes to paſs, that the air, coming according to the general rule, out of the north-eaſt in the Indian ſea, is ſometimes hotter, ſometimes colder, than that which by this circulation is returned out of the ſouth-weſt; and by conſequence, ſometimes the under current or Wind is from the north-eaſt, ſometimes from the ſouth-weſt.

That this has no other cauſe, is clear from the times wherein theſe Winds ſet, viz. in April, when the ſun begins to warm thoſe countries to the north, the ſouth-weſt Monſoons begin, and blow during the heat till October; when the ſun being retired, and all things growing cooler northward, and the heat increaſing to the ſouth, the north-eaſt enter and blow all the winter, till April again. And it is undoubtedly from the ſame principle, that ſouthward of the equator, in part of the Indian ocean, the north-eaſt Winds ſucceed the ſouth-eaſt, when the ſun draws near the tropic of Capricorn.

But in this latter occurs a difficulty not well to be accounted for, which is, why this change of the Monſoons ſhould be any more in this ocean, than in the ſame latitudes in the Æthiopic, where there is nothing more certain than a ſouth-eaſt Wind all the year.

It is likewiſe very hard to conceive, why the limits of the trade Winds ſhould be fixed about the thirtieth degree of latitude all round the globe; and that they ſhould ſo ſeldom tranſgreſs or fall ſhort of thoſe bounds; as alſo that in the Indian ſea, only the northern part ſhould be ſubject to the changeable Monſoons, and in the ſouthern there ſhould be a conſtant ſouth-eaſt.

This account of Wind is taken from the learned Dr. Halley's diſcourſe on this ſubject, Philoſoph. Tranſ. N° 183.

The Rev. Mr. Robinſon gives this account of the origin of Wind; that in the greateſt probability it proceeds from vaſt ſwarms of nitrous particles, which riſe from the bottom of the ſea, and have been put into motion, either by the central fire, or by that heat and fermentation which abounds in this huge body of the earth; and therefore this firſt commotion, which is excited by the ſaid fermentation, is called a bottom Wind, which is preſently diſcovered by the porpoiſes, and other ſea fiſh, that delight to ſport and play upon the waves of the ſea, and by their playing, give to the mariners the firſt notice of an approaching ſtorm.

When theſe nitrous ſwarms are riſen toward the ſurface of the ſea, they cauſe, in a dark night, ſuch a ſhining light upon the waves, as if the ſea were on fire; and being delivered from the brackiſh water, and received into the open air, thoſe fiery and ſhining meteors, which fix upon maſts and ſides of the ſhips, are only nitrous particles condenſed by the circumambient cold, and like that which the chemiſts call phoſphorus, or artificial glow-worm, ſhine and caſt a light, but have no heat.

This gives the ſecond notice to the mariners, that the ſtorm is riſing; for the ſea begins to be rough upon the firſt breaking out of the Wind, and the waves ſwell and riſe, though the air at the ſame time is calm and clear.

This boiling fermentation of the ſea cauſes the vapours to ariſe, which by the intenſeneſs of the circumambient cold, are condenſed into thick clouds, and fall down in ſtorms of Wind and rain; firſt upon the ſea, from whence they roſe; and then the attractive power of the mountain cold, by a ſecret magnetiſm between vapour and cold, attracts the wateriſh vapours, and intermixed with nitrous particles, they aſcend to the high tops of mountains and hills, where they hang hovering in thick fogs, and watery miſts, until the atmoſpherical heat rarefies the nitrous part of the fog, which is almoſt uppermoſt, and appears white and tranſlucent, into briſk gales of Wind.

And the intenſeneſs of the atmoſpherical cold having attracted the vapours into the colder regions of the air, where they are condenſed into clouds, the Wind breaks, diſſipates, and drives them before it, till they fall down in rain, and water the ſurface of the earth.

And this ſeems to be the reaſon why they have but little Wind, and leſs rain in Egypt, and thoſe level countries where they have no mountains.

Dr. Derham ſays, Wind is a current of the air; and that which excites or alters its current, may juſtly be ſaid to be the cauſe of Wind.

An equipoiſe of the atmoſphere produces a calm; but if that equipoiſe be taken off, more or leſs, a ſtream of air or Wind is accordingly thereby produced, either ſtronger or weaker, ſwifter or ſlower.

And there are divers things that may cauſe ſuch alterations in the equipoiſe or balance of the atmoſphere, viz. eruptions of vapours from the ſea and land, rarefactions and condenſations in one place more than in another, the falling of rain, preſſure of the clouds, &c.

It is obſerved of caves, that they always emit Winds more or leſs; and as great caves, ſo great lakes alſo ſend forth Winds; but the moſt univerſal and conſtant alterations of the atmoſphere are produced by heat and cold.

This is manifeſt in the general trade Winds, which, between the tropics, blow all the year from eaſt to weſt; if the cauſe of this be (according to the opinion of ſome ingenious men) the daily progreſs of the ſun round that part of the globe, and by his heat rarefying one part of the air, while the cooler and heavier air behind preſſes after.

And ſo the land and ſea breezes; and ſo in our climate, the northerly and ſoutherly Winds (which are commonly eſteemed the cauſe of warm and cold weather) are really the effects of the cold or warmth of the atmoſphere.

Of this Dr. Derham ſays, he has had ſo many confirmations, that he does not doubt of it; and he produces for an inſtance of it, that it is not uncommon to ſee a warm ſoutherly Wind, on a ſudden change to the north, by the fall of ſnow or hail; and in a cold froſty morning, to ſee the Wind north, and to wheel about toward the ſoutherly quarters, when the ſun has well warmed the air; and then again, in the cold evening, to turn northerly or eaſterly.

And hence alſo it is, that the Winds and clouds are oftentimes contrary to each other in thunder ſhowers (eſpecially if hail falls;) the ſultry weather below directs the Wind one way, and the cold above the clouds another way.

And that he has obſerved ſeveral times, that when the morning has been warm, and what Wind was ſtirring was weſt-ſouth-weſt, that the clouds were thick

thick and black (as they generally are when snow follows;) and that, a little before noon, the Wind veered about to the north by west, and sometimes to other points; the clouds at the same time flying, some north by west, and some south-west; that about one o'clock it rained apace, the clouds sometimes flying north-east, then north; and at last both Winds and clouds have settled north by west; and at that time the sleet fell very plentifully, and it grew very cold.

From all which he observes;

First, that though the region below was warm, the region of the clouds was cold, as the black snowy clouds shewed.

Secondly, That the struggle between the warmth of our region, and the cold of the cloudy region stopped the airy currents of both regions.

Thirdly, That the falling of the snow through our warmer air, did at first melt into rain; but after the superior cold had conquered the inferior warmth, it became sleet.

Fourthly, That as the cold prevailed by degrees, it wheeled about both the Winds and clouds, from the northward towards the south.

It is not at all improbable, that there is often assembled in the atmosphere, a sufficient quantity of vapours to maintain a lasting condensation; and that it is also quick enough at some times to create a great Wind.

For according to Dr. Halley's experiment, it may be computed, that there is 129,762,219 cubical miles of the atmosphere filled by vapours every day. This prodigious quantity, being divided and ranged in bodies at various situations throughout the world, occasions, by the mutual condensations, almost constant results of the air, to supply the empty places; so may be thought abundantly sufficient for producing and maintaining all Winds universally.

From these and other considerations, it may be concluded, that the production of Winds depends chiefly on the condensation of vapours; and in order to confirm this hypothesis, we shall proceed to explain several properties and cases solvable thereby.

1. That the direction or course of any Wind is according to the situation of the body of vapours, whose condensation produces it; so if a concourse of vapours be gathered over the kingdom of France, the condensation thereof would draw the air from England in a southerly direction, in Spain would be a northerly Wind, in Germany would blow westerly, at the Bay of Biscay an easterly Wind.

2. That the force or intensity of a Wind is the extension of the condensing vapour, and the quickness of their condensations.

3. This may account for there being more Winds about the equinoxes than at other seasons.

4 We must add that it is understood, that the greater quantities of rain that fall in the winter, must occasion more Winds than in summer, there being a proportionable quantity of vapours condensed; and likewise,

5. That there are more Winds in distant latitudes than toward the equator; because the former are more subject to rain.

6. Why there is more rain and Wind in the winter than in the summer, when the heat of the sun is in the former more weak and languid, by which it is incapable of raising any great quantity of vapour to produce that rain and Wind.

7. Why they have more rain and Wind toward the poles and about the equator, although the latter is a part of the world where the sun makes the greatest evaporation.

The industry of some late writers have brought the theory and production, and motion of the Winds, to somewhat of mathematical demonstration, we shall here give it to the reader in that form.

*Laws of the production, &c. of Winds.*

1. If the spring of the air be weakened in any place, more than in the adjoining places, a Wind will blow through the place where the diminution is.

For since the air endeavours by its elastic force to expand itself every way, if that force be less in one place than another, the nisus of the more against the less elastic will be greater, than the nisus of the latter against the former.—The less elastic air, therefore, will resist with less force than it is urged by the more elastic; consequently, the less elastic will be driven out of its place, and the more elastic will succeed.

If now the excess of the spring of the more elastic, to that of the less elastic, be such as to occasion a little alteration in the baroscope, the motion both of the air expelled, and that which succeeds it will become sensible.

2. Hence, since the spring of the air increases, as the compressing weight increases, and compressed air is denser than air less compressed, all Winds blow into a rarer air out of a place filled with a denser.

3. Wherefore since a denser air is specifically heavier than a rarer, an extraordinary lightness of the air in any place, must be attended with extraordinary Winds or storms.

Now an extraordinary fall of the mercury in the barometer, shews an extraordinary lightness of the atmosphere; therefore it is no wonder if that foretels storms.

4. If the air be suddenly condensed in any place, its spring will be suddenly diminished; hence, if this diminution be great enough to affect the barometer, there will be a Wind blow through the condensed air.

5. But since it cannot be suddenly condensed, unless it has before been much rarefied, there will a Wind blow through the air as it cools, after it is violently heated.

6. In like manner if air be suddenly rarefied, its spring is suddenly increased; wherefore it will flow through the contiguous air, not acted on by the rarefying force.—A Wind therefore will blow out of a place in which the air is suddenly rarefied; and on this principle it is, in all probability, that

7. Most caves are found to emit Wind, either more or less.—Since the sun's power in rarefying the air is notorious, it must necessarily have a great influence on the generation of Winds.

The rising and changing of the Wind is determined experimentally, by means of weather-cocks placed on the tops of houses, &c.—But these only indicate what passes about their own height, or near the surface of the earth; Wolfius assuring us, from observations of several years, that the higher Winds which drive the clouds, are different from the lower ones, which move the weather-cocks.

Dr. Derham observes, upon comparing several series of observations made of the Winds in divers countries, viz. England, Ireland, Switzerland, Italy, France, New England, &c. that the Winds in those several places seldom agree; but when they do, it is commonly when they are strong, and of long continuance in the same quarter; and more, he thinks, in the northerly and easterly, than in any other points.—Also, that a strong Wind in one place is oftentimes a weak one in another; or moderate, according as the places are nearer or more remote.

*The laws of the force and velocity of Wind.*

Wind being only air in motion, and air a fluid subject to the laws of other fluids, its force may be brought to a precise computation: thus;

The ratio of the specific gravity of any other fluid to that of the air, together with the space that fluid, impelled by the pressure of the air, moves in any given time, being given; we can determine the space

which the air itſelf, acted on by the ſame force, will move in the ſame time by this rule.

1. As the ſpecific gravity of air is to that of any other fluid, ſo reciprocally is the ſquare of the ſpace which that fluid, impelled by any force, moves in any given time, to the ſquare of the ſpace, which the air, by the ſame impulſe, will move in the ſame time.

Suppoſing therefore, the ratio of the ſpecific gravity of that other fluid to that of air, to be $=b:c$; the ſpace deſcribed by the fluid to be called $s$; and that which the air will deſcribe by the ſame impulſe $x$: the rule gives us $x=\surd\,(b\,s:c.)$

Hence, if we ſuppoſe water, impelled by the given force, to move two feet in a ſecond of time; then will $s=2$; and ſince the ſpecific gravity of water to air is as 970 to 1, we ſhall have $b=970$, and $c=1$; conſequently $x=\surd\,970.\ 4=\surd\,3880=632$ feet: the velocity of the Wind, therefore to that of water, moved by the ſame power, will be as 623 to 2; i. e. if water move two feet in a ſecond, the Wind will fly 623 feet.

2. Add, that $s=\surd\,(c\,x^2:b;)$ and therefore the ſpace any fluid, impelled by any impreſſion, moves in any time, is determined by finding a fourth proportional to the two numbers that expreſs the ratio of the ſpecific gravity, and the ſquare of the ſpace the Wind moves in the given time. The ſquare root of that fourth proportional is the ſpace required.

M. Mariotte, e. g. found, by various experiments, that a pretty ſtrong Wind moves 24 feet in a ſecond of time; wherefore, if the ſpace which the water, acted on by the ſame force as the air, will deſcribe in the ſame time, be required, then will $c=1$, $x=24$, $b=970$, and we ſhall find $s=\surd\,(576:970=\frac{24}{31}.)$

3. The velocity of Wind being given, to determine the preſſure required to produce that velocity, we have this rule.

The ſpace the Wind moves in one ſecond of time, is to the height a fluid is to be raiſed in an empty tube, in order to have a preſſure capable of producing that velocity, in a ratio compounded of the ſpecific gravity of the fluid to that of air; and of quadruple the altitude a body deſcends in the firſt ſecond of time, to the aforeſaid ſpace of air.

Suppoſe, e. gr. the ſpace the air moves in a ſecond $a=24$ feet, or 288 inches; call the altitude of the third $x$, and the ratio of the mercury to the air $b:c=13580:1$, $d=181$ inches; $x$ will be leſs than the number by one line, or $\frac{1}{12}$ of an inch. And hence we ſee why a ſmall, but ſudden change in the barometer, ſhould be followed by violent Winds.

The force of the Wind is determined experimentally, by a peculiar machine called an anemometer, or Wind meaſurer; which being moved by means of ſails, like thoſe of a Windmill, raiſe a weight, that ſtill the higher it is raiſed, receding farther from the center of motion, by ſliding along a hollow arm fitted on to the axis of the ſails, becomes heavier and heavier, and preſſes on the arm, till, being a counterpoiſe to the force of the Wind on the ſails, it ſtops the motion of them. An index then, fitted upon the ſame axis, at right angles with the arm, by its riſing or falling, points out the ſtrength of the Wind, on a plane divided like a dial plate into degrees.

Winds are either conſtant or variable. The conſtant Winds are up and down always at a certain time of the year, and in certain parts of the world; but the variable vary ſo much, that they cannot be reduced to any rule.

The conſtant and periodical Winds are only in the wideſt ſeas; as in the Atlantic and Ethiopic ſeas, between the tropics, there is generally an eaſterly Wind all the year long, without any conſiderable variation, unleſs declining ſome few points toward the north or ſouth; but all along the coaſts of Guiney, for five hundred leagues, the ſoutherly and ſouth-weſt Winds are perpetual.

In the Indian ocean the Winds are partly general, as in the Ethiopic ocean, and partly periodical; that is, they blow one way half the year, and upon the oppoſite points the other half.

This that is here ſaid relates to the ſea Winds, at ſome diſtance from the land; for upon the land, and near the ſhores, the land and ſea breezes are almoſt every where ſenſible; and the great variety that happens in their periods, force, and direction, happens from the ſituation of mountains, valleys, and woods, and from the various texture of the ſoil, more or leſs capable of retaining or reflecting heat, or of exhaling or condenſing vapours.

Of variable Winds, ſome are common to all countries, others are more peculiar to ſome certain parts.

Of the latter ſort, the moſt famous are hurricanes, which chiefly infeſt the Caribbee iſlands, but are not anniverſary, nor equally frequent.

Their fury is ſo great, that they throw down all before them, tear up trees, overturn houſes, toſs ſhips prodigiouſly, and blow about things of a vaſt weight. They are not even continued Winds, but blow in guſts, which ſuddenly come and go; neither do they extend very wide, but are ſometimes confined to a narrow compaſs, and at other times take a larger ſcope. As for their duration, it is but a few days, and ſometimes only for a few hours. They are more common in America than any where elſe, but yet Europe and Aſia are not altogether without them, as appears from hiſtories and travels.

The cauſes of tempeſts and hurricanes are hardly to be accounted for in all particulars. However it may, in the firſt place be noted, that the ratio of all liquids is much the ſame, and therefore an extraordinary motion may be excited in the air, by the ſame way as in water.

Now, if water fall from a high place, or if there be a confluence of ſeveral ſtreams together, this gives a violent motion, and cauſes a many whirlings and eddies in it. This is apparent in the torrents falling down the rocks, and the confluence of rivers.

If therefore ſomething analogous may happen in the air, there needs muſt be furious tempeſts of Wind raiſed in it. And ſuch a thing may happen, if any extraordinary quantity of vapours be drawn by the Wind, upon a certain place, which they cannot eaſily get over, by reaſon of mountains or contrary Winds, which oppoſe them: for example; ſuppoſe a Wind, upon ſome point between north and eaſt, carries a large collection of vapours out of Africa into the Caribbee iſlands; this Wind lights upon the continent of America; now, it is poſſible, that not only the mountains and woods of Panama may reſiſt the current of this Wind, and croud the vapours together there; but a contrary Wind, upon a point between ſouth and weſt, may blow at the ſame time upon the weſtern ſhore of America, which ſhall force the vapours back again. When ſuch a rencounter happens, there muſt be a wild uproar in the air about the Caribbee iſlands, and in all that tract between South and North America, and the vapours in this circular motion muſt needs be furious on all ſides, juſt as it is in the water.

For we ſee in the confluence of two rivers, if their currents are rapid at the place where they fall in, they cauſe violent eddies, whirl things about that are caſt in them, ſwallowing them up for a little time, and then throwing them back again.

This ſhews us the reaſon, why heavy bodies are often toſſed in the air by the whirling of hurricanes, and then daſhed to the ground again; for the air being a circular motion, is with great fury toſſed backwards and forwards, between the ground and the clouds; for as the waters of the rolling ſea do not run to the ſhores in an even ſtream, but in ſuch waves as daſh by fits and turns; ſo the courſe of a violent Wind is in broken and diſtinct blaſts.

Such tempeſts do not extend very far, though their bounds are uncertain, becauſe the neighbouring air giving way to them, they ſpend themſelves in the progreſs of their motion.

Thus,

WIN

Thus, when a great stone is cast into the water, we see a great agitation round about the place where it fell; but the more the waves retire from the center of motion, the slower and the less sensible they grow; and as such motions do not last long in water, no more do they in the air, for the same reason.

Though there may be unusual storms of Wind any where, the air and vapours are drawn together thereabout by contrary Winds, yet they are more frequent about the Caribbee islands, especially in June and August, when the sun is vertical there, for their air being rarefied by the sun's heat, the usual Winds bring thither a vast quantity of air and vapours, which being crouded together, in the gulf of America, cause a great estuation about the neighbouring islands.

When the sun is on this side the equator, the air is more rarefied thereabouts, and it may so happen, that the south-south-east Wind, which constantly blows beyond the line, may sometimes transgress its limits, and bring the vapours of the Æthiopic sea to the same place where those of the Atlantic are already gathered; which, being kept in by the shore of America, must necessarily be driven about the Caribbee islands.

*Of the qualities of Winds.*

1. A Wind that blows from the sea is always moist; in summer it is cold, in winter warm, unless the sea be frozen up. This is well demonstrated thus: there is vapour continually rising out of all water (as appears even hence, that a quantity of water, being left a little while in an open vessel, is found sensibly diminished,) but especially if it be exposed to the sun's rays, in which case the evaporation is beyond all expectation. By this means the air incumbent on the sea becomes impregnated with a deal of vapour, but the Winds, blowing from off the sea, sweep these vapours along with them, and consequently are always moist.

Again, water in summer, &c. conceives less heat than terrestrial bodies, exposed to the same rays of the sun; but in winter, sea water is warmer than the earth, covered with frost, snow, &c. Wherefore, as the air, contiguous to any body, is found to partake of its heat and cold; the air, contiguous to sea water, will be warmer in winter, and colder in summer, than that contiguous to the earth: or thus; vapours raised from water by the sun's warmth in winter, are warmer than the air they rise in, as appears from the vapours condensing, and become visible, almost as soon as they are got out into the air. Fresh quantities of vapours therefore, continually warming the atmosphere over the sea, will raise its heat beyond that over the land.

Again, the sun's rays reflected from the earth into the air in summer, are much more than those from the water into the air. The air therefore over the earth, warmed by the reflection of more rays than that over water, is warmer. Hence sea Winds make cloudy hazy weather.

2. Winds which blow from the continent are always dry, in summer warm, and cold in winter; for there is much less vapour arising from the earth, than from water, and therefore the air over the continent will be impregnated with much fewer vapours: add, that the vapours or exhalations raised by a great degree of heat out of the earth, are much finer and less sensible than those from water. The Wind therefore, blowing over the continent, carries but little vapour with it, and is therefore dry.

Our northern and southern Winds, however, which are commonly esteemed the causes of cold and warm weather, Dr. Derham observes (as we have said,) are really the effects of the cold or warmth of the atmosphere: hence it is, that we frequently see a warm southerly Wind on a sudden changed to the north, by the fall of snow or hail, and that in a cold frosty morning we see the Wind north, which afterward wheels about toward the southerly quarters, when the sun has well warmed the air, and again in the cold evening turns northerly or easterly.

Some Winds are drying, others are moist; some gather clouds, others disperse them; some are warm, others cold, but their influence is not one and the same in all places, for such Winds as are warm in one country are cold in another; those that are wet with us are dry with other nations, and on the contrary.

The dry Winds are such as carry but a few vapours along with them, and therefore lick off the moist particles from the bodies over which they pass; and thus in Holland the north and east Winds, with the intermediate points, are drying, because the cold northern sea yields but few vapours in comparison of those that come from warmer parts of the ocean, but the westerly Winds and others are moist, because they issue from warm and vaporous parts, the western Wind seldom failing to send rain.

Such Winds gather clouds, which blow from the quarters where the vapours arise, which, in conjunction with the vapours of our own region, fill the air; and, on the contrary, those that bring little vapours along with them, and bear away that which hangs over us, bring fair weather.

Winds are either warm or cold, as the countries are from whence they blow; and therefore when a brisk wind blows from a cold quarter, it allays the heat of summer, which is very troublesome in still weather. Thus a quick blast of a pair of bellows will put out a flame, which a gentle blowing increases; for the quick blast drives all the flame to one side, where it is stifled by the force of the incumbent air for want of aliment, but a gentle wind augments the motion of the flame every way, and makes it seize on more parts of fuel.

Now, because all the heat or cold of Wind proceeds from the heat or cold of the country where it blows, therefore the same Winds are cold or hot every where. Beyond the line they are just the reverse of what they are with us; their cold Winds are from the south, ours from the north; and as our south Winds are warm, from no other reason, but because they bring us an air heated by the sun, for the very same reason the north Winds are warm to our antipodes.

From what has been said, it is evident, that the sun is the cause of the Wind, and motion the cause of vapours.

*Prognostics of weather from the Wind.*

The Winds, Mr. Pointer says, are the causes of the most sudden and extraordinary alterations of the air.

The nature of the Winds are such, that by the experience we have of them, we may very nearly predict what weather we shall have for two or three days after; as for example, we know that, in our climate, a south Wind generally brings rain, and a west Wind more; and a west Wind is the predominant Wind with us, because the ocean lies on the west side of our country.

And also, that a north Wind brings fair weather to us, as well as the east Wind, which does not last so long as the north; therefore the north-east and south-west Winds are those that are necessary chiefly to be treated of.

Mr. Pointer gives the following rules to know when the Wind will set in one of these two points, for the most part, for two or three months together. First, as to the north-east Wind; when the Wind turns to the north-east point, and continues in it two days without rain, and does neither turn to the southward the third day, nor rain, then it is likely to continue eight or nine days without rain, and then to return into the south.

If this Wind turns out of the south to the north-east again, and continues two days in that point without rain, and neither rains nor turns to the south the third day, it is likely to continue north-east for two months, and for the most part for three months. The Wind will finish these turns toward the north in three weeks time.

Secondly,

Secondly, as to the south-west Winds; when the Wind has been in the north for two months or more, and comes to the south, there are usually three or four fair days at first, and then, on the fourth or fifth day comes rain, or else the Wind turns north, and continues dry still; if within a day or two, without rain, it return to the south, and with rain turn northward, and return into the south the first or second day, as before, two or three times together after this manner, then it is like to be in the south or south-west two or three months together, for the most part, as it was in the north before. The Wind will finish these turns in a fortnight.

He does not mention the east or west Winds, because he says, the rains usually come from the south, or in shifting of the Wind from the south to the north; as for the drought, the Wind is, for the most part, north-east.

The Wind usually turns from the north to the south quietly without rain; but comes back again into the north, with a strong Wind and rain. The greatest Winds which blow down houses and trees, usually come by the turning of the Wind out of the south by the west into the north, which drives away rain, and clears the air.

*Signs of the changing of the Wind.*

Mr. Pointer says, in what point soever the Wind is, when the sun rises with many pale spots appearing in its orb, and part of it hid in a cloud, it will soon turn to the south.

That when the Wind has been settled for twenty-four hours or more, in any of the full points, as north, east, west, or south, when it begins to turn, it will not settle till it comes to the opposite point, as from the north to the south, and so from full east to full west; and so of the angular points as from the north-east, to the south-west.

Upon whatsoever quarter the Wind is when the moon changes, it presently changes upon the new moon.

When the generality of the clouds tack with the Wind (though there should be many little fleeces, or long flakes, lying higher) the Wind is flagging, and will change soon, and shift its point.

*Common observations and signs of Winds and storms arising.*

If pale spots seem to appear in the orb of the sun at his setting, and dazzle there, strong Winds from the south will ensue; the Wind soon shifting into that point, in what quarter soever it was before.

If there appear upon the sun when he is setting, fiery spots, or of a reddish colour, much Wind will ensue; and a louring morning is frequently a fore-runner of Wind.

If the moon, when at full, has a reddish circle about her, it presages much Wind.

When meteors, or as they are commonly called, stars, shoot, and spread a long train of light, they are fore-runners of Wind that will soon follow.

The Lord Bacon says, the following are prognostics of high Winds or tempests arising.

When the sea resounds upon the shore, when the Winds murmur in the woods, without any apparent Wind, they portend that Wind will follow; for such Winds, breathing chiefly out of the earth, are not first perceived, except they are pent by water or wood, and therefore a murmur out of the caves likewise portends as much.

When the brightness of the smaller stars is on a sudden obscured, it is a sign of a tempest arising, for the upper regions of the air perceive the matter of the collection of tempests and Winds, before the air here below; therefore the obscuring of the smaller stars is a sign of tempest following.

He says, the air and fire have subtile perception of the rising Winds before men.

We may perceive the trembling of a candle will discover a Wind, that otherwise we do not feel; and the flexuous burning of flames shews the air is beginning to be unquiet; and in like manner coals of fire, by casting off the ashes more than usual; and as for the ashes, it is not to be admired at, if the Wind unperceived shake them off; for it is a common thing to try which way the Wind blows, by throwing up Grass, chaff, or such like things, into the air.

*Signs of the Wind's ceasing.*

If a hasty shower of rain falls, when the Wind has raged for some hours, it soon abates.

If water ruckles much, and frequent bubbles arise, the storm is but of a short continuance.

If sparrows chirp merrily, and moles come out of their holes, it is a sign of the storm ceasing.

If the bird called king's-fisher, or halcyon, attempts the seas when the Wind blows hard, it is a sign of its abating.

*Of* WINES, *and vinous liquors.*

WINE is a brisk, agreeable, and spirituous juice, drawn from vegetable bodies, and fermented.

Dr. Boerhaave characterizes Wine, that the first thing that it affords by distillation, be a thin, fatty, inflammable, &c. fluid, called a spirit; and in this it is distinguished from another class of fermented vegetable juices; viz. vinegars, which, instead of such spirit, yield for the first thing an acid, uninflammable matter.

In order to the making Wines, it will be of great advantage to be well acquainted with the business of fermentation. This Dr. Boerhaave defines and explains as follows:

Fermentation is a change produced in vegetable bodies, by means of an intestine motion excited therein; the effect whereof is this, that the part which first rises from them in distillation, is either a thin, fat, acrid, hot, transparent, volatile, and inflammable fluid, that will mix with water; or else a thin, acid, pellucid, less volatile, uninflammable liquor, capable of extinguishing fire.

The liquor, obtained by means of fermentation, is called thin, because none appears to be thinner than the spirit of fermented vegetables; acid, because it acts almost like fire, when applied to the tongue, or other parts of the body; volatile, because there appears to be no liquor, that is raised with greater ease; but it is this liquor being totally inflammable, and at the same time capable of mixing with water, that ultimately distinguishes fermentation from all other operations in nature; for neither putrefaction, digestion, effervescence, or any thing of that kind, will ever afford a liquor at once possessed of those qualities.

Putrefaction, indeed, as well as fermentation, is performed by means of an intestine motion; but the former will never produce either of the liquors above described, as the effects of fermentation; i. e. neither a vinous nor acetous liquor.

We see then, that there are two different effects of fermentation, the production of an inflammable spirit, and an uninflammable acid; and whatever operation will afford neither of these liquors, is improperly called fermentation, which therefore can only take place in the vegetable kingdom; for all the art in the world, so far as hitherto appears, will never gain such spirits from animals or fossils; and consequently never excite an actual and real fermentation in them; for fermentation is the single operation in nature, by which such spirits can be obtained.

2. Any vegetable liquor so fermented, as to afford the inflammable spirit above-mentioned, for the first thing in distillation, we call Wine; but if the liquor be so fermented, as first to afford the acid uninflammable one, it is called vinegar; by which we mean every thin, acid, volatile, vegetable liquor, capable of extinguishing fire. So likewise, under the name of Wine, we

we include beer or ale, mead and metheglin, cyder, perry, all ſorts of artificial Wines, and whatever liquors afford ſpirits poſſeſſed of the properties before ſet down.

The like is to be underſtood of vinegar, which is obtainable from all the ſame bodies that afford Wine; ſo that we have either the Wine or vinegar of all ſorts of fruits, as of Grapes, Currants, Mulberries, Cherries, &c. all ſorts of Grain, as Barley, Wheat, Oats, &c. all ſorts of pulſe, as Beans, Peas, Tares, &c. all ſorts of roots, as Turneps, Carrots, Radiſhes, &c. and in ſhort, all ſorts of vegetable ſubſtances, even Graſs itſelf.

3. All the bodies capable of being changed by fermentation, either into Wine or vinegar, are ſaid to be fermentable bodies; and becauſe ſuch a change can only be wrought, ſo far as we know at preſent, upon vegetables, theſe alone are accounted fermentable.

4. Any matter, which being mixed with a fermentable body, increaſes its inteſtine motion, or excites or forwards the fermentation, is called the ferment; and, according to the doctrine before delivered, nothing can properly be called ſo, but what will produce either Wine or vinegar.

Theſe fermentable bodies may be reduced to the following claſſes;

The firſt claſs will conſiſt of the meally ſeeds, i. e. all the grain, which, being fully ripe, and well dried, may be reduced, by grinding to a light meal or flour, that is neither clammy nor unctuous.

The ſecond claſs conſiſts of all the pulpy ſummer fruits, which, when ripe, affect the tongue with the ſenſe of acidity and ſharpneſs, as Apples, Pears, Grapes, Gooſberries, &c. Under this claſs may be ranged all manner of bulbous pulpy roots growing in the ground, if they are firſt deprived of their volatile alkaline ſalt, which is apt to determine them to putrefaction.

The third claſs takes in all the juicy parts of plants, as the leaves, flowers, ſtalks, and roots, provided they are not too oily, or too alkaline; in which caſes vegetables will rather putrify than ferment.

The fourth claſs contains the freſh, expreſſed, and native juices of all kinds of vegetables; to which may be added, all the native ſaline liquors that diſtil from wounded plants, as the tears of the Vine, the Walnut, the Birch-tree, &c.

Under the fifth claſs come the moſt perfect of all the vegetable juices, viz. thoſe that are unctuous, condenſed, and elaborated by nature herſelf, ſuch as honey, manna, ſugar, and all other kinds of concocted juices capable of diſſolving in water.

In order to fit any of the fermentable bodies for fermentation, there are ſeveral particulars requiſite:

1. Maturity; the juice of unripe berries, as of Currants or Gooſberries, for inſtance, will ſcarce be brought to ferment at all, while it is very difficult to hinder their juice, when fully ripe, from falling ſpontaneouſly into fermentation.

Thus the juice of unripe Grapes, being uncapable of fermenting, is a rough acid liquor, called verjuice, that will for ſeveral years remain in the ſame unactive ſtate; but after they are come to maturity, it can no ſooner be preſſed into the veſſel, than it becomes a fermentable ſpirituous fluid.

2. Another requiſite to prepare a body for fermentation is, that it ſhould contain only a moderate proportion of oil; for if it either exceeds in the quantity, or be entirely deſtitute of oil, it will never be brought to ferment at all. Thus Almonds, Fennel-feeds, &c. are always deprived of their oil before they are attempted to be fermented.

3. The bodies intended for fermentation muſt not be too acid or auſtere, as is plain from the acid juices of unripe fruit, which are not greatly diſpoſed to ferment.

4. The laſt thing required to fit and prepare a body to undergo fermentation, is the property of diſſolving in water; for want of which, all acid bodies, and ſuch woods, roots, and herbs, as are dry and hard, become unfit for this operation; for unleſs the parts of theſe bodies are diſſolved, the requiſite inteſtine motion thereof will not enſue; but without ſuch motion fermentation cannot ſubſiſt.

Hence honey itſelf can never be made to ferment, whilſt it retains its native thick conſiſtence; but being diſſolved by heat, or let down with water, it immediately enters the ſtate of fermentation. On the other hand, ſo violently as the juice of Grapes affects this ſtate, yet if, immediately after it is expreſſed, it be reduced, by boiling, to the conſiſtence of a jelly, it will lie quiet, and never ferment at all, unleſs it be again diluted, and let down with water.

Ferments are of two kinds; the natural or ſpontaneous, and thoſe produced by fermentation.

The ſpontaneous, or natural ferments, are,

1. All the freſh expreſſed juices of fully ripened plants, which eaſily run into fermentation.

2. Honey, manna, ſugar, and the like thick and inſpiſſated vegetable juices, which cauſe a ſtrong fermentation.

3. The ferments produced by fermentation are, the freſh flowers or yeaſt of any fermenting vegetable juice or liquor, as of Wine, beer, &c. By flowers or yeaſt is to be underſtood that light frothy matter, which covers the ſurface of the fermenting liquor in the nature of a tender cruſt; and which, being added to any other fermentable juices, will excite a fermentation in them.

4. The freſh fæces or lees of any fermenting liquor, as of Wine, ale, beer, &c. For all fermentation divides the liquor, which is the ſubject of it, into three parts, viz. the flowers or yeaſt, which poſſeſs the uppermoſt place; the operating or fermenting fluid, which lies in the middle; and the groſs and ſeemingly exhauſted matter, which, falling to the bottom of the veſſel, is known by the name of lees, ſediments, feculence, or mother, that will, if raiſed again out of the liquor into which it was precipitated, cauſe it to work afreſh.

Thus, when a hogſhead of Wine has done fermenting, and is fined down, if the veſſel be any way ſhaken or diſturbed, it will grow turbid again, and ferment anew, as vintners very well know. For ſuch as were the flowers in the act of fermentation, ſuch is the mother after the action is over.

5. Acid paſte, or bakers leaven, which is no more than any kind of meal brought into a cloſe lump by means of water, after the ſame manner as common bread is made; for this being ſet in a warm place, during the ſpace of four or five days, it will firſt ſwell, then turn very acid, and at length become a ferment.

6. Thoſe ferments which reſide in, or ſtick to the ſides of the caſks that have contained fermenting liquors; for ſuch caſks will of themſelves raiſe a fermentation in the liquors committed to them; and Helmont was of opinion, that they might be capable of doing this for ever.

Upon account of this inherent ferment it is, that old-ſeaſoned veſſels, or ſuch as have been long employed by vintners or brewers, bear ſo great a price among them.

It is very remarkable, though a thing well known to brewers and vintners, that a new caſk checks the fermentation of vinous liquors, and renders them weak and ſpiritleſs; for which reaſon they never chuſe to make uſe of ſuch a caſk before it is ſeaſoned, as they call it, by having firſt contained ſome ſpirituous or fermented liquor or other; which being plentifully drank in by the wood, the original liquor comes to be deprived of a large proportion of its ſpirit, and more fermentable part, whence the remainder muſt needs taſte flat and vapid.

This is certain, that even muſt itſelf will not eaſily ferment in a new pure veſſel, but with the greateſt facility, if put into one that has before contained fermenting juices; for the parts of the fermenting liquors, with which ſuch a veſſel muſt have been impregnated, preſently rouſe and determine it to action.

7. There are ſome ferments that appear to be heterogeneous, or which are improperly called ferments;

as the white of an egg beat into a froth, which is used when the liquor to be fermented proves too dilute or thin to sustain the operation. For in this case the fermentable parts of the fluid easily extricate themselves, and so fly off for want of something to detain and keep them in the body of the liquor; which therefore requires some viscid substance to be mixed with it, in order to prevent this avolation of its subtile parts. And this cannot be more commodiously effected than by the white of an egg.

8. Of the like heterogeneous kind of ferments are all fixed and acid salts. Thus, if the liquor designed for fermentation be too acid to work kindly, the addition of an alkaline salt, as that of Vine branches, or any saponaceous substance, will, by taking off from the acidity, fit it for, and so promote the operation; but if the liquor be of itself too alkaline, then tartar, or the like, ought to be added to it, to promote the fermentation.

But this does not happen, because either the acid or alkaline salt is an actual ferment, as some chymists have vehemently contended for the alkaline, because the salts employed respectively temper and take down the predominant acid or alkali, which before hindered the fermentation of the liquor,

And if such salts should in due quantities be mixed with any proper subject of fermentation, possessed of all the qualities before set down, as requisite to it, the operation would be entirely checked and prevented; so that alkaline bodies may as well be said to hinder, as promote fermentation.

9. And lastly; Of the same sort are certain austere or rough tasted substances, as all harsh and green fruit, Pomegranate bark and flowers, the Tamarisk bark, Crab Apples, unripe Medlars, &c. which, when the liquor designed for the fermentation is too much broken in its parts, or dissolved in its texture, bind it together again by its astringent quality; so that though it was before too thin and aqueous, it is now reduced to a proper consistence for fermentation.

Thus, when must proves thin and watery, it will not ferment kindly, unless some austere or astringent ingredient, as red Rose leaves, or the like, be added to it, to thicken and improve its consistence, and at the same time prevent the air it contains from making too easy an escape.

But when a liquor is too austere, or its roughness proves so great, that it cannot ferment, the addition of a fixed alkali, in a proper quantity, will remove the obstruction, and leave it at liberty to work.

So likewise, when the operation is prevented by too large a proportion of acid in the liquor, the method is to throw chalk, crab's eyes, bole armoniac, or the like, into it; but if it be too unctuous or oily, as is the case of some Spanish Wines, salt of tartar is made choice of; and thus, as circumstances alter, different bodies are employed to stop or promote fermentation in liquors.

In order for fitting the subjects of the second class for fermentation, and making vinous liquors, viz. pulpy summer fruits, and the roots of bulbous plants; in case they prove crude or hard, they are to be first boiled in water, and afterwards bruised, which will dispose them for fermentation; but if such subjects are juicy, they may be directly ground to a pulp, or have the juice pressed from them; or if they are very succulent, there may be no occasion to bruise them, only directly to commit them to the press, and squeeze out all their juice.

But if the flesh or substance be strong and tough, it may be proper to rasp, shave, or cut them into small pieces, which will be of service in some bulbous roots, and make them yield their juice with the greater ease, and in greater plenty.

Prepared fruits seldom stand in need of any thing to make them ferment, for they generally begin to work of their own accord; but if the weather should prove exceeding cold, or the operation proceed but languidly, it may not be amiss to quicken it by adding a small proportion of a ferment, as a little yeast, the lees or mother of Wine; or even a little new Wine may serve the turn.

The subjects of the third class, viz. the succulent parts of plants, need only, in order to their fermentation, be beat to a thick kind of pulp, while they are fresh, and mixed with a proper proportion of rain water, that is just enough to dilute them; for if much water be employed, the spirit will be the weaker for it.

These require but very little ferment, or none at all, to make them work in the summer season, and no large proportion in the winter; but in case any at all be required, nothing will prove more serviceable than honey or sugar.

The subjects of the fourth and fifth classes, viz. the fresh native juices, and weeping liquors of vegetables, with the condensed and unctuous juices of the same, are to be diluted, and let down with rain water, to a due consistence, which is then thought to be obtained, when the compound liquor will just keep a new-laid egg afloat; but some vegetable juices may naturally be of this very density or consistence, and in that case they will require no water at all. If any be thicker or denser, they ferment not so kindly; and if thinner or rarer, they afford but a weak spirit. Thus, in order to ferment sugar, treacle, or any common syrup, we first let down the matter with water, to the consistence above-mentioned; and then, if there be occasion, put yeast to it, to quicken the fermentation, and make it proceed kindly.

The subjects of the fourth class, viz. the prepared recent juices, and spontaneous tears of vegetables, are so far from requiring any ferment, that it often proves very difficult to strain or check the fermentation they naturally fall into, especially if the season be warm, and the juices rich; at most, if the weather should prove cold, they need only be set in a warm place to make them work.

The subjects of the fifth class, viz. the prepared or inspissated juices of vegetables, require no ferment at all in the summer, and but a small proportion in winter, to set them on working; less than an ounce of yeast to twenty pints of prepared liquor, will usually do for that purpose in the coldest season; but in hot countries, or sultry seasons, these prepard juices, and especially sugar, are of themselves apt to fall into a too violent fermentation, which therefore ought to be abated by the contrary means.

All the vegetable bodies of the several classes designed for fermentation, and prepared for it in the foregoing manner, ought, together with their ferments, to be committed to casks of Oak already seasoned with the same kind of fermented liquor, or some other, consisting of subtile and penetrating parts. Then those casks or vessels having their bung-holes lightly covered with a thin or single cloth, and being set in a warm place, the liquor will ferment.

The mouths of the vessels are thus slightly covered over, that the air may have a free passage in and out of them, for they are here designed to serve as vent-holes; and these vessels are ordered of wood, because fermentation is never observed to be so well carried on in those of glazed earth or glass; though on account of their transparency, it is sometimes performed in the latter, that the phænomena may be better observed.

The preparatory business of fermentation hitherto described, has been carried on by art, but nature must now perform the rest of the work; so that we are here only concerned to observe the phænomena which arise in the operation.

When therefore any fermentable body is prepared after the manner above delivered, and with its due proportion of a ferment, committed to a large strong glass vessel, standing in a warm place;

1. The whole body of the liquor soon begins to swell, heave, rarefy, and send up little bubbles to the top of the vessel, where they burst with an audible noise, and form into froth. Now the liquor which was before

fore transparent, grows opaque, and a violent uninterrupted intestine motion manifests itself therein.

2. The parts of the fermenting fluid appear to be incredibly elastic, and the motion of them exceeding violent. Indeed, by means of this property of fermentation, very terrifying and surprising actions may be performed. Thus, if a hundred pints of must were, on some warm day in autumn, to be confined close in a vessel of Oak above an inch thick in the sides, and made ever so tight and strong with iron hoops, yet could not this prevent the working of the liquor; but in spite of so great a resistance, it would burst the vessel, with a report as loud as that of a cannon.

And therefore the way to preserve new Wine in the state of must is, to put it up in very strong but small casks, firmly closed on all sides; by which means it will be kept from fermenting, and then it goes by the name of stum: but if it should happen to fall into fermentation, the readiest and only way to stop it, is by the fume of sulphur, or something of the like nature.

Were it not for the knowledge of this property of burning sulphur, the wine merchants and vintners might frequently sustain great damages from the bursting of their vessels, when the liquor is upon the fret, or, by some alteration in the air, or other accident, begins to ferment again: but the smoke of a little common brimstone, or a lighted match dipped in it, and held under a cask of Wine that is just ready to burst its hoops, will calm its fury, and make it subside as suddenly as a spoonful of oil, thrown into a large foaming copper of boiling sugar, takes down its heat, and prevents the mischief it might otherwise occasion.

3. A thick skin, or crusty scurf, forms itself on the surface, through which the elastic or fermenting matter is continually breaking. This crust appears to be the principal cause of fermentation; for it keeps in, or prevents the spirituous part of the liquor from flying off; and if it be frequently broken, it puts a check to the fermentation, and will often entirely stop it, if wholly taken away.

4. This skin or crust, which we now call flowers or yeast, gradually consumes and precipitates to the bottom of the liquor; in which case it is called by the name of fæces or mother; and after this, the fluid above it immediately becomes transparent again, ceases to hiss and bubble, has a very penetrating, pungent, spirituous, or vinous taste and scent, with a mixture of acidity and sweetness. And now the liquor, having undergone the operation of fermentation, is become Wine.

The vapour arising from the liquor, during its fermentation, ought not to be approached too near, or breathed in too great a quantity, because it is highly poisonous; and, if it prove not mortal, may at least render the person apoplectic and paralytic. We have accounts in the French and German Transactions, of people who were immediately struck dead, by receiving at the nose the fumes that issued from large vessels of Wine, in the state of fermentation.

And now, if the liquor thus fermented be stopped down close, it will begin to feed upon and digest its own lees or mother, and at length consume them; in which case we commonly say, the Wine begins to ripen; and afterwards, this mother shoots to the sides of the containing vessel, and there appears in the form of an essential salt, which is then called tartar.

The space of time required for finishing the fermentation differs with the subject matter, the season of the year, the nature of the place, and other circumstances; but it is known to be perfectly performed by the several phænomena just now mentioned.

As soon as the flowers fall to the bottom, the vessel should be bunged down, otherwise the volatile part would fly off, and the fermented liquor become vapid and flat.

In this state it ought to stand for some weeks in a cool place, by which means it will grow stronger, and more liquid; for during this time, it imbibes and consumes its own fæces, which abound in subtile spirituous parts, and grows soft, and loses of its acidity, by throwing off its tartar.

And the longer it is thus suffered to stand, the more strength it gains, or the more spirit it will yield in distillation.

Thus, for instance; malt liquors, newly brewed, afford but a small quantity of inflammable spirit; but if suffered to remain for some weeks in the vessel, till they become fine and clean, they will yield a much greater proportion: though to avoid so great an apparatus of vessels as would then be required, malt liquors, brewed, in order to make spirits, are seldom kept, but immediately after fermentation committed to the still. And hence we are furnished with a reason, why all stale vinous liquors are stronger, and inebriate sooner, than such as are new.

*The physical effects.*

The physical properties of a vinous liquor, prepared in the manner above described, are those which follow:

1. It will have an inebriating quality, when received into the body; and nothing is properly possessed of this quality, but what has been first fermented.

For if a person should eat ever such a quantity of Grapes, or drink ever so freely of must, he might indeed bring a looseness upon himself by that means, but he would not be fuddled. So likewise to take down large draughts of sweet-wort, or the tincture of malt, might throw one into a violent vomiting and flux, but never produce the symptoms of drunkenness. And whatever some pretend, as to Mandrake, Hemlock, Poppies, opium, and the like, the effects they have upon the human body are rather stupefying than inebriating; but drunkenness is different from stupefaction.

An over dose of vinous liquors makes a man brisk, lively, and joyful, or disposes him to sing, dance, or be merry; at length however, his legs will not support him; and, if the fit be violent, he grows furious, raving, or paralytic, and so he dies.

But opium has not these effects; it brings on a profound sleep; and he who has taken too much of it, dies lethargic.

2. Wine has the faculty of heating the body. Nothing appears to cool the body more than Currants; yet the wine prepared from them is very heating. The like is to be understood of Cherries, and all fermentable bodies, though ever so cold, for these will afford a vinous liquor.

3. It is inflammable, and will mix with water.

4. It contains tartar, and affords it after the fermentation is over. This tartar is the essential salt of the vegetable made use of, and differs from the lees or mother, being resolvable by distillation into a water, a spirit, two kinds of oil, an alkaline salt, and earth. All fermented vegetables afford it. Must yields a feculent salt, and no tartar; but if once it works, so as to become pure Wine, it will, in the space of half a year, throw off a clean tartar, which therefore appears to be the effect of a perfect fermentation, and accordingly is never obtained without it.

5. It retains neither the colour, taste, nor smell of the specific vegetable from which it is made Thus we have seen, that Rosemary affords a quite different water, after it has been fermented, from what it did before. Thus fermented Hydromel, malt liquors, treacles, sugar, &c. yield spirits by distillation, that cannot be distinguished from one another.

The Grapes of some countries are as sweet as honey, and so is their must before fermentation, yet the Wine prepared from either, may have little or no sweetness, and sometimes even gain a degree of acidity. It is not easy to believe that Rhenish Wine should proceed from so sweet a Grape as it does.

6. It acquires a somewhat acid and spirituous taste and smell. The taste of honey or malt, &c. is sweet, and their scent scarce perceivable, before you commit them to fermentation; but, after having undergone that

that operation, they are less sweet, but sharper upon the tongue, and affect the nose with a brisk, spirituous, or vinous odour.

7. It contains the volatile salt and oil of the vegetable, attenuated, and reduced into one spirit, as may appear by the chemical analysis of a fermented subject.

8. It renders the oil of the vegetable more volatile than the water. When an unfermentable vegetable is distilled, the first thing that comes over is water, and the next the essential oil, but the contrary is observed after fermentation; for, by that operation, the oil is rendered more volatile than the water, and therefore rises first in distillation, having been broken and ground so fine by the preceding operation, as now to come over the helm, not in its own form, as before, but as the finest and most volatile part of the fermented liquor, capable of uniting with water.

The things that promote fermentation are,

1. Rest; by means of which the crust on the surface may remain unbroken, for it is this crust that prevents the spirituous part from flying off.

2. A free admission of the external air, so that it may come at the internal parts of the fermenting fluid; for, according to Mr. Boyle, if a fermenting liquor be put into his exhausted receiver, the operation immediately ceases.

3. A moderate degree of warmth; for too great heat, and too great cold, are the bane of fermentation.

4. A proper season of the year; that is, when the vegetables of the same species with that made use of are in their bloom, for it is then their juices are most in motion; accordingly we find, when Vines are in the blossom, the Wines of former years growth will again spontaneously run into fermentation. When these several conditions meet, fermentation is performed to the best advantage.

The things which check or hinder fermentation are,

1. Too large a proportion of acid salts, such as spirit or oil of vitriol, oil of sulphur per Campanam, spirit of salt, &c. Thus, when any liquor ferments too violently, a few drops of oil put into it, or the burning a little sulphur under or near the vessel will immediately check and restrain its fury.

2. An over-proportion of fixed alkalies; such are salt of tartar, pot-ashes, or saponaceous bodies.

3. Terrestrial alkalies, as chalk, marl, crabs eyes, &c.

4. A close stopping up of the vessel.

5. A great degree of cold.

6. A violent compression of the air in a vessel, which Mr. Boyle has shewn, will stop fermentation, as well as taking out the air by means of his pneumatic engine.

*Some short general directions as to the making of Wines.*

Wine is made of Grapes, by stamping them in a vat, or crushing and expressing the juice out of them in a press, and then fermenting, &c.

In the southern part of France their method is, for red Wines, to tread the Grapes, or squeeze them between their hands, and to let the whole stand, juice and husks, till the tincture be in colour as they would have it, and then they press it; but for white Wines, they press the Grapes immediately.

When they have been pressed, they tun the must, and stop up the vessel, leaving the cask empty about the depth of half a foot, or better, to give room for its working.

At the end of ten days they fill this space with some other proper Wine, that will not provoke it to work again, repeating this every ten days for some time: new Wine spending itself a little before it be perfect.

About Paris, and in the northern parts of France, they let the marc and must stand two days and nights for white Wines, and at least a week for claret Wines, before they tun it, and while it continues working, they keep it as warm as possible.

Some, upon stopping it up for good and all, roll the cask about the cellar to mix it with the lees, and after it has been settled a few days, rack it off with great improvement.

To fine it down, they put shavings of green Beech into the cask, but they first take off all the rind, and boil them an hour in water to extract their rankness, and afterward dry them in the sun, or an oven. A peck of these will serve for a hogshead of Wine; they put it in a gentle working, and purify it in twenty-four hours; they also give it an agreeable flavour.

Some sweeten their Wines with Raisins of the sun, trod in the vat with the Grapes, they having been first plumped by boiling; others by boiling half the must, scumming it, and tunning it up hot with the other.

Wine is distinguished, from the several degrees and steps of its preparation, into,

1. Mere-goute, (mother-drop,) which is the virgin Wine, or that which runs of itself out of the tap of the vat, before the Grapes are trodden.

2. The must, surmoust, or scum, which is the Wine or liquor in the vat, after the Grapes have been trodden in the vat.

3. The pressed Wine, or vin de pressurage, which is that squeezed with a press out of the Grapes, half-bruised by treading.

4. Boisson, or draught Wine. This is made of the husks left of the Grapes, which are called rape or marc, by throwing water upon which and pressing afresh, they make a liquor for servants.

*Wines are also distinguished into*

Vin doux, or sweet Wine, which is that which has not yet worked nor boiled.

Bourou; that which has been prevented working by casting in cold water.

Wine of the cuve, or worked Wine, i. e. that which has been let to work in the vat to give it a colour.

Vin cuit, i. e. boiled Wine; that which has had a boiling before it worked, and which, by that means, still retains its native sweetness.

Vin passé, i. e. strained Wine; that which is made by steeping dry Grapes in water, and letting it ferment of itself.

The goodness of Wine consists in its being neat, dry, clear, fine, brisk, without any taste of the soil, of a clean steady colour; in its having a strength, without being heady, a body without being sour, and its keeping without growing hard.

After Wines have been made, they require to be managed according to their different state and circumstances. We shall therefore consider them under these four general heads following:

1. The natural purification or clarification of Wines, whereby, of themselves, they pass from the state of crudity and turbulency, to that of maturity, by degrees growing clear, fine, and potable.

2. The unseasonable workings, frettings, and other sicknesses, to which, from either internal or external accidents, they are afterward subject.

3. Their state of declination or decay, wherein they degenerate from their goodness and pleasantness, becoming palled, or turning into vinegar.

4. The several artifices used to them, in each of these states and conditions. As to the first, viz. the natural clarification of new Wines, two things occur, which deserve consideration; the manner how, and the cause by which the same is effected.

As for the manner, it is to be observed, that Wine, while yet in the must, is usually put into open vessels, the abundance and force of the spirits, i. e. the more subtile and active parts therein contained, being then so great as not to endure being imprisoned in close ones; at which time it appears troubled, thick, and feculent, all parts of it being violently moved and agitated, so that the whole mass of the liquor seems to boil like water in a cauldron over the fire.

This tumult being in ſome degree compoſed, and the gas ſylveſtre (as Van Helmont calls it,) or wilder ſpirit ſufficiently evaporated, they then pour the muſt into cloſe veſſels, there to be farther defecated by continuance of the ſame motion of fermentation, reſerving the froſt or flower of it, and putting the ſame into ſmall caſks hooped with iron, leſt otherwiſe the force of it might break them.

This flower thus ſeparated, is what they call ſtum, either by tranſpoſition of the letters in the word muſt, or from the word ſtum, which in High Dutch ſignifies mute, becauſe this liquor (as one may ſay,) is hindered from that maturity, by which it ſhould ſpeak its goodneſs and wholeſomeneſs.

This being done, they leave the reſt of the Wine to finiſh its own fermentation, during which it is probable that the ſpirituous parts impel and diffuſe the groſſer and feculent parts up and down in a confuſed and tumultuous manner, until, all being diſpoſed in their proper regions, the liquor becomes more pure in ſubſtance, more tranſparent to the eye, more piquant and guſtful to the palate, more agreeable to the ſtomach, and more nutritive to the body.

The impurities being thus ſeparated from the liquor, are upon chemical examinations, found to conſiſt of ſalts, ſulphur (each of which is impregnated with ſome ſpirits,) and much earth, which being now diſſociated from the pureſt ſpirits, either mutually cohere, coagulate, and affix themſelves to the ſides of the veſſels in form of a ſtony cruſt, which is called tartar and argol, or ſink to the bottom in a muddy ſubſtance, like the grounds of ale or beer, which is called the lees of Wine. And this is the proceſs of nature, in the clarification of all Wines, by an orderly fermentation.

As for the principal agent, or efficient cauſe of this operation, it ſeems to be no other but the ſpirit of the Wine itſelf, which moving every way in the maſs of the liquor, thereby diſſolves that common tye of mixture, whereby all the heterogeneous parts thereof were combined and blended together; and having gotten itſelf free, at length abandons them to the tendency of their gravity, and other properties, which, they ſoon obeying, each kind conſorts with its like, and betaking themſelves to their ſeveral places or regions, leave the liquor to the poſſeſſion and government of its nobleſt principle, the ſpirit. For this ſpirit, as it is the life of the Wine, doubtleſs it is alſo the cauſe of its purity and vigour, in which the perfection of that life ſeems to conſiſt.

From the natural fermentation of the Wines, we paſs to the accidental; from their ſtate of ſoundneſs, to that of their ſickneſs, which is the ſecond general head.

We have the teſtimony of experience, that frequently even thoſe Wines that are good and generous, are invaded by unnatural and ſickly commotions, or (as the Wine coopers call them) workings; during which they are turbulent in motion, thick of conſiſtence, unſavoury in taſte, unwholeſome in uſe, and, after which, they undergo ſundry alterations for the worſe.

The cauſes of this may be either internal or external.

Among the internal, the chief place may be aſſigned to the exceſſive quantity of tartar, or of lees, which contain much ſalt and ſulphur, and continually ſend forth into the liquor abundance of quick and active particles, that like ſtum, or other adventitious ferment, put it into a freſh tumult or confuſion, which, if not in time allayed, the Wine either grows rank or pricking, or elſe turns ſour, by reaſon that the ſulphur being too much exalted above the reſt of the elements or ingredients, predominates over the pure ſpirits, and affects the whole maſs of liquor with ſharpneſs or acidity; or elſe it comes to paſs, that the ſpirits being ſpent and flown away in the commotion, the ſalt, diſſolved and ſet afloat, obtains the maſtery over the other ſimilar parts, and introduceth rankneſs or ropineſs.

Nay, if thoſe commotions chance to be ſuppreſſed before, the Wine is thereby much depraved, yet do they always leave ſuch ill impreſſions, as more or leſs alienate Wine from the goodneſs of its former ſtate, in colour, conſiſtence, and taſte.

For hereby all Wines acquire a deeper tincture, i. e. a thicker body or conſiſtence; ſacks and white Wines changing from a clear white to a cloudy yellow; and claret loſing its bright red for a duſkiſh Orange colour, and ſometimes for a tawney. In like manner they degenerate alſo in taſte, and affect the palate with foulneſs, roughneſs, and rancidity, very unpleaſant.

Among the external are commonly reckoned the too frequent or violent motion of Wines, after their ſettlement in their veſſels; immoderate heat, thunder, or the report of cannon, and the admixture of any exotic body, which will not ſymbolize or agree, and incorporate with them; eſpecially the fleſh of vipers, which has been frequently obſerved to induce a very great acidity upon even the ſweeteſt and fulleſt-bodied Malaga and Canary Wines.

This brings us, in the next place, to the third previous thing conſiderable; viz. the palling or flatting of Wines, and their declining towards vinegar, before they have attained to their ſtate of maturity and perfection.

Of this the greateſt and neareſt cauſe ſeems to be their jejuneneſs and poverty of ſpirits, either native or adventitious:

Native, when the Grapes themſelves are of a poor and hungry kind, or gathered unripe, or nipt by early froſts, or half ſtarved in their growth, by a dry and unkindly ſeaſon, or too full of watery parts:

Adventitious, when the liquor, rich perhaps, and generous enough at firſt, comes afterwards to be impoveriſhed by loſs of ſpirits, either by oppreſſion, or by exhauſtion.

The ſpirits of Wine may be oppreſſed, when the quantity of impurities or dregs, with which they are combined, is ſo great, and their crudity, viſcoſity, and tenacity, ſo ſtubborn, that they can neither overcome them, nor deliver them from the adheſion; but are forced to yield to the obſtinacy of the matter on which they ſhould operate, and ſo to remain unactive and clogged, as may be exemplified in the coarſe Wines of Moravia, which, by reaſon of their great auſterity and roughneſs, ſeldom attain to a due exaltation of their ſpirits, but ſtill remain turbulent, thick, and in a ſtate of crudity, and therefore eaſy pall; in which reſpect they are condemned by ſome German phyſicians, as bad for generating the ſcurvy, and adminiſtering matter for the ſtone and gout, they yielding more of the tartar than other Wines.

The ſpirits of Wine may be exhauſted or conſumed, either ſuddenly or gradually; ſuddenly, by lightning, which ſpoils Wine, not by congelation or fixation of its ſpirits; for then ſuch Wines might be capable of being reſtored by ſuch means as are apt to reinforce and volatilize the ſpirits again, contrary to what hath been found by experience; but perhaps by diſgregation, and putting them to flight, ſo as to leave the liquor dead, palled, and never to be revived by any ſupply.

Gradually, two ways; viz. by unnatural fermentation; of the ill effects of which, ſomething has been already ſaid; or by heat from without; of which we have an inſtance in the making of vinegar, which commonly is done by ſetting the veſſels of Wine againſt the hot ſun, which, beating upon the maſs of liquor, and rarefying the finer parts thereof, gives wings to the fugitive ſpirits to fly away together with the purer and more volatile ſulphur, leaving the remainder to the dominion of the ſalt, which ſoon debaſeth and infecteth it with ſourneſs.

This being the common manner of turning Wine into vinegar, in all ages, and in all countries, it may be doubted, whether ſpirit of Wine may be drawn out of vinegar, notwithſtanding it hath been delivered as practicable by Sennertus himſelf.

The times of the year when Wines are obſerved to be moſt prone to ferment and fret, and then to grow qually (as it is called,) that is, turbulent and foul, are Midſummer and Allhallowtide, when our vintners are wont to rack them from their groſs lees, eſpecially Rheniſh, which commonly grows ſick in June, if not racked; and they chuſe to do it in the wane of the moon, and fair weather, the wind being northerly.

Having thus ſuccinctly recounted the moſt remarkable diſtempers of Wines, gueſſed at their reſpective cauſes, and touched upon the times, it is proper to proceed to their uſual remedies; ſuch, at leaſt, as may be collected from Wine coopers and vintners; which is the fourth and laſt part propoſed to be treated of.

To begin therefore with ſome of the artifices uſed to Wines when yet in muſt; it is obſervable, that tho', to raiſing a fermentation in them at that time, there is not ſo much need of any additional ferment, as there is in the wort of ale, beer, hydromel, metheglin, and other ſorts of drinks, familiar to us in England; becauſe the juice of the Grape is repleniſhed with generous ſpirits, ſufficient of themſelves to begin that work; yet it is uſual in ſome countries to put quick lime either upon the Grapes, when they are preſſing, or into the muſt; to the end that, by the force and quickneſs of its ſaline and fiery particles, the liquor may be both accelerated and aſſiſted in the working.

For the ſame reaſon perhaps, it is, that the Spaniards mix with their Wines, while they are yet flowing from the preſs, a certain thing they call gieſſo, which probably is a kind of gypſum or plaiſter, whereby the Wines are made more durable, of a paler colour, and pleaſanter taſte; others put into the caſk ſhavings of Fir, Oak, or Beech, for the ſame purpoſe.

Again; though the firſt fermentation ſucceeds generally well, ſo that the whole maſs of liquor is thereby delivered from the groſs lee; yet ſometimes it happens either through ſcarcity of ſpirits at firſt, or through immoderate cold, that ſome part of thoſe impurities remain confuſed and floating therein.

Now, in this caſe, Wine coopers put into the Wine certain things to haſten and help its clarification; ſuch as being of groſs and viſcous parts, may adhere to the floating lee, and ſinking, carry it with them to the bottom; of which ſort are iſinglaſs, and the whites of eggs, or ſuch as, meeting with the groſſer and earthy particles of the lee, diſſociate and ſink them by their gravity; of which kind are the powders of alabaſter, calcined flints, white marble, roche allum, &c.

The Grecians, at this day, have a peculiar way of ſpurring nature, in fining and ripening the ſtrongeſt and moſt generous Wines; and this is done by adding to them, when they begin to work, a proportionate quantity of ſulphur and allum; not (as is very probable) to prevent their fuming up to the head, and inebriating, according to the conjecture of that great man, the Lord St. Albans; for, notwithſtanding this mixture, they cauſe drunkenneſs as ſoon, if not ſooner than other Wines; nor are men intoxicated with the vapours of Wine flying up immediately from the ſtomach into the brain; but only to excite and promote fermentation, and haſten their clarification that enſues thereupon; the ſulphur perhaps helping to attenuate and divide thoſe groſs and viſcid parts, wherewith Greek Wine abounds, and the allum conducing to the ſpeedier precipitation of them afterwards. And a learned traveller relates, that ſome merchants put into every pipe of their Greek Wine a jill, or thereabouts, of the chemical oil of ſulphur, in order to preſerve it the longer clear and ſound:

Which, though it is very probable, becauſe the ſulphur is known to reſiſt putrefaction in liquors, yet one would decline the uſe of Wines ſo preſerved, unleſs in time of peſtilential infection.

But of all ways of the haſtening the clarification and ripening of Wine, none ſeems to be more eaſy, or leſs noxious, than that borrowed from one of the ancients by the Lord Chancellor Bacon; which is, by putting the Wine into veſſels well ſtopped, and letting it down into the ſea.

That this practice was very ancient, is manifeſt from that diſcourſe of Plutarch, Quæſt. Natur. 27. about the efficacy of cold upon muſt, whereof he gives this reaſon, That cold, not ſuffering the muſt to ferment, by ſuppreſſing the activity of the ſpirits therein contained, conſerveth the ſweetneſs thereof a long time; which is not improbable; becauſe experience teaches, that ſuch as make their vintage in a rainy ſeaſon, cannot get their muſt to ferment well in a vault, unleſs they cauſe great fires to be made near the caſks; the rain mixed with the muſt, together with the ambient cold, hindering the motion of fermentation, which ariſes chiefly from heat.

That the ſame is frequent at this day alſo, may be collected from what Mr. Boyle has obſerved in his Hiſtory of Cold, on the relation of a Frenchman; viz. that the way to keep Wine long in the muſt (in which the ſweetneſs makes many to deſire it) is, to tun it up immediately from the preſs; and before it begins to work, to let down the veſſels, cloſely and firmly ſtopped, into a well, or deep river, there to remain for ſix or eight weeks; during which time the liquor will be ſo confirmed in its ſtate of crudity, as to retain the ſame, together with its ſweetneſs, for many months after, without any ſenſible fermentation.

But it may be objected, How can theſe two ſo different effects, the clarification of new Wine, and the conſervation of Wine in the muſt, be derived from one and the ſame cauſe, the cold of the Water?

But this may be conceived without much difficulty; for it ſeems not unreaſonable, that the ſame cold which hinders muſt from fermenting, ſhould yet accelerate and promote the clarification of Wine after fermentation; in the firſt, by giving a check to the ſpirit before it begins to move and act upon the crude maſs of liquor, ſo that it cannot in a long time after recover ſtrength enough to work; in the latter, by keeping in the pure and genuine ſpirit, otherwiſe apt to exhale; and rendering the flying lee more prone to ſubſide, and ſo making the Wine much ſooner clear, fine, and potable. Thus much concerning the helps of new Wine.

The general and principal remedy for the preternatural or ſickly commotions incident to Wines after their firſt clarification, and tending to their impoveriſhment or decay, is racking, i. e. drawing them from their lees into freſh veſſels.

Which yet being ſometimes inſufficient to preſerve them, vintners find it neceſſary to pour into them a large quantity of new milk, as well to blunt the ſharpneſs of the ſulphureous parts now ſet afloat and exalted, as to precipitate them, and other impurities, to the bottom by adheſion.

But, taught by experience, that by this means the genuine ſpirits of the Wine alſo are much flatted and impaired, (for the lee, though it makes the liquor turbid, doth yet keep the Wine in heart, and conduce to its duration;) therefore, leſt ſuch Wines ſhould pall and die upon their hands, as of neceſſity they muſt, they draw them for ſale as faſt as they can vend them.

For the ſame diſeaſe they have divers other remedies, particularly accommodated to the nature of the Wine that needs them: to inſtance a few;

For Spaniſh Wines diſturbed by a flying lee, they have this receipt: Make a parell (as they call it) of the whites of eggs, bay ſalt, milk, and conduit water; beat them well together in a convenient veſſel, then pour them into a pipe of Wine (having firſt drawn out a gallon or two to make room,) and blow off the froth very clean; hereby the tumult will in two or three days be compoſed, the liquor refined, and drink pleaſantly, but will not continue to do ſo long; and therefore they adviſe to rack it from the milky bottom, after a week's ſettlement, leſt otherwiſe it ſhould drink foul, and change colour.

If

If sacks or Canary Wines chance to boil over, draw off four or five gallons; then putting into the Wine two gallons of milk, from which the cream hath been skimmed, beat them till they are thoroughly mixed together, and add a pennyworth of roche allum, dried in a fire-shovel, and powdered, and as much of white starch; after this take the white of eight or ten eggs, a handful of bay salt, and having beaten them together in a tray, put them also into the Wine, filling up the pipe again, and letting the Wine stand two or three days; in which time the Wine will recover to be fine and bright to the eye, and quick to the taste; but you must be sure to draw it off that bottom very soon, and spend it as fast as you can.

For claret, in like manner distempered with a flying lee, they make use of this artifice:

They take two pounds of the powder of pebble stones, baked in an oven, the whites of ten or twelve eggs, a handful of bay salt; and having beaten them well together in two gallons of the Wine, they mix them with that in the cask, and after two or three days draw off the Wine from the bottom.

The same parell serves also for white Wines upon the fret, by the turbulency and rising of their lee.

To cure Rhenish of its fretting (to which it is most prone a little after Midsummer, as was before observed,) they seldom use any other art but giving it vent, and covering the Oaken bung with a tile or slate, from which they carefully wipe off the filth purged from the Wine by exhalations; and after the commotion is by this means composed, and much of the fretting matter cast forth, they let it remain quiet for a fortnight, or thereabouts, and then rack in into a fresh cask, newly fumed with a sulphurated match.

As for the various accidents that frequently ensue, and vitiate Wine (after those before-mentioned reboilings, notwithstanding their suppression before they were incurable;) you may remember they have all been referred to such as alter and deprave Wines, either in colour or consistence, or taste, or smell. Now for each of these maladies our vintners are provided of a cure.

To restore Spanish and Austrian Wines grown yellow or brownish, they add to them sometimes milk alone, and sometimes milk and isinglass well dissolved therein; sometimes milk and white starch; by which they force the exalted sulphur to separate from the liquor, and sink to the bottom; so reducing the Wine to its former clearness and whiteness.

The same effect they produce with a composition of Iris roots and salt-petre, of each four or five ounces, the whites of eight or ten eggs, and a competent quantity of common salt, mixed and beaten in the Wine.

To amend claret decayed in colour, first they rack it upon a fresh lee, either of Alicant or red Bourdeaux Wine; then they take three pounds of Turnsole, and steep it all night in two or three gallons of the same Wine; and having strained the infusion thro' a bag, they pour the tincture into a hogshead (sometimes they suffer it first to fine itself in a rundlet,) and then cover the bung-hole with a tile, and so let it stand for two or three days, in which time the Wine usually becomes well-coloured and bright.

Some fuse only the tincture of Turnsole.

Others take half a bushel of full ripe Elder-berries, pick them from their stalks, bruise them, and put the strained juice into a hogshead of discoloured claret, and so make it drink brisk, and appear bright.

Others, if the claret be otherwise sound, and the lee good, overdraw three or four gallons; then replenish the vessel with as much good red Wine, and roll it upon its bed, leaving it reversed all night; and then next morning they turn it again, so as the bung-hole may be uppermost; which stopped, they leave the Wine to fine.

But in all these cases they observe to set such newly recovered Wines abroach the very next day after they are fined, and to draw them for sale speedily.

To correct Wines faulty in consistence, i. e. such as are lumpish, foul, or ropy;

They generally make use of the powders of burnt allum, lime chalk plaister, Spanish white, calcined marble, bay salt, and other the like bodies, which cause a precipitation of the gross and viscid parts of the Wine then afloat: as for example;

For attenuation of Spanish Wines that are foul and lumpish, having first racked them into a newly scented cask, they make a parell of burnt allum, bay salt, and conduit water; then they add to these a quart of Bean flour, or powder of Rice; and if the Wine be brown and dusky, milk, otherwise not; and beating all these well together with the Wine, blow off the froth, and cover the bung with a clean tile or stone. Lastly, they rack the Wine again after a few days, and put it into a cask well scented.

The manner of scenting casks is as follows:

They take four ounces of brimstone, one ounce of burnt allum, and two ounces of aqua vitæ; these may be put together in an earthen pan or pipkin, and hold them over a chafing-dish of glowing coals, till the brimstone is melted and runs; then they dip therein a little piece of new canvas, and instantly sprinkle thereon the powders of Nutmegs, Cloves, Coriander, and Anise-seeds. This canvas they fire, and let it burn out in the bung-hole, so as the fume may be received into the vessel; and this is said to be the best scent for all Wines.

To prevent the foulness and ropiness of Wines, the old Romans used to mix sea water with their must.

To cure the ropiness of claret, the vintners, as well French as English, have many remedies; of which these that follow are the most usual:

First they give the Wine the parell, then draw it from the lee, after the clarification by that parell; this done, they infuse two pounds of Tournsole in good sack all night; and the next day, putting the strained infusion into a hogshead of Wine with a spring funnel, leave it to fine, and after draw it for excellent Wine.

Another is this: they make a lee of the ashes of Vine branches, or of Oaken leaves, and pour it into the Wine hot, and after stirring, leave it to settle; the quantity of a quart of lee to a pipe of Wine.

A third is only spirit of Wine; which, put into a muddy claret, serves to the refining it effectually and speedily; the proportion being a pint of spirit to a hogshead; but this is not to be used in sharp and eager Wines.

When white Wines grow foul and tawny, they only rack them on a fresh lee, and give them time to fine.

For the mending of Wines that offend in taste, vintners have few other correctives, but what conduce to clarification; nor do they indeed much need variety in the case, seeing all unsavouriness of Wines whatever proceeds from their impurities set afloat, and the dominion of others, their sulphureous or saline parts, over the finer and sweeter; which causes are removed chiefly by precipitation.

For all clarification of liquors may be referred to one of these three causes:

1. Separation of the grosser parts of the liquor from the finer.

2. The equal distribution of the spirits of the liquor, which always renders bodies clear and untroubled.

3. The refining of the spirit itself.

And the two latter are consequents of the first, which is effected chiefly by precipitation, the instruments whereof are weight and viscosity of the body mixed with it; the one causing it to cleave to the gross parts of the liquor flying up and down in it, the other sinking them to the bottom.

But this being more than vintners commonly understand, they rest not in clarification alone, having found out certain specifics, as it were, to palliate the several vices of Wines of all sorts, which make them disgustful. Of these I shall recite two or three of the greatest use and esteem amongst them.

To

To correct rankness, eagerness, and pricking of sacks, and other sweet Wines, they take twenty or thirty of the whitest lime stones, and slack them in a gallon of the Wine; then they add some more Wine and stir them together in a half tub, with a parelling staff; next they pour this mixture into the hogshead, and having again used the parelling instrument, leave the Wine to settle, and then rack it.

This Wine may probably be no ill drink for gross bodies, and rheumatic pains; but injurious to good fellows of a hot and dry constitution, and meagre habits.

Against the pricking of French Wines they prescribe this easy and cheap composition: take of the powder of Flanders tile one pound, of roche allum half a pound; mix them and beat them well, with a convenient quantity of Wine; then put them into the hogshead, as the former.

When their Rhenish Wines prick, they first rack them off into a clean and strongly-scented cask or vat, then they add to the Wine eight or ten gallons of clarified honey, with a gallon or two of skim-milk; and beating all together, leave them to settle.

Sometimes it happens, that claret loses much of its briskness and piquantness; and in such case they rack it upon a good lee of red Wine, and put into it a gallon of Sloes or Bullace, which, after a little fermentation and rest, makes the Wine drink brisk and rough.

To meliorate the taste of hungry and too eager white Wines; they draw off three or four gallons of it, and infusing therein as many pounds of Malaga Raisins stoned, and bruised in a stone mortar, till the Wine has sufficiently imbibed their sweetness and tincture (which it will do in a day's time,) they run it through an hippocras bag; then put it into a fresh cask well scented, together with the whole remainder of the Wine in the hogshead, and so leave it to fine.

To help stinking Wines, the general remedy is racking them from their old and corrupt lee; besides which, some give them a fragrant smell or flavour, by hanging in them little bags of spices, such as Ginger, Zedoary, Cloves, Cinnamon, Orris-roots, Cubebs, Grains of Paradise, Spikenard, and other aromatics.

Others boil some of these spices in a pottle of good sound Wine of the same sort, and tun up the decoction hot.

Others correct the ill savour of rank-leed French Wine with only a few Cinnamon canes hung in them.

Others again, for the same purpose, use Elder flowers and tops of Lavender.

Having thus run over the vintners dispensatory, and described many of their principal receipts or secrets, for the cure of the acute diseases of Wine, we shall come to the fourth head, which contains medicaments proper for their chronic distempers; viz. loss of spirits, and decay of strength.

Concerning these, therefore, it is observable, that as when Wines are in preternatural commotions, from an excess and predomination of their sulphureous parts, the grand medicine is, to rack them from their lees, so on the contrary, when they decline, and tend towards palling, by reason of the scarcity of their spirits and sulphur, the most effectual preservative is to rack them upon other lees, richer and stronger than their own; that being from thence supplied with the new spirits, they may acquire somewhat more of vigour and quickness.

I say, preservative; because there is, in truth, no restoring of Wines after they are perfectly palled and dead, for nothing that is past perfection, and hath run its natural race once, can receive much amendment.

But besides reinforcing of impoverished Wines, by new and more generous lees, there are sundry confections, by which also, as by cordials, the languishing spirits of many of them may be sustained, and, to some degree, recruited, of which the following examples.

When sacks begin to languish (which doth not often happen, especially in this city, where it is drank in plenty;) they refresh them with a cordial syrup, made of most generous Wine, sugar, and spices.

For Rhenish and white Wines, a simple decoction of Raisins of the sun, and a strong-scented cask, usually serve the turn.

For claret inclining to a consumption, they prescribe a new and richer lee, and the shavings of Fir wood, that the spirit being recruited by the additional lee, may be kept from exhaling by the unctuous spirit of the turpentine.

This artifice is used in Paris in the most delicate and thin-bodied Wines in France, and is very probably the cause of that exceeding dulness and pain of the head, which always attends debauches with such Wines.

Nor is it a modern invention, but well known to, and frequently used by the Romans, in the time of their greatest wealth and luxury; for Pliny (Hist. Nat. lib. 14. cap. 2.) takes singular notice of the custom of the Italian vintners, in mixing with their Wines turpentine of several sorts.

The Grecians long before had their Vina Picata and Resinata, as is evident by the commendation of such Wines by Plutarch, and the prescription of them to women, in some cases by Hippocrates, and they were so much delighted with their Vinum Pissites, that they consecrated the Pitch-tree to Bacchus; but I shall next take some notice of the more disingenuous practices of vintners in the transmutation or sophistication, which they call trickings or compassings.

They transform poor Rochelle and Cogniac white Wines into Rhenish; Rhenish into sack; the lags of sack and malmseys into muscadels.

They counterfeit Raspie Wine with Fleur-de-lys roots; Verdea with decoctions of Raisins; they sell decayed Xeres, vulgarly Sherry, for Lusenna Wine; in all these impostures deluding the palate so nearly, that few are able to discern the fraud, and keeping these Arcana so close, that few can come to the knowledge of them.

As for their metamorphosis of white into claret, by dashing it with red, nothing is more commonly either done or known.

For their conversion of white into Rhenish, they have several artifices to effect it, among which this is the most usual:

They take a hogshead of Rochelle, or Cogniac, or Nantz white Wine; rack it into a fresh cask strongly scented, then give it the white parell; put into it eight or ten gallons of clarified honey, or forty pounds of coarse sugar, and, beating it well, leave it to clarify.

To give this mixture a delicate flavour, they sometimes add the decoction of the yellow Clary flowers, or Galitricum, of which drugs there is an incredible quantity used every year at Dort, where the staple of Rhenish Wines was; and this is that drink with which the English ladies were wont to be so delighted, under the specious name of Rhenish in the must.

The manner of making adulterate bastard is thus:

Take four gallons of white Wine, three gallons of old Canary, five pounds of bastard syrup; beat them well together, put them into a clean rundlet well scented, and give them time to fine.

Sack is made of Rhenish, either by a strong decoction of Malaga Raisins, or by a syrup of sack, sugar, and spices.

Muscadel is sophisticated with the lags of sack or malmsey thus:

They dissolve it in a convenient quantity of Rose water, of musk two ounces, of calamus aromaticus powdered one ounce, of Coriander beaten half an ounce; and while this infusion is yet warm, they put it into a rundlet of old sack or malmsey, and this they call a flavour for muscadel.

There are many other ways of adulterating Wines in this city; but because they all tend to the abovementioned alterations, and are not so general, I shall pass

pass them over, and mention the observations of a certain curious author on this subject.

The mystery of Wines consists in the making and meliorating of natural Wines.

Melioration is either of sound or vicious Wines. Sound Wines are bettered,

1. By preserving.
2. By timely fining.
3. By mending colour, smell, or taste.

1. To preserve Wines, care must be taken, that after the pressing they may ferment well; for without good fermentation they become qually, i. e. cloudy, thick, and dusky, and will never fine themselves, as other Wines do; and when they are fined by art they must be speedily spent, or else they will become qually again, and then will not be recoverable by any art.

To preserve Spanish Wines, and chiefly Canary, and therefore principally that which is razie, which will not keep long, they make a layer of Grapes and Giesse, whereby it acquires a better durance and taste, and a white colour, most pleasing to the English.

Razie Wine is so called, because it comes from Rhenish Vine cuttings, sometimes renewed. The Grapes of this Vine are fleshy, yielding but a little juice.

The French and Rhenish Wines are chiefly and commonly preserved by the match, thus used at Dordt in Holland:

They take twenty or thirty pounds of brimstone, rack into it melted, as Cloves, Cinnamon, Mace, Ginger, and Coriander-seeds; and some, to save charges, use the reliques of the Hippocras bag, and, having mixed these well with the brimstone, they draw through this mixture, long, square, narrow pieces of canvas, which pieces they light, and put into the vessel at the bung-hole, and presently stop it close: great care is to be had in proportioning the brimstone to the quantity and quality of the Wine, for too much makes it rough. This smoking keeps the Wine long white and good, and gives it a pleasant taste.

There is another way for French and Rhenish Wines, viz. firing it. It is done in a stove, or else a good fire made round about the vessel, which will gape wide, yet the Wine never runs out. It will boil, and afterwards may soon be racked.

Secondly, for timely fining of Wines. All Wines in the must are more opacous and cloudy. Good Wine soon fines, and the gross settle quickly, and also the flying lee in time. When the grosser lees are settled, they draw off the Wine; this is called racking. The usual times for racking are Midsummer and Allhallowtide.

The practice of the Dutch and English to rid the Wine of the flying lees speedily, and which serves most for French and Spanish Wine is thus performed:

Take of isinglass half a pound; steep it in half a pint of the hardest French Wine that can be got, so that the Wine may fully cover it; let them stand twenty-four hours; then pull and beat the isinglass to pieces, and add more Wine; four times a day squeeze it to a jelly, and as it thickens add more Wine. When it is full, and perfectly jellied, take a pint or quart to a hogshead, and so proportionably; then overdraw three or four gallons of that Wine you intend to fine, which mix well with the said quantity of jelly; then put this mixture to the piece of Wine, and beat it with a staff, and fill it top-full.

Note, That French Wines must be bunged up very close, but not the Spanish; and that isinglass raises the lees to the top of strong Wines, but, in weaker, precipitates them to the bottom.

They mend the colour of sound clarets by adding thereto red Wine, tent, or Alicant; or by an infusion of Turnsole, made in two or three gallons of Wine, and then putting it into the vessel, to be then (being well stopped) rolled for a quarter of an hour. This infusion is sometimes twice or three times repeated, according as more colour is to be added to the Wine; about three infusions of the Turnsole are sufficient; but then it must be rubbed and wringed.

Claret over-red is amended with the addition of white Wines.

White Wines coming over sound, but brown, are thus remedied:

Take of alabaster powder, overdraw the hogshead three or four gallons, then put this powder into the bung, and stir and beat it with a staff, and fill it top-full. The more the Wine is stirred, the finer it will come upon the lee, that is, the finer it will be.

To colour sack white: take of white starch two pounds, of milk two gallons, boil them together two hours; when cold, beat them well with a handful of white salt, and then put them into a clean but sweet butt, beating them with a staff, and the Wine will be pure and white.

One pound of the before-mentioned jelly of isinglass takes away the brownness of French and Spanish Wines, mixed with two or three gallons of Wine; according as it is brown and strong, more or less to be used. Then overdraw the piece of Wine about eight gallons, and use the rod; then fill the vessel full, and in a day or two it will be fine, and be white, and mend, if qually.

The first buds of Ribes nigra, i. e. black Currants, infused in Wines, especially Rhenish, make it diuretic, and more fragrant in smell and taste, and so doth Clary. The inconvenience is, that the Wine becomes more heady; a remedy for which is Elder-flowers added to the Clary, which also betters the fragrancy thereof, as it is manifest in Elder vinegar, but these flowers are apt to make the Wine ropy.

To help brown Malagas and Spanish Wines: take powder of Orris-roots and salt-petre, of each four ounces, the whites of eight eggs, to which and as much salt as will make a brine; put this mixture into Wine, and mix them with a staff.

To meliorate muddy and tawny clarets: take of rain water two pints, the yolks of eight eggs, salt a handful; beat them well, let them stand six hours before you put them into the cask; then use the rod, and in three days it will come to itself.

To amend the taste and smell of Malaga Wine: take of the best Almonds four pounds, make an emulsion of them with a sufficient quantity of the Wine to be cured; then take the whites and yolks of twelve eggs, beat them together with a handful of salt, put them into the pipe, using the rod.

To amend the smell and taste of French and Rhenish Wines, which are foul: take one pound of honey, a handful of Elder-flowers, an ounce of Orris-powder, one Nutmeg, a few Cloves to an auln of the Wine; boil them in a sufficient quantity of the Wine to be cured, to the consumption of half, and when it is cold, strain it, and use it with the rod; some add a little salt. If the Wine be sweet enough, add one pound of the spirits of Wine to a hogshead, and give the cask a strong scent. Spirit of Wine makes any Wine brisk, and fines it, without the former mixture.

A lee of the ashes of Vine branches, viz. a quart to a pipe, being beaten into Wine, cures the ropiness of it, and so infallibly doth a lee of Oaken ashes.

For Spanish ropy Wine: rack it from the lees into a new-scented cask, then take of allum one pound, of Orris-roots powdered half a pound; beat them well into the Wine with a staff; some add fine and well dried sand, put warm to the Wine. If the Wine besides prove brown, add three pottles of milk to a pipe: this cures ropy Wine, before it begins to fret.

To mend and preserve the colour of clarets: take red Beet-roots, q. s. scrape them clean, and cut them into small pieces; then boil them in q. s. of the same Wine, to the consumption of the third part; scum it well, and when cool, decant off what is clear, and use the rod.

Firing of Wines in Germany is thus performed: They have in some vaults three or four stoves, which they heat very hot; others make fires almost before every vat; by this means the must fermenteth with that vehemency, that the Wine appears between the staves; when this ebullition, fermentation, and

working ceaſe, they let the Wine ſtand ſome days, and then rack it. This firing is only uſed in cold years, when the Wine falls out green.

To ſet old Wine a fretting, being deadiſh, and dull of taſte: take of ſtum two gallons to a hogſhead, put it hot upon the Wine; then ſet a pan of fire before the hogſhead, which will then ferment till all the ſweetneſs of the ſtum is communicated to the Wine, which thereby becomes briſk and pleaſant.

Some uſe this ſtumming at any time; ſome in Auguſt only, when the Wine hath a diſpoſition to fret of itſelf, more or leſs ſtum to be added, as the Wine requires.

The beſt time to rack Wine is in the decreaſe of the moon, and when the Wine is free from fretting, the wind being at north-eaſt or north-weſt, and not at ſouth, the ſky ſerene, free from thunder and lightning.

Having thus given an account of the different practices of the vignerons, vintners, and Wine-coopers, in the management of their ſeveral Wines, I ſhall next offer a few things which have occurred to me from ſome obſervations and experiments, relating to the making of Wines in England.

The Grapes, being ripe, ſhould be cut when they are perfectly dry, and carried into a large dry room, where they muſt be ſpread upon Wheat ſtraw, in ſuch a manner as not to lie upon each other; in this place they may remain a fortnight, three weeks, or a month, according as there is conveniency, obſerving to let them have air every day, that the moiſture perſpired from the Grapes may be carried off. Then, having the preſſes and other things in order, you ſhould proceed in the following manner: firſt, all the Grapes ſhould be pulled off the bunches, and put into tubs, being careful to throw away ſuch as are mouldy, rotten, or not ripe, which, if mixed with the others, will ſpoil the Wine; and if the ſtalks of the bunches are preſſed with the Grapes, there will be an auſtere juice come from them, which will render the Wine acid and ſharp; this, I fear, has ſpoiled a great quantity of Wine which was made in England, which, if otherwiſe managed, might have proved very good; for we find in France, and other Wine countries, where perſons are deſirous of having good Wine, they always pick the Grapes from off the ſtalks before they are preſſed, though indeed the common vignerons, who have more regard to the quantity than quality of their Wines, do not practiſe this. But as in England we labour under the inclemency of climate, we ſhould omit nothing of art which may be neceſſary to help the want of ſun.

The Grapes, being thus carefully picked off, ſhould be well preſſed, and if it is deſigned for red Wine, the huſks and ſtones ſhould be put into the liquor, and if the ſeeds or ſtones of the Grapes are broken in the preſs, the Wine will have more ſtrength, which muſt be put into a large vat, where the whole ſhould ferment together five or ſix days; after which the Wine ſhould be drawn off, and put into large caſks, leaving the bung-hole open to give vent to the air which is generated by fermentation. But it muſt be remarked, that after the Wine is preſſed out, and put into the vat with the huſks, if it does not ferment in a day or two at moſt, it will be proper to add a little warmth to the room by fires, which will ſoon put it into motion; and for want of this it often happens, where people preſs their Wine, and leave it to ferment in open cold places, that the nights, being cold, check the fermentation, and ſo cauſe the Wine to be foul, and almoſt ever after upon the fret. This huſbandry is much practiſed upon the Rhine, where they always have ſtoves placed in the houſes where the Wine is fermented, wherein they keep fires every night, if the ſeaſon is cold, while the Wines are fermenting.

If white Wine is deſired, then the huſks of the Grapes ſhould not remain in the liquor above twelve hours, which will be long enough to ſet it a fermenting; and when it is drawn off, and put into other veſſels, it ſhould not remain there above two days before it is drawn off again; and this muſt be repeated three or four times, which will prevent its taking any tincture from the huſks in fermenting.

When the greateſt fermentation is over the Wine ſhould be drawn off into freſh caſks, which muſt be filled to the top, but the bung-hole ſhould be left open three weeks, or a month, to give vent to the generated air, and that the ſcum may run over; and as the Wine ſubſides in the caſks, they ſhould be carefully refilled with Wine of the ſame ſort from a ſtore caſk, which ſhould be provided for that purpoſe; but this muſt be done with much care, leſt, by haſtily refilling the caſks, the ſcum, which is naturally produced upon all new Wines ſhould be broken thereby, which will mix with the Wine, and foul it, cauſing it to take an ill taſte; therefore it would be proper to have a funnel, which ſhould have a plate at the ſmall end, bored full of little holes, that the Wine may paſs through in ſmall drops, which will prevent its breaking the ſcum.

After the Wine has remained in this ſtate a month or ſix weeks, it will be neceſſary to ſtop up the bung-hole, leſt, by expoſing it too much to the air, the Wine ſhould grow flat, and loſe much of its ſpirit and ſtrength; but it muſt not be quite ſtopped up, but rather ſhould have a pewter or glaſs tube, of about half an inch bore, and two feet long, placed in the middle of the bung-hole. The uſe of this tube is to let the air which is generated by the fermentation of the Wine paſs off, becauſe this, being of a rancid nature, would ſpoil the Wine, if it were pent up in the caſk; and in this tube there may always remain ſome Wine, to keep the caſk full as the Wine ſubſides; and, as it ſhall be neceſſary, the Wine in the tube may be eaſily repleniſhed. For want of rightly underſtanding this affair, a great qnantity of the choiceſt Wines of Italy, and other countries, have been loſt. A great complaint of this misfortune I received from a very curious gentleman in Italy, who ſays, "Such "is the nature of this country Wines in general, (nor "are the choiceſt Chianti's excepted), that at two "ſeaſons of the year, viz. the beginning of June and "September, the firſt when the Grapes are in flower, "and in the other when they begin to ripen, ſome of "the beſt Wines are apt to change, eſpecially at the "latter ſeaſon; not that they turn eager, but take a "moſt unpleaſant taſte, like that of a rotten Vine "leaf, which renders them not only unfit for drink-"ing, but alſo to make vinegar of, and is called the "ſettembrine. And what is moſt ſtrange is, that "one caſk drawn out of the ſame vat, ſhould be in-"fected, and another remain perfectly good, and yet "both have been kept in the ſame cellar.

"As this change happens not to Wines in flaſks, (tho' "that will turn eager), I am apt to attribute it to "ſome fault in refilling the caſk, which muſt always "be kept full, which, either by letting alone too "long, till the decreaſe be too great, and the ſcum "there naturally is on all Wines, thereby being too "much dilated, is ſubject to break, or elſe being "broken, by refilling the caſk, gives it that vile "taſte. But againſt this there is a very ſtrong ob-"jection, i. e. that this defect ſeizes the Wine only "at a particular ſeaſon, viz. September; over which "if it gets, it will keep good many years, ſo the "caſe is worthy the enquiry of naturaliſts, ſince it is "evident, that moſt Wines are more or leſs affected "with this diſtemper, during the firſt year after "making."

Upon receiving this information from Italy, I conſulted the Rev. Dr. Hales of Teddington, who was then making many experiments on fermenting liquors, and received from him the following curious ſolution of the cauſe of this change in Wine, which I ſent over to my friend in Italy, who has tried the experiment, and it has accordingly anſwered his expectation, in preſerving the Wine which was thus managed, perfectly good. He has alſo communicated the experiment to ſeveral vignerons in ſeveral parts of Italy, who

who are repeating the ſame, which take in Dr. Hales's words:
" From many experiments which I made the laſt ſummer, I find that all fermented liquors generate air in large quantities, during the time of their fermentation; for, from an experiment made on twelve cubic inches of Malaga Raiſins, put into eighteen cubic inches of water the beginning of March, there were 411 cubic inches of air generated by the middle of April; but afterwards, when the fermentation was over, it reſorbed a great quantity of this air; and from forty-two cubic inches of ale from the tun (which had fermented thirty-four hours before it was put into the bolt-head) had generated 639 cubic inches of air from the beginning of March to the middle of June; after which, it reſorbed thirty-two cubic inches of air; from whence it is plain, that fermented liquors generate air, during the time of their fermentation, but afterwards they are in an imbibing ſtate, which may perhaps account for the alteration of the nice Italian Wines; for Wine, during the firſt year after making, continues fermenting more or leſs, during which time a great quantity of air is generated, until the cold in September put a ſtop to it; after which it is in an imbibing ſtate. Now the air thus generated is of a rancid nature (as the Grotto del Cano), and will kill a living animal, if put into it. So that if, during the fermentation of the Wine, there are two quarts of this rancid air generated, which is cloſely pent up in the upper part of the veſſel, when the cold ſhall ſtop the fermentation, the Wine, by abſorbing this air, becomes foul, and acquires this rancid taſte; to prevent which, I would propoſe the following experiment:

" Suppoſe the veſſel A filled with Wine, in the bung-hole of this veſſel *b*, I would have a glaſs tube of two feet long, and about two inches bore, fixed with a pewter ſocket cloſely cemented, ſo as that there may be no vacuities on the ſides, and into this tube ſhould be another, of about half an inch bore, coſely fixed; the lower tube ſhould always be kept about half full of Wine, up to X, which will ſupply the veſſel as the Wine therein ſhall ſubſide; ſo that there will be no room left in the upper part of the veſſel to contain any generated air, which will paſs off through the upper ſmall tube, which muſt be always left open for this purpoſe; and the tube being ſmall, there will be no danger of letting in too much air to the Wine.
" As the Wine in the lower tube ſhall ſubſide, it may be refilled by introducing a ſlender funnel through the ſmall tube, down to the ſcum upon the ſurface of the Wine in the larger tube, ſo as to prevent its being broken by the Wine falling too violently upon it. This experiment, being tried with glaſs tubes, will give an opportunity to obſerve what impreſſion the different ſtates of the air have upon the Wine, by its riſing or falling in the tubes; and if it ſucceeds, it may be afterwards done by wooden or metal tubes, which will not be in danger of breaking."

This curious experiment, having ſucceeded wherever it has yet been tried, will be of great ſervice in the management of Wines, there being many uſeful hints to be taken from it, particularly with regard to fermenting Wines; for, ſince we find that Wines too long fermented (eſpecially thoſe which are produced in cool countries) ſeldom keep well, ſo, by letting them ſtand in a cool place, the fermentation will be checked, which is agreeable to the practice of the Champagnois, who keep the Wines in winter in cellars above ground; but when the weather grows warmer in ſpring, they then carry them down into their vaults, where they are cooler than in the cellars; and this method of removing their Wines from the cellars to the vaults, and back again into the cellars, as the ſeaſons of the year ſhall require, is found of great ſervice in preſerving the Wines in perfection; for theſe Wines, being weak, (when compared with thoſe produced in more ſouthern countries) have not body enough to maintain them, if they are permitted to ferment all the ſucceeding ſummer, which the heat of the ſeaſon will promote where the Wine is expoſed to its influence; and this ſurely muſt be worth the trial by thoſe who make Wine in this country, ſince it is the practice of the northern countries, which is the moſt proper for our imitation, and not that of the moſt ſouthern.

But after the Wine has paſſed its fermentation in the vat, and is drawn off into the caſks, it will require ſomething to feed upon; ſo that you ſhould always preſerve a few bunches of the beſt Grapes, which may be hung up in a warm dry room for that purpoſe, until there be occaſion for them; when they ſhould be picked off the ſtalks, and two or three good handfuls put into each caſk, according to their ſeveral ſizes; for want of this many times people make uſe of other things, which are by no means ſo proper for this purpoſe.

The vignerons of different countries do alſo put various ſorts of herbs into the vat when the Wine is fermenting, to give it different flavours. Thoſe of Provence make uſe of Sweet-marjoram, Balm, and other ſorts of aromatic herbs; and upon the Rhine they always put ſome handfuls of a peculiar kind of Clary into the vats, from whence ariſe the different flavours we obſerve in Wines, which, it is poſſible, were made in the ſame manner, and from the ſame ſorts of Grapes. How far this might be thought worth practiſing in England, a few experiments would inform us; though it is to be queſtioned, whether theſe herbs mend the Wine, becauſe it ſeems to obtain among the vignerons, purely to alter the flavour of their Wines, in order to render them agreeable to the palate of their particular cuſtomers; but, however this be, it is yet certain, that there is ſome art uſed to alter the flavour of the Wine in moſt of the different Wine countries of France; for it is the ſame ſort of Grape, which the curious always plant in Orleans, Champagne, and Burgundy; and how different theſe Wines are in their flavour and quality, every one who is acquainted with them, well knows; and this difference can never be effected by the ſituation of the places, ſince there is no very great difference in the heat of thoſe countries; nor do I believe their different ways of making the Wine can alter their flavour ſo much, eſpecially thoſe of Orleans and Burgundy, where there is little difference in their management; but in Champagne there is this difference from the reſt, that they always cut their Grapes in a morning, before the dew is gone off, or in cloudy weather; whereas, the vignerons of all the other places never cut any till they are perfectly dry; which may occaſion a great alteration in the Wine.

The method commonly practiſed to give the red colour to Wine, is to let it ferment a few days upon the ſkins, which they always obſerve to preſs two or three times, in order to make them diſcharge their contents; but where a deep-coloured rough Wine is deſired, there they put a quantity of a certain ſort of Grape, whoſe juice is red, into each vat; this is well known in England by the name of Claret Grape; the leaves of this Vine always change to a deep purple colour as the fruit ripens, and the Grapes are of a fine blue colour, with a flue over them like fine Plums; but the juice of them is very auſtere, eſpecially if they are not very ripe.

This red Wine will not require to be drawn off into caſks more than at firſt from the vat; for it may remain in the ſame veſſel until it is fit to bottle off, which, I think, ſhould not be done till the Wine is two or three years old; the greater quantity of Wine there is in each veſſel, the more force it will have, and ſo conſequently be in leſs danger of ſuffering from the injuries of weather, eſpecially if the before-mentioned method be practiſed; but where there are large quantities of Wine preſerved in cloſe vaults, people ſhould be very cautious how they at firſt enter them, after they have been

been ſhut up for ſome time; becauſe the air of this vault will become rancid from the mixture of generated air proceeding from the Wines, which has often killed people who have incautiouſly entered them.

*Of the concentration of Wines, and other fermented liquors, ſo as to reduce them in bulk, render them more unalterable and perfect, more durable, and fit for ſervice, carriage, and exportation, by Dr. Stahl; tranſlated by Dr. Shaw.*

Dr. Stahl treats this ſubject to the purpoſe following:

1. He obſerves, that Wines, and all fermented liquors, both before and after fermentation, conſiſt not of ſimilar parts, but heterogeneous ones connected together in one certain determinate order. Thus the action and eſſence of fermentation being a ſeparation and deſtruction of the former connexion of the ſubject, and tranſpoſing its parts anew, there muſt of neceſſity have been a kind of free and durable texture in the ſubject ſo disjoined, ſeparated, and new ranged.

2. For example; Grapes, being laid upon dry ſtraw in a cold place, will, for ſome time after they are ſeparated from the Vine, preſerve that texture which gives them their ſaline, unctuous, and ſlimy ſweetneſs, which the juice alſo retains after preſſing, and becomes a clear tranſparent muſt, without ſeparating itſelf into the heterogeneous parts, but continuing uniformly and evenly mixed, ſo as to preſerve the different matters it conſiſts of, intimately collected among themſelves. And in this firmly connected ſtate it may be kept for many months, if a caſk be perfectly filled therewith, and ſet in a cold place, as is evidently ſeen in ſtum.

3. Wine, in the preciſe, chemical, or philoſophical notion thereof, is a ſaline, clammy, oleaginous matter, diluted with a large proportion of water, whereby it is ſet at a diſtance from itſelf, or expanded; whilſt the ſaline parts are ſaturated with, and interſperſed among the ſubtile earthy ones, that make the ſlimineſs; and then together they imbibe, detain, entangle, and hold the groſſer oily parts; beſides which, there are other oily parts, vaſtly more ſubtile, that, by means of the highly attenuated portion adhering to them, remain as much connected with the water as the reſt, and theſe are what we call ſpirituous parts; but the connexion of them all together is ſo ſtrong and durable, that they move for a long time as one body, without ſeparating, if carefully preſerved.

4. But if the ſpirituous part be once drawn away, and ſeparated from the Wine by diſtillation, tho' it were immediately poured back, or reſtored to the remaining maſs from whence it came, and ever ſo finely ſhaken in again therewith, the whole by no means recovers its former taſte, odour, and durability, but turns to a confuſed turbid mixture of a different nauſeous taſte, unnatural ſmell, and approaches near to a vapidity.

5. Again; if an inflammable ſpirit, diſtilled from the ſame, or any other kind of Wine, be put to a parcel of Wine that was too ſaline, or not ſufficiently ſpirituous, the bare addition, or tumultuary admixture thereof, very far from giving the fine and intimate ſoftneſs of a good Wine, will rather manifeſt its own burning acrimony, and inodorous flavour, to the ſmell and taſte; and alſo add a nauſeous bitterneſs to the former tartneſs and auſterity.

6. So likewiſe any conſiderable heat, or even a degree of ſimmering or tepidity, will, by its inteſtine and ſubtile agitation, that barely diſturbs the exceeding fine ſpirituous parts, which are very ſuſceptible of the motion of heat, or disjoins them from the reſt, occaſioning an alteration of its taſte, tranſparency, and durability, as much as if the ſpirit had really been drawn off, and poured back again.

7. On the other hand, Wine kept in a cool vault, well ſecured from the external air will preſerve its texture entire in all the conſtituent parts, and be ſufficiently ſtrong for many years; as appears not only from old Wines, but other foreign fermented liquors, particularly thoſe of China, prepared from a decoction of Rice; which, being well cloſed down, and buried deep under ground, continue for a long ſeries of years rich, ſtrong, and generous, as the hiſtories of that country univerſally aſſure us.

8. The like is alſo to be underſtood of vinegar, after it has thrown off the ſuperabundant earthy parts, and many of the oily ones that preſided while it continued Wine; whence the ſaline ones now get the aſcendant, and, as it were, ſubdue and preſide over the ſpirituous; for good and perfect vinegar, being well ſtopped down, will continue pure and unaltered for a great length of time.

9. But if it be left open, ſo that its fine vapour exhales, or its more ſubtile part be drawn off from it, and again poured back; in either caſe its loſes its uniform conſiſtence, and particularly its durability, and now directly hurries into vapidity and corruption.

10. If, either by fraud or accident, a larger proportion of water comes to be mixed with Wine, than is abſolutely proper for its conſiſtence, and no way neceſſary or eſſential; this ſuperfluous water does not only deprave the taſte, and ſpoil the excellence of the Wine, but alſo renders it leſs durable; for humidity in general, and much more a ſuperfluous aqueous humidity, is the primary and reſtleſs inſtrument of all the changes by fermentation.

11. It may therefore, doubtleſs, be uſeful, and ſometimes very convenient to take away this ſuperfluous water from the other part, which ſtrictly and properly conſtitutes the Wine; but for the method that this may commodiouſly be done, he firſt examines thoſe propoſed by others for that purpoſe, and ſhews the difficulties and inſufficiencies, and afterwards propoſes an eaſy way of effecting the thing.

*The method of condenſing Wines by heat or evaporation.*

1. It will be found, by any perſon who ſhall make the experiment, that all fermented liquors labour with an over-proportion of water; and that, if a very conſiderable quantity of it were taken away, they would become not only more rich, but alſo more durable, provided ſo much humidity were ſtill retained as is juſt neceſſary to preſerve the vinous conſiſtence, keep the ſaline part fluid, and the ſlimy unctuous parts mixed in, and expanded along with the reſt.

2. But as an actual and truly ſaline matter abounds in Wine and vinegar, and that of an acid, auſtere, or tartareous kind, when the ſpirituous part is drawn away, the Wine becomes ſurpriſingly more auſtere; and when a large quantity of the watery part is ſeparated, this ſuperabundant, ſaline, tartareous matter coagulates into a cryſtalline form, and falls to the bottom, or ſtrikes to the ſides of the caſk; for the ſubtile oily matter, which makes the ſpirituous part in Wine, blunts and takes off from a tartareous acidity, in the ſame manner as the addition of rectified ſpirits of Wine blunts, ſheaths, and dulcifies, the corroſive and acid ſpirits of nitre, ſalt, and vitriol.

3. But this tartareous ſalt alſo abounding with an over-proportion of a groſs unctuous matter, cannot be diſſolved or diluted without a very large proportion of water; which being taken away, it preſently concretes into dry ſolid cryſtals, as is the known caſe of cremor tartar.

And hence proceeds the effect before obſerved, viz. that the acidity and roughneſs of the Wine manifeſt themſelves the more, when the Wine is deprived of its ſpirit.

And this is an experiment familiar in the kitchen, when Wine is burnt or uſed in ſauce; for boiling always gives it a much greater degree of auſterity.

4. And when this water is, even by diſtillation, plentifully drawn off from Wine, not of a terreſtrial and chalky, but of a tartareous nature, a beautiful tartar will be found to cryſtallize among the remaining maſs, and deſtroying thoſe properties thereof, which ought to be preſerved.

5. For, firſt, the ſpirituous part is the life of the Wine, and all fermented liquors; and not only keeps them together,

together, embalms the whole, and renders it durable, or not subject to corruption, but also, in great measure, gives them that aromatic, refreshing, and restorative virtue and effect they have upon the human body.

6. This inevitably proves the case, whenever Wine is evaporated or distilled, which constantly requires a degree of heat sufficient to convert water into vapour; whence the spirituous part, being much more volatile than the aqueous, flies off together with, or even before it, and thus leaves the Wine dissolved in its texture, and without its soul.

Upon which the remaining, saline, slimy, unctuous mass is so disturbed, as no longer to remain connected, but immediately turns thick and turbid, and afterwards runs impetuously into a kind of corruption, attended with vapidity and ropiness.

All which circumstances abundantly shew the method of exhalation to be absolutely unfit for condensing Wines, as it so many ways destroys the whole vinous texture and compages.

*Of the method of condensing Wines by percolation.*

1. That Wine, strictly and properly so called, is of a grosser and thicker body than water, or that the essential and truly constituent parts of Wine may be considered as separate and distinct from a superfluous and copious aquosity, appears a priori and a posteriori.

2. For, first, it is rational to conceive, that a matter consisting of a collection of saline, slimy, and unctuous parts, brought into one mass, should have a grosser consistence than pure and simple water.

3. And next, this grossness of the proper and essential particles of Wine manifests itself to the eye,

1. In those diseases of Wine, wherein they become viscous and ropy, when they not only lose their transparency, but may be drawn out and extended like a mucus; and do not, upon pouring out, then fall in drops, but run down in long ropy strings.

2. It appears again to the eye, in vinegar grown mothery, mucilaginous, and tough, so as sometimes to afford a dense skin, like leather; which cannot well be supposed to proceed from the water, but from the more proper and essential parts of the Wine it was made of.

3. But because these inspissations may possibly be attributed to some supernatural disorder of the Wine, we may add, that our method of concentration exhibits this grossness of parts to the eye, whilst the Wine remains in a perfect state, free from its superfluous aquosity; for here it appears much denser, and deeper in colour; less fluid, less thin, less transparent, and in every respect of a thicker and higher consistence.

4. Lastly, This is still more evident in malt liquors, which being concentrated in our manner, taste full and thick, almost like oil in the mouth, and pour out like that, or a thin syrup; being at the same time also heightened or concentrated in colour.

From the preceding phænomena it should seem natural, that these different parts of Wine, which vary so much in consistence and tenuity of matter, might be separated from each other by a commodious percolation: so that the aqueous parts, which appear the finest, should run through the pores of a proper strainer, and leave the grosser behind.

But the practice hereof is clogged with great difficulties; for,

First, those thin liquors, which have a manifest and copious saltness, as Wine has, are either so attenuated, and their gross part, however thick in comparison of water, is yet so subtile and penetrating in itself, as at the same time to pass the pores of any ordinary strainer; at least, such liquors will, along with their aqueous, transmit the finest and most delicate of all their parts, and leave the more sluggish, the truly grosser, or those most tending to ropiness, behind.

It must also be observed, that most kinds of Wine besides their genuine, substantial, rich, and essential part, have constantly joined with them some foreign, superfluous, and prevailing gummy or mucilaginous matter; which, the more it inviscates the nobler part, the thicker and grosser it actually becomes; whilst the other finer portion, which is not clogged with such a load, remains more penetrating and active.

And hence also the difficulty of condensing Wines by percolation is increased, as this subtile spirituous part passes the strainer along with the water.

A contrary difficulty attends the use of a close strainer, arising from the gross mucilaginous particles, either accidentally interspersed in the Wine, or cleaving to this and other fermented liquors, but especially malt-drinks; for these viscous, tenacious, and clammy particles presently clog and stop the pores of the strainer, and by that means hinder the thinner and more watery particles from getting away; and the natural tenacity and clamminess of liquors prepared from malt, honey, and the like, communicates in the manner of a mucilage, such a ropiness, even to the superfluous water, and diffuses and expands itself so much therein, that the water itself is thereby thickened, and rendered much less apt to flow.

A third difficulty attends this method by percolation, viz. that although it were possible to make the separation, yet the work would proceed so slow, that the more subtile, fine, brisk, volatile, and spirituous parts, which give the pungent taste and odour, might, in the mean time, exhale, and leave the remaining Wine flat and vapid; or if this inconvenience could be prevented, yet, in so tedious an operation, some prejudicial, fermentative operation would, in all probability happen.

And, after all, there would still remain a question, as to the matter to be used to the strainer; which they who have never made any experiment that way might little dream of.

For, as the common filters or strainers are generally made of paper, linen, or some kind of cloth, all these readily communicate and impress a foreign disagreeable taste to the liquor, especially to Wine if intended for condensation in this manner.

And it may seem surprising, that even a momentaneous passage of condensed Wine through the cleanest linen, will give it a remarkable and very disagreeable taste of the bag, that shall continue for many months. This happens in a much greater degree to condensed Wine, after the same manner as the highest rectified spirit or alcohol of Wine will, in many cases, perform a solution, immensely quicker, and more powerful than such a phlegmy spirit, though mixed but with a tenth proportion of water; for so our concentrated, or, as we may call it, our rectified Wine, being freed from its superfluous phlegm, has a more powerful, more immediate, and more intimate effect, upon the parts of the cloth and other bodies, by means of the concentration of its spirituous and saline parts, than when its efficacy is weakened by being diluted with water.

This method, however, by percolation, though no way sufficient to free the Wine of all its superfluous water, may yet be of some service, if applied with due regard to the difference there is between fermented liquor, especially in point of consistence; and therefore some faint or imperfect imitation of our method may be had by means of such paper filters, or other common strainers.

And, in this view, the common tavern trick, with a piece of list, when dextrously performed, might be of some service; for if a long, thick, woollen string be first soaked in water, and then one end of it plunged into Wine, whilst the other end hangs a great way down without the glass, it will, in an imperfect manner, draw away the water from the Wine.

But all these, and the like attempts, are trifling and useless, in comparison of our easy, expeditious, and perfect manner of effecting the thing; to which we next proceed.

*Of the method of condensing Wines, and other saline spirituous liquors, by cold.*

Having shewn above, what effect the motion of heat, and the action of fire, have upon all fermented liquors, and especially upon the finer parts of them, and more directly upon those of Wine; and how much they contribute to dissolve the intimate union of vinous fluids, and change their whole nature, which consists in that union, and connection; we pass on to the consideration of cold, which, being opposite to heat, may be supposed to have different effects; or at least, such as bettter suit the present purpose.

If any kind of Wine, but rather such as has never been adulterated, being in a considerable quantity, as that of a gallon or more, exposed to a sufficient degree of cold in frosty weather, or in any place where the ice continues all the year, and so be brought to freeze; the superfluous water contained in the Wine will be turned to ice, and leave the proper, and truly essential part unfrozen, unless the degree of cold should be very intense, or the Wine but weak and poor.

When the frost is moderate, the experiment has no difficuly; because in that case, not above a third or fourth part of the superfluous water will be frozen in a whole night; but if the cold be very intense, the best way is, at the end of a few hours, when a tolerable quantity is formed, to pour out the remaining liquor, and expose it to freeze afresh by itself. And

1. Because, when the quantity of ice grows large, more of the concentrated Wine will be apt to hang and lodge in it.

2. Because it would otherwise require a longer time to drain away from the ice.

If the vessel that thus by degrees receives the several parcels of condensed Wine, be suffered to stand in the cold freezing place where the operation is performed, the quantity lying thin, in pouring out, or otherwise, will be very apt to freeze anew; and if it be set in a warm place, some of this aqueous part thaws again, and so weakens the rest.

The condensed Wine therefore should be emptied in some place of a moderate temper, as to cold and heat; where neither the ice may dissolve, nor the vinous substance mixed among it be congealable. But the best experiment of all is, to perform the operation with a large quantity of Wine, as that of several gallons, where the utmost exactness or prevention of all waste need not be so much regarded.

By this method, there freezes about one third of the whole liquor, and is properly the more pure aqueous part thereof; insomuch that when all the vinous fluid is poured off, to be exposed to a farther concentration, the ice remaining behind, upon this first emptying, being set to thaw gently in a warm place, dissolves into a perfectly aqueous fluid, retaining only a light scent, but extremely little of the taste and colour of the Wine.

If the Wine, now once concentrated, should, by longer continuance in the freezing cold, be again congealed to the utmost (unless the cold were very severe,) and then again be drained from the ice, there soon after falls to the bottom of the glass it is poured into, a gross white, and shining powder or tartar; and even the icy part, remaining behind, deposits a little more of this powder, after thawing, and again, the same vinous concentrated matter does the same upon standing a few days or hours; but the more of it, as the Wine was austere or genuine, neat, and unadulterated with sugar, brandy, or the like.

The ice of the second operation differs in no respect from that of the first, provided the vinous matter be perfectly drained away from it, before the ice is set to melt; whereby it runs into the same kind of phlegm, excepting only when the Wine was less spirituous, that it tastes a little more saline than the water separated by the first operation.

The part which has escaped being frozen in both operations, is a real concentrated Wine, as appears by its colour, consistence, taste, and smell; for it has now all those properties in a greater degree, and a much narrower space, than when so largely diluted with superfluous water; and therefore becomes a much nobler and richer Wine, than without such a contrivance could possibly be procured; for as by this means two third parts of phlegm are taken away, in the better sort of Wine, or three fourths in the weaker, what remains must needs become highly rich and saturate.

This operation, though it be perfect in Wine, does not succeed altogether so well in rich malt liquors.

Thus, for example: Having by several concentrations reduced a full gallon of strong malt liquor to the quantity of a pint and a half; the ice separated from it in the first concentration, resolved into a liquor somewhat of the colour and taste of small beer, and that obtained at last, might have almost passed for small beer, though a flashy watery taste manifestly predominated in it; but the part that remained uncongealed was extremely rich, and for consistence and taste, far exceeded the famous double Brunswic mum.

In point of strength or spirituosity, it seemed perfectly aromatic, and nobly flavoured.; a thing not found in common malt liquors; and for consistence, it resembled a dilute syrup, and with a pleasing softness, sheathed the acrimony of the spirit, and concealed the bitterness of the Hop, which before was very considerable.

The mucilaginous nature, predominant in all malt liquors, here occasions a greater inaccuracy, as not suffering the condensed part to get clear and run from the ice; but as this liquor is cheaper than Wine, the loss is less considerable; and not only so, but if the operation were to be performed in large, the thawed liquor might be commodiously employed in a fresh brewing; so that, with a slight enchiresis, all manner of loss may be prevented.

And thus likewise the phlegm of Wine, separated in the operation, may, by a proper ferment, be converted into good vinegar, with a great deal of ease, and moderate profit.

What a large quantity of water abounds in vinegar, is well known to those that are skilled in chemistry; so that a great quantity of vinegar will saturate but a small one of alkaline salt; and again, a deal of vinegar is required to dissolve a little quantity of metal.

A pint of the strongest vinegar will scarce dissolve above two drams of iron; or saturate more than the like quantity of good salt of tartar; but our method of condensation effectually remedies this inconvenience; and so far deprives the vinegar of its superfluous water, and collects its acetous penetrating sharpness, as to render it extremely powerful; thus throwing out five or six parts of useless phlegm, that tastes scarce perceptibly acid, and, at the same time, retaining the strength and virtue of the whole, in the part remaining uncongealed.

*The advantages of the method of condensing Wines by cold.*

It is certain, that the best and noblest Wines, if exposed for several days to the warm open air of the summer, out of a vault, or other proper receptacle, will inevitably corrupt and spoil, throwing a mouldy and mucilaginous matter to their surface, and acquiring a degree of stench or vapidity, or at best, turning to vinegar. On the contrary, the Wine condensed in our manner suffers none of these changes, upon being so exposed; but remains for a long time not only uncorrupted, but even unaltered, as we have experienced for several years.

And as this difference is owing to nothing more than freeing the Wine of its superfluous water; it may hence be fairly presumed, that water alone is the principal or immediate instrument of all the fermentative motions and changes of vinous liquors.

We condensed, in our method, a gallon and a half of poor, weak, austere, and acid Wine, to about a quart, in the winter of the year 1696, and put it into a glass bottle, whereof a third part remained empty, and stopped it only with a hard wreath of paper; and thus it stood for the space of two years in my bed-chamber, where, during the summer, when the weather was fair, the windows were open all day long; and where also, in the winter, other aqueous liquors froze. During this time, it was often opened, and some of it poured out, both to taste, and otherwise to use; and yet all this time it neither grew mouldy nor sour, nor suffered any separation of parts; only deposited a small quantity of tartar, but retained its original consistence and taste entire; except some small change in both for the better.

In the same manner we concentrated a somewhat better kind of Wine to a little more than a fourth part; but the bulk of this did not keep so well as the former, as having many more tasters, than the austere and disagreeable sort.

When it was by degrees tasted away to half a pint, I put the remainder into a glass, and tied it over with a piece of bladder; then set it in the same place, near the former, but could not prevent its being sipped away by degrees, till only about three ounces were left.

This small quantity stood all the summer, barely covered with a loose bladder, without alteration, or growing in the least mouldy or acid, and long after retained its most grateful taste, and quick smell; only the latter was somewhat weakened thro' the bottle's remaining untied down; and that under this inconvenience it should continue so perfect and entire is surprising.

I had in the winter of the year before, condensed a very small quantity of the same sort of Wine to half an ounce, and put it into an ounce phial, which remained lightly tied down all the next year in my ordinary stove room, where it kept without corrupting, till after the end of the winter; when by the unequal, and sometimes violent heating of the room, it became vapid and mouldy.

A parcel of vinegar concentrated after the same manner in the winter 1694, and by that means brought to a corrosive degree of sharpness, which rendered it unfit for the table, stood in the same room with the concentrated Wines, for three whole summers and winters, without any manner of tendency to corruption, or the smallest signs either of mouldiness or ropiness.

These examples and experiments sufficiently shew, that liquors thus concentrated, may for a long time be kept in a state of perfection with little care.

But there are some particular changes of Wines and vinegars, thus concentrated, that happen in process of time.

1. Wines upon being thus concentrated, seem to acquire a more austere taste, than they had originally; and no wonder, as the concentration brings their saline and rough matter into a third or fourth of its original compass; so that this is no new addition or increase of the rough taste, but perhaps some degree of mitigation thereof, in regard to the closeness whereto this rough matter is brought; which, of itself, ought rather to multiply the effect in a greater proportion.

The change may be conceived owing to this, that all Wines are observed to grow mild and soft by long lying; which effect is greatly promoted in them by a successive separation of their tartar, and a gentle evaporation of some part of their water; occasioning that necessity we find of frequently filling up the casks in the summer months; but in our concentrated Wine, though some tartar be successively separated, yet there is found no concurrent evaporation; for the concentrated Wine grows soft and mellow in a well-stopped glass, where no sensible diminution of the quantity is perceived.

But the effect proceeds principally upon a closer combination of the grosser with the spirituous part, which now wanting water, successively throws off the grosser tartar from the rest of the mixture.

But besides this, there seems to be another remarkable change incident to our concentrated Wines, not only in the taste, but abundantly in the smell; for although that very austere Wine above-mentioned had a much milder taste the third year than the second, yet its specific odour perfectly resembled that of sack or Canary, so as to be mistaken for it, from the smell alone, by good judges, who were acquainted with the original flavour of the Wine, from whence it was concentrated.

Nor is this change of odour peculiar to Wine alone; but concentrated vinegar participates somewhat of it, and was observed for some time to lose it, in great measure, upon being left long stopped only with paper, and the bottle often poured out.

And therefore as it is plain, that Wines, and all other fermented liquors, become much more durable by concentration; and yet this durability is here confirmed and proved from small and inconsiderable quantities, wherein they always retain their goodness; it is obvious, that if the operation were performed in large, a great bulk of the liquor thus concentrated would be still immensely less subject to alteration from the air and heat, which are the two great incentives to fermentative motion; and that if such small parcels suffered no change for the worse, much less would the larger.

But as these concentrated liquors, by reason of their considerable proportion of saline and fine spirituous parts, have a less tendency to dissolution and corruption; so, on the contrary, the aqueous part, separated from them, has a very strong tendency thereto; for as it takes from the Wine, and carries off with it a little of the mucilaginous and unctuous part, and yet is almost wholly a mere moveable fluid water, that is, the most active instrument of fermentative motion, it cannot but presently fall into corruption.

This business of congelation is not only applicable to immediate profit, but also paves the way to certain matters of curiosity, and shews one particular, which, though not new, but anciently common and familiar, has yet grown strangely into disuse through the indolence of mankind.

As to the point of immediate use, it needs no explanation; for he must be very dull indeed, who does not immediately perceive, that Wines, &c. by this method may be reduced to any degree of vinosity, strength, or perfection.

Thus, for example: If a Wine of a moderate strength have a third part of its water taken away, in the form of ice, by congelation, the remaining part will thereby be doubled in strength and goodness; for if in the better sorts of Wines we allow, as we may, one third part to be good, or truly vinous, and two third parts to be water, then that one third good part is divided among the two aqueous parts; whence, if one of the two aqueous parts be taken away, that same third part before divided between the two waters, now remains collected or condensed, in a double proportion, along with but one of them.

But if this concentration be carried up to the utmost, and practised in a large quantity, with a somewhat intense cold, it may perhaps reduce good Wines to a sixth; and this small quantity might commodiously be used as a quintessence, to meliorate, improve, and even specificate, smaller and low flavoured Wines.

To conclude; as to the direct and immediate use of our method of concentration, he who has the secret, by means of a little, dry, powdery body, of turning water into Wine, will not perhaps easily divulge the capital use he may make of the experiment.

WINE PRESS. [A description of the great taisson or famed Press.] The Press, which is a machine, or moving power, contrived to squeeze the juice out of Grapes, consists of an assemblage of many pieces of timber, placed after different dispositions, which compose

pose three bodies of timber work, closely joined to the axis, which serves as a swing, whereby it may be moved by the vice.

The great Presses are thirty or thirty-three feet long, and twelve or sixteen wide. To make one of these machines, they first dig a pit in the ground about four feet deep, and sixteen feet square, in the most commodious place where the Press is designed. In the middle of this hollow they build a small pile of masonry the whole length, for a foundation, two feet thick, and three feet high, in such a manner, as to have only one foot below the surface of the ground; then they make a parallel wall, to surround the Press from the right to the left, to the extremity of the pit, at an equal distance from the pile in the middle, for supporting some of the timbers, and to prevent the earth from falling down into the pit. The space between these three little walls of three feet depth, is necessary to give air to the wood, to prevent its rotting.

The wall, which ought to be from the sides of the beams (which may be placed from the right to the left of the Press, according to the greatest conveniency of the place,) should be deeper than the hollow of the beams, which shall be explained hereafter; and that which is contrived on the bent side of the beams, should be thicker than the square of the bason, which will be more easily comprehended by what follows.

Upon the little wall of the middle, they lay a piece of timber lengthwise, which they call a false stilling; upon this, to the side of the hollow beams, they place a ground plate, which is supported by another pile of masonry, which is joined close to the beams, and the piles which they cross; all these pieces should be laid level, in order to support four stillings, which are placed across them at an equal distance. These pieces ought to extend beyond the wall of the bason, on the side of the beams, about three feet, and be laid upon the piles, to hinder them from rising; there must always be allowed a declivity of three or four inches from the front to the four stillings, in order to facilitate the draining of the wine into the cask, which should be placed under the middle, in the fore part of the bason, to receive it from the side where the holes are bored.

They afterwards place upon these four stillings, cross the bason of the Press, some pieces of wood called maye; these should have their tops level with the top of the stillings, and ought to be cut in notches of four inches in length on both sides the bason, for receiving the maye in such a manner, that they may be fastened on each side with wedges, after having put in the middle of the joints potters-earth and Moss, to prevent the wine from getting out at the crevices; these pieces of maye are simply joined together without fillets or notches, that they may the better close the two ends to the middle of the quoins their whole length, between the stillings and the side of the last pieces of maye; these pieces should be raised in the middle with a ridge, to make a gutter in each joint, to facilitate the draining of the wine; they also make for the same purpose, a ridge or furrow all round the extremity of the pieces of maye.

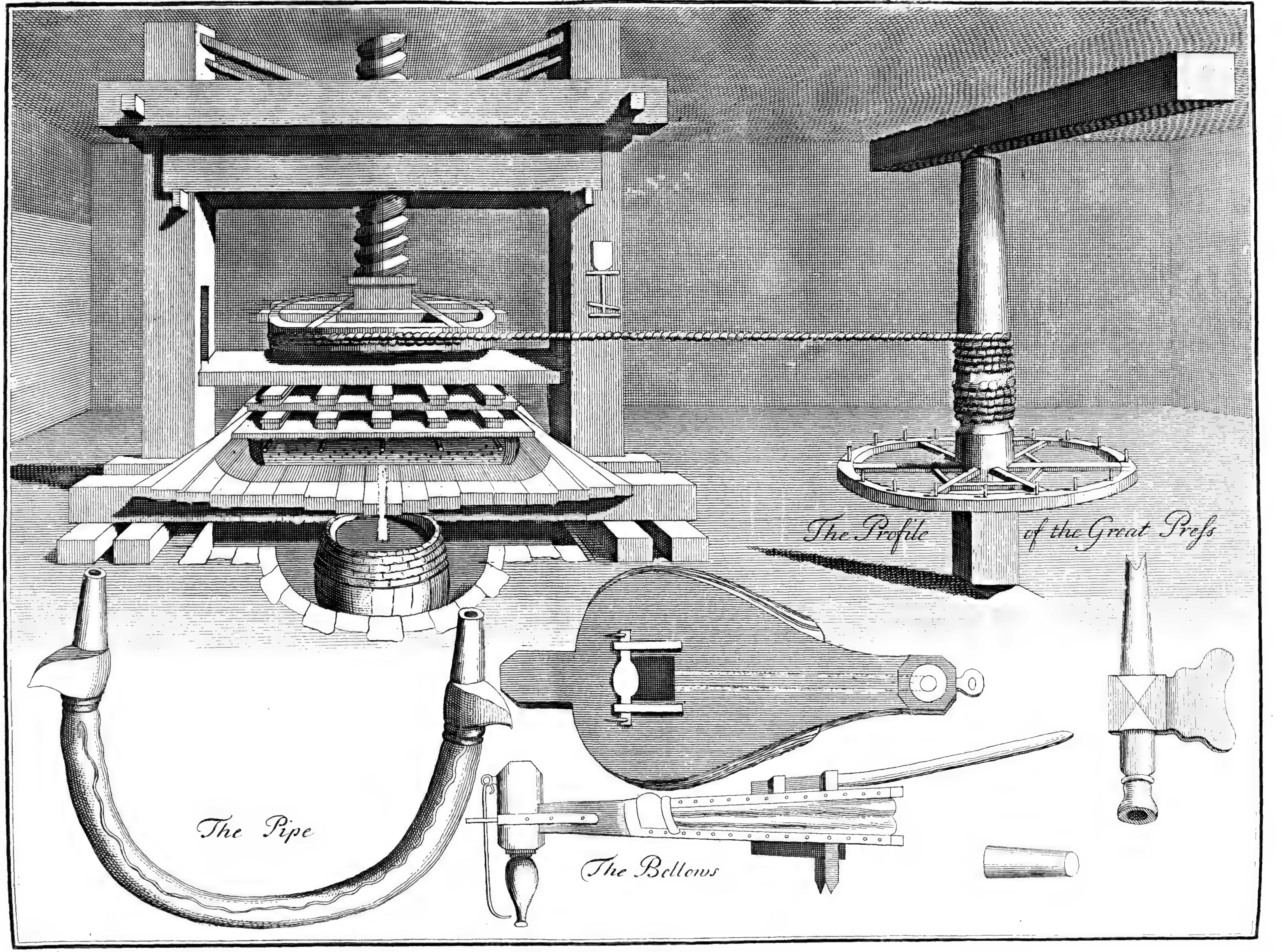
In the place appointed for the beams, on the right or left of the bason, they make a hole big enough to erect a frame of masonry twelve feet deep, eight long, and five broad. One of the three piles of masonry, which supports the bason, serves there instead of one side of the wall to the beams, which are driven into the ground at the bottom of the said frame, twelve feet deep, and are fifteen or sixteen feet above the level of the ground; these they join with the piles which cross them, upon which they put the beams, which are all joined by cramps of wood, except the last, to which the stillings serve instead of braces. They afterwards erect the masonry, in which they inclose the ends of the piles, as also those of the braces, to prevent the beams from rising; these piles ought to be placed contrary to the stillings, which surround or cross them every three feet, and dove-tailed into the square supporters; the space left between the masonry they do not fill up, that the beams may be preserved from rotting, and that, if occasion be, they may go down into the pit. The beams ought to be laid in such a manner, that their sides may occupy the middle of the bason, and they should incline two inches beyond it; the front and sides must be made smooth and even, but the back and tops must be left rough; they make a-top, under the pieces of maye, a ledge of two or three inches, for support to the carriage; the top of the beams is joined with a cross beam, under which is a spindle supported by a diagonal beam, on which all the force and resistance of the Press bears; this diagonal beam should be closely fastened with nails and girders under the heads of the beams. In the middle of the other side of the bason, they put upon the ground plate, between the ends of the stillings, two false beams a little distance from the true ones, because it is on this side that the axle tree is notched to receive the beams, to prevent their recoiling back; these are a little enlarged towards the false beams; they sustain these with four cross pieces or strong jambs, two on the front, and two on the sides, which abut against them, and keep them in their places; these cross pieces are borne by the ground plate and the posts, and let in at the other end just to the middle of the false beams; these ought to be bored about four feet high, that the moving pins may be put in there for the beam to rest upon; these false beams should have holes at the bottoms, to receive the wooden pegs, which cross the ground plate, and are cut to half their thickness, that they may be capable to enter the notches, and be joined with keys and pins where they cross the false beams; they likewise bind these beams at the top with a cross beam, and they sustain them again at the bottom with two cross pieces on their sides; these cross pieces are placed upon the posts, which are joined into the ground plate by a dove-tail, and are borne up horizontally by a small piece of masonry of their own size, which is chiefly hid in the ground; there must also be on each side a large cross piece to cross the bason, which binds together the false beams with the true, both before and behind; these they fasten to the top of the beams, allowing them a foot and a half declivity to the place where they are mortised into the false beams.

They also make in the ground, on the side of the false beams, ten feet from the bason, a pit twelve feet deep, and ten feet square, to place the two blocks, which should join at bottom, and be separated by the great ends, about two feet above the surface of the ground, in such a manner, that the screw may be able to play between them; these must be joined at bottom to the piles by a strong dove-tail, and the piles joined with braces; and near the top, about fifteen inches from the head, they should be bound with girders and pins, to keep them asunder, and prevent their parting. The space between the blocks and the piles must be filled up with earth, which should be well rammed; these girders should be let in seven or eight inches to the body of the blocks.

In the middle of the girders there should be a hole to put in the screw, which should there descend perpendicularly, and which is rounded to this place, and lessened to a third part of its thickness; and a foot lower than the girders ought to be a rail placed as a support, from bottom to top, in a slope, for a rest to the screw; there should be on this rail a plate of iron, and an axis to the screw, for its play; the screw must be twelve feet long, and thirteen inches thick at the top; the screw-tap, or the extremity of the spiral line, ought to be three inches and a half, and should form an exact square; the screw should pass cross a wheel, which is placed three feet from the surface of the ground, and which in this place should be square, and about an inch and a half of its thickness pared off for the play of the wheel; this wheel should be joined with spokes and curb, athwart, into

Plan of the Great Wine Press.

Profile of Great Wine Press



into which they put divers pegs, that they may be able, with five or six men, to give it the neceſſary motion.

Laſtly: There ſhould be placed, at five feet from the bottom of the baſon, two great beams, which muſt paſs between the true and the falſe beams; theſe muſt be both ſquared or pared away at the great end, on both ſides where the beams touch, where they let them into a notch, to prevent their coming out; and at the back part they put a key, to ſecure them from being diſplaced (for they cannot put them into it;) but nevertheleſs, in ſuch a manner, that they may play between the beams, without changing their poſition; theſe beams ſhould be well fitted to their bed, and joined with keys, that they cannot part from each other; for they ſhould open inſenſibly from the falſe beams, where they ought alſo to ſeparate to the right of the ſcrew, to give place for it. Upon the end of theſe beams muſt be joined the nut of the Preſs with moveable keys, that by this means it may be raiſed or lowered, ſo that the beams may riſe and fall as a kind of ſwing, which has the keys for its center, which are the falſe beams, where the great beams reſt, and the bag which is upon the baſon. When they preſs, before the preſſman raiſes the beam, by means of the ſcrew, they lower it on the ſides of the falſe beams a little, that they may force the quoins between the beams and the ſpurs, which is upon the falſe beams, then they lower it with the ſame ſcrew from the ſide of the falſe beams. After they have moulded the Grapes with the free poles, the planks, and the nave, by the help of the wheel which moves the ſcrew, they preſs the bag ſtrongly.

Theſe beams ſhould be two feet and a half thick, and if that is not big enough, they put two upon each other, and ſometimes three, if it be neceſſary; theſe they join together with nails in different places, both on the bed, and in the front, that they may work together, as if there were but two; and they raiſe at the end of the Preſs, on the ſide of the falſe beams, a ſmall hanging ſcaffold or ſteps to go up to ſtrike the quoins.

### *Of the great framed Preſs.*

This ſort of Preſs is made like the other, except that inſtead of blocks, they uſe a frame. They make a great pit in the earth twelve feet deep, and nine feet diameter; and, to ſupport the earth, they build a wall of ſtone all round it, in the form of a well, which ought to be ſeven feet diameter, that they may place in this ſpace a frame of wood work of a ſquare figure, joined together with poſts, joiſts, ground-plates, and rafters, like a St. Andrew's croſs. In this frame they put a ſolid ſtone of about three thouſand weight; then they join the ſcrew to the center of the frame, that they may be turned together, and ſo keep the beams upon the ſtock of the wheel, to preſs the Grapes, in ſuch a manner as if one man was ſuſpended at one end of a pole, which is made faſt at the other, and in the middle there is ſomething to preſs. At about two or three feet from the ground is a wheel, by means of which, and the weight of the frame, they make the ſcrew deſcend, which lowers the beam. The frame ſhould be ten feet high, and four feet nine inches ſquare on each front. Great care ſhould be taken of the block Preſſes not to ſcrew them too hard, leſt it break the beams, and ſplit them to pieces, nothing being of greater force than a ſcrew. You muſt not fail to make the dove-tails very exact, but above all, the ſcrew and the nut ſhould be made artificially to their work.

Theſe great Preſſes make, at one vat or ſtowage, from twenty to twenty-five pieces of Wine. One may make it leſs by a fourth part, and it will preſs as well, when there are not above ten or fifteen pieces of wine. In this caſe the pieces ſhould be proportionably diminiſhed in the bigneſs from what has been deſcribed.

### *The names, length, and thickneſs, of the pieces which compoſe a great Preſs.*

The main beams from thirty-two to thirty-five feet long, and one with another, from two feet and a half to three feet thick.

The cheeks or ſide beams twenty-eight feet long, about two feet thick at the bottom, and eighteen inches at the top.

The piles twelve feet long, and twelve or thirteen inches thick. It muſt be obſerved to make theſe with counter dove-tails to thoſe of the cheeks; the firſt is placed at fifteen inches from the bottom of the cheeks; one ought to put three from the top, to that which is in the ground, and the latter ſhould be even with the top of the falſe ſtiller.

Upon the piles of the cheeks, and upon thoſe of the blocks, are placed braces of wood nine feet long, and about nine or ten inches thick, to bind them together.

The ſtillers ſix feet long, and about fifteen or ſixteen inches ſquare.

The ground plate eighteen feet long, about eighteen inches broad, and fifteen inches thick.

The falſe beams fourteen or fifteen feet long, about thirteen or fourteen inches broad, nine inches thick at the bottom, and ſix at the top; theſe ought to be planed to the ſize of the keys, to ſupport the main beam.

The croſs piece of the falſe beams ſix feet long, four inches broad, and nine or ten thick.

The keys of the beams, to the direction of the worm, five feet and a half long, eight inches thick towards the head, but reduced to half the ſize in the remaining length.

The pegs of the keys fourteen inches long, about five broad, and at leaſt one and a half thick.

The two croſs timbers of the falſe beams about eight feet long, four or five inches thick, and the ſame breadth of the falſe beams.

The two other croſs timbers of the falſe beams nine feet long, and about eight inches thick.

The poſts ſix feet long, and about eight or nine inches thick.

The pieces of maye, which are at the baſon, twelve feet long, about nine or ten inches broad, and ſix thick.

The great croſs timbers, put as a band between the falſe beams, ſix or ſeven inches thick.

The two blocks fourteen feet long each; about ſixteen inches thick at the head, and twelve at the bottom.

The ſcrew fifteen inches at the bottom before it is ſquared, thirteen inches, according to the foot of the ſcrew which forms the ſpiral line, and twelve feet long.

The wheel ten feet diameter, with ſpokes of four inches thickneſs, the ſame as the ribs, upon which are wooden pegs for four or five inches high, and one diameter, admitting eight or nine men in the circumference of the wheel.

The nut of the Preſs ſix feet long, two feet broad, and fourteen inches thick, which ought to be creſted with iron.

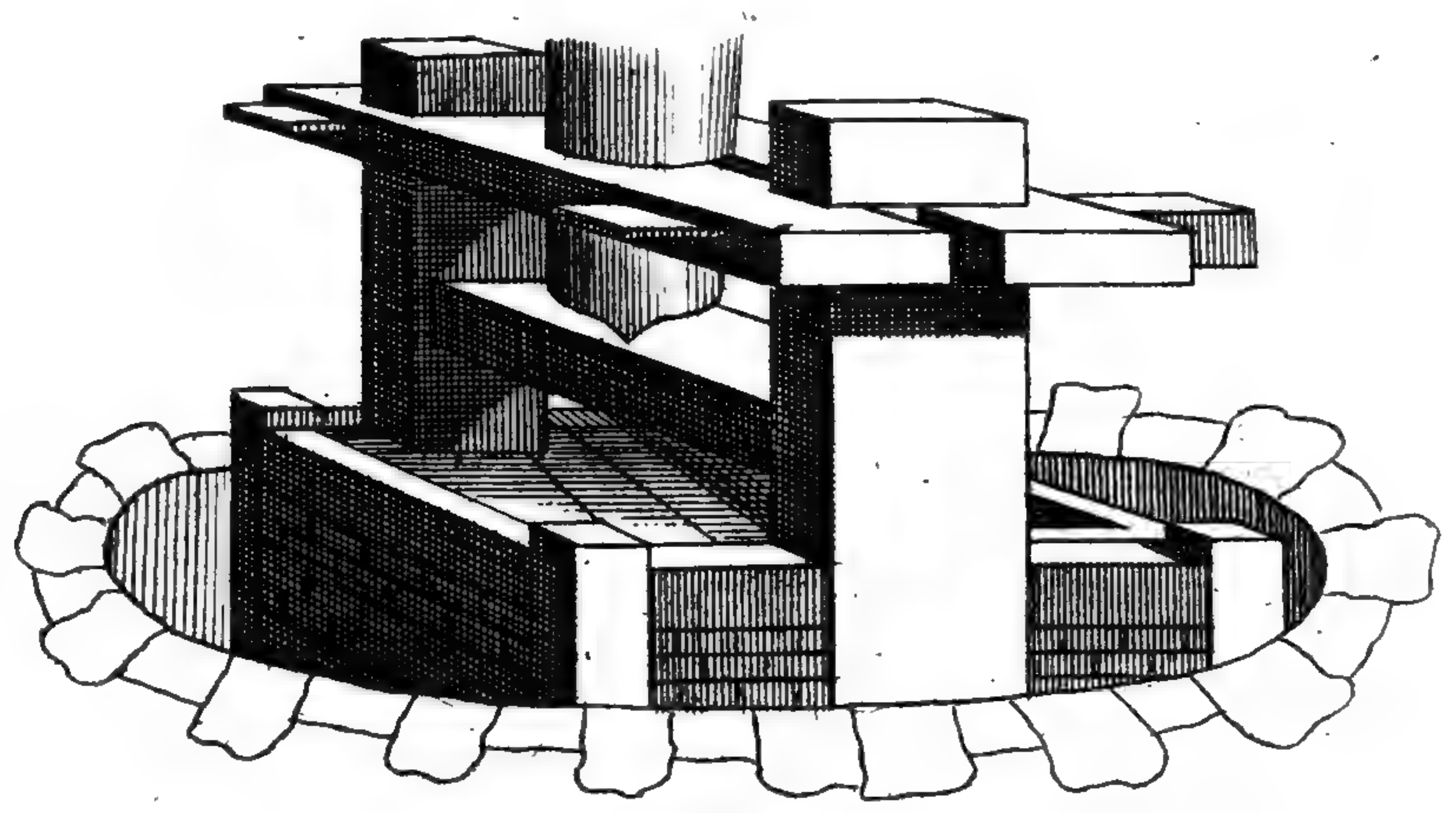
The croſs piece of the cheeks five feet long, about a foot thick, and of the ſame breadth as the top of the cheeks.

The ſpurs, which are placed under the ſpindle, between the two cheeks, ſhould be of the ſame breadth as the cheeks, and thirteen or fourteen inches thick.

The girders, which ought to embrace the top of the cheeks, muſt be two inches higher than the under part of the ſpurs, one foot broad, and about five inches thick.

The ſpindle two feet high, and twelve or fourteen inches thick; this is placed between the ſpurs and the croſs piece, and croſſes the cheeks and the ſpindle with a key, which ought to be worked very

exact, for there it is the whole force of the Press resides.
The quoins two feet long, about nine or ten inches broad, and six or seven thick.
The frame, in the framed Press, ten feet long or deep, and four feet nine inches square, with four fronts.
The nave eight feet and a half long, about five inches thick one way, and six the other.
All these timbers should be Oak, except the screw, which should be Elm, which will last longer, and the spindle should be of Walnut. One may make the most part of these timbers longer or shorter, according to the size of the wood made use of.



*The Small Framed Press*

*The description of a slight Press.*

This sort of Press is much less chargeable than the others, and it also presses a much less quantity of Wine, but it is nevertheless of great use for private persons, who have no great vintage, where this will be sufficient, for it will make eight or ten pieces of Wine at each tunning.
The construction of this slight Press is much the same with that of the other Presses, but I shall explain wherein they differ.
The pit which is made in the earth ought to be four feet deep, fourteen broad, and eighteen long, more or less, according to the size of the intended Press. They make three little walls of free-stone cross the Press, which occupies the bottom of the square of the bason; they make the walls in the middle two feet, and those on the sides two and a half thick. An opening must be left in the middle of each of the side walls, about twenty inches square, to place the two cheeks one opposite to the other on each side of the bason, which should incline an inch and a half towards the bason; these must be squared and planed on three sides, from the top of the stillings, but the top should remain rough. In these sides, which are towards the bason, they make a notch at the height of two feet and a half from the bason, three inches broad, four inches deep, and two feet high in ascending towards the head.
They place the false stillings upon the middle wall; and upon each of the other they place two piles, which embrace the cheeks, and are joined to them by square supporters and dove-tails. In crossing the piles and the false stillings, they put the four stillings in notches as in the other Presses; those of the middle embrace the cheeks, and are joined to them as the piles are, and should extend beyond the piles, which are behind the cheeks eight or nine inches. The top of the stillings ought to be notched an inch and a half, fit to receive the piles to keep the whole together; then they put upon these the pieces of maye, which they close, as hath been already said, and the bason is the same with the other Presses.
The spindle of the screw ought to be seven or eight inches longer than the back of the cheeks, and embrace them in their thickest parts; this is placed upon them, and supported upon the keys, which cross the cheeks, by nails, and must be stayed behind the cheeks with a key; also in front with four iron bars, making a square of a foot and a half, bored at the four corners with pins and nails four or five inches long towards the screw-tap. Upon the spindle they lay planks of the same length, which they cross in such a manner, that their ends are turned towards the front of the Press; upon these planks they lay two cross pieces of the same length as the spindle, which embrace the top of the cheeks under their heads; they let them in at each end in front, where they are joined. These cross pieces and the cheeks ought to be nailed together, and they must put four cross timbers, which should take hold of the head of the beams, and reach half the length of the head pieces, for a support to each.
They afterwards make a screw with the same instrument as that of the other Press, with a square at bottom, to join it to a wheel, which should be laid horizontally well consolidated with the screw, and joined with ribs and spokes a foot wide crosswise; these spokes ought to project out of the ribs three or four inches of half their width, to be able to contain the rope, which must be round the wheel. Under the centre of the wheel they place a standard of the length of the space between the cheeks, and eight inches thick or more, to make a sort of tenon at each end, which goes into the notch of the cheeks. The standard should be sustained by an iron pin, which goes in at the end of the screw, to be held suspended by it, in such a manner that it may waggle. In order to this, the end of the pin which is under the standard, should play with the key which holds it at the other end of the screw.
At ten or twelve feet from the Press they place a wheel, either horizontally or perpendicularly, with an axle-tree, which ought to play in the fliers of wood, well fixed; they bind to the wheel, which is at the top of the bason, to one of the spokes, or one of the pins which is driven in for this purpose, the eilet hole of a great rope two inches and a half diameter. They can turn the wheel once or twice round with the hand, before they take hold of the rope, which ought

ought to go round the wheel five or six times, and be fastened at the other end to that which is at the side of the Press. They employ seven or eight men to turn this wheel. It is of great consequence to observe, that when there is no more than one turn and a half of the rope above the wheel, and if there is another bag to press, they should remit two or three turns of the rope to the wheel to finish the pressing, otherwise they would risque the breaking of the wheel at the bottom, and laming the pressers. When the bag is sufficiently pressed, they stop the perpendicular wheel for half an hour, to allow time for the wine to drain off. In this sort of Press, there is nothing but the standard Presses, which is borne by the nave, and supplies the place of the great beams which are in the other Presses. There ought to be one experienced man, to whom the others ought to be obedient, to conduct the pressing, and to cut and chop the marc as often as it shall need.

*The particular pieces of a slight Press.*

The two cheeks, sixteen feet long, and about eighteen or twenty inches thick.

The spindle, fifteen or sixteen feet long, and about three wide.

The head-piece, sixteen feet long, and about thirteen or fourteen inches thick.

The cross timbers, six feet long, and about six or seven inches thick.

The piles, twelve feet long, and about twelve or thirteen inches thick.

The screw, seven or eight feet long, about thirteen inches thick to the spiral line, and sixteen inches at the bottom, fitted to a square; this should be notched in that place two inches, for placing the wheel.

The standard twelve feet and a half long, seventeen or eighteen inches broad in the middle, and ten at the ends, and eight or ten inches thick in the middle, reduced to six or seven at the ends.

The middle wheel, nine feet diameter, and ten or eleven inches thick.

The perpendicular wheel of an equal diameter, and five or six inches thick in every part of the timber.

The axle-tree ten or eleven feet long, and eight inches diameter.

The false stillings, and the pieces of maye, ought to be the same as in the other Presses in every part.

The stillings, eighteen feet long, and the same breadth and thickness, as in the other Presses.

The nave, as in the other Presses, that is to say, seven or eight feet long, and five or six inches square.

This description of the different sorts of Presses which are used in Champagne, together with the annexed plates, will, it is hoped, be sufficient to instruct a workman how to erect either of the sorts here exhibited.

WINTER. [Prognostics of a hard Winter.] The Lord Bacon gives these as signs or forerunners of a hard winter:

If stone or wainscot, that has been used to sweat (as it is called), be more dry in the beginning of winter, or the drops of eaves of houses come down more slowly than they used to do, it portends a hard and frosty Winter. The reason is, that it shews an inclination in the air to dry weather, which, in the Winter time, is always joined with frost.

Generally a moist and cool summer betokens a hard Winter likely to ensue. The reason is, that the vapours of the earth, not being dissipated by the sun in the summer, do rebound upon the Winter.

A hot and dry summer, especially if the heat and drought extend far in September, betokens an open beginning of Winter, and cold to succeed towards the latter part of the Winter, and in the beginning of the spring; for all that time the former heat and drought bear the sway, and the vapours are not sufficiently multiplied.

An open and warm Winter portends a hot and dry summer; for the vapours disperse into the Winter showers; whereas cold and frost keep them in, and transport them into the late spring and summer following.

The country people have made this observation, that those years in which there are store of Haws and Heps, commonly portend cold Winters; the natural cause of this may be the want of heat, and abundance of moisture, in the summer preceding, which puts forth those fruits, and must of necessity leave a great quantity of cold vapours undissipated, which causes the cold of the following Winter.

When birds lay up Haws and Sloes, and other stores, in old nests, and hollow trees, it is a sign of a hard Winter approaching.

If fowls or birds, which used at certain seasons to change countries, come earlier than the usual time, they shew the temperature of the weather, according to that country from whence they came; as the Winter birds, fieldfares, snipes, woodcocks, &c.

If they come earlier, and out of the northern countries, they intimate cold Winters likely to ensue with us. And if it be in the same country, they shew a temperature of season, like that of the season in which they come, as bats, cuckoos, nightingales, and swallows, which come towards summer, if they come early, it is a sign of a hot summer to follow. Cold dews, and morning rains, about Bartholomew-tide, and hoar frosts in the morning about Michaelmas, foretel a hard Winter.

When sea pyes flock from salt to fresh water, it signifies a sudden alteration of weather to much cold.

WINTERANIA. Lin. Sp. Plant. 636. Winter's Bark.

The Characters are,

*The empalement of the flower is bell-shaped, composed of three roundish concave lobes; the flower has five oblong sessile petals, which are longer than the empalement, and a conical cup shaped nectarium, which is concave and the length of the petals: it hath no stamina, but linear, parallel, distinct summits, sitting on the outside of the nectarium, with an oval germen within the nectarium, supporting a cylindrical style, crowned by three obtuse stigmas; the germen afterward becomes a round berry, having three cells, containing two heart-shaped seeds.*

This genus is ranged in the first section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina or summits and one style.

We have but one Species of this genus, viz.

Winterania (*Canella.*) Lin. Sp. Plant. 636. Cassia Cinnamomea, sc. Cinnamomum sylvestre, Barbadendium. Pluk. Alm. 89. tab. 169. f. 7. *Wild Cinnamon, or Cassia of Barbadoes.*

This tree grows naturally in most of the English islands in the West Indies, where it rises to the height of about twenty feet; the stem is generally furnished with branches from the ground to the top, covered with a light Ash-coloured bark, and garnished pretty closely with oblong leaves about two inches and a half long, which are narrow at their footstalks, but at their extremity, where they are enlarged and rounded, they are a full inch broad, of a light or pale green colour, standing upon short foot-stalks; they are placed without order toward the end of the branches, where the flowers come out almost in form of an umbel, which are composed of five oblong petals of a scarlet colour; these are succeeded by roundish berries, having an umbilical calyx at their top, inclosing shining black seeds.

The whole plant, bark, leaves and fruit, are very aromatic, and has much the taste of spiced gingerbread.

The bark is much used by the inhabitants as a spice to relish their viands, and also in medicine to discharge phlegm; though it is much doubted whether it is the same with the bark which was brought by Captain Winter, from the Streights of Magellan.

As this tree is a native of hot climates, so it is too tender to live in England out of a stove. I raised several of these plants from seeds, which were sent me from Antigua a few years past, some of which are grown

four

four or five feet high; and one old plant which came from Barbadoes several years since, is more than twelve feet high, but has not yet produced any flowers. These plants require to be plunged into a tan-bed in the stove, and in winter should be sparingly watered, but in summer they should have it in greater plenty; when also they should have a good share of air admitted to them when the weather is warm. With this management the plants may be preserved very well, but they are difficult to propagate; for I have laid down many of their under branches into the earth, but not one in twelve has put out roots: I have also planted cuttings with as little success; so that the surest method is to procure fresh seeds from America.

WOODS and groves are the greatest ornaments to a country seat, therefore every seat is greatly defective without them; Wood and water being absolutely necessary to render a place agreeable and pleasant. Where there are Woods already grown to a large size, so situated as to be taken into the garden or park, or so nearly adjoining, as that an easy communication may be made from the garden to the wood; they may be so contrived by cutting of winding walks through them, as to render them the most delightful and pleasant parts of a seat (especially in the heat of summer), when those walks afford a goodly shade from the scorching heat of the sun.

As I have already treated of the use and beauty of wildernesses, and have given directions for the making and planting of them, I shall not enlarge much upon that head in this place; therefore I shall only give some short instructions, for the cutting and making of these Wood walks in those places where persons are so happy as to have any grown Woods, so situated as to be near the habitation, and are either taken into the garden, or walks made from the house or garden, leading to them; as also how to plant and decorate the sides of these walks with shrubs and flowers, so as to render them agreeable and pleasant; and then I shall more fully treat of the method to raise and improve Woods, so as to be of the greatest advantage to the possessor, and a public benefit to the nation.

Where persons have the convenience of grown Woods near their habitation, so as that there may be an easy communication from one to the other, there will be little occasion for wildernesses in the garden; since the natural Woods may be so contrived as to render them much pleasanter than any new plantation can possibly arrive to within the compass of twenty years, where the trees make the greatest progress in their growth; and in such places where their growth is slow, there cannot be expected shade equal to the grown Woods, in double that number of years; but there is not only the pleasure of enjoying a present shade from these Woods, but also a great expence saved in the planting of Wildernesses; which, if they are large, and the trees to be purchased, will amount to no small sum. If the Wood is so situated, as that the garden may be contrived between the house and that, then the walk into the Wood should be made as near to the house as possible, that there may not be too much open space to walk through in order to get into the shade; if the Wood is of small extent, then there will be a necessity for twisting the walks pretty much, so as to make as much walking as the compass of ground will admit; but there should be care taken not to bring the turns so near each other, as that the two walks may be exposed to each other, for want of a sufficient thickness of Wood between; but where the Wood is large, the twists of the walks should not approach nearer to each other than fifty or sixty feet; or in very large Woods, they should be at a greater distance; because, when the under Wood is cut down, which will be absolutely necessary every tenth or twelfth year, according to its growth, then the walks will be quite open, until the under Wood grows up again, unless a border of shrubs, intermixed with some evergreens, is planted by the sides of the Walks, which is what I would recommend, as this will greatly add to the pleasure of these walks.

These Wood-walks should not be less than eight or nine feet broad in small Woods; but in large ones fifteen feet will not be too much, and on each side of the Walks. The border of shrubs and evergreens may be nine or ten feet broad; which may be so managed, as to shut out the view from one part of the walk to the other, at those times when the under Wood is cut down, at which times there will be an absolute occasion for such plantations; and at all times they will afford great pleasure, by adding to the variety, as also by their fragrant odour. The particular sorts of shrubs which will thrive in the shade of Woods, as also the flowers proper to plant near these walks, are mentioned in separate lists, at the end of this work, so I shall not insert them in this place.

The former method which was practised in cutting of these walks through Woods, was to have them as strait as possible, so that there was much trouble to make sights through the Woods, for direction how to cut them; but where this was practised, every tree which stood in the line, good and bad, were cut down, and many times boggy or bad ground was taken into the walks; so that an expence of draining and levelling, was necessary to render them proper for walking on; besides this, there were many other inconveniencies attending these strait cuts through Woods, as, first, by letting in a great draught of air, which in windy weather renders the walks unpleasant; and these cuts will also appear at a great distance from the Woods, which will have a very bad effect; therefore the modern practice of twisting the walks through Woods, is to be preferred. In the cutting of these walks, there should be particular care taken to lead them over the smoothest and soundest part of the ground, as also to avoid cutting down the good trees; so that whenever these stand in the way, it will be better to lead the walk on one side, than to have the tree stand in the middle; for although some persons may contend for the beauty of such trees which are left standing in walks, yet it must be allowed, that unless the walk is made much broader in those places than in the other, the trees will occasion obstructions to the walkers, especially when two or three persons are walking together, so that it will be much better to have the walks entirely clear from trees; and where any large-spreading trees stand near the walk, to cut away the small Wood, so as to make an opening round the trees, where there may be some seats placed, for persons to rest under the shade. The turns made in these walks should be as easy and natural as possible; nor should there be too many of them, for that will render the walking through them disagreeable; therefore the great skill in making of these walks is, to make the turns so easy as not to appear like a work of art, nor to extend them strait to so great length, as that persons who may be walking at a great distance, may be exposed to the sight of each other; both these extremes should be avoided as much as possible, since they are equally disagreeable to persons of true taste. When a Wood is properly managed in this way, and a few places properly left like an open grove, where there are some large trees so situated as to form them, there can be no greater ornament to a fine seat than such a Wood.

We shall now treat of the culture of Woods for profit to the possessor, and for the public benefit of the nation. The great destruction of the Woods and forests which has been of late years made in this country, should alarm every person who wishes well to it; since there is nothing which seems more fatally to threaten a weakening, if not a dissolution, of the strength of this once famous and flourishing nation, than the notorious decay of its timber; and as this devastation has spread through every part of the country, so unless some expedient be seriously and speedily resolved on, to put a stop to this destruction of the timber, and also for the future increase of it, one of the most glorious bulwarks of this nation will, in a few years, be wanting to it.

And as there are small hopes of this being remedied by those intrusted with the care of the public Woods, since their private interest is so much better advanced by the destroying the timber, which they were appointed to preserve: therefore, unless private persons can be prevailed on to improve their estates, by encouraging the growth of timber, it is greatly to be feared, that in an age there will be a want of it for the supply of the navy; which, whenever it happens, must put a period to the trade of this country.

It has been often urged, by persons whose judgment in other affairs might be depended on, that the great plantations, which, for several years past, have been carried on in several parts of this kingdom, will be of public benefit, by the propagation of timber; but in this they are greatly mistaken; for in most of the plantations which have been made for years past, there has been little regard had to the propagation of timber; present shade and shelter have been principally considered; and in order to obtain these soon, great numbers of trees have been taken out of Woods, hedge rows, &c. which, if they had remained in their first situation, might in time have afforded good timber; but by being transplanted large, are absolutely rendered unfit for any use but fuel; so that the great quantity of plantations which have been made, I fear, will rather prejudice than be of use, to the improvement of timber; nor is there any other method of increasing the useful timber of this country, than by sowing the seeds in the places where they are to remain; or in such situations, where there are plenty of Oaks in the neighbourhood, if the ground is properly fenced, to keep out cattle and vermin, the Acorns which drop from those trees will soon produce plenty of young trees; which, if properly taken care of, will soon grow to Woods.

The two most substantial timbers of this country are the Oak and Chestnut, though the latter has been of late years almost entirely destroyed in England, so that there are scarce any remains of trees of size in the Woods at present; but there can be no doubt of this tree having been one of the most common trees of this country, as may be proved by the old buildings in most parts of England, in which the greatest part of the timber is Chestnut. But as I have already treated largely of the method of propagating both these trees for profit, under their respective titles, I shall not repeat it here. Next to these, the Elm is esteemed as a profitable timber; but of these there are few cultivated in Woods, especially in the south part of England, where they chiefly grow in hedge rows, or plantations near houses; but in the north-west part of England, there are numbers of very large trees of the Witch-Elm growing in parks, and some in Woods, as if that tree was a native of this country, which has been much doubted; though as this tree propagates itself by seeds, it may be deemed an indigenous plant in England.

The Beech is another tree common in the Woods, especially upon the chalky hills of Buckinghamshire, Kent, Sussex, and Hampshire, where there are some very large Woods, entirely of this sort; some of which have been of long standing, as appears by the age of the trees; but whether this tree is a native of this country, has been a point often disputed.

The Ash is a very profitable tree, and of quick growth; so that in less than an age, the trees will arrive to a large size from the seeds; therefore a person may hope to reap the profits of his labour, who sows the seeds; but this is not a beautiful tree to stand near a habitation, being late in the spring in putting out its leaves, and the first that sheds them in autumn; nor is a friendly tree to whatever grows near it, the roots drawing away all the nourishment of the ground, whereby the trees or plants which grow near are deprived of it; so that where the Ash-tree grows in hedge rows, the hedge rows in a few years are entirely destroyed; and if they are in pasture grounds, and the cows browze on them, the butter made with their milk will be bad; for which reason the Ash should be sown separate in lands which are inclosed, where cattle are not permitted to come, and at a distance from the habitation.

Upon sandy or rocky soils, the Scotch Pine will thrive exceedingly, and turn to great advantage to the planter, provided the plants are planted young, and treated in the manner directed in the article PINUS, to which the reader is desired to turn, to avoid repetition.

There are also several aquatic trees, which are very profitable to those who have low marshy lands, where the harder kinds of timber will not thrive; these are the Poplars of several sorts, the Willow, Alder, &c. but as these, and all the other kinds of trees, have been fully treated of, both as to their propagation and uses, and also an account of the different soils in which each will thrive best, under their respective titles, the reader is referred to them for farther information; and I shall next treat of the general management of Woods, of whatever kinds of trees they are composed.

Where there are young Woods, great care must be taken of the fences; for if cattle should get in among the trees, especially while they are young, they will in a short time do infinite damage to them, by browzing on the branches, or barking the trees; so that during the first twenty years of their growth, they should be secured from hares and rabbets, otherwise in severe frost, or when the ground is covered with snow, whereby they are deprived of other food, they get into the Woods, and eat off the bark from the young trees, and gnaw all the branches within their reach; so that in a few days, where there are plenty of these animals, there may be such destruction made among the young trees, as cannot be retrieved, but by cutting them down to the ground, which will be a loss of several years; therefore those persons who have the care of young Woods, should be very diligent in frosty weather, in looking over the trees, and stopping the holes in the fences, to keep out all vermin.

Another care to be taken of young Woods, is the thinning the trees from time to time, as they increase in their growth; but in doing of this, there must be great caution used; for it should be gradually performed, so as not to open the trees too much, to let the cold air among them, which will greatly retard their growth; nor should the trees be left so close, as to draw each other up like May-poles, but rather observe a medium in this work, cutting down a few each year, according as there may be necessity for it, being careful not to permit those to stand, which may spoil the growth of the neighbouring trees, always observing to leave those trees which are the most promising.

The young trees in these Woods should not be lopped or pruned, for the more they are cut, the less they will increase in bulk; every branch which is cut off, will rob the tree of its nourishment, in proportion to the size of the branch; therefore the hatchet should not be suffered to come into young Woods, unless in the hands of skilful persons.

Where persons have more regard to the future welfare of the timber than their immediate profit, the under Wood should be grubbed up as the trees advance, that the roots may have the whole benefit of the soil, and their stems enjoy the free air; without which, their stems are generally covered with Moss, and their growth greatly stinted; as may be observed in all such Woods, where there is any quantity of under Wood remaining; in which places it is rarely found, that the trees do ever grow to a large size; therefore where large timber is desired, the trees must have room to extend their roots and branches, without which it cannot be expected; but from a covetous temper, many people let their under Wood remain as long as it will live; for as the timber increases, the under Wood will be gradually decaying, by the shade and drip of the large trees; so that by this method the timber suffers more in a few years, than the value of the under Wood; therefore, by endeavouring to have both, neither of them can be so good, as where they are separately preserved.

If persons who have estates would be careful to nurse up trees in their hedge rows, it would in time become a fortune to their successors, as hereby the timber growing in the hedges may be worth more than the freehold of the estate, which has often been the case with estates, from which their possessors have cut down timber for fortunes for their younger children; the frequency of this should encourage persons to be a little more attentive to the growth and preservation of young Woods, since the expence and trouble is not great, and the future profit very certain; besides, the pleasure of seeing trees of a man's own sowing make yearly advances, must be very great to those who have any relish for country amusements.

There are several persons who plant copses for cutting every ten or twelve years, according to their growth. These are usually planted in autumn, either with stools or young plants, which are drawn out of the Woods; the latter should always be preferred to the former. These copses are commonly planted with several sorts of trees, as Oak, Beech, Chestnut, Ash, Birch, Willow, &c. but the Ash and Chestnut are the most profitable, where they grow kindly, because the poles of Ash are very valuable; these also are good for hoops, so that there is no danger of having sale for these copse Woods when they are fit for cutting; but where the copses are intended to remain, there should be no standard-trees left for timber; because as the heads of the trees spread, and overtop the under Wood, it will cause that to decay; and where the standards are left upon the stumps of the copse Wood, they will never grow to a large size, nor will the timber be so valuable as that produced immediately from a young root; therefore whoever will make the experiment, will be convinced, that it is more for the advantage of both, to keep them in distinct Woods.

But where persons plant copses upon land free from trees, it will be the better method to sow the seeds, especially if Chestnut, Oak or Beech, are the trees intended; for although it is a prevailing opinion with the generality of persons, that by planting they save time, yet I am sure of the contrary; for if the seedling plants are kept clear from weeds, they will in eight or ten years out-grow those which are planted, and these unmoved copses will continue much longer in vigour than the other; so that for either timber or copse Wood, the best method is to prepare the ground well, and secure the fences, and sow the seeds, which is so far from losing, that in twenty years it will be found to gain time, which is what every planter wishes to do.

The usual time of felling timber is from November to February, at which time the sap in the trees is hardened; for when the sap is flowing in the trees, if they are cut down, the worm will take the timber, and cause it to decay very soon; therefore if the durableness of the timber is considered, the trees should always be cut in the winter months; but as the bark of the Oak is so valuable for tanning leather, there has been a law passed, to oblige persons to cut these trees during the spring season, when the bark will readily peel off; by which the timber is rendered unfit for building either ships or houses, as it will be very subject to cast, rift, or twine, and the worm will soon take it; therefore it would be more for the public benefit, if a law were enacted, to oblige every person to strip off the bark of such trees as are designed to be cut down in the spring, leaving the trees with their branches standing till the following winter, which will be found to answer both purposes well.

# X.



XANTHIUM. Tourn. Inst. R. H. 438. tab. 252. Lin. Gen. Plant. 937. Lesser Burdock.

The Characters are,

*It hath male and female flowers on the same plant. The male flowers have a common scaly empalement; they are composed of several tubulous funnel-shaped florets, which are equal, and disposed in a hemisphere; they are cut into five segments at the top, and have each five very small stamina, terminated by erect parallel summits. The female flowers are situated under the male by pairs; they have no petals or stamina, but they are succeeded by oblong, oval, prickly fruit, having two cells, each including one oblong seed, convex on one side, and plain on the other.*

This genus is ranged in Dr. Linnæus's first section of his twenty-first class, which contains the plants which have separate male and female flowers, and the male flowers have five stamina.

The Species are,

1. Xanthium (*Strumarium*) caule inermi, foliis cordatis trinervatis. Hort. Cliff. *Xanthium with an unarmed stalk, and heart-shaped leaves having three veins.* Xanthium sive Lappa minor. J. B. 3. 572. *Lesser Burdock.*
2. Xanthium (*Canadense*) caule inermi, foliis cuneiformi-ovatis subtrilobis. Lin. Sp. 1400. *Canada Xanthium with an unarmed stalk, and oval wedge-shaped leaves, having almost three lobes.* Xanthium majus Canadense. H. L. 635. *Greatest Canada Burdock.*
3. Xanthium (*Spinosum*) spinis ternatis. Hort. Upsal. 283. *Portugal Xanthium with triple thorns.* Xanthium Lusitanicum spinosum. Pluk. Alm. 206. *Portugal Prickly Burdock.*
4. Xanthium (*Chinense*) caule inermi ramosa, aculeis fructibus erectis longissimis. *China Xanthium with an unarmed branching stalk, and the spines of the fruit very long and upright.*

The first sort grows naturally in Europe, and also in India, from whence I have received the seeds; it has been found growing wild in a few places in England, but of late years it has not been seen in those places. I did once see it growing in the road near Dulwich College. The stalk of this plant is round, and has many black spots; it rises in good ground two feet high, sending out a few side branches. The leaves stand upon slender foot-stalks, which are near four inches long. From the wings of the stalk arise the foot-stalks of the flowers. The leaves are almost heart-shaped, but some of the larger are cut on their sides into three acute lobes; they are irregularly in-

dented on their edges, ending in acute points, and are of a pale green on their under side, but of a dark green on their upper. The flowers are produced in loose spikes, the male flowers growing at the top, and the female flowers under them, which are of an herbaceous colour, and are collected in roundish heads. The female flowers are succeeded by oblong oval fruit, closely armed with short erect spines. This plant flowers in July, and the seeds ripen in autumn.

This plant has been much esteemed by some physicians, for the cure of scrophulous tumours, and also in leprosies, but is rarely now used.

The second sort grows naturally in North America. The stalks of this are much thicker, and rise higher than those of the first; the leaves are not hollowed at their base, nor are they divided so deeply on their sides, as those of the first; they are unequally indented on their edges, and have three strong longitudinal veins, but are of the same colour with the former. The flowers are produced in shorter and looser spikes. The fruit are much larger, and are armed with stronger spines which are incurved. This flowers in August, and in warm seasons the fruit will ripen in autumn.

The third sort grows naturally in Portugal and Spain. The stalks of this rise three feet high, and send out many branches the whole length; these are garnished with oblong leaves which are indented on their edges, and end in acute points; they are from two to three inches long, and three quarters of an inch broad, of a dark green on their upper side, but hoary on their under, having very short foot-stalks. The flowers come out from the side of the branches, two or three at each place, one of which is female, and is succeeded by oblong oval fruit, armed with slender sharp spines which are erect. The stalks and branches are armed with long, stiff, triple thorns on every side, which renders it dangerous to handle them. This flowers in July and August, and in warm seasons the seeds ripen in autumn.

The fourth sort grows naturally in China, from whence I have often received the seeds; the plants are like those of the first sort, but grow larger, and branch more; the flowers are produced in loose spikes at the top of the stalks; the fruit is like that, but the spines are slender, single, and strait. This flowers about the same time with the third sort, but, unless the autumn proves warm, the seeds will not ripen in England.

All these plants are annual. The first will come up from the seeds which fall in autumn, and requires no other care but to thin the plants where they are too close, and keep them clear from weeds; the second sort formerly was as easily cultivated, and came up from the self-sown seeds as readily, and rarely failed to ripen its seeds; but of late years the autumns have proved so bad, as that the seeds have not come to maturity.

The third sort will perfect its seeds some years on self-sown plants, but, as they sometimes fail, the sure way is to raise the plants on a gentle hot-bed, and after they have obtained strength, plant them on a warm border on a lean soil, which will stint the plants in their growth, and cause them to be more fruitful; for when they are planted in rich ground, the plants will grow to a large size, and will not produce flowers till late in autumn, so the seeds will not ripen.

The fourth sort must be raised on a hot-bed in the spring, and the plants should be transplanted each into a small pot, and plunged into a fresh hot-bed to bring them forward. After they have obtained strength, they should be inured to the free air gradually, and in June some of the plants may be turned out of the pots, preserving the ball of earth to their roots, and planted in a south border, where, if the season proves favourable, they will perfect their seeds.

All these plants delight to grow in a rich moist soil.

XANTHOXYLUM. Lin. Gen. Plant. 335. The Tooth-ache-tree.

The Characters are,

*It hath male and female flowers on different plants. The male flower has no empalement, but has five oval petals, and five slender stamina which are longer than the petals, terminated by furrowed summits; it has three germen, which are united at their base, having each a lateral style crowned by obtuse stigmas. The germen afterward become so many capsules, each containing one roundish, hard, shining seed.*

This genus of plants is ranged in the fifth section of Linnæus's twenty-second class, which includes those plants which have male and female flowers on different plants, whose flowers have five stamina and as many styles.

The Species are,

1. Xanthoxylum (*Clava Herculis*) foliis pinnatis. Lin. Sp. Plant. 1455. *Tooth-ache-tree with winged leaves.* Xanthoxylon spinosum, lentisci longioribus foliis, euonymi fructu capsulari. Catesb. Carolin. 1. p. 26. *Prickly Tooth-ache-tree with longer Mastich-tree leaves, and capsules to the fruit like that of the Spindle-tree.*
2. Xanthoxylum (*Americanum*) foliis pinnatis, foliolis oblongo ovatis integerrimis sessilibus. *Tooth-ache-tree with winged leaves, having oblong, oval, entire lobes without foot-stalks, commonly called broad-leaved Tooth-ache-tree.*

The first sort grows naturally in South Carolina, where it rises to the height of fifteen or sixteen feet. The stem is woody, and about a foot thick, covered with a whitish rough bark, and armed with short thick spines; these grow to a large size as the trunk increases in bulk, so as to become protuberances terminating in spines. The leaves are sometimes placed by pairs, and at others they stand without order; they are composed of three, four, or five pair of spear-shaped lobes placed opposite, terminated by an odd one; they are of a deep green on their upper side, and of a yellowish green below, a little sawed on their edges, and stand upon short foot-stalks. At the end of the branches come forth the foot-stalks which sustain the flowers; these branch out, and form a loose panicle. The flowers are composed of five white petals which are small, having no cover; they are by some called the empalement, but being of a different colour from the leaves, I shall take the liberty to stile them petals. Within these are situated five stamina which are terminated by reddish summits, and in the female flowers there are five styles fastened to the side of the germen. After the flower is past, the germen turns to a roundish four-cornered capsule, each containing one roundish, hard, shining seed. It is sometimes called Pellitory-tree.

This has been generally confounded with the prickly yellow Wood, or yellow Hercules of Sir Hans Sloane, but is very different from that; for in the West-Indies it is one of their largest timber trees, and the specimens which I have received from Jamaica, are very different from those of Carolina. The leaves of the former are twice as large as those of the latter; the lobes of the leaves are almost three inches long, and an inch and a half broad; they sit close to the foot-stalk, and the leaves are equally winged, having no single lobe at the end. The flowers of this I have not seen, but the capsules have five cells, each containing one black, shining, hard seed.

The second sort grows naturally in Pensylvania and Maryland; this hath a woody stem, which rises ten or twelve feet high, sending out many branches toward the top; these have a purplish bark, and are armed with short thick spines standing by pairs. The leaves are unequally winged, and are composed of four or five pair of oblong oval lobes, terminated by an odd one; these stand close to the midrib, having no foot-stalks. The midrib is armed on the under side with some small spines. The upper side of the leaves are of a deep green, their under side is of a pale green; they have a warm biting taste. The bark of the tree is used for curing the tooth-ache, from whence it has the name. The flowers grow in loose panicles like those of the former sort, and these are succeeded by fruit with five cells, each including one hard shining seed.

These plants are generally propagated by seeds, but as they never ripen in this country, they must be procured from those places where they naturally grow, or the plants must be propagated by layers. When the seeds arrive in England, they should be sown in pots filled with light earth as soon as possible, for they do not grow the first year; and when they are kept out of the ground till spring, they frequently lie two years in the ground before the plants appear; therefore the pots should be plunged into the ground up to their rims, in an east-aspected border, where they may remain during the summer; this will prevent the earth in the pots from drying too fast, which it is very apt to do when the pots are set upon the ground in the sun. The only care to be taken of the seeds is, to keep the pots constantly clean from weeds, and in very dry weather refresh them now and then with water. In autumn the pots should be placed under a common hot-bed frame, where they may be screened from frost, or else plunged into the ground in a warm border, and covered with tan to keep out the frost, and the following spring they should be plunged into a hot-bed, which will bring up the plants. When these appear, they must be frequently, but sparingly watered, and kept clean from weeds; and, as the summer advances, those of the second sort should be gradually inured to bear the open air, into which they should be removed in June, placing them in a sheltered situation, where they may remain till autumn, when they must be placed in a hot-bed frame to shelter them in winter. The spring following, before the plants begin to shoot, they should be carefully taken up, and each planted into a separate small pot; these may be plunged into a gentle hot-bed, which will forward them greatly in putting out new roots. The after care must be to shelter them for a year or two in winter, until the plants have gotten strength; then in the spring, after the danger of frost is over, some of them may be turned out of the pots, and planted in the full ground in a warm sheltered situation, where the second sort will thrive very well, and resist the cold; but the first is not so hardy, so these may be planted against a south wall, where they will thrive very well. Some of the plants of this sort had been planted in the open air, in the Chelsea Garden, some years past, where they had thriven and endured the cold without any covering, but the severe winter in 1740 destroyed them all. These plants may be increased by cutting off some of their strong roots, preserving their fibres to them, and these planted in pots filled with light earth, plunging them into a moderate hot-bed, will cause them to push out roots and become plants; but these will not thrive so well, nor grow near so large as those which are raised from seeds.

XERANTHEMUM. Tourn. Inst. R. H. 499. tab. 284. Lin. Gen. Plant. 851. [from ξηρὸς dry, and ἄνθος a flower, q. d. dry flower. Clusius calls this plant Ptarmica Austriaca, but that name being applied to another genus, this title of Xeranthemum is now generally received. It is vulgarly called Immortal, because the flower of it may be kept for many years; for it has rigid petals, which crackle as if they were plates of metal.] Eternal Flower, or Ptarmica, vulgò.

The Characters are,

*The flower is composed of hermaphrodite and female florets, which have one common scaly empalement. The hermaphrodite florets which form the disk, are funnel-shaped, spreading, and cut into five points; the female florets, which compose the border or rays, are tubulous, and cut into five less equal points; the hermaphrodite florets have five short stamina terminated by cylindrical summits, and a short germen, supporting a slender style, crowned by a bifid stigma. The germen afterward becomes an oblong seed crowned with hairs, which ripens in the empalement. The female florets have no stamina, but their germen, styles, and seeds, are the same as the hermaphrodite.*

This genus of plants is ranged in the second section of Linnæus's nineteenth class, which contains those plants whose flowers are composed of female and hermaphrodite florets which are both fruitful.

The Species are,

1. Xeranthemum (*Annuum*) herbaceum foliis lanceolatis patentibus, caule herbaceo. Lin. Sp. Plant. 1201. *Eternal Flower with spreading spear-shaped leaves.* Xeranthemum flore simplici purpureo majore. H. L. *Eternal Flower, with a larger, purple, single flower, commonly called Ptarmica.*
2. Xeranthemum (*Inapertum*) foliis lineari-lanceolatis utrinque tomentosis. *Eternal Flower with linear spear-shaped leaves, which are downy on both sides.* Xeranthemum flore simplici purpureo minore. Tourn. Inst. R. H. 499. *Eternal Flower with a smaller, single, purple flower.*
3. Xeranthemum (*Orientale*) foliis lineari-lanceolatis, capitulis cylindraceis, semine maximo. *Eternal Flower with linear spear-shaped leaves, cylindrical heads, and a very large seed.* Xeranthemum flore purpureo simplici minimo, semine maximo. H. L. *Eternal Flower, with the smallest, single, purple flower, and the largest seed.*
4. Xeranthemum (*Speciosissimum*) fruticosum erectum, foliis amplexicaulibus trinerviis, ramis unifloris subnudis. Lin. Sp. Plant. 1202. *Shrubby, erect, Eternal Flower, with spear-shaped leaves, and almost naked branches bearing one flower.* Xeranthemum tomentosum latifolium, flore maximo. Burman. Pl. Afr. 178. tab. 66. fig. 2. *Broad-leaved, woolly, Eternal Flower, with the largest flower.*
5. Xeranthemum (*Retortum*) caulibus frutescentibus provolutis, foliis tomentosis recurvatis. Lin. Sp. 858. *Eternal Flower with shrubby trailing stalks, and downy recurved leaves.* Xeranthemoïdes procumbens, polii folio. Hort. Elth. 423. *Trailing Bastard Eternal Flower, with a Mountain Poley leaf.*
6. Xeranthemum (*Sesamoïdes*) ramis unifloris imbricatis, foliis linearibus adpressis. Lin. Sp. Plant. 1203. *Eternal Flower with imbricated branches with one flower, and linear pressed leaves.* Xeranthemum ramosum, foliolis squamosis linearibus, floribus argenteis. Burm. Afr. 181. tab. 67. f. 2. *Branching Eternal Flower, with squamose leaves and silvery flowers.*

The first sort grows naturally in Austria, and some parts of Italy, but has been long cultivated in the English gardens for ornament. Of this there are the following varieties; one with a large, single, white flower, the purple and white with double flowers, though these only differ in the colour and multiplicity of petals in their flowers, so are not mentioned as distinct species, yet where their seeds are carefully saved separate, they are generally constant.

These plants are annual; they have a slender branching stalk, which is covered with a white down that is angular and furrowed; it rises about two feet high, and is garnished with spear-shaped leaves an inch and a half long, and a quarter of an inch broad, which are hoary, sitting close to the stalk, but spread out from it. The stalk divides into four or five branches; these are garnished with a few leaves at their lower parts, of the same shape with the other, but are less. The upper part of the branches is naked, and sustains one flower at the top, composed of several female and hermaphrodite florets, included in one common scaly empalement of a silvery colour. The florets are succeeded by oblong seeds crowned with hairs. The petals of these flowers are dry, so if they are gathered perfectly dry, and kept from the air, they will retain their beauty a long time; they flower in July, August, and September, and the seeds ripen in autumn.

The second sort grows naturally in Italy. The stalks of this do not rise much more than a foot high, and do not branch so much as the former. The leaves are narrower, and the whole plant very hoary. The flowers are not half so large as those of the former, and the scales of their empalements are very neat and silvery. This flowers at the same time as the former.

The third sort grows naturally in the Levant; this rises about the same height as the first sort. The leaves are narrower, and are placed closer on the stalks

ftalks to the top. In other refpects the plants are very like, but the flowers are much lefs, of a paler purple colour, and have a cylindrical empalement. The feeds are very large, and feldom more than three or four in each head. This flowers about the fame time as the firft.

Thefe flowers were formerly much more cultivated in the Englifh gardens than at prefent, efpecially the two forts with double flowers, which the gardeners near London propagated in great plenty for their flowers, which they brought to market in the winter feafon, to adorn rooms, to fupply the place of other flowers, which are not eafy to be procured at that feafon; for thefe, being gathered when they are fully blown, and carefully dried, will continue frefh and beautiful many months; but as there are no other colours in thefe flowers but white and purple, the gardeners had a method of dipping them into various tinctures, fo as to have fome of a fine blue, others fcarlet, and fome red, which made a pretty variety; and if they were rightly ftained, and afterwards hung up till they were thorough dry, they would continue their colours as long as their flowers lafted. The ftalks of the flowers were not fet in water, but the pots or glaffes were half filled with dry fand, into which the ftalks were placed, and in thofe they would continue in beauty the whole winter.

Thefe plants are propagated by feeds, which may be fown either in the fpring or autumn on a border of light earth, but the latter feafon is preferable; for thofe plants which come up in autumn will flower fooner, the flowers will be doubler and much larger than thofe which are fown in the fpring, and from thefe good feeds may be always obtained; whereas the fpring plants many times fail in cold years, and in hot dry feafons the plants do not grow to any fize.

When the plants come up, and are about two inches high, they fhould be pricked out into another border under a warm wall, pale, or hedge, at about four or five inches diftance from each other, or into the borders of the flower-garden. In this place the plants will endure the cold of our ordinary winters extremely well, and in the fpring will require no farther care but to keep them clear from weeds, for they may remain in the fame place for good. In June they will begin to flower, and the beginning of July they will be fit to gather for drying; but a few of the beft and moft double flowers of each kind fhould be fuffered to remain for feed, which, in about fix weeks or two months time will be ripe, and the plants will perifh foon after; fo that the feeds muft be annually fown, in order to preferve the kinds.

The fourth fort grows naturally at the Cape of Good Hope; this rifes with a fhrubby ftalk three or four feet high, dividing into four or five branches, whofe lower parts are garnifhed with thick-pointed leaves, about two inches long and one broad, which are hoary on their under fide, and are ranged without order. The upper part of the branches are naked, and are terminated by one large yellow flower, compofed of many oblong acute-pointed rays in the border, and the middle or difk, which is prominent, is made up of hermaphrodite florets, which are of a fplendid yellow colour.

The fifth fort alfo grows naturally at the Cape of Good Hope. The ftalks of this fort are very flender, ligneous, and trail upon the ground; they extend three or four feet in length, and are garnifhed with fmall filvery leaves placed without order, which fit clofe to the ftalks, and are reflexed. The flowers are produced from the wings of the branches, fometimes one, and at others two or three flowers arife at the fame point; thefe have fcaly empalements; their border or rays are compofed of many female florets of a white colour, and their middle of hermaphrodite florets, and are fucceeded by oblong feeds crowned with hairs. This plant flowers in July and Auguft, but the feeds feldom ripen in England.

The fixth fort is a native of the country near the Cape of Good Hope; this has a fhrubby branching ftalk, which rifes three or four feet high. The branches are flender, and like thofe of the Spanifh Broom, but are hoary; thefe have very fmall leaves refembling fcales, which fit clofe to the branches; they are narrow and hoary, ending in acute points. The ftalks are each terminated by one large filvery flower, having a ftiff, dry, fcaly empalement. The rays of the flower are compofed of many dry female florets, and the difk or middle is made up of hermaphrodite florets; thefe are fucceeded by oblong feeds crowned with hairs, which do not ripen in England.

As thefe laft mentioned plants do not ripen their feeds in England, they are propagated by cuttings, which, if planted on a bed of light earth, during any of the fummer months, and fhaded from the fun, will put out roots. When they have gotten fufficient ftrength, they fhould be carefully taken up, and planted into feparate pots filled with light earth, and placed in a fhady fituation till they have taken frefh root; then they may be removed to a fheltered fituation, where they may have more fun, and here they may remain till autumn, when they muft be removed into fhelter, for they are too tender to live abroad through the winter in England, though they do not require any artificial warmth. I have kept thefe plants in a common hot-bed frame all winter, expofing them always to the open air in mild weather, but covering them in froft, and thefe plants have been ftronger, and have flowered better than thofe which were placed in the green-houfe; fo that I would recommend this method of treatment as the beft, for the plants are apt to draw up weak in a green-houfe, and that prevents their flowering; nor are the plants near fo handfome, as thofe which are more expofed to the open air.

In the fummer time they fhould be placed abroad in a fheltered fituation with other hardy exotic plants, and in dry weather they will require to be often watered, for they are pretty thirfty plants, but in winter it fhould be fparingly given to them. As thefe plants are not of long duration, there fhould be young plants propagated to fucceed them, for if they live four or five years, it will be long enough, becaufe after that age they become unfightly.

XIMENIA. Plum. Gen. Nov. 6. tab. 21. Lin. Gen. Plant. 1105.

The title of this genus was given to it by Father Plumier, in honour of the Reverend Francifcus Ximenes, a Spaniard, who publifhed an account of the Mexican trees and plants in four books, in the year 1615.

The Characters are,

*The flower has a fmall empalement of three leaves, which falls off; it has one bell-fhaped petal which is cut into three fegments at the top, which turn backward; it has eight fhort awl-fhaped ftamina terminated by fingle fummits, and a fmall oval germen, fituated under the flower, fupporting a very fhort ftyle, crowned by a headed ftigma. The germen afterward turns to an oval flefhy berry, including an oval nut with one cell, containing one feed of the fame form.*

This genus of plants is ranged in the firft fection of Linnæus's eighth clafs, the flowers having eight ftamina and one ftyle.

The Species are,

1. Ximenia (*Americana*) foliis oblongis, pedunculis multifloris. Lin. Sp. Plant. 1193. *Ximenia with oblong leaves, and foot-ftalks bearing many flowers.* Ximenia aculeata, flore villofo, fructu luteo. Plum. Gen. Nov. 6. *Prickly Ximenia with a hairy flower, and a yellow fruit.*
2. Ximenia (*Agihalid*) foliis geminis lanceolatis. *Ximenia with fpear-fhaped twin leaves.* Agihalid. Alpin. Egypt. 38.

The firft fort grows naturally in the iflands of the Weft-Indies; it rifes with a woody ftalk twenty feet high, fending out feveral branches on every fide, which are armed with thorns, and garnifhed with fpear-fhaped leaves ftanding round the branches without order. The flowers are produced at the end of the branches; they

they have one bell-shaped petal, cut almost to the bottom into three segments which are rolled backward, and are hairy; within they are of a yellow colour, and are succeeded by an oblong, oval, fleshy fruit, shaped like a Plum, including a hard nut of the same form.

The second sort grows naturally in Egypt, where it becomes a tree of middling size. The stem is large and woody; the branches are slender and stiff; they have a green bark while young, and are armed with strong spines; the leaves come out by pairs; they are larger than those of the Box-tree, and end in points, but are of the like consistence and colour. The flowers come out on the side of the branches; they are shaped like those of the Hyacinth, but are small, and of a white colour; these are succeeded by oblong black berries including an oval nut, having one kernel or seed.

Both these sorts are propagated by seeds, which must be procured from the countries where they grow naturally; these should be sown in pots filled with light earth, and plunged into a good hot-bed of tanners bark. If the seeds are fresh, the plants will appear in six weeks or two months. When these are about three inches high, they must be each carefully transplanted into a separate small pot filled with light earth, and plunged into a good hot-bed of tanners bark, where they must be shaded from the sun till they have taken new root; then they must be treated in the same manner as other tender plants from the warm countries. During the first summer they may be kept in the tan-bed under frames, where they will thrive better than in the stove; but in autumn, when the nights grow cool, they should be removed into the stove, and plunged into the tan-bed; and in this they should always be kept, observing to shift them into larger pots when they require it; and in summer, when the season is warm, they should have a large share of free air admitted to them. With this management the plants will thrive well, but they cannot be expected to flower very soon in this country.

XIPHION or XIPHIUM. Tourn. Inst. R. H. 362. tab. 189. Iris. Lin. Gen. Plant. 57. Bulbous Iris, or Flower-de-luce.

The CHARACTERS are,

*The flowers have each a permanent spatha or sheath; they have six petals, the three outer broad, obtuse, and reflexed, the inner erect, pointed, and joined to the other at their base; they have three awl-shaped stamina, which lie upon the reflexed petals, and are terminated by oblong depressed summits, and an oblong germen under the flower, supporting a short style, crowned by a tripartite stigma. The germen afterward becomes an oblong angular capsule with three cells, filled with roundish seeds.*

This genus of plants is ranged in the second section of Tournefort's ninth class, which includes the herbs with a Lily flower cut into six parts, whose empalement becomes the fruit. He separates this from Iris, because the root is bulbous, to which we may add, that the leaves are boat-shaped, and the stigma of the flower is long and narrow. Dr. Linnæus joins the plants of this genus, as also the Sisyrinchium and Hermodactylus of Tournefort, to his genus of Iris, and places it in the first section of his third class, which contains those plants whose flowers have three stamina and one style. And although there is no material distinction between the flowers of this genus and those of Iris, yet, as there are many species of the latter, it is better to separate these plants from them, as they differ greatly in their external habit.

The SPECIES are,

1. XIPHIUM. (*Persicum*) foliis carinatis caule longioribus. *Bulbous Iris, with keel-shaped leaves which are longer than the stalk.* Xiphion Persicum præcox, flore variegato. Tourn. Inst. R. H. 363. *Early Persian bulbous Iris, with a variegated flower.*
2. XIPHIUM (*Vulgare*) foliis subulato-canaliculatis, caule brevioribus. *Bulbous Iris, with channelled awl-shaped leaves which are shorter than the stalk.* Iris bulbosa, flore cæruleo violaceo. C. B. P. 38. *Bulbous Iris with a blue Violet flower.*
3. XIPHIUM (*Latifolium*) foliis subulato-canaliculatis, floribus majoribus. *Bulbous Iris, with channelled awl-shaped leaves and larger flowers.* Xiphion latifolium, caule donatum, flore cæruleo. Tourn. Inst. R. H. 363. *Broad-leaved bulbous Iris, having a stalk and a blue flower.*
4. XIPHIUM (*Planifolium*) foliis planis caule longioribus. *Bulbous Iris, with plain leaves which are longer than the stalk.* Iris bulbosa latifolia, flore cæruleo. J. B. 2. 703. *Broad-leaved bulbous Iris, with a blue flower.*

The first sort grows naturally in Persia, but has been many years cultivated in the English gardens for the beauty of its flowers; it has an oval bulbous root, from which come out five or six pale green leaves, which are hollowed like the keel of a boat; they are about six inches long, and one broad at the base, ending in points. Between these the flower-stalk arises, which is seldom above three inches high, supporting one or two flowers, which are included in spathæ (or sheaths); these have three erect petals called standards, which are of a pale sky blue colour, and three reflexed petals called falls, which on their outside are of the same colour; but the lip has a yellow streak running through the middle, and on each side are many dark spots, with one large deep purple spot at the bottom. These flowers have a very fragrant scent, and generally appear in February, which renders them more valuable.

The second sort grows naturally in the warm parts of Europe. There are several varieties of this species: the most common sort is blue, but there is one with a yellow, and another with a white flower; one with a blue flower having white falls, another with yellow falls; one with a Violet-coloured flower having blue falls, with some others; but these are all supposed to be varieties which have been produced by culture. The root of this is bulbous; the leaves are hollow or channelled, ending in points, where their two sides meet; these are not so long as the flower-stalk which rises between them, and is embraced by the base of the leaves. This supports two or three flowers, which are each inclosed in a separate sheath, at the top of the stalk. The flowers are shaped like those of the first sort, but differ in their colour. This sort flowers in May, and the seeds ripen in August.

The third sort has much larger bulbous roots than either of the former. The leaves are shaped like those of the second sort, but are much larger; the flower-stalk is near twice the height of the second sort, and the flowers are more than double their size. This is by some supposed to be only a variety of the second sort, but I think it a distinct species, for I have many years raised a great number of the plants from seed, and have never found a single one degenerated to the second sort, and have raised many of the second sort from seeds, without one instance of a plant improving to the third sort.

There is a great variety of this species, which differ in the colours of their flowers. Some are of a deep blue, others of a light or sky blue, some of a deep purple, and others with fine variegated flowers, which make a fine appearance during their continuance, which is not long, unless the season proves cold, or the flowers are shaded from the sun. This sort flowers five or six weeks after the second sort, which is also an argument for its being specifically different.

The fourth sort grows naturally in Spain and Portugal. The root of this has a dark-coloured coat, but is white within, and of a sweet taste. The leaves are eight or nine inches long, and more than an inch broad at their base; they are almost plain, but toward their base are hollowed like the keel of a boat, and end in points, being of a pale green on their upper side, and a little hoary on their under. The flowers stand upon naked foot-stalks which arise from the root, and grow five or six inches high, sustaining two or three flowers at the top, which are each wrapped up in a separate sheath; these are shaped like those of the other sorts, and have a very agreeable odour; they appear in May, but are of short duration.

There

There are four or five varieties of this species which differ in the colour of their flowers, but the most common colour is blue.

These are propagated by offsets from their roots; but to obtain new varieties, they must be propagated by seeds in the following manner.

Having procured a parcel of seeds from good flowers, the beginning of September you should provide some flat pans or boxes, which must have holes in their bottoms to let the moisture pass off; these should have pieces of tile or oyster shells laid over each hole, to prevent their being stopped; then they must be filled with fresh light sandy earth, and the seeds sown thereon pretty thick, observing to scatter them as equally as possible; then cover them over about half an inch thick with the same light fresh earth, and place the boxes or pans where they may have the morning sun till eleven o'clock; and if the season should prove very dry, they must be now and then refreshed with water.

In this situation they may remain until the middle of October, when they should be removed into a warmer situation, where they may have the full sun most part of the day, and screened from severe frosts; in which place they must abide all the winter, observing to keep them clear from weeds and Moss, which, at this season, are very apt to spread over the surface of the earth in pots, when they are exposed to the open air.

In the spring the plants will appear above ground, when, if the season is dry, they must be now and then refreshed with water, and constantly kept clear from weeds; and as the season advances, and the weather becomes warm, they should be again removed into their former shady situation, where they may enjoy the morning sun only. When the leaves begin to decay (which will be in June,) they must be cleared from weeds and dead leaves, and some fresh earth sifted over them about half an inch thick, still suffering them to abide in the same situation all the summer season; during which time, they will require no farther care but to keep them clear from weeds until the beginning of October, when they must be again removed into a warm situation, and the surface of the earth lightly taken off, and some fresh earth sifted over them.

In this place they must remain all the winter as before, and in the spring they must be treated as was directed for the former years.

When the leaves are decayed, the bulbs should be carefully taken up (which may be best done by sifting the earth through a fine sieve) and a bed or two of good light fresh earth should be prepared, into which the bulbs must be planted, at about three inches asunder each way, and three inches deep. These beds must be constantly kept clean from weeds and Moss; and if the winter should prove severe, the beds should be covered with rotten tanners bark, or Peas haulm, to keep out the frost; and in the spring, just before the plants come up, the surface of the beds should be stirred, and some fresh earth sifted over them about half an inch thick, which will greatly strengthen the roots. During the spring and summer they must be constantly weeded; and at Michaelmas the earth should be again stirred, and some fresh sifted over the beds again, as before, observing in winter and spring still to keep the beds clean, which is the whole management they will require; and in June following the greatest part of the roots will flower, at which time you should carefully look over them, and put down a stick by all those whose flowers are beautiful, to mark them; and as soon as their leaves are decayed, these roots may be taken up to plant in the flower-garden amongst other choice sorts.

But the nursery-beds should still remain, observing to keep them clear from weeds, as also to sift fresh earth over them, as was before directed; and the following season the remaining part of the roots, which did not flower the foregoing season, will now shew their blossoms; so that you may know which of them are worth preserving in the flower-garden, which should now be marked; and when their leaves are decayed, they must be taken up, and planted with the other fine sorts, in an east border of light fresh earth; but the ordinary sorts may be intermixed with other bulbous rooted flowers in the larger borders of the pleasure-garden, where, during their continuance in flower, they will afford an agreeable variety.

But after these choice flowers are obtained from seeds, they may be increased by offsets, as other bulbous flowers are. The offsets should be planted in a separate border from the blowing roots, for one year, until they have strength enough to produce flowers, when they may be placed in the flower-garden with the old roots.

These bulbs need not be taken up oftener than every other year, which should always be done soon after their leaves decay, otherwise they will send forth fresh fibres, when it will be too late to remove them; nor should they be kept long out of the ground, a month is full enough; for when they are kept longer, their bulbs are subject to shrink, which causes their flowers to be weak the following year.

The earth which the flowers thrive best in, is a light sandy loam; and if it be taken from a pasture ground with the sward, and laid in a heap until the Grass is thoroughly rotted, it will be still better; for these bulbs do not delight in a rich dunged soil, nor should they be planted in a situation where they may be too much exposed to the sun; for in such places their flowers will continue but a few days in beauty, and their roots are apt to decay; but in an east border, where they have the sun until eleven o'clock, they will thrive and flower extremely well, especially if the soil be neither too wet, nor over dry. From the most beautiful of these flowers should seeds be saved, and sown every year, which will always furnish new varieties, some of which will greatly exceed the original kinds.

The Persian Iris is greatly esteemed for the beauty and extreme sweetness of its flowers, as also for its early appearance in the spring, it generally being in perfection in February, or the beginning of March, according to the forwardness of the season, at which time there are few other plants in beauty.

This may be propagated by seeds, in the same manner as the other sorts: but the boxes in which they are sown, should be put under a garden frame in winter, to shelter them from hard frost; because, while the plants are young, they are somewhat tender. From the seeds of this kind I could never obtain any varieties, their flowers being always the same.

These plants are also propagated by offsets, in the same manner as the other sorts, but their roots should not be transplanted oftener than every third year; nor should they be ever kept out of the ground long, because their roots will shrink and entirely decay when they are long above ground, so as not to be recovered again. This sort was formerly more common in the gardens near London than at present; which, I suppose, has been occasioned by the keeping the roots above ground too long, which destroyed them.

XYLON. See Bombax.

# Y.



YEW-TREE. See TAXUS.

YUCCA. Dillen. Gen. Nov. 5. Lin. Gen. Plant. 388. Cordyline. Roy. Lug. Prod. 22. The Indian Yucca, or Adam's Needle.

The CHARACTERS are,

*The flower has no empalement; it has a bell-shaped flower, composed of six large petals whose tails are joined, and six short reflexed stamina terminated by small summits, and an oblong three-cornered germen which is longer than the stamina, having no style, crowned by an obtuse stigma with three furrows. The germen afterward turns to an oblong three-cornered capsule divided into three cells, filled with compressed seeds, lying over each other in a double arrangement.*

This genus of plants is ranged in the first section of Linnæus's sixth class, which includes those plants whose flowers have six stamina and one style.

The SPECIES are,

1. YUCCA (*Gloriosa*) foliis integerrimis. Vir. Cliff. 29. *Yucca with entire leaves.* Yucca foliis Aloës. C. B. P. 91. *Yucca with leaves like those of the Aloe, commonly called Adam's Needle.*
2. YUCCA (*Aloifolia*) foliis crenulatis strictis. Lin. Sp. Plant. 319. *Yucca with narrow leaves which are slightly crenated.* Yucca arborescens, foliis rigidioribus rectis serratis. Dill. Hort. Elth. 435. *Tree-like Yucca with strait, stiff, sawed leaves.*
3. YUCCA (*Draconis*) foliis crenatis nutantibus. Lin. Sp. Plant. 319. *Yucca with nodding crenated leaves.* Yucca draconis folio serrato. Hort. Elth. 437. *Yucca with a sawed Dragon-tree leaf.*
4. YUCCA (*Filamentosa*) foliis serrato-filamentosis. Lin. Sp. Plant. 319. *Yucca with sawed thready leaves.* Yucca foliis filamentosis. Mor. Hist. 2. p. 419. *Thready-leaved Yucca.*

The first of these plants is a native of Virginia, and other parts of North America, but has been long an inhabitant of the English gardens, where it was formerly nursed up in green-houses, supposing it was too tender to live in the open air in winter; but of late years the plants have been planted into the full ground, where they have resisted the greatest cold of our winters where they are in a dry soil.

This sort seldom rises with a stem above two feet and a half or three feet high, which is garnished with leaves almost to the ground. The leaves of this are broad, stiff, and have the appearance of those of the Aloe, but are narrower; they are of a dark green colour, ending in a sharp black spine. This sort frequently produces its panicles of flowers, which rise from the center of the leaves. The stalks grow three feet high; they branch out on every side to a considerable distance, but the flowers are placed very sparsedly on the stalks, which renders it less beautiful than the flowers of the other kinds; they are white within, but each petal is marked with a purple stripe on the outside; they are bell-shaped, and hang downward; they appear in August and September, but are not succeeded by seeds in England.

The second sort rises with a thick, tough, fleshy stalk, to the height of ten or twelve feet, having a head or tuft of leaves at the top; these are narrower and stiffer than those of the former sort, and are of a lighter green colour; their edges are slightly sawed, and their points end with sharp thorns. The flower-stalk rises in the center of the leaves, and is from two to three feet long, branching out into a pyramidal form. The flowers grow close on the branches, and form a regular spike; they are of a bright purple colour on the outside, and white within, making a fine appearance. The flowers appear at the same time with the former, but the plants of this do not flower so often as the other sort; and when they flower, the head decays, but one or two young heads come out from the side of the stalk, below the old one.

The third sort grows naturally in South Carolina, from whence I received the seeds by the title of Oil Seed. The stalks of this sort rise about three or four feet high; the leaves are narrow, of a dark green colour, and hang downward; they are sawed on their edges, and end in acute spines. I never saw the flowers of this sort, but have been informed they are white.

The threaded sort is not so common as the others in the English gardens, but as it is a native of Virginia, it might easily be procured in plenty from thence. The stalk and leaves are like those of the first sort, but the leaves are obtuse, and have no spines at their ends. The flower-stalk rises five or six feet high, which is generally garnished with flowers most of its length; the flowers are larger and whiter than those of the other species, and sit close to the stalk. From the side of the leaves come out long threads which hang down.

All these plants are either propagated by seed, when obtained from abroad, or else from offsets or heads taken from the old plants, after the manner of Aloes. When they are raised from seeds, they should be sown in pots filled with light fresh earth, and plunged into a moderate hot-bed, where the plants will come up in five or six weeks after; and when they are two or three inches high, they should be transplanted each into a separate small pot filled with light fresh earth, and plunged into a hot-bed, where the plants should have air and water in proportion to the warmth of the season, and the bed wherein they are placed.

In July they should be inured by degrees to bear the open air, into which they must be removed, to harden them before winter, placing them in a well sheltered situation, where they may remain until the beginning of October, when they must be removed into the green-house, where they may be ranged amongst the hardier sort of Aloes, and should be treated in the same manner as hath been already directed for them; to which the reader is desired to turn, for further instructions.

When these plants have acquired strength, those of the common sort, and also the threaded, may be afterwards turned out into a warm border, where they will endure the cold of our ordinary winters very well, but the other sorts must be kept in pots, that they may be sheltered in winter; and if they are treated in the same way as the large American Aloe, they will do very well.

The offsets taken from the old plants should be laid in a dry place, for a week or ten days before they are planted, that their wounds may heal, otherwise they will be subject to rot with moisture.

As the second and third sorts do not put out offsets so plentifully as the first and fourth, so in order to propagate them, the heads of the plants may be cut off in June; and after the wounded part is dry, the heads may be planted, which will soon take root, provided the pots are plunged into a moderate hot-bed; and this cutting off the heads will occasion the stems to put out suckers, which they seldom do without until they flower; so that by this method, the plants may be obtained in plenty.

# Z.



ZANTHOXYLUM. See XANTHOXYLUM.

ZEA. Lin. Gen. Plant. 926. Mays. Tourn. Inst. R. H. 531. tab. 303, 304, 305. Indian, or Turkey-corn; in French, *Blé de Turquie.*

The CHARACTERS are,

*It has male and female flowers situated at remote distances on the same plant. The male flowers are disposed in a loose spike, having oval, oblong, chaffy empalements, opening with two valves, each inclosing two flowers; these have two short compressed nectariums, and three hair-like stamina, terminated by quadrangular summits, which open in four cells at the top. The female flowers, which are situated below the male, are disposed in a thick spike inclosed with leaves; these have thick chaffy empalements with two valves. The flowers are composed of two short membranaceous broad valves which are permanent, and a small germen, with a slender style, crowned by a single stigma, which is hairy toward the point. The germen afterward turns to a roundish compressed seed, angular at the base, and half inclosed in its proper receptacle.*

This genus of plants is ranged in the third section of Linnæus's twenty-first class, which includes those plants which have male and female flowers at distances on the same plant, and the male flowers have three stamina.

The SPECIES are,

1. ZEA (*Americana*) caule altissimâ, foliis latioribus pendulis, spicâ longissimâ. *Indian Corn with the tallest stalk, broader hanging leaves, and the longest spike.* Mays granis aureis. Tourn. Inst. R. H. 531. *Indian Maize with yellow grains.*
2. ZEA (*Alba*) caule graciliore, foliis carinatis, pendulis, spicâ longâ gracili. *Indian Corn with slenderer stalks, keel-shaped hanging leaves, and a long slender spike.* Mays granis albicantibus. Tourn. Inst. R. H. 531. *Indian Maize with white grains.*
3. ZEA (*Vulgare*) caule humiliori, foliis carinatis pendulis, spicâ breviore. *Indian Corn with a lower stalk, hanging keel-shaped leaves, and a shorter spike.* Mays spicâ aureâ & albâ. Tourn. Inst. R. H. 531. *Turkey or Indian Maize, with a yellow and white spike.*

These three species have been generally supposed but one, and no more than accidental variations; but from long experience I can affirm, they are different, and do not alter by culture.

The first sort grows naturally in the islands of the West-Indies; this hath a very large strong stalk, which rises to the height of ten or twelve feet. The leaves are long, broad, and hang downward; they have a broad white midrib. The male flowers come out in branching spikes at the upper part of the stalks; these are eight or ten inches long. The female flowers come out from the bottom of the leaves on the side of the stalk; they are disposed in a close, long, thick spike, and are covered closely with thin spathæ or sheaths; out of the end of these covers hang a small long bunch of filaments or threads, which are supposed receive and convey the farina of the male flowers to the germen of the female. When the seeds of this sort are ripe, the spikes or ears are nine or ten inches long, and sometimes a foot, but these rarely ripen in England.

I have not seen any variety of colours in this species, though it is very probable there are the same varieties in the colour of the grain, as in the other species; but as this is less common in Europe, we are not so well acquainted with it.

The second sort is cultivated in Italy, Spain, and Portugal. The stalks of this sort are slenderer than those of the former, and seldom rise more than six or seven feet high. The leaves are narrower than those of the first sort, and are hollowed like the keel of a boat, and their tops hang downwards. The spikes of male flowers are shorter than those of the first, and the ears or spikes of grain are slenderer, and not more than six or seven inches long. The grains of this sort do not come to maturity in England, unless the season proves very warm, and that the grains are planted early in a warm soil and situation.

The third sort is cultivated in the northern parts of America, and also in Germany. The stalks of this are slender, and seldom rise more than four feet high. The leaves are shorter and narrower than those of the two former; they are hollowed like the keel of a boat, and their tops hang down. The spikes of male flowers are short, and the ears or spikes of grain are seldom more than four or five inches long. This sort ripens its grain perfectly well in England, in as little time as Barley, so may be cultivated here to advantage.

There are several varieties of the two last species, which differ in the colour of their grain. The most common colour is that of a yellowish white; but there are some with deep yellow, others with purple, and some with blue grains; and when the different colours are planted near each other, the farina will mix, and the ears will have grains of several colours intermixed on the same spike; but when the grains of the different varieties are planted at a proper distance from each other, the produce will be the same with the grains which were sown.

These plants are seldom cultivated in England for use, but in Italy and Germany it is the food of the poor inhabitants; as it is also in many parts of North America, where it is treated in the following manner.

They first dig the ground well in the spring, and after having made it level, they draw a line cross the whole piece intended to be planted; then they raise little hills at about three or four feet distance, into each of which they put two or three good seeds, covering them about an inch thick with earth; then they move the line four feet farther, continuing to do the same through the whole spot of ground, so that the rows may be four feet asunder, and the hills three or four feet distance. Six quarts of this seed is generally allowed to an acre of land, which, if the soil be good, will commonly produce fifty bushels of Corn.

In the planting of this Corn, where they observe to plant the grain of any one colour in a field by itself, and no other coloured grain stand near it, it will produce all of the same colour again, as hath been affirmed by many curious persons who have tried the experiment; but if the rows are alternately planted with the grain of different colours, they will interchange, and produce a mixture of all the sorts in the same row, and frequently on one and the same spike; and some do affirm they will mix with each other, at the distance of four or five rods, provided there is no tall fence or building between to intercept them.

There is nothing more observed in the culture of this grain, but only to keep it clear from weeds, by frequent hoeing of the ground; and when the stems are advanced, to draw the earth up in a hill about each plant, which, if done, will greatly strengthen them, and preserve the ground about their roots moist for a considerable time.

When the Corn is ripe, they cut off the stalks close to the ground, and after having gathered off the spikes of grain, they spread the stalks in the sun to harden and dry, which they afterward use in the same manner as Reeds in England for making fences, covering sheds, &c. for which purpose they are very useful to the inhabitants of warm countries; and when there is a scarcity of forage, they feed their cattle with them green, as fast as the Corn is gathered off.

The Corn is ground to flour, and the poorest sort of people in America, and also in Italy and Germany, make their bread of this flour; and in many of the warmer countries, the inhabitants roast the whole spikes, and dress them many different ways, making several dishes of it; but this grain seldom agrees with those who have not been accustomed to eat it; however, in times of scarcity of other grain, this would be a better substitute for the poor than Bean flour, or other sorts, which have been used in England; and at all times will be found a hearty food for cattle, hogs, and poultry; so that in light sandy lands, where Beans and Peas succeed not well, this grain may be cultivated to answer both purposes to advantage.

If this grain is cultivated by the horse hoeing husbandry, it may be done at less expence than in any other method; for this is one of the plants which is more particularly adapted for this husbandry; therefore I shall here give an account of the method in which it has been cultivated by the horse-hoe, and has succeeded beyond expectation.

The land was very light and sandy, and far from being rich; this was ploughed deep before winter, and laid up in high ridges till the spring, when it was well harrowed to break it fine, and the beginning of April the ground was again ploughed, laid level, and well harrowed to make the surface smooth; then the seeds were sown in drills, which were made four feet asunder, into which the seeds were dropped at about a foot distance. When the plants were come up three inches high, where any of them were too close, they were cut up with a hand-hoe, and the intervals between the rows were ploughed shallow to destroy the young weeds. But when the stems were advanced, the ground in the intervals was ploughed deeper, and the earth laid up to the plants on both sides; and when the weeds began to grow again, the ground was a third time ploughed to destroy them; this kept the ground pretty clean from weeds till the grain was ripe, as the season was not wet, but otherwise it would have required a fourth ploughing to answer this purpose. The stalks of these plants produced from three to six spikes of grain each, which was a great increase.

The time for sowing this Corn, is about the same as for Barley; in light warm land it may be sown the latter end of March or the beginning of April, but in cold ground, the middle or end of April will be early enough, for the grain is subject to rot in cold land, especially if the season proves wet. When the large sorts are planted in a garden for curiosity, their seeds should be sown upon a moderate hot-bed the beginning of March; and when the plants are fit to remove, they should be transplanted on another moderate hot-bed to bring them forward; but they must not be kept too closely covered, for that will draw them up weak; therefore, when the weather is mild, they should be inured to bear the open air; and the beginning of May they should be taken up with balls of earth to their roots, and transplanted into a warm border at three or four feet distance, carefully watering them if the weather proves dry, until they have taken new root, after which they will require no other care but to keep them clean from weeds. If the season should prove warm, these plants will ripen the Corn in autumn.

ZINZIBER. See Amomum.

ZIZIPHORA. Lin. Gen. Plant. 33. Clinopodium. Tourn. Inst. R. H. 194. tab. 92. Field Basil.

The Characters are,

*The flower hath a long, rough, cylindrical empalement, which is slightly cut into five parts at the brim. The flower is of the labiated kind, having a long cylindrical tube. The upper lip is oval, reflexed, and entire; the under lip (or beard) is divided into three equal segments; it has two spreading stamina terminated by oblong summits, and a quadrifid germen supporting a bristly style, crowned by a sharp-pointed inflexed stigma. The germen afterward turn to four oblong seeds, which ripen in the empalement.*

This genus of plants is ranged in the first section of Linnæus's second class, which includes those plants whose flowers have two stamina and one style.

The Speies are,

1. Ziziphora (*Capitata*) capitulis, terminalibus, foliis ovatis. Lin. Sp. Plant. 31. *Field Basil with heads terminating the stalks, and oval leaves.* Clinopodium fistulosum pumilum, Indiæ occidentalis, summo caule floridum. Pluk. Alm. 111. *Low fistulous Field Basil of the West-Indies, having flowers on the top of the stalk.*
2. Zizophora (*Tenuior*) floribus lateralibus, foliis lanceolatis. Lin. Sp. Plant. 31. *Field Basil with flowers growing on the sides of the stalk, and spear-shaped leaves.* Acinos Syriaca, folio mucronato, capsulis hirsutis. Mor. Hist. 3. p. 404. *Syrian Field Basil with an acute-pointed leaf, and hairy capsules.*
3. Ziziphora (*Hispanica*) floribus lateralibus, foliis inferioribus lineari lanceolatis, summis ovato mucronatis. *Field Basil with flowers growing on the sides of the stalks, the lower leaves linear and spear-shaped, and those on the top oval, terminating with long points.*
4. Ziziphora (*Alpina*) foliis lanceolatis, floribus terminalibus. Hort. Cliff. 305. *Alpine Field Basil with spear-shaped leaves, and flowers terminating the stalks.* Clinopodium Alpinum roseum, saturejæ foliis. Boccon. Mus. 119. *Alpine Field Basil with Rose-like heads and Savory leaves.*

The first sort grows naturally in Virginia; this is an annual plant, which has a four-cornered stalk about four inches high, sending out side branches from the bottom, which stand opposite; these are terminated by a cluster of small flowers surrounded by oval leaves, ending in acute points. The flowers have a slender cylindrical empalement, out of which they just peep; they are purple, of the lip kind, and have but two stamina; it flowers in June, July, and August, and the seeds ripen about six weeks after.

The second sort grows naturally in Spain, and also in the Levant; this sends up many slender ligneous stalks, which rise near a foot high, are garnished with spear-shaped leaves about the size of those of Summer Savory, and have a scent like those. The flowers are produced in whorls round the stalks, which are like those of the former sort, and appear at the same season.

The seeds of the third sort I received from Dr. Russel, who procured them from Aleppo; this rises about eight or nine inches high; the stalks branch out their whole length. The lower leaves are narrow, and hairy; those at the top are oval, running out in acute points. The flowers are disposed in whorls round the stalks, and are like those of the former sort. The whole plant smells like Pennyroyal.

The fourth sort grows naturally on the Alps, and Appenine mountains. The stalks of this rise about six inches high, and are garnished with small spear-shaped leaves placed opposite. The flowers are produced in a cluster at the top of the stalks, which are of the same shape and colour as those of the first sort, and are surrounded with spear-shaped leaves.

These plants are all of them annual, so are propagated only by seeds.

The seeds may be sown in a border of light earth, either in spring or autumn. Those plants which

come up in autumn, will abide through the winter, and will grow much larger than thoſe which come up in the ſpring, though neither of them riſe very high. The ſeeds ſhould be ſown where the plants are to remain, for they do not thrive well when they are tranſplanted, unleſs the earth remains to their roots. Theſe have a pretty ſtrong aromatic ſcent, ſomewhat reſembling Summer Savory, but as they are plants of little beauty, they are ſeldom cultivated but in botanic gardens for variety ſake.

The ſeeds of thoſe plants which come up in autumn, will be ripe in July or Auguſt; but thoſe of the ſpring plants will not ripen till the latter end of Auguſt, or the beginning of September; when, if the ſeeds are permitted to ſcatter, the plants will come up, and require no farther care but to clear them from weeds, and thin them where they are too cloſe.

ZIZIPHUS. Tourn. Inſt. R. H. 627. tab. 403. Rhamnus. Lin. Gen. Plant. 235. The Junjube.

The Characters are,

*The flower has no empalement; it has one funnel-ſhaped petal, which ſpreads open at the top, and is cut into four or five ſegments; it has five awl-ſhaped ſtamina, whoſe baſe are inſerted to the petal, and are terminated by ſmall ſummits, and an oval germen ſupporting two ſlender ſtyles, crowned by obtuſe ſtigmas. The germen afterward becomes an oblong oval berry, incloſing a ſingle nut of the ſame form, which has two cells, each containing an oblong ſeed.*

This genus of plants is ranged in the ſeventh ſection of Tournefort's twenty-firſt claſs, which contains the trees and ſhrubs with a Roſe flower, whoſe pointal turns to a fruit pregnant with a ſtony ſeed. Dr. Linnæus has joined this genus to the Rhamnus, which he ranges in the firſt ſection of his fifth claſs, which contains thoſe plants whoſe flowers have five ſtamina and one ſtyle; but the flowers of theſe plants having two ſtyles, the plants ſhould be ſeparated from the Rhamnus.

The Species are,

1. Ziziphus (*Jujuba*) aculeis geminatis rectis, foliis oblongo ovatis ſerratis. *Jujube with ſtrait thorns growing by pairs, and oblong, oval, ſawed leaves.* Ziziphus. Dod. p. 807. *The common Jujube.*
2. Ziziphus (*Sylveſtris*) aculeis geminatis, altero recurvo, foliis ovatis nervoſis. *Jujube with twin ſpines, one of which is recurved, and oval veined leaves.* Ziziphus ſylveſtris. Tourn. Inſt. 627. *The wild Jujube.*
3. Ziziphus (*Œnoplia*) aculeis ſolitariis recurvis pedunculis aggregatis, foliis cordato-rotundis nervoſis, ſubtus tomentoſis. *Jujube with ſingle recurved ſpines, foot-ſtalks in cluſters, and round, heart-ſhaped, veined leaves, which are downy on their under ſide.* Jujube aculeata, nervoſis foliis infra ſericeis flavis. Burm. Zeyl. 131. *Prickly Jujube with veined leaves, which are ſilky and yellow on their under ſide.*
4. Ziziphus (*Africana*) aculeis geminatis rectis, foliis ovatis nervoſis. *Jujube with double ſtrait thorns, and oval veined leaves.* Jujube, ſc. Ziziphus Africana, mucronatis foliis, ſpina gemellâ. Pluk. Alm. 199. *African Jujube with pointed leaves and double ſpines.*

The firſt ſort grows naturally in the warm parts of Europe; it has a woody ſtalk which divides into many crooked irregular branches, which are armed with ſtrong ſtrait thorns ſet by pairs at each joint. The leaves are two inches long and one broad, ſlightly ſawed on their edges, and ſtand upon ſhort foot-ſtalks. The flowers are produced on the ſide of the branches, two or three ariſing from the ſame place, which ſit cloſe; they are ſmall, and of a yellow colour; theſe are ſucceeded by an oval fruit, about the ſize of a middling Plum, of a ſweetiſh taſte, and are clammy, including a hard oblong ſtone, pointed at both ends. The fruit of this tree was formerly uſed in medicine; it is reckoned pectoral, and good for coughs, pleuriſies, and hot ſharp humours, but is now ſeldom to be found in the ſhops. In Italy and Spain, this fruit is ſerved up at the table in deſerts during the winter ſeaſon, as a dry ſweetmeat.

The ſecond ſort grows naturally about Tunis in Africa; this has ſlender woody ſtalks, which ſend out many weak branches, covered with a grayiſh bark, and armed with ſpines, which come out by pairs at each joint, one of which is longer than the other, and is ſtrait; the other is ſhort and recurved. The leaves are ſmall, oval, and veined; they are half an inch long, and as much in breadth, ſitting cloſe to the branches. The flowers of this ſort I have not ſeen, ſo can give no farther deſcription of this plant.

The third ſort grows naturally in India; this riſes with ſhrubby ſtalks ten or twelve feet high, ſending out many ſlender branches, which have a yellowiſh bark, and are armed with ſingle recurved thorns at each joint. The leaves are round, heart-ſhaped, about two inches long, and as much in breadth, and are indented at the foot-ſtalk; they have three longitudinal veins, and are covered with a yellowiſh down on their under ſide. The flowers come out in cluſters from the wings of the branches; they are ſmall, and of a yellowiſh colour; theſe are ſucceeded by oval fruit about the ſize of ſmall Olives, incloſing a ſtone of the ſame ſhape.

The fourth ſort grows naturally in Syria, from whence I have received the ſeeds; this ſends up ſeveral ſhrubby ſtalks from the root, which divide into ſlender branches, which are armed with ſtrait ſpines, and are ſet by pairs at each joint; the leaves are ſmall, oval, and veined, and are placed alternate, ſtanding upon very ſhort foot-ſtalks. The flowers are ſmall, of a yellow colour, ariſing from the wings of the branches. The fruit is round, and about the ſize of Sloes.

Theſe plants are preſerved in the gardens of ſome curious perſons only for the ſake of variety, for they do not produce fruit in England. The firſt and fourth ſorts, which are the moſt hardy, will ſcarcely live thro' the winters in England, even when they are planted againſt ſouth walls; in which ſituation I have kept the plants two or three years, when the winters have proved mild, but they were afterward killed by a ſharp froſt. They may be propagated by putting their ſtones into pots of freſh light earth, ſoon after their fruits are ripe; and in winter they ſhould be placed under a common hot-bed frame, where they may be ſheltered from ſevere froſt. In the ſpring theſe pots ſhould be plunged into a moderate hot-bed, which will greatly forward the growth of the ſeeds; and when the plants are come up, they ſhould be inured to the open air by degrees, into which they muſt be removed in June, placing them near the ſhelter of a hedge; and in very dry weather they muſt be frequently refreſhed with water.

In this ſituation they may remain till the beginning of October, when they muſt be removed either into the green-houſe, or placed under a hot-bed frame, where they may be defended from froſt, but ſhould have as much free air as poſſible in mild weather.

During the winter ſeaſon they ſhould be now and then refreſhed with water; but after their leaves are fallen (as they always ſhed them in winter), they muſt not be over watered, which would rot the tender fibres of their roots, and cauſe the plants to decay.

In March, juſt before the plants begin to ſhoot, they ſhould be tranſplanted, each into a ſeparate ſmall pot filled with light freſh earth; and if they are plunged into a moderate hot-bed, it will greatly promote their taking root; but in May they muſt be inured to the open air by degrees, into which they ſhould be ſoon after removed.

Thus theſe plants ſhould be managed while young, at which time they are tender; but when they are three or four years old, ſome of them may be planted in the full ground, againſt a warm wall or pale, where, if they have a dry ſoil, they will endure the cold of our ordinary winters pretty well; but in hard froſts they will require to be ſheltered, ſo it will be proper to keep a plant or two in pots, which may be houſed in winter.

These plants may be also propagated by suckers, which the old ones many times send forth from their roots, but these are seldom so well rooted as those produced from seeds, nor do they make so good plants, for which reason they are but rarely propagated that way.

The second sort is not so hardy as the first, so these plants must be kept in pots, and in the winter placed into the green-house, and treated in the same way as other hardy exotic plants, being careful not to over-water them at that season, but especially when they have shed their leaves.

This sort is propagated by seeds, which must be procured from the country where it naturally grows; these should be sown in pots filled with light earth, and plunged into a hot-bed of tanners bark, which will bring up the plants in about six weeks, if the seeds are good. When the plants begin to advance in height, they should be gradually hardened, and in June they may be placed in the open air in a sheltered situation; but in autumn they must be removed into shelter, where they must remain all the winter, and in the spring, before the plants begin to push out their leaves, they should be carefully transplanted, each into a separate small pot, and plunged into a gentle hot-bed to forward their putting out new roots. In summer they must be exposed abroad, but in winter they must be housed.

The third and fourth sorts are tenderer than the former, so will not thrive in this country unless the plants are kept in a warm stove. These are propagated in the same way as the former, but the plants must be more tenderly treated, for they should not be wholly exposed abroad at any time of the year; in summer they must have a large share of air in warm weather, and in winter they must be kept in a warm stove.

ZYGOPHYLLUM. Lin. Gen. Plant. 474. Fabago. Tourn. Inst. R. H. 258. tab. 135. Bean Caper.

The Characters are,

*The empalement of the flower is composed of five oval obtuse leaves. The flower has five obtuse petals which are longer than the empalement, and are indented at their points; it has a closed nectarium, which includes the germen, composed of several scales or little leaves, to which the bases of the stamina are fastened; it hath ten awl-shaped stamina, terminated by oblong summits, and an oblong germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterward become an oval five-cornered capsule with five cells, containing several roundish seeds.*

This genus of plants is ranged in the first section of Linnæus's tenth class, which includes those plants whose flowers have ten stamina and one style.

The Species are,

1. Zygophyllum (*Fabago*) foliis petiolatis, foliolis obovatis caule herbaceo. Lin. Sp. 551. *Bean Caper with foot-stalks to the leaves, and herbaceous stalks.* Fabago Belgarum sive peplus Parisiensium. Lugd. 458. *Common Bean Caper, or Peplus of the Parisians.*
2. Zygophyllum (*Sessilifolium*) foliis sessilibus, foliolis lanceolato-ovalibus margine scabris caule fruticoso. Lin. Sp. 552. *Bean Caper with oval spear-shaped leaves sitting close to the stalks, and a shrubby stalk.* Fabago Africana arborescens, flore sulphureo, fructu rotundo. Com. Plant. Rar. 10. *Tree-like African Bean Caper, with a brimstone flower and a round fruit.*
3. Zygophyllum (*Morgsana*) foliis subpetiolatis, foliolis obovatis caule fruticoso. Lin. Sp. 551. *Bean Caper with oval small leaves having short foot-stalks, and a shrubby stalk.* Fabago tetraphylla flore tetrapetalo, fructu membranaceo quadrangulari. Burm. Plant. Afr. 7. *Four-leaved Bean Caper with a flower of four petals, and a four-cornered membranaceous fruit.*
4. Zygophyllum (*Fulvum*) capsulis ovatis acutis. Lin. Sp. Plant. 386. *Bean Caper with oval acute-pointed capsules.* Fabago flore luteo, petalorum unguibus rubris, fructu sulcato acuto oblongo. Burm. Plant. Afr. 6. *Bean Caper with a yellow flower, the tails of the petals red, and an acute, oblong, furrowed fruit.*

The first sort grows naturally in Syria; this has been long an inhabitant of some curious gardens in England. The root is thick, fleshy, and strikes deep into the ground, and will grow as thick as a man's arm when old. The stalks decay every autumn to the root, from which spring new shoots every year, in number proportionable to the size of the root; they rise three or four feet high, sending out a few side branches; these are smooth, green, and jointed; they are garnished with smooth fleshy leaves like those of Purslane, two standing together upon the same foot-stalk, which is an inch long; they are of a bluish green colour. The flowers are produced from the wings of the stalk, two or three arising at the same joint upon short foot-stalks; they are composed of five roundish concave petals of a reddish colour on their outside, and ten stamina which are twice the length of the petals. The flowers are succeeded by long prismatical capsules with five sides, which have cells filled with roundish seeds. This sort flowers in June and July, and the seeds ripen in autumn.

The second sort grows naturally at the Cape of Good Hope; this rises with a thick woody stalk three or four feet high, sending out many branches, which are garnished with succulent leaves placed by fours, sitting close to them. From the wings of the stalks the flowers are produced upon pretty long slender foot-stalks; they are composed of five sulphur-coloured petals which have a brown spot on each of their tails; these are succeeded by roundish depressed fruit having five cells, each containing two roundish seeds. This plant continues flowering all summer and autumn, and the seeds ripen in winter.

The third sort grows naturally at the Cape of Good Hope; this has a shrubby stalk which divides into many irregular jointed branches, which rise four or five feet high, and are garnished with thick succulent leaves, which are larger, and more obtuse than those of the second sort; they are placed by fours at each joint, two on each side the stalk opposite. The flowers come out from the wings of the stalk upon slender foot-stalks; these have but four petals, which are broader than those of the second sort, but of the same colour, each having a brown spot at their tails. The fruit has four broad membranaceous wings, resembling the sails of a mill. This plant flowers most part of summer, but the fruit seldom ripens well in England.

The fourth sort is a native of the Cape of Good Hope. The stalks of this branch out greatly from the bottom; they are shrubby, jointed, and irregular. The leaves are of the consistence of those of Purslane; they are narrow at their tails, but oval toward their points, and are placed by fours at each joint like the former. The flowers come out from the wings of the stalk upon slender foot-stalks; they are of a pale yellow colour, each petal having a pretty large red spot at their tails. The fruit is oval, about three quarters of an inch long, having five deep furrows, and is divided into five cells, which are filled with roundish seeds. This plant flowers great part of the year, and the fruit ripens in autumn and winter.

The first sort is propagated only by seeds, which ripen very well in England in warm seasons; these may be either sown upon a moderate hot-bed in the spring, or on a warm border of light ground; those which are sown upon the hot-bed will come up in three weeks or a month, and about a month after, the plants will be fit to remove, when they should be each planted in a separate small pot filled with fresh light earth, and plunged into a gentle hot-bed to promote their taking root, and shaded from the sun in the day time; afterward they must be gradually hardened to bear the open air, to which they should be exposed all the summer; but in autumn, when their stalks begin to decay, they should be placed in a hot-bed frame to shelter them from the frost in winter, for while they are young, they are a little tender. The spring following they may be turned out of the pots, and planted in a south border close to the wall, in a dry rubbishy soil, where they will endure the cold without covering.

ing. There is a plant of this kind in the Chelſea Garden, which is more than fifty years old, and has reſiſted the ſevereſt cold without any covering, and produces great plenty of flowers and fruit annually.

Thoſe plants which come up in the full ground will require no other care but to keep them clean from weeds, and thin them where they come up too cloſe, giving them room to grow the firſt year; and when their ſtalks decay in autumn, the ſurface of the ground ſhould be covered with tan to prevent the froſt from penetrating to the roots, or in froſty weather, they may be covered with ſtraw or Peas haulm, which will anſwer the ſame purpoſe, the young plants being ſomewhat tender; and in the ſpring, the roots ſhould be carefully taken up, planting them cloſe to a warm wall, as before directed.

The other three ſorts are too tender to live through the winter in the open air in this country, ſo they muſt be kept in pots, and houſed in autumn. Theſe plants may be propagated either by ſeeds or cuttings.

The ſecond and fourth ſorts ripen their ſeeds pretty well in England, ſo theſe may be propagated by ſowing them on a moderate hot-bed in the ſpring; and when the plants are about an inch high, they ſhould be each tranſplanted into a ſmall pot filled with light earth, and plunged into a moderate hot-bed, ſhading them from the ſun till they have taken new root; then as the ſeaſon advances, they ſhould be gradually hardened to bear the open air, into which they ſhould be removed the latter end of May, placing them in a warm ſheltered ſituation, where they may remain till autumn, when they ſhould be placed in a dry airy glaſs-caſe, where they will ſucceed better than in a green-houſe; for they require a large ſhare of air in mild weather, otherwiſe their ſhoots are apt to be weak and tender, ſo are often injured by damp air in winter, but they do not require any artificial heat. If they are ſcreened from the froſt, and have plenty of air, they will thrive very well.

The third ſort ſeldom produces good ſeeds in England, ſo is propagated by cuttings, and the two others are generaly increaſed in the gardens the ſame way, that method being very expeditious, though the ſeedling plants grow ſtronger, and riſe to a greater height. Theſe cuttings may be planted in a bed of light earth during any of the ſummer months; if theſe are covered cloſe down with bell or hand-glaſſes, and ſhaded from the ſun, they will put out roots in five or ſix weeks, and then may be taken up carefully and potted, placing them in the ſhade till they have taken new root; after which they may be removed to a warm ſheltered ſituation, and treated in the ſame way as thoſe plants raiſed from ſeeds.

ZYLOSTEUM. See Lonicera.

# INDEX LATINUS.


ABIES
Abrotanum
Abrotanum Fœmina, vide Santolina
Abrus, vide Glycine
Abſinthium, vide Artemiſia
Abutilon
Acacia, vide Mimoſa
Acacia Germanorum, vide Prunus
Acacia Virginiana, vide Robinia
Acajou, vide Anacardium
Acalypha
Acanaceous
Acanthus
Acarna, vide Cnicus
Acaulis
Acer
Acetoſa
Acetoſella, vide Oxalis
Achillea
Achyranthes
Acinos, vide Thymus
Acinus
Aconitum
Aconitum Hyemale, vide Helleborus
Acorus
Acriviola, vide Tropæolum
Actæa
Adanſonia
Adenanthera
Adhatoda, vide Juſticia
Adianthum
Adnata
Adonis
Adoxa
Æſchynomene
Æſculus
Æther
Agave
Ageratum
Ageratum officinarum, vide Achillæa
Agnus Caſtus, vide Vitex
Agrifolium, vide Ilex
Agrimonia
Agroſtemma
Ahouai, vide Thevetia
Aizoon
Ajuga
Ala
Alabaſtrum
Alaternoides, vide Phylica, Clutia, & Celaſtrus
Alaternus
Alcea
Alchemilla
Aletris
Alkekengi, vide Phyſalis
Alliaria, vide Heſperis
Allium
Alnus
Alnus nigra baccifera, vide Frangula
Aloe
Aloides, vide Stratiotes
Alopecuros
Alpinia
Althæa
Alyſſoides, vide Alyſſum
Alyſſum
Amaranthoides, vide Gomphrena
Amaranthus
Amaranthus Criſtatus, vide Celoſia
Amaryllis
Ambroſia
Amelanchier, vide Chionanthus
Amentaceous
Amethyſtea
Ammannia
Ammi
Ammi perenne, vide Silaum
Amomum Plinii, vide Solanum
Amoris Pomum, vide Lycoperſicon
Amorpha
Amygdalus
Anacampſeros, vide Sedum
Anacardium
Anacyclus
Anagallis
Anagyris
Ananas
Anapodophyllon, vide Podophyllon
Anaſtatica
Anchuſa
Andrachne
Andromeda
Androſace
Androſæmum, vide Hypericum
Andryala
Anemone
Anemonoides, vide Anemone
Anemoſpermos, vide Arctotis
Anethum
Angelica
Anguria
Anil, vide Indigophera
Aniſum, vide Pimpinella
Annona
Anonis, vide Ononis
Anthemis
Antheræ
Anthericum
Anthology
Antholyza
Anthoſpermum
Anthyllis
Antirrhinum
Aparine
Apetalous
Aphaca, vide Lathyrus
Apios, vide Glycine
Apium
Apocynum
Aquifolium, vide Ilex
Aquilegia
Arabis
Arachis
Aralia
Arbor
Arbor Camphorifera, vide Laurus
Arbor Coral, vide Erythrina
Arbor Judæ, vide Cercis
Arbor Vitæ, vide Thuya
Arboreus
Arbutus
Arctium
Arctotis
Arcuation
Arethuſa
Argemone
Argilla
Aria Theophraſti, vide Cratægus
Ariſarum, vide Arum
Ariſta
Ariſtolochia
Armeniaca
Armerius, vide Dianthus
Arnica
Artedia
Artemiſia
Arum
Arundo
Arundo Saccharifera, vide Saccharum
Aſarina
Aſarum
Aſclepias
Aſcyrum
Aſpalathus
Aſparagus
Aſperifolious
Aſperugo
Aſperula
Aſphodelus
Aſplenium
Aſter
Aſteriſcus, vide Buphthalmum
Aſteroides, vide Inula
Aſtragalus
Aſtrantia
Athamanta
Atractylis
Atragena
Atraphaxis
Atriplex
Atriplex Baccifera, vide Blitum
Atropha
Avena
Aurantium
Auricula muris
Auricula urſi
Azalea
Azederach, vide Melia


B.


BACCA
Baccharis
Bacciferous
Balauſtia, vide Punica
Ballotte
Balſamina, vide Impatiens
Balſamita, vide Tanacetum
Bamia Moſchata, vide Hibiſcus
Banana, vide Muſa
Banniſteria
Baobob, vide Adanſonia
Barba Capræ, vide Spiræa
Barba Jovis, vide Anthyllis
Barbarea, vide Siſymbrium
Bardana, vide Arctium
Barleria
Bartramia, vide Triumfetta
Baſſella
Baſilicum, vide Ocymum
Baſteria
Bauhinia
Belladona, vide Atropa
Bellis
Bellis major, vide Chryſanthemum
Bellonia
Benzoin, vide Laurus
Berberis
Bermudiana
Bernardia, vide Croton
Beſleria
Beta
Betonica
Betonica Aquatica, vide Scrophularia
Betonica Pauli, vide Veronica
Betula
Bidens
Bifolium, vide Ophris
Bignonia
Biſcutella
Biſſerula
Biſlingua, vide Ruſcus
Biſtorta, vide Polygonum
Bivalvular
Bixa
Blattaria, vide Verbaſcum
Blitum
Bocconia
Boerhaavia
Bombax
Bonduc, vide Guilandina
Bontia
Bonus Henricus, vide Chenopodium
Borbonia
Borago
Boſea
Botrys, vide Chenopodium
Bra-

Brabejum
Branca Urſina, vide Acanthus
Braſſica
Breynia, vide Capparis
Bromelia
Browallia
Brunella, vide Prunella
Brunsfelſia
Bruſcus, vide Ruſcus
Bryonia
Bryonia nigra, vide Tamus
Bubon
Buddleja
Bugloſſum, vide Anchuſa & Lycopſis
Bugula, vide Ajuga
Bulbous
Bulbocaſtanum, vide Bunium
Bulbocodium
Bunias
Bunium
Buphthalmum
Bupleuroides, vide Phyllis
Bupleurum
Burſa Paſtoris, vide Thlaſpi
Butomus
Buxus

C.

CAAPEBA, vide Ciſampelos
Cacalia
Cacalianthemum, vide Cacalia
Cacao
Cachrys
Cactus
Cæſalpina
Cainito, vide Chryſophyllum
Cakile, vide Bunias
Calaba, vide Cornus
Calamintha, vide Meliſſa
Calceolus, vide Cypripedium
Calendula
Calla
Caltha
Calyx
Camara, vide Lantana
Cameraria
Campaniformis
Campanula
Camphora, vide Laurus
Canna
Cannabina, vide Datiſca
Cannabis
Cannacorus, vide Canna
Capillamenta
Capillaris
Capitulum
Capnoides, vide Fumaria
Capparis
Capparis Fabago, vide Zygophyllum
Capraria
Capreolus
Caprifolium, vide Periclymenum
Capſicum
Capſula
Caracalla, vide Phaſeolus
Cardamindum, vide Tropæolum
Cardamine
Cardiaca, vide Leonurus
Cardioſpermum
Carduus
Carduus Benedictus, vide Centaurea
Carduus Fullonum, vide Dipſacus
Carica
Carlina
Carpeſium
Carpinus
Carthamus
Carum
Caryophyllata, vide Geum
Caryophyllus, vide Dianthus
Caſia, vide Oſiris
Caſia
Caſſida, vide Scutellaria
Caſſine
Caſtanea
Caſtanea Equina, vide Eſculus
Caſtorea, vide Durantia
Catananche
Cataputia major, vide Ricinus
Cataputia minor, vide Euphorbia
Cataria, vide Nepeta
Cateſbæa
Caucalis
Cauliferous
Caulis
Ceanothus
Cedrus
Ceiba, vide Bombax
Celaſtrus
Celoſia
Celſia
Celtis
Centaurea
Centaurium minus, vide Gentiana
Cepa
Cephalanthus
Ceraſtium
Ceratocarpus
Ceraſus
Ceraſus racemoſa, vide Padus
Ceratonia
Ceratophyllum
Cerbera
Cercis
Cerefolium, vide Chærophyllum
Cereus, vide Cactus
Cerinthe
Ceſtrum
Chærophyllum
Chamæceraſus, vide Lonicera
Chamæciſtus, vide Helianthemum
Chamæclema, vide Glechoma
Chamæcypariſſus, vide Santolina
Chamædaphne, vide Ruſcus
Chamædrys, vide Teucrium
Chamælæa, vide Cneorum
Chamemelum, vide Anthemis
Chamæmeſpilus, vide Meſpilus
Chamæmorus, vide Rubus
Chamænerium, vide Epilobium
Chamæpytis, vide Teucrium
Chamæriphes, vide Chamærops
Chamærops
Chamærubus, vide Rubus
Chamæſyce, vide Euphorbia
Chamærhododendron, vide Rhododendron
Cheiranthus
Chelidonium
Chelone
Chenopodio-morus, vide Blitum
Chenopodium
Chionanthus
Chironia
Chondrilla
Chriſtophriana, vide Actæa
Chryſanthemoides, vide Oſteoſpermum
Chryſanthemum
Chryſobalanus
Chryſocoma
Chryſophyllum
Chryſoſplenium
Cicer
Cichorium
Cicuta
Cicutaria, vide Luguſtrum
Cinara, vide Cynara
Cineraria, vide Othonna
Circea
Cirri
Circium, vide Carduus
Ciſtus
Citharexylon
Citrus
Claviculus
Claytonia
Clematis
Cleome
Cleonia
Clethra
Cliffortia
Clinopodium
Clitoria
Cluſia
Clutia
Clymenum, vide Lathyrus
Clypeola
Cneorum
Cnicus
Coa, vide Hippocratea
Coccygria, vide Rhus
Cochlearia
Coffea
Coix
Colchicum
Coldenia
Collinſonia
Colocaſia, vide Arum
Colocynthis, vide Cucurbita
Columnea
Colutea
Colutea Scorpioides, vide Emerus
Coma Aurea, vide Chryſocoma
Comarum
Commelina
Coniferous
Conium
Conocarpodendron, vide Protea
Conocarpus
Conſolida major, vide Symphytum
Conſolida media, vide Ajuga
Conſolida minima, vid. Bellis
Conſolida regalis, vide Delphinium
Convallaria
Convolvulus
Conyza
Copaiba
Corallodendron, vide Erythrina
Corchorus
Cordia
Coreopſis
Coriandrum
Coriara
Corindum, vide Cardioſpermum
Coris
Coriſpermum
Cornus
Cornutia
Corona Imperialis, vide Fritillaria
Corona Solis, vide Helianthus
Coronilla
Cortuſa
Corylus
Corymbiferous
Corymbus
Coſtus
Cotinus, vide Rhus
Cotonea Malus, vide Cydonia
Cotoneaſter, vide Meſpilus
Cotula
Cotyledon
Courbaril, vide Hymenæa
Crambe
Craniolaria
Craſſula
Cratægus
Crateva
Crepis
Creſcentia
Crinum
Crithmum
Criſta Pavonis, vide Poinciana
Crocus
Crotolaria
Croton
Crucianella
Crupina Belgarum, vide Centaurea
Cucubalus
Cuculate
Cucumis
Cucumis Agreſtris, vide Momordica
Cucurbita
Cuiete, vide Creſcentia
Culmiferous
Cuminoides, vide Lagœcia
Cuminum
Cunila, vide Sideritis
Cunonia
Cupreſſus
Curcuma
Cururu
Cuſpidatus
Cyanus, vide Centaurea
Cyclamen
Cydonia
Cynanchum
Cynara
Cynogloſſum
Cypripedium
Cyſticapnos, vide Fumaria
Cytiſo-geniſta, vide Spartium
Cytiſus

D.


DALECHAMPIA
Damaſonium, vide Aliſma
Daphne
Datiſca
Datura
Daucus
Daucus Creticus, vide Athamanta
D'ayena
Delphinium
Dens Canis, vide Erithronium
Dens Leonis, vide Leontodon
Dentaria
Dianthera
Dianthus
Diapenſia, vide Sanicula
Dictamnus
Dictamnus Creticus, vide Origanum
Diervilla
Digitalis
Dioſcorea
Dioſma
Dioſpyros
Dipſacus
Dirca
Dodartia
Dolichos
Doria, vide Solidago & Othonna
Doronicum
Dorſiferous
Dorſtenia
Dorycnium vide Pſoralea
Douglaſſia
Draba
Draco Herba, vide Abrotanum
Draco Abor, vide Palma
Dracocephalum
Dracontium
Dracunculus Pratenſis, vide Achillæa
Dulcamara, vide Solanum
Duranta


E.


EBELUS, vide Sambucus
Ebenus
Echinus
Echinomelocactus, vide Cactus
Echinophora
Echinops
Echium
Edera quinquefolia, vide Vitis
Ehretia
Efflorefcente
Egerminate
Elaterium, vide Momordica
Elatine, vide Linaria
Elæagnus
Elephantopus
Elichryſum, vide Gnaphalium
Ellifia
Emerus
Empetrum
Enucleation
Enula Campana, vide Inula & Ephedra
Ephemeron, vide Tradeſcantia
Epigæa
Epilobium
Epimedium
Epiphylloſpermous
Equiſetum
Eranthemum, vide Adonis
Erica
Erica Baccifera, vide Empetrum
Erigeron
Erinus
Eriocephalus
Eruca
Erucago, vide Bunias
Ervum
Eryngium
Eryſimum
Erythrina
Erythronium
Eſchynomene, vide Æſchynome
Eſculentus
Euonymus
Euonymoides, vide Celaſtrus
Eupatoriophalacron vide Verbeſina
Eupatorium
Euphorbia
Euphraſia


F


FABA
Faba Ægyptiaca, vide Arum
Faba Craſſa, vide Sedum
Fabago, vide Zygophyllum
Fagonia
Fagopyrum, vide Helxine
Fagus
Ferraria
Ferrum Equinum, vide Hippocrepis
Ferula
Ficoides, vide Meſembryanthemum
Ficus
Ficus Indica, vide Cactos & Opuntia
Filago
Filipendula, vide Spiræa
Flammula Jovis, vide Clematis
Flos Africanus, vide Tagetes
Flos Paſſionis, vide Paſſiflora
Flos Solis, vide Helianthus
Flos Trinitatis, vide Viola
Fœniculum
Fœnum Burgundiacum, vide Medica
Fœnum Græcum, vide Trigonella
Fragaria
Frangula
Fraxinella
Fraxinus
Fritillaria
Fritillaria Craſſa, vide Stapelea Aſclepias
Fructiferous
Fructus
Frumentaceous
Frumentum Indicum, vide Zea
Frutex
Frutex Pavonius, vide Poinciana
Fuchſia
Fumaria


G.


GALANTHUS
Gale, vide Myrica
Galega
Galenia
Galeopſis
Galeopſis fruteſcens, vide Praſium
Gallium
Garcinia
Garidella
Gaura
Geniſta
Geniſta ſpinoſa, } vide Ulex
Geniſtella, }
Gentiana
Gentianella, vide Gentiana
Geranium
Geſnera
Geum
Gingidium, vide Artedia
Gladiolus
Glaucium, vide Chelidonium
Glaux
Glechoma
Gleditſi
Globularia
Glorioſa
Glycine
Glycyrrhiza
Gnaphalodes, vide Micropus
Gomphrena
Goſſypium
Gramen
Granadilla, vide Paſſiflora
Gratiola
Grewia
Gronovia
Groſſularia
Guaiabara, vide Coccolobus
Guajacana, vide Dioſpyros
Guajacum
Guajava, vide Pſidium
Guanabanus, vide Annona
Guazuma, vide Theobroma
Guidonia, vide Samyda
Guilandina
Gundelia
Gypſophylla


H.


HÆMANTHUS
Hæmatoxylum
Haletia
Halicabum, vide Phyſalis
Halicacabus peregrinus, vide Cardioſpermum
Halimus, vide Atriplex
Halleria
Hamamelis
Hamelia
Harmala, vide Peganum
Hedera
Hedera Terreſtris, vide Glecoma
Heydypnois, vide Hyoſeris
Hedyſarum
Helenium
Helianthemum, vide Ciſtus
Helianthus
Helicteres
Heliocarpos
Heliotropium
Helleborine, vide Serapias
Helleborus
Helleborus albus, vide Veratrum
Hemerocallis
Hemionitis
Hepatica, vide Anemone
Hepatorium, vide Eupatorium
Heptaphyllum, vide Potentilla
Heracleum, vide Sphondylium
Herba Gerardi, vide Angelica
Herba Paris, vide Paris
Herbous
Hermannia
Hermodactylus
Hernandia
Herniaria
Heſperis
Hibiſcus
Hieracium
Hippocaſtanum
Hippocratea
Hippocrepis
Hippolapathum, vide Rumex
Hippomane
Hippophae
Hippoſelinum, vide Smyrnium
Hirundinaria, vide Aſclepias
Holchus
Hordeum
Horminum
Hottonia
Humilis
Hura
Hyacinthus
Hyacinthus Peruvianus, vide Ornithogalum
Hyacinthus Tuberoſus, vide Crinum
Hydrangea
Hydrocotyle
Hydrolapathum, vide Rumex
Hydrophyllum
Hydropiper, vide Polygonum
Hymenæa
Hyoſeris
Hyoſcyamus
Hypecoun
Hypericum
Hypericum frutex, vide Spireæa
Hypochæris
Hypophylloſpermous
Hyſſopus


I.


JACEA, vide Centaurea
Jacobæa, vide Othonna & Senecio
Jaſminoides, vide Ceſtrum & Lycium
Jaſione


Jaſminum

Jasminum
Iatropha
Iberis
Ibiscus, vide Hibiscus
Icaco, vide Chrysobalanus
Ilex
Illecebrum
Impatiens
Imperatoria
Indigophera
Intibus, vide Cichorium
Inula
Johnsonia
Ipomœa
Iris
Iris Bulbosa, } vide Xiphium
Iris Persica, }
Isatis
Isopyrum
Isora, vide Helicteres
Itea
Judaica Arbor, vide Cercis
Juglans
Jujube, vide Ziziphus
Julian, vide Hesperis
Juncus
Juniperus
Jussiæa
Justicia
Ixia

K.

KALI, vide Salsola
Kalmia
Karatas
Kempfera
Ketmia, vide Hibiscus
Kiggelaria
Knautia

L.

LABLAB, vide Dolichis
Labrum Veneris, vide Dipsacus
Labrusca, vide Vitis
Laburnum, vide Cytisus
Lacryma Jobi, vide Coix
Lactifera
Lactuca
Lactuca Agnini, vide Valeriana
Lagœcia
Lagopus, vide Trifolium
Lamium
Lampsana, vide Lapsana
Lantana
Lanuginous
Lapathum, vide Rumex
Lapsana
Larix
Laserpitium
Lathyrus
Latifolius
Lavatera
Lavendula
Laureola, vide Daphne
Lauro-Cerasus, vide Padus
Laurus
Laurus Alexandrina, vide Ruscus
Laurus Tinus, vide Tinus
Lawsonia
Leguminous
Lens, vide Ervum
Lentiscus, vide Pistacea
Leontopetalon, vide Leontice
Leontice
Leontodon
Leonurus
Lepidium
Lepidocarpodendron, vide Protea
Leucanthemum, vide Anthemis & Chrysanthemum
Leucoium
Lichen
Ligusticum
Ligustrum
Lilac, vide Syringa
Liliastrum, vide Hemerocallis
Lilio Asphodelus, vide Hemerocallis & Crinum
Lilio-Fritillaria, vide Fritillaria
Lilio-Hyacinthus, vide Scilla
Lilio-Narcissus, vide Amaryllis
Lilium
Lilium Convallium, vide Convallaria
Lilium Persicum, vide Fritillaria
Lilium Superbum, vide Gloriosa
Limodorum
Limon
Limonium
Linaria
Lingua Cervina, vide Pteris
Linum
Linum Umbilicatum, vide Cynoglossum
Lippia
Liquidamber
Lithospermum
Lobelia
Lobus Echinatus, vide Guilandinia
Lonchitis
Lonicera
Loranthus
Lotus
Lotus Arbor, vide Celtis
Ludvigia
Luffa, vide Mormordica
Lunaria
Lupinus
Lupulus, vide Humilius
Luteola, vide Reseda
Lychnidea, vide Phlox
Lychnis
Lycium
Lycopersicon
Lycopsis
Lycopus
Lysimachia
Lysimachia Galericulata, vide Scutellaria
Lysimachia non Papposa, vide Onagra
Lysimachia Siliquosa, vide Epilobium
Lythrum

M.

MACALEB, vide Cerasus
Magnolia
Mahaleb, vide Cerasus
Majorana, vide Origanum
Mala Æthiopica, vide Lycopersicon
Mala Armeniaca, vide Armeniaca
Mala Cotonea, vide Cydonia
Mala Insana, vide Melongena
Malacoides, vide Malope
Malope
Malpighia
Malva
Malva Arborea, vide Lavatera
Malva Rosea, vide Alcea.
Malus
Malus Armeniaca, vide Armeniaca
Malus Aurantia, vide Aurantium
Malus Limonia, vide Limon
Malus Persica, vide Persica
Malus Punica, vide Punica
Mammea
Mançanilla, vide Hippomane
Mandragora
Manihot, vide Iatropha
Maranta
Marrubiastrum, vide Sideritis
Marrubium
Marrubium Nigrum, vide Ballote
Martynia
Marum, vide Teucrium
Marum Vulgare, } vide Satureja
Mastichina, }
Matricaria
Maurocenia
Mays, vide Zea
Meadea
Medeola
Medica
Medicago
Melampyrum
Melastoma
Melia
Melianthus
Melilotus, vide Trigonella
Melissa
Melissa Turcica, vide Dracocephalon
Melitis
Melo
Melocactus, } vide Cactus
Melocarduus }
Melochia, vide Corchorus
Melongena
Melopepo, vide Cucurbita
Melothria
Menispermum
Mentha
Mentha Cataria, vide Nepeta
Mentzelia
Menyanthes
Mercurialis
Mesembrianthemum
Mespilus
Methonica, vide Gloriosa
Meum, vide Athamanta
Mezeron, vide Thymelæa
Micropus
Milium
Millefolia, vide Achillæa
Milleria
Mimosa
Mimulus
Mirabilis
Mitella
Moldavica, vide Dracocephalon
Molle, vide Schinus
Molucca, vide Molucella
Molucella
Moly, vide Allium
Momordica
Monarda
Monbin, vide Spondias
Montia, vide Heliocarpos
Moræa
Morina
Morus
Moschatellina, vide Adoxa
Muntingia
Murucuia, vide Passiflora
Muscari
Muscipula, vide Silene
Muscus
Myagrum
Myosotis, vide Cerastium
Myosurus
Myrica
Myrrhis, vide Chærophyllum, Scandix, & Sison
Myrtus
Myrtus Barbantica, vide Myrica
Myxa, vide Cordia

N.

NAPELLUS, vide Aconitum
Napæa
Napus, vide Brassica & Rapa
Narcisso Leucoium, vide Galanthus
Narcissus
Nasturtium
Nasturtium Indicum, vide Tropæolum
Nepeta
Nerium
Nicotiana
Nigella
Nigelastrum, vide Agrostemma
Nissolia, vide Lathyrus
Noli me tangere, vide Impatiens
Nummularia, vide Lysimachia
Nux Juglans, vide Juglans
Nux Vesicaria, vide Staphylæa
Nyctanthes
Nymphæa
Nyssa

O.

OBELISCOTHECA, vide Rudbeckia
Ochrus, vide Pisum
Oculus Christi, vide Salvia
Ocymum
Oenanthe
Oenothera
Oldenlandia
Olea
Omphaloïdes, vide Cynoglossum
Onagra, vide Oenothera
Onobrychis
Ononis
Onopordum
Ophioglossum
Ophrys

Opulus, vide Viburnum
Opuntia
Orchis
Oreofelinum, vide Athamanta
Origanum
Ornithogalum
Ornithopodium, vide Ornithopus
Ornithopus
Orobus
Ortega
Oryza
Ofmunda
Ofteofpermum
Ofyris
Othonna
Oxalis
Oxyacantha, vide Berberis
Oxys, vide Oxalis

P.

PADUS
Pæonia
Paliurus
Palma
Panax
Pancratium
Panicum
Papaver
Papaver Corniculatum, vide Chelidonium
Papaver Spinofum, vide Argemone
Papaya, vide Carica
Parietaria
Paris
Parkinfonia
Parnaffia
Paronychia, vide Illecebrum
Parthenium
Pafferina
Paffiflora
Paftinaca
Pavia, vide Efculus
Paullinia
Pedicularis
Peganum
Pelecinus, vide Bifferula
Pentaphylloides, vide Potentilla
Peltaria
Pentapetes
Penthorum
Pepo, vide Cucurbita
Perefkia, vide Cactos
Periclymenum
Periploca
Perfea, vide Laurus
Perfica
Perficaria, vide Polyganum
Pervinca, vide Vinca
Petafites
Petiveria
Petrea
Petrofelinum, vide Apium
Peucedanum
Phaca
Phalangium, vide Anthericum
Phafeoloides, vide Glycine
Phafeolus
Philadelphus
Phillyrea
Phlomis
Phlox
Phylica
Phyllanthus
Phyllis
Phyfalis
Phytolacca
Piercea
Pieris
Pilofella, vide Hieracium
Pimpinella
Pimpinella Sanguiforba, vide Poterium & Sanguiforba
Pinafter, vide Pinus
Pinguicula
Pinus
Piper
Pifonia
Piftacia
Pifum
Pifum Cordatum, vide Cardiofpermum
Pittonia, vide Tournefortia
Plantago
Platanus
Plumbago
Plumeria
Podophyllum
Poinciana
Polemonium
Polianthes
Polium
Polyanthus, vide Primula
Polygola
Polygonatum, vide Convallaria
Polymnia
Polypodium
Pomum Adami, vide Aurantium
Populago, vide Caltha
Populus
Porrum
Portulaca
Potentilla
Poterium
Prafium
Prenanthes
Primula
Prinos
Protea
Prunella
Prunus
Pfeudoacacia, vide Robinia
Pfeudodictamnos, vide Marrubium
Pfidium
Pforalea
Pfylium, vide Plantago
Ptarmica, vide Achillæa
Ptelea
Pulegium
Pulmonaria
Pulfatilla
Punica
Pyracantha, vide Mefpilus
Pyrola
Pyrus

Q.

QUAMOCLIT, vide Ipomæa
Quercus
Quinquefolium, vide Potentilla

R.

RACEMUS
Ramus
Randia
Ranunculus
Rapa, vide Braffica
Raphanus
Rapiftrum, vide Sinapis
Rapunculus
Rapuntium
Rauvolfia
Refeda
Rhabarbarum, vide Rheum
Rhabarbarum Monachorum, vide Rumex
Rhamnoides, vide Hippophae
Rhamnus
Rhaponticum, vide Rheum
Rhexia
Rhinanthus
Rhodiola
Rhododendron
Rhus
Ribes
Ricinoides, vide Iatropha
Ricicus
Rivinia
Robinia
Rondeletia
Rofa
Rofa Sinenfis, vide Hibifcus
Rofmarinus
Royena
Rubia
Rubus
Rudbeckia
Ruellia
Rumex
Rufcus
Ruta
Ruta Canina, vide Scrophularia
Ruta Muraria, vide Adianthum
Ruta Sylveftris, vide Peganum
Ruyfchiana

S.

SABINA, vide Juniperus
Saccharum
Sagittaria
Salicaria, vide Lythrum
Salicornia
Salix
Salfola
Salvia
Salvia Agreftis, vide Teucrium
Sambucus
Samolus
Samyda
Sanguinaria
Sanguiforba
Sanguis Draconis, vide Palma
Sanicula
Santolina
Sapindus
Saponarja
Sapota, vide Achras
Sarracena
Satureia
Satyrium
Saururus
Saxifraga
Scabiofa
Scandix
Schinus
Scilla
Sclarea
Scleranthus
Scolymus
Scordium, fee Teucrium
Scorpiurus
Scorzonera
Scrophularia
Scutellaria
Secale
Securidaca
Sedum
Selago
Selinum
Sempervivum
Senecio
Senna, vide Caffia
Serapias
Serjana, vide Paullinia
Serpentaria, vide Ariftolochia
Seriphium
Serratula
Sefamum
Sefeli
Sherardia
Sherardia Vaill. vide Verbena
Sicyoides, vide Sicyos
Sicyos
Sida
Sideritis
Sideroxylum
Sigefbekia
Silaum, fee Peucedanum
Silene
Siler
Siliqua, vide Ceratonia
Siliquaftrum, vide Cercis
Siliquofa
Silphium
Sinapi, vide Cleome
Sinapiftrum, vide Cleoma
Sifarum, vide Sium
Sifon
Sifymbrium
Sifyrinchium
Sium
Smilax
Smyrnium
Solanoides, vide Piercea
Solanum
Soldanella
Solidago
Sonchus
Sophora
Sorbus
Sorbus Sylveftris, vide Cratægus
Spartium
Spergula, vide Arenaria
Spermacoce
Sphæranthus
Sphondylium
Spigelia
Spina Alba, vide Mefpilus
Spina Nigra, vide Prunus
Spinacia
Spiræa
Stachys
Stæhelina
Stapelia
Staphylæa
Statice
Stellatus
Stewartia
Stœbe
Stœchas
Stramonium, vide Datura
Stratiote
Styrax
Suber, vide Quercus

Suriana

Suriana
Swertia
Symphytum
Syringa

T.

TAbernæmontana
Tacamahacca, vide Populus
Tagetes
Tamarindus
Tamariscus, vide Tamarix
Tamarix
Tamus
Tanacetum
Tapia, vide Crateva
Tarconanthus
Taxus
Telephioides, vide Andrachne
Telephium
Terebinthus, vide Pistacia
Ternatea, vide Clitoria
Tetracera
Tetragonia
Tetragonocarpos, vide Tetragonia
Tetragonotheca
Teucrium
Thalictrum
Thapsia
Theligonum
Theobroma
Thlaspi
Thlaspidium, vide Iberis
Thuya
Thymbra
Thymelæa, vide Daphne
Thymus
Tiarella
Tilia
Tinus, vide Viburnum
Tithymalus
Toluifera
Tordylium
Tormentilla
Tournefortia
Toxicodendron
Trachelium
Tradescantia
Tragacantha
Tragia
Tragopogon
Tragoselinum, vide Pimpinella
Trianthema
Tribulus
Trichomanes
Tricosanthes
Trichostema
Tridax
Trifolium
Triglochin
Trigonella
Trillium
Triopteris
Triosteum
Tripolium, vide Aster
Triticum
Triumfetta
Trollius
Tropæolum
Tulipa
Tulipifera
Turnera
Turritis
Tussilago

V.

VACCARIA, vide Saponaria
Vaccinium
Valeriana
Valeriana Græca, vide Polemonium
Valerianella, vide Valeriana
Vanilla
Vella
Veratrum
Verbascum
Verbena
Verbesina
Veronica
Viburnum
Vicia
Vinca
Vincetoxicum, vide Asclepias
Viola
Viorna, vide Clematis
Virga Aurea, vide Solidago
Viscum
Visnaga, vide Daucus
Vitex
Vitis
Vitis Idæa, vide Vaccinium
Vitis Sylvestris, vide Clematis
Volkameria
Ulex
Ulmaria, vide Spiræa
Ulmus
Umbella
Urena
Urtica
Uva Ursi
Vulneraria
Uvularia

W.

WALTHERIA
Watsonia
Winterania

X.

XANTHIUM
Xeranthemum
Xiphion
Xylon

Y.

YUCCA

Z

ZANTHOXYLUM
Zinziber, vide Amomum
Zea
Zinnia
Ziziphora
Ziziphus
Zygophyllum
Zylosteum, vide Lonicera

THE

# THE ENGLISH NAMES OF PLANTS mentioned in this WORK, Referring to their LATIN NAMES.


A BELE-Tree, fee Populus
Acacia, or Egyptian Thorn, fee Mimofa
Acacia, the falfe, fee Robinia
Acacia, the German, fee Prunus
Acacia, the three-thorned, or Honey-Locuft, fee Gleditfia
Aconite, or Wolf's-bane, fee Aconitum
Aconite, the Winter, fee Helleborus
Adam's-Apple, fee Aurantium
Adder's-Tougue, fee Ophioglossum
Adder's-wort, or Snake-weed, fee Polygonum
Adonis-flower, fee Adonis
African Marigold, fee Tagetes
Agrimony, fee Agrimonia
Agrimony, the Water, fee Bidens
Ague-tree, or Saffafras, fee Laurus
Alecoaft, or Coaftmary, fee Tanacetum
Alehoof, or Ground Ivy, fee Glecoma
Alder-tree, fee Alnus
Alder, the Berry-bearing, fee Frangula
Alheal, fee Panax
Alheal, the Clown's, fee Sideritis
Alifander, or Alexander, fee Smyrnium
Alkanet, fee Anchufa
Allelujah, or Wood-forrel, fee Oxalis
Alligator-Pear, fee Laurus
Allfpice, fee Caryophyllus
Almond-tree, fee Amygdalus
Almond, the Dwarf, fee Perfica
Almond, the Ethiopian, fee Brabeium
Aloe, fee Agave
Amaranth, fee Amaranthus and Celofia
Amaranth, the Globe, fee Gomphrena
Amber-tree, fee Anthofpermum
Anatomy of Plants
Anemony, fee Anemone
Anis, fee Apium
Apple, fee Malus
Apple, the Cuftard, fee Annona
Apple of Love, fee Lycoperficon and Solanum
Apple, the Mad, fee Melongena
Apple, Male Balfam, fee Momordica
Apple, the Paradife, fee Malus
Apple, the Sour, or Sourfop, fee Annona
Apple, the Sweet, or Sugar, Id.
Apple, the Thorn, fee Datura
Apricot, fee Armeniaca
Archangel, fee Lamium
Aron, or Wake-robin, fee Arum
Arrrow-root, fee Maranta
Arfmart, fee Polygonum
Artichoke
Artichoke of Jerufalem, fee Helianthus
Afarabacca, fee Afarum
Afh, fee Fraxinus
Afh, the Mountain, fee Sorbus
Afhes
Afparagrafs, or Sparrowgrafs, fee Afparagus
Afpen-tree, fee Populus
Afphodel, fee Afphodelus
Afphodel, the African, fee Anthericum
Afphodel Lily, fee Hemerocallis and Crinum
Avens, fee Geum
Avenue
Avocado Pear, fee Laurus
Ax-vetch, fee Securidaca
Azarole, fee Mefpilus


B.


BALM of Gilead, fee Dracocephalon
Balm of Gilead Fir, fee Abies
Balfam of Capevi, fee Copaiba
Balfam-tree, fee Piftacia
Balfamine, fee Impatiens
Balfam-apple, fee Momordica
Bamboo Cane, fee Arundo
Banana, fee Mufa
Baneberries, fee Actæa
Barbadoes Cherry, fee Malpighia
Barbadoes Flower-fence, fee Poinçiana
Barberry, fee Berberis
Barley, fee Hordeum
Barley, the Naked, fee Triticum
Barrenwort, fee Epimedium
Bafil, fee Ocymum
Bafil, the Stone, fee Thymus
Baftard Acacia, fee Robinia
Baftard Dittany, fee Marrubium
Bachelor's Button, fee Lychnis and Centaurea
Bachelor's Pear, fee Solanum
Baulm, fee Meliffa
Baulm, the Molucca, fee Moluccella
Baulm, the Turkey, fee Dracocephalon
Bay, fee Laurus
Bay of Alexandria, fee Rufcus
Bay, the Cherry, fee Padus
Bay, the Indian, fee Laurus
Bay, the Rofe, fee Nerium
Bay, the Sweet-flowering, fee Magnolia
Bead-tree, fee Melia
Beam, the Hard, or Hornbeam, fee Carpinus
Beam-tree, the White, fee Crategus
Bean, fee Faba
Bean, the Hog, or Bogbean, fee Menyanthes
Bean, the Kidney, or French, fee Phafeolus
Bean Caper, fee Zygophyllum
Bean Trefoil, fee Cytifus
Bean-tree, fee Erythrina
Bean, the Kidney-bean-tree, fee Glycine
Beard, the old Man's, fee Clematis
Bear's-breech, fee Acanthus
Bear's-ear, fee Auricula
Bear's-ear Sanicle, fee Cortufa and Verbafcum


Bear's

Bear's-foot, see Helleborus
Bedinjan, or Pottle John, see Melongena
Bedstraw, our Lady's, see Gallium
Bee-flower, see Orchis
Beech-tree, see Fagus
Beet, see Beta
Bell-flower, } see Campanula
Bells, the Canterbury, } see Campanula
Bell's-hair, see Hyacinthus
Bell-flower, the Peach-leaved, } see Campanula
Bell-flower, the Steeple, } see Campanula
Bell-pepper, see Capsicum
Belly-ache Weed, see Iatropha
Belmusk, or Abelmosk, see Hibiscus
Benjamin-tree, see Laurus
Bennet-herb, see Geum
Berberry, see Berberis
Betony, see Betonica
Betony, Paul's, see Veronica
Betony, the Water, see Scrophularia
Bethlehem Star, see Ornithogalum
Bifoil, or Twayblade, see Ophrys
Bilberry, see Vaccinium
Bindweed, see Convolvulus
Bindweed, the black, see Tamus
Bindweed, the prickly, see Smilax
Birch-tree, see Betula
Birch-tree of America, see Pistacia
Bird-cherry, see Padus
Bird's-eye, see Adonis and Primula
Bird's-foot, see Ornithopus
Bird's-foot Trefoil, see Lotus
Bird's-nest, see Daucus
Bird-pepper, see Capsicum
Birthwort, see Aristolochia
Bishop's-weed, see Ammi
Bitter-sweet, see Solanum
Bitter Vetch, see Orobus
Bitterwort, see Gentiana
Blackberry, see Rubus
Black Briony, see Tamus
Blackthorn, see Prunus
Bladder-nut, see Staphylæa
Bladder-nut, the African, see Royenia
Bladder Sena, see Colutea
Blights
Blite, see Blitum
Blood-flower, see Hæmanthus
Bloodwort, see Rumex
Bluebottle, see Hyacinthus and Centaurea
Bolbonach, or white Satten, see Lunaria
Bonana, see Musa
Borecole, see Brassica
Borrage, see Borago
Box, see Buxus
Box-thorn, see Lycium
Brake, see Filix
Bramble, see Rubus
Brank-ursine, see Acanthus
Bread, St. John's, see Ceratonia
Briar, the Sweet, } see Rosa
Briar, the Wild, } see Rosa
Briony, see Brionia
Bristol-flower, see Lychnis
Brimstonewort, see Peucedanum
Broccoli, see Brassica
Brooklime, see Veronica
Broom, see Genista
Broom, the Butcher's, see Ruscus
Broom, the Green, see Spartium
Broom, the Spanish, see Genista
Broom, the White, see Spartium
Broom, Rape, see Orobanche
Brownwort, see Scrophularia and Prunella
Bruisewort, see Lychnis
Buckshorn, or Hartshorn Plantain, see Plantago
Buckthorn, see Rhamnus
Buckthorn, the Sea, see Hippophae
Buck-wheat, see Helxine
Budding, see Inoculating
Bugle, see Ajuga
Buglofs, see Anchusa
Buglofs, the Viper's, see Echium
Bullace-tree, see Prunus
Bully-tree, see Chrysophyllum
Burdock, see Arctium
Burdock the lesser, see Xanthium
Burnet, see Sanguisorba
Burnet Saxifrage, see Pimpinella
Butcher's Broom, see Ruscus
Butter-bur, see Petasites
Butterfly-flower, see Orchis
Butterwort, see Pinguicula
Button-tree, see Platanus and Cephalanthus
Button-tree of Jamaica, see Conocarpus

C.

CABBAGE, see Brassica
Cabbage, the Sea, see Crambe
Cabbage-tree, see Palma
Cajou, see Anacardium
Calabash, see Cucurbita
Calabash-tree, see Crescentia
Calamint, see Melissa
Calamint, the Water, see Mentha
Caltrops, see Tribulus
Calve's-snout, see Antirrhinum
Cammock, see Ononis
Camomile, see Anthemis
Camphire-tree, see Laurus
Campion, see Lychnis
Candle-berry-tree, see Myrica
Candy-carrot, see Athamanta
Candy-tuft, } see Iberis
Candy-tuft-tree, } see Iberis
Cane, the Bamboo, see Arundo
Cane, the Indian-flowering, see Canna
Cane, the dumb, see Arum
Cane, the Fishing-rod, see Arundo
Cane, the Sugar, see Saccharum
Canterbury-bell, see Campanula
Caper, see Capparis
Caper, the Bean, see Zygophyllum
Caraway, see Carum
Cardinal's-flower, see Rapuntium
Carline Thistle, see Carlina
Carlock, see Sinapis and Raphanus
Carnation, see Dianthus
Carnation, the Spanish, see Poinçiana
Carob, see Ceratonia
Carrot, see Daucus
Carrot, the Deadly, see Thapsia
Carrot, the Candy, see Athamanta
Carrot, the Scorching, see Thapsia
Cassada, or Cassavi, see Iatropha
Cassidony, see Stœchas
Cassidony, the Mountain, } see Gnaphalium
Cassidony, the Golden, } see Gnaphalium
Cassioberry-tree, see Cassine
Catchfly, see Silene
Caterpillar Plant, see Scorpiurus
Cat-mint, see Nepeta
Cauliflower, see Brassica
Cedar of Bermudas, } see Juniperus
Cedar of Carolina, } see Juniperus
Cedar, the Bastard, see Theobroma
Cedar of Libanus, see Larix
Cedar of Lycia, see Juniperus
Cedar, the white, see Cupressus
Celandine, see Chelidonium
Celeri, see Apium
Cells of Plants
Centaury, see Gentiana
Ceterach, see Asplenium
Chamomile, see Anthemis
Charlock, see Sinapis
Chaste-tree, see Vitex
Cheese-runnet, see Gallium
Cherry-tree, see Cerasus
Cherry Bay, see Padus

Cherry of Barbadoes, see Malpighia
Cherry, the Bird, } see Padus
Cherry Laurel, }
Cherry, the Cornelian, see Cornus
Cherry, the Portugal, see Padus
Cherry, the Cowhedge, see Malpighia
Cherry, the Winter, see Physalis and Solanum
Cherry, the perfumed, see Cerasus
Chervil, see Chærophyllam
Chervil, see Scandix
Chestnut-tree, see Castanea
Chestnut, the Horse, } see Esculus
Chestnut, the scarlet Horse, }
Chiches, see Cicer
Chickling Pea, see Lathyrus
Chickweed, see Alsine
Chickweed, the Berry-bearing, see Cucubalus
Chives, see Cepa
Chocolate-nut, see Cocoa
Christmas-rose, see Helleborus
Christ's-thorn, see Paliurus
Christopher-herb, see Actea
Cibouls, see Cepa
Cicely, see Chærophyllum
Cinquefoil, } see Potentilla
Cinquefoil Shrub, }
Cinnamon, see Laurus
Cistus, or Rock Rose, see Cistus
Cistus, the Dwarf, see Helianthemum
Citron-tree, see Citrum
Citrul, see Anguria
Cives, see Cepa
Clary, the Garden, } see Salvia
Clary, the wild, }
Climber, see Clematis and Vitis
Clivers, see Aparine
Cloud Berry, see Rubus
Clover, see Trifolium
Clover, the Snail, see Medicago
Clove Gilliflower, see Dianthus
Clowns Woundwort, see Sideritis
Coastmary, see Tanacetum
Cob-nut, see Corylus
Coccygria, see Rhus
Cockscomb, } see Celosia
Cockscomb Amaranth, }
Cockshead, see Onobrychis
Cocoa-nut, see Coccus
Codlin-tree, see Malus
Codlins and Cream, see Epilobium
Coffee
Cole-seed, } see Brassica
Colewort, }
Colewort, the Sea, see Convolvulus
Colliflower, see Brassica
Coloquintida, see Cucumis
Coltsfoot, see Tussilago
Coltsfoot, the Alpine, see Cacalia
Columbine, see Aquilegia
Columbine, the feathered, see Thalictrum
Comfry, see Symphytum
Comfry, the spotted, see Pulmonaria
Compartments
Composts
Compound Flowers
Cone
Consound the great, see Symphytum
Consound the middle, see Bugula
Consound, the least, see Bellis
Consound, Saracens, see Solidago
Conservatory, see Green-house
Conval Lily, see Convallaria
Coral-tree, see Erythrina
Coriander, see Coriandrum
Cork-tree, see Suber
Corn Bottle, see Centaurea
Corn Flag, see Gladiolus
Corn Marigold, see Chrysanthemum
Corn Violet, see Campanula
Corn Sallad, see Valeriana
Cornelian Cherry, } see Cornus
Cornel-tree, }
Corniculate Plants
Costmary, see Tanacetum
Cotton, see Gossipium
Cotton, the Silk, see Bombax
Cotton Weed, see Filago
Corymbus
Couch, or Dog Grass, see Gramen
Coventry Bells, see Campanula
Cowl, the Friars, see Arum
Cowslip, see Primula
Cowslip of Jerusalem, see Pulmonaria
Cows Lungwort, see Verbascum
Crab-tree, see Malus
Cranesbill, see Geranium
Cress, see Nasturtium
Cress, the Indian, see Tropeolum
Cress, the Sciatica, see Iberis
Cress, the Swines, see Cochlearia
Cress, the Water, } see Sisymbrium
Cress, the Winter, }
Crimson Grass Vetch, see Lathyrus
Cross-wort, see Cruciata
Cross of Jerusalem, see Lychnis
Crowfoot, see Ranunculus
Crow Garlick, see Cepa
Crow Flowers, see Lychnis
Crown Imperial, see Fritillaria
Cuckow Flower, see Cardamine
Cucumber, see Cucumis
Cucumber, the wild, see Momordica
Cudweed, see Gnaphalium and Filago
Cullion, see Orchis
Cumin, see Cuminum
Currant-tree, see Ribes
Custard Apple, see Annona
Cypress-tree, see Cupressus
Cypress, the Garden, or Lavender Cotton, see Santolina
Cypress, the Summer, see Chenopodium

D.

Daffodil, see Narcissus
Daffodil Lily, see Amaryllis
Daffodil, the Sea, see Pancratium
Daisy, see Bellis
Daisy, the Ox Eye, see Chrysanthemum
Dames Violet, see Hesperis
Dandelion, see Leontodon
Danewort, or Dwarf Elder, see Sambucus
Date-tree, see Palma
Date Plum, see Diospyrus
Day Lily, see Hemerocallis
Dead Nettle, see Lamium
Deadly Carrot, see Thapsia
Deadly Nightshade, see Atropa
Devil in a Bush, see Nigella
Devil's Bit, see Scabiosa
Dew
Diers Broom, see Genista
Diers Weed, see Reseda
Dill, see Anethum
Distaff Thistle, see Atractylis
Dittander, or Pepperwort, see Lepidium
Dittany, see Origanum
Dittany, the Bastard, see Marrubium
Dittany, the white, see Dictamnus
Dock, see Rumex
Doctor Tinkar's Weed, see Triosteum
Dogsbane, see Apocynum, Asclepias, and Cynanchum
Dogberry-tree, see Cornus
Dog Grass, see Gramen
Dog's Mercury, see Mercurialis
Dog's Tooth, see Erythronium
Dog's Stones, see Orchis
Dog's Tongue, see Cynoglossum
Dogwood, see Cornus

Dogwood of Jamaica, see Robinia
Dogwood of Virginia, see Laurus
Double Leaf, or Twyblade, see Ophrys
Double Tongue, see Ruscus
Dove's-foot, see Geranium
Dragons, see Dracontium
Dragon-tree, see Palma
Dragon, the wild, or Tarragon, see Abrotanum
Dropwort, see Spiræa
Dropwort, the Water, see Oenanthe
Duck's-foot, see Podophyllum
Duck's Meat, see Lenticula
Dung
Dwale, or deadly Nightshade, see Atropa
Dwarf Bay, see Daphne
Dwarf Cistus, see Helianthemum
Dwarf Almond, see Persica
Dwarf Oak, see Quercus
Dwarf Trees

E.

EARTH
Earth Nut, see Bunium
Earth Peas, see Lathyrus
Earth Peas, the African, see Arachis
Edging
Eglantine, see Rosa
Elder-tree, see Sambucus
Elder, the Marsh, see Viburnum
Elder, the Spanish, see Saururus
Elecampane, see Inula
Elm-tree, see Ulmus
Enchanters Nightshade, see Circæa
Endive, see Cichorium
Equinoctial
Equinox
Eringo, see Eryngium
Espalier
Eternal Flower, see Gnaphalium and Xeranthemum
Evergreen Honeysuckle, see Periclymenum
Evergreen Oak, see Quercus
Evergreen Privet, see Ligustrum
Evergreen Rose, see Rosa
Evergreen Thorn, see Mespilus
Everlasting Pea, see Lathyrus
Exotic Plants
Eyebright, see Euphrasia

F.

FEATHERFEW, see Matricaria
Feather, the Princes, see Amaranthus
Felonwort, see Solanum
Fellwort, see Gentiana
Fences
Fennel, see Fœniculum
Fennel, the Hogs, see Peucedanum
Fennel-giant, see Ferula
Fennel, the scorching, see Thapsia
Fennel-flower, see Nigella
Fenugreek, see Trigonella
Fern, see Felix
Fern, the sweet, see Scandix
Feverfew, see Matricaria
Feverfew, the Bastard, see Parthenium
Fiddle Dock, see Rumex
Fiddle Wood, see Citharexylon
Field Basil, see Acinos
Fig-tree, } see Ficus
Fig, the arched Indian, } see Ficus
Fig, the Indian, see Opuntia
Fig, the infernal, see Argemone
Fig, Pharaoh's, see Musa
Fig Marigold, see Mesembryanthemum
Figwort, see Scrophularia
Filbert, see Corylus
Fingrigo, see Pisonia
Finochia, see Fœniculum
Fir-trees, see Abies
Fir, the Scotch, see Pinus
Fire
Fistular Flowers
Flag, the Corn, see Gladiolus
Flag, the common, see Iris
Flag, the sweet-scented, see Acorus
Flag, the yellow Marsh, see Iris
Flax, see Linum
Flax, the Toad, see Linaria
Fleabane, see Conyza
Fleabane, the African, see Tarconanthus
Fleawort, see Psyllium
Flixweed, see Sisymbrium
Flower
Flower-de-luce, see Iris and Xiphion
Flower gentle, see Amaranthus
Flower eternal, see Xeranthemum
Flower everlasting, see Gnaphalium
Flower-fence, see Poinçiana
Flower, the four o'Clock, see Mirabilis
Flower, Sun, see Hælianthus
Fluelline, see Veronica
Flywort, or Catchfly, see Lychnis and Silene
Fools Stones, see Orchis
Fox-Glove, see Digitalis
Fountains
Framboise, see Rubus
French Cowslip, see Auricula
French Honeysuckle, see Hedysarum
French Lavender, see Stœchas
French Marigold, see Tagetes
French Mercury, see Mercurialis
French Wheat, see Helxine
French Willow, see Epilobium
Friars Cowl, see Arum
Fringe-tree, see Chionanthus
Fritillary, see Fritillaria
Fritillary Crassa, see Stapelia
Frost
Fruit
Fumatory, } see Fumaria
Fumatory, the bulbous-rooted, } see Fumaria
Fumatory, the Bladder, } see Fumaria
Fumatory, the podded, } see Fumaria
Furz, see Ulex
Fustick-tree, see Morus

G.

GALE, or Sweet Willow, see Myrica
Galingale, see Cyperus
Galleries
Gall Oak, see Quercus
Gardens
Garlick, see Allium
Garlick, the Crow, or wild, see Cepa
Gatton-tree, see Cornus
Gaule, or Dutch Willow, see Myrica
Gelder Rose, see Viburnum
Generation
Gentian, } see Gentiana
Gentianella, } see Gentiana
Germander, } see Teucrium
Germander-tree, } see Teucrium
Germander, the Water, } see Teucrium
Gilliflower, see Dianthus
Gilliflower, the Queen's, see Hesperis
Gilliflower, the Stock, see Cheiranthus
Gill-go-by-ground, see Glechoma
Ginger, see Amomum
Glade
Gladwin, see Iris
Glandulous
Glass-wort, see Salicornia and Salsola
Glastenbury Thorn, see Mespilus
Globe Daisy, see Globularia
Globe Crowfoot, see Trollius
Globe Amaranthus, see Gomphrena
Globe-flower, or Bottle, see Centaurea
Globe Thistle, see Echinops

Goat's-beard, see Tragopogon
Goat's-rue, see Galega
Goat's-stones, see Orchis
Goat's-thorn, see Tragacantha
Gold of Pleasure, see Myagrum
Goldy-locks, see Chrysocoma
Golden-flower-gentle, see Amaranthus
Golden-cups, see Ranunculus and Trollius
Golden-rod, see Solidago
Gooseberry, see Grossularia
Gooseberry of Barbadoes, see Pereskia
Gooseberry, the American, see Melastoma
Goose-grass, see Aparine
Goose-foot, see Chenopodium
Gorse, or Furz, see Ulex
Go-to-bed-at-noon, see Tragopogon
Gourd, } see Cucurbita
Gourd, the bitter, } see Cucurbita
Gourd, the Indian-tree, see Crescentia
Gourd, the sour, see Adansonia
Gout-wort, see Ægopodium
Grafting
Grain, the oily, see Sesamum
Grain, the scarlet, see Opuntia and Quercus
Grape, see Vitis
Grape, the Sea-side, see Coccolobus
Grape Hyacinth, see Muscari
Grass, see Gramen
Grass of Parnassus, see Parnassia
Grass, the three-leaved, see Trifolium
Grass-vetch, see Lathyrus
Grass, the Viper's, see Scorzonera
Gravel
Gravity
Graymill, or Gromwell, see Lithospermum
Greek Valerian, see Polemonium
Green-house
Green, the Winter, see Pyrola
Gromwell, see Lithospermum
Ground-ivy, see Glechoma
Ground-Pine, see Teucrium
Groundsel, see Senecio and Erigeron
Groundsel, the African, see Cacalia
Grove
Guava, see Psidium
Guiney Corn, see Milium
Guiney Henweed, see Petiveria
Guiney Pepper, see Capsicum
Guiney Wheat, see Zea
Gum Succory, see Chondrilla

H.

Hair-bell, see Hyacinthus
Hardbeam, see Carpinus
Hare's-ear, see Bupleurum
Hare's-foot Trefoil, see Trifolium
Hare's-lettuce, see Sonchus
Hare's-strong, see Peucedanum
Harmel, see Peganum
Hartwort, see Tordylium
Hartwort of Ethiopia, see Bupleurum
Hart's-horn, see Plantago
Hart's-tongue, see Lingua Cervina
Hatchet-vetch, see Securidaca
Hawkweed, see Hieracium
Hawthorn, see Mespilus
Hazel, see Corylus
Hazel, the Witch, see Ulmus
Heart's-ease, see Viola
Heath, see Erica
Heath, the Berry-bearing, see Empetrum
Heath, the low Pine, see Coris
Hedges
Hedge-hog, see Medicago
Hedge-hog Thistle, see Cactus
Hedge Hyssop, see Gratiola
Hedge Mustard, see Erysimum
Hedge Nettle, see Galeopsis
Hedge Nettle Shrub, see Prasium
Heliotrope, see Heliotropium
Heliotrope, or Sunflower, see Helianthus
Hellebore, the Black, see Helleborus
Hellebore, the Bastard, see Serapias
Hellebore, the White, see Veratrum
Helmet-flower, see Scutellaria
Hemlock, see Cicuta
Hemlock, the Bastard, see Ligusticum
Hemlock, the Water, see Phellandrium
Hemp, see Cannabis
Hemp Agrimony, see Eupatorium
Hemp, the Bastard, see Datisca
Hemp, the Water, see Bidens
Henbane, see Hyoscyamus
Henbane, the yellow, see Nicotiana
Herb Bennet, see Geum
Herb Christopher, see Actæa
Herb Gerard, see Angelica
Herb of Grace, see Ruta
Herb Paris, see Paris
Herb Robert, see Geranium
Herb Trefoil, see Trifolium
Herb Trinity, see Viola
Herb True-love, see Paris
Herb Two-pence, see Lysimachia
Herb Willow, see Epilobium
Hercules's All-heal, see Heracleum and Pastinaca
Hermodactyl, see Hermodactylus
Hightaper, see Verbascum
Hills
Hog's-fennel, see Peucedanum
Hog Plum, see Spondias
Hog Weed, see Boerhaavia
Hollow-root, see Fumaria
Hollyhock, see Alcea
Holly-tree, see Ilex
Holly, the Knee, see Ruscus
Holly, the Sea, see Eryngium
Holm Oak, see Quercus
Holy Rose, see Cistus
Holy Thistle, see Cnicus
Honeysuckle, see Periclymenum
Honeysuckle, the French, see Hedysarum
Honeysuckle, the Trumpet, see Periclymenum
Honeysuckle, the upright, see Lonicera
Honesty, see Lunaria
Honey-flower, see Melianthus
Honey-wort, see Cerinthe
Hone-wort, see Sium
Hops, see Lupulus
Hop Hornbeam, see Carpinus
Hop, the Wild, see Ptelea
Horehound, see Marrubium
Horehound, the Black, see Ballotte
Horehound, the Base, see Stachys
Horehound, the Bastard, see Sideritis
Horehound, the Water, see Lycopus
Hornbeam, see Carpinus
Horizontal Shelters
Horned Poppy, see Chelidonium
Horse Chestnut, } see Esculus
Horse Chestnut, the scarlet, } see Esculus
Horse-mint, see Mentha
Horse-radish, see Cochlearia
Hoseshoe-vetch, see Hippocrepis
Horse-tail, see Equisetum
Horns and Hedgehog, see Medicago
Hose-in-Hose, see Primula
Hound's-tongue, see Cynoglossum
Hot-bed
Housleek, see Sedum and Sempervivum
Humble Plant, see Mimosa
Hyacinth, see Hyacinthus
Hyacinth, the Grape, } see Muscari
Hyacinth of Peru, } see Muscari
Hyacinth, the starry, see Ornithogalum
Hyacinth, the Tuberose, see Polianthes and Crinum
Hydrostatics
Hygrometer

Hyssop, see Hyssopus
Hyssop, the Hedge, see Gratiola

J.

JAcinth, see Hyacinthus
Jack by the Hedge, see Erysimum
Jack in a Box, see Hernandia
Jacob's Ladder, see Polemonium
Jalap, see Convolvulus
Jalap, the False, see Mirabilis
Jasmine, see Jasminum
Jasmine, the Ilex-leaved, see Lantana
Jasmine, the American scarlet, see Bignonia
Jasmine, the Red of Jamaica, see Plumeria
Jasmine, the Persian, see Syringa
Jasmine, the Fennel-leaved, see Ipomæa
Ice
Ice-House
Jerusalem Artickoke, see Helianthus
Jerusalem Cowslip, see Pulmonaria
Jerusalem Sage, see Phlomis
Jesuits Bark, the False, see Baccharis
Jet-d'eau
Jews Mallow, see Corchorus
Immortal Eagle Flower, see Impatiens
Immortal Flower, see Gnaphalium
Inarching
Indian Arrow-root, see Maranta
Indian Cress, see Tropæolum
Indian Corn, see Zea
Indian Fig, see Opuntia
Indian God-tree, see Ficus
Indian Reed, see Canna
Indigo, see Indigophera
Inoculating
Job's Tears, see Coix
St. John's Bread, see Ceratonia
St. John's Wort, see Hypericum
John's-sweet, see Dianthus
Jonquil, see Narcissus
Iron-wood, see Sideroxylum
Iron-wort, see Sideritis
Jucca, see Yucca
Judas-tree, see Cercis
Jujube, see Ziziphus
Julians, see Hesperis
Juniper, see Juniperus
Jupiter's Beard, see Anthyllis
Ivy-tree, see Hedera
Ivy, the Ground, see Glechoma

K.

KATKIN
Kidney-bean, see Phaseolus
Kidney-bean Tree, see Glycine
Kidney-wort, see Geum and Cotyledon
King's Spear, see Asphodelus
Kitchen-garden
Knapweed, see Centaurea
Knee-holm, } see Ruscus
Knee-holly, } see Ruscus
Knights-cross, see Lychnis
Knot-berries, see Rubus
Knot-grass, see Polygonum
Knot-grass, the Mountain, see Illecebrum

L.

LAburnum, see Cytisus
Labyrinth
Ladies Bedstraw, see Gallium
Ladies Bower, see Clematis
Ladies Comb, see Scandix
Ladies Mantle, see Alchemilla
Ladies Seal, see Tamus
Ladies Slipper, see Cyprypedium
Ladies Smock, see Cardamine
Ladies Traces, see Orchis
Ladder to Heaven, see Convallaria
Lamb's Lettuce, see Valeriana
Land
Larch-tree, see Larix
Larkspur, see Delphinium
Laserwort, see Laserpitium
Lavender, see Lavendula
Lavender-cotton, see Santolina
Lavender, the French, see Stœchas
Lavender, the Sea, see Limonium
Laurel, } see Padus
Laurel, the Portugal, } see Padus
Laurel of Alexandria, see Ruscus
Laurel, the Dwarf, or Spurge, see Daphne
Laurel, the Sea-side, see Phyllanthus
Laurustinus, see Viburnum
Lawn
Layers
Leadwort, see Plumbago
Leaves
Leeks, see Porrum
Legume
Lemon-tree, see Limon
Lemon, the Water, see Passiflora
Lentil, see Ervum
Leopard's-bane, see Doronicum
Lettuce, see Lactuca
Lettuce, the Lamb's, see Valeriana
Lettuce, the Wild, see Prenanthes
Level
Levity
Life Everlasting, see Gnaphalium
Light
Lily, see Lilium
Lily, Asphodel, see Hemerocallis and Crinum
Lily, Daffodil, see Pancratium and Amaryllis
Lily, the Belladonna, see Amaryllis
Lily, the Day, } see Hemerocallis
Lily, St. Bruno's, } see Hemerocallis
Lily, the Guernsey, see Amaryllis
Lily, Hyacinth, see Scilla
Lily, the May, see Convallaria
Lily, the Mexican, } see Amaryllis
Lily of Japan, } see Amaryllis
Lily, the Persian, see Fritillaria
Lily, the Superb, see Gloriosa
Lily, the Water, see Nymphæa
Lime-tree, see Tilia
Lime, the four, see Limon
Lion's-leaf, see Leontice
Lion's-foot, see Catananche
Lion's-tail, see Leonurus
Liquidamber
Liquorice, see Glycirrhiza
Liquorice-vetch, see Orobus
Liquorice, the Wild, see Astragalus
Live-ever, see Anacampseros and Sempervivum
Live in Idleness, see Viola
Liverwort, see Hepatica and Lichen
Lizard's-tail, see Saururus
Loam
Locker Goulans, see Trollius
Locust, or St. John's Bread, see Ceratonia
Locust, the Bastard, see Hymenæa
Locust of Virginia, see Gleditsia
Logwood, see Hæmatoxylum
London Pride, see Saxifraga
Looking-glass, Venus's, see Campanula
Loosestrife, see Lysimachia
Loosestrife, the podded, see Epilobium
Loosestrife, the spiked, see Lythrum
Lopping
Lote-tree, see Celtis
Lote, the Bastard, see Diospyrus
Love-apple, see Lycopersicum and Solanum
Love-in-a-mist, see Passiflora
Love-lies-a-bleeding, see Amaranthus
Loveage, see Ligusticum
Lousewort, see Delphinium
Lucern, see Medica

Lungwort, see Pulmonaria
Lungwort, Cows, see Verbascum
Lupine, see Lupinus
Lustwort, see Drosera

M.

MAccaw-tree, see Palma
Mad Apple, see Melongena
Madder, see Rubia
Madder, Petty, see Asperula
Madwort, see Alyssum
Mahogany, see Cedrus
Maiden Hair, see Adianthum
Maiden Hair, the Black, see Filicula
Maiden Hair, the English, see Trichomanes
Maiden Hair, the White, see Ruta muraria
Malabar Nut, see Justicia
Male Balsam Apple, see Momordica
Mallow, see Malva
Mallow, the Jews, see Corchorus
Mallow, the Indian, see Urena and Sida
Mallow, the Marsh, see Althæa
Mallow, the Rose, see Alcea
Mallow, the Syrian, see Hibiscus
Mallow, the Tree, see Lavatera
Mallow, the Venetian, see Hibiscus
Mallow, the Yellow, see Abutilon
Malt Dust
Mammee, see Mammea
Mammee Sapota, see Sapota
Manchineel Tree, see Hippomane
Mandrake, see Mandragora
Mangrove-tree, see Hibiscus
Mangrove Grape, see Coccolobus
Mantle, Ladies, see Alchemilla
Manure
Maple-tree, see Acer
Maracock, see Passiflora
Marigold, see Calendula
Marigold, the African, see Tagetes
Marigold, the Corn, see Chrysanthemum
Marigold, the Fig, see Mesembryanthemum
Marigold, the French, see Tagetes
Marigold, the Marsh, see Caltha
Marjoram, } see Origanum
Marjoram, the Pot, } see Origanum
Marjoram, the Wild, } see Origanum
Marjoram, the Winter, } see Origanum
Marle
Marsh Elder, see Viburnum
Marsh Mallow, see Althæa
Marsh Trefoil, see Menianthes
Martagon, see Lilium
Marvel of Peru, see Mirabilis
Marum, or Mastich, see Satureja
Master-wort, see Imperatoria and Astrantia
Mastich, see Satureja
Mastich-tree, see Pistacia
Mastich-tree of Jamaica, see Cornus
Mastich, the Indian, see Schinus
Matfelon, or Knapweed, see Centaurea
Maudlin, see Achillea
May Bush, see Mespilus
May Lily, see Convallaria
May Weed, see Anthemis
Meadow
Meadow Rue, see Thalictrum
Meadow Saffron, see Colchicum
Meadow-sweet, see Spiræa
Meadow Trefoil, see Trifolium
Meally-tree, see Viburnum
Medick, see Medica
Medick Vetchling, see Onobrychis
Medick, the Bastard, see Medicago
Medlar, see Mespilus
Melancholy Thistle, see Cirsium
Melilot, see Trifolium
Melon, the Musk, see Melo
Melon, the Water, see Anguria
Melon Thistle, see Cactos
Mercury, see Mercurialis
Mercury, the English, see Chenopodium
Mercury, the French, see Mercurialis
Meu, or Spignel, see Athamanta
Mezereon, see Daphne
Microscope
Mildew
Milfoil, see Achillea
Milk-vetch, see Astragalus
Milk-vetch, the Bastard, see Phaca
Milkwort, see Polygala and Glaux
Milkwort, or Wartwort, see Euphorbia
Millet, see Milium
Miltwaste, see Asplenium
Mint, see Mentha
Mint, the Cats, see Nepeta
Missleto, see Viscum
Mithridate Mustard, see Thlaspi and Iberis
Mock Orange, see Philadelphus
Mock Privet, see Phillyrea
Moneywort, see Lysimachia
Monkshood, see Aconitum
Monks Rhubarb, see Rumex
Moonseed, see Menispermum
Moonwort, see Lunaria
Moon Trefoil, see Medica
Moss, see Muscus
Motherwort, see Cardiaca and Matricaria
Mother-of-thyme, see Thymus
Mould
Mountain Heath, see Saxifraga
Moth-mullein, see Verbascum
Mouse-ear, see Hieracium
Mouse-tail, see Myosurus
Mugwort, see Artemisia
Mulberry-tree, see Morus
Mulberry Blight, see Blitum
Mullein, } see Verbascum
Mullein, the Moth, } see Verbascum
Mummy
Mushroom
Musk, Hyacinth, see Muscari
Musk-seed, see Hibiscus
Mustard, see Sinapis
Mustard, Bastard Mithridate, see Thlaspi and Iberis
Mustard, the China, see Sinapis and Brassica
Mustard, the Hedge, see Erysimum
Mustard, the Mithridate, see Thlaspi
Mustard, the Tower, see Turritis
Mustard, the Treacle, see Thlaspi and Lepidium
Myrrh, see Myrhis
Myrtle, see Myrtus
Myrtle, the Dutch, } see Myrica
Myrtle, the Candleberry, } see Myrica

N.

NAsberry-tree, see Chrysophyllum
Nature
Navelwort, the Bastard, see Crassula
Navelwort, Venus's, see Cynoglossum
Navelwort, the Water, see Hydrocotyle
Navew, see Rapa
Nectarine
Negro-oil, see Palma
Nep, see Nepeta
Nerves
Nettle, see Urtica
Nettle, the Dead, see Lamium
Nettle, the Hedge, see Galeopsis
Nettle, the shrubby Hedge, see Prasium
Nettle-tree, see Celtis
Nightshade, see Solanum
Nightshade, the climbing, see Bassella
Nightshade, the deadly, see Atropa
Nightshade, the Enchanters, see Circea
Nightshade, the American, see Piercea
Nipplewort, see Lapsana
Nitre

None-so-pretty, see Saxifraga
None-such, or Flower of Bristol, see Lychnis
Northern Aspect
Nose-bleed, see Achillea
Nursery
Nut, the Hazel, see Corylus
Nut, the Bladder, see Staphylæa
Nut, the Cocoa, see Coccus
Nut, the Earth, see Arachis
Nut, the Peas, see Lathyrus
Nut, the Physic, see Iatropha
Nut, the Pig, see Bunium
Nut, the Malabar, see Justicia
Nut, the Walnut, see Juglans

O.

OAK, } see Quercus
Oak, the Evergreen, } see Quercus
Oak, the Holm, } see Quercus
Oak of Jerusalem, see Chenopodium
Oats, see Avena
Oily-grain, see Sesamum
Oily-palm, see Palma
Oleander, see Nerium
Olive-tree, see Olea
Olive, the Wild, see Elæagnus
Olive, the Wild Barbadoes, see Bontia
Olive, the Spurge, see Daphne
One Berry, see Paris
One Blade, see Smilax
Onion, see Cepa
Onion, the Sea, see Scilla
Orach, see Atriplex and Chenopodium
Orange-tree, see Aurantium
Orange Mint, see Mentha
Orange, the Mock, see Philadelphus
Orchard
Origany, see Origanum
Orpine, see Sedum
Orpine the True, see Telephium
Orpine the Bastard, see Andrachne
Osier, see Salix
Osmund-royal, see Osmunda
Ox-eye, see Buphthalmum
Ox-eye Daisy, see Chrysanthemum
Oxslip, see Primula

P.

PAigles, or Cowslip, see Primula
Palm-tree, } see Palma
Palmetto, } see Palma
Panic, see Panicum
Panicle
Pansies, see Viola
Papaw, see Carica
Pappose Plants
Paradise Apple, see Malus
Parasitical Plants
Park Leaves, see Hypericum
Parsley, see Apium
Parsley, the Bastard, see Caucali
Parsley, the Fool's, see Æthusa
Parsley, the Mountain, see Athamanta
Parsley, the wild milky, see Thesselinum
Parsley, the Macedonian, see Bubon
Parsnep, see Pastinaca
Parsnep, the Cows, see Sphondylium
Parsnep, the Prickly-headed, see Echinophora
Parsnep, the Water, see Sium
Pasque Flower, see Pulsatilla
Passion Flower, see Passiflora
Pasture
Patience, see Rumex
Pea, see Pisum
Peach, see Persica
Peach, the Wolf's, see Lycopersicon
Pear-tree, see Pyrus
Peas, Earth Nut, } see Lathyrus
Peas, Everlasting, } see Lathyrus
Peas, the Heart, see Cardiospermum
Peas, the Pigeon, see Cytisus
Peas, the winged, see Lotus
Pedicle
Pellitory of the Wall, see Parietaria
Pellitory of Spain, see Anthemis
Pellitory, the Double, see Achillea
Penguin, see Karatas
Pennyroyal, see Pulegium
Pennywort, see Cotyledon
Pennywort, the Marsh, see Hydrocotyle
Peony, see Peonia
Pepper, the Jamaica, see Caryophyllus
Pepper, the Poor Man's, see Lepidium
Pepper, the Indian, see Capsicum
Pepper, the Wall, see Sedum
Pepper, the Water, see Persicaria
Pepper-mint, see Mentha
Pepperwort, see Lepidium
Perennial Plants
Periwinkle, see Vinca
Pestilencewort, see Petasites
St. Peter'swort, see Ascyrum and Hypericum
Petty-whin, see Ulex
Pheasant's Eye, see Adonis
Pheasant-eye Pink, see Dianthus
Physic Nut, see Iatropha
Pigeon Pea, see Cytisus
Pilewort, see Ranunculus
Pimento, or Jamaica Pepper, see Caryophyllus
Pimpernel, see Anagallis
Pimpernel, the Water, see Samolus
Pimpillo, see Opuntia
Pimpinel, see Pimpinella and Sanguisorba
Pineaster, see Pinus
Pine-apple, see Ananus
Pine, the Dwarf, see Teucrium
Pine-tree, see Pinus
Pine, the Wild, see Karatas
Pink, see Dianthus
Pipe-tree, see Syringa
Pipe, the Pudding, see Cassia
Piperidge-tree, see Berberis
Pishamin, or Persimon, see Diospyros
Pistacia
Pitch-tree, see Abies
Plane-tree, see Platanus
Plane-tree, the false, see Acer
Plant, see Planta
Plantain, } see Plantago
Plantain, the Buckshorn, } see Plantago
Plantain-tree, see Musa
Plantain Shot, see Canna
Planting
Planting reverse
Pliant-meally-tree, see Viburnum
Plowing
Plowman's Spikenard, see Conysa
Plum-tree, see Prunus
Plum, the American, } see Chrysobalanus
Plum, the Black, } see Chrysobalanus
Plum, the Hog, see Spondias
Plum, the Maiden, see Chrysobalanus
Plum, the India Date, see Diospyros
Poccoon, see Sanguinaria
Pockwood, see Guaiacum
Poets Rosemary, see Casia
Poison Ash, } see Toxicodendron
Poison Oak, } see Toxicodendron
Poison Bush, see Tithymalus
Poke, or Pork Physic, see Phytolacca
Poley-mountain, see Polium
Polyanthus, see Primula
Polypody, see Polypodium
Pomgranate, see Punica
Pondweed, see Potamogeiton
Poor Man's Pepper, see Lepidium
Poplar-tree, see Populus

Popy, see Papaver
Poppy, the Horned, see Chelidonium
Poppy, the Prickly, see Argemone
Poppy, the Spatling, see Cucubalus
Potatoes, see Lycoperficon
Potato, the Spanish, see Convolvulus
Prickly-pear, see Opuntia and Cactus
Prick Madam, see Sedum
Prick Timber, see Euonymus
Priest's Pintle, see Arum
Primrose, see Primula
Primrose-tree, } see Oenothera
Primrose, the Night, } see Oenothera
Privet, see Ligustrum
Privet, the Mock, see Phillyrea
Pruning
Pudding-grass, see Pulegium
Pudding Pipe-tree, see Casia
Pumkin, see Pepo
Purging-nut, see Iatropha
Purplewort, see Trifolium
Purslane, see Portulacca
Purslane, the Sea, see Atriplex and Chenopodium

Q.

QUaking Grass, see Gramen
Queen's Gilliflower, see Hesperis
Queen of the Meadow, see Spiræa
Quick, see Mespilus
Quickbeam, } see Sorbus
Quicken-tree, } see Sorbus
Quince-tree, see Cydonia
Quincunx

R.

RAdiated Flowers
Radish, see Raphanus
Radish, the Horse, see Cochlearia
Ragwort, see Othonna
Ragged Robin, see Lychnis
Rain
Rainbow
Rampion, see Campanula
Ramsons, see Allium
Rape, see Rapa
Rape, the Wild, see Sinapis
Rape, the Broom, see Orobanche
Raspberry, see Rubus
Rattle-grass, see Rhinanthus
Redwood, see Ceanothus
Reed, see Arundo
Reed, the Indian flowering, see Canna
Rest-harrow, see Ononis
Rhubarb, see Rheum
Rhubarb, the Monk's, see Rumex
Ribwort, see Plantago
Rice, see Oryza
Ripening of Fruit
Robin, Wake, see Arum
Rocket, see Eruca
Rocket, the Corn, see Bunias
Rocket, the Garden, see Hesperis
Rocket, the Winter, see Sisymbrium
Rock-rose, see Cistus
Roots
Rose-tree, see Rosa
Rose-bay, see Nerium
Rose-campion, see Agrostemma
Rose, the China, see Hibiscus
Rose-bay, the Mountain, see Kalmia
Rose, the Gelder, see Viburnum
Rose of Jericho, see Anastatica
Rose, the South Sea, see Nerium
Rose, the Rock, see Cistus
Rose-root, see Sempervivum
Rosemary, see Rosmarinus
Rue, see Ruta
Rue, Dog's, see Scrophularia
Rue, the Goat's, see Galega
Rue, the Meadow, see Thalictrum
Rue, the Wall, see Ruta muraria
Rue, the Syrian, see Peganum
Rupturewort, see Herniaria
Rush, see Juncus
Rush, the Flowering, see Butomus
Rye, see Secale
Rye-grass, see Gramen

S.

SAffron, see Crocus
Saffron, the Bastard, see Carthamus
Saffron, the Meadow, see Colchicum
Sage, see Salvia
Sage of Jerusalem, see Phlomis
Sage, the Indian Wild, see Lantana
Sage-tree, see Phlomis
Sage, the Wood, see Teucrium
Saintfoin, see Onobrychis
Salt
Saltwort, see Salicornia and Salsola
Sallow, see Salix
Salomon's Seal, see Convallaria
Samphire, see Crithmum
Sand
Sanicle, see Saxifraga
Sanicle, the Bear's-ear, see Cortusa
Sap
Sappadilla, see Chrysophyllum
Saracens Consound, see Solidago
Sassafras, see Laurus
Satin, the White, see Lunaria
Satyrium, see Orchis
Sauce-alone, see Erysimum
Savin, see Juniperus
Savin, the Indian, see Bauhinia
Savory, see Satureja
Saw-wort, see Serratula
Saxifrage, see Saxifraga
Saxifrage, the Burnet, see Pimpinella
Saxifrage, the Golden, see Chrysosplenium
Saxifrage, the Meadow, see Peucedanum
Scabious, see Scabiosa
Scarlet Lychnis, see Lychnis
Scarlet, Cardinal-flower, see Rapuntium
Scarlet Oak, see Quercus
Sciatica Cress, see Lepidium
Scorching Fennel, see Thapsia
Scorpion-grass, or Caterpillar, see Scorpiurus
Scorpion Senna, see Emerus
Scull-cap, see Scutellaria
Scurvy-grass, see Cochlearia
Sea-Buckthorn, see Hippophae
Sea-Cabbage, see Crambe
Sea-Colewort, see Convolvulus
Sea-Lavender, see Limonium
Sea-Pink, see Statice
Seeds
Segments
Self-heal, see Prunella
Seminary
Seminal Leaves
Sengreen, or Housleek, see Sedum and Sempervivum
Senna, the Bastard, see Cassia
Senna, the Bladder, see Colutea
Senna, the Jointed-podded, see Coronilla
Senna, the Scorpion, see Emerus
Sensitive Plant, see Mimosa
Sermountain, see Laserpitium
Serpent's Tongue, see Ophioglossum
Service-tree, see Sorbus
Service, the Wild, see Cratægus
Setwell, see Valeriana
Setter-wort, or Bear's-foot, see Helleborus
Shaddock, see Aurantium
Shave-grass, see Equisetum
Shepherd's-needle, see Scandix
Shepherd's-pouch, see Alyssum

Shepherd's Staff, see Dipsacus
Side-saddle Flower, see Sarracena
Silk-grass, see Aloe and Apocynum
Silk-grass of Virginia, see Periploca
Silver Bush, see Anthyllis
Silver Tree, see Protea
Silver Weed, see Potentilla
Skirret, see Sium
Slipper, the Lady's, see Cypripedium
Sloe-tree, see Prunus
Smallage, see Apium
Snail Trefoil, see Medicago
Snakeweed, see Bistorta
Snakeroot, see Aristolochia
Snakeroot, the Rattle, see Polygala
Snapdragon, see Antirrhinum
Snapdragon of America, see Ruellia
Snap-tree, see Justicia
Sneezewort, see Achillea
Snowdrop, see Galanthus
Sumach, the Myrtle-leaved, see Coriaria
Soldanel, see Soldanella
Soldier, the fresh Water, see Stratiotes
Solstice
Sopeberry, see Sapindus
Sopewort, see Saponaria
Sorrel, see Acetosa
Sorrel, the Indian, see Hibiscus
Sorrel, the Wood, see Oxalis
Southernwood, see Abrotanum
Sourfop, see Annona
Sowbread, see Cyclamen
Sow-thistle, see Sonchus
Spanish Nut, see Sisyrinchium
Spanish Arbor-vine, see Convolvulus
Spanish Elder, see Saururus
Spanish Rosemary, see Passerina
Spanish Broom, see Genista and Spartium
Spanish Picktooth, see Daucus
Spanish Marjoram, see Urtica
Sparrowgrass, see Asparagus
Spatling Poppy, see Cucubalus
Spear, the King's, see Asphodelus
Spearwort, see Ranunculus
Spear-mint, see Mentha
Spearage, see Asparagus
Speedwell, see Veronica
Spiderwort, see Phalangium, Anthericum, and Ephemerum
Spignel, see Athamanta
Spike Lavender, see Lavendula
Spinach, see Spinacia
Spindle-tree, see Euonymus
Spindle-tree, the African, see Celastrus
Spleenwort, see Asplenium
Spleenwort, the Rough, see Lonchitis
Spoonwort, see Cochlearia
Spurge Laurel, see Daphne
Spurge Olive, see Cneorum
Spurry, see Arenaria
Squashes, see Cucurbita
Squill, see Scilla
Stagshorn-tree, see Rhus
Stamina
Star-apple, see Chrysophyllum
Star of Bethlehem, } see Ornithogalum
Star Hyacinth, } see Ornithogalum
Star of Naples, } see Ornithogalum
Star Thistle, see Centaurea
Starwort, see After
Starwort, the Yellow, see Inula
Statues
Stellate Plants
Stickadore, see Stœchas
Stock-gilliflower, see Cheiranthus
Stock-gilliflower, the Dwarf, see Hesperis
Stone-break, see Alchemilla
Stone-crop, see Sedum
Stone-crop-tree, see Chenopodium
Storax-tree, see Styrax
Storax, the Liquid, see Liquidamber
Stove
Strawberry, see Fragaria
Strawberry Blite, } see Blitum
Strawberry Spinach, } see Blitum
Strawberry-tree, see Arbutus
Style, see Stylus
Succory, see Cichorium
Succory, the Gum, see Chondrilla
Sugar-cane, see Saccharum
Sugar-maple, see Acer
Sulphur-wort, see Peucedanum
Sultan-flower, see Centaurea
Sumach, } see Rhus
Sumach, the Tanners, } see Rhus
Sumach, the Venetian, } see Rhus
Snowdrop Tree, see Chionanthus
Summit of Flowers
Sun
Sun-dew, see Drosera
Sun-flower, see Helianthus
Sun-flower, the Dwarf, see Rudbeckia
Sun-flower, the Willow-leaved, see Helenium
Sun-spurge, see Euphorbia
Swallow-wort, see Asclepias
Sweet-apple, see Annona
Sweet Johns, } see Dianthus
Sweet William, } see Dianthus
Sweet William of Barbadoes, see Ipomoea
Sweet Willow, see Myrica
Swines Cress, see Cochlearia
Sycamore, } see Acer
Sycamore, the false, } see Acer

## T.

Tamarind, see Tamarindus
Tamarisk, see Tamarix
Tan
Tansey, see Tanacetum
Tansey, the Wild, see Potentilla
Tare, see Vicia
Tarragon, see Abrotanum
Tea, the South Sea, see Cassine
Teasel, see Dipsacus
Thermometer
Thistle, see Carduus
Thistle, the Blessed, see Centaurea
Thistle, the Carline, see Carlina
Thistle, the Distaff, } see Atractylis
Thistle, the Fish, } see Atractylis
Thistle, the Fuller's, see Dipsacus
Thistle, the Globe, see Echinops
Thistle, the Ladies, see Carduus
Thistle, the Melon, see Cactus
Thistle, the Melancholy, see Cirsium
Thistle, the Milk, see Carduus
Thistle, the Sow, see Sonchus
Thistle, the Star, see Centaurea
Thistle, the Torch, see Cactus
Thorn-apple, see Datura
Thorn, the Black, see Prunus
Thorn, the Box, see Lycium
Thorn, Christ's, see Paliurus
Thorn, Cockspur, see Mespilus
Thorn, the Egyptian, see Acacia
Thorn, the Evergreen, } see Mespilus
Thorn, the Glastenbury, } see Mespilus
Thorn, the Goat's, see Tragacantha
Thorn, the Haw, see Mespilus
Thorn, the Purging, see Rhamnus
Thorn, the White, see Mespilus
Thorough-wax, see Bupleurum
Three-leaved Grass, see Trifolium
Thrift, see Statice
Throatwort, see Trachelium and Campanula
Thunder
Thyme, } see Thymus
Thyme, the Lemon } see Thymus
Thyme, the Mastich, see Satureja

Toad-flax, fee Linaria
Tobacco, fee Nicotiana
Tooth-pick, fee Daucus
Tooth-wort, fee Dentaria
Tormentil, fee Tormentilla
Touch-me-not, fee Impatiens
Tower Muftard, fee Turritis
Traces, Lady's, fee Orchis
Traveller's Joy, fee Clematis
Trefoil, fee Trifolium
Trefoil, the Bean, fee Cytifus
Trefoil, the Bird's-foot, fee Lotus
Trefoil, the Marfh, fee Menianthes
Trefoil, the Moon, fee Medica
Trefoil-fhrub, fee Dorycnium and Ptelea
Trefoil, the Snail, fee Medicago
Trefoil, the Star-headed, } fee Trifolium
Trefoil, the Strawberry-headed, } fee Trifolium
Treacle Muftard, fee Thlafpi and Iberis
Tree, the Cork, fee Quercus
Tree, the Chafte, fee Vitex
Tree Germander, fee Teucrium
Tree, the Indian God, fee Ficus
Tree, the White-leaf, or Meally, fee Viburnum
Tree of Life, fee Thuya
True-love, fee Paris
Trumpet Flower, fee Bignonia
Trumpet Honeyfuckle, fee Periclymenum
Tuberofe, fee Polianthes
Tuberofe Roots
Tulip, fee Tulipa
Tulip, the African, fee Hæmanthus
Tulip-tree, fee Tulipifera
Tulip-tree, the Laurel-leaved, fee Magnolia
Turnhoof, or Ground Ivy, fee Glechoma
Turbith, fee Thapfia
Turks-cap, fee Lilium
Turks-head, fee Cactus
Turky Baulm, fee Dracocephalon
Turky Wheat, fee Zea
Turnep, } fee Rapa
Turnep, the French, } fee Rapa
Turnep Cabbage, fee Braffica
Turnfol, fee Heliotropium and Helianthus
Turpentine-tree, fee Piftacia
Turpentine, the Venice, fee Larix
Tutfan, fee Hypericum
Twyblade, fee Ophrys

V.

Valerian, fee Valeriana
Valerian, the Greek, fee Polemonium
Vapour
Vafes
Vegetable
Vegetation
Venus Comb, fee Scandix
Venus Looking-glafs, fee Campanula
Venus Navelwort, fee Cynogloffum
Verge
Vervain, fee Verbena
Vervain Mallow, fee Alcea
Vetch, fee Vicia
Vetch, the Bitter, fee Orobus
Vetch, the Chichling, } fee Lathyrus
Vetch, the Crimfon-grafs, } fee Lathyrus
Vetch, the Hatchet, fee Securidaca
Vetch, the Horfe-fhoe, fee Hippocrepis
Vetch, the Kidney, fee Vulneraria
Vetch, the Liquorice, fee Glycine
Vetch, the Medick, fee Aftragalus
Vetchling, fee Lathyrus
Vine, fee Vitis
Vine, the Black, fee Tamus
Vine, the Spanifh Arbor, fee Convolvulus
Vine, the White, fee Bryonia
Violet, fee Viola
Violet, the Dame's or Queen's, fee Hefperis
Violet, the bulbous, fee Galanthus
Violet, the Dog's Tooth, fee Erythronium
Violet, the Corn or Venus Looking-glafs, fee Campanula
Viper's Buglofs, fee Echium
Viper's Grafs, fee Scorzonera
Virgin's Bower, fee Clematis
Virginian Silk, fee Periploca
Virginian Acacia, fee Robinia

W.

Wake Robin, fee Arum
Walks
Walls
Wallflower, fee Cheiranthus
Wallwort, or Dwarf Elder, fee Sambucus
Walnut, fee Juglans
Wartwort, fee Euphorbia
Water
Water Calaminth, fee Mentha
Water Crefs, fee Sifymbrium
Water Dropwort, fee Oenanthe
Water Germander, fee Teucrium
Water Hemp Agrimony, fee Bidens
Water Horehound, fee Lycopus
Water Lily, fee Nymphæa
Water Parfnep, fee Sium
Water Pepper, fee Perficaria
Way-faring-tree, fee Viburnum
Weather
Weeds
Weed, the Dyers, } fee Refeda
Weld, or Would, } fee Refeda
Wheat, fee Triticum
Wheat, the Cow, fee Melampyrum
Wheat, the French, fee Helxine
Wheat the Indian, fee Zea
Whicken, or Quickbeam, fee Sorbus
Whins, or Gorfe, fee Ulex
Whortleberry, fee Vaccinium
Widow-wail, fee Cneorum
Wildernefs
Willow-tree, fee Salix
Willow, the Dutch, or Sweet, fee Myrica
Willow, the French, fee Epilobium
Willow Herb, fee Lythrum
William, fweet, fee Dianthus
Wind
Wind Flower, fee Anemone
Wind Seed, fee Arctotis
Wine
Winter Aconite, fee Helleborus
Winter Cherry, fee Phyfalis and Solanum
Winter Crefs, fee Sifymbrium
Winter Green, fee Pyrola
Witch Hazle, fee Ulmus and Hamamelis
Woad, fee Ifatis
Wolffbane, fee Aconitum
Woodbine, fee Periclymenum
Woodroof, fee Afperula
Wood Sage, fee Teucrium
Wood Sorrel, fee Oxalis
Woody Nightfhade, fee Solanum
Wormwood, fee Abfinthium
Woundwort, fee Vulneraria
Woundwort, fee Solidago
Woundwort of Achilles, fee Achillea

Y.

YARROW, fee Achillea
Yarrow, the Water, fee Hottonia

A CATA-

## *A* CATALOGUE *of such hardy deciduous Trees and Shrubs as will thrive in the open Air in* England *without Shelter.*

In this Catalogue we have only given the generical title of each tree or ſhrub, and added the numbers as they are marked in the body of the work to the ſeveral ſpecies, ſo that they may be readily turned to. To the Latin titles are added the common Engliſh names, which may anſwer the expectations of our readers full as well as if they were inſerted at length to each ſpecies.

We have alſo reduced them into one liſt, and not diſpoſed them in ſeveral, according to their different growths, as they were in the former editions of the *Gardeners Dictionary*, but have marked them with the following letters, A B C D. Thoſe marked A are ſuch as grow more than forty feet high; thoſe marked B are ſuch as grow from twenty to forty feet; thoſe marked C riſe from ten to twenty-five; and ſuch as are marked D are ſhrubs of lower growth. To ſuch as produce flowers for ornament or ſcent, and are worthy of the pleaſure-garden, is added the letter F, whereby every perſon will be capable of ſelecting ſuch trees and ſhrubs as are proper for their different purpoſes.

It is not propoſed to inſert in this liſt any of the underſhrubs, which are of ſhort duration, ſuch as Southernwood, Roſemary, Lavender, Lavender-cotton, &c. becauſe, whenever theſe decay, they occaſion gaps in the plantation.

ACER, 1. Sycamore, A
Acer, 2. Maple, C
Acer, 3. Aſh-leaved Maple, A
Acer, 4. Norway Maple, B
Acer, 5. Flowering Maple, C F
Acer, 6. Sugar Maple, B
Acer, 7. Mountain Maple, C
Acer, 8. Italian Maple, A
Acer, 9. Montpelier Maple, C
Acer, 10. Eaſtern Maple, C
Acer, 11. Oval-leaved Maple, D
Æſculus, Horſe Cheſtnut, A F
Alnus, 1. Common Alder, B
Alnus, 2. Long-leaved Alder, B
Alnus, 3. Dwarf Alder, D
Amorpha, Baſtard Indigo, D F
Amygdalus, 1. Almond-tree, C F
Amygdalus, 5. Dwarf Almond, D F
Andromeda, 2, 3, 5. D
Annona, 8. Papaw, C
Aralia, 3. Angelica-tree, D

B.

Baſteria, Allſpice, D F
Berberis, 1. Barberry, D
Betula, 1. Birch-tree, B
Bignonia, 3. Catalpa, C F

C.

Carpinus, 1. Hornbeam, A
Carpinus, 2, 3, 4. Hop Hornbeam, C
Caſſine, 1. Caſſioberry Buſh, D
Caſtanea, 1. Cheſtnut, A
Caſtanea, 2. Chinquapin, D
Ceanothus, 1. Jerſey Tea, D F
Celtis, 1, 2. Nettle-tree, B
Celtis, 3, 4. C
Cephalanthus, Button-tree, D
Ceraſus, Double-flowering Cherry, C F
Ceraſus, 4. Perfumed Cherry, D
Ceraſus, 5. Dwarf Cherry, D F
Cercis, 1, 2. Judas-tree, C F
Chionanthus, Snowdrop-tree, C F
Clethra, D F
Colutea, 1. Bladder Sena, C F
Colutea, 2, 3. Bladder Sena, D F
Coriaria, Myrtle-leaved Sumach, D
Cornus, 1, 2, 3, 4, 5, 6. Dogwood, C
Cornus, 7. D
Corylus, 1, 2, 3. Nut-tree, C
Cratægus, 1, 2. B
Cratægus, 3, 4. D
Cupreſſus, 4. American deciduous Cypreſs, A
Cydonia, Quince-tree, C
Cytiſus, 1, 2. Laburnum, B F
Cytiſus, 3, 5, 12. D F

D.

Daphne, 2, 5, 7, 8. Mezereon, D F
Diervilla, D
Dioſpyrus, 1, 2. Date Plum, C

E.

Elæagnus, 1, 2. Wild Olive, C
Emerus, 1, 2. Scorpion Sena, D F
Euonymus, 1, 2. Spindle-tree, C

F.

Fagus, Beech-tree, A
Frangula, 1, 2. Berry-bearing Alder, D
Fraxinus, 1, 4. Aſh-tree, A
Fraxinus, 2, 3, 5, 6. Aſh, B

G.

Gleditſia, 1, 2. Three-thorned Acacia, C

H.

Hamamelis, Witch Hazel, D
Hibiſcus, 1. Althæa Frutex, D F
Hippophae, 1, 2. Sea Buckthorn, C
Hydrangea, D
Hypericum, 3, 4, 6. St. John's Wort, D F

I.

Johnſonia, D
Itea, D F
Juglans, 1, 2, 3. Walnut, A
Juglans, 4, 5, 6. Hickery Nut, B

L.

Larix, 1. Larch-tree, A
Laurus, 6, 7, 8. C
Liguſtrum, 1 Privet, C
Liquid Amber, 1, 2. B
Lonicera, 1, 2, 3, 4, 5, 6, 7. Upright Honeyſuckle, C F

M.

Magnolia, 1. Sweet Bay, C F 3, 4. B F
Meſpilus, 3, 4, 5, 7, 8, 9, 10, 12, 13, 14, 15, 16. Medlar, B F
Meſpilus, 17, 18, 19, 20, 21, 22. C F

Morus,

Morus, 6. Mulberry, B
Myrica, 1, 2, 3, 4. Candleberry, C

O.

Ononis, 5. Rest-harrow, C F
Orobus, 10. Caragana, C F

P.

Padus, 1. Bird Cherry, C F 2, 3. B F
Paliurus, Christ's Thorn, C
Pavia, Scarlet Horse-Chestnut, C F
Periclymenum, 5, 6, 7. Honeysuckle, C F
Persica, 1. Peach, B F 2, 3. C F
Philadelphus, 1, 2, 3. Syringa, C F
Pistacia, 1, 4. C
Platanus, 1, 2. Plane-tree, A
Populus, 1, 2, 3, 4, 5, 6. Poplar, A
Prinos, 1, 2. C
Ptelea, 1. Trefoil Shrub, C

Q.

Quercus, 1, 2, 5, 9, 13. Oak, A
Quercus, 7, 8, 11, 12, 14, 15. B

R.

Rhamnus, 1, 2, 3. Buckthorn, C
Rhododendron, 1, 2. Rose-laurel, C
Rhus, 1, 2, 3, 4, 5, 6. Sumach, C F
Robinia, 1, 2. A F 3, 10. Acacia, C F
Rosa, all the sorts, Rose, D F
Rubus, 5, 6. Bramble, C F

S.

Salix, 1, 2, 3. A 5, 6, 7, 8, 9, 10, 11. Sallow, B
Sambucus, 1. B 2, 3. Elder, C
Sorbus, 1, 2. Service, B
Spartium, 1, 2, 3. Broom, C F
Spiræa, 1, 2, 3, 6, 7, 8. C F
Staphylæa, 1, 2. Bladder-nut, C
Stewartia, C F
Syringa, 1. Lilac, B 2, 3. C F

T.

Tacamahacca, B
Tamarix, 1. Tamarisk, B 2. C
Tilia, 1, 2. Lime-tree, A 3, 4. B
Toxicodendron, 2, 3, 4, 5. Poison Oak, C
Tulipifera, Tulip-tree, A F

V.

Viburnum, 1, 2, 3, 4. Way-faring-tree, C F
Vitex, 1, 2. Chaste-tree, C
Ulmus, 1, 2, 3, 4. Elm, A 5. B

## *A List of climbing shrubby plants, whose branches must be supported to prevent their trailing upon the ground, and which should be fastened to walls, pales, or trellisses.*

Bignonia, 1, 2, 5, 6, 8. Trumpet-flower.
Ceanothus, 2.
Clematis, 4, 5, 6, 7, 8, 9, 10, 11, 12. Traveller's Joy.
Glycine, 2. Kidney-bean-tree.
Hedera, 1. Ivy.
Jasminum, 1. Jasmine.
Lycium, 6, 7. Boxthorn.
Menispermum, 1, 2, 3. Moonseed.
Mespilus, 6. Medlar.
Passiflora, 2. Passion-flower.
Periclymenum, 1, 2, 5, 6, 7, 8. Honeysuckle.
Periploca, 1. Virginia Silk.
Rosa, 8, 9. Rose
Smilax, 1, 2, 3, 4, 9, 11. Rough Bindweed.
Solanum, 8. Nightshade.
Toxicodendron, 2, 6. Poison Oak.
Vitis, 1, 5. Vine.

## *A Catalogue of hardy evergreen trees and shrubs.*

Those marked with A are such as grow more than forty feet high; those with B are such as grow from twenty to forty feet high; those with C grow from ten to twenty feet; and those marked with D are low shrubs.

Abies, 1, 2, 3, 4, 5. Fir-tree, A 6, 7, 8, 9. B
Alaternus, 1, 2, 3, 4. C
Arbutus, 1, 2. Strawberry, C
Bupleurum, 6. Hare's-ear, D
Buxus, 1, 2. Box, C 3. D
Celastrus, 1. Staff-tree, D
Cistus, 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16. Rock-rose, D
Cneorum, Widow-wail, D
Cupressus, 1, 2. Cypress, B 3. C 5. D
Cytisus, 6. Trefoil-tree, D
Daphne, 1, 4. Mezereon, D
Euonymus, 3. Spindle-tree, D
Hedera, Ivy, D
Hypericum, 3, 4, 6. St. John's-wort, D
Ilex, 1. Holly, B 2, 3. C
Juniperus, 1, 10, 11. Juniper, D 2, 3, 4, 5, 6. C 7, 8, 12, 13. B
Kalmia, 1, 2, 3. Rose-laurel, D
Larix, 3. Cedar of Libanus, A
Laurus, 1, 2. Bay-tree, B
Ligustrum, 2. Privet, C
Magnolia, 2. Laurel-leaved Tulip-tree, C
Medica, 8. Moon Trefoil, D
Mespilus 6. Pyracantha, C
Padus, 4, 5, 6. Laurel, C
Periclymenum, 1, 8. Honeysuckle, D
Phillyrea, 1, 2, 3. C 4, 5, 6, 7. D
Pinus, 1, 3, 5, 10, 13. Pine-tree, A 2, 4, 6, 7, 11. B 8, 9, 14. C
Quercus, 3, 16. Oak, A 17, 20. B 19. C 18
Rosa, 8, 9. Rose, D
Taxus, Yew, B
Thuya, 1, 2. Tree of Life, C
Viburnum, 5, 6. Laurus Tinus, D

## *A Catalogue of hardy perennial plants, which will thrive in the open borders without any shelter, whose roots do not require to be every year taken out of the ground; these are such as have ornamental flowers, and are proper furniture for the flower-garden.*

Aconitum, 1, 2, 3, 4, 5, 7, 8, 9, 10. Wolfsbane.
Adonis, 3. Pheasant-eye
Anthemis, 16, 17. Camomile.
Anthericum, 1, 3. Spiderwort.
Antirrhinum, 3, 4, 5. Snapdragon.
Apocynum, 3. Dogsbane
Aquilegia, 1, 2, 3, 4. Columbine.
Asclepias, 6, 9, 10. 11. Swallow-wort.
Asphodelus, 1, 2, 3, 4. King's-spear.
After, 1, 2, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29. Starwort.
Bellis, 3. Daisy.
Chelone, 1, 2, 3.
Coreopsis, 4. Tickseed.
Cylamen, 1, 2. Sowbread.
Delphinium, 5, 6, 7, 9. Larkspur.
Dianthus, 1, 4. Gilliflower.
Dictamnus, Fraxinella.
Eryngium, 4, 5, 6. Sea Holly.
Fumaria, 3, 7, 8. Fumitory.
Gentiana, 1, 2, 4. Gentian

Helianthus, 2. Sunflower.
Helleborus, 3, 4, 5, 6. Hellebore.
Hemerocallis, 1, 2, 4. Day Lily.
Hesperis, 1, 2, 4. Rocket, or Dame's Violet.
Hibiscus, 18. Indian Mallow.
Hieracium, 3. Hawkweed.
Iberis, 2. Candy Tuft.
Inula, 3, 6, 10. Yellow Starwort
Iris, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 16, 17, 18, 19. Flower-de-luce.
Ixia, 1.
Lathyrus, 15, 16. Everlasting Pea.
Lupinus, 6. Lupine.
Lychnis, 1, 2, 3, 4, 5. with double flowers.
Meadia.
Monarda, 1, 2. Oswego Tea.
Ononis, 6, 15. Rest-harrow
Orobus, 4, 7, 8. Bitter Vetch.
Pœonia, all the varieties, Piony.
Papaver, 7. Poppy.
Phlox, 2, 3, 4, 5, 6, 7. Lychnidea.
Pulmonaria, 3, 6. Lungwort.
Pulsatilla, all the species. Pasque-flower.
Rudbeckia, 1, 2, 4, 5, 6. Dwarf Sunflower.
Solidago, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31. Golden Rod.
Thalictrum, 3, 5. Feather'd Columbine.
Trachelium. Throatwort.
Trollius, 1, 2. Goldylocks.
Veratrum, 1, 2, 3, 4. White Hellebore.
Verbascum, 10. Mullein.
Veronica, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14. Speedwell.

*A List of such plants as will thrive under the shade of deciduous trees, therefore are proper furniture for wilderness quarters.*

Acanthus, 1, 2, 3, 4, 5. Bear's-breech.
Aconitum, 6. Wolfsbane.
Actæa, 1, 2, 3. Herb Christopher.
Anemone, 1, 2, 3. Anemony.
Aralia, 1, 2.
Convallaria, all the species, Lily of the Valley.
Geum, 1, 2, 3, 4, 5. London Pride.
Hemerocallis, 3. St. Bruno's Lily.
Hypericum, 7. St. John's Wort.
Primula, all the varieties, Primrose.
Vinca, 1, 2. Periwincle.
Viola, 1, 2. with their varieties, Violet.

*A Catalogue of plants, which are too tender to live abroad in winter in England, but require no artificial heat; these are commonly called green-house plants; but those whose leaves and stalks are succulent, will succeed better if they are kept in a dry airy glass-case in winter, where they may enjoy the sun and air at all times when the weather is mild.*

Agave, 1, 2, 7. Aloe.
Aizoon, 1. Evergreen.
Aloe, 1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21. Aloe.
Anthericum, 4, 5, 6, 7, 8, 9. Spider-wort.
Antholyza, 1, 2.
Anthospermum.
Anthyllis, 6, 7. Jupiter's Beard.
Arctotis, 2, 3, 4, 5, 6, 7, 8. Wind-seed.
Aristolochia, 4, 5. Birthwort.
Asclepias, 12, 13, 14, 15. Swallow-wort.
Asparagus, 5, 6, 7, 8, 9, 10. Asparagus.
Asphodelus, 6. King's Spear.
Aster, 31, 32, 37. Starwort.
Aurantium, 1, 2, 3, 4, 5. Orange.
Baccharis, 1. Ploughman's Spikenard.
Bignonia, 5, 12. Trumpet-flower.
Bosia.
Brabejum.
Bubon, 3, 4. Macedonian Parsley.
Buphthalmum, 7, 10, 11, 12. Ox-eye.
Bupleurum, 7. Hare's-ear.
Cacalia, 5, 6, 7, 8. Foreign Colt's-foot.
Calendula, 7, 8. Marigold.
Calla, Arum.
Campanula, 14, 15. Bell-flower.
Capparis, 1, 2. Caper.
Celastrus, 3, 4. Staff-tree.
Ceratonia, St. John's Bread.
Cereus, 11. Torch-thistle.
Chironia, 1, 2.
Chrysocoma, 3, 4. Goldylocks.
Cistus, 10, 11, 17, 18. Rock Rose.
Cliffortia, 1, 2, 3.
Clutia, 1, 2, 3.
Convolvulus, 16, 22, 27. Bindweed.
Coronilla, 1, 2. Jointed podded Colutea.
Cotyledon, 4, 5, 6, 7, 8, 9. Navel-wort.
Crassula, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.
Cunonia.
Cupressus, 6. Cypress.
Cyclamen, 3, 4, 5, 6. Sowbread.
Cytisus, 4, 14, 15. Tree Trefoil.
Diosma, 1, 2, 3, 4.
Ebenus, Ebony.
Euphorbia, 6, 7, 10, 12, 13, 16.
Ferraria.
Galenia.
Geranium, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 43. Cranesbill.
Gnaphalium, 10, 16, 18, 20, 21. Cudweed.
Grewia, 1, 2.
Guajacum, 3.
Halleria.
Heliotropium, 4, 5, 6. Heliotrope.
Hermannia, all the species.
Hypericum, 8. St. John's Wort.
Jasminum, 5, 6. Jasmine.
Iberis, 1. Candy-tuft.
Inula, 12. Yellow Starwort.
Justicia, 4.
Ixia, 2, 3, 4, 5, 6, 7, 8.
Kiggelaria.
Laurus, 3, 4, 5, 9. Bay.
Leonurus, 1, 2. Lion's-tail.
Limon, all the varieties, Lemon.
Lotus, 5, 16. Bird's-foot Trefoil.
Lycium, 1, 2, 3, 4, 7, 8, 9, 10. Boxthorn.
Malva, 14. Mallow.
Medeola, 1, 2, 3.
Melia, 1, 2. Bead-tree.
Mesembryanthemum, all the species, Ficoides.
Myrica, 5, 6, 7. Candleberry Myrtle.
Myrtus, 1, 2, 3, 4, 5, 6, 7. Myrtle.
Nerium, 1, 2, 3. Oleander.
Olea, 1, 2, 3, 4, 5. Olive.
Ononis, 4. Rest-harrow.
Opuntia, 1. Indian Fig.
Osteospermum, 2, 3, 4, 5. Hard-seeded Sunflower.
Othonna, 3, 4, 5, 7, 8, 9. Jacobæa.
Oxalis, 4, 5, 6. Wood-sorrel.
Palma, 1, 8. Palm.
Passerina, 1, 2, 3, 4.
Periploca, 2, 7. Virginia Silk.
Phylica, 1, 2.
Phyllis.
Physalis, 2, 3, 4. Winter Cherry.
Pistacia, 3, 4, 5.
Poterium, 3.
Protea, all the species, Silver-tree.
Psoralea, 1, 10.
Rhus, 8, 9, 10, 11, 12. Sumach.
Royena, 1, 2, 3.
Ruscus, 7. Butcher's Broom.
Salvia, 10, 11, 12. Sage.
Scabiosa, 17, 18. Scabious.
Schinus, 1. Indian Mastich.
Sclarea, 15, 16. Clary.
Selago.
Sempervivum, 5, 6, 7. Houseleek.
Sideroxylum, 1, 2. Iron-wood.
Smilax, 15, 16. Rough Bindweed.
Solanum, 9, 11, 12, 13, 14, 25, 26, 28. Nightshade.
Spartium, 4, 10. Broom.
Stapelia, 1, 2.
Tarconanthus.
Tetragonia, 1, 2, 3.
Teucrium, 3, 4. Germander.
Vitex, 3. Chaste-tree.
Wackendorfia.
Watsonia.

# *A* CATALOGUE *of plants, which will not thrive in this country without artificial heat in winter.*

Those marked A, should be placed in the bark-stove; and those marked B, will succeed in a moderate warmth.

ACACIA, 1, 2, 3, 4, 11, 22. B 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21. Egyptian Thorn, A
Achyranthes, 1, 2, 3, 4. B
Adansonia, A
Adenanthera, A
Æschynomene, 1, 3, 4. Sensitive Plant, A
Agave, 3, 4, 5, 6, 8. Aloe, B
Aloe, 2, 7, 22, 24. B
Alpinia, A
Amaryllis, 5, 7, 8, 11. Lily Daffodil, B
Amomum, 1, 2, 3. Ginger, A
Anacardium, Cashew-nut, A
Ananas, Pine-apple, A
Andrachne, 1, 2, 3. A
Apocynum, 4, 5, 6, 7, 8, 9, 10, 11. Dogsbane, B
Aristolochia, 8, 9, 10, 11, 12, 13. Birthwort, B.
Arum, 10, 11, 13, 14, 15, 16, 17, 18, 19. Wake-robin, A
Arundo, 4, 5. Reed, A
Asclepias, 17, 18, 19, 20. Swallow-wort, B
Banisteria, 1, 2, 3, 4, 5, 6, 7. A
Barleria, 1, 2, 3. A. 4. B
Bartramia, A
Bauhinia, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. A
Besleria, 1, 2, 3. A
Bignonia, 4, 9, 10, 11, 13, 14, 15. Trumpet-flower, A.
Bixa, A
Bocconia, A
Bombax, 1, 2. Cotton, A
Bontia, Wild Olive, B
Breynia, 1, 2. A
Brunsfelsia, A
Buddleja, 1, 2. A
Cacao, Cocoa, A
Cactus, 1, 2, 3, 4. Melon Thistle, A. 5, 6. B
Cæsalpinia, 1, 2. A
Cameraria, 1, 2. A
Canna, 2, 3, 4, 5. Flowering-reed, B
Capparis, 3, 4, 5, 6, 7, 8, 9, 10. Caper, B
Capsicum, 7, 8, 9, 10. Guinea Pepper, B
Carica, 1, 2. Papaw, A
Caryophyllus, 1. Cloves, A. 2, 3, 4, 5. B
Cassia, 2, 3, 4, 8, 10, 11, 13, 17. A
Catesbæa, A
Cedrus, 1, 2, 3. Mahogany, B
Celastrus, 5. Staff-tree, B
Cerbera, 1, 2, 3. A
Cereus, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Torch-thistle, B
Cestrum, 1, 2, 3, 4, 5, 6. B
Chamærops, 1, 2. B
Chrysobalanus, 1, 2. A
Chrysophyllum, 1, 2. A
Citharexylon, 1, 2. Fiddle-wood, B
Clusia, 1, 2. A
Clutia, 4. B
Coccolobus, Sea-side Grape, A
Coffee, Coffee, A
Colococcus, A
Columnia, A
Colutea, 5. Bladder Sena, B
Commelina, 3. B
Conocarpus, 1, 2. Buttonwood, B
Convolvulus, 14, 19, 31, 32. Bindweed, A
Conyza, 5, 7, 9, 11, 12, 13. Fleabane, B
Copaiba, A
Cordia, A
Cornutia, A
Coronilla, 7. A
Costus, A
Cotyledon, 10. Navelwort, B
Crateva, 1, 2. A
Crescentia, 1, 2. A
Crinum, 1, 2, 3, 4. Lily Hyacinth, B
Croton, 6, 7, 8, 9, 12. A
Curcuma, 1, 2. A
Cynanchum, 4, 6. B
Cytisus, 16. Base Trefoil, B
Datura, 7. Thorn-apple, B
Douglassia, A
Dracontium, 2, 3, 4, 5. Dragon, A
Durantia, 1, 2, 3. A
Elæagnus, 3. B
Ellissea, B
Emerus, 3. B
Eretia, A
Eryngium, 10. Sea-holly, A
Erythrina, 1, 2, 3, 4, 5, 6. Coral-tree, B
Euonymus, 4. Spindle-tree, B
Eupatorium, 6, 10, 11, 14. B
Euphorbia, 1, 2, 3, 4, 5, 8, 9, 14, 15, 17. Spurge, B
Fuchsia, B
Garcinia, Mangosteen, A
Gesnera, 1, 2. A
Gnaphalium, 17, 24. Cudweed, B
Gossipium, 3, 4. Cotton-tree, A
Guajacum, 1, 2. Lignum Vitæ, A
Guilandina, 1, 2, 4. A
Hæmanthus, 1, 2. Blood-flower, B
Hæmatoxylum, Logwood, A
Hedysarum, 6, 7, 8, 16, 18. B
Helicteres, 1, 2, 3. Screw-tree, A
Heliotropium, 8, 9, 11. Turnsole, B
Hernandia, Jack-in-a-Box, A
Hibiscus, 5, 6, 7, 13, 23. Marsh-mallow, B
Hippocratea, A
Hippomane, 1, 2, 3. Mançaneel, A
Jasminum, 7. Jasmine, A
Iatropha, 1, 2, 3, 4, 5, 6, 7, 8. A
Inga, 1, 2. A
Justicia, 1, 3, 6, 7, 8. A. 5. B
Karatas, Penguin, A
Kæmpifera, A
Lantana, all the species, Viburnum, B
Laurus, 10. Bay, B
Lawsonia, 1, 2. B
Lippia, B
Loranthus, B
Malpighia, all the species, American Cherry, B
Mammea, A
Maranta, 1, 2. Arrow-root, B
Melastoma, all the species, B
Mimosa, 4, 5, 6, 7, 8, 9. A
Muntingia, 1, 2, 3. B
Musa, 1, 2. Plantain-tree, A
Myrtus, 8, 9. Myrtle, B
Nyctanthes, 1, 2. Arabian Jasmine, A
Opuntia, 2, 3, 4, 5, 6, 7, 8. Indian Fig, B. 9. A
Orobus, 11, 12. Bitter Vetch, B
Oxalis, 7. Wood-sorrel, B
Palma, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14. Palm-tree, A. 19. B
Pancratium, 3, 4, 5, 6, 7, 8, 9. Sea-Daffodil, A
Parkinsonia, Jerusalem Thorn, B
Passiflora, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19. Passion-flower, A
Paullinia, all the species, B
Pereskia, B
Periclymenum, 2, 3, 4. Honey-suckle, A
Periploca, 3, 4, 5, 6. Indian Silk, B
Persea, Avocado Pear, B
Petrea, A
Phyllanthus, B
Physalis, 6, 9. Winter-cherry, B
Piercea, 1, 2. B
Piper, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14. A
Pisonia, Fingrigo, B
Pistacia, 7, 8, Pistacia-nut, A. 9. B
Plumbago, 2. Leadwort, B
Plumeria, 1, 2, 3, 4, 5. B
Poinçiana, Flower-fence, A
Psoralea, 3, 6, 8. B
Ptelea, 2. Trefoil Shrub, B
Randia, A
Rhus, 14. Sumach, B
Rivinia, 1, 2. Currants, A
Robinia, 4, 5, 6, 7, 8, 9. False Acacia, B
Rondeletia, 1, 2. A
Ruellia, 1, 2, 3, 4. Snap-grass, A
Saccharum, Sugar-cane, A
Samida, 1, 2. B
Sapindus, Sopeberry, B
Sapota, 1, 2. A
Schinus, 2. Indian Mastich, A
Sicyos, 3. A
Sisyrinchium, 3. Earth-nut, A
Smilax, 12, 13, 14. Rough Bindweed, B
Solanum, 10, 17, 18, 19, 20, 21, 22, 23, 24, 27, 29, 30, 31, 32, 33. Nightshade, B
Sophora, 2. A
Spartium, 11. Broom, B
Suriana, A
Tabernemontana, 1, 2. A
Tamarindus, Tamarind-tree, A
Tetracera, A
Teucrium, 18, 19. Germander, B
Theobroma, Bastard Cedar, A
Tithymalus, Spurge, B
Toluifera, A
Tournefortia, 1, 2, 3, 4, 5, 6. A
Toxicodendron, 8, 9. Poison Oak, B
Turnera, 1, 2. A
Vanilla, 1, 2. A
Vinca, 3. Periwinkle, B
Urtica, 9. Nettle, B
Waltheria, 1, 2. A

A CA-

*A* CATALOGUE *of ſuch Medicinal Plants as may be cultivated in the* Engliſh *Gardens, being hardy enough to bear the cold in the open air. Such of them as grow in the fields, and are generally termed* Weeds, *are alſo diſtinguiſhed with their places of growth, ſo that any perſon who is inclinable to cultivate them, may know where to obtain them. The titles of theſe plants are ſuch as have been adopted in the Diſpenſaries, and the figures which are added to them, denote the ſpecies in the body of this work.*

ABrotanum mas anguſtifolium majus. C. B. P. Southernwood. Sp. 1.

Abſinthium vulgare majus. J. B. Common Wormwood. Engliſh. In lanes, and on dunghills. Sp. 1.

Abſinthium Ponticum tenuifolium incanum. C. B. P. Roman Wormwood. Sp. 2.

Abſinthium marinum album. Ger. Sea Wormwood. Engliſh. On the ſea-ſhore. Sp. 13.

Acanthus ſativus vel mollis Virgilii. C. B. P. Bear's-breech. Sp. 1.

Acetoſa pratenſis. C. B. P. Common Sorrel. Engliſh. In meadows, and other paſtures. Sp. 1.

Acetoſa arvenſis lanceolata. C. B. P. Sheep's Sorrel. Engliſh. On dry gravelly ſoils. Sp. 3.

Acetoſa rotundifolia hortenſis. C. B. P. French Sorrel. Sp. 4.

Acorus verus, ſive Calamus Aromaticus officinarum. C. B. P. The true Acorus. Engliſh. In deep ſtanding waters, but pretty rare. Sp. 1.

Adianthum foliis longioribus pulverulentis pediculo nigro. C. B. P. Black Maiden Hair. Engliſh. In joints of old walls, and on the ſides of ſhady banks.

Ageratum foliis ſerratis. C. B. P. Sweet Maudlin. Achillæa. Sp. 8.

Agrimonia officinarum. Inſt. R. H. Agrimony. Engliſh. In woods and ſhady lanes.

Alcea vulgaris major. C. B. P. Vervain Mallow. Engliſh. In paſtures. Malva.

Alchemilla vulgaris. C. B. P. Ladies Mantle. Engliſh. In moiſt paſtures. Sp. 1.

Alkekengi officinarum. Inſt. R. H. Winter Cherry. Phyſalis. Sp. 1.

Allium ſativum. C. B. P. Garlick. Sp. 1.

Alſine media. C. B. P. Chickweed. Engliſh. In every dunghill, and in every garden.

Althæa Dioſcoridis & Plinii. C. B. P. Marſh Mallows. Engliſh. In moiſt lanes in Kent.

Amaranthus maximus. C. B. P. Flower Gentle. Sp. 5.

Ammi majus. C. B. P. Biſhop's Weed. Sp. 1.

Anagallis phœniceo flore. C. B. P. The female Pimpernel. Engliſh. On ploughed lands, but pretty rare. Sp. 2.

Anchuſa puniceis floribus. C. B. P. Alkanet. Lythoſpermum.

Anethum hortenſe. C. B. P. Dill. Sp. 1.

Angelica ſativa. C. B. P. Angelica. Sp. 1.

Anonis ſpinoſa, flore purpureo. C. B. P. Reſt-harrow. Engliſh. On commons, and in other uncultivated places. Ononis. Sp. 1.

Anthora, ſeu Aconitum ſalutiferum. C. B. P. Wholeſome Monkſhood. Aconitum. Sp. 4.

Aparine vulgaris. C. B. P. Clivers, or Gooſe-graſs. Engliſh. Under hedges, &c.

Apium paluſtre, & Apium officinarum. C. B. P. Smallage. Engliſh. In ſtanding waters. Sp. 4.

Apium hortenſe. Ger. Garden Parſley. Sp. 1.

Apium Macedonicum. C. B. P. Macedonian Parſley. Bubon. Sp. 1.

Aquilegia ſylveſtris. C. B. P. Wild Columbine. Engliſh. In woods, but rare. Sp. 1.

Ariſtolochia clematis recta. C. B. P. Creeping Birthwort. Sp. 3.

Ariſtolochia longa vera. C. B. P. Long Birthwort. Sp. 2.

Ariſtolochia rotunda, flore ex purpura nigro. C. B. P. Round Birthwort. Sp. 1.

Artemiſia vulgaris major. C. B. P. Mugwort. Engliſh. On the ſides of fields. Sp. 1.

Arum vulgare. Ger. Wake Robin. Engliſh. In woods, and under hedges. Sp. 1.

Arundo vulgaris, ſive Phragmites Dioſcoridis. C. B. P. The Reed. Engliſh. In deep waters. Sp. 1.

Aſarum vulgare. Park. Aſarabacca. Engliſh. In moiſt ſhady places, but rare. Sp. 1.

Aſclepias flore albo. C. B. P. Swallow-wort, or Tame Poiſon. Sp. 1.

Aſparagus ſativus. C. B. P. Sparagus. Sp. 1.

Aſperula, ſive Rubeola montana odora. C. B. P. Woodroof. Engliſh. In woods and ſhady places. Sp. 1.

Aſphodelus albus ramoſus mas. C. B. P. The true white Aſphodel, or King's Spear. Sp. 2.

Aſphodelus luteus, & flore, & radice. C. B. P. Yellow King's Spear. Sp. 1.

Aſplenium, ſive Ceterach. J. B. Spleenwort, or Miltwaſte. Engliſh. On old walls.

Aſter Atticus cœruleus vulgaris. C. B. P. Blue Italian Starwort. Sp. 2.

Atractylis lutea. C. B. P. Yellow Diſtaff Thiſtle. Carthamus. Sp. 2.

Atriplex hortenſis alba, ſive pallide virens. C. B. P. Garden Orach. Sp. 1.

Atriplex fœtida. C. B. P. Stinking Orach. Engliſh. On dunghills, and in cultivated lands. Chenopodium. Sp. 2.

Balſamita major. Dod. Pempt. Coſtmary, or Ale-coſt. Tanacetum. Sp. 3.

Bardana vulgaris major. Park. Burdock. Engliſh. By the ſides of roads. Arctium. Sp. 1.

Behen album officinarium. J. B. Spatling Poppy. Engliſh. On arable land. Cucubalus. Sp. 2.

Bellis ſylveſtris, caule folioſo, major. C. B. P. Ox-Eye Daiſy. Engliſh. In Corn-fields, and in paſtures. Chryſanthemum. Sp. 2.

Bellis ſylveſtris minor. C. B. P. Daiſy. Engliſh. In Graſs-fields. Sp. 1.

Berberis

Berberis dumetorum. C. B. P. The Berberry, or Pipperidge Bush. English. In some hedges. Sp. 1.

Beta alba vel pallescens, quæ Cicla officinarum. C. B. P. The white Beet. Sp. 2.

Beta rubra vulgaris. C. B. P. the Red Beet. Sp. 3.

Betonica purpurea. C. B. P. Wood Betony. English. In woods, &c. Sp. 1.

Bistorta radice minus intorta. C. B. P. Bistort, or Snakeweed. English. In moist meadows. Sp. 1.

Blitum album majus. C. B. P. White Blites. Amaranthus. Sp. 8.

Blitum rubrum majus. C. B. P. Red Blites. Amaranthus. Sp. 6.

Borago floribus cœruleis. J. B. Borage. English. In arable land. Sp. 1.

Botrys ambrosioides vulgaris. C. B. P. Oak of Jerusalem. Chenopodium. Sp. 4.

Brassica capitata alba. C. B. P. Cabbage. Sp. 1.

Bryonia aspera, sive alba, baccis rubris. C. B. P. Briony. English. Under hedges, and on the sides of banks. Sp. 1.

Bryonia lævis, sive nigra, ramosa. C. B. P. Black Briony. English. In woods, and under hedges. Tamus. Sp. 1.

Buglossum angustifolium majus. C. B. P. Garden Bugloss. Anchusa. Sp. 1.

Buglossum sylvestre minus. C. B. P. Wild Bugloss. English. On arable land. Lycopsis. Sp. 1.

Bugula vulgaris. Park. Bugle. English. In most meadows and woods. Sp. 1.

Buphthalmum cotulæ folio. C. B. P. Ox-eye. Anthemis. Sp. 12.

Bursa pastoris major, folio sinuato. C. B. P. Shepherd's Purse. English. By the sides of paths every where. Sp. 1.

Buxus arborescens. C. B. P. The Box-tree. English. On Box-hill, near Darkin in Surry. Sp. 1.

Calamintha vulgaris, vel officinarum Germaniæ. C. B. P. Mountain Calamint. English. On uncultivated land. Melissa.

Calamintha pulegii odore, sive Nepeta. C. B. P. Calamint with the scent of Pennyroyal. English. On the sides of roads, and other uncultivated places. Melissa.

Calamintha arvensis verticillata. C. B. P. Water Calamint. English. By the sides of ditches, and in most arable land. Mentha.

Calcitrapa flore purpureo. Vaill. The Star Thistle. English. On the sides of banks. Centaurea. Sp. 40. Lin.

Caltha vulgaris. C. B. P. Marigold. Calendula. Sp. 2.

Cannabis sativa. C. B. P. Hemp. English. On dunghills. Sp. 1.

Capparis spinosa, fructu minore, folio rotundo. C. B. P. Caper. Sp. 1.

Cardamine magno flore purpurascente. Inst. R. H. Ladies Smock, or Cuckow-flower. English. In meadows. Sp. 1.

Cardiaca. Inst. R. H. Motherwort. English. By the sides of paths. Sp. 1.

Carduus albis maculis notatus, vulgaris. C. B. P. Our Lady's Thistle. English. On uncultivated places. Sp. 4.

Carlina acaulos, magno flore. C. B. P. The Carline Thistle. Sp. 3.

Carthamus officinarum, flore croceo. Inst. R. H. Saffron-flower, or Bastard Saffron. Sp. 1.

Carui. Cæsalp. Caraway. English. On dunghills, but rare. Carum. Sp. 1.

Caryophillata vulgaris. C. B. P. Avens, or Herb Bennet. English. In woods, and under hedges. Geum. Sp. 1.

Caryophyllus altilis major. C. B. P. Clove Gilliflower. Dianthus. Sp. 5.

Centaurium majus, folio in lacinias plures diviso. C. B. P. Great Centaury. Centaurea. Sp. 3.

Centaurium minus. C. B. P. Centaury. English. In cultivated lands, and in woods. Gentiana. Sp. 1.

Cepa vulgaris. C. B. P. Onion.

Chærophyllum sativum. C. B. P. Chervil. Sp. 5.

Chamædrys vulgo vera existimata. J. B. Germander. English. On chalky lands. Teucrium. Sp. 6.

Chamæmelum nobile, sive Leucanthemum odoratum. C. B. P. Chamomile. English. On commons and heaths. Anthemis. Sp. 2.

Chamæmelum vulgare Leucanthemum Dioscoridis. C. B. P. May Weed, Field Chamomile. English. On arable land, and dunghills. Anthemis. Sp. 2.

Chamæpitys lutea vulgaris, sive folio trifido. C. B. P. Ground Pine. English. On arable land. Teucrium. Sp. 16.

Chelidonium majus vulgare. C. B. P. Celandine. English. In woods and under hedges. Sp. 1.

Chelidonia, rotundifolia minor. C. B. P. Pilewort. English. By the sides of ditches, and other moist places. Ranunculus.

Chenopodium folio triangulo. Inst. R. H. Mercury, or Allgood. English. In lanes and unfrequented places. Sp. 1.

Cicer, sativum. C. B. P. Cicers, or Chich Peas. Sp. 1.

Cichorum sylvestre, sive officinarum. C. B. P. Wild Succory. English. In lanes and commons. Sp. 1.

Cicuta major. C. B. P. Hemlock. English. On the side of banks. Conium. Sp. 1.

Cinara hortensis, foliis aculeatis, & non aculeatis. C. B. P. Artichoke. Sp 1.

Cistus mas, folio oblongo incano. C. B. P. Holy Rose. Sp. 2.

Cistus ladinifera Cretica, flore purpureo. Tourn. Cor. The Gum Cistus. Sp. 9.

Cnicus sylvestris hirsutior, sive Carduus Benedictus. C. B. P. Carduus, or the Blessed Thistle. Sp. 1.

Cochlearia folio subrotundo. C. B. P. Scurvy-grass. Sp. 1.

Cochlearia folio sinuato. C. B. P. Sea Scurvy-grass. English. In salt marshes. Sp. 2.

Conyza major vulgaris. C. B. P. On dry land. Sp. 1.

Conyza minor, flore globoso. C. B. P. Fleabane. English. On chalky uncultivated ground. Inula. 6. Lin. Sp. 1.

Coriandrum majus. C. B. P. Coriander. Sp. 1.

Coronopus sylvestris hirsutior. C. B. P. Buckshorn Plantain. English. On commons and uncultivated places. Plantago. Lin.

Coronopus Ruellii. J. B. Swines Cress. English. On moist commons. Cochlearia. Lin. Sp. 5.

Corylus sylvestris. C. B. P. Hazel. English. In woods. Sp. 1.

Cotula fœtida. Dod. Stinking Chamomile. English. On arable land. Anthemis.

Cotyledon major. C. B. P. Navelwort, or Wall Pennywort. English. On the sides of banks, and upon walls, but rare near London. Sp. 1.

Crithmum, sive fœniculum maritimum minus. C. B. P. Camphire. English. On the rocks by the sea-side. Sp. 1.

Crocus sativus. C. B. P. Saffron. Sp. 1.

Cruciata hirsuta. C. B. P. Crosswort. English. By the sides of hedges. Valantia. Lin.

Cucumis sylvestris asininus dictus. C. B. P. Wild Cucumber. Momordica. Sp. 4.

Cucumis sativus vulgaris. C. B. P. Garden Cucumber. Sp. 1.

Cupressus meta in fastigium convoluta, quæ fœmina Plinii. C. B. P. The common Cypress. Sp. 1.

Cyanus montanus latifolius, vel verbasculum cyanoides. C. B. P. The great Blue Bottle. Centaurea. Sp. 7.

Cyanus minor, sive segetum. C. B. P. The small Blue Bottle. English. Amongst Corn, &c. Centaurea. Sp. 11.

Cyclamen hederæ folio. C. B. P. Sowbread. Sp. 1.

Cynoglossum majus vulgare. C. B. P. Hound's-tongue. English. By hedges sides, and in other uncultivated places. Sp. 1.

Cyperus odoratus, radice longa, sive Cyperus officinarum. C. B. P. Long Cyperus.

Daucus

Daucus foliis fœniculi tenuissimis. C. B. P. Daucus of Crete, or Candy Carrot. Athamanta. Sp. 2.

Daucus vulgaris. Clus. Hist. Wild Carrot, or Bird's-nest. English. On the side of paths in fields, and other uncultivated places. Sp. 1.

Delphinium majus, sive vulgare. Park. Larkspur. In Cambridgeshire plentifully. Sp. 1.

Dens leonis latiore folio. C. B. P. Dandelion. English. On walls, and in Grass fields every where. Leontodon. Sp. 1.

Digitalis purpurea, folio aspero. C. B. P. Fox-glove. English. On the sides of banks, in woods, and in other uncultivated places. Sp. 1.

Dipsacus sativus. C. B. P. The manured Teasel. Cultivated in some western counties in England. Sp. 2.

Dipsacus sylvestris, aut Virga pastoris major. C. B. P. The wild Teasel. English. On dry banks. Sp. 1.

Doronicum radice scorpii. C. B. P. Leopard's-bane. Sp. 1.

Dracunculus polyphyllus. C. B. P. Dragons. Arum. Sp. 8.

Echium vulgare. C. B. P. Viper's Buglosss. English. On fallowed land, and amongst the Corn. Sp. 1.

Elatine folio subrotundo. C. B. P. Fluellin, or female Speedwell. English. On arable land. Antirrhinum. Lin.

Endivia latifolia sativa. C. B. P. Endive. Cichorium. Sp. 4.

Equisetum palustre, longioribus setis. C. B. P. Horse-tail. Eng. By the side of ditches, and other moist places.

Eruca latifolia alba, sativa Dioscoridis. C. B. P. Rocket. Sp. 1.

Eryngium maritimum. C. B. P. Eryngo. English. On the side of sea-shores. Sp. 1.

Erysimum vulgare. C. B. P. Hedge Mustard. English. On walls, and by the way-sides, very common. Sp. 1.

Eupatorium cannabinum. C. B. P. Hemp-leaved Agrimony. English. By the sides of ditches, and standing waters. Sp. 1.

Euphrasia officinarum. C. B. P. Eyebright. English. In commons, and uncultivated fields. Sp. 1.

Faba. C. B. P. The Garden Bean. Sp. 1.

Faba minor, sive Equina. C. B. P. The Horse Bean. Sp. 2.

Filipendula vulgaris, a Molon Plinii. C. B. P. Drop-wort. English. On commons, &c. Spiræa. Sp. 10.

Filix ramosa major, pinnulis obtusis non dentatis. C. B. P. Female Fern. English. On commons and heaths. Sp. 1.

Filix non ramosa dentata. C. B. P. The male Fern. English. On the side of banks, and in woods. Sp. 2.

Fœniculum vulgare Germanicum. C. B. P. Fennel. English. On uncultivated ground. Sp. 1.

Fœniculum dulce. C. B. P. Sweet Fennel. Sp. 3.

Fœnum Græcum sativum. C. B. P. Fenugreek. Trigonella. Sp. 1.

Fragaria vulgaris. C. B. P. Strawberry. English. In woods. Sp. 1.

Frangula, seu Alnus nigra, baccifera. Park. Berry-bearing Alder. English. In moist woods. Sp. 1.

Fraxinella. Clus. Hist. Fraxinella, or white Dittany. Dictamnus. Sp. 1.

Fumaria officinarum, & Dioscoridis. C. B. P. Fumitory. English. On arable land. Sp. 1.

Galega vulgaris. C. B. P. Goat's-rue. Sp. 1.

Galium luteum. C. B. P. Ladies Bedstraw, or Cheese-rennet. English. On the side of banks, in meadows. Sp. 1.

Genista angulosa & scoparia. C. P. B. Broom. English. On commons, &c. Spartium. Sp. 5.

Gentiana major lutea. C. B. P. Gentian, or Fellwort. Sp. 1.

Geranium folio malvæ rotundo. C. B. P. Dove's-foot Crane's-bill. English. On the sides of banks.

Geranium moschatum. C. B. P. Musk Crane's-bill. English. In unfrequented lanes, but rare. Sp. 17.

Geranium Robertianum primum. C. B. P. Herb Robert. English. By hedges.

Glycirrhiza siliquosa, vel Germanica. C. B. P. Liquorice. Sp. 1.

Gnaphalium vulgare majus. C. B. P. Cudweed. English. On commons, &c. Filago. Lin.

Gramen caninum arvense, sive Gramen Dioscoridis. C. B. P. Dog Grass, or Couch Grass. English. On arable land every where.

Gratiola centauroides. C. B. P. Hedge Hyssop. Sp. 1.

Grossularia spinosa sativa. C. B. P. Gooseberry. Sp. 1.

Harmala. Dod. Pemp. Wild Rue. Peganum. Lin. Sp.

Hedera arborea. C. B. P. Ivy. English. Climbing on trees. Sp. 1.

Hedera terrestris vulgaris. C. B. P. Ground Ivy, or Alehoof. English. Under hedges, and on bank-sides. Glechoma. Lin.

Helenium vulgare. C. B. P. Elecampane. Inula. Sp. 1.

Helleborus albus, flore subviridi. C. B. P. White Hellebore. Veratrum. Sp. 1.

Helleborus niger, flore roseo. C. B. P. Black Hellebore. Sp. 3.

Hepatica flore simplici cæruleo. Clus. Hist. Noble Liverwort. Sp. 1.

Herba Paris. Ger. Herb Paris, One-berry, or True-love. English. In shady woods. Paris. Sp. 1.

Herniaria glabra. J. B. Rupturewort. Sp. 1.

Hieracium majus, folio sonchi. C. B. P. Hawkweed. English. On the way-sides, pretty common.

Hordeum distichum. C. B. P. Barley. Sp. 1.

Horminum Sclarea dictum. C. B. P. Clary. Sclarea. Sp. 1.

Horminum sylvestre, lavendulæ flore. C. B. P. Wild Clary. English. On uncultivated fields. Sp. 1.

Hyacinthus oblongo flore cæruleus major. C. B. P. Hair-bells. English. In woods, and under hedges. Sp. 1.

Hyoscyamus albus major. C. B. P. White Henbane. Sp. 1.

Hyoscyamus vulgaris niger. C. B. P. Black Henbane. English. On commons, and uncultivated land. Sp. 1.

Hypericum vulgare. C. B. P. St. Johnswort. English. Under hedges, and by the way-sides. Sp. 1.

Hyssopus officinarum, cærulea seu spicata. C. B. P. Hyssop. Sp. 1.

Jasminum vulgatius, flore albo. C. B. P. Jasmine. Sp. 1.

Iberis latiore folio. C. B. P. Sciatica Cress. Lepidium. Sp. 4.

Imperatoria major. C. B. P. Masterwort. Sp. 1.

Iris alba Florentina. C. B. P. Orris.

Iris vulgaris Germanica, sive sylvestris. C. B. P. Garden Flower-de-luce. Sp. 2.

Iris sylvestris fœtida. Inst. R. H. Stinking Gladwin. English. In woods, and most uncultivated places. Sp. 19.

Iris palustris lutea. Ger. Bastard Acorus. English. In standing waters. Sp. 1.

Isatis sativa vel latifolia. C. B. P. Woad. Sp. 1.

Juniperus vulgaris fruticosa. C. B. P. Juniper. English. On heaths. Sp. 1.

Kali majus, cochleato semine. C. B. P. Glass-wort. Salsola. Sp. 3.

Lactuca sativa. C. B. P. Lettuce. Sp. 1.

Lamium album, non fœtens, folio oblongo. C. B. P. White Archangel. English. Under hedges. Sp. 2.

Lamium purpureum fœtidum, folio subrotundo, sive Galeopsis Dioscoridis. C. B. P. Red Archangel, or Dead Nettle. English. On the sides of banks. Sp. 1.

Lapathum folio acuto plano. C. B. P. Sharp-pointed Dock. English. In fields and uncultivated places. Sp. 4.

Lapathum aquaticum, folio cubitali. C. B. P. The great Water Dock. English. In standing waters. Sp. 3.

Lapathum hortense rotundifolium, sive montanum. C. B. P. Bastard Monks Rhubarb. Rumex. Sp. 2.

Lapathum folio acuto, rubente. C. B. P. Bloodwort. English. On the way-side.

Lapathum hortense, folio oblongo, sive secundum Dioscoridis. C. B. P. Patience. Rumex. Sp. 1.

Lapathum hortense latifolium. C. B. P. True Monks Rhubarb.

Lapathum præstantissimum, Rhabarbarum officinarum dictum. Moris. Rhapontic. Rheum. Sp. 2.

Lavendula angustifolia. C. B. P. Lavender. Sp. 2.

Lavendula latifolia. C. B. P. Lavender Spike. Sp. 1.

Laureola sempervirens, flore viridi, quibusdam Laureola mas. J. B. Spurge Laurel. English. In woods. Daphne. Sp. 2.

Laureola folio deciduo, flore purpureo, officinis. Laureola fœmina. C. B. P. Mezereon, or Spurge Olive. Daphne. Sp. 1.

Laurus vulgaris. C. B. P. The Bay. Sp. 2.

Lens vulgaris. C. B. P. The Lentil. Sp. 1.

Lenticula palustris vulgaris. C. B. P. Duck's Meat. English. On the surface of standing waters every where.

Lepidium latifolium. C. B. P. Dittander, or Pepperwort. English. On uncultivated ground, but not very common. Sp. 1.

Leucoium incanum majus. C. B. P. Stock-gilliflower. Cheiranthus. Sp. 6.

Leucoium luteum vulgare. C. B. P. Wall-flower. English. On old walls and buildings. Cheiranthus. Sp. 3.

Levisticum vulgare. C. B. P. Lovage. Ligusticum. Sp. 1.

Lichen terrestris cinereus. Raii Syn. Ash-coloured Ground Liverwort. English. On heaths and commons.

Ligustrum Germanicum. C. B. P. Privet. English. In hedges. Sp. 1.

Lilium album, flore erecto, & vulgare. C. B. P. The White Lily. Sp. 1.

Lilium convallium album. C. B. P. Lilies of the Valley. English. In shady woods. Convallaria. Sp. 1.

Limonium maritimum majus. C. B. P. Sea Lavender. English. In the salt marshes. Sp. 1.

Linaria vulgaris lutea, flore majore. C. B. P. Toadflax. English. On the side of banks. Sp. 1.

Lingua cervina officinarum. C. B. P. Hart's-tongue. English. On the walls of wells, and other moist places.

Linum sativum. C. B. P. Flax. Sp. 1.

Linum pratense, flosculis exiguis. C. B. P. Mountain or purging Flax. English. In meadows and pastures. Sp. 13.

Lithospermum majus erectum. C. B. P. Gromwill, or Graymill. English. On uncultivated land. Sp. 1.

Lotus hortensis odora. C. B. P. Sweet Trefoil. Trifolium. Sp. 12.

Lunaria racemosa minor. C. B. P. Moonwort. English. On commons and heaths.

Lupinus sativus, flore albo. C. B. P. White Lupine. Sp. 5.

Lupulus mas & fœmina. C. B. P. Hop.

Lycopersicon fructu cerasi. Inst. R. H. Love Apple. Sp. 1.

Lysimachia lutea major. C. B. P. Loosestrife. English. On the side of ditches. Sp. 1.

Majorana vulgaris. C. B. P. Sweet Marjoram. Origanum. Sp. 7.

Malva sylvestris, folio sinuato C. B. P. Mallow. English. On banks and uncultivated places. Sp. 1.

Malva rosea, folio subrotundo. C. B. P. Hollyhock. Alcea. Sp. 1.

Mandragora fructu rotundo. C. B. P. Mandrake. Sp. 1.

Marrubium album vulgare. C. B. P. White Horehound. English. On dry chalky land. Sp. 1.

Marrubium nigrum fœtidum. Ballote Dioscoridis. C. B. P. Black or stinking Horehound. English. On banks, and by the way-side. Ballotte. Sp. 1.

Marum vulgare. Ger. Herb Mastich, or Mastich Thyme. Satureja. Sp. 4.

Marum Syriacum vel Creticum. H. L. Marum, or Syrian Mastich. Teucrium. Sp. 7.

Matricaria vulgaris, vel sativa. C. B. P. Feverfew. Eng. On dunghills, and in unfrequented places. Sp. 1.

Melilotus officinarum Germaniæ. C. B. P. Melilot. English. By the side of cultivated fields. Trifolium. Sp 11.

Melissa hortensis. C. B. P. Balm. Sp. 1.

Mentha angustifolia spicata. C. B. P. Mint, or Spear-mint. Sp. 1.

Mentha rotundifolia palustris, seu aquatica major. C. B. P. Water-mint. English. In ditches and shallow waters. Sp. 11.

Mentha spicis brevioribus & habitioribus, foliis menthæ fuscæ, sapore fervido piperis. Raii Syn. Peppermint. English. In watery places. Sp. 6.

Mentha sylvestris, longiore folio. C. B. P. Horsemint. English. In uncultivated places. Sp. 4.

Mercurialis testiculata sive mas, & spicata, sive fœmina Dioscoridis & Plinii. C. B. P. French Mercury. English. On the way-side. Sp. 2.

Mespilus apii folio, sylvestris, spinosa, sive oxyacantha. C. B. P. The White Thorn, or Hawthorn. English. In hedges. Sp. 4.

Mespilus vulgaris. J. B. The common Medlar. Sp. 1.

Meum foliis anethi. C. B. P. Mew, or Spignel. Athamanta. Sp. 1.

Milium semine luteo vel albo. C. B. P. Millet. Sp. 1.

Millefolium vulgare album. C. B. P. Yarrow, Milfoil, or Nosebleed. English. By the path-sides every where. Achillea. Sp. 1.

Myrrhis magno semine longo sulcato. J. B. Sweet Cicely, or sweet Fern. Scandix. Sp. 5.

Napus sativus. C. B. P. Sweet Navew, or French Turnep. Rapa. Sp. 2.

Napus sylvestris. C. B. P. Wild Navew, or Colefeed. English. On banks. Rapa. Sp. 3.

Nasturtium aquaticum supinum. C. B. P. Water Cress. English. In ditches and standing waters. Sisymbrium. Sp. 1.

Nasturtium hortense vulgatum. C. B. P. Garden Cress. Sp. 1.

Nepeta major vulgaris. Park. Nep, or Cat-mint. English. On chalky dry fields. Sp. 1.

Nicotiana major latifolia. C. B. P. Tobacco. Sp. 2.

Nigella flore minore simplici candido. C. B. P. Fennel-flower. Sp. 3.

Ocymum vulgatius. C. B. P. Basil. Sp. 1.

Olea sativa. C. B. P. The Olive-tree. Sp. 1.

Ophioglossum vulgatum. C. B. P. Adder's-tongue. English. In moist meadows.

Orchis morio mas, foliis maculatis. C. B. P. Male Satyrium, or Fools-stones. English. In woods and moist meadows. Sp. 2.

Orchis morio fœmina. C. B. P. Female Satyrium. English. In meadows. Sp. 1.

Origanum sylvestre, cunila bubula Plinii. C. B. P. Wild Marjoram English. On dry uncultivated places. Sp. 1.

Origanum onites. C. B. P. Origany of Crete. Sp. 6.

Orobus siliquis articulatis, semine majore. C. B. P. Bitter Vetch. Ervum. Sp. 5.

Osmunda regalis. Ger. Flowering Fern, or Osmundroyal. Sp. 1.

Oxys. Inst. R. H. Wood Sorrel, English. In moist woods. Oxalis. Sp. 1.

Pæonia fœmina, flore rubro majore. C. B. P. Piony. Sp. 2.

Pæonia folio nigricante splendido, quæ mas. C. B. P. Male Piony. Sp. 1.

Panax coloni, & marrubium aquaticum acutum. Ger. Clowns All-heal. English. By the sides of ditches, and other watery places. Stachys. Sp. 8.

Panax Pastinacæ folio. C. B. P. Hercules's All-heal. Pastinaca. Sp. 3.

Paniculum Germanicum, sive panicula minore. C. B. P. Panic. Sp. 1.

Papaver hortense, semine albo. C. B. P. White Poppy. Sp. 9.

Papaver hortense, semine nigro. C. B. P. Black Poppy. Sp. 8.

Papaver erraticum, Rhoias Dioscoridi, Theophrasto, Plinio. C. B. P. Red Poppy. English. On arable land. Sp. 1.

Parietaria officinarum. C. B. P. Pellitory of the wall. English. On walls. Sp. 1.

Paronychia rutaceo folio. Ger. Rue-leaved Whitlow Grass. Eng. On walls and buildings. Saxifraga. Lin.

Pastinaca sativa latifolia. C. B. P. Parsnep. Sp. 2.

Pastinaca sylvestris latifolia. C. B. P. Wild Parsnep. English. On uncultivated places. Sp. 1.

Pentaphylloides argentina dicta. Raii Syn. Silver Weed, or wild Tansey. English. On moist commons, and by the sides of ditches. Potentilla. Sp. 1.

Perfoliata vulgatissima, sive arvensis. C. B. P. Thorough Wax. English. On arable land. Bupleurum. Sp. 1.

Periclymenum non perfoliatum Germanicum. C. B. P. Honeysuckle. English. In hedges. Sp. 5.

Persicaria mitis maculosa. C. B. P. Spotted Arsesmart. English. On dunghills. Sp. 2.

Persicaria urens, seu Hydropiper. C. B. P. Arsesmart, or Water Pepper. English. By the side of ditches, and in other watery places. Sp. 1.

Petasites major & vulgaris. C. B. P. Butter-bur. English. By ditch-sides. Sp. 1.

Peucedanum Germanicum. C. B. P. Hog's-fennel, or Sulphur-wort. English, but very rare. Sp. 1.

Phellandrium, vel cicutaria aquatica quorundam. J. B. Water Hemlock. English. In standing waters.

Pilosella major repens hirsuta. C. B. P. Mouse-ear. English. On walls and dry gravelly commons.

Pimpinella sanguisorba minor. C. B. P. Burnet. English. On chalky ground. Potentilla. Sp. 1.

Pimpinella saxifraga major, umbella candida. C. B. P. Burnet Saxifrage. English. Under hedges, and by the side of fields. Sp. 2.

Pimpinella saxifraga major altera. C. B. P. The lesser Burnet Saxifrage. English. In pastures. Sp. 1.

Pisum arvense, flore candido, fructu rotundo albo. C. B. P. Peas. Sp. 1.

Plantago latifolia sinuata. C. B. P. Plantain. English. In moist places.

Plantago angustifolia major. C. B. P. Narrow-leaved Plantain, or Ribwort. English. On dunghills, and by the way-side every where.

Plumbago quorundam. Clus. Hist. Toothwort, or Leadwort. Sp. 1.

Polium maritimum erectum Monspeliacum. C. B. P. Poley Mountain. Sp. 4.

Polium angustifolium Creticum. C. B. P. Poley of Crete. Sp. 5.

Polygonatum latifolium vulgare. C. B. P. Solomon's Seal. English. In some woods, but not common. Convallaria. Sp. 3.

Polygonum latifolium. C. B. P. Knot-grass. English. In uncultivated places.

Polypodium vulgare. C. B. P. Polypody. English. On shady banks and walls. Sp. 1.

Porrum commune capitatum. C. B. P. The Leek. Sp. 1.

Portulaca latifolia, seu sativa. C. B. P. Purslane. Sp. 1.

Primula veris. Inst. R. H. Primrose. English. In woods, and under hedges. Primula Sp. 1.

Primula veris major. Ger. Cowslip, or Paigles. English. In meadows. Primula. Sp. 2.

Prunella major, folio non dissecto. Self-heal. English. In meadows, and pasture land. Sp. 1.

Prunus sylvestris. C. B. P. The Sloe-tree. English. In hedges. Sp. 1.

Psyllium majus erectum. C. B. P. Fleawort. Sp. 1.

Ptarmica vulgaris, folio longo serrato, flore albo. J. B. Sneezewort. English. In woods, and under hedges. Achillea. Sp. 10.

Pulegium latifolium. C. B. P. Pennyroyal. English. On moist commons. Sp. 1.

Pulegium angustifolium. C. B. P. Hart's Pennyroyal. Sp. 3.

Pulmonaria maculosa latifolia. Park. Spotted Lungwort, or Jerusalem Sage. Sp. 1.

Punica sativa. Inst. R. H. Pomegranate. Sp. 1.

Punica sylvestris, flore pleno majore. Inst. R. H. The Wild Pomegranate with a large double flower. Sp. 2.

Pyrethrum Hispanicum. C. B. P. Pellitory of Spain. Anthemis. Sp. 11.

Pyrola rotundifolia major. C. B. P. Winter Green. In shady woods in the north of England. Sp. 1.

Quinquefolium majus repens. C. B. P. Cinquefoil. English. In pastures. Potentilla. Lin.

Ranunculus pratensis, radice verticilli modo rotundo. C. B. P. Crowfoot. English. In pastures.

Ranunculus apii folio, lævis. C. B. P. Marsh Crowfoot. English. Very common in standing waters.

Rapa rotunda sativa. C. B. P. Turnep. Sp. 1.

Raphanus minor oblongus. C. B. P. Radish. Sp. 1.

Raphanus rusticanus. C. B. P. Horse-radish. English. On dunghills, and by the sides of fields. Cochlearia. Sp. 5.

Rhamnus catharticus. C. B. P. Buckthorn. English. In hedges. Sp. 1.

Rhus folio ulmi. C. B. P. Sumach. Sp. 1.

Ribes vulgaris, fructu rubro. H. L. Red Currants. Sp. 1.

Ros solis folio rotundo. C. B. P. Rosa-solis, or Sundew. English. On commons where there are bogs.

Rosa alba vulgaris major. C. B. P. The White Rose. Sp. 16.

Rosa Damascena, flore pleno. Hort. Eyst. The Damask Rose. Sp. 15.

Rosa rubra multiplex. C. B. P. The Red Rose. Sp. 20.

Rosa sylvestris vulgaris, flore odorato, incarnato. C. B. P. The Dog Rose, or Wild Briar. English. In hedges. Sp. 1.

Rosmarinus hortensis, angustiori folio. C. B. P. Rosemary. Sp. 1.

Rubia tinctorum sativa. C. B. P. Madder. Sp. 1.

Rubis vulgaris, sive rubus fructu nigro. C. B. P. The Bramble, or Blackberry. English. Very common in hedges. Sp. 1.

Rubus Idæus spinosus, fructu rubro. J. B. Raspberry Bush. English. In some woods. Sp. 3.

Ruscus myrtifolius aculeatus. Inst. R. H. Knee-holm, or Butcher's Broom. English. In woods, and on commons. Sp. 1.

Ruscus latifolius, fructu folio innascente. Inst. R. H. Horse-tongue, or Double-tongue. Sp. 2.

Ruscus latifolius, fructu folio insidente. Inst. R. H. The Bay of Alexandria. Sp. 3.

Ruta hortensis latifolia. C. B. P. Rue. Sp. 1.

Ruta muraria. C. B. P. White Maiden Hair, or Wall Rue. English. On walls, and other buildings, in moist places.

Sabina folio tamarisci Dioscoridis. C. B. P. Savin. Sp. 1.

Salvia nigra. C. B. P. Common Red Sage. Sp. 1.

Salvia minor, aurita & non aurita. C. B. P. Sage of Virtue. Sp. 3.

Sambucus fructu in umbella nigro. C. B. P. Elder, English. In hedges. Sp. 1.

Sambucus racemosa rubra. C. B. P. Mountain Elder. Sp. 3.

Sambucus humilis, sive ebulus. C. B. P. Dwarf Elder, or Danewort. English, but not common near London. Sp. 4.

Sanicula officinarum. C. B. P. Sanicle. English. In woods and shady places.

Santolina foliis teretibus. R. H. Lavender-cotton. Sp. 1.

Saponaria major lævis. C. B. P. Sopewort. English. On the side of banks. Sp. 1.

Satureja hortensis, sive Cunila sativa Plinii. C. B. P. Savory. Sp. 1.

Satureja montana durior. C. B. P. Winter Savory. Sp. 3.

Saxifraga rotundifolia alba. C. B. P. White Saxifrage. English. In meadows. Sp. 1.

Scabiosa pratensis hirsuta, quæ officinarum. C. B. P. Scabious. English. On arable land. Sp. 1.

Scabiosa radice succisa, flore globoso. Raii Syn. Devil's Bit, or Wood Scabious. English. In woods, and under hedges. Sp. 2.

Scordium

15L2

Scordium legitimum. Park. Scordium, or Water Germander. English. In watery places, but not common. Teucrium. Sp. 13.

Scordium alterum, sive salvia agrestis. C. B. P. Wood Sage. English. In woods, and on heaths. Teucrium. Sp. 12.

Scorzonera latifolia sinuata. C. B. P. Scorzonera, or Viper Grass. Sp. 1.

Scrophularia nodosa fœmina. C. B. P. Figwort. English. In woods and shady places. Sp. 1.

Scrophularia aquatica major. C. B. P. Water Figwort, or Water Betony. English. By the side of ditches. Sp. 2.

Secale hybernum vel majus. C. B. P. Rye. Sp. 1.

Sedum majus vulgare. C. B. P. Housleek. English. On house-tops and walls. Sempervivum. Sp. 12.

Sedum minus teretifolium album. C. B. P. Lesser Housleek. English. On walls, &c. Sp. 1.

Sedum minus vermiculatum acre. C. B. P. Wall Pepper, or Stone-crop. English. On walls and buildings. Sp. 5.

Senecio minor vulgaris. C. B. P. Groundsel. English. On walls, and on arable lands, and also on bye-paths every where.

Serpyllum vulgare minus. C. B. P. Mother-of-thyme. English. On heaths and commons. Thymus. Sp. 6.

Seseli pratense, Silaus forte Plinio. C. B. P. Meadow Saxifrage. English. In moist pastures.

Siler montanum majus. Mor. Umb. Siler Mountain, Bastard Lovage, or common Hartwort. Sp. 1.

Sinapi rapi folio. C. B. P. Mustard. English. On dunghills, &c. Sinapis. Sp. 2.

Sinapi hortense, semine albo. C. B. P. White Mustard Sinapis. Sp. 1.

Sisarum Germanorum. C. B. P. Skirret. Sium. Sp. 4.

Sium latifolium. C. B. P. Broad-leaved Water Parsnep. English. In standing waters. Sp. 1.

Sium aromaticum, Sison officinarum. Inst. R. H. The German, or common Amomum. English. Under hedges, and in shady lanes. Sison. Sp. 1.

Smyrnium. Matth. Alexanders. English. By the side of fields, but not common. Sp. 1.

Solanum hortense. Ger. Nightshade. English. On dunghills. Sp. 1.

Solanum scandens, seu dulcamara. C. B. P. Woody Nightshade. English. In hedges. Sp. 8.

Soldanella maritima minor. C. B. P. Seacole-wort, or Sea Bindweed. English. On the sea-shore. Convolvulus. Sp. 29.

Sonchus asper laciniatus. C. B. P. Prickly Sowthistle. English. On arable land.

Sonchus lævis laciniatus latifolius. C. B. P. Smooth Sowthistle. English. With the former.

Sophia chirurgorum. Ger. Flixweed. English. On arable land. Sisymbrium. Sp. 6.

Sorbus sativa. C. B. P. The true Service. Sp. 2.

Sorbus torminalis. Ger. The wild Service. English. In hedges. Cratægus. Sp. 2.

Spinachia vulgaris, capsula seminis aculeata. Inst. Spinach. Sp. 1.

Staphysagria. Matth. Staves-acre. Delphinium. Sp. 11.

Stœchas purpurea. C. B. P. Stœchas, French Lavender, or Stick-a-dore. Sp. 1.

Stœchas citrini tenuifolia Narbonensis. J. B. Goldylocks. Gnaphalium. Sp. 1.

Stramonium fructu spinoso oblongo, flore albo. Inst. R. H. Thorn-apple. English. On dunghills. Datura. Sp. 1.

Symphytum consolida major fœmina, flore albo, vel pallide luteo. C. B. P. Comfrey. English. In uncultivated places. Sp. 1.

Tamariscus Narbonensis. Lob. Tamarisk. Sp. 1.

Tanacetum vulgare luteum. C. B. P. Tansey. English. In unfrequented lanes. Sp. 1.

Telephium vulgare. C. B. P. Orpine. English. In woods, and moist land. Sedum. Sp. 14.

Thapsia Carotæ folio. C. B. P. Deadly Carrot. Sp. 3.

Thlaspi arvense, siliquis latis. C. B. P. Treacle Mustard. English. In arable land, but rare. Sp. 2.

Thlaspi arvense, vaccariæ incano folio, majus. C. B. P. Mithridate Mustard. English. In arable land, and near hedges. Sp. 1.

Thuya Theophrasti. C. B. P. Tree of Life. Sp. 1.

Thymelæa foliis lini. C. B. P. Spurge-flax. Daphne. Sp. 7.

Thymus vulgaris, folio tenuiore. C. B. P. Thyme. Sp. 2.

Tithymalus latifolius, Cataputia dictus. H. L. Garden Spurge. Euphorbia. Sp. 18.

Tithymalus palustris fruticosus. C. B. P. German Spurge, or greater Esula. Euphorbia. Sp. 22.

Tithymalus foliis pini, forte Dioscoridis Pityusa. C. B. P. The lesser Esula. Euphorbia. Sp. 27.

Tormentilla sylvestris. C. B. P. Tormentil. English. On heaths. Sp. 1.

Tragacantha. C. B. P. Goat's-thorn. Sp. 1.

Trichomanes, sive Polytrichum officinarum. C. B. P. Maiden-hair. English. On walls, and the side of shady banks. Sp. 1.

Trifolium pratense purpureum majus. C. B. P. Trefoil. English. In pastures. Sp. 1.

Trifolium arvense humile spicatum, sive Lagopus. C. B. P. Hare's-foot Trefoil. English. On arable land. Sp. 9.

Trifolium palustre. C. B. P. Bog-bean, or Marsh Trefoil. English. On bogs. Menyanthes.

Triticum hybernum, aristis carens. C. B. P. Wheat. Sp. 1.

Tussilago vulgaris. C. B. P. Coltsfoot. English. On barren land. Sp. 1.

Valeriana hortensis, phu folio olusatri Dioscoridis. C. B. P. Valerian. Sp. 1.

Valeriana palustris minor. C. B. P. The lesser Valerian. English. On moist meadows, and in woods.

Valeriana sylvestris major, foliis angustioribus. Rand. Wild Valerian. English. On chalky closes. Sp. 2.

Verbascum mas latifolium luteum. C. B. P. Mullein. English. On dry banks, and sandy land. Sp. 1.

Verbena communis, cæruleo flore. C. B. P. Vervain. English. Near farm-yards. Sp. 1.

Veronica mas supina, & vulgatissima. C. B. P. Speedwell, or Paul's Betony. English. In woody places. Sp. 1.

Veronica aquatica major, folio subrotundo. Mor. Hist. Brooklime. English. In standing water. Sp. 16.

Vicia sativa vulgaris, semine nigro. C. B. P. Vetch, or Tare. Sp. 5.

Vinca Pervinca vulgaris. Ger. Periwinkle. English. In hedges and woods. Vinca. Sp. 1.

Viola martia purpurea, flore simplici odoro. C. B. P. Violet. English. In woods, and near hedges. Sp. 1.

Viola tricolor hortensis repens. C. B. P. Heart's-ease, or Pansies, common in the north of England. Sp. 10.

Virga aurea angustifolia minus serrata. C. B. P. Golden Rod. English. In woods, and near hedges. Solidago. Sp. 1.

Vitex foliis angustioribus, cannabis modo dispositis. C. B. P. The Chaste-tree. Sp. 1.

Vitis Idæa, foliis oblongis crenatis, fructu nigricante. C. B. P. Bilberry. English. On moory heaths. Vaccinium. Sp. 1.

Vitis vinifera. C. B. P. The Vine. Sp. 1.

Ulmaria. Clus. Meadow-sweet, or Queen of the Meadows. English. In moist meadows, and by the side of ditches. Spiræa. Sp. 12.

Urtica urens maxima. C. B. P. Nettle. English. By hedges and banks. Sp. 1.

Urtica urens, pilulas ferens prima Dioscoridis, semine lini. C. B. P. The Roman Nettle. Sp. 1.

Xanthium. Dod. The lesser Burdock. Sp. 1.

Zea briza dicta, vel Monococcos Germanica. C. B. P. Spelt, or St. Peter's Corn.

*A* CATALOGUE *of the large Trees which are admitted in the* London Difpenfary, *as medicinal Plants, but generally grow too large to be admitted into fmall gardens.*

ABIES mas, conis furfum fpectantibus. C.B.P. The Silver Fir. Sp. 1.

Abies tenuiore folio, fructu deorfum inflexo. C.B.P. The common, or Spruce Fir, or Pitch-tree. Sp. 2.

Amygdalus fativa. C. B. P. The Almond-tree. Sp. 1.

Armeniaca fructu majore. Inft. R. H. The Apricot. Sp. 1.

Betula. C. B. P. The Birch-tree. Englifh. In woods. Sp. 1.

Caftanea fativa. C. B. P. The Cheftnut-tree. Sp. 1.

Cerafus major ac fylveftris, fructu fubdulci, nigro colore inficiente. C. B. P. The Black Cherry. Englifh. In hedge-rows, and fome woods. Sp. 2.

Cerafus fativa rotunda, rubra & acida. C.B.P. The Red Cherry. Sp. 1.

Cydonia fructu oblongo læviori. Inft. R. H. The Quince-tree. Sp. 1.

Ficus communis. C. B. P. The Fig-tree. Sp. 1.

Fraxinus excelfior. C. B. P. The Afh-tree. Englifh. In hedge-rows. Sp. 1.

Fraxinus rotundiore folio. C. B. P. The Manna Afh. Sp. 2.

Ilex aculeata cocciglandifera. C. B. P. The Kermes Oak. Quercus. Sp. 18.

Larix folio deciduo, conifera. J. B. The Larch-tree. Sp. 1.

Malus fylveftris, acido fructu albo. Inft. R. H. The Crab-tree. Englifh. In hedges. Sp. 1.

Malus fativa. Raii Syn. The Apple-tree. Sp. 2.

Morus fructu nigro. C. B. P. The Mulberry. Sp. 1.

Nux juglans, five regia vulgaris. C. B. P. The Walnut. Juglans. Sp. 1.

Perfica molli carne, & vulgaris, viridis & alba. C. B. P. The Peach-tree. Sp. 1.

Pinus fativa. C. B. P. The Pine-tree. Sp. 2.

Pinus fylveftris. C. B. P. The wild Pine, or Pinafter. Sp. 1.

Populus nigra. C. B. P. The Black Poplar. Englifh. In hedge-rows. Sp. 3.

Pyrus fativa. C. B. P. The Pear-tree. Sp. 1.

Quercus latifolius fœmina. C. B. P. The Oak-tree. Englifh. In forefts and woods. Sp. 1.

Salix vulgaris alba arborefcens. C. B. P. The Willow. Englifh. By the fide of rivers. Sp. 1.

Suber latifolium, perpetuo virens. C. B. P. The Cork-tree. Quercus. Sp. 20.

Tilia fœmina, folio majore. C. B. P. The Lime-tree. Sp. 1.

Ulmus campeftris & Theophrafti. C. B. P. The Elm-tree. Englifh. In hedge-rows. Sp. 3.

*F I N I S.*

*The* READER *is desired to correct the Mistakes, as also to add to the trivial Titles where they are wanting. The Figures after the generical Titles denote the Species.*

ACANTHUS 2. lege (*Niger*)
Acanthus 3. lege (*Dioscordis*)
Acer 10. lege (*Creticum*)
Acetosa 3. lege (*Scutata*)
Acetosa 4. lege (*Digyna*)
Adansonia, add (*Baobob*)
Adenanthera, add (*Pavonica*)
Adoxa, add (*Moschatellina*)
Agave 2. lege (*Virginica*)
Alchemilla 2. add (*Hybrida*)
Aloe 8. lege (*Brevifolia*)
Aloe 10. add (*Humilis*)
Aloe 13. lege (*Linguiformis*)
Amethystea, add (*Cærulea*)
Amomum 1. add (*Zinziber*) and lege *ovata* instead of *ovato*
Amomum 2. add (*Zerumbet*)
Amygdalus 3. lege (*Sativa*)
Ananas 3. lege (*Glaber*)
Anguria, add (*Citrullus*)
Annona 2. lege (*Muricata*)
Arctium 3. lege (*Tomentosum*)
Arum 13. lege (*Betifolium*)
Arum 15. lege (*Esculentum*)
Asparagus 1. add (*Sativa*)
Asperugo, add (*Procumbens*)
Aster 17. lege (*Glaber*)
Astragalus 2. lege (*Hamosa*)
Atraphaxis 1. add (*Spinosa*)
Atraphaxis 2. add (*Undulata*)
Atriplex 1. add (*Hortensis*)
Atriplex 2. add (*Halimus*)
Atriplex 3. add (*Portulacoides*)
Avena, add (*Sativa*)
Aurantium 1. lege (*Acre*)
Basteria, add (*Calycanthus*)
Bellonia, add (*Aspera*)
Bloodwort, see Rumex
Bombax 3. lege (*Villosum*)
Cachrys 1. lege (*Trifida*)
Cæsalpinia 2. lege (*Crista*)
Cannabis, add (*Sativa*)
Capparis 5. lege (*Racemosa*)
Capparis 8. lege (*Laurifolia*)
Capparis 10. lege (*Triflora*)
Cassia 7. lege (*Bicapsularis*)
Catesbeæ, add (*Spinosa*)
Cecropia, add (*Peltata*)
Cerinthe 2. lege (*Glaber*)
Chamærops, lege (*Humilis*)
Cheiranthus 2. lege (*Integrifolius*)
Cheiranthus 4. lege (*Angustifolius*)
Cheiranthus 9. lege (*Glaber*)
Cheiranthus 15. lege (*Sinuatus*)
Chionanthus, add (*Virginica*)
Chironia 1. add (*Frutescens*)
Chironia 2. add (*Baccifera*)
Cissampelos, lege (*Pareira*)
Cistus 3. lege (*Brevifolius*)
Cleonia, add (*Lusitanica*)
Cliffortia 1. lege (*Illicifolia*)
Coix 2. lege (*Angulata*)
Convolvulus 2. lege (*Serpens*)
Convolvulus 11. lege (*Glaber*)
Conyza 3. lege (*Candida*)
Conyza 5. lege (*Tomentosa*)
Conyza 6. lege (*Salicifolia*)
Conyza 12. lege (*Trinervia*)
Conyza 17. lege (*Odorata*)
Corchorus 4. lege (*Tetragona*)
Corchorus 5. lege (*Linearis*)
Corchorus 6. lege (*Bifurcatus*)
Corchorus 8. lege (*Hirsutus*)
Coreopsis 5. lege (*Radiata*)
Cotyledon 2. lege (*Spinosa*)
Cotyledon 6. lege (*Ramosissima*)
Croton 7. lege (*Populifolium*)
Croton 9. lege (*Althæifolium*)
Croton 10. lege (*Salvifolium*)
Cupressus 2. lege (*Horizontalis*)
Cytisus 4. lege (*Sessilis*)
Cytisus 5. lege (*Hirsutus*)
Delphinium 2. lege (*Ajacis*)
Dianthus 9. lege (*Ferrugineus*)
Digitalis 4. lege (*Grandiflora*)
Diosma 1. lege (*Oppositifolia*)
Ebenus, add (*Cretica*)
Eleagnus 1. lege (*Spinosa*)
Epigea, add (*Repens*)
Erica 4. lege (*Ciliaris*)
Eryngium 5. lege (*Pallescens*)
Euonymus 4. lege (*Pinnatus*)
Ficus 2. lege (*Sycamorus*)
Ficus 6. lege (*Maxima*)
Galeopsis 5. lege (*Orientalis*)
Gentiana 10. lege (*Perfoliata*)
Gladiolus 5. lege (*Angustifolius*)
Gramen 1. add (*Repens*)
Gramen 2. add (*Perenne*)
Gramen 3. add (*Bulbosa*)
Grewia 2. lege (*Africana*)
Grossularia 1. lege (*Reclinata*)
Gundelia, lege (*Glabra*)
Helianthemum 3. lege (*Pilosum*)
Helianthus 2. lege (*Multiflorus*)
Helianthus 4. lege (*Strumosus*)
Helicteres 2. lege (*Brevior*)
Hermannia 5. lege (*Trifoliata*)
Hibiscus 8. lege (*Vitifolius*)
Hibiscus 20. lege (*Africanus*)
Horminum 1. lege (*Verbenaceum*)
Horminum 2. lege (*Lyrata*)
Hyacinthus 1. lege (*Nonscriptus*)
Hyacinthus 3. lege (*Campanulatus*)
Hyacinthus 5. lege (*Amethystinus*)
Hypericum 4. add (*Canariense*)
Hyssopus 3. lege (*Altissima*)
Jatropha 2. lege (*Quinquelobata*)
Jatropha 5. lege (*Vitifolia*)
Jatropha 6. lege (*Aconitifolia*)
Inula 7. lege (*Oculus*)
Juncus 4. lege (*Conglomeratus*)
Juniperus 2. lege (*Suecica*)
Lantana 2. lege (*Inermis*)
Lathyrus 4. lege (*Parisiensis*)
Lathyrus 7. lege (*Hirsutus*)
Lathyrus 14. lege (*Magniflorus*)
Lathyrus 19. lege (*Americanus*)
Laurus 2. lege (*Undulata*)
Laurus 8. lege (*Enervia*)
Limon 2. lege (*Spinosus*)
Limon 3. lege (*Racemosus*)
Lotus 3. lege (*Glaber*)
Lotus 5. lege (*Creticus*)
Lupinus 4. lege (*Hirsutus*)
Lupulus, lege (*Humilus*)
Lychnis 3. lege (*Diœcia*)
Mammea, add (*Americana*)
Martynia 3. lege (*Louisianica*)
Medicago 3. lege (*Tornata*)
Melastoma 1. lege (*Plantaginifolia*)
Melastoma 9. lege (*Petiolata*)
Melongena 2. lege (*Teres*)
Menispermum 3. lege (*Carolinianum*)
Mentha 10. lege (*Chalepensis*)
Mespilus 4. lege (*Cordifolia*)
Mimosa 4. lege (*Dealbata*)
Morus 2. lege (*Siciliana*)
Muscari 1. lege (*Botryoides*)
Muscari 2. lege (*Comosum*)
Muscari 3. lege (*Racemosum*)
Muscari 4. lege (*Monstrosum*)
Muscari 5. lege (*Orchioides*)
Ophrys 1. lege (*Nidus avis*)
Ophrys 2. lege (*Cordata*)
Orchis 8. lege (*Conopsea*)
Origanum 12. lege (*Hybridum*)
Ornithopus 2. lege (*Nodosus*)
Orobus 8. lege (*Venetus*)
Palma 5. lege (*Gracilis*)
Panicum 4. lege (*Alopecurodeum*)
Passiflora 6. lege (*Olivæformis*)
Phlomis 10. lege (*Flavescens*)
Phlox 5. lege (*Paniculata*)
Physalis 9. dele *c*
Piper 2. lege (*Pellucidum*)
Piper 4. lege (*Humile*)
Piper 6. lege (*Laurifolium*)
Prenanthes 4. lege (*Amplexicaulis*)
Prunella 7. lege (*Novæ Angliæ*)
Psoralea 7. lege (*Humilis*)
Raphanus 3. lege (*Orbicularis*)
Raphanus 5. lege (*Chinensis*)
Rapunculus 5. lege (*Orbicularis*)
Rhamnus 3. lege (*Longifolius*)
Rhamnus 4. lege (*Africanus*)
Rubus 4. lege (*Glaber*)
Rubus 8. lege (*Saxatilis*)
Rudbeckia 6. lege (*Digitata*)
Rumex 2. lege (*Alpinus*)
Rumex 11. lege (*Chalepensis*)
Ruscus 5. lege (*Trifoliatus*)
Ruta 5. lege (*Ciliata*)
Salicornia 2. lege (*Perennis*)
Salsola 3. lege (*Soda*)
Sambucus 5. lege (*Humilis*)
Saponaria 4. lege (*Hispanica*)
Scabiosa 9. lege (*Virga pastoris*)
Scabiosa 13. lege (*Ochroleuca*)
Scabiosa 18. lege (*Incisa*)
Scabiosa 19. lege (*Fimbriata*)
Scrophularia 4. lege (*Betonicæfolia*)
Sesasum, lege Sesamum
Sideroxylum 2. lege (*Oppositifolium*)
Sisyrinchium 2. lege (*Angustifolium*)
Sisyrinchium 3. lege (*Bulbosum*)
Smilax 11. lege (*Humilis*)
Solidago 15. lege (*Hirsutissima*)
Solidago 11. lege (*Humilis*)
Solidago 20. lege (*Carnosa*)
Stachys 8. lege (*Palustris*)
Stœchas 2. lege (*Pedunculata*)
Stœchas 3. lege (*Dentata*)
Taxus, lege (*Baccata*)
Thymus 6. lege (*Glaber*)
Toxicodendron 4. lege (*Pinnatifolium*)
Toxicodendron 8. lege (*Arboreum*)
Tragia 2. lege (*Involucrata*)
Vaccinium 3. lege (*Pensilvanicum*)
Vanilla 3. lege (*Axillaris*)
Vitex 3. lege (*Indica*)
Vitis 4. lege (*Laciniosa*)
Ulmus 2. lege (*Scaber*)
Ulmus 3. lege (*Sativa*)
Ulmus 4. lege (*Glaber*)
Ulmus 5. lege (*Hollandica*)
Uvularia 1. lege (*Amplexicaulis*)
Zea 3. lege (*Vulgaris*)